ARKANSAS CORN AND SORGHUM PROMOTION BOARD MEETING—DAY 1
Zoom Option

Minutes

February 3, 2025
3:00 p.m.

Members Present in Person: Kenny Falwell, Patrick "Matt" Smith, Trent Dabbs, Tommy Young, William "Perry" Galloway, and Matt Gammill

Members Present via Zoom: Jason Felton

Members Absent: None

WELCOME AND INTRODUCTIONS
Chairman Kenny Falwell commenced the promotion board meeting at 3:00 p.m. and welcomed all members and guests. Members and staff introduced themselves and a quorum was established by Department staff.

ADMINISTRATIVE & FINANCIAL REPORTS
Chairman Falwell then asked members if there was anything they desired to amend within the meeting agenda.

Motion to approve the meeting agenda as-is; moved by Matt Smith, seconded by Perry Galloway. Motion carried.

Administrator Scott Bray then presented the minutes from the board's previous meeting held on November 12th, 2024, providing a brief overview.

Motion to approve the November 12, 2024, meeting minutes; moved by Tommy Young, seconded by Trent Dabbs. Motion carried.

Chairman Falwell then asked Mr. Inoussa Zaki, Chief Financial Officer for the AR Department of Agriculture to present the board's expenses and financial reports.

Zaki reminded the board that they need a motion to approve reimbursement for travel for the calendar year 2025.

Motion to approve all board travel for 2025; moved by Matt Smith, seconded by Trent Dabbs. Motion carried.

Zaki then presented the board's financial report period that ended December 31st, 2024, stating that the board started 2025, with $1,792,074 total. **ATTACHMENT 1**

In total gross collections, for the period between July 1, 2024, through December 31, 2024, totaled up to $541,514: $525,817 of which was for corn collections, and $15,697 of which was for grain sorghum collections.

The total transfer to the board netted to approximately $525,268, for a total revenue value of $2,317,342 for this July 1, 2024, through December 31, 2024, reporting period.

Total expenditures for this reporting period were around $496,403.

Zaki then stated that the board was looking at around $1.7 Million available to fund future projects.

Member Matt Smith asked how these numbers compare with the previous year. Zaki answered that the numbers are consistent with the previous year, leading to some discussion.

Chairman Falwell asked Zaki if these numbers included the University of Arkansas Division of Agriculture (UADA) interest bearing account that is holding around $400,000. Zaki announced that that was not included. Zaki said that would put the total of around $2 Million to fund future projects, leading to some discussion.

Chairman Falwell asked the board what the plan was for that interest bearing account, further asking the board if they plan on leaving this money in the account indefinitely. Member Dabbs mentioned that he does not have a problem leaving the money in the account as-is.

Discussion ensued. Dr. Slaton said that the interest is placed in high earning certificate of deposit (CD) account, adding that no money has been spent from the interest funds. He further added that with the AR Rice Promotion Board, researchers that need equipment updated from these funds would submit a request for funding. Discussion ensued.

Member Young asked Zaki if the board has more money than they typically do to fund future projects. Zaki agreed.

Zaki also provided a 2024-2025 board approved funding report. He added that last year the board funded projects for a total of $1.2 million, with $192,000 spent on promotions and $1 million spent on research projects.

He added that for 2025-2026 funding, so far, $249,000 for promotion, and $1.2 million for research, for a gross total of $1,482,000.

Chairman Falwell asked if there were any further questions and there were none.

Motion to approve the Department's financial report; moved by Perry Galloway, seconded by Matt Smith. Motion carried.

CARBON SEQUESTRATION STUDY UPDATE
Chairman Falwell then called on Dr. William Johnson to present their update report on carbon sequestration before the board. **ATTACHMENT 2**

Johnson mentioned the methods of their carbon sequestration research plan, which investigates how much carbon is contained within specific parts of the corn plant in different locations throughout the state.

Johnson also presented on how different corn hybrids have different root masses, which affects nitrogen requirements. Johnson noted that this research may be beneficial in understanding carbon credits and their potential value.

Johnson mentioned that they would like to continue doing the research for another year, but the Department noted that a request for funding was not received. Discussion ensued.

Chairman Falwell asked if there were any further questions and there were none.

PROMOTION REPORTS AND NEW PROPOSALS

ARKANSAS AGRICULTURAL LEARNING CENTER
Chairman Falwell then introduced Kristen Larey with the Arkansas Agricultural Learning Center to give their presentation, requesting for a funding amount for $20,000. **ATTACHMENT 3**

She provided an overview of the promotion project, adding that the goal is to educate and connect with area schools, childcare centers, and youth organizations to promote agriculture and Arkansas commodities. She also plans on using the funding to develop more interactive activities focused on Arkansas agriculture and commodities.

Member Smith asked if the project was mostly focused on elementary-aged students, and the presenter answered that most classes are elementary school, but sometimes they have high school students attend class.

Chairman Falwell asked if there were any further questions and there were none.

U.S. GRAINS COUNCIL
Chairman Falwell the introduced Ellen Zimmerman with the United States Grains Council (USGC) to give their presentation, requesting for base funding amount of $74,117. **ATTACHMENT 4**

Zimmerman discussed the USGC's organization, including their budgeting process and structure, key markets and products, and their impact on global trade via their operations. She highlighted the organization's global footprint and its efforts to secure federal funding to support international operations. She emphasized the importance of USGC's role in increasing trade and improving the lives of Arkansas farmers.

She also addressed the budget breakdown for their funding request, for a funding total of $74,117, which is a 4% increase from the previous year.

Zimmerman then concluded her presentation, inviting any questions. Some discussion regarding the organization ensued.

Member Young then asked Zimmerman to briefly provide an overview on the way states vote with delegates and the amount they provide to the USGC. She stated that every $1,000 equals one vote, and with Arkansas funding at $74,000, that would be 74 votes.

Member Smith asked how many votes they have relative to the rest of the organization. Zimmermann said that it's about 15,000 total votes.

Chairman Fawell then asked Zimmerman about the USGC mission of increasing trade and how successful they have been at accomplishing this mission. She answered that she knows that exports are increasing significantly, emphasizing that their programs have return on investment (ROI) of $24 for every $1 spent. Some discussion ensued.

Chairman Falwell asked if there were any further questions and there were none.

COMMUNICATIONS GROUP

Chairman Falwell then introduced Carson Horn with the Communications Group to give their presentation, proposing various funding amounts dependent on different services offered. **ATTACHMENT 5**

The Communications group presented on the board's website performance from 2024, and proposed a website hosting package for $8,000, which would include any monthly reporting and updates.

They also presented a proposal for implementing organic social media strategies to drive website traffic, as well as an events management service.

Discussion ensued regarding procurement procedures and funding orders with the state. Members asked questions regarding the group's social media management.

Chairman Falwell asked the board if there were any questions and there were none.

Discussion ensued regarding the Department's website and social media capabilities versus the Communication Group's management. Discussion continued regarding procurement procedures.

AR FARM BUREAU

Chairman Falwell then invited the Arkansas Farm Bureau to give their presentation, proposing two different projects: 1) Corn Ag Readers Update/Printing for $5,000 & 2) Elementary Ag Education Pilot Program for Corn Curriculum and Supplies for $10,000. **ATTACHMENT 6**

Donette Spann with the AR Farm Bureau mentioned that many of their materials are outdated and need updating, especially when it comes to corn information.

Chairman Falwell asked if there were any questions and there were none.

NATIONAL CORN GROWERS ASSOCIATION

Chairman Falwell then invited Laura Wolf with the National Corn Growers Association (NCGA) to give their presentation, proposing 1) a base funding amount of $14,000 as well as 2) funding for the NCGA action team for $14,500. **ATTACHMENT 7**

Wolf highlighted the organization's focus on driving demand for corn and corn products and protecting the profitability of corn growers. Key areas of focus include trade, biofuel demand, and farm policy.

Wolf emphasized the importance of trade negotiations, entering new markets, and reducing barriers to market access, including the organization's development of sustainable aviation fuel.

Wolf invited members to ask questions. Members requested clarification on the total amount to be funded, to which Wolf answered it would be $28,500 total.

Member Young then asked a brief question regarding the introduction of a resolution at NCGA Corn Congress congratulating Arkansas Senator John Boozman on his Senate Agriculture Chair reappointment.

Chairman Falwell asked if there were any further questions and there were none.

AR DEPARTMENT OF AGRICULTURE

Chairman Falwell then invited Secretary Wes Ward with the AR Department of Agriculture to give their funding request presentation, proposing a sponsorship at the silver-level for $2,500 for the upcoming National Associations of State Departments of Agriculture (NASDA) conference being held in Little Rock, AR. **ATTACHMENT 8**

Member Young asked what that price gets the board. Sec. Ward mentioned that it would include branding for the board and other promotional items, as well as one complementary registration for the event.

Chairman Falwell asked what the gold-level and platinum-level sponsorship was, and Sec. Ward said it was $5,000 and $10,000, respectively.

Sec. Ward asked if there were any further questions and there were none.

OTHER BUSINESS

Chairman Falwell then invited members if they had any other business to bring before the board.

Member Young provided details regarding a last-minute joint-funding proposal for promoting the state's FFA program, requesting a proposed funding amount of $15,000. **ATTACHMENT 9**

Discussion ensued regarding the joint funding venture and the state's FFA program.

RECESS
Chairman Falwell then asked for a motion to recess until the next morning.

Motion to recess until 8:30am the following morning; moved by Perry Galloway, seconded by Trent Dabbs. Motion carried.

Meeting recessed at 5:00pm.

Kenny Falwell

Kenny Falwell, Chairman

ARKANSAS CORN AND SORGHUM PROMOTION BOARD MEETING—DAY 2
Zoom Option

Minutes

February 4, 2025
8:30 a.m.

Members Present in Person:	Patrick "Matt" Smith, Trent Dabbs, Matt Gammill, Tommy Young, Jason Felton, William "Perry" Galloway, & Kenny Falwell
Members Present via Zoom:	None
Members Absent:	None

WELCOME & INTRODUCTIONS
Chairman Kenny Falwell commenced the second day of the AR Corn & Grain Sorghum Promotion Board meeting at 8:30 a.m. and welcomed all members and guests. The Department confirmed that a quorum was established.

Chairman Falwell then introduced Dr. Nathan Slaton to give a brief introduction and provided general housekeeping information about the University of Arkansas Division of Agriculture (UADA) proposals to be presented before the board.

UADA RESEARCH PROPOSAL PRESENTATIONS
Dr. Slaton then introduced the first ***new*** research project proposal before the board, reminding presenters that they have five (5) minutes to give their presentations.

The first new research project proposal entitled, "Development, evaluation and production of agricultural biologicals for Arkansas crop production (Year 1 of 3)," was then presented before the board, requesting a proposed funding amount of $23,857. **ATTACHMENT 10, PAGE 9**

The presenter stated that the objectives of this research was to evaluate commercial biologicals, create novel biologicals for AR agriculture, and launch an Arkansas-based production facility for biologicals.

Member Felton asked the presenter about the specific targeting of certain weeds as part of their research. Dr. Bluhm answered that their research targets specific weeds using certain fungi as natural pathogens. Dr. Bluhm discussed the potential of developing these fungi as bioherbicides.

Member Young asked the presenter if this type of research would be embraced by environmentalist groups. Dr. Bluhm said that this work is considered environmentally friendly and sustainable.

Board members continued to ask several questions and discussion ensued.

Dr. Slaton then introduced the first ***in progress*** research project proposal entitled, "Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $45,000. **ATTACHMENT 10, PAGE 37**

Chairman Falwell asked the presenter what he was seeing in his third year in terms of progress. Dr. Bluhm answered that progress is moving slowly, but the project aims to apply the materials developed to larger federal projects like USDA-NIFA (National Institute of Food and Agriculture) to accelerate progress further.

Chairman Falwell asked what the connection between semi-dwarf hybrids and aflatoxin, and Dr. Bluhm answered that the breeding community has primarily focused on yield, often neglecting stress tolerance and disease resistance, but semi-dwarf hybrids are showing some promise. There is a need to pick strong parental lines of the hybrids while ensuring stress tolerance and environmental challenges. No further questions from members.

Dr. Slaton then introduced the next ***new*** research project proposal entitled, "Exploring plasma-activated water for enhanced biocontrol of Aflatoxin and diseases in corn plants (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $63,080. **ATTACHMENT 10, PAGE 5**

Member Young asked about the application of this technology to various sectors of the corn and agriculture industry. Board members asked several questions and discussed ensued.

Dr. Slaton then introduced the next ***new*** research project proposal entitled, "Greenhouse gas data summarization in a corn production system with and without cover crops (Year 1 of 1)," which was presented before the board, for a proposed funding amount of $11,267. **ATTACHMENT 10, PAGE 13**

Chairman Falwell asked the presenter how this data would benefit the corn farmer in Arkansas. The presenter answered that the data would be specifically catered to Arkansas's specific conditions and corn production practices. The data would ultimately aid in understanding soil carbon sequestration and carbon credits. No further questions from members.

Dr. Slaton then introduced the next ***new*** research project proposal entitled, "Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas (Year 1 of 2)," which was presented before the board, requesting a proposed funding amount of $32,537. **ATTACHMENT 10, PAGE 17**

Chairman Falwell asked if they would plant the same hybrid varieties at different locations, and the presenter answered affirmatively. Discussion ensued regarding planting dates.

Chairman Falwell asked if there were any further questions and there were none.

Dr. Slaton then introduced the next ***new*** research project proposal entitled, "Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $50,065. **ATTACHMENT 10, PAGE 21**

Board members asked several questions, and discussion ensued regarding sumac sorghum.

Dr. Slaton then introduced the next ***new*** research project proposal entitled, "Better burns yield better air: Practical implications of implementing voluntary smoke management guidelines in Arkansas (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $20,599. **ATTACHMENT 10, PAGE 24**

Member Young mentioned that corn farmers do not burn as often as other crop farmers do. Discussion ensued.

Dr. Slaton then introduced the last ***new*** research project proposal entitled, "Innovative application of Arkansas corn: Replacement of forever chemicals in food packaging and corn gluten meal (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $45,150. **ATTACHMENT 10, PAGE 28**

Member Young asked several questions from the presenter and discussion ensued. Member Galloway mentioned that he has heard of other companies investigating similar research and asked if they had plans to investigate other products. The presenter indicated that they are newer to this type of research and had not investigated other products.

This presentation concluded the ***new*** research project proposals presented before the board. Chairman Falwell then called for a short break at 10:00 am.

Meeting resumed at 10:15 am.

The next series of presentations were considered ***in progress*** research project proposals.

The next ***in progress*** research project proposal entitled, "Evaluation of new herbicides, premixes, programs, and application methods of improved control of problematic weeds in corn (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $86,150. **ATTACHMENT 10, PAGE 32**

Discussion ensued. Chairman Falwell asked if there were any questions and there were none.

The next ***in progress*** research project proposal entitled, "Development and verification of a stand counting application using drone imagery for research and production decision support (Year 2

of 3)," which was presented before the board, requesting a proposed funding amount of $16,360. **ATTACHMENT 10, PAGE 41**

Member Smith asked how they would be able to access this data. The presenter answered that it would be stored on a PC that anyone could have access to.

Discussion ensued. Chairman Falwell asked if there were any questions and there were none.

The next ***in progress*** research project proposal entitled, "The Arkansas Irrigation Yield Contest (Year 8)," which was presented before the board, requesting a proposed funding amount of $10,000. **ATTACHMENT 10, PAGE 111**

Dr. Slaton asked if there were any questions and there were none.

The next ***in progress*** research project proposal entitled, "Improving Irrigation technology for corn production in Arkansas (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $185,280. **ATTACHMENT 10, PAGE 45**

Some slight discussion ensued regarding the future of this project. Dr. Slaton asked if there were any further questions and there were none.

The next ***in progress*** research project proposal entitled, "Corn and Grain Sorghum research verification program (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $130,000. **ATTACHMENT 10, PAGE 49**

The presenter asked if there were any further questions and there were none.

The next ***in progress*** research project proposal entitled, "Arkansas corn & grain sorghum research study series, an annual report and archival system for all board-funded research (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $4,800. **ATTACHMENT 10, PAGE 53**

Member Young then asked the presenter if they had the ability to do a QR code for the study series for ease and convenience of access, and the presenter indicated that was something they could more than likely accomplish. The presenter asked if there were any further questions and there were none.

The next ***in progress*** research project proposal entitled, "Optimizing plant population and nitrogen rate in corn (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $34,000. **ATTACHMENT 10, PAGE 57**

Member Falwell asked why there is not more short-statured corn on the market. The presenter answered that historically short-statured corn was great until it went away due to poor yields.

Members asked several questions regarding the project. Discussion ensued regarding decorative corn and parthenogenic tar spot.

The next ***in progress*** research project proposal entitled, "Use of Gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $30,000. **ATTACHMENT 10, PAGE 61**

Chairman Falwell asked the presenter if their research is dependent on feeding the feral hogs, and the presenter answered in the affirmative. Member Galloway asked about how this research compares to the research being done at Louisiana State University (LSU). The presenter answered that that research primarily deals with poisons, and this line of research is meant to be another tool in the toolbox to combat feral hog reproduction. Members asked several questions of the presenter, and some discussion ensued.

The next ***in progress*** research project proposal entitled, "Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $55,000. **ATTACHMENT 10, PAGE 65**

Members asked several questions of the presenter, leading to some discussion.

The next ***in progress*** research project proposal entitled, "Cover crops in corn rotations – what works and what doesn't? (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $40,247. **ATTACHMENT 10, PAGE 69**

The presenter asked if there were any questions and there were none.

The next ***in progress*** research project proposal entitled, "Improving nitrogen management for Arkansas corn production (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $81,625. **ATTACHMENT 10, PAGE 73**

Chairman Falwell asked a question regarding cover crops and how he was under the impression that they were not needed for corn crops, since a farmer could not achieve a stand. The presenter answered that it primarily depends on knowing your production system and how prepared you are. Members asked several questions of the presenter, and some discussion ensued.

The next ***renewal*** research project proposal (completed funding cycle and resubmitted) entitled, "Fine-tuning potassium recommendations and investigating intensive tissue analysis for sustainable corn production (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $74,876. **ATTACHMENT 10, PAGE 98**

Chairman Falwell asked if there were any further questions and there were none.

The next ***in progress*** research project proposal entitled, "Determining disease resistance and susceptibility of corn and grain sorghum hybrids (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $40,000. **ATTACHMENT 10, PAGE 77**

Members asked several questions of the presenter, and some discussion ensued.

The next ***in progress*** research project proposal entitled, "Corn and grain sorghum enterprise budgets and production economic analysis (Year 3 of 3)," which was presented before the board, requesting a proposed funding amount of $10,000. **ATTACHMENT 10, PAGE 85**

Members asked several questions of the presenters, and some discussion ensued.

The next ***renewal*** research project proposal entitled, "Evaluate management options for corn nematodes in Arkansas (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $58,383. **ATTACHMENT 10, PAGE 94**

Chairman Falwell asked what percentage of acres have this problem. The presenter mentioned that it is hard to arrive at that answer without sampling every field in the state, but if he had to guess, somewhere closer to 50%. The presenter briefly spoke about tar spot on decorative corn and the potential impacts that could have. The presenter asked if there were any questions and there were none.

The next ***renewal*** research project proposal entitled, "Developing effective insect pest management strategies for Arkansas corn and grain sorghum (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $39,964. **ATTACHMENT 10, PAGE 106**

The presenter asked if there were any questions and there were none.

Chairman Falwell then called for a break for lunch at 12:11 pm.

Meeting resumed at 12:45 pm.

The next ***in progress*** research project proposal entitled, "Generating a high-value wax material from sorghum bran using an innovative green approach (Year 2 of 3)," which was presented before the board, requesting a proposed funding amount of $42,968. **ATTACHMENT 10, PAGE 81**

Chairman Falwell asked where they were sourcing the sorghum to get the wax for the bran. The presenter indicated that they get the material from a private company called New Life. No further questions from members.

The next ***renewal*** research project proposal entitled, "Economic analysis of corn and grain sorghum production and marketing practices (Year 1 of 1)," which was presented before the board, requesting a proposed funding amount of $6,000. **ATTACHMENT 10, PAGE 90**

The presenter asked if there were any further questions and there were none.

The next ***renewal*** research project proposal entitled, "Arkansas future Ag leaders tour (Year 1 of 3)," which was presented before the board, requesting a proposed funding amount of $5,000. **ATTACHMENT 10, PAGE 102**

Members asked a few questions, and some discussion ensued.

BOARD DETERMINATION OF FUNDING RESEARCH PROJECTS
Dr. Slaton then kindly asked the presenters to leave the room as the board launched into discussion and determinations of funding research and promotion projects.

Some brief discussion ensued regarding how the board would go about selecting projects.

Chairman Falwell then mentioned that he would like to address the promotion projects first, confirming with AR Department of Agriculture Chief Financial Officer, Inoussa Zaki, that the board has approximately $1.7 Million available to fund future projects. Zaki answered in the affirmative. Members referenced Zaki's excel spreadsheet as a guide when determining funding of projects. **ATTACHMENT 11**

Member Young asked what percentage of 2024 corn collections has been turned in, and Zaki said collections were at approximately 57%. Some discussion ensued.

Chairman Falwell asked if there were any continuation projects that members would not support renewing. Members did not indicate any projects.

Motion to approve funding the in-progress research projects; Moved by Tommy Young; seconded by Jason Felton. Motion carried.

Chairman Falwell then asked Zaki to clarify the total of ***in progress*** proposals, which totaled to be $801,430.

The board then decided to address renewal projects. Discussion ensued regarding the renewal projects after Admin Scott Bray listed the projects by name.

Motion to move the Arkansas Future Ag Leaders Tour project from research to promotion; moved by Matt smith; seconded by Trent Dabbs. Motion carried.

Some discussion ensued.

Motion to approve the continuation of the four renewal or in-progress research projects; moved by Perry Galloway; seconded by Jason Felton. Motion carried.

Member Young then asked Zaki what the total of the renewal projects for research would be, and he answered that it totaled to be $179,223, noting that Deane Robinson/William Johnson was not included in that figure.

Motion to fund William Johnson's new company (previously Deane Robinson Seed Co.), contingent upon the submission of required company paperwork, at the same funding level as last year, which was $18,195; Moved by Tommy Young.

Discussion ensued. Admin Bray added that a better option may be for them to resubmit their request for funding proposal and call another board meeting, which gives Members more time to review the information and the company to provide the require information.

Motion failed after discussion.

The board then shifted focus to ***new*** promotion projects.

Motion to fund the Arkansas Agricultural Learning Center for $20,000; moved by Jason Felton.

Discussion ensued—Member Felton asked if any other AR Promo Board fund this project, and Admin Bray answered that only the Beef Promo Board funded $10,000 to the project. Members commented that they would rather split the cost with another promo board instead of funding the full requested amount.

Motion failed after discussion.

Motion to provide the base funding amount to the U.S. Grains Council (USGC) for $74,117; moved by Matt Smith; seconded by Perry Galloway. Discussion ensued. Motion carried.

The board then shifted discussions to the Communications Group promotion project. Carson Horn with the Communications Group presented a new, updated proposal to the board.

Horn gave a brief presentation showing appreciation to the board, providing information on services their marketing group provides as support to the board, and gave next-step recommendations for the board.

Member Young asked Horn if they were recommending spending around $30,000 for their recommended marketing services, and Horn answered that he estimated the budget to be between $1,950 and $2,450 per month.

Discussion ensued regarding the procurement process with the state, contracting with the Communications Group, and the board's website.

Motion to fund website maintenance with the Communications Group; discussion ensued; motion failed.

Further discussion ensued regarding the board's website versus Department website capabilities. Admin Bray mentioned that he would have Department marketing staff available at the next board meeting to discuss this further.

Motion to table the three Communications Group marketing services proposals; moved by Matt Smith; seconded by Jason Felton. Motion carried.

Motion to fund both AR Farm Bureau proposals for $15,000; Moved by Tommy Young; seconded by Jason Felton. Motion Carried.

Discussion ensued regarding the National Corn Growers Association (NCGA).

Motion to fund the NCGA base funding amount of $14,000, as well as the action team funding amount of $14,500, contingent upon splitting the $14,500 funding between three specific action teams: 1) Trade, Transportation & Animal Ag Action Team, 2) Sustainable Production Action Team, and 3) Research & New Uses Action Team, for a total funding amount of $28,500 to NCGA; moved by Matt Smith; seconded by Matt Gammill. Motion carried.

Discussion ensued regarding which proposal the board would address next.

Motion to fund the AR Department of Agriculture's sponsorship request for the National Association of State Departments of Agriculture (NASDA) funding for gold level sponsorship amount of $5,000; moved by Perry Galloway, seconded by Matt Gammill. Motion carried.

Member Young asked if the AR Irrigation Contest was a promotion or a research proposal, and Zaki answered that it is considered a promotion project.

Motion to fund the AR Irrigation Contest as a promotion project for $10,000; moved by Tommy Young, seconded by Matt Smith. Motion carried.

Motion to fund the AR Future Ag Leader's tour for $5,000; moved by Trent Dabbs, seconded by Jason Felton. Motion carried.

Chairman Falwell excused Member Young from the room for members to discuss the proposal for FFA and 4-H Executive officers to attend the Commodity Classic national meeting.

Member Smith mentioned that he was good with the proposal, adding that he believed it should be funded every year and not in perpetuity.

Motion to fund the FFA and 4-H State Executive Officers attending the Commodity Classic meeting for $7,500, contingent on the Soybean promo board's approval for the other $7,500; moved by Jason Felton; seconded by Matt Gammill. Discussion ensued. Motion carried, with recusal from Member Tommy Young.

The board then shifted focus to the ***new*** research project proposals.

Member Young asked Zaki how much money the board had spent on promotion projects, and Zaki answered that the amount was $152,617. Member Smith asked how much the board spent total on projects last year, and Zaki answered it was approximately $1.2 Million.

Member Young asked how much money was left to spend, and Zaki answered that there was approximately $500,000 remaining.

The board then reviewed the ***new*** research proposal (#1) from the UADA: exploring plasma-activated water for enhanced biocontrol. Discussion ensued. The board tentatively decided not to fund this project.

The board then reviewed the next ***new*** research proposal (#2): Development, evaluation and production of agricultural biologicals for Arkansas crop production. Discussion ensued. Chairman Falwell noted that most members liked this research project proposal.

The board then reviewed the next ***new*** research proposal (#3): Greenhouse gas data summarization in a corn production system with and without cover crops. Discussion ensued. Members indicated they liked this research project proposal.

The board then reviewed the next ***new*** research proposal (#4): Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas. Discussion ensued. Members indicated they liked this research project proposal.

The board then reviewed the next ***new*** research proposal (#5): Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity. Discussion ensued. Members indicated this project might be too expensive relative to Arkansas sorghum production.

The board then reviewed the next ***new*** research proposal (#6): Better burns yield better air: Practical implications of implementing voluntary smoke management guidelines in Arkansas. Discussion ensued. Members indicated this research project is somewhat out of the scope of the types of projects they traditionally like to fund.

The board then reviewed the next ***new*** research proposal (#7): Innovative application of Arkansas corn: Replacement of forever chemicals in food packaging and corn gluten meal. Discussion ensued.

Members asked UADA staff about their staff rating recommendations for certain research projects. Members indicated they would be supportive of this research project. Discussion ensued.

Motion to fund the following *new* research projects:

- **Development, evaluation and production of agricultural biologicals for Arkansas crop production for $23,857.**
- **Greenhouse gas data summarization in a corn production system with and without cover crops for $11,267.**
- **Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas for $32,537.**
- **Innovative application of Arkansas corn: Replacement of forever chemicals in food packaging and corn gluten meal for $45,150.**
- **William Johnson's research project for $18,195 for the third year, contingent upon them turning in required request for funding paperwork.**

Moved by: Matt Smith, seconded by Perry Galloway. Motion carried.

Chairman Falwell asked if there was any other business that needed to come before the board.

Member Young then reminded the board that they had intentions of giving $10,000 every year to the AR Corn & Grain Sorghum Promo Board building in Newport, AR. Members noted that this promotion project should be on their funding list every year.

Motion to continue funding the electronic sign at the AR Corn & Grain Sorghum Promotion Board Building located in Newport, AR for $10,000 maintenance as a promotion project; moved by Tommy Young; seconded by Jason Felton. Motion carried.

Dr. Slaton then launched into a discussion regarding summer meeting dates/locations and other general housekeeping information from the UADA. Discussion ensued.

Members agreed on July 8th, 2025, to tentatively visit the research station in Harrisburg, AR, agreeing to revisit the location decision after planting season was completed.

Chairman Falwell then asked for a motion to adjourn.

Motion to adjourn; moved by Tommy Young, seconded Jason Felton. Motion carried.

Meeting adjourned at 2:41 pm.

Kenny Falwell, Chairman

ATTACHMENT 1

Corn and Grain Sorghum Board Financials
Total Annual Collections

	June 2019	June 2020	June 2021	June 2022	June 2023	June 2024	December 2024	Forecast 2025
Beginning Fund Balance	**$ 611,975**	**$ 540,103**	**$ 787,097**	**$ 1,386,425**	**$ 2,156,313**	**$ 2,483,014**	**$ 1,792,074**	**$ 1,792,074**
Revenue								
Gross Collections	$ 1,068,141	$ 1,155,588	$ 1,257,966	$ 1,516,473	$ 1,050,172	$ 1,295,693	$ 541,514	$ 1,070,077
Corn	$ 1,060,950	$ 1,141,977	$ 1,244,519	$ 1,450,919	$ 1,044,635	$ 1,288,120	$ 525,817	$ 1,063,230
Grain Sorghum	$ 7,191	$ 13,611	$ 13,447	$ 65,554	$ 5,538	$ 7,574	$ 15,697	$ 6,847
Rev. & Treas. Dept. 3%	$ 34,181	$ 36,979	$ 40,255	$ 48,527	$ 33,606	$ 40,521	$ 16,245	$ 33,172
Other Income	$ 1,770	$ 2,642	$ -	$ 5,538	$ -	$ 22,843		$ -
Transfers to CGSPB (Net)	**$ 1,035,730**	**$ 1,121,251**	**$ 1,217,711**	**$ 1,473,485**	**$ 1,016,567**	**$ 1,278,016**	**$ 525,268**	**$ 1,036,905**
Total Revenue	**$ 1,647,706**	**$ 1,661,355**	**$ 2,004,807**	**$ 2,859,909**	**$ 3,172,880**	**$ 3,761,030**	**$ 2,317,342**	**$ 2,828,979**
Expenses								
Payments to Research	$ 943,000	$ 764,633	$ 482,275	$ 492,117	$ 965,315	$ 1,292,298		
Payments to Research					$ 492,117	$ 10,000		
Payments to Research					$ 351,470	$ 600,000	$ 403,801	$ 421,996
Preapproved Research								
AMCOE								
U S Grains Council								
Membership	$ 58,000	$ 63,800	$ 66,352	$ 67,679	$ 68,525	$ -	$ 71,266	$ 142,532
Export Exchange-Medallion Sponsorship			$ 12,000			$ -	$ 8,074	$ 15,000
U.S. Grains Meeting					$ 1,169			
National Corn Growers Association								
Membership	$ 11,500	$ 11,500	$ 12,000	$ 22,000	$ 28,000	$ 28,000		$ 56,500
Promotion			$ 10,000					
Commodity Classic	$ 8,306	$ 4,506			$ 2,438			$ 8,000
Arkansas Farm Bureau Foundation								
County Meetings			$ 3,228	$ 10,000				$ 5,001
Ag in the Classroom	$ 60,000			$ 10,000	$ 10,000	$ 9,000		$ 10,000
Producer Conference								$ 5,001
Other Promotion	$ 22,250	$ 23,000	$ 30,000	$ 94,000	$ 271,500		$ 500	$ 4,500
Total Promotion	**$ 160,056**	**$ 102,806**	**$ 133,580**	**$ 203,679**	**$ 381,632**	**$ 37,000**	**$ 79,840**	**$ 246,534**
Board Travel Lodging	$ 1,677	$ 3,348	$ 528	$ 6,301	$ 4,133	$ 6,718	$ 3,790	$ 7,001
Board Travel Meals	$ 1,858	$ 1,971			$ 1,771	$ 3,995	$ 749	$ 10,001
Board Travel Other						$ 5,438	$ 4,661	
Board Travel Mileage						$ 811	$ 529	
Office Supplies						$ 45		
Postage						$ -		
Admin Expenses						$ 4,423	$ 33	
Board Exp.	**$ 3,535**	**$ 5,318**	**$ 528**	**$ 6,301**	**$ 5,904**	**$ 21,430**	**$ 9,762**	**$ 17,002**
Website	$ 1,011	$ 1,500	$ 2,000	$ 1,500	$ 9,000	$ 8,229	$ 3,000	$ 17,000
Total Board Exp.	**$ 4,547**	**$ 6,818**	**$ 2,528**	**$ 7,801**	**$ 14,904**	**$ 29,659**	**$ 12,762**	**$ 34,002**
Total Expenditures	**$ 1,107,602**	**$ 874,258**	**$ 618,383**	**$ 703,597**	**$ 2,205,438**	**$ 1,968,956**	**$ 496,403**	**$ 702,532**
Outstanding Commitment							$ 128,521	
Ending Fund Balance	**$ 540,103**	**$ 787,097**	**$ 1,386,425**	**$ 2,156,313**	**$ 967,442**	**$ 1,792,074**	**$ 1,692,418**	**$ 2,126,447**

2024-2025 Board Funding	2024-2025 Approved Board Amount	Paid To Date	Remaining
Promotion	**192,666.00**	**82,839.95**	**110,326.05**
AR Corn angd Grain Sorghum Building in Jackson Campus	10,000.00		10,000.00
Export Exchange (Sponsorship)	15,000.00	8,073.95	6,926.05
Southern Soil Health Conference Sponsorship		500.00	-
National Corn Growers Association	28,500.00		28,500.00
Sign (Jackson County Ext. Center. AR Grain Building)	49,900.00		49,900.00
The Arkansas Irrigation Yield Contest (Year 7).	10,000.00	-	10,000.00
The Communications Group	8,000.00	3,000.00	5,000.00
US Grain Council	71,266.00	71,266.00	-
Research	**1,021,996.00**	**1,003,801.00**	**18,195.00**
Dean Robinson Seed Co Inc.	18,195.00		18,195.00
Arkansas Corn & Grain Sorghum Research Studies Series, an annual report and archival system for all Board-funded research (Year 3 of 3).	4,667.00	4,667.00	-
Arkansas Discovery Farms (Year 3 of 3).	5,000.00	5,000.00	-
Arkansas Future Ag Leaders Tour (Year 3 of 3).	5,000.00	5,000.00	-
Assess Management Options for Corn Nematodes in Arkansas (Year 3 of 3).	55,401.00	55,401.00	-
Assessing Susceptibility of Insect Pests of Corn in Storage to Selected Insecticides (Year 3 of 3).	41,305.00	41,305.00	-
Corn and grain sorghum enterprise budgets and production economic analysis (Ongoing)	10,000.00	10,000.00	-
Corn and Grain Sorghum Research Verification Program (Year 1 of 3).	130,000.00	130,000.00	-
Corn Yield Forecast System for the US Mid-South (New, Year 1 of 3).	-	-	-
Cover Crops in Corn Rotations- What Works and What Doesn't? (Year 2 of 3).	39,729.00	39,729.00	-
Determining disease resistance and susceptibility of corn and grain sorghum hybrids (New, Year 1 of 3).	40,000.00	40,000.00	-
Developing a satellite-based field scouting tool for corn (New, Year 1 of 3).	-	-	-
Development and verification of a stand counting application using drone imagery for research and production decision support.	19,660.00	19,660.00	-
Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices (New, Year 1 of 1)	5,777.00	5,777.00	-
Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn (Year 2 of 3).	87,293.00	87,293.00	-
Exploring Plasma-Activated Water for Enhanced Biocontrol of Aflatoxins and Diseases in Corn Plants (New, Year 1 of 3).	-	-	-
Fine-tuning Potassium Recommendations and Investigating Intensive Tissue Analysis for Sustainable Corn Production (Year 3 of 3)	56,395.00	56,395.00	-
Generating a high-value wax material from sorghum bran using an innovative green approach (New, Year 1 of 3).	42,761.00	42,761.00	-
Improving Irrigation Technology for Corn Production in Arkansas (Year 2 of 3).	185,280.00	185,280.00	-
Improving Nitrogen Management for Arkansas Corn Production (New, Year 1 of 3).	78,547.00	78,547.00	-
Optimizing Plant Population and Nitrogen Rate in Corn (Year 3 of 3).	34,000.00	34,000.00	-
Performance Crop Insurance as a risk management tool for corn and grain sorghum producers in Arkansas (Year 3 of 3).	29,486.00	29,486.00	-
Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (New, Year 1 of 3).	56,000.00	56,000.00	-
Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy (Year 2 of 3).	45,000.00	45,000.00	-
University of Arkansas System Division of Agriculture Feed Kits (New, Year 1 of 3).	2,500.00	2,500.00	-
Use of Corn Protein Concentrate in Plant-Based Diets for Largemouth Bass to Optimize Production Sustainability and Profitability (New, Year 1 of 1).	-		-
Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 2 of 3).	30,000.00	30,000.00	-
Utilizing Plasma Technology to Inhibit Tannin Effects in Grain Sorghum for Enhanced digestibility and Protein Quality (New, Year 1 of 3).	-		-
Grand Total Promotion & Research	**1,214,662.00**	**1,086,640.95**	**128,521.05**

2025-2026 Board Funding	2025-2026 Proposals
Promotion	**249,917.00**
Arkansas Department of Agriculture - 2025 NASDA Annual Meeting	2,500.00
Four States & Fair Rodeo - Ag Learning Center	104,800.00
Arkansas Farm Bureau - Ag in the Classroom	15,000.00
National Corn Growers Association	28,500.00
The Communications Group	15,000.00
US Grain Council	74,117.00
The Arkansas irrigation yield contest (Year 8).	10,000.00
Research	**1,232,208.00**
Exploring plasma-activated water for enhanced biocontrol of Aflatoxin and diseases in corn plants (New, Year 1 of 3).	63,080.00
Development, evaluation and production of agricultural biologicals for Arkansas crop production (New, Year 1 of 3).	23,857.00
Greenhouse gas data summarization in a corn production system with and without cover crops (New, Year 1 of 1).	11,267.00
Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas (New, Year 1 of 2).	32,537.00
Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity (New, Year 1 of 3).	50,065.00
Better burns yield better air: Practical implications of implementing voluntary smoke management guidelines in Arkansas (New, Year 1 of 3).	20,599.00
Innovative application of Arkansas corn: Replacement of forever chemicals in food packaging and corn gluten meal (New, Year 1 of 3).	45,150.00
Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn (Year 3 of 3).	86,150.00
Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy (Year 3 of 3).	45,000.00
Development and verification of a stand counting application using drone imagery for research and production decision support (Year 2 of 3).	16,360.00
Improving Irrigation technology for corn production in Arkansas (Year 3 of 3).	185,280.00
Corn and grain sorghum research verification program (Year 2 of 3).	130,000.00
Arkansas corn & grain sorghum research studies series, an annual report	4,800.00
Optimizing plant population and nitrogen rate in corn (Year 3 of 3).	34,000.00
Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 3 of 3).	30,000.00
Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (Year 2 of 3).	55,000.00
Cover crops in corn rotations- What works and what doesn't? (Year 3 of 3).	40,247.00
Improving nitrogen management for Arkansas corn production (Year 2 of 3).	81,625.00
Determining disease resistance and susceptibility of corn and grain sorghum hybrids (Year 2 of 3).	40,000.00
Generating a high-value wax material from sorghum bran using an innovative green approach (Year 2 of 3).	42,968.00
Corn and grain sorghum enterprise budgets and production economic analysis (Year 3 of 3).	10,000.00
Economic analysis of corn and grain sorghum production and marketing practices (New, Year 1 of 1).	6,000.00
Evaluate management options for corn nematodes in Arkansas (New, Year 1 of 3).	58,383.00
Fine-tuning potassium recommendations and investigating intensive tissue analysis for sustainable corn production (New, Year 1 of 3).	74,876.00
Arkansas future Ag leaders tour (New, Year 1 of 3).	5,000.00
Developing effective insect pest management strategies for Arkansas corn and grain sorghum (New, Year 1 of 3).	39,964.00
Grand Total Promotion & Research	**1,482,125.00**

2025-2026 Board Funding	2025-2026 Proposals	Presentation Order	Presentation Date	Amended Proposal	Comment
Promotion	**165,117.00**				
Arkansas Department of Agriculture - 2025 NASDA Annual Meeting	2,500.00	7	2/3/2025		
Four States & Fair Rodeo - Ag Learning Center - **Kristen Larey**	20,000.00	2	2/3/2025	84,800.00	
Arkansas Farm Bureau - Ag in the Classroom - **Donnette**	15,000.00	5	2/3/2025		
National Corn Growers Association	28,500.00	6	2/3/2025		
The Communications Group - **Carson Horn**	15,000.00	4	2/3/2025		Funding to be determined.
US Grain Council	74,117.00	3	2/3/2025		
The Arkansas irrigation yield contest (Year 8).	10,000.00				
Commodity Classic		8	2/3/2025		Added by Tommy Young . Funding to be determined.
Research	**1,250,403.00**				
Exploring plasma-activated water for enhanced biocontrol of Aflatoxin and diseases in corn plants (New, Year 1 of 3).	63,080.00				
Development, evaluation and production of agricultural biologicals for Arkansas crop production (New, Year 1 of 3).	23,857.00				
Greenhouse gas data summarization in a corn production system with and without cover crops (New, Year 1 of 1).	11,267.00				
Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas (New, Year 1 of 2).	32,537.00				
Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity (New, Year 1 of 3).	50,065.00				
Better burns yield better air: Practical implications of implementing voluntary smoke management guidelines in Arkansas (New, Year 1 of 3).	20,599.00				
Innovative application of Arkansas corn: Replacement of forever chemicals in food packaging and corn gluten meal (New, Year 1 of 3).	45,150.00				
Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn (Year 3 of 3).	86,150.00				
Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy (Year 3 of 3).	45,000.00				
Development and verification of a stand counting application using drone imagery for research and production decision support (Year 2 of 3).	16,360.00				
Improving Irrigation technology for corn production in Arkansas (Year 3 of 3).	185,280.00				
Corn and grain sorghum research verification program (Year 2 of 3).	130,000.00				
Arkansas corn & grain sorghum research studies series, an annual report	4,800.00				
Optimizing plant population and nitrogen rate in corn (Year 3 of 3).	34,000.00				
Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 3 of 3).	30,000.00				
Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (Year 2 of 3).	55,000.00				
Cover crops in corn rotations- What works and what doesn't? (Year 3 of 3).	40,247.00				
Improving nitrogen management for Arkansas corn production (Year 2 of 3).	81,625.00				
Determining disease resistance and susceptibility of corn and grain sorghum hybrids (Year 2 of 3).	40,000.00				
Generating a high-value wax material from sorghum bran using an innovative green approach (Year 2 of 3).	42,968.00				
Corn and grain sorghum enterprise budgets and production economic analysis (Year 3 of 3).	10,000.00				
Economic analysis of corn and grain sorghum production and marketing practices (New, Year 1 of 1).	6,000.00				
Evaluate management options for corn nematodes in Arkansas (New, Year 1 of 3).	58,383.00				
Fine-tuning potassium recommendations and investigating intensive tissue analysis for sustainable corn production (New, Year 1 of 3).	74,876.00				
Arkansas future Ag leaders tour (New, Year 1 of 3).	5,000.00				
Developing effective insect pest management strategies for Arkansas corn and grain sorghum (New, Year 1 of 3).	39,964.00				
Dean Robinson Seed Co Inc. Sequestered Carbon	18,195.00	1	2/3/2025	Added	
Grand Total Promotion & Research	**1,415,520.00**				

ATTACHMENT 2

Agronomics

Grower	Planting Date	Population	Yield	
		thousands	Bu/a	
Davis	4/16/2024	35	DKC 239	P 217
McLain	4/16/2024	34	DKC 272	P 268
Watkins	4/23/2024	35	DKC 275	P 264

DKC 65-99 Pioneer P17677YHR

1

Sample Analysis

- Waypoint Analytical
- Total dry weight
- Total combustible carbon

2

Sequestered Carbon

Hybrid	Root	Stalk	Leaves	Shuck	Silk	Cob	Grain	Carbon
	%	%	%	%	%	%	%	Tons/acre
DKC 65-99	17	22	21	7.7	0.6	8.4	23	10.9
P17677YHR	16	25	22	5.8	0.5	8.3	22	10.7

3

ATTACHMENT 3

1

2

3

4

5

6


Our
Clientele
Who We Serve:
• Students and educators
• Fair attendees and the public
• Volunteers
Four States Fair
Students
Educators
Fair Attendees
Volunteers

7


Needed
Resources
Four States Fair
Funding Request
• $20,000
Resource Allocation
• Staff support.
• Facility costs and updates.
• Supplies for educational outreach.

8


Evaluation
Plan
• Feedback from volunteers, teachers, and community leaders.
• Continuous improvement through collaboration.
Four States Fair
(870) 774-6455
alc@fourstatesfair.com
www.fourstatesfair.com
3700 East 50th Street
Texarkana, AR 71854

9

Arkansas Corn & Grain Sorghum Research and Promotion Proposal

Mission Statement:
The Agriculture Learning Center at the Four States Fairgrounds is dedicated to promoting and educating the non-rural public on the importance of agriculture. Through engaging experiences and a focus on Arkansas Commodities, including corn & grain sorghum, we highlight the significance of agriculture in our daily lives and its role in sustaining our communities.

Key Objectives:

- **Enhancing Agricultural Education:**
  Providing local schools with quality, hands-on learning opportunities to foster understanding and appreciation of agriculture.
- **Promoting Arkansas Commodities:**
  Emphasizing the economic and cultural importance of commodities like corn & grain sorghum in Arkansas and beyond.
- **Connecting Communities:**
  Building a bridge between rural and non-rural audiences, inspiring curiosity and respect for the agricultural industry.

Vision for the Future:
By collaborating with educators, industry professionals, and community members, the Agriculture Learning Center aims to inspire the next generation of agricultural leaders and advocates. Our vision extends beyond food to include all aspects of life influenced by agriculture, such as housing, clothing, and sustenance. We strive to cultivate an understanding of how agriculture impacts every facet of our daily lives, from the materials that build our homes to the fibers that make our clothes, and the food that nourishes our families.

Project Overview

In 2024, the Ag Learning Center at the Four States Fairgrounds has continued to grow and thrive through strong community partnerships. These collaborations have allowed us to develop new games and hands-on activities, enriching the educational experiences we provide to young minds in our community.

We have found that engaging students through interactive, sensory-based learning helps them retain and understand the information more effectively. Our approach—"hear it, see it, do it"—ensures that students are actively involved in lessons. At the Ag Learning Center, we emphasize hands-on activities focused on rice and its by-products, teaching students about their significance in everyday life.

During classroom field trips, we explore the diverse products derived from corn & grain sorghum, along with other commodities, discussing their uses and nutritional value. Students participate in activities such as identifying corn & grain sorghum-based products and by-products, as well as those from other key agricultural

commodities. This makes learning more dynamic and memorable. The hands-on approach has proven to be far more impactful than traditional reading-based methods, creating a fun and engaging experience for students of all ages.

From June to December 2024, we reached over 15 schools and nearly 700 students ranging from Preschool to High School, through field trips and outreach programs. Teachers have been highly responsive to these initiatives, and many have already scheduled future visits with us. The success of these programs reinforces our belief in the importance of providing interactive agricultural education.

The Ag Learning Center's dedicated staff, along with the support of community leaders and enthusiastic volunteers, is committed to the success of this program. Together, we are shaping a brighter future by fostering a deeper understanding and appreciation of agriculture among the next generation.

Project Details – Goals and Objectives

The Ag Learning Center continues to focus on promoting education about Arkansas-grown commodities, with a particular emphasis on corn & grain sorghum, while incorporating hands-on activities and community involvement. Our goals and objectives for 2024 are outlined below:

Goal 1 – Educate students and adults on the importance of the corn & grain sorghum industry and other commodities.

- Incorporate hands-on activities and lessons.
- Develop engaging projects and educational exhibits.
- Add new interactive learning games to enhance participation.

Objective: Deliver valuable and engaging information through games, demonstrations, and diagrams that capture interest and encourage retention.

Goal 2 – Promote health and nutrition awareness in the community.

- Highlight the nutritional benefits of soybeans and its by-products.
- Use handouts, educational exhibits, and displays to inform the community about the health benefits of agricultural products.

Objective: Provide practical and accessible health and nutrition education, emphasizing the role of corn & grain sorghum products and by-products in a balanced diet.

Goal 3 – Strengthen community involvement through effective volunteer participation.

- Train more volunteers to confidently and effectively lead lessons.
- Develop additional programs and activities to engage the community during events such as the fair.

Objective: Expand the volunteer base and ensure they are equipped to support the Ag Learning Center's educational mission while fostering greater community engagement.

Clientele

The Ag Learning Center serves three primary groups:

1. **Students and Educators**:
   This includes students from schools, educational organizations, youth groups, and summer camps who

participate in our programs. It also encompasses the teachers and sponsors who accompany these groups. Additionally, students engaged in our outreach program benefit from on-site presentations when visiting the Ag Learning Center is not possible.

2. **Fair Attendees and the Public**:
   These are individuals and families who experience the Ag Learning Center during the Four States Fair and other public events.
3. **Volunteers**:
   Dedicated community members who assist in delivering educational programs and supporting activities at the Ag Learning Center.

Methods

To effectively reach these groups, the Ag Learning Center employs the following strategies:

- Incorporating educational activities that align with industry partnerships into programs for students and educators.
- Developing new games and activities focused on key agricultural commodities and industry topics.
- Delivering outreach programs directly to schools and organizations, bringing our classes to students unable to visit the center.
- Hosting community educational events to highlight industry partnerships and foster greater awareness.
- Recruiting and training volunteers through outreach to local clubs and organizations, ensuring adequate support for our programs.

Staff/Administration

Kristen Larey
Director, Ag Learning Center
Kristen is a certified teacher in Arkansas and Texas with 15 years of classroom experience. This background in education is beneficial when creating engaging, hands-on lessons at the Ag Learning Center by connecting students to agriculture in meaningful ways. The Director of the Ag Learning Center is responsible for coordinating and scheduling programs with schools, educational organizations, youth groups, and clubs that visit the center for agricultural education. This includes designing, developing, and delivering engaging programs for students, educators, and the public. Additional responsibilities involve collaborating with local agencies, recruiting, training, and scheduling volunteers to assist with activities as needed.

The director also oversees the creation of educational materials such as handouts, brochures, coloring books, and pamphlets, as well as the design and development of new games and exhibits that align with the partnering industry.

Lisa Garner
Four States Fair
The Ag Learning Center operates under the umbrella of the Four States Fair. The Four States Fair team collaborates with the Ag Learning Center staff to support the creation and implementation of educational programs during the annual fair and throughout the year. They also assist with budget management and facility maintenance to ensure the center’s ongoing success.

Support System and Volunteers

The Ag Learning Center is supported by a dedicated network of over 250 volunteers from local organizations and the broader community. These volunteers play a critical role in delivering programs and engaging the public, especially during the annual fair and other community events.

Needed Resources

To ensure the continued success of our programs, the Ag Learning Center requires the following resources:

- Support for both permanent and temporary staff to coordinate and deliver educational programs.
- Assistance with facility-related costs, including necessary updates and utilities.
- Promotional items from partnering industries to enhance educational outreach.
- Supplies and funding to support events, activities, and program development.

The Ag Learning Center respectfully requests funding of $20,000 from the Arkansas Corn & Grain Sorghum Board to help sustain and expand our efforts in agricultural education. This support will enable us to continue providing impactful learning experiences for students, educators, and the community.

Evaluation Plan

The Ag Learning Center staff will be responsible for evaluating the effectiveness of all programs and activities. To ensure continuous improvement, the staff will create new and informative programs aimed at expanding our reach and educating more individuals. Evaluations will be conducted in collaboration with volunteer committees, the Four States Fair Board, and the Arkansas Corn & Grain Sorghum Board to assess the impact and success of these initiatives.

Feedback will be gathered from volunteers, community leaders, teachers, and staff members who participate in these programs. This input will help measure the educational outcomes and the effectiveness of our ongoing efforts in both regular programs and special events.

Ag Learning Center estimated total year expenses:

Category	Description	Total ($)
Facilities	Upkeep, Utilities, Office, Maintenance; Personnel Salary, Postage, Travel	65,000.00
Special Events	Kid's Day, Crossties Fall Festival, Fair; Pizza Ranch, Volunteer Meals, Ice Cream Mix, Ice Cream Cones	5,000.00
Supplies	Class Supplies, Crafting Supplies, Crayons	4,500.00
Educational Equipment	Educational Posters, Signage Displays, 3-D Educational Displays	8,500.00
Games/Activities	Games/Activities	1,000.00
Promotional	Backpacks, Totes, Brochures, Coloring Books; Staff Logo Shirts, Signage	15,000.00
Barnyard	Shavings, Feed, Weed/Insect Control, Maintenance, Repairs	800.00
Special Entertainment	Agricultural Live Programs and Guest Speakers	5,000.00

Total Estimated Expenses: $104,800

THE FOUR STATES FAIR ASSOCIATION, INC., AND ITS WHOLLY OWNED SUBSIDARIES
FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2023

THE FOUR STATES FAIR ASSOCIATION, INC., AND ITS WHOLLY OWNED SUBSIDIARIES
TABLE OF CONTENTS

WILF & HENDERSON, P.C.
CERTIFIED PUBLIC ACCOUNTANTS
Member of American Institute of Certified Public Accountants
Member of Private Company Practice Section
Member of AICPA Governmental Audit Quality Center

INDEPENDENT ACCOUNTANT'S REVIEW REPORT

July 29, 2024

To the Board of Directors
The Four States Fair Association, Inc., And its Wholly Owned Subsidiaries
Texarkana, Arkansas

We have reviewed the accompanying financial statements of The Four States Fair Association, Inc., And its Wholly Owned Subsidiaries (a nonprofit organization), which comprise the statement of financial position as of December 31, 2023, and the related statements of activities and change in net assets, functional expenses, and cash flows for the year then ended, and the related notes to the financial statements. A review includes primarily applying analytical procedures to management's financial data and making inquiries of entity management. A review is substantially less in scope than an audit, the objective of which is the expression of an opinion regarding the financial statements as a whole. Accordingly, we do not express such an opinion.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement whether due to fraud or error.

Accountant's Responsibility

Our responsibility is to conduct the review engagement in accordance with Statements on Standards for Accounting and Review Services promulgated by the Accounting and Review Services Committee of the AICPA. Those standards require us to perform procedures to obtain limited assurance as a basis for reporting whether we are aware of any material modifications that should be made to the financial statements for them to be in accordance with accounting principles generally accepted in the United States of America. We believe that the results of our procedures provide a reasonable basis for our conclusion.

We are required to be independent of The Four States Fair Association, Inc., And its Wholly Owned Subsidiaries and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements related to our review.

Accountant's Conclusion

Based on our review, we are not aware of any material modifications that should be made to the accompanying financial statements in order for them to be in accordance with accounting principles generally accepted in the United States of America.

Supplementary Information

The accompanying supplementary information included on pages 11-13 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information is the responsibility of management and was derived from, and relates directly to, the underlying accounting and other records used to prepare the financial statements. The supplementary information has been subjected to the review procedures applied in our review of the basic financial statements. We are not aware of any material modifications that should be made to the supplementary information. We have not audited the supplementary information and do not express an opinion on such information.

Wilf & Henderson, P.C.

Wilf & Henderson, P.C.
Certified Public Accountants
Texarkana, Texas

FINANCIAL STATEMENTS

The Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries
Consolidated Statement of Financial Position
December 31, 2023

Assets	
Cash and Cash Equivalents	$ 547,663
Certificates of Deposit	413,100
Accounts Receivable	33,167
Inventories	3,294
Prepaid Expenses	22,355
Property and Equipment, Net	3,315,799
Other Assets	3,736
Total Assets	$ 4,339,114
Liabilities and Net Assets	
Liabilities	
Accounts Payable	$ 8,024
Deferred Revenue	3,103
Accrued Expenses	60,469
Total Liabilities	71,596
Net Assets	
Without Restrictions	4,265,239
With Restrictions	2,279
Total Net Assets	4,267,518
Total Liabilities and Net Assets	$ 4,339,114

The accompanying notes are an integral part of the financial statements.

The Four States Fair Associaiton, Inc., and Its Wholly Owned Subsidiaries
Consolidated Statement of Activities and Changes in Net Assets
For the Year Ended December 31, 2023

	Without Donor Restrictions	With Donor Restrictions	Total
Revenues			
Grants and Contributions	$ 82,662	$ -	$ 82,662
Fair Income	831,985	-	831,985
RV Space Rentals	136,892	-	136,892
Special Events Gross Revenue	407,203	-	407,203
Membership Dues	725	-	725
Food and Beverage, net of cost of goods sold	41,823	-	41,823
Other	1,844	-	1,844
Total Revenues	1,503,134	-	1,503,134
Net Assets Released from Donor Restictions			
Contributions - Expiration of Time Restriction	-	-	-
Expenses			
Program Services	1,307,992	-	1,307,992
Food and Beverage	34,320	-	34,320
Supporting Services			
Management and General	302,754	-	302,754
Fundraising	-	-	-
Total Expenses	1,645,066	-	1,645,066
Non-operating Revenues (Expenses)			
Interest	12,937	-	12,937
Total Non-operating Revenues (Expenses)	12,937	-	12,937
Increase (Decrease) in Net Assets	(128,995)	-	(128,995)
Net Assets at Beginning of Year	4,394,234	2,279	4,396,513
Net Assets at End of Year	$ 4,265,239	$ 2,279	$ 4,267,518

The accompanying notes are an integral part of the financial statements.

The Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries
Consolidated Statement of Functional Expenses
For the Year Ended December 31, 2023

	Program Services	Food and Beverage	Management and General	Fundraising	Total Expense
Advertising	$ 54,263	$ -	$ -	$ -	$ 54,263
Depreciation	154,309	6,710	-	-	161,019
Equipment Rentals	56,783	-	-	-	56,783
Fair Activities	171,642	-	-	-	171,642
Insurance	70,249	-	11,773	-	82,022
Legal and Accounting	2,048	-	14,750	-	16,798
Licenses and Fees	9,005	3,292	9,069	-	21,366
Payroll Taxes	18,488	-	13,387	-	31,875
Postage and Shipping	3,172	-	1,080	-	4,252
Property Taxes	38,186	-	-	-	38,186
Repairs and Maintenance	110,519	8,291	4,890	-	123,700
Salaries and Causal Labor	305,639	-	221,325	-	526,964
Special Events	35,645	-	-	-	35,645
Supplies and Miscellaneous	38,861	16,027	288	-	55,176
Telephone and Utilities	235,730	-	26,192	-	261,922
Travel	3,453	-	$ -	-	3,453
Total	$ 1,307,992	$ 34,320	$ 302,754	$ -	$ 1,645,066

The accompanying notes are an integral part of the financial statements.

The Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries
Consolidated Statement of Cash Flows
For the Year Ended December 31, 2023

Cash Flow from Operating Activities	
Cash received from fair, dues and special events	$ 1,399,460
Cash paid to suppliers and employees	(1,475,353)
Grants and contributions received	82,662
Other income	1,844
Net Cash Provided by Operating Activities	8,613
Cash Flow from Investing Activities	
Purchase of Fixed Assets	(356,290)
Interest income	1,281
Net Cash Used in Investing Activities	(355,009)
Cash Flow from Financing Activities	
Net Cash Provided by Financing Activities	-
Net (Decrease) in Cash and Cash Equivalents	(346,396)
Cash and Cash Equivalents at Beginning of Year	894,059
Cash and Cash Equivalents at End of Year	$ 547,663

Reconciliation of change in net assets to cash provided by operating activities:

Change in net assets	$ (128,995)
Adjustments to reconcile change in net assets to net cash provided by operating activities:	
Depreciation	161,019
Interest reinvested	(12,937)
(Increase) decrease in assets	
Accounts receivable, net	(19,168)
Other assets	(2,529)
Increase (decrease) in liabilities	
Accounts payable	(6,211)
Accrued expenses	15,415
Unearned revenue	2,019
Total Adjustments	137,608
Net cash provided by operating activities	$ 8,613

The accompanying notes are an integral part of the financial statements.

Note 1 - Summary of Significant Accounting Policies

Nature of Activities

The Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries (the Fair) sponsor the Four States Fair each year. The Fair promotes agriculture, livestock, home arts and cultural arts in the four states area. The Fair also rents its facilities for special events held in the arena and on the fairgrounds. The wholly owned subsidiaries, Four States Concessions, Inc., and Four States Expo Center, Inc., operate concessions at the fairgrounds.

Basis of Accounting

The consolidated financial statements of the Fair have been prepared on the accrual basis of accounting and, accordingly, reflect all significant receivables, payables and other liabilities.

Consolidation

The consolidation financial statements include the accounts of the Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries after elimination of all significant intercompany transactions and accounts.

Revenue from Contracts with Customers

Revenue recognition guidance requires the recognition of revenue when promised goods or services are transferred to customers in an amount that reflects the consideration to which the Fair expects to be entitled in exchange for goods or services. The Fair's services that fall within the scope of ASC 606 are presented as sales revenue and are recognized as revenue when the Fair satisfies its obligation to the patron (when the agreement is completed). Services within the scope of ASC 606 include deposits on rentals of facilities, sponsorship agreements, in-kind sponsorship agreements and advance ticket sales.

Financial Statement Presentation

The Fair reports information regarding its financial position and activities according to two classes of net assets: net assets without donor restrictions and net assets with donor restrictions. A description of these categories is as follows:

Net Assets without Donor Restrictions – Net assets which are available for use at the discretions of the Board of Directors and/or management for general operating purposes. Contributions that are restricted by the donor are reported as increases in net assets without donor restriction if the restrictions expire in the fiscal year which the contributions are recognized.

Net Assets with Donor Restriction – Net assets, which consist of contributed funds subject to specific donor-imposed restrictions, are contingent upon specific performance of a future event or a specific passage of time before The Fair may spend the funds. The Fair had $2,279 of net assets with donor restrictions at December 31, 2023.

Note 1 - Summary of Significant Accounting Policies – (continued)

Contributions

Contributions received are recorded as increases in net assets without donor restrictions or net assets with donor restrictions depending on the existence and/or nature of any donor restrictions. When a restriction expires (that is, when a stipulated time restriction ends or purpose restriction is accomplished), net assets with donor restrictions are reclassified to net assets without donor restrictions. If net assets with donor restrictions have met the restrictions in the same year, they are recorded as net assets without donor restrictions.

Use of Estimates

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents

For purposes of the statements of cash flows, cash and cash equivalents include cash, interest-bearing cash accounts and unrestricted certificates of deposit with an original maturity date less than three months.

Certificates of Deposit

The Fair reports certificates of deposits at cost plus accrued interest, which approximates fair value.

Accounts Receivable

The Fair considers accounts receivable to be fully collectible; accordingly, no allowance for doubtful accounts is required. If amounts become uncollectible, they will be written off when that determination is made.

Accounting principles generally accepted in the United States of America requires the use of the allowance method for recording bad debts. However, management believes that the use of the direct write-off method is not materially different from the results that would have been obtained had the allowance method been followed.

Inventories

Inventories are valued at the lower of cost (generally determined on a first-in, first-out basis) or net realizable value and consist of food, beverages and supplies.

Property and Equipment

Property and equipment items are presented at cost if purchased and fair market value is contributed. The Fair capitalizes all expenditures for property and equipment in excess of $1,000.

Depreciation has been computed by the straight-line method with estimated lives as follows:

Buildings and improvements	5 - 40 years
Equipment, automobiles, furniture, and office equipment	3 - 20 years

Note 1 - Summary of Significant Accounting Policies – (continued)

Deferred Revenue

Deferred revenue included advance ticket sales for events not yet held, in-kind trade sponsorship agreements and deposits on facility rentals. This revenue will be recognized in the year earned.

Compensated Absences

The Organization's policy is to recognize the cost of compensated absences when actually paid.

Advertising

All advertising costs are expensed as incurred and totaled $54,263 for 2023.

Leases

The Organization has implemented ASU 2016-02, Leases, which requires lessees to recognize operating and financing lease liabilities and corresponding right-of-use assets on the balance sheet. A right-to-use lease is defined as a contract that conveys control of another entity's nonfinancial asset as specified in the contract for a period of time in an exchange or exchange-like transaction. The lease liability is calculated as present value of the reasonably certain expected payments to be made over the term of the lease and the interest included in the lease payment is recorded as an expense. The Organization did not have any material leases individually or in the aggregate for the fiscal year.

Income Taxes

The Four States Fair Association, Inc., is a nonprofit organization exempt from federal income tax under Internal Revenue Code Section 501(c)(3). Its wholly owned subsidiaries, Four States Expo Center, Inc., and Four States Concessions, Inc., are taxable corporations and each file separately for income tax purposes.

Methods Used for Allocation of Expenses from General and Administrative Activities

The consolidated financial statements report certain categories of expenses that are attributable to one or more programs or supporting functions of the Fair. Salaries and benefits are allocated on the basis of estimates of time and effort.

Note 2 – Liquidity

The Fair's financial assets available within one year of the financial statement date for general expenses consist of cash and certificates of deposits in the amount $958,484, which is cash of $960,763 less donor-imposed restrictions of $2,279 (Note 10). The Fair's policy is to structure financial assets to be available as general expenses come due.

Note 3 – Certificate of Deposit

At December 31, 2023, the Fair held 2 certificates of deposits with interest rates ranging from .15 percent to .25 percent. All certificates held were short-term.

Note 4 – Accounts Receivable, Contract Assets and Liabilities

The Fair has the following receivables, contract assets and liabilities:

	12/31/2023	1/1/2023
Contracts receivable	$ 33,167	$ 13,999
Contract assets	-	-
Contract liabilities	$ 3,013	$ 1,084
Revenue recognized in the period:		
Amounts included in contract liabilities at the beginning of the year	$ 1,084	$ -

The timing of revenue recognition, billings and cash collections result in receivables, contract assets and liabilities. Generally, billing occurring subsequent to revenue recognition results in contract assets. However, the Fair also receives advances and deposits from customers before revenue is recognized resulting in contract liabilities. Accounts receivable are recorded when the right to consideration becomes unconditional and includes contract receivables. Contract liabilities are included in deferred revenue in the consolidated statement of financial position.

Note 5 – Property and Equipment

Property and equipment consist of the following:

Land	$ 639,970
Buildings	8,064,060
Furniture and Equipment	1,075,556
	9,779,586
Accumulated Depreciation	6,463,787
Total Property and Equipment	$ 3,315,799

Note 6 – Contribution of Land

The City of Texarkana, Arkansas, has conveyed 105.776 acres of land to the Four States Fair Association, Inc. Title to the contributed property will revert to the City should the Fair cease to operate the Four States Fair and related activities. The City will reimburse the Fair all monies contributed by the Fair for improvements should the reverter clause become effective.

Note 7 – Income Taxes

The Fair files income tax returns in the U.S. federal jurisdiction. Four States Expo Center, Inc., and Four States Concessions, Inc., also file in the state of Arkansas.

In accordance with generally accepted accounting principles, the Fair accounts for uncertainty in income taxes by recognizing tax positions in the consolidated financial statements when it is more-likely-than-not the position will be sustained upon examination by the tax authorities. At December 31, 2023, the Fair had no uncertain tax positions that would require recognition or disclosure. The Fair recognizes interest accrued related to unrecognized tax benefits in interest expense and penalties in supporting expenses. During the years ended December 31, no interest or penalties were incurred. Tax years 2020 through 2023 are subject to examination for each entity.

Note 7 – Income Taxes – (continued)

Four States Expo Center, Inc., had a taxable loss of $2,805 for 2023, which increased its tax loss carryforward. Four States Concessions, Inc. had a taxable loss of $9,692 for 2023. Tax years 2020 through 2023 are subject to examination.

Note 8 – Net Assets with Donor Restrictions

Net assets with donor restrictions are available for fine arts expenditures and totaled $2,279 at December 31, 2023.

Note 9 –Credit Risk

The Fair maintains its cash accounts at several financial institutions. Cash accounts at each institution are insured by the Federal Deposit Insurance Corporation for up to $250,000. Amounts in excess of insured limits at December 31, 2023 was approximately $126,000.

Note 10 – Concentrations

The Fair received 56% of its revenue from the Four States Fair and Rodeo.

Note 11 – Rental

The Fair rents various types of equipment when needed. All rent payments are expensed as incurred. Rental payments total $56,784 for 2023.

Note 12 – Contributed Services

Contributed services are recognized as contributions if the services (a) create or enhance nonfinancial assets or (b) require specialized skills and would otherwise be purchased by the Fair. A substantial number of unpaid volunteers have also made contributions of their time to assist in the presentation of numerous activities. The value of this contributed time is not reflected in these statements since it is not susceptible to objective measurement or valuation.

Note 13 – Covid-19 Pandemic

The future impact of Covid-19 on the Fair will depend on certain developments, including the duration and spread of the outbreak, and the impact on future events all of which is uncertain and cannot be predicted. Consequently, the extent to which Covid-19 may affect the financial condition or results of operations is unclear.

The Company qualified for the employee retention credit for three quarters in 2020 and one quarter in 2021. The company claimed this credit by filing a 941X for those quarters. The credit was collected in 2022. The IRS has five years to audit the 941X the company filed.

The company received a Payroll Protection Program Loan in 2020, which was forgiven in its entirety in 2021. The IRS has six years from the date of the forgiveness to audit the loan.

Note 14 – Subsequent Events

Management has evaluated subsequent events through the date of the auditor's report, which is the date the consolidated financial statements were be issued.

The Four States Fair Association, Inc., and Its Wholly Owned Subsidiaries
Consolidating Statement of Financial Position
December 31, 2023

	FOUR STATES FAIR ASSOCIATION, INC.	FOUR STATES EXPO CENTER, INC.	FOUR STATES CONCESSIONS, INC.	ELIMINATIONS	CONSOLIDATED
Assets					
Current Assets					
Cash and Cash Equivalents	$ 456,861	$ 84,222	$ 6,580	$ -	$ 547,663
Certificates of Deposit	413,100	-	-	-	413,100
Accounts Receivable	33,167	-	-	-	33,167
Inventories	-	2,740	554	-	3,294
Prepaid Expenses	22,305	50	-	-	22,355
Intercompany Receivables	131,955	-	-	(131,955)	-
Total Current Assets	1,057,388	87,012	7,134	(131,955)	1,019,579
Property and Equipment, at cost					
Building and Improvements	7,978,739	81,107	38,130	-	8,097,976
Equipment	966,991	74,649	-	-	1,041,640
Total	8,945,730	155,756	38,130	-	9,139,616
Less: Accumulated Depreciation	(6,321,536)	(138,464)	(3,787)	-	(6,463,787)
Land	639,970	-	-	-	639,970
Property and Equipment, net	3,264,164	17,292	34,343	-	3,315,799
Other Assets					
Investment in subsidiaries	17,326	-	-	(17,326)	-
Other Assets	236	-	3,500	-	3,736
Total Other Assets	17,562	-	3,500	(17,326)	3,736
Total Assets	$ 4,339,114	$ 104,304	$ 44,977	$ (149,281)	$ 4,339,114
Liabilities and Net Assets					
Current Liabilities					
Accounts Payable	$ 8,024	$ -	$ -	$ -	$ 8,024
Accrued Expenses	60,469	-	-	-	60,469
Deferred Revenue	3,103	-	-	-	3,103
Intercompany Payables	-	58,792	73,163	(131,955)	-
Total Current Liabilities	71,596	58,792	73,163	(131,955)	71,596
Net Assets					
Without Donor Restictions	4,265,239	45,512	(28,186)	(17,326)	4,265,239
With Donor Restrictions	2,279	-	-	-	2,279
Total Net Assets	4,267,518	45,512	(28,186)	(17,326)	4,267,518
Total Liabilities and Net Assets	$ 4,339,114	$ 104,304	$ 44,977	$ (149,281)	$ 4,339,114

The Four States Fair Associaiton, Inc., and Its Wholly Owned Subsidiaries
Consolidating Statement of Activities
For the Year Ended December 31, 2023

	FOUR STATES FAIR ASSOCIATION, INC.	FOUR STATES EXPO CENTER, INC.	FOUR STATES CONCESSIONS, INC.	ELIMINATIONS	CONSOLIDATED
Revenues					
Fair Income	$ 831,985	$ -	$ -	$ -	$ 831,985
Membership Dues	725	-	-	-	725
Special Events	407,203	-	-	-	407,203
RV Space Rentals	136,892	-	-	-	136,892
Food and Beverage, net of cost of goods sold	-	37,413	4,410	-	41,823
Grants & Contributions	82,662	-	-	-	82,662
Conditional Contributions	-	-	-	-	-
Other	9,347	-	-	(7,503)	1,844
Total Revenues	1,468,814	37,413	4,410	(7,503)	1,503,134
Expenses					
Program Services	1,307,992	-	-	-	1,307,992
Food and Beverage	-	40,218	14,102	(20,000)	34,320
Supporting Services					
General and Administrative	302,754	-	-	-	302,754
Fundraising	-	-	-	-	-
Total Expenses	1,610,746	40,218	14,102	(20,000)	1,645,066
Non-operating Revenues (Expenses)					
Interest	12,937	-	-	-	12,937
Total Non-operating Revenues (Expenses)	12,937	-	-	-	12,937
Increase (decrease) in net assets	$ (128,995)	$ (2,805)	$ (9,692)	$ 12,497	$ (128,995)

The Four States Fair Association, Inc., and its Wholly Owned Subsidiaries
Consolidating Schedule of Expenses by Functional Classification
For the Year Ended December 31, 2023

	FOUR STATES FAIR ASSOCIATION, INC.		FOUR STATES EXPO CENTER, INC.	FOUR STATES CONCESSIONS, INC.		
	PROGRAM	SUPPORTING	PROGRAM	PROGRAM	ELIMINATIONS	TOTAL
Advertising	$ 54,263	$ -	$ -	$ -	$ -	$ 54,263
Depreciation	154,309	-	2,923	3,787	-	161,019
Equipment Rentals	56,783	-	-	-	-	56,783
Fair Activities	171,642	-	-	-	-	171,642
Insurance	70,249	11,773	-	-	-	82,022
Interest	-	-	-	-	-	-
Legal and Accounting	2,048	14,750	-	-	-	16,798
Licenses and Fees	9,005	9,069	1,135	2,157	-	21,366
Payroll Taxes	18,488	13,387	-	-	-	31,875
Postage and Shipping	3,172	1,080	-	-	-	4,252
Property Taxes	38,186	-	-	-	-	38,186
Repairs and Maintenance	110,519	4,890	4,976	3,315	-	123,700
Salaries and Causal Labor	305,639	221,325	-	-	-	526,964
Special Events	35,645	-	-	-	-	35,645
Supplies and Miscellaneous	38,861	288	31,184	4,843	(20,000)	55,176
Telephone and Utilities	235,730	26,192	-	-	-	261,922
Travel	3,453	-	-	-	-	3,453
Total Expenses	$ 1,307,992	$ 302,754	$ 40,218	$ 14,102	$ (20,000)	$ 1,645,066

ATTACHMENT 4

Arkansas Corn & Grain Sorghum Board

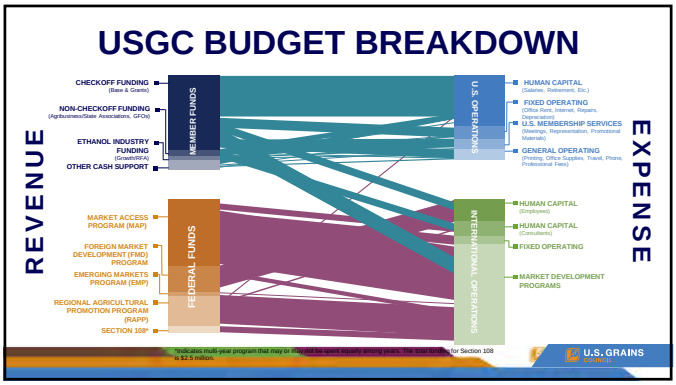
USGC Funding Proposal Presentation

U.S. GRAINS COUNCIL

1

2

3



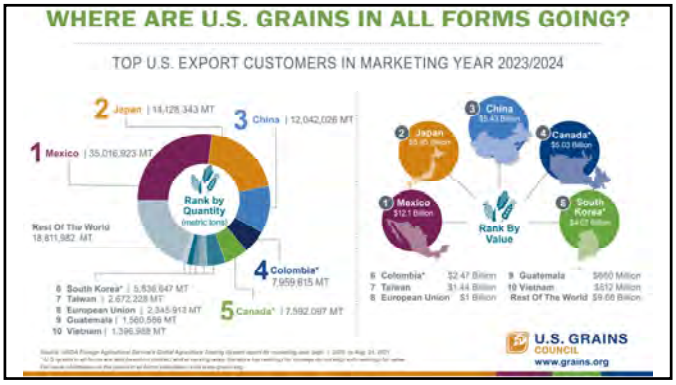
4

FY25 USGC Funding Request

To meet these goals, in FY2025, the USGC respectfully requests the Arkansas Corn & Sorghum Board consider the following:

funding $74,117 which is a 4% increase from last year's contribution.

5



6


WHERE IS U.S. DDGS GOING?
TOP U.S. EXPORT CUSTOMERS IN MARKETING YEAR 2023/2024
1 Mexico | 2,456,832 MT
2 South Korea | 1,534,283 MT
3 Vietnam* | 1,003,261 MT
4 Indonesia* 1,023,470 MT
5 Canada | 745,539 MT
Rest Of The World 2,526,565 MT
Rank by Quantity (metric tons)
7 European Union | 567,936 MT
8 Colombia | 461,874 MT
9 Japan | 454,681 MT
10 China | 372,471 MT
Rank By Value ($ thousands)
5 Turkey $185,753,942
7 European Union $154,522,866
8 Colombia $151,486,129
9 Japan $124,802,945
10 China $90,850,311
Rest Of The World $581,364,710
U.S. GRAINS COUNCIL
www.grains.org

7


Global Aquaculture Promotion
Tunisia
India
Turkey
U.S. GRAINS COUNCIL

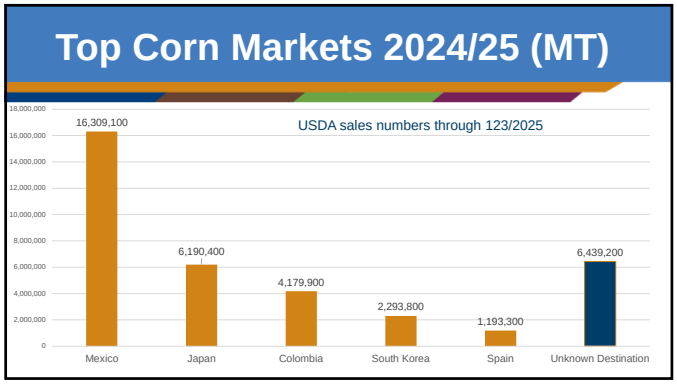
8


WHERE IS U.S. CORN GOING?
TOP U.S. EXPORT CUSTOMERS IN MARKETING YEAR 2023/2024
1 Mexico | 23,475,619 MT
2 Japan | 11,337,248 MT
3 Colombia 6,285,347 MT
4 China | 2,975,006 MT
5 Canada | 2,748,693 MT
Rest Of The World 4,378,357 MT
Rank by Quantity (metric tons)
6 South Korea | 2,349,810 MT
7 Taiwan | 1,732,281 MT
8 Guatemala | 969,602 MT
9 European Union* | 952,740 MT
10 Honduras* | 935,900 MT
Rank By Value ($ thousands)
5 South Korea $530,816,735
7 Taiwan $410,459,231
8 Guatemala $233,843,193
9 Honduras* $210,688,800
10 European Union* $177,899,077
Rest Of The World $1,040,525,274
U.S. GRAINS COUNCIL
www.grains.org

9


Marketing Superior Performance
U.S. GRAINS COUNCIL

10


Top Corn Markets 2024/25 (MT)
USDA sales numbers through 123/2025
16,309,100
6,190,400
4,179,900
2,293,800
1,193,300
6,439,200
Mexico
Japan
Colombia
South Korea
Spain
Unknown Destination

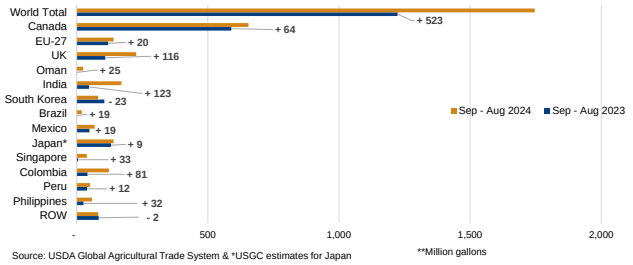
11


WHERE IS U.S. ETHANOL GOING?
TOP U.S. EXPORT CUSTOMERS IN MARKETING YEAR 2023/2024
1 Canada | 654,879,265
2 United Kingdom | 226,587,554
3 India | 170,668,211
4 European Union* 140,674,100
5 Colombia* | 123,090,521
Rest Of The World 128,194,982
Rank by Quantity (gallons)
6 South Korea | 82,534,860
7 Mexico | 69,260,498
8 Philippines | 39,195,199
9 Peru | 51,650,028
10 Singapore | 39,565,276
Rank By Value ($ thousands)
6 South Korea $189,107,400
7 Mexico $163,560,685
8 Peru* $137,029,563
9 Philippines* $130,530,035
10 Singapore $82,648,252
Rest Of The World $283,904,411
U.S. GRAINS COUNCIL
www.grains.org

12

U.S. Ethanol Exports

Total **1.75 billion gallons** in MY 2023/24, largest export year on record



Source: USDA Global Agricultural Trade System & *USGC estimates for Japan

13

WHERE IS U.S. SORGHUM GOING?

TOP U.S. EXPORT CUSTOMERS IN MARKETING YEAR 2023/2024

14

Increasing Sorghum to China

15

Petfood Promotion in Mexico

16

RAPP

U.S. GRAINS COUNCIL

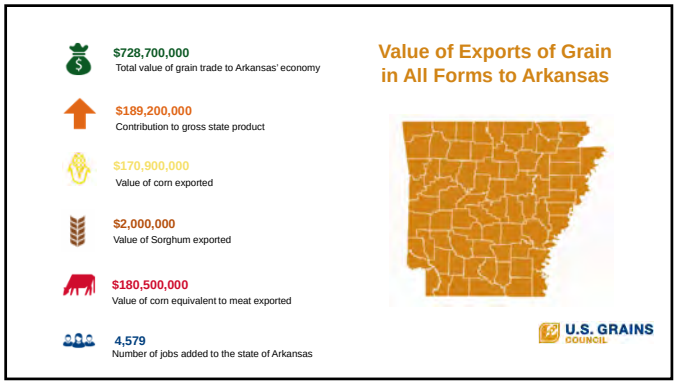
17

Regional Agricultural Promotion Program

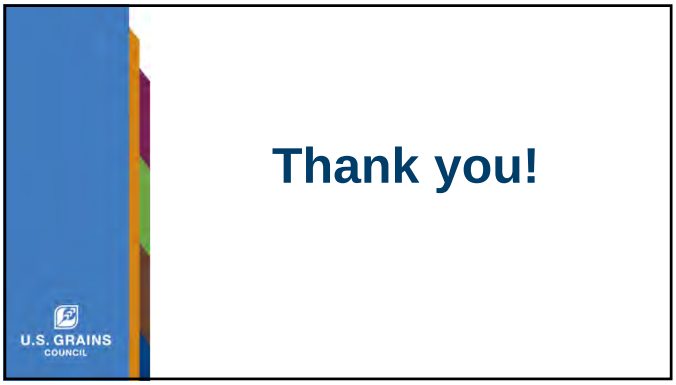
- RAPP1
  - First allocation is for $300 million ($25 million allocated for Africa)
  - Duration of: June 1, 2024, to September 30, 2029
  - Markets ***excluded*** are China, Canada, Mexico and EU
  - $17 Million awarded to USGC for expanded programming
- RAPP2
  - Duration of funding: January 1, 2025, to December 31, 2030
  - INCLDUES EU!
  - $16 Million awarded to USGC for expanded programming

U.S. GRAINS COUNCIL

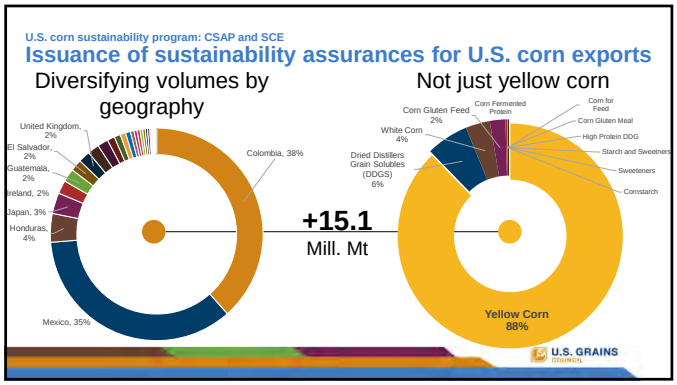
18


$728,700,000
Total value of grain trade to Arkansas' economy
$189,200,000
Contribution to gross state product
$170,900,000
Value of corn exported
$2,000,000
Value of Sorghum exported
$180,500,000
Value of corn equivalent to meat exported
4,579
Number of jobs added to the state of Arkansas
Value of Exports of Grain in All Forms to Arkansas
U.S. GRAINS COUNCIL

19


U.S. GRAINS COUNCIL
Thank you!

20


U.S. corn sustainability program: CSAP and SCE
Issuance of sustainability assurances for U.S. corn exports
Diversifying volumes by geography
Not just yellow corn
United Kingdom, 2%
El Salvador, 2%
Guatemala, 2%
Ireland, 2%
Japan, 3%
Honduras, 4%
Colombia, 38%
Mexico, 35%
+15.1
Mill. Mt
Corn Gluten Feed 2%
Corn Fermented Protein
White Corn 4%
Dried Distillers Grain Solubles (DDGS) 6%
Corn for Feed
Corn Gluten Meal
High Protein DDG
Starch and Sweetners
Sweeteners
Cornstarch
Yellow Corn 88%
U.S. GRAINS COUNCIL

21

U.S. GRAINS COUNCIL

January 10, 2025

Dear Scott, and the Arkansas Corn and Grain Sorghum Board,

On behalf of the Board of Directors of the U.S. Grains Council, I am submitting the enclosed funding request for your consideration. Your previous investment in the U.S. Grains Council has helped increase demand for U.S. sorghum, corn, ethanol and co-products around the world – and increased profitability for farmers in Arkansas and around the country.

For fiscal year 2025, the U.S. Grains Council respectfully requests the Arkansas Corn and Grain Sorghum Board increase its base funding to $74,117 which is a 4 percent increase from last year's contribution.

The Council greatly appreciates your continued support of our programs through funding and via guidance provided through Advisory Team and participation.

If you have any questions about the proposal, please feel free to contact me.

Best,

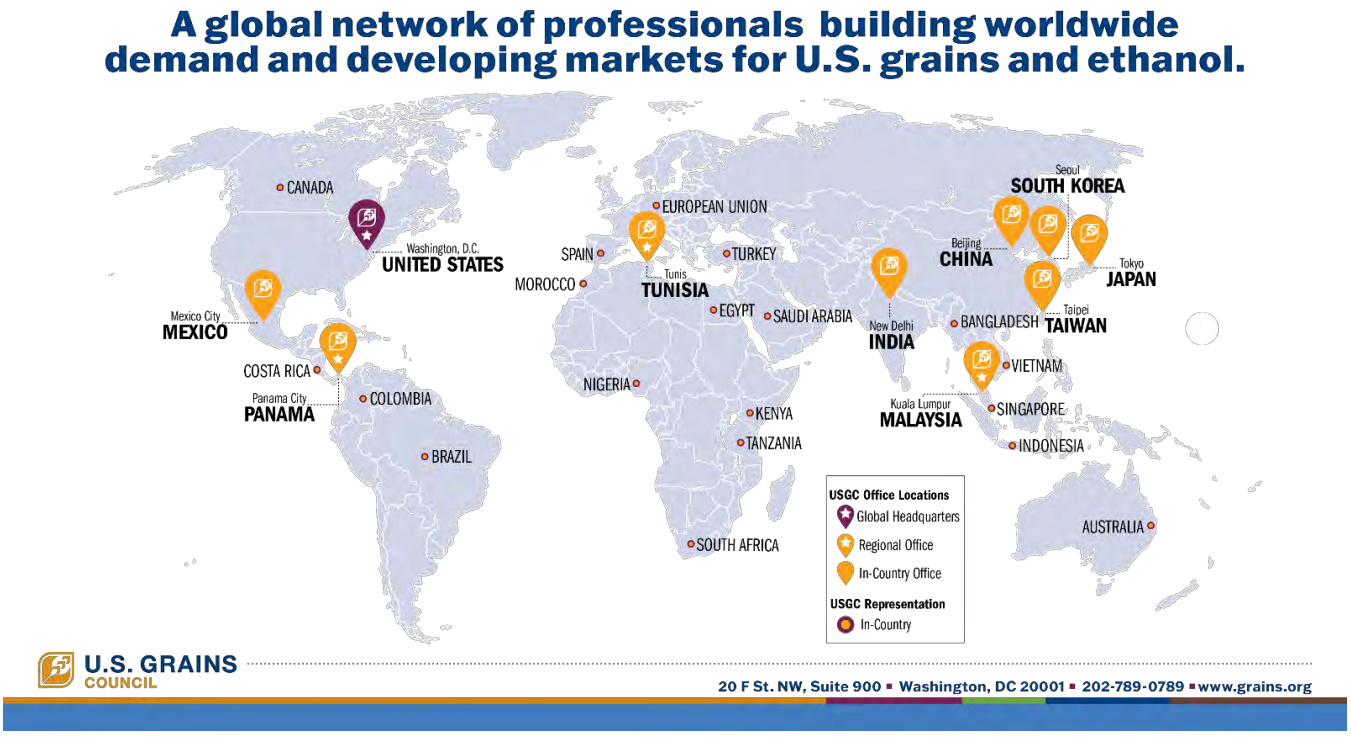
Ryan LeGrand
President and CEO

Cultivate the Future: FY2025 Request For Funding

As our world adapts to increasing inflation costs, supply chain disruptions and transportation issues, the U.S. Grains Council is continuing to work on behalf of U.S. farmers to educate and promote the use of U.S. grains in all forms. Future customers on six continents are being born today – which is why engagement to build and maintain market share is critical now. Our theme of *Cultivate the Future* reinforces our focus on programs that will move bushels of grain today and for generations to come. We are proud to work collaboratively with our partners in the corn industry like Arkansas Corn and Grain Sorghum and we look forward to working together in the future to *Develop Markets, Enable Trade and Improve Lives.*

A study conducted by the Council showed that in 2022 Arkansas grain and grain product exports were valued at $728 million – creating a total of $189 million in economic output across the Arkansas economy and supporting more than 4,579 jobs in the state. The Council actively works to present U.S. farmers with opportunities for export growth, which benefits their bottom lines and agriculture. To continue and expand this progress in FY 2025, USGC respectfully requests the Arkansas Corn and Grain Sorghum increase its base funding to $74,117 which includes a 4% increase from last year's contribution on base funding.

The successes USGC can win for Arkansas farmers stem directly from our global network of dedicated professionals working daily with our members and customers to promote sorghum, corn, ethanol, DDGS and more.

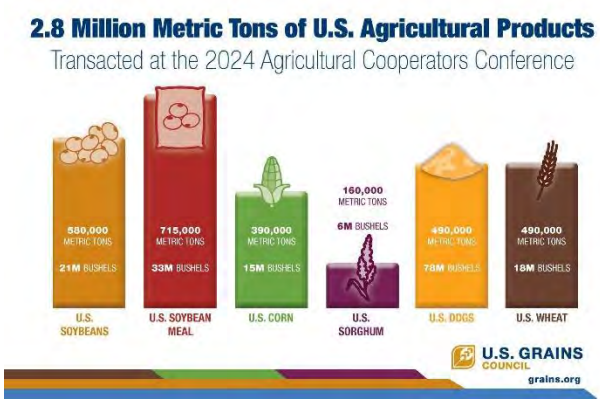


The Council's goal is to build new demand where it doesn't yet exist and grow demand in existing markets. Some examples of what that work has looked like recently, and a selection of successes include:

South Asia Aqua Conference

The Council's South Asia office hosted Indian shrimp and freshwater fish producers in Vijayawada, India this week to discuss the benefits of DDGS inclusion in the world's third largest market for farmed fish production. Aqua feed production has grown to reach 54.52 million metric tons (MMT) globally, with the Asia Pacific region leading the way. The meeting provided attendees with a global aquacultural market outlook and gave participants an opportunity to learn about the various uses for DDGS in the aqua sector.

Council's Southeast Asia Office Hosts Agricultural Co-operators Conference



Sales numbers have been released from the 20th Southeast Asia (SEA) U.S. Agricultural Cooperators Conference (ACC), recently held in Ho Chi Minh City, Vietnam by the U.S. Grains Council (USGC), U.S. Soybean Export Council (USSEC) and U.S. Wheat Associates. Survey results showed nearly 3 million metric tons (MT) (118 million bushels) of U.S. agricultural products, including more than one metric ton (40 million bushels) of coarse grains and corn co-products, were negotiated during the conference.

"Every major market player is here. Working with our fellow cooperators, USSEC and U.S. Wheat Associates, has made this event the premier, can't miss trade event in SEA," said Caleb Wurth, USGC regional director for Southeast Asia and Oceania (SEA&O).
Nearly 500 participants from more than 20 countries gathered at ACC to discuss the future of global agriculture. The conference regularly draws participants from other regions, including end users from South and North Asia.

Aside from the business-to-business opportunities, ACC featured presentations from expert speakers on a wide variety of topics affecting agricultural production and trade, with innovation in grain shipping and logistics emerging as the main talking points during the conference.

With global trade corridors facing increasing pressure—from bottlenecks in the Panama Canal to geopolitical tensions—the event highlighted the need for more efficient transportation routes for U.S. agricultural exports. Speakers noted that the Pacific Northwest has emerged as a cost-effective route for U.S. grain and soybean exports, providing a competitive advantage over other global suppliers.

"With increased pressures from competing origins, this conference is critical to display the value of partnering with the U.S. agricultural industry," said Jolene Riessen, president of the Iowa Corn Growers Association, a supporter of the SEA ACC. "Providing spaces for U.S. exporters to market our commodities is paramount to value at the farm."

Starch Conference Offers Global Stage For Council's Recent Study

The U.S. Grains Council (USGC) held its third annual Global Starch Conference in Chicago, IL on June 10-13, drawing more than 80 participants from nearly 15 countries. Speaker presentations focused on the fundamentals of corn wet milling, wet milling technologies and enzyme uses, sustainability, grain storage and value-based procurement. Invitees included staff from technical and processing departments of global wet milling plants and procurement managers.

Dr. Vijay Singh of the University of Illinois gave the first presentation of the conference, sharing the results of a three-year research project that showed U.S.-origin corn can yield two to four percent more starch extractability in corn wet milling, which can translate to roughly one million dollars in additional revenue for wet millers each year. Additionally, research showed that U.S.-origin corn only requires 24 hours of steeping, compared to 48 hours needed for corn of other origins, greatly impacting the output and overall efficiency of wet milling plants.

"The research project highlights how U.S. corn can directly create a positive economic impact for wet milling plants around the world. Procurement-related presentations also allowed participants to see how corn origin and performance can impact all aspects of the value chain," said Alexander Grabois, USGC manager of global strategies and trade. "We hope attendees' key takeaways are the importance of considering a variety of non-price factors upon procurement and the return on investment for superior performing corn will offset any price premiums."

The conference also included producer perspectives from Illinois Corn Marketing Board Past Chairman Mark Wilson and Iowa Corn Growers' Association Director Mark Mueller, who gave participants a more detailed look into the harvesting process and sustainability practices of U.S. producers. This outlook, along with shipping logistics updates, was an important measure to show international customers how their product is being traded and what to look for in the coming months. Following the conference the international delegation visited farms and river loading facilities with the goal of creating more awareness of the grain origination process and understanding how grain quality is monitored throughout the process.

"The wet milling industry is projected to grow exponentially in the coming years, and demand for starch in both industrial and food uses will require procurement managers to see high-quality corn as an investment in an ingredient that will add value to the operation and co-products, and not just a commodity," Grabois said.

U.S. Grains Council Builds Relationships In Panama

To strengthen and increase U.S. corn and corn co-product exports to Panama, the U.S. Grains Council (USGC) recently engaged with Coopagro, an association of 29 aquaculture, pork and poultry producers in the country, to conduct a feed pelleting training program for its members.

"Coopagro requested this training to enhance the efficiency of its pelleting operations and providing a great opportunity for the Council to gain a deeper understanding of the needs and use applications of different grains among Panamanian producers," said Angelica Rios, USGC marketing specialist for Latin America (LTA).

Coopagro serves its membership by consolidating supply and production chains to offer a reliable and competitively priced source of animal feed. The organization accounts for nearly 20 percent of Panama's annual corn imports, purchasing 120,000 metric tons each year, making it a valuable partner for the Council and the U.S. agricultural industry.

Rios was joined by USGC Feed Grains Consultant Alejandro Gonzalez and Auburn University Poultry Science Extension Specialist and Associate Professor Wilmer Pacheco for the program that attracted 20 stakeholders from Panamanian agricultural sectors.

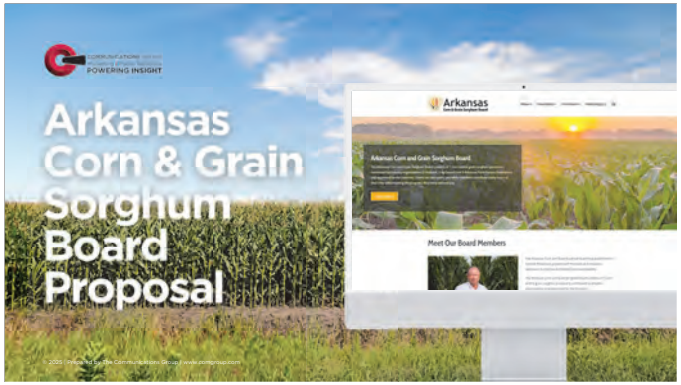
The training began with an overview of the feed pelleting process, including strategies to improve mash conditioning, equipment operation, pellet quality and how to formulate diets depending on species. The program continued with several visits to local farms to observe how producers are using and implementing the pelleting process to enhance operational efficiency.
After the program, Rios and USGC Regional Director for LTA Marri Tejada met with Javier Ho, dry bulk leader at the Panama Canal Authority, to maintain a mutually beneficially relationship with the vitally important trade conduit.

"The U.S. and Panama enjoy a healthy trade partnership, and collaborating with organizations like Coopagro will be essential to increase U.S. corn exports to the country, especially as consumer demand for protein continues to rise," Rios said. "This training program will result in higher-quality animal feed that benefits the livelihood of Panamanian producers and consumers and promotes livestock health, and simultaneously expands a market for U.S. growers."

Thank you!

As the Council looks to seize these challenges and aggressively pursue opportunities, we are grateful for our longstanding partnership with Arkansas Corn and Grain Sorghum. We look forward to working together in FY2025!

ATTACHMENT 5



RECOMMENDATION ONE

Website

- Annual Hosting Fees - $2,000 per year
- Website Management, Optimizations & Analytics - $500 per month

Benefits

- **Continuous Improvement**: Monthly management ensures your website remains up-to-date, secure, and aligned with the latest web standards and technologies.
- **Data-Driven Decisions**: Regular analytics review can help inform strategic adjustments for improved outcomes.

Why Social Media Matters

In today's digital landscape, social media isn't just a platform for sharing content—it's a powerful tool for:

Strengthening Industry Presence
Social media allows you to connect directly with farmers, industry partners, and stakeholders. By sharing timely updates, research, and success stories, the board can reinforce its role as a trusted resource in Arkansas agriculture.

Driving Website Traffic & Promoting Key Resources
By sharing valuable insights, educational materials, and funding opportunities, social media helps direct more visitors to the website. Increased engagement on social platforms also signals relevance to search engines, improving visibility and access to important industry resources.

Supporting Farmers & Advocating for Agriculture
A strong social media presence ensures that farmers stay informed on best practices, policy changes, and funding opportunities. By showcasing real-world applications of research and resources, the board can influence industry decisions and reinforce the value of its work.

Establishing the Board's Credibility & Authority
Social media strengthens the board's credibility by sharing research, market updates, and farmer success stories. It positions the board as a trusted resource, educating stakeholders and reinforcing its leadership in advancing innovation and sustainability.

Cost-Effective Promotion
Social media offers the board a cost-effective option for research promotion, market updates, and farmer success stories. It maximizes outreach, engages stakeholders, and reinforces the board's impact with marginal, yet high-yielding investments.

RECOMMENDED PLATFORM

Facebook

Facebook remains the largest social media platform with a broad demographic reach, especially among adults who are key decision-makers in the agricultural and consumer sectors. It excels in community building, information sharing, and driving engagement.

RECOMMENDATION TWO

Organic Social Media

- **Account Setup and Optimization**
  - Creation and optimization of the Facebook Page, including profile and account set up.
  - Integration of Facebook with the website to make it easier for farmers and stakeholders to find resources.
- **Content Strategy & Creation**
  - Posting 2-3 times per week to maintain engagement and visibility.
- **Engagement and Community Management**
  - Responding to comments, messages, and inquiries to build relationships and encourage interaction.
- **Analytics and Monthly Reporting**
  - Monthly analytics to track audience growth, engagement levels, and website traffic from social media.

One-Time Setup Investment: $1,000
Monthly Investment: $1,950 - $2,450

RECOMMENDATION THREE

Event Management & Support

ONE TIME INVESTMENT: $1,500

- **Designing a Tradeshow Booth**
  - Begin with foundational elements while keeping future growth in mind. We will create a cost-effective yet striking tradeshow booth with a modular design, allowing for easy expansion later on.

INVESTMENT: STANDARD HOURLY RATE

- **Tradeshow/Event Support**
  - Allow us to take care of registration and represent you at the shows. Following each event, we will deliver a detailed impact report that includes any connections made, leads generated, and social media analytics collected.

COMMUNICATIONS GROUP
Marketing | Public Relations
201 E Markham St., Suite 300
Little Rock, Arkansas 72201

PRINCIPALS

Dan Cowling III, Dane Cowling,
Lisa Van Hook

Arkansas
Corn & Grain Sorghum Board

WEBSITE REPORT

REPORT

OVERVIEW

WEBSITE

SITUATION ANALYSIS

The Arkansas Corn & Sorghum Board's website is a valuable resource for farmers and stakeholders, offering relevant content and industry updates. While it provides useful information, traffic remains low, limiting its overall performance.

Enhancing visibility, social media integration, and proactive traffic strategies will help maximize visibility and engagement, ensuring the site reaches its full potential while continuing to serve its audience effectively.

2024

SUMMARY OF UPDATES

June
- Added events section to About Page

July
- Updated images and links of Farmar Handbooks
- Revised Allocations Graphics and Numbers

August
- Added the 2023 Research Study

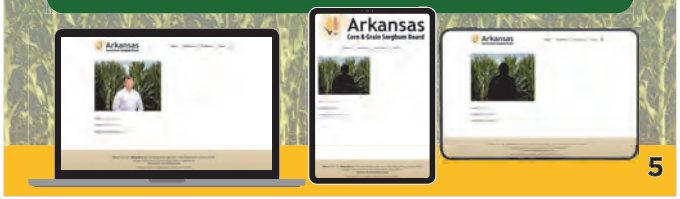
September
- Developed new Resources Page

November
- Made title updates to Board Member Bios and Home Page Gallery

WEBSITE

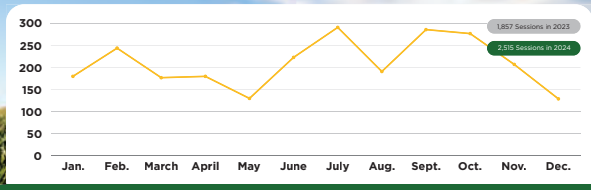
PENDING UPDATES

1. Add missing info to Tommy Young's board member page
2. Add missing info and photo for Matt Gammill's board member page
3. Add missing info and photo for Matt Smith's board member page



PERFORMANCE INSIGHTS

WEBSITE TRAFFIC



Website sessions saw a significant increase in 2024—a 35% growth from 2023. This increase can be attributed to the updates that were made.

PERFORMANCE INSIGHTS

BOUNCE RATE AND TIME ON SITE

Average Bounce Rate	
2024	54.24%
2023	64.47%

Bounce rate dropped by over 10% from 2023 to 2024, indicating improved user engagement and better content alignment with visitor expectations.

Average Time on Site	
2024	1 minute 23 seconds
2023	1 minute 31 seconds

While visitors are navigating more efficiently, further opportunities exist to enhance content depth and user journey to increase time on site.

WEBSITE

RECOMMENDATIONS

- Continue to Monitor and Track Website Performance
- Continue to Perform Monthly Health Checks and Regular Maintenance to Keep Site Current
- Implement an Organic Social Media Strategy to Help Drive Website Traffic

Questions?

COMMUNICATIONS GROUP
Marketing | Public Relations

201 E Markham St., Suite 300
Little Rock, Arkansas 72201

PRINCIPALS

Dan Cowling III, Dane Cowling,
Lisa Van Hook

2025 Arkansas Corn & Sorghum Board Budget Proposal

WEBSITE SERVICES		Fqy.	Investment	TOTAL	Details
	Website Hosting	Annual	$2,000	$2,000	
	Website Management	Monthly	$500	$6,000	
	Website Maintenance				
	Website Performance Monitoring				
	Website Performance Reporting				
			SUBTOTAL:	$8,000	
OPTIONAL SERVICES					
SOCIAL MEDIA SERVICES		**Fqy.**	**Investment**	**TOTAL**	**Details**
	Social Media Establishment	1x	$1,000	$1,000	
	Social Media Strategy Development				
	Social Media Management	Monthly	$1,800	$21,600	
	Round the Clock Social Media Monitoring				
	Social Media Reporting				
	Paid Social Ad Budget (Optional)	Varies	Varies	Varies	Ad Budgets are determined by client; Recommended Investment: $1,000 to $1,500 per month for 6 months
			SUBTOTAL:	$22,600	
EVENT MANAGEMENT SERVICES		**Fqy.**	**Investment**	**TOTAL**	**Details**
	Booth Production	1x	Varies	Varies	Pricing depends on project scope; Ranges from $1,000 - $10,000+
	Collateral Production	1x	Varies	Varies	Pricing depends on project scope
	Premium Item Inventory Management and Procurement	1x	Varies	Varies	Pricing depends on project scope
	Event Schedule Development and Management	1x	$1,000	$1,000	Estimate only
	Onsite Event/Booth Management and Board Representation	Varies	$175/Hour	Varies	Billed at standard hourly rate
	Event Impact Reporting				
	Event Sponsorship Management and Coordination (Optional)	Varies	Varies	Varies	Client sets sponsorship budget, ComGroup coordinates event relationship at standard hourly rate
			SUBTOTAL:	TBD	

Arkansas Corn & Sorghum Board
2025 Promotion Request For Proposal – RESPONSE
The Communications Group
Submitted: Tuesday, January 14, 2025

1. State the goals and objectives of the promotional activity

PRIMARY SERVICE PROPOSAL

Website Services

2. Website Hosting
3. Website Management
4. Website Maintenance
5. Website Performance Monitoring
6. Website Performance Reporting

OPTIONAL SERVICE PROPOSAL

Social Media Services

1. Social Media Establishment
2. Social Media Strategy Development
3. Social Media Management
4. Round the Clock Social Media Monitoring
5. Social Media Reporting
6. Paid Social Advertising

Event Management Services

1. Booth production
2. Collateral production
3. Premium Item Inventory Management and Procurement
4. Event Schedule Development and Management
5. Onsite Event/Booth Management and Board Representation
6. Event Impact Reporting
7. Event Sponsorship Management and Coordination

2. State the expected benefits to the Arkansas corn and/or grain sorghum industries from the proposed promotional efforts

Website Service Proposal Benefits:

1. Maintains board's website and uninterrupted online digital presence
2. Maintains board's primary communication channel to key audiences
3. Performance monitoring and reporting informs board of audience behaviors, preferences, interests and understanding of how they interact with the board to help guide the board's strategic communications and messaging
4. Serve stakeholders by providing transparency and access to timely and useful information

Social Media Service Proposal Benefits:

1. Generates awareness of board mission and activities
2. Enhances board's digital presence, footprint, and community
3. Meets stakeholder audiences where they seek information and redirects traffic to website

4. Captures high-quality information about audience interests and preferences to inform strategic board decisions
5. Paid social advertising is recommended, at least for a limited period of time, to initially establish and grow your social media following

Event Management Service Proposal Benefits:

1. Provides turnkey solution that gives the board professional representation at popular industry events to engage with key stakeholders and promote the board's activities and resources
2. Reporting gives board insight into how it can best support key stakeholders through personal interactions
3. ComGroup can optionally support the board in managing an annual event schedule, including the negotiation and coordination of sponsorships to maximize the promotional value of event related opportunities

3. Seek to promote generic corn and/or grain sorghum and non-specific business entities

The intent of the proposed services is to promoted and educate key stakeholder audiences about the Arkansas Corn & Grain Sorghum Board, it's mission, activities, funded research projects, the state's general corn and grain sorghum industry and its role in Arkansas's #1 economic driver, agriculture.

4. Include a budget and explain how the entity will be accountable for its use of the requested funds

Please find proposed budget attached.

Regarding ComGroup's accountability to the Board:

ComGroup provides regular performance reporting and maintains constant proactive and reactive communication with the Board administrator through a dedicated account executive and account team. Billing is conducted on a monthly cycle and includes transparent itemized invoicing for services and expenses.

5. Present audited financial statements for funding requests over $15,000

Please refer to attached Budget Proposal.

6. Funds will not be awarded for administrative costs and cannot be used to duplicate activities funded by other programs

All funds appropriated for services requested by the Board are allocated in an approved budget to support the primary goals and objectives of the project, including all professional services, account management and software subscriptions necessary to perform the essential tasks of the contract.

Arkansas
Ag in the Classroom

Arkansas Corn & Grain Sorghum Board
Funding Proposal

Donette Spann
Director, Ag in the Classroom
Arkansas Farm Bureau Federation
February 3, 2025

Who We Are

- Our goal is to educate and engage both youth and adults in the field of agriculture.
- We strive to improve agricultural literacy—this includes raising awareness, knowledge, and appreciation of agriculture and its impact on quality of life—specifically among preK-12 teachers and students.
- Using materials we develop in-house and in collaboration with other Ag in the Classroom programs, we provide students with materials and lessons that align with state academic standards.

What We Do

- Arkansas Ag Readers for every commodity
  - Corn, Rice, Soybean, Beef, Small Ruminants, Dairy, Aquaculture, Swine, Cotton, Poultry & Forestry
- Ag Fact Booklets
- Classroom Grants for Teachers
- Outstanding Teacher of the Year
- Interactive Education trailers
- Partnerships with FFA and 4H
- Garden Grants
- Youth Ag Immersion Events
- Elementary Agriculture Education Pilot Program

Corn Ag Reader

- Over 50,000 Ag Readers distributed to students since 2023
- Eight-page tabloid-style publication
- Topics include types of corn, nutrition, products & by-products, and production
- Plans are to update and print in 2025
- To offer for no charge
- Request: $5,000

Elementary Agriculture Education Pilot Program

- Established as Act 243 in 2023 by the Arkansas Legislature.
- Aimed at introducing K-6th grade students to agriculture.
- Curriculum will be developed by the National Center for Agricultural Literacy (NCAL) and will emphasize the commodities grown in Arkansas.
- Up to 30 schools will be accepted into the program.
- Corn will be the focus of at least one lesson for each grade, covering seven lessons in total.
- Funding is requested for curriculum development and for purchasing supplies and materials for projects and lessons involving corn at the pilot schools.
- Request: $10,000.

Summary

Arkansas Ag in the Classroom requests:

Corn Ag Readers Update/Printing	$5,000
Elementary Ag Education Pilot Program Corn Curriculum & Classroom Supplies	$10,000
Total	$15,000

Thank you!

Arkansas Ag in the Classroom
Funding Proposal for the Arkansas Corn & Grain Sorghum Board

January 15, 2025

Submitted by:
Donette Spann, Director, Ag in the Classroom

The Arkansas Ag in the Classroom program engages and educates students and teachers about the importance of agriculture in Arkansas. Last year, our educational materials and programs reached over 175,000 people. We collaborate with schools, as well as county and state organizations, through various workshops and partnerships.

Arkansas Ag in the Classroom programs aim to educate youth and adults about the various commodities produced in the state. Since Arkansas is a significant corn-producing state, we see a valuable opportunity to raise awareness and educate people specifically about this commodity through various methods.

Corn, Poultry, and Beef Ag Readers

Since 2023, over 75,000 Ag Readers have been distributed to students, schools, and other organizations. The Arkansas Ag in the Classroom Corn, Poultry, and Beef Ag Readers are the most popular in the Ag Reader series. To highlight the connection between corn and other commodities, we include corn-related information in the Poultry and Beef Ag Readers, as corn is a vital part of livestock diets. We plan to update these Ag Readers in 2025 and are requesting $5,000 for these updates, which will also allow us to print new Corn Ag Readers. Our goal is to offer these resources at no cost to the users.

Elementary Agriculture Education Pilot Program – Corn Curriculum

The Arkansas Legislature passed Act 243 in 2023, establishing the Elementary Agriculture Education Pilot Program. This program aims to introduce kindergarten through 6th grade students to agriculture by utilizing a curriculum developed by the National Council of Agricultural Literacy (NCAL) in collaboration with the University of Utah. The lessons will highlight commodities grown in Arkansas, with corn being featured in at least one lesson for each grade level, totaling seven lessons.

We are seeking $10,000 to help cover the costs of developing the curriculum and to purchase supplies and materials necessary for conducting hands-on STEM projects in the classroom.

Budget

Corn Ag Readers Update/Printing	$5,000
Elementary Agriculture Education Pilot Program – Corn Curriculum/Supplies	$10,000
Total Requested	**$15,000**

ELEMENTARY AGRICULTURE EDUCATION PILOT PROGRAM

AS ESTABLISHED IN ACT 243 OF 2023

★ 3 ★

YEAR

Pilot Program

Act 243 of 2023 established a program for Arkansas public elementary schools to participate in an agriculture education program for students in grades K-6.

The Pilot Program
Available for up to 30 schools with a minimum requirement of 6 schools participating.

Curriculum
Lessons will be provided at no cost to the school or school district. The curriculum will be in line with state standards.

Community Partner Funding
Funding for specific activities within the curriculum can come from the community or ag industry organization partnerships. Working with partners is encouraged.

Commitment
The pilot program requires a **3-year** commitment and the sharing of enrollment data, demographics, and the program's academic impact.

Instructor
The school will have a dedicated instructor to carry out the pilot program. Schools will have discretion on who/how to select an instructor.

Professional development workshops will begin in the Summer of 2025.

APPLICATIONS DUE FEBRUARY 15
Accepted schools will be notified by March 1.

Rollout:
2025-26 school year

Working with your school district's junior high or senior high school ag education program is encouraged.

For more information, contact Donette Spann at Arkansas Farm Bureau Federation (501) 228-1222
donette.spann@arfb.com

Arkansas AG READER

POULTRY

AN AGRICULTURAL MAGAZINE FOR KIDS

RUFFLE YOUR FEATHERS

Poultry are domestic fowl, such as chickens, turkeys, ducks, ostriches, emus, quail, pigeons, pheasants or geese, raised for meat or eggs. The most common poultry in Arkansas are chickens and turkeys. Arkansas has over 5,000 chicken farms and over 500 turkey farms. Chickens that are raised for their meat are called broilers, and chickens that are raised for their eggs are called laying hens. Most of our chicken and turkey farmers grow their birds on contract for poultry companies like Tyson Foods or Butterball. Arkansas is home to numerous poultry companies and businesses that support those companies and the farmers.

Most poultry in Arkansas are raised in large poultry houses that protect the birds from predators, provide a controlled environment and help keep the birds healthy. Inside these houses the birds have room to roam, access to quality feed and clean water 24 hours a day. Arkansas poultry farmers make sure the birds are well cared for and constantly monitor feed, water, and air quality. New technology in the poultry houses helps the farmer conserve energy, monitor the flock, and protect the environment.

CHICKEN CHAT

Male chickens are called roosters. They have larger combs on top of their heads, and wattles under their beaks. They are larger than female chickens, which are called hens, and their feathers are more colorful. Baby chickens are called chicks. A female chicken that is raised for eggs is called a laying hen. Laying hens sit on the eggs for 21 days until they hatch. In large commercial chick production, large incubators (machines that keep eggs warm) are used to hatch chicks instead of laying hens. Only eggs that are fertilized will hatch. Chickens need grit, small pieces of sand or stone, in their diet to produce eggs.

Chickens raised for their meat are called broilers or fryers. Some examples of breeds of chickens are White Leghorns, Rhode Island Reds, Plymouth Rock, Polish, Sussex, and Cochin.

ROOSTER
(male)

HEN
(female)

CHICKS
(babies)

CHICKEN TRIVIA

Approximately 5.8 billion dozen eggs per year are produced in the US, and Arkansas is ranked 9th in egg production. Poultry makes up 35% of agriculture in the state of Arkansas.

The largest single chicken egg ever laid weighed one pound with a double yolk and double shell.

A person eats approximately 250 eggs per year.

Egg yolks are one of the few foods that naturally contain Vitamin D. They also contain 13 essential vitamins and minerals. Eggs contain the highest quality food protein.

Eggs age more in one day at room temperature than in one week in the refrigerator.

A hen must eat about four lbs of feed to produce one dozen eggs. A hen requires 24 to 26 hours to produce one egg.

CHICKEN PRODUCTION

Chickens eat chicken feed. The main ingredients are corn, wheat, sorghum, or DDGS (distillers' dried grains with solubles). Vitamins and protein supplements, such as soybean meal, are added to the feed. For every pound of growth, a broiler will eat approximately 2 lbs of feed. Laying hens eat approximately 4 lbs of feed for every dozen eggs they lay.

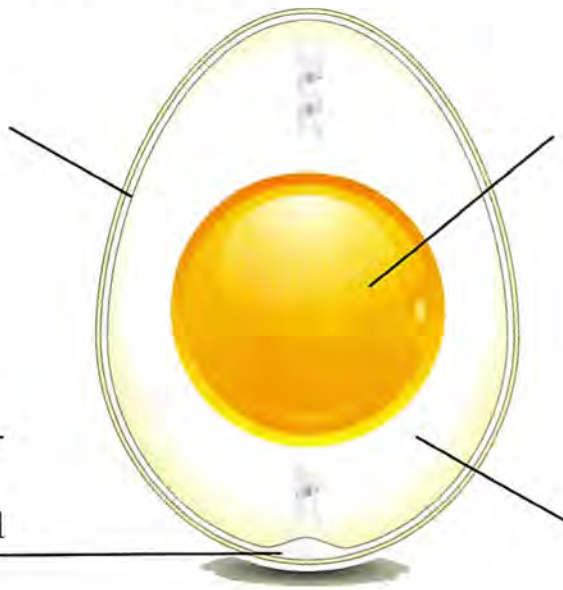
FFA students raise chickens to show, like the broiler above.

Decades of research by poultry companies and universities have led to better genetics from selective breeding, optimum nutrition and quality animal health. Today a farmer needs approximately 8 lbs of feed to raise a 4 lb chicken, compared to the 1940s when it took nearly 16 lbs of feed to raise a 4 lb chicken.

Chickens that are market size are sent to a processing plant to be slaughtered, inspected, and packaged. Eggs are moved from the farm to the egg handling facility very quickly. The handling facility will wash, size, grade, package, and ship the eggs. Most eggs produced today will be at the grocery store within 72 hours.

PARTS OF AN EGG

Shell – Outer covering of the egg, composed largely of calcium carbonate, that provides protection to the rest of the egg.



Yolk – Yellow portion of the egg. The yolk is a major source of vitamins, minerals, and almost half of the protein.

Air Cell – Pocket of air formed at large end of the egg between the shell membranes that increases in size with age. This is caused by the contraction of the contents as the egg cools after laying.

Albumen – Clear-like portion of the egg that is the major source of egg protein. It provides protein to the growing embryo and cushions the embryo during its development. It also protects against microbes.

TURKEY PRODUCTION

Arkansas is ranked 3rd for turkey production among the United States. Every Butterball™ brand whole turkey is produced in Arkansas. Some turkeys are raised outside and some are raised in environmentally controlled barns where they are able to roam freely. These barns provide protection against predators, disease, and bad weather.

Turkeys are mainly fed a balanced diet of corn and soybean meal with vitamin and mineral supplements mixed in. Turkey hens go through a 25-week laying cycle which produces about 80-100 eggs per hen. To raise a thirty-pound tom turkey, it takes about 75-80 lbs of feed. It usually takes hens 14 weeks to reach maturity. It takes toms 18 weeks. Hens are processed and sold as whole birds. Toms are processed into products such as turkey deli meats, turkey franks, turkey sausage, tenderloins, and cutlets.

More and more consumers are recognizing the great taste and nutritional value of turkey. Since 1975 the consumption of turkey has increased by 218 percent!

TURKEY TALK

Wild turkeys are different than domestic turkeys. Domestic turkeys are the ones used for meat we buy at the grocery store. Wild turkeys are larger and they look more like what you see drawings of around Thanksgiving.

Toms are male turkeys and hens are female turkeys. Large groups of turkeys are called flocks. A baby turkey is called a poult.

Turkey eggs, which are larger than chicken eggs, are tan with brown specks. Only tom turkeys gobble. Hen turkeys make a clicking noise.

Wild turkeys can fly up to 55 miles per hour for short distances and can run 20 miles per hour.

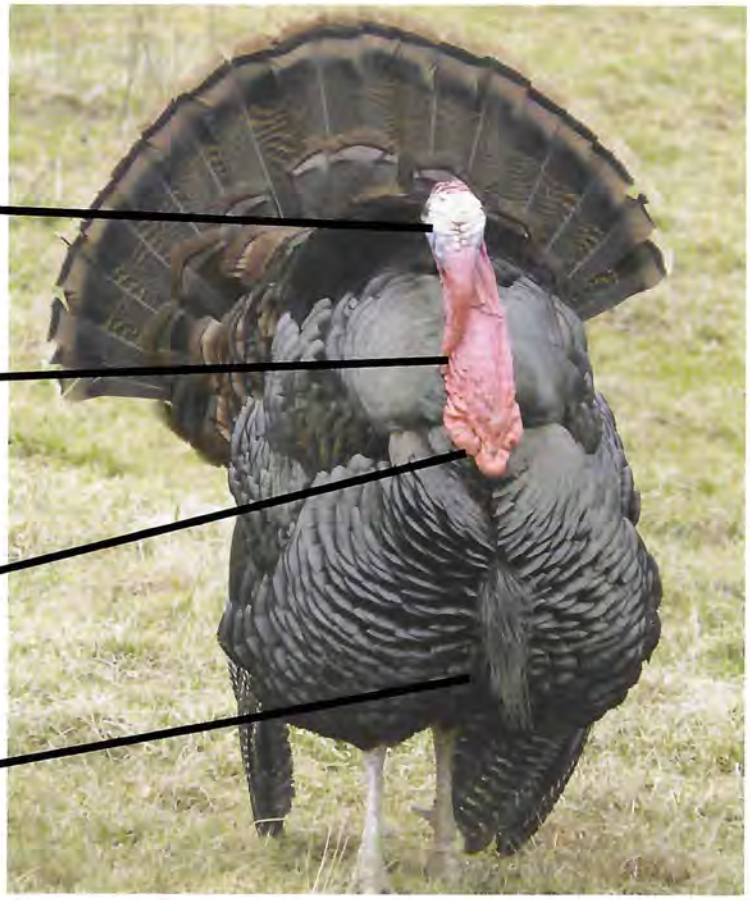
PARTS OF A TURKEY

Caruncle – the red-pink fleshy growth on the head and upper neck of the turkey.

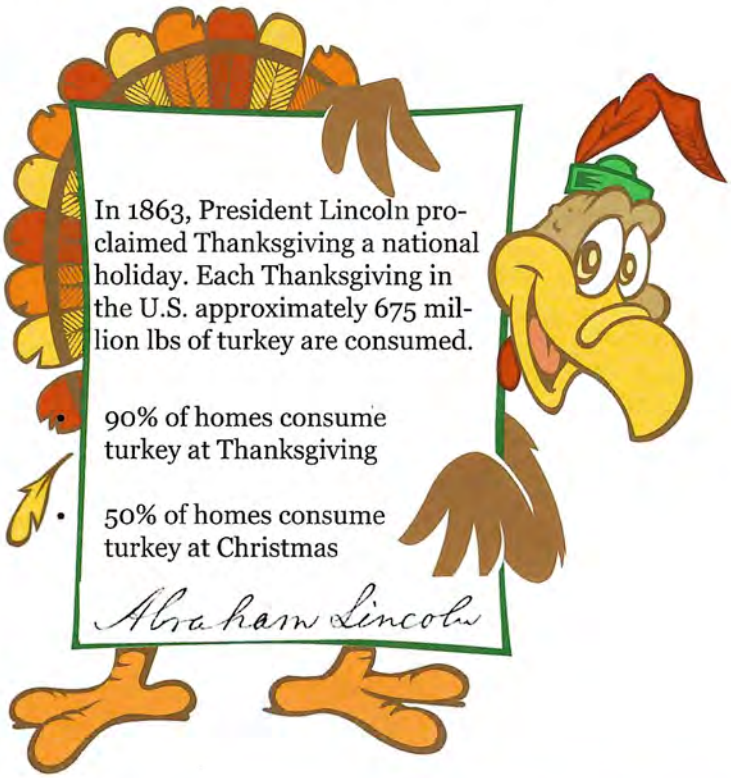
Snood – the long, red, fleshy growth from the base of the beak that hangs down over the beak.

Wattle – a bright red appendage at the neck of the turkey.

Beard – the black lock of hair found on the chest of the male turkey.



TURKEY TRIVIA



Type: Bird

Diet: Omnivore

Average life span in the wild: 3 to 4 years

Size: Body, 3.6 to 3.8 ft.

Wingspan, 4.1 to 4.8 ft.

Weight:5.5 to 18.8 lbs.

Group name: Flock

GROW A TURKEY

SUPPLIES:

- Emptied out egg shells
- Wheat grass seeds
- Soil
- Googly eyes
- Craft foam
- Water
- Sunny window

DIRECTIONS:

1. Empty the egg shells. Do this by tapping the bottom of the egg to crack the surface and break it off. Dispose of the inside (or use to make breakfast). Rinse thoroughly.

2. With glue, add the googly eyes and felt to decorate the egg to look like a turkey.

3. Add a little soil to the egg.

4. Plant the wheat grass seeds.

5. Add more soil.

6. Water your turkey.

7. Place the turkey in a sunny window.

8. Wait...

9. In two days your turkey will have feathers!

SHOW WHAT YOU KNOW *Quiz*

1. How long does it take eggs to get to the grocery store?
   a. 24 hours
   b. 96 hours
   c. 72 hours
   d. 36 hours

2. How many days does it take for a chicken egg to hatch?
   a. 24
   b. 18
   c. 30
   d. 21

3. The yellow portion of the egg is called the _____.
   a. yolk
   b. shell
   c. chalaza
   d. albumen

4. Eggs are a good source of vitamins and minerals, they also contain the highest quality of what other nutrient?
   a. Vitamin D
   b. Protein
   c. Calcium
   d. Vitamin A

5. Male chickens are called _____.
   a. toms
   b. hens
   c. roosters
   d. chicks

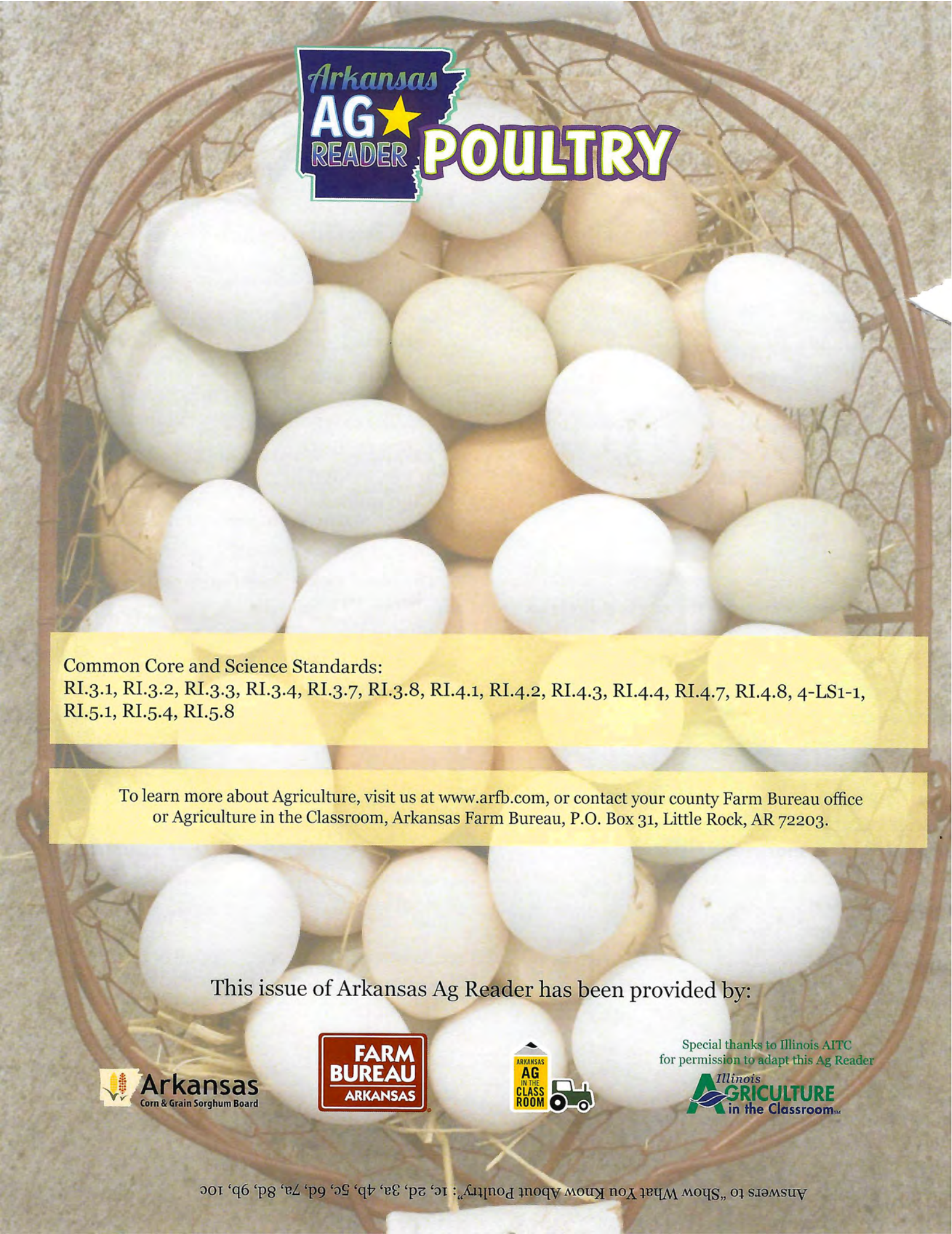
6. What sound do hen turkeys make?
   a. ticking
   b. clucking
   c. crowing
   d. clicking

7. How many lbs of turkey are consumed during Thanksgiving?
   a. 675 million
   b. 264 million
   c. 30 million
   d. 1.2 billion

8. The black lock of hair found on the chest of a male turkey is called a _____.
   a. snood
   b. wattle
   c. caruncle
   d. beard

9. What is Arkansas' rank among the states for turkey production?
   a. 2nd
   b. 3rd
   c. 1st
   d. 4th

10. Arkansas has over ____ poultry farms?
   a. 7,000
   b. 6,000
   c. 5,000
   d. 4,500



Common Core and Science Standards:
RI.3.1, RI.3.2, RI.3.3, RI.3.4, RI.3.7, RI.3.8, RI.4.1, RI.4.2, RI.4.3, RI.4.4, RI.4.7, RI.4.8, 4-LS1-1, RI.5.1, RI.5.4, RI.5.8

To learn more about Agriculture, visit us at www.arfb.com, or contact your county Farm Bureau office or Agriculture in the Classroom, Arkansas Farm Bureau, P.O. Box 31, Little Rock, AR 72203.

This issue of Arkansas Ag Reader has been provided by:

Arkansas Corn & Grain Sorghum Board

FARM BUREAU ARKANSAS

ARKANSAS AG IN THE CLASS ROOM

Special thanks to Illinois AITC for permission to adapt this Ag Reader

Illinois AGRICULTURE in the Classroom℠

Answers to "Show What You Know About Poultry": 1c, 2d, 3a, 4b, 5c, 6d, 7a, 8d, 9b, 10c

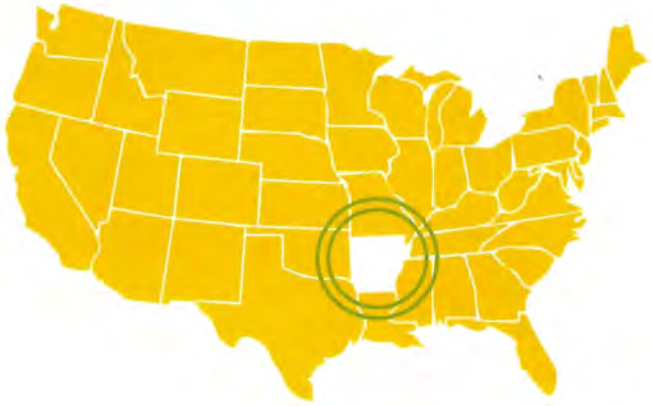
Photo courtesy of the USDA

THAT IS A LOT OF CORN!

Across Arkansas, thousands of acres of corn are planted and harvested each year. Much of the corn grown in Arkansas is field corn, which is not the type of corn you eat on the cob or with your dinner. It is a special type of corn that has a hard outer shell and is full of starch. So, what do we do with it?

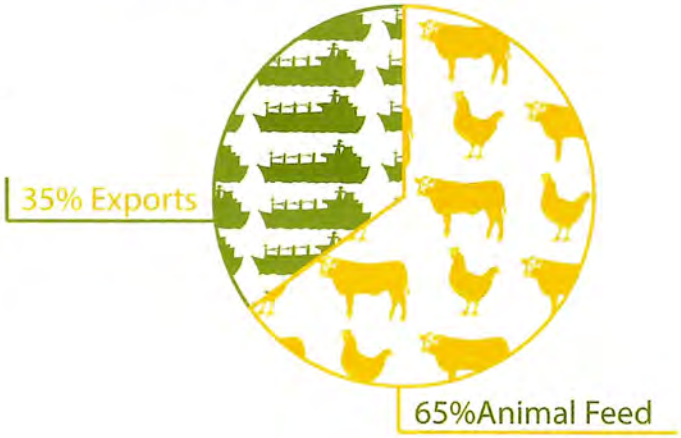
Field corn is processed to make products you use every day. Processing means changing field corn into different usable products through a series of steps. The corn is soaked and milled (ground) so that the germ oil, starch, gluten and hulls can be separated. These items are then made into cornstarch, cooking oil, sweeteners, high fructose corn syrup, cereal, beverages and fuel. And that's just the beginning!

Arkansas farmers rank 20th in the country in corn production



On average, Arkansas farmers plant about 855,000 acres of corn annually

Corn use in Arkansas



1 bushel of corn weighs 56 pounds
56 pounds X 160 million bushels =

8.9 billion pounds of corn!

GAS UP BY PUMPING CORN!

Why is it important for us to use fuel made from corn?

Ethanol is good for our environment!

More than half of the air pollution in the U.S. comes from automobiles.

Mixing ethanol with gasoline, can cut harmful carbon monoxides by

one-fourth!

Ethanol is a renewable resource!

When we need more fuel, we can

grow more corn.

Gasoline is made from crude oil!

Crude oil is not a renewable resource and once we have used it all, it is gone.

crude oil

Mixing ethanol with gasoline, makes the Earth's limited supply of crude oil

last longer!

crude oil ethanol

There are 204 ethanol plants in the U.S.

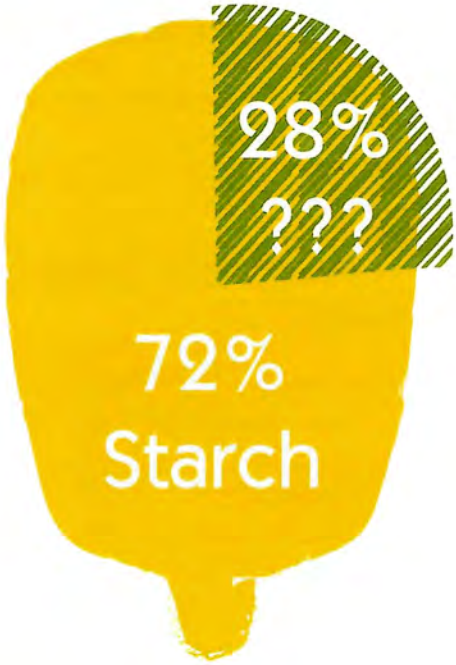
14 are located in Illinois!

1.6 billion gallons
(560 million bushels of corn)
of ehthanol are produced
every year in Illinois.

Corn processed into ethanol in the U.S. uses less energy than importing crude oil from other countries!

In 2007, the IndyCar Series created a 17-race schedule in which race cars used 100 percent fuel-grade ethanol. Ethanol is a high-performance fuel made from corn. It can be used in race cars, but you do not have to be a race car driver to use it. Most gas stations sell gasoline that is mixed with ethanol. How do you know which gasoline at the station has ethanol in it? Just look for the sticker on the fuel pump that says "10% ethanol."

Most ethanol plants in the U.S. are dry-grind facilities. Dry-grind ethanol facilities use starch from corn to produce ethanol, but starch makes up only about 72% of the corn kernel. What happens to the rest of the corn?



Ethanol Activity

1. Survey your neighborhood and find the gas station closest to your house that provides E10 ethanol-blended gasoline (10% ethanol).
2. Create a map showing how to travel from your house to this gas station and explain the route in words.
3. Next, plot the location of ethanol plants in Illinois on a map.
4. Using words and illustrations, describe how ethanol is transported from the ethanol plant to your local gas station.

What Happens Next?

You have already learned that corn can be used to make ethanol and help reduce our dependence on fossil fuels. But did you know when ethanol is made from corn, several co-products are also produced? The most common co-product is distiller's dried grains with solubles, or DDGS.

What is DDGS?

DDGS is a nutrient-rich co-product, high in both energy and protein, that can be used in livestock feed for beef cattle, dairy cattle, poultry, and swine. DDGS is made at the same ethanol plants where fuel is produced. The 204 ethanol plants in the U.S. can produce 14 billion gallons of ethanol and 30 million tons of DDGS each year.

Other countries have also learned about the nutritional benefit of DDGS, causing the global market to grow a great deal. More than 45 countries imported DDGS in 2014. China receives about 52% of the DDGS exports.

How is DDGS Made?

Do you remember the 28% of corn that is not used to make ethanol? The corn remaining after the ethanol production consists of water and solids called whole stillage. In the process of DDGS production, the solids and liquids are separated. The solids, called wetcakes, are dried after separation. The liquid, called thin stillage, is then sent through an evaporator to remove moisture. The liquid is condensed into a soluble matter. Soluble matters are those that can be easily dissolved. After evaporation the condensed solubles are combined with the wetcake, where both matters are dried toegther to produce DDGS.

Learn more about corn and DDGS at these websites:

Arkansas Corn & Grain Sorghum Board
www.corn-sorghum.org

U.S. GRAINS COUNCIL
www.grains.org

WHAT IS INSIDE THAT SEED?

Endosperm: Holds the energy and protein the new plant will use to begin to grow. This area is full of starch which is used the most in corn processing.

Pericarp (seed coat): Outside cover of the seed. It protects the inside of the seed from cold temperatures, moisture and insects until the seed is ready to germinate.

Germ: Only living part of the seed and will become the new plant. It has all of the gentics, vitamins and minerals for the new plant to be created. There is also oil inside of the germ, which is the most valuable part of the corn kernel when it is processed.

Tip Cap: Where the kernel was attached to the cob. As the kernel grows on the cob it takes in water and nutrients from this area.

TRANSPORTATION AND THE WORLD MARKET

Photo courtesy of the USDA

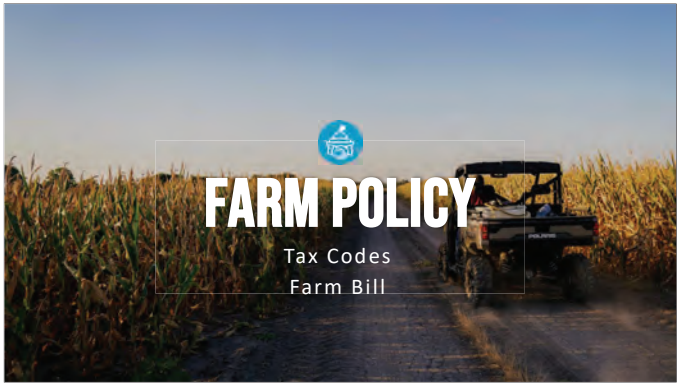
Many farms in Arkansas and the United States are great places to grow corn. We actually grow more than we can use. We sell this extra corn to other countries. This is called exporting. The Mississippi River plays a very important role in the exporting of corn and other commodities. Corn can be loaded onto large, flat boats called barges and shipped south down the river to New Orleans cheaper than if it was hauled by semi trucks or trains. Once in New Orleans, the corn is loaded into large ships and sent around the world.

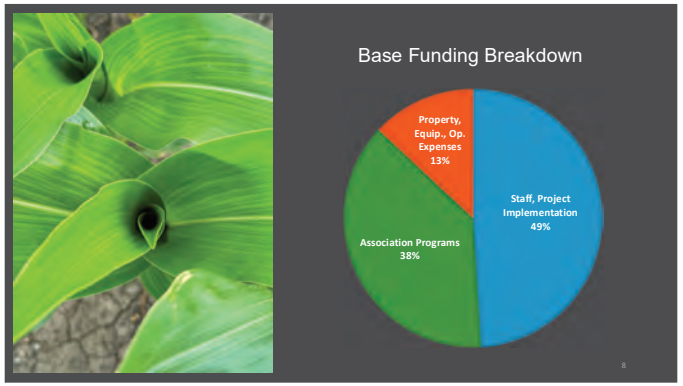
The graph below shows the top ten countries that buy U.S. corn. Can you identify each of the countries by their flag? Then see if you can find them on the world map and choose a route that might have been taken to deliver corn grown in Arkansas to each country.

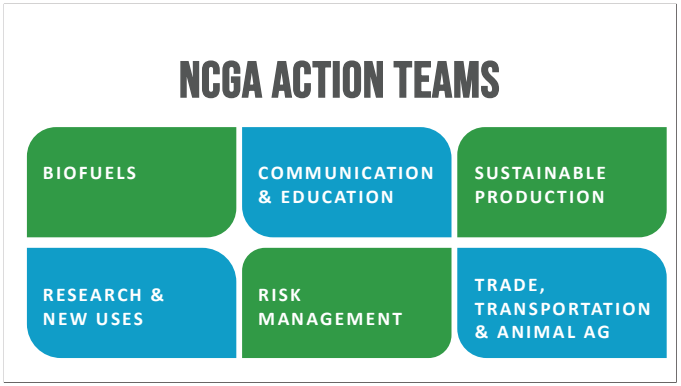
World Market Activity

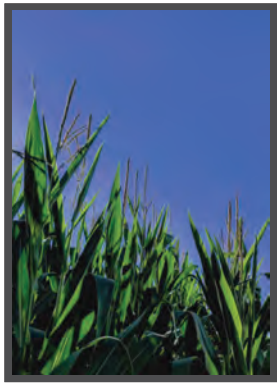
LEADING U.S. CORN EXPORT MARKETS (THOUSAND METRIC TONS)

ATTACHMENT 7









FY2025 NCGA Funding Request

Base Funding	$14,000
Action Team Funding	$14,500
Total	$28,500

NCGA Impact Report

NOV. 2024

Highlights

ADVOCATE

- Herbicide strategy
- HBIIP
- Input tariffs

ENGAGE

- 45Z collaboration

EXCEL

- Yield Contest
- Advocacy engagement

Greetings,

It's no secret that this year has been a difficult one across farm country. From an unfavorable farm economy to natural disasters in some parts of the country, it's a year that tested our resolve. But it's when we work together as a team of state and national corn organizations that we really make a difference. It takes all our talents and expertise to build demand and protect profitability for U.S. corn growers. I'm grateful that past leaders had the vision to create our federation, and that you continue to invest leadership, time and funds to make it successful. In 2024, like many of our grower members, NCGA worked hard to break even.

We held off the worst versions of herbicide restrictions and input tariffs. We fought hard to convince Congress to pass a farm bill. Our biggest steps forward came from collaboration, like our approach to shaping tax credits for sustainable aviation fuel. That's why this year, I'm focused on building bridges, strengthening our ties with state corn organizations and other legacy partners as well as forging new ones, all to grow markets for corn and make sure we can keep farming sustainably and profitably. But first, I want to thank you for your generous support of NCGA and acknowledge the progress your investment made this year.

Sincerely,

Kenneth R Hartman Jr.

Kenneth Hartman Jr.
NCGA President

Arkansas Corn & Grain Sorghum Board

NATIONAL CORN GROWERS ASSOCIATION

NCGA Impact Report

Advocacy Snapshot

Corn advocates in your state contributed to NCGA's successful grassroots efforts.

144
ACTIVE CORN ADVOCATES

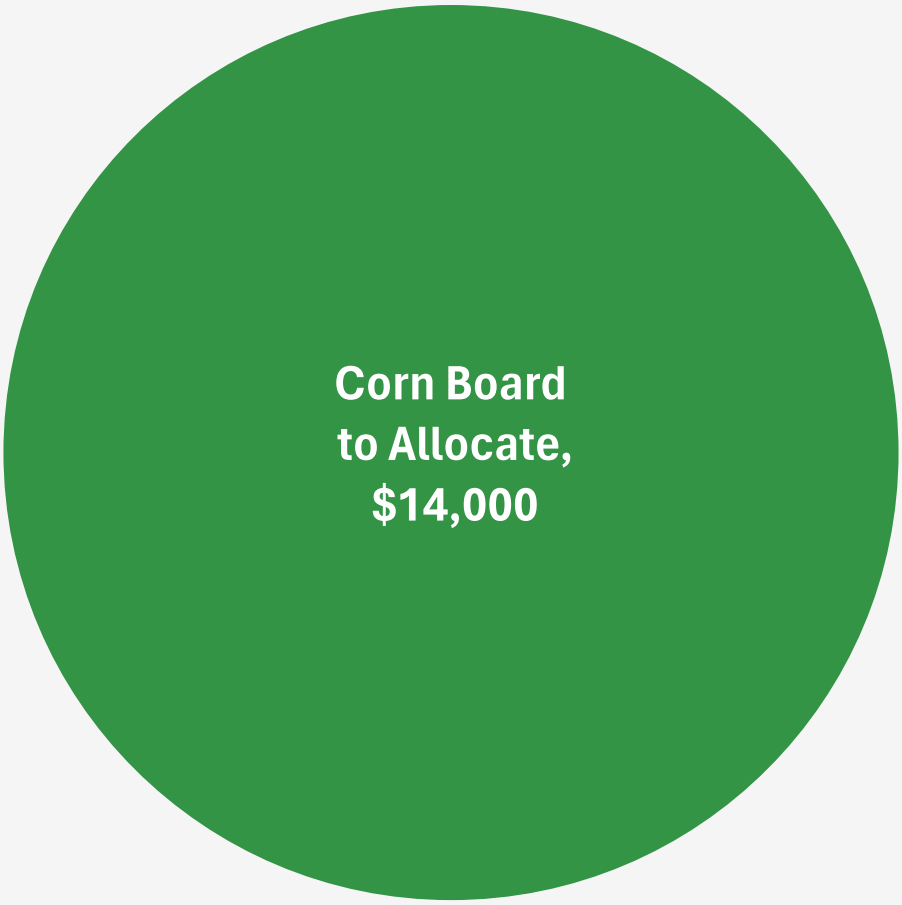
47
ADVOCACY MESSAGES SENT

Arkansas Corn & Grain Sorghum Board

NATIONAL CORN GROWERS ASSOCIATION

NCGA Impact Report

FY24 Team & Program Funding - $14,000

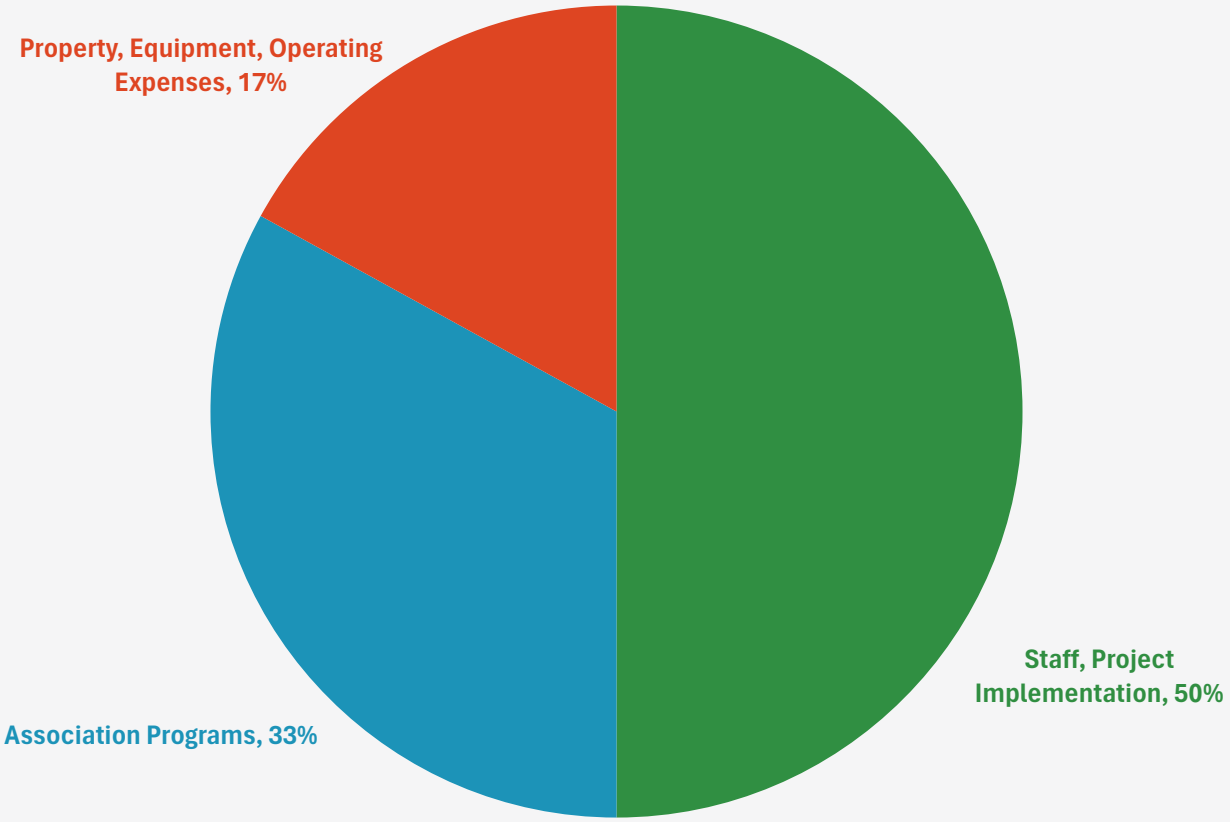


Arkansas Corn & Grain Sorghum Board

NATIONAL CORN GROWERS ASSOCIATION

NCGA Impact Report

FY24 Base Funding - $14,000



ADVOCATE

Work focused on influencing federal policies to ensure freedom to operate and market opportunities for U.S. corn farmers.

Persistent Engagement on EPA's Herbicide Strategy

PRODUCTION AND TECHNOLOGY ACCESS ACTION TEAM

What Worked

NCGA grower leaders and technical staff, along with state partners, engaged in a full court press to shape the outcomes of EPA's strategies to prove compliance with the Endangered Species Act, taking a fine-toothed comb to the draft strategies and sharing real-world perspectives with EPA officials. The agency's draft herbicide strategy included burdensome mitigation requirements that could have been catastrophic for growers. However, bringing solutions to the table returned dividends; the final strategy released in August showed significant improvements for farm-level outcomes.

What's Next

NCGA will continue to leverage state expertise and engage with EPA, USDA and others to protect grower access to critical pesticides and ensure grower requirements are reasonable, from strategy to implementation. The agency has released draft versions of insecticide and fungicide strategies that will require similar engagement.

Investing in Expanded Ethanol Infrastructure

ETHANOL ACTION TEAM

What Worked

To expand consumer access to higher blends of ethanol at the pump, NCGA partnered with the Renewable Fuels Association to support USDA's Higher Blends Infrastructure Incentive Program. The program provides retailers with technical assistance as they apply for grants to install equipment to store and dispense higher blends of ethanol. The assistance boasts a success rate of 100%, with more than $200 million in grants awarded. According to USDA, locations that have installed equipment using HBIIP are expected to contribute more than 1.7 billion gallons of higher blends annually. The ROI for this application assistance is roughly $900 for every $1 invested by NCGA.

What's Next

NCGA will continue to build on the success of this program, working to ensure its continued growth and impact. This investment in fuel infrastructure is a critical component of increasing corn demand and providing consumers with cost-effective fuel options.

Pushing Back on Input Tariffs

MARKET DEVELOPMENT ACTION TEAM

What Worked

As the Biden administration considered placing duties on imports of critical farm inputs, including phosphate and 2,4-D, NCGA amplified farmer perspectives on the impact of disruptions in availability in a tough farm economy. NCGA President Harold Wolle testified at a hearing on the 2,4-D petition. In addition, NCGA called on the administration to reconsider duties on inputs in collaboration with industry partners and encouraged Congressional offices to do the same.

What's Next

Mosaic, the company seeking phosphate duties, recently decided against pursuing a third request for administrative review – a sign that the case is drawing to a close. However, in the 2,4-D case, Commerce announced preliminary duties with mixed results for corn growers. NCGA's technical staff and corn advocates will continue to monitor developments and weigh in with the agencies and coordinate with Congress throughout this process.

ENGAGE

Work focused on collaborating with value chain members and influencers to enhance the value and trust in corn.

Collaboration to Shape Outcomes for 45Z

MARKET DEVELOPMENT AND STEWARDSHIP ACTION TEAMS

What Worked

NCGA staff, action teams and state corn organizations worked in lockstep on the 45Z tax credit, part of the Inflation Reduction Act, to clear the way for long-term demand for sustainable aviation fuel and combat restrictive standards that limit choice for corn growers. Action teams focused on biofuels and sustainable production collaborated on grower resources to explain opportunities with climate smart practices and carbon intensity scoring. NCGA's economic analysis quantified the acreage that qualified for the precursor 40B tax credit, which required bundled practices. NCGA submitted two rounds of public comments and served as a conduit for state groups to get a handle on the CI scoring tools from companies like Incite, Continuum, Gevo, IndigoAg and others.

What's Next

NCGA will maintain regular communications with the working group and between our Biofuels and Production and Sustainability Action Teams to shape the development of the sustainable aviation fuel market. Additional support for members will include sharing learnings from legal review of sample elevator contracts engaging in the market. While the future of the tax credit remains uncertain, we will continue to advocate for our priorities to the Administration and Congress.

EXCEL

Work focused on strengthening NCGA's organizational capacity to deliver a return on investment for our current and prospective investment partners and allies.

Reintroducing the Yield Contest in its 60th Year

NCGA BASE

What Worked

The nation's premier crop production contest reached a milestone in 2024: 60 years of celebrating the country's top-producing corn growers. Leveraging feedback from participants and stakeholders, NCGA updated the program's look and name. The 2024 Yield Contest saw strong participation this year, with over 7,500 entries and continued growth in the newest class focused on nitrogen management.

What's Next

This launch is just one piece of a plan to grow the Yield Contest's impact, increasing grower participation and driving value for participants and for NCGA. Upcoming work includes platforms for participants to learn from each other's methods in person and virtually.

Advocacy on the Ground in DC and Beyond

NCGA BASE

What Worked

With a tight congressional calendar and an approaching election, NCGA stepped up in-person grassroots efforts to make a bigger impact.

- Ag on the Mall: Showcased family farming and sustainability for lawmakers and officials.
- Celebration of Women in Agriculture: Hosted congresswomen, corn growers and ag policy professionals to discuss key issues affecting corn growers
- Congressional Baseball Game: Advertised corn as America's Crop and raised a toast to the American farmer with Anheuser-Busch.
- Republican National Convention: Co-hosted the Great American Farm Fair on a corn farm outside of Milwaukee. Reps. Derrick Van Orden, Mary Miller and Chairman G.T. Thompson stopped by, among others.
- Democratic National Convention: Co-hosted the Leaders of American Agriculture event, which included notable speakers like Secretary Vilsack.

What's Next

To forge relationships with a new Congress and administration, NCGA's grassroots efforts will balance high-impact events with work that activates corn advocates across the nation. In development now, the approach will be tailored to meet the moment.

NCGA FY25 Funding Request

JAN. 2025

Thank you for considering NCGA's 2025 funding proposal. NCGA recognizes that our ability to advance the corn industry is undoubtedly greater when we collaborate with state corn grower organizations. We value our partnership with each state corn grower association and understand it takes each of us working together to achieve our common goals. We look forward to presenting this request to you fully at your upcoming meeting and encourage you to reach out if you have any questions or concerns before that time.

Sincerely,

Kenneth Hartman, Jr
NCGA President

Kelly Harsh
NCGA Corn Board Member
Arkansas Corn Growers Liaison

NCGA FY2025 FUNDING REQUEST

Base Funding	$14,000
Action Team Funding	$14,500
TOTAL	**$28,500**

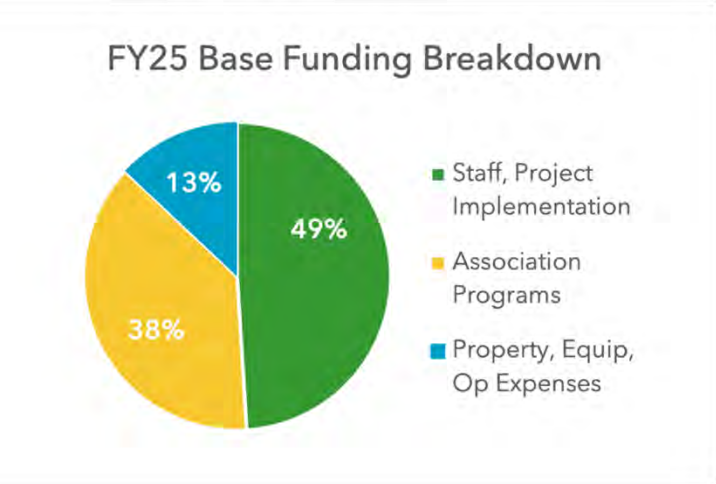
BASE FUNDING: Base funding supports the fundamental work of NCGA, including events like Corn Congress and NCGA's leadership programs, membership growth, program staff salaries and some operating expenses including office space. Base funding does not include NCGA's federal advocacy efforts, which are supported through non-checkoff funding, including industry partner support and NCGA's Yield Contest. In addition to annual audits, corn grower leaders, including the Corn Board and Finance and Governance Committees, oversee NCGA's utilization of checkoff funding.

ACTION TEAM FUNDING: NCGA's six action teams operate with two key areas of focus: driving demand for U.S. corn and corn products; and protecting U.S. corn farmers' profitability and ability to operate. These will be accomplished through work guided by three strategic intentions:

1. Advocate for federal policies to ensure freedom to operate and expand market opportunities;
2. Engage with value chain members and influencers to enhance the value and trust in corn; and
3. Strengthen NCGA's organizational capacity to deliver a return on investment for our investment partners and allies.

BASE FUNDING: $14,000

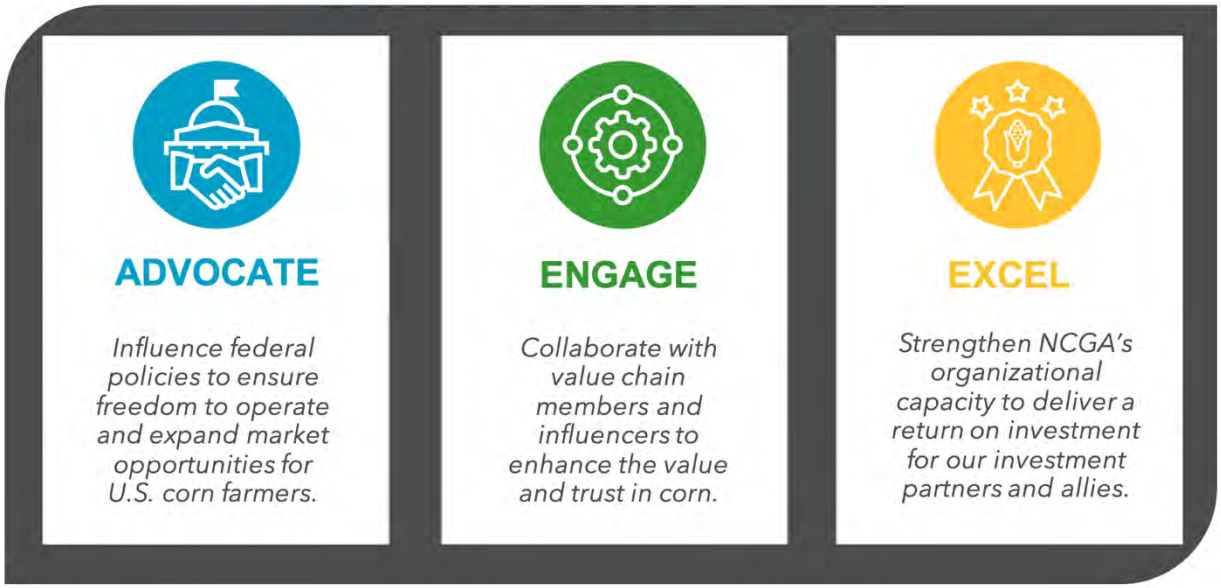
Base funding supports the fundamental work of NCGA, including events like Corn Congress, NCGA leadership programs, membership growth, program staff salaries and some operating expenses including office space. **Base funding does not support NCGA's federal advocacy efforts.** These efforts are supported through non-checkoff funding sources, including industry partner support and NCGA's Yield Contest.



About half of base funding is used for project implementation and program staff salaries. Slightly more than one-third of base funding is used for Association Programs, such as Corn Congress and leadership programs. The remaining funds are used for property and operating expenses.

ACTION TEAM FUNDING: $14,500

NCGA's six action teams are the association's backbone, driving the organization forward to reach its strategic goals. Each team, made up of grower leaders, focuses on developing programs that support a specific aspect of the corn industry, guided by three strategic intentions:



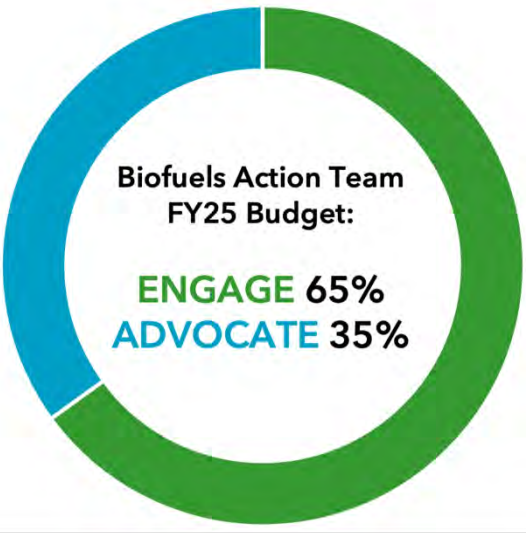
ACTION TEAMS OVERVIEW

BIOFUELS ACTION TEAM

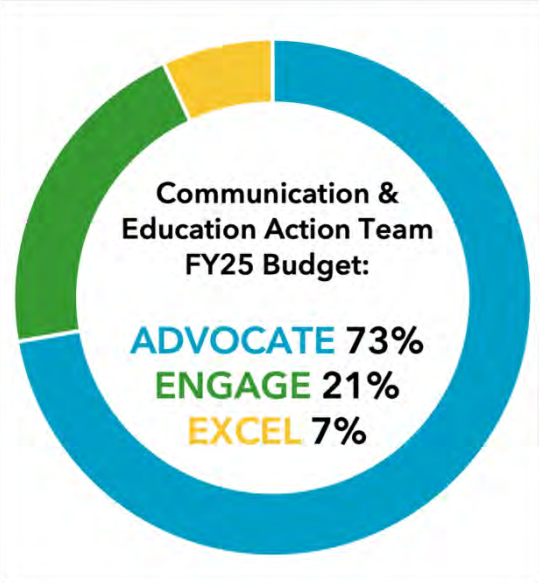
FY25 Budget: $2,573,000

Mission: *Engage in the development and expansion of markets for corn-based biofuels.*

- **Ethanol Promotion & Education**: Ethanol-related promotion and research, including targeted communications in Washington D.C. Provide expertise on various engine technologies and higher ethanol blended fuels.
- **Ethanol Regulation, RFS, Public Policy**: Research, analysis and projects to ensure market stability, competition, and expansion.
- **Sustainable Aviation Fuel**: Research and analysis supporting development of new demand for corn as SAF.



COMMUNICATION & EDUCATION ACTION TEAM



FY25 Budget: $1,361,000

Mission: *Strengthen the understanding and perception of U.S. corn and corn-based products with key stakeholders.*

- **Corn Reputation**: A marketing campaign to DC policymakers to improve the perception of corn – both in production and as a feedstock.
- **CommonGround**: A platform for female farmers to help consumers sort through misinformation on food and farming.
- **Nourish the Future & Donors Choose**: Provides teachers with curriculum for ag education in their classrooms.

SUSTAINABLE PRODUCTION ACTION TEAM

FY25 Budget: $1,300,955

Mission: *Protect and expand voluntary access to economically viable sustainable production practices and technologies for U.S. corn farmers.*

- **Corn Environmental Solutions**: Identification and development of carbon and carbon intensity scoring tools and resources.
- **Crop Protection**: Defend grower access to crop protection products. Lead proactive efforts with U.S. government agencies and others to ensure Endangered Species Act implementation strategies include workable solutions for corn growers.
- **Nutrient Inputs & Impacts**: Address potential challenges to farmer access to affordable crop nutrient inputs.

RESEARCH & NEW USES ACTION TEAM

FY25 Budget: $986,000

Mission: *Support research and development of new production practices and demand opportunities for U.S. corn.*

- **Sustainable Ag Research**: Fund innovative work that aims to improve productivity, efficiency, quality and/or sustainability. Ex: Corn Tar Spot, enhanced efficiency fertilizers
- **New Uses & Products**: Support the identification and development of new uses for U.S. corn and corn products. Includes exploring legislative/regulatory paths to aid in commercialization new technologies. Host the Consider Corn Challenge to highlight novel uses of corn.
- **Research Ambassadors**: Connects graduate students working on research relevant to corn producers with NCGA growers and allied industry.

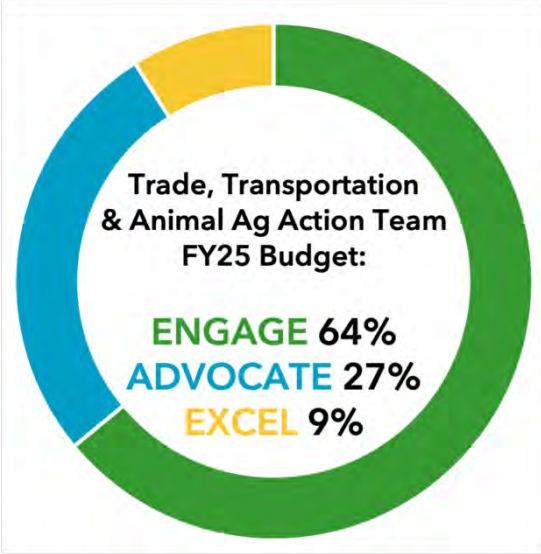
RISK MANAGEMENT ACTION TEAM

FY25 Budget: $377,955

Mission: *Utilize research, education, and advocacy in the development of policy supporting the viability of U.S. corn farmers.*

- **Farm & Risk Management Policy:** Research, analysis and projects to support policies and tools that enable U.S. corn farmers to compete globally, respond to evolving markets. Includes Farm Bill, disaster, commodities futures, USDA reporting, etc.
- **Tax Policy**: Protect important federal tax code provisions for agriculture to ensure long-term continuity and smooth transition between generations of family farms.

TRADE, TRANSPORTATION & ANIMAL AG ACTION TEAM



FY25 Budget: $986,000

Mission: *Engage in the development and expansion of demand for U.S. corn in all forms for Export and Animal Agriculture.*

- **Animal Ag**: Support expansion of U.S. animal ag exports. Research and promotion of corn and corn co-product feed utilization.
- **Trade**: Increase corn and corn-based exports by supporting expanded free trade agreements and removal of trade barriers through communications, coalition building and developing advocates.
- **Transportation**: Support policies and programs for a transportation system that enables U.S. growers to compete in global markets.

NCGA FY2025 Budget

FY2025 BASE FUNDING	Breakdown
Project Implementation & Program Staff	49%
Association Programs *(e.g., Corn Congress, leadership programs)*	38%
Property & Operating Expenses	14%
Base Funding Total	**$ 10,704,000** *up 3.0% from FY24*
Arkansas Corn FY2025 Base Funding Contribution	*$ 14,000* *equal to FY24*

Approved by NCGA Corn Board December 2023 for 10/1/2024 thru 9/30/2025

FY2025 ACTION TEAM FUNDING	Breakdown
Biofuels	$ 2,573,000
Communication & Education	$ 1,361,000
Sustainable Production	$ 1,300,955
Research & New Uses	$ 986,000
Risk Management	$ 377,000
Trade, Transportation & Animal Ag	$ 520,000
Action Team Total	**$ 7,117,955**
Arkansas Corn FY2025 Action Team Contribution	*$ 14,500*

Approved by Corn Congress July 2024 for 10/1/2024 thru 9/30/2025

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY

COMBINED FINANCIAL STATEMENTS AND SUPPLEMENTARY INFORMATION

Years Ended September 30, 2024 and 2023

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY

TABLE OF CONTENTS

INDEPENDENT AUDITOR'S REPORT

To the Board of Directors
National Corn Growers Association, Inc.

Opinion

We have audited the accompanying combined financial statements of National Corn Growers Association, Inc. and Related Entity, which comprise the combined statements of financial position as of September 30, 2024 and 2023, and the related combined statements of activities and changes in net assets, functional expenses and cash flows for the years then ended, and the related notes to the combined financial statements.

In our opinion, the combined financial statements referred to above present fairly, in all material respects, the financial position of National Corn Growers Association, Inc. and Related Entity as of September 30, 2024 and 2023, and changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Combined Financial Statements section of our report. We are required to be independent of National Corn Growers Association, Inc. and Related Entity and to meet our other ethical responsibilities in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Combined Financial Statements

Management is responsible for the preparation and fair presentation of the combined financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of combined financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the combined financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about National Corn Growers Association, Inc. and Related Entity's ability to continue as a going concern within one year after the date that the combined financial statements are available to be issued.

Auditor's Responsibilities for the Audit of the Combined Financial Statements

Our objectives are to obtain reasonable assurance about whether the combined financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

Auditor's Responsibilities for the Audit of the Combined Financial Statements (Continued)

Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the combined financial statements.

In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the combined financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the combined financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of National Corn Growers Association, Inc. and Related Entity's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the combined financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about National Corn Growers Association, Inc. and Related Entity's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audit.

UHY LLP

St. Louis, Missouri
January 10, 2025

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINED STATEMENTS OF FINANCIAL POSITION

	September 30, 2024	September 30, 2023
ASSETS		
CURRENT ASSETS		
Cash	$ 3,303,298	$ 3,236,828
Accounts receivable	2,140,502	2,336,157
Due from affiliate	731,713	602,761
Prepaid expenses and refundable deposits	839,126	759,312
Total current assets	7,014,639	6,935,058
NONCURRENT ASSETS		
Investments	10,562,000	11,582,562
Investment in Commodity Classic	312,500	312,500
Property and equipment, net	1,755,452	985,018
Right-of-use assets - financing	45,324	62,555
Right-of-use assets - operating	4,103,252	4,275,287
Investments - deferred compensation	303,812	194,879
Other assets	299,114	-
Total noncurrent assets	17,381,454	17,412,801
Total assets	$ 24,396,093	$ 24,347,859
LIABILITIES		
CURRENT LIABILITIES		
Current lease liabilities - financing	$ 16,966	$ 16,379
Current lease liabilities - operating	126,192	114,473
Accounts payable	976,996	1,612,422
Accrued expenses	428,685	290,515
Contract liabilities	9,909,383	9,726,815
Deferred compensation	303,812	207,463
Total current liabilities	11,762,034	11,968,067
LONG-TERM LIABILITIES		
Lease liabilities - financing	29,870	46,006
Lease liabilities - operating	4,263,707	4,389,668
Total long-term liabilities	4,293,577	4,435,674
Total liabilities	16,055,611	16,403,741
NET ASSETS WITHOUT DONOR RESTRICTIONS		
BOARD DESIGNATED NET ASSETS		
Operating Reserve	3,500,000	2,825,000
Legal and threat contingency fund	1,000,000	1,000,000
Total board designated net assets	4,500,000	3,825,000
UNDESIGNATED NET ASSETS	3,840,482	4,119,118
Total net assets without donor restrictions	8,340,482	7,944,118
Total liabilities and net assets	$ 24,396,093	$ 24,347,859

See notes to combined financial statements.

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINED STATEMENTS OF ACTIVITIES AND CHANGES IN NET ASSETS

	Years Ended September 30,	
	2024	**2023**
REVENUES		
Memberships	**$ 743,350**	$ 765,112
Sponsorships	**936,300**	1,325,244
Checkoff Investments	**16,539,609**	16,279,577
Commodity Classic	**919,025**	1,084,261
Corn Yield Contest	**1,059,728**	832,875
Grants	**790,626**	322,473
Interest	**637,746**	476,613
Other income	**6,503**	322,127
Total revenues	**21,632,887**	21,408,282
EXPENSES		
Program Services		
Team programs	**12,136,288**	11,963,916
Association programs	**8,169,402**	6,233,593
Total program services	**20,305,690**	18,197,509
Supporting Services		
Management and general	**423,106**	386,065
Fundraising	**507,727**	342,437
Total supporting services	**930,833**	728,502
Total expenses	**21,236,523**	18,926,011
CHANGES IN NET ASSETS	**396,364**	2,482,271
NET ASSETS, Beginning of year	**7,944,118**	5,461,847
NET ASSETS, End of year	**$ 8,340,482**	$ 7,944,118

See notes to combined financial statements.

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINED STATEMENT OF FUNCTIONAL EXPENSES
Year Ended September 30, 2024

	Program Services								Supporting Services			
	ETHAT	MCEAT	MDAT	All Other Team Programs	Total Team Programs	Association Programs	Shared Services	Total Program Services	Management and General	Fundraising	Total Supporting Services	Total
Accounting Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,598	$ 37,598	$ 2,112	$ 2,535	$ 4,647	$ 42,243
Advertising	440,000	648,827	-	-	1,088,827	245,118	-	1,334,945	-	-	-	1,334,945
Bad Debts	-	-	-	-	-	15,000	10,680	25,680	600	720	1,320	27,000
Computer Support	-	-	-	-	-	5,350	37,276	42,626	2,094	2,513	4,607	47,233
Depreciation and amortization	-	-	-	-	-	168,320	104,766	273,086	5,886	7,063	12,949	286,035
Dues and Subscriptions	46,950	52,425	50,630	102,720	252,725	184,533	171,775	609,033	9,550	11,680	21,230	630,263
Electronic Communications	-	-	-	5,000	5,000	1,440	64,480	70,920	3,623	4,347	7,970	78,890
Equipment Leases, Rentals, and Purchases	-	-	725	14,091	14,816	421,743	25,245	462,804	1,474	1,769	3,243	466,047
General Liability Insurance	-	-	-	-	-	-	61,786	61,786	3,471	4,165	7,636	69,422
Health Insurance	-	-	-	-	-	-	376,687	376,687	21,152	25,395	46,557	423,244
Interest Expense	-	-	-	-	-	-	1,656	1,656	93	112	205	1,861
Legal Fees	100,000	-	106,123	110,065	316,188	1,148	5,732	323,068	322	387	709	323,777
Maintenance	-	-	-	-	-	-	69,260	69,260	3,891	4,669	8,560	77,820
Meetings	3,296	7,675	15,338	20,983	47,492	1,126,168	17,944	1,191,604	1,008	1,210	2,218	1,193,822
Office Expense	295	54,687	925	25,036	80,943	291,609	107,545	480,096	5,042	7,250	13,292	493,390
Payroll Taxes	-	-	-	-	-	-	319,915	319,915	17,973	21,567	39,540	359,455
Professional Development	-	-	-	-	-	10,000	31,475	41,475	1,768	2,122	3,890	45,365
Professional Services	1,635,788	690,383	191,888	1,663,254	4,181,313	1,687,916	395,013	6,264,242	22,192	26,630	48,822	6,313,064
Property Taxes	-	-	-	-	-	-	36,555	36,555	2,054	2,464	4,518	41,073
Rental/Leases	-	-	-	-	-	-	438,556	438,556	24,638	29,566	54,204	492,760
Retirement	-	-	-	2,354	2,354	-	351,077	353,431	19,723	23,668	43,391	396,822
Salaries	-	-	-	407,409	407,409	197,600	4,707,150	5,312,159	264,447	317,336	581,783	5,893,942
Sponsorship	15,000	-	796,392	201,364	1,012,756	43,200	-	1,055,956	-	-	-	1,055,956
Travel	37,349	4,139	78,549	104,498	224,535	739,268	88,785	1,052,588	4,986	5,988	10,974	1,063,562
Utilities	-	-	-	543	543	-	69,321	69,864	3,695	4,673	8,368	78,232
Shared Services	1,343,416	859,777	731,389	1,666,705	4,601,287	3,029,989	(7,631,276)	-	-	-	-	-
Totals	$ 3,622,094	$ 2,318,113	$ 1,971,969	$ 4,224,122	$ 12,136,288	$ 8,169,402	$ -	$ 20,305,690	$ 423,106	$ 507,727	$ 930,833	$ 21,236,523

See notes to combined financial statements.

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINED STATEMENT OF FUNCTIONAL EXPENSES
Year Ended September 30, 2023

	Program Services							Supporting Services			
	ETHAT	MCEAT	MDAT	All Other Team Programs	Total Team Programs	Association Programs	Shared Services	Total Program Services	Management and General	Fundraising	Total Supporting Services	Total
Accounting Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,697	$ 37,697	$ 2,100	$ 1,863	$ 3,963	$ 41,660
Advertising	547,200	308,182	-	-	855,382	-	-	855,382	-	-	-	855,382
Bad Debts	-	1,190	-	-	1,190	15,000	-	16,190	-	-	-	16,190
Computer Support	-	-	-	-	-	12,091	65,917	78,008	3,672	3,257	6,929	84,937
Depreciation and amortization	-	-	-	-	-	-	98,022	98,022	5,460	4,843	10,303	108,325
Dues and Subscriptions	95,373	46,694	39,155	135,553	316,775	89,979	83,696	490,450	4,662	4,135	8,797	499,247
Electronic Communications	-	-	1,695	480	2,375	4,660	62,697	69,732	3,492	3,096	6,588	76,322
Equipment Leases, Rentals, and Purchases	-	9,406	556	15,603	25,567	429,354	2,108	457,029	117	104	221	457,250
General Liability Insurance	-	-	-	-	-	-	67,013	67,013	3,733	3,311	7,044	74,057
Health Insurance	-	-	-	-	-	-	461,721	461,721	25,720	22,813	48,533	510,254
Interest Expense	-	-	-	-	-	-	2,539	2,539	142	125	267	2,806
Legal Fees	65,000	-	-	46,304	111,304	1,768	15,616	128,688	870	772	1,642	130,330
Maintenance	-	-	-	-	-	-	16,874	16,874	940	834	1,774	18,648
Meetings	8,066	93,944	30,069	29,986	162,065	1,054,073	13,678	1,229,816	762	676	1,438	1,231,254
Office Expense	871	22,090	4,908	24,146	52,015	249,075	58,762	359,852	3,273	2,903	6,176	366,028
Payroll Taxes	-	-	-	-	-	-	307,163	307,163	17,111	15,177	32,288	339,471
Professional Development	-	-	-	-	-	-	15,581	15,581	888	770	1,658	17,219
Professional Services	2,043,065	953,534	177,690	1,351,847	4,526,136	1,111,745	226,197	5,864,078	12,600	11,176	23,776	5,887,854
Property Taxes	-	-	-	-	-	-	34,602	34,602	1,927	1,710	3,637	38,239
Rental/Leases	-	-	-	-	-	-	436,438	436,438	24,311	21,564	45,875	482,313
Retirement	-	-	-	-	-	-	411,411	411,411	22,917	20,327	43,244	454,655
Salaries	-	-	-	37,043	37,043	197,600	4,393,832	4,628,475	244,754	217,094	461,848	5,090,323
Sponsorship	151,598	2,825	763,385	177,954	1,095,762	88,625	-	1,184,387	-	-	-	1,184,387
Travel	31,373	29,913	90,181	80,265	231,732	595,501	49,682	876,915	2,767	2,455	5,222	882,137
Utilities	-	-	-	-	-	-	69,426	69,426	3,867	3,430	7,297	76,723
Shared Services	1,810,083	902,894	675,327	1,166,266	4,556,570	2,374,122	(6,930,692)	-	-	-	-	-
Totals	$ 4,752,629	$ 2,370,674	$ 1,773,166	$ 3,067,447	$ 11,963,916	$ 6,233,593	$ -	$ 18,197,509	$ 386,065	$ 342,437	$ 728,502	$ 18,926,011

See notes to combined financial statements.

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINED STATEMENTS OF CASH FLOWS

	Years Ended September 30, 2024	2023
CASH FLOWS FROM OPERATING ACTIVITIES		
Changes in net assets	$ 396,364	$ 2,482,271
Adjustments to reconcile changes in net assets to net cash provided (used) by operating activities		
Provision for bad debts	27,000	16,190
Depreciation and amortization	117,714	108,325
Equity earnings from Commodity Classic	(652,746)	(723,086)
Gain on disposal of property and equipment	(250)	(23,100)
Non-cash lease expense	50,943	63,181
Changes in operating assets and liabilities		
Accounts receivable	168,655	(695,754)
Due from affiliate	(57,042)	(21,925)
Prepaid expenses and refundable deposits	(79,814)	301,977
Other assets	(299,114)	-
Accounts payable	(635,426)	1,029,130
Accrued expenses	138,170	(65,568)
Due to affiliate	-	(7,500)
Contract Liabilities	182,568	136,923
Deferred compensation	96,349	(53,533)
Net cash provided (used) by operating activities	(546,629)	2,547,531
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchases of investments	(18,385,000)	(17,805,272)
Proceeds from sale of investments	19,405,562	14,838,349
Purchases of investments - deferred compensation	(108,933)	-
Proceeds from sale of investments - deferred compensation	-	66,117
Receipt of distributions from Commodity Classic	580,836	359,998
Proceeds from disposal of property and equipment	250	91,997
Purchases of property and equipment	(870,917)	(54,452)
Net cash provided (used) by investing activities	621,798	(2,503,263)
CASH FLOWS FROM FINANCING ACTIVITIES		
Principal payments on lease liability - financing	(8,699)	(14,169)
Net cash used by financing activities	(8,699)	(14,169)
NET CHANGES IN CASH	66,470	30,099
CASH, Beginning of year	3,236,828	3,206,729
CASH, End of year	$ 3,303,298	$ 3,236,828
NON-CASH INVESTING AND FINANCING ACTIVITIES		
Distributions receivable from Commodity Classic	$ 652,746	$ 580,836
Right of use asset obtained in exchange for lease liability - financing	$ -	$ 76,554
Right of use asset obtained in exchange for lease liability - operating	$ -	$ 4,607,190

See notes to combined financial statements.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Combination

The accounts of National Corn Growers Association, Inc. (NCGA) and National Corn Growers Association Foundation (NCGAF) are included in the combined financial statements. All significant transactions between the entities have been eliminated. The combined entity will be referred to as "NCGA" throughout the notes to combined financial statements.

Nature of Operations

NCGA's purpose is to enable corn growers to sustainably feed and fuel a growing world. NCGA works to create competitive market demand, enhance customer and consumer trust, and promote increased sustainable production, in conjunction with state corn and other organizations and other corn industry participants, in order to accomplish this vision. Founded in 1957, the NCGA represents nearly 35,000 dues-paying corn farmers nationwide and the interests of more than 300,000 corn farmers who contribute through corn checkoff programs in their states. NCGA and 50 state associations and checkoff organizations work together to create and increase opportunities for their members, corn farmers and their industry.

NCGA's two major programs are Team programs and Association programs. Team programming is focused on a specific interest working to achieve certain goals and includes:

- Ethanol (ETHAT) - ensures corn growers take a leadership role in the utilization, promotion, and advocacy of corn-based biofuels.
- Membership and Consumer Engagement (MCEAT) - communicates with consumers on matters important to growers while growing membership participation and building diversity of thought.
- Market Development (MDAT) – supports the development of new uses of corn to increase market demand for corn grown in the U.S.

Association programming focuses on corn as a whole, such as communications, memberships, and leadership.

NCGA provides administrative support to NCGAF and has common board members.

Basis of Accounting

NCGA's policy is to prepare its combined financial statements on the accrual basis of accounting. The accounting policies have been consistently applied in the preparation of the combined financial statements.

Use of Estimates

The preparation of financial statements in accordance with generally accepted accounting principles in the United States of America requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results may differ from those estimates.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Cash

Cash consists of unrestricted bank balances available for immediate use.

Accounts Receivable

NCGA grants credit to all qualified customers. Accounts receivable are carried at cost, less allowance for credit losses. Generally, NCGA does not accrue finance charges on overdue receivables. On a periodic basis, NCGA evaluates accounts receivable and establishes an allowance for credit losses, based on history, past write-offs and collections, current and expected future loss experience, and other pertinent factors. An account is written off when it is determined that all collection efforts have been exhausted. The allowance for credit losses was $12,000 and $-0- as of September 30, 2024 and 2023, respectively.

Changes in the allowance for credit losses for the years ended September 30, 2024 and 2023 are as follows:

	Years Ended September 30,	
	2024	2023
Balance at beginning of year	$ -	$ -
Amounts written off	(15,000)	(16,190)
Provision for credit losses	27,000	16,190
Balance at end of year	$ 12,000	$ -

Fair Value Measurements

NCGA determines the fair value of certain financial assets and liabilities on a recurring basis through application of ASC 820, *Fair Value Measurements,* as disclosed in Note 3 to the combined financial statements.

The framework for measuring fair value provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels of the fair value hierarchy are described below:

Level 1: Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active markets that NCGA has the ability to access.

Level 2: Inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets; quoted prices for identical or similar assets and liabilities in inactive markets, inputs other than quoted market prices that are observable for the asset or liability; inputs that are derived principally from or corroborated by observable market data by correlation or other means. If the asset or liability has a specified (contractual) term, the Level 2 input must be observable for substantially the full term of the asset or liability.

Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Fair Value Measurements (Continued)

Accounting standards define fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (an exit price). Fair value is a market-based measurement that should be determined based on the assumptions market participants would use in pricing the asset or liability.

There were no triggering events that required fair value measurements of NCGA's nonfinancial assets and liabilities at September 30, 2024 and 2023.

Concentration of Credit Risk

Financial instruments which potentially subject NCGA to concentrations of credit risk consist principally of temporary cash and investments. NCGA places its temporary cash investments with financial institutions assessed by management to be of high credit quality.

NCGA maintains cash balances in financial institutions in excess of FDIC insurance limits. Management believes the risk of loss associated with these accounts is negligible and NCGA has not experienced any losses in the past.

Property and Equipment

Property and equipment are recorded at cost. Expenditures greater than $1,000 with an estimated useful life in excess of one year are reviewed for capitalization. Expenditures for repairs and maintenance are charged to expense as incurred, and additions and improvements that significantly extend the lives of assets are capitalized. Property and equipment is depreciated or amortized on a straight-line basis with estimated useful lives of 3 - 5 years with the exception of the building and building improvements which are depreciated on a straight-line basis over 5 - 40 years.

Other Assets

NCGA capitalized license fees and implementation costs of the Nimble CRM implementation and the World of Corn Website upgrade. The capitalized assets are amortized on a straight-line basis with estimated useful lives of 2-6 years, based on the contract useful life.

Asset Impairment Assessments

NCGA reviews long-lived assets for impairment whenever events or circumstances indicate that the carrying value of such assets may not be fully recoverable. Impairment is recognized to the extent that the sum of undiscounted estimated future cash flows expected to result from use of the assets is less than carrying value. If impairment is recognized, the carrying value of the impaired asset is reduced to its fair value.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Leases

NCGA determines if an arrangement is a lease at inception by determining whether the agreement conveys the right to control the use of the identified asset for a period of time, whether NCGA has the right to obtain substantially all of the economic benefits from use of the identified asset, and the right to direct the use of the asset. Lease liabilities are recognized at the commencement date based upon the present value of the remaining future minimum lease payments over the lease term using the rate implicit in the lease or the risk-free rate. The risk-free rate is defined as the daily treasury par yield curve rate for a period of time that approximates the lease term.

The lease right-of-use assets are initially measured at the carrying amount of the lease liability and adjusted for any prepaid or accrued lease payments, remaining balance of lease incentives received, unamortized initial direct costs, or impairment charges relating to the right-of-use-asset. Certain leases contain escalation clauses, which are factored into the right-of-use asset where appropriate. Lease expense for minimum lease payments are recognized on straight-line basis over the lease term.

Board Designated Net Assets

NCGA has designated a portion of the unrestricted net assets for an operating reserve and a legal and threat contingency fund as of September 30, 2024 and 2023. The operating reserve was established to set aside funds for future operations and totaled $3,500,000 and $2,825,000 at September 30, 2024 and 2023, respectively. The legal and threat contingency fund was established to fund potential future legal and other threats to NCGA and totaled $1,000,000 at September 30, 2024 and 2023. No specific threats have been identified.

Revenue Recognition for Contracts with Customers

NCGA's revenue streams under contracts with customers are comprised of Memberships, Sponsorships, Checkoff Investments, Corn Yield Contest, and Grants.

For each revenue stream identified above, revenue recognition is subject to the completion of performance obligations. For each contract with a customer, NCGA determines whether the performance obligations in the contracts are distinct or should be bundled. Factors to be considered include the pattern of transfer, whether customers can benefit from the resources and whether the resources are readily available. NCGA's revenue is recognized when a given performance obligation is satisfied, either over a period of time or at a given point in time. NCGA recognizes revenue over a period of time if the customer receives and consumes the benefit that NCGA provided or has an enforceable right to payment for the performance.

In some situations (such as Memberships, Sponsorships, Checkoff Investments, and Grant revenues), NCGA bills customers and collects cash prior to the satisfaction of the performance obligation, which results in NCGA recognizing contract liabilities upon receipt of payment.

Accounts receivable from contracts with customers were $2,140,502, $2,336,157 and $1,656,593 at September 30, 2024 and 2023 and October 1, 2022, respectively.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Revenue Recognition for Contracts with Customers (Continued)

Contract liabilities from contracts with customers were $9,909,383, $9,726,815 and $9,589,892 at September 30, 2024 and 2023 and October 1, 2022, respectively.

The following explains the performance obligations related to each revenue stream and how they are recognized:

Memberships - NCGA earns membership dues over 12, 36, or 120 months, depending on the period which satisfies NCGA's performance obligations. Memberships primarily consist of 1-year, 3-year, or Lifetime membership terms.

Sponsorships - These revenues are from corporate entities in the agriculture industry and are provided for specific Action Team programs, or to support NCGA's sponsored events, such as Action Team meetings. Revenue is recognized typically as costs are incurred.

Checkoff Investments - These revenues come from state programs. States provide funding to NCGA based on the corn yields that vary by state and by year. Funding is provided for a specific Action Team program or for base funding. Revenue is recognized for base funding under Accounting Standard Codification 958-605 *Contributions* and accordingly is recognized when received and represents $10,420,000 and $9,537,000 during the years ended September 30, 2024 and 2023, respectively. Base funding revenue is included in Checkoff Investments revenue on the statement of activities and changes in net assets. Action Team program revenue is typically recognized as costs are incurred.

Corn Yield Contest - The Corn Yield Contest (CYC) recognizes three types of revenue: membership, registration, and sponsorship. Membership is recognized over 12, 36, or 120 months, depending on the period which satisfies NCGA's performance obligations. Memberships primarily consist of 1-year, 3-year, or Lifetime membership terms. Registration revenue is recognized when the participant enters the contest. Sponsorship revenue is recognized during the Corn Yield Contest.

Grants - NCGA receives grants for various sources to fund specific activities or projects. This revenue is exchange revenue and is recognized upon receipt if there are no conditions or is recognized as revenue as conditions are satisfied, typically as costs are incurred. The exchange grants are reviewed for performance obligations. As the performance obligations are met, revenue is recognized.

Revenue Recognition – Commodity Classic

Revenue derived from Commodity Classic is recognized in the period of the event.

NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

Functional Allocation of Expenses

The costs of providing the various programs and supporting services have been summarized on a functional basis in the combined statements of activities and changes in net assets. The combined statements of functional expenses presents the natural classification detail of expenses by function. Accordingly, certain costs have been allocated among the programs and supporting services benefited. Expenses have been allocated between various programs and supporting services on several bases and estimates. Although the methods of allocation used are considered appropriate, other methods could be used that would produce different results.

Advertising

The costs of advertising are expensed as incurred. NCGA incurred advertising expenses of $1,334,945 and $855,382 for the years ended September 30, 2024 and 2023, respectively.

Income Taxes

NCGA qualifies as a tax-exempt organization under Section 501(c)(5) of the Internal Revenue Code. NCGAF qualifies as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code. As such, no provision is made for income taxes in the accompanying combined financial statements.

NCGA follows the provisions of FASB Accounting Standards Codification 740, *Income Taxes* (ASC 740), related to uncertain tax positions. There have been no interest or penalties recognized in the combined statements of activities and changes in net assets related to uncertain tax positions. In addition, no tax positions exist for which it is reasonably possible that the total amount of unrecognized tax benefits will significantly increase or decrease within the next 12 months. NCGA evaluates its uncertain tax positions, if any, on a continual basis through review of its policies and procedures, review of its regular tax filings, and discussions with outside experts.

Recently Adopted Accounting Pronouncement

Effective October 1, 2023, the Company adopted accounting standards update ASU 2016-13 *Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which replaced the incurred loss methodology with an expected loss methodology. There was no material impact to the financial statements as a result of the adoption of ASU 2016-13.

Subsequent Events

NCGA has evaluated subsequent events through January 10, 2025, which is the date the combined financial statements were available to be issued.

NOTE 2 — LIQUIDITY AND AVAILABILITY

Financial assets available for general expenditure, that is, without donor or other restrictions limiting their use, within one year of the combined statements of financial position date comprise the following:

	September 30, 2024	September 30, 2023
Cash	$ 3,303,298	$ 3,236,828
Investments	5,315,000	7,260,562
Accounts Receivable	2,140,502	2,336,157
Due from Affiliate	731,713	602,761
	$ 11,490,513	$ 13,436,308

As part of its liquidity management plan, NCGA invests excess cash in certificates of deposit and a money market mutual fund. Additionally, NCGA had $4,500,000 and $3,825,000 in a board designated net assets as of September 30, 2024 and 2023, respectively. Although there is no intention to spend from the board designated net assets, these amounts could be made available if necessary.

NOTE 3 — INVESTMENTS

Investments of NCGA are carried at cost, which approximates fair value. Investments consist of the following:

	September 30, 2024	September 30, 2023
Certificates of Deposit - Level 2	$ 1,992,000	$ 1,992,562
Money Market Mutual Fund Account - Level 1	8,570,000	9,590,000
	$ 10,562,000	$ 11,582,562

NOTE 4 — INVESTMENT IN COMMODITY CLASSIC

NCGA has entered into a joint venture (Commodity Classic) with the American Soybean Association to produce a joint annual convention. NCGA accounts for its 50% investment in this joint venture using the equity method. Below is a rollforward of NCGA's investment in the joint venture:

Investment in Commodity Classic – October 1, 2022	$ 170,250
Equity Earnings from Joint Venture	723,086
Distributions Receivable from Joint Venture	(580,836)
Investment in Commodity Classic - September 30, 2023	312,500
Equity Earnings from Joint Venture	652,746
Distributions Receivable from Joint Venture	(652,746)
Investment in Commodity Classic - September 30, 2024	$ 312,500

NOTE 4 — INVESTMENT IN COMMODITY CLASSIC (Continued)

Financial information summarizing the financial position of the joint venture and its operating performance are as follows:

	September 30, 2024	September 30, 2023
Financial Position		
Total Assets	$ 6,542,079	$ 5,838,959
Total Liabilities	5,917,079	5,213,959
Equity	$ 625,000	$ 625,000

	For the Years Ended September 30, 2024	For the Years Ended September 30, 2023
Operating Performance		
Total Revenues	$ 7,938,060	$ 6,638,286
Total Expenses	6,632,568	5,192,114
Excess revenues over expenses	$ 1,305,492	$ 1,446,172

During the years ended September 30, 2024 and 2023, NCGA recorded revenue of $266,279 and $361,085, respectively, from the joint venture for banquet incentives, and professional fees.

At September 30, 2024 and 2023, NCGA had a receivable from Commodity Classic totaling $78,967 and $21,925, respectively. At September 30, 2024 and 2023, NCGA had accrued distributions from Commodity Classic totaling $652,746 and $580,836, respectively.

NOTE 5 — PROPERTY AND EQUIPMENT

Property and equipment consists of the following:

	September 30, 2024	September 30, 2023
Building and building improvements	$ 1,979,636	$ 1,341,759
Furniture and equipment	536,582	469,938
Land	240,000	240,000
	2,756,218	2,051,697
Accumulated Depreciation	(1,000,766)	(1,066,679)
	$ 1,755,452	$ 985,018

Depreciation charged to operations for the years ended September 30, 2024 and 2023 was $100,483 and $92,875, respectively.

NOTE 6 — DEFERRED COMPENSATION

NCGA has a payroll deferral plan under Section 457(b) of the Internal Revenue Code (the Plan). The Plan provides that NCGA retain ownership of the assets earned under the Plan until the assets are distributed to the participants. The Plan vests immediately with no matching contributions. The participants assume all of the risk and benefits associated with the Plan's performance. The Plan's assets are reflected on the combined statements of financial position as investments - deferred compensation and the corresponding liabilities are reflected as deferred compensation.

NOTE 7 — LEASES

NCGA primarily has third-party operating leases for office space and equipment and third-party finance leases for equipment. NCGA's leases have remaining lease terms that range from one and a half years to leases that mature through 2041.

	For the Years Ended September 30,	
	2024	2023
Operating lease expense	$ 349,174	$ 349,174
Short-term lease expense	143,586	133,139
Finance leases		
Amortization of right-of-use asset	17,231	15,450
Interest on lease liabilities	1,860	2,151
	$ 511,851	$ 499,914

Future minimum lease payments required under the leases that have remaining noncancelable lease terms in excess of one year, are as follows:

Year ending September 30,	Finance Leases	Operating Leases
2025	$ 18,240	$ 298,282
2026	18,240	304,944
2027	9,741	312,557
2028	2,749	320,376
2029	-	328,386
Thereafter	-	4,606,417
	48,970	6,170,962
Less: present value discount	2,134	1,781,063
Total lease liabilities	46,836	4,389,899
Less: current portion of lease liabilities	16,966	126,192
Long-term lease liabilities	$ 29,870	$ 4,263,707

NOTE 7 — LEASES (Continued)

The weighted average remaining lease term and discount rates are as follows:

	As of September 30,	
	2024	2023
Weighted average remaining lease term (years)		
Financing leases	2.74	3.71
Operating leases	16.91	17.91
Weighted average discount rate		
Financing leases	3.43%	3.46%
Operating leases	4.00%	4.00%

NOTE 8 — EMPLOYEE BENEFIT PLAN

NCGA has a 401(k) retirement savings plan covering employees with one year of service who have attained age 21. NCGA contributed 10% of each eligible employee's earnings for the years ended September 30, 2024 and 2023. NCGA's retirement expense for the years ended September 30, 2024 and 2023 was $396,822 and $454,655, respectively.

NOTE 9 — RISKS AND UNCERTAINTIES

NCGA's investments are exposed to various risks, such as interest rate, market, and credit risks. Due to current economic conditions, it is at least reasonably possible that changes in the value of NCGA's investments will occur in the near term and those changes could materially affect the amounts reported in NCGA's combined financial statements.

While there are no material legal proceedings to which NCGA is a party, NCGA may be involved in various claims, legal actions, and regulatory proceedings arising in the ordinary course of business. In the opinion of NCGA's management, the resolution of these matters will not have a material adverse effect on NCGA's combined financial statements.

NOTE 10 — SIGNIFICANT GRANTORS

NCGA derived 38% and 39% of its revenues from three grantors during the years ended September 30, 2024 and 2023, respectively. Accounts receivable from these grantors were $556,950 and $785,064 at September 30, 2024 and 2023, respectively.

UHY LLP
Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT ON SUPPLEMENTARY INFORMATION

To the Board of Directors
National Corn Growers Association, Inc.

We have audited the combined financial statements of the National Corn Growers Association, Inc. and Related Entity as of and for the years ended September 30, 2024 and 2023, and have issued our report thereon dated January 10, 2025, which contained an unmodified opinion on those combined financial statements. Our audits were performed for the purpose of forming an opinion on the combined financial statements as a whole. The accompanying supplementary information is presented for purposes of additional analysis and is not a required part of the combined financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the combined financial statements. The information has been subjected to the auditing procedures applied in the audits of the combined financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the combined financial statements or to the combined financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the combined financial statements as a whole.

UHY LLP

St. Louis, Missouri
January 10, 2025

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINING STATEMENT OF FINANCIAL POSITION
September 30, 2024

	National Corn Growers Association, Inc. 501(c)(5)	National Corn Growers Association Foundation 501(c)(3)	Eliminations	Combined Total
ASSETS				
CURRENT ASSETS				
Cash	$ 3,295,846	$ 7,452	$ -	$ 3,303,298
Accounts receivable	2,140,502	-	-	2,140,502
Due from affiliate	737,713	-	(6,000)	731,713
Prepaid expenses and refundable deposits	839,126	-	-	839,126
Total current assets	7,013,187	7,452	(6,000)	7,014,639
NONCURRENT ASSETS				
Investments	10,562,000	-	-	10,562,000
Investment in Commodity Classic	312,500	-	-	312,500
Property and equipment, net	1,755,452	-	-	1,755,452
Right-of-use assets - financing	45,324	-	-	45,324
Right-of-use assets - operating	4,103,252	-	-	4,103,252
Investments - deferred compensation	303,812	-	-	303,812
Other assets	299,114	-	-	299,114
Total noncurrent assets	17,381,454	-	-	17,381,454
Total assets	$ 24,394,641	$ 7,452	$ (6,000)	$ 24,396,093
LIABILITIES				
CURRENT LIABILITIES				
Current lease liabilities - financing	$ 16,966	$ -	$ -	$ 16,966
Current lease liabilities - operating	126,192	-	-	126,192
Accounts payable	976,996	-	-	976,996
Accrued expenses	428,685	-	-	428,685
Due to affiliate	-	6,000	(6,000)	-
Contract liabilities	9,909,383	-	-	9,909,383
Deferred compensation	303,812	-	-	303,812
Total current liabilities	11,762,034	6,000	(6,000)	11,762,034
LONG-TERM LIABILITIES				
Lease liabilities - financing	29,870	-	-	29,870
Lease liabilities - operating	4,263,707	-	-	4,263,707
Total long-term liabilities	4,293,577	-	-	4,293,577
Total liabilities	16,055,611	6,000	(6,000)	16,055,611
NET ASSETS WITHOUT DONOR RESTRICTIONS				
BOARD DESIGNATED NET ASSETS				
Operating Reserve	3,500,000	-	-	3,500,000
Legal and threat contingency fund	1,000,000	-	-	1,000,000
Total board designated net assets	4,500,000	-	-	4,500,000
UNDESIGNATED NET ASSETS	3,839,030	1,452	-	3,840,482
Total net assets Without donor restrictions	8,339,030	1,452	-	8,340,482
Total liabilities and net assets	$ 24,394,641	$ 7,452	$ (6,000)	$ 24,396,093

See independent auditor's report on supplementary information.

NATIONAL CORN GROWERS ASSOCIATION, INC. AND RELATED ENTITY
COMBINING STATEMENT OF ACTIVITIES AND CHANGES IN NET ASSETS
Year Ended September 30, 2024

	National Corn Growers Association, Inc. 501(c)(5)	National Corn Growers Association Foundation 501(c)(3)	Eliminations	Combined Total
REVENUES				
Memberships	$ 743,350	$ -	$ -	$ 743,350
Sponsorships	936,300	-	-	936,300
Checkoff Investments	16,539,609	-	-	16,539,609
Commodity Classic	919,025	-	-	919,025
Corn Yield Contest	1,059,728	-	-	1,059,728
Grants	790,626	-	-	790,626
Interest	637,745	1	-	637,746
Other income	6,503	-	-	6,503
Total revenues	21,632,886	1	-	21,632,887
EXPENSES				
Program Services				
Team programs	12,136,288	-	-	12,136,288
Association programs	8,169,402	-	-	8,169,402
Total program services	20,305,690	-	-	20,305,690
Supporting Services				
Management and general	423,106	-	-	423,106
Fundraising	507,727	-	-	507,727
Total supporting services	930,833	-	-	930,833
Total expenses	21,236,523	-	-	21,236,523
CHANGES IN NET ASSETS	396,363	1	-	396,364
NET ASSETS, Beginning of year	7,942,667	1,451	-	7,944,118
NET ASSETS, End of year	$ 8,339,030	$ 1,452	$ -	$ 8,340,482

See independent auditor's report on supplementary information.

Sarah Huckabee Sanders
Governor

ARKANSAS DEPARTMENT OF AGRICULTURE

1 Natural Resources Drive, Little Rock, AR 72205
agriculture.arkansas.gov
(501) 225-1598

Wes Ward
Secretary of Agriculture

January 15, 2025

ATTACHMENT 8

Arkansas Corn and Grain Sorghum Promotion Board
Promotion Request: 2025 NASDA Annual Meeting

State the goals and objectives of the promotional activity.
The National Association of State Departments of Agriculture's (NASDA) president, Arkansas Agriculture Secretary Wes Ward, requests your support of the upcoming 2025 NASDA Annual Meeting, September 14 through September 17 in Rogers, Arkansas. NASDA is a nonpartisan, nonprofit association that represents the elected and appointed commissioners, secretaries and directors of the departments of agriculture in all fifty states and four U.S. territories. NASDA enhances American food and agricultural communities through policy, partnerships and public engagement.

During the 2025 Annual Meeting, local partners receive access to an unprecedented level of networking with over 350 agricultural leaders advancing agriculture at the state, regional and federal levels. The success of this national event is dependent upon local partners.

State the expected benefits to the Arkansas industry from the proposed promotional efforts.
Hosted in Northwest Arkansas, the 2025 NASDA Annual Meeting will provide many opportunities to highlight Arkansas agriculture and will also be a great opportunity to gain insights on critical issues affecting the agriculture industry. There will be opportunities to engage with producers and leaders from local, state and national levels. Opportunities to showcase the importance of corn and grain sorghum to the state's economy and its impact on the global market.

Seek to promote generic commodity and non-specific business entities.
Arkansas is serving as the host state for this year's Annual Meeting. The team at the Arkansas Department of Agriculture is working with NASDA staff and vendors in Northwest Arkansas to highlight Arkansas products and incorporate Arkansas commodities into the menu. Our goal is to serve Arkansas grown and made whenever possible.

Include a budget and explain how the entity will be accountable for its use of the requested funds.
The Arkansas Department of Agriculture respectfully requests $2,500 in funding to support the 2024 NASDA Annual Meeting. All funds will go to the general sponsorship fund that will support the meeting. Sponsorship dollars will be used to highlight and showcase Arkansas through meals, off-site tours, regional dinners, plenary sessions, among other events. We look forward to elevating the Arkansas corn and grain sorghum industry and raising awareness of its impact through Arkansas and the world.

ATTACHMENT 9

Tommy Young
107 Young Street
Tuckerman, AR 72473
Phone: 501-412-0598
Email: Bestsprinkler@aol.com

January 31, 2025

Arkansas Corn & Grain Sorghum Promotion Board, Kenny Falwell, Chair
Arkansas Soybean Promotion Board, Brad Doyle, Chair
c/o Arkansas Department of Agriculture
Scott Bray, State Executive Administrator to the Boards
1 Natural Resources Drive
Little Rock, AR 72205-1539

Attn: Joint Funding Proposal for Promotion of Education Concerning Corn, Sorghum and Soybeans for Arkansas Youth.

Mr. Bray, Doyle and Falwell

I am writing this letter with joy and excitement. I recently attended the American Farm Bureau Federation meeting held in San Antonio, Texas. While there I noticed that both the Arkansas State FFA Officer delegation and the Arkansas State 4-H delegation were in attendance. These groups of youth were very visible with the 4-H green jackets and the Blue FFA jackets with Arkansas in big letters across the back. It made we feel real good to know that these freshman in college were attending this farmer advocacy event. I was very active in FFA during my high school career but nothing past that point. The FFA helped me to develop leadership skills, public speaking skills and how to conduct proper meetings as well as educate me on various aspects of agriculture. My farming partner nephew Jim Young has a son whose name is Noah Young he is currently serving as the Arkansas State FFA Secretary. I have watched and talked to Noah throughout the past year and it truly is amazing at all of the work these young leaders do to promote FFA and 4-H throughout the state. We did not see Noah only for two days this summer because he was busy traveling around the state visiting various donors and going to schools promoting membership. We need to support our agriculture youth in our state.

I am proposing that the Arkansas Corn & Grain Sorghum Board and the Arkansas Soybean Board jointly and equally provide funding to sponsor each states entire delegation or variation thereof of both FFA and 4H State Officers including staff or chaperones to attend the NCGA Commodity Classic each year. I am proposing to provide enough funding to pay for transportation, lodging, food, registrations, tours, admissions or any other related expense that is deemed necessary by each organizations staff or administration. Each organization will bill for expenses incurred and these expenses will be divided equally between the boards not to exceed $15,000.00 per/board/per/year. All unused expenses will not transfer to the following year.

I believe Commodity Classic is a perfect campus to allow these students to see grassroots advocacy and innovation first hand. This event is a classic in that it encompasses all of the commodities that each of our boards represents. It provides excellent networking among agriculture industries. It showcases the most up to date technology. It creates pride in each of our related fields. This show is the one stop shop for letting these youth see how an idea, need or a problem can possibly be resolved from your local town or county all the way up to the national level.

We must invest in our youth who are interested in agriculture. The average age of farmers today is in the mid 50's and rising. These students we are funding are the spearhead leaders who promote agriculture to thousands of youth all across the state. I believe we should fund this perpetually and ask that they come back and give us a short report on how attending this event helped them and also let us know the value it returns to us.

This letter/proposal was written in haste and I am sure there are many many more things I could say. However time is of the essence and the 2025 Commodity Classic is a month away. The State FFA Advisor Jason Binz believes he can get a few students to this year's event if this is passed. I urge you to pass this proposal and I strongly ask that it be looked at each year following to keep the crops of youth motivated toward agriculture and especially row crop agriculture such is what we represent with our boards.

NOTICE: BEING FULLY TRANSPARENT, I do have a family member that will benefit from this action if passed. I will recuse myself from the vote while the Arkansas Corn & Grain Sorghum board considers this proposal.

With Best Regards,

Tommy Young
Arkansas Corn & Grain Sorghum Board Member

cc: Scott Bray
Brad Doyle
Kenny Falwell
John Thomas
Jason Binz

Enclosures/


State Vice President
2024-2025
State Secretary
2024-2025


CONVENTION
ARKANSAS
ASSOCIATION


JOSIE
HADEN
RAINLYN

ATTACHMENT 10

Presenter #1

Dr. Griffiths Atungulu

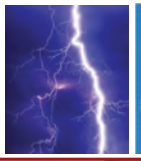
Exploring Plasma Activated Water for Enhanced Biocontrol of Aflatoxins in Corn Plants

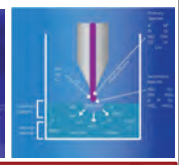
Exploring Plasma Activated Water for Enhanced Biocontrol of Aflatoxins in Corn Plants

- **Investigators:** G. Atungulu, M. Rahman & B. Bluhm
- **Status:** (New, Year 1 of 3)
- **Budget Request:** $63,080
- **Objective:**
  1) *Generate various plasma-activated water types using a recently acquired plasma generator and assess their efficacy against fungal pathogens of corn.*
  2) *Evaluate plasma-activated water's ability to suppress pathogenic activity and prevent toxin accumulation when applied to corn plants.*
  3) *Analyze traits of harvested corn treated with plasma-activated water versus untreated samples.*

Background

- Traditional biocontrol methods show promise in managing aflatoxin contamination in field plants, but face limitations influenced by environmental factors.
- Integrating biocontrol with innovative approaches could enhance efficacy and sustainability in disease management, impacting grain quality positively.
- *Plasma, the fourth state of matter, generates charged particles, altering atmospheric gases to create biologically active plasma activated water.*





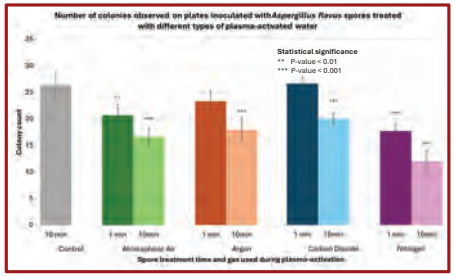
This research aims to evaluate the efficacy of plasma activated water on corn plants as a novel biocontrol method for aflatoxins and other plant diseases affecting grain quality.

Approaches

Phase 1: Generate four plasma-activated water types, testing effectiveness and dosages against a wide range of corn pathogens, with emphasis on aflatoxigenic strains of A. flavus.

Phase 2: Inoculate healthy corn plants with different pathogens, assessing treatment efficacy based on dosage and application timing.

Phase 3: Study treatment implications on corn traits post-treatment. Non-treated samples will serve as controls in each phase.



Value to the industry

Technology offers scalability and cost-effectiveness; Leveraging existing infrastructure, like irrigation, and potential aerial application via planes or drones, could significantly reduce aflatoxin loads and combat a wide range of corn diseases; could potentially be used in sanitation (e.g., trucks, bins) to reduce post-harvest infection with *A. flavus* and other storage fungi.

Presenter #2

Dr. Burt Bluhm

- **Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production**
- **Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy**

Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production

- **Investigators: Dr. Burt Bluhm, Dr. Kelly Cartwright (ARI, Inc.)**
- **Status: New**
- **Budget Request: $23,857 (Equal match also requested from the Arkansas Soybean Board and the Arkansas Rice Promotion Boards)**
- **Objectives:**

1. Evaluate the efficacy of commercial microbials in major Arkansas crops, including corn and sorghum production.
2. Isolate and develop novel, Arkansas-based agricultural microbials customized for our major crops, including corn and sorghum.
3. Obtain and evaluate pilot-scale equipment (biofermenters, bioreactors) to launch an Arkansas- based facility to serve as a scale up testing facility for microbial technologies and as a pilot level production center for commercial-scale, Arkansas-based production of agricultural microbials.

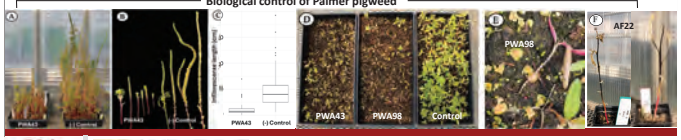
Agricultural Biologicals – beneficial microbes (or their products) that protect yields and boost plant productivity. *Biofertilizers, growth/yield enhancers, pest management*

- Provide novel, cost-effective alternatives to conventional inputs
- Forecast to grow from a $7 billion industry to $40 billion by 2030
- Bluhm lab emphasis (to date) has been biologicals for pest management

Aflatoxin control

Biological control of Hemp sesbania

Biological control of Palmer pigweed



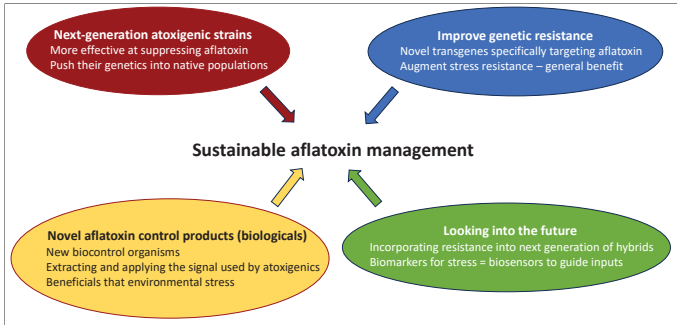
Our overarching goal: Evaluate emerging products and create novel biologicals specifically tailored for Arkansas agriculture

Objective 1: Evaluate commercial biologicals	Objective 2. Create novel biologicals for Arkansas agriculture	Objective 3. Launch an Arkansas-based production facility for biologicals
Field test existing/emerging biologicals in Arkansas	Arkansas soils naturally contain diverse populations of beneficial microbes	Create bioreactor/fermentation capacity – pilot-stage, initially
Emphasis on biofertilizers, growth enhancers	Focus initially on groups of microbes known to act as biofertilizers/biostimulants	Scale-up for internal discoveries, collaborations with other groups
Effect on yield, plant health	Evaluate their ability to boost yields/reduce stress in Arkansas production	No such facility/capacity currently exists in Arkansas
Aflatoxin management	Compare to existing commercial products	
Weed/pest management		

Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy

- **Investigator: Dr. Burt Bluhm**
- **Collaborator: Dr. Guri Johal, Purdue University**
- **Status: Year 3 of 3**
- **Budget Request: $45,000**
- **Objectives:**

1. Identify genes in corn associated with protein misfolding during heat and drought stress
2. Create novel aflatoxin-resistance genes through transgenic approaches and genome editing
3. Incorporate aflatoxin resistance into new semi-dwarf maize hybrids
4. Acquire and organize resources to launch a comprehensive 'moon shot' among multiple institutions to control aflatoxin in corn



- Corn genes involved in environmental stress response
  - Targets for genome editing
  - Utilization as biosensors
  - Key focus – linking specific stress response genes to aflatoxin susceptibility
- Novel transgenes to control aflatoxin
  - Identified numerous fungal targets from parallel project in our program
  - Building and testing transgenes
- Aflatoxin resistance in new semi-dwarf hybrids
  - Collaborating with Dr. Guri Johal (Purdue)
- Coordination of efforts across aflatoxin research community
  - Working with numerous university/government researchers to maximize efficiency & eliminate duplication

Presenter #3

Dr. Diego Lunga presenting for Dr. Kristofor Brye

Greenhouse gas data summarization in a corn production system with and without cover crops

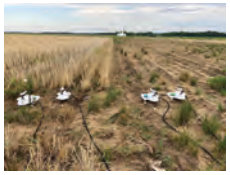
Greenhouse gas data summarization in a corn production system with and without cover crops

- **Investigators:** Dr. K. Brye (CSES)
  Dr. D. Della Lunga (CSES)
- **Status:** New, Year 1 of 1
- **Budget Request:** $11,267 for software for statistical analyses

Objectives: corn with and without cover crop

- Soil respiration
- Nitrification-denitrification
- Methanogenesis

105 days; 1680 observations per variable; 25 response variables



Presenter #4

Dr. Elvis Elli

Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas

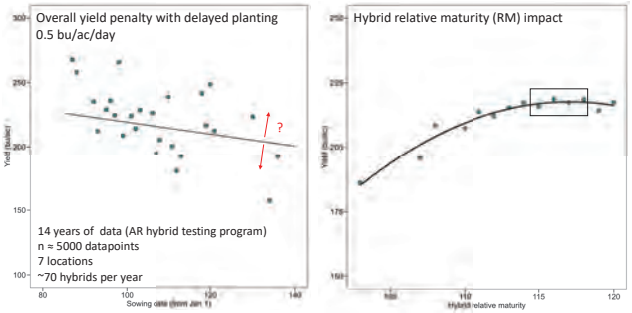
Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas

- **Investigators:** Elvis Elli, Jason Kelley
- **Status:** New (Year 1 of 2)
- **Budget Request:** $32,537
- **Objectives:**

1) Identify the most appropriate planting window and corn relative maturity for different environmental conditions in Arkansas that provide the greatest yield potential

2) Quantify differences in yield components that result in lower grain yields from late planting or hybrid maturity differences

3) Document emergence, silking, maturity, and harvest dates across planting dates and hybrid maturities for planning purposes



Experiment

- ✓ Three locations: Fayetteville, Rohwer, and Marianna
- ✓ ~12 popular hybrids (RM from 100-day to 120-day)
- ✓ Three sowing dates (at least): April 10, May 1, and May 20

Deliverables

- ✓ Yield penalty due to late planting across AR environments
- ✓ Hybrid relative maturity impact
- ✓ Grain weight & number, number of rows per ear & kernels per row
- ✓ Emergence, silking, maturity, and harvest dates
- ✓ Approximate water use

Presenter #5

Dr. Sun-Ok Lee

Understanding the Impact of Whole Grain Sumac Sorghum on Metabolic Health in Individuals with Obesity

Understanding the Impact of Whole Grain Sumac Sorghum on Metabolic Health in Individuals with Obesity

- **Investigator:** Sun-Ok Lee, Department of Food Science, U of A-Fayetteville
- **Status:** New
- **Budget Request:** $50,000
- **Objectives:**
  - ✓ Characterize the chemical composition and antioxidant properties of muffins mad from whole grain sumac sorghum and white wheat (control)
  - ✓ Compare the effects of consuming whole grain sumac sorghum muffins (SSM) and white wheat muffins (WWM, control) on blood glucose and insulin resistance
  - ✓ Determine the effects of consuming SSM and WWM on the lipid profile

Metabolic Health Risk

[https://metabolicmultiplier.org]

Our preliminary work showed improvements in postprandial blood glucose and insulin levels

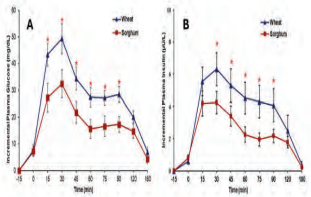


Figure. Mean incremental changes in blood glucose (A) and insulin (B) in healthy men (n=13) after consumption of whole grain sorghum or wheat muffins. Data are expressed as mean ± standard error mean. * Indicates P<0.05 significance.

Randomized, Controlled, Crossover Clinical Trial

- **Projected Value**

The proposed study will address the metabolic health benefits of whole grain sumac sorghum consumption in individuals with obesity while also supporting Arkansas grain sorghum growers and sorghum industries by enhancing awareness, boosting sales, and expanding market opportunities.

Presenter #6

Dr. John Nowlin

Practical Implications of Implementing Voluntary Smoke Management Guidelines in Arkansas

Better Burns Yield Better Air

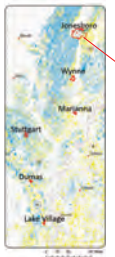
Practical Implications of Implementing Voluntary Smoke Management Guidelines in Arkansas

Lead Investigator: Dr. John Nowlin[1]
Co-Investigators: Drs. Jacob Manlove[1], Joseph Massey[2] & Michele Reba[2]
[1] Arkansas State University - College of Agriculture
[2] USDA Delta Water Management Research Unit, Jonesboro AR

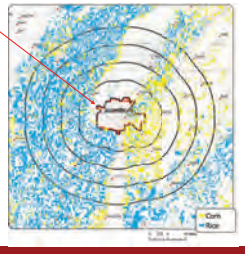
Status: New
Budget Request: $20,599
Objectives:

- Use the Arkansas V*oluntary Smoke Guidelines* to denote airsheds around Jonesboro and five other representative cities in Eastern Arkansas.
- Use historical cropping and wind data plus various burn tools to refine these airsheds in terms of prevailing wind direction.
- Identify fields, if any, where burning may consistently have disproportionate negative impacts on air quality in the designated cities.
- Assess the economic implications of not burning these problematic fields (i.e., $ required for producers to disk the fields, etc. instead of burning).

5-mile buffers - Jonesboro, AR & Prevailing Wind Direction



City boundary for Jonesboro & Corn and Rice cropland in 2023

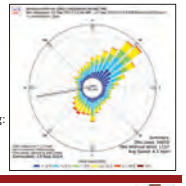


Based on "Arkansas Voluntary Smoke Management Guidelines for Row Crop Burning":

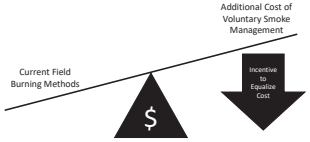
- 5-mile buffers 20 miles around city.
- Statistics to include the sum of Corn and Rice acreage at each distance from the city boundary. i.e. The 20-mile Jonesboro buffer includes:
  127,952 ac Corn
  301,020 ac Rice

Weather:

- Wind direction: Aug-Sep-Oct-Nov
- Building database of Fire Weather forecasts equaling: 646,980 forecasts from 10,011 docs



Economic Objectives



Estimate the Cost of Subsidizing Non-Burning Practices:

- Develop a detailed analysis of the financial requirements to subsidize farmers adopting non-burning techniques. This estimation will include the costs of equipment, training, and other resources needed for the transition, ensuring a clear understanding of the investment required.

Utilize Cost Estimates to Advocate for Future Farm Bill Funding:

- Leverage the estimated subsidy costs as a foundational argument to secure dedicated funding in future iterations of the Farm Bill. Demonstrate the alignment of this initiative with broader agricultural sustainability and climate resilience goals, ensuring long-term policy and financial support for farmers.

Presenter #7

Dr. Mahfuzur Rahman

Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten Meal

Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten Meal

- **Investigator: Mahfuzur Rahman**
- **Status: New**
- **Budget Request: $45,150**
- **Objectives:**
  - Develop corn gluten meal-based (CGM) biodegradable films for food packaging applications.
  - Comparative analysis of PFAS and CGM films to evaluate the potential of CGM as a PFAS alternative
  - Evaluate the environmental sustainability and food safety of corn gluten meal films

Forever Chemical requires a replacement

Not degradable, require > 500°C

CGM is an excellent candidate for PFAS replacement

- Corn gluten meal contains a unique protein
- Zein which is insoluble in water
- Hydrophobic amino acids account for 55% of zein's composition
- It is also a biodegradable polymer

Rice bran film

Rice bran protein film

Because of the hydrophobicity of CGM, it is an excellent candidate for PFAS replacement.

Presenter #8

Dr. Tom Barber

Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn

Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn

Investigators: Tom Barber and Jason Norsworthy
Status: Year 3
Budget Request: $86,150

Objectives:

1. To evaluate current, new and potential herbicide options for weed control in corn
   - Trying to acquire seed to also look at programs with short stature corn.
2. Evaluate effectiveness of weed control programs with proposed EPA guidelines on atrazine
3. Evaluate state-wide Palmer amaranth populations for differing sensitivity to HPPD herbicides
4. Determine off-target effects from drift rates of paraquat plus soybean and cotton residuals at various corn growth stages.
5. Determine off-target effects with Reviton and Sharpen spring burndown applications on corn.
6. Evaluate the utility of the See and Spray Ultimate in corn.
7. Provide rapid transfer of weed control information & recommendations to stakeholders through multiple outreach methods. **MP44, Weeds AR Wild Podcast; Text "weeds" to 501-300-8883**

Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn

Objectives:

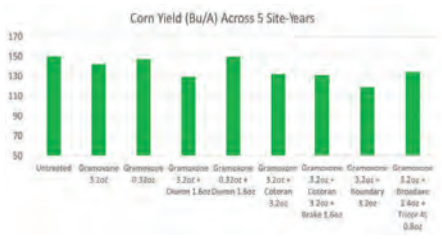
Evaluate effectiveness of weed control programs with proposed EPA guidelines on atrazine.

- Atrazine: Likely POST only option with reduced maximum rate and 9 points for runoff mitigation
- Amicarbazone alone and with metribuzin was evaluated as a potential replacement for atrazine. Corn had good tolerance to amicarbazone over a range of rates on a clay soil, but injury was observed under cool, wet conditions on a silt loam soil. Efforts are underway to determine if injury is more likely with high soil moisture or cool conditions shortly after planting.
- Corn hybrids differed in sensitivity to amicarbazone in a greenhouse trial. A subsequent trial under field conditions will be conducted this spring.
- Soybean could not be immediately planted in a failed stand of corn treated with amicarbazone + metribuzin without some injury to the later crop.
- Amicarbazone was often more effective than atrazine on several annual grasses and yellow nutsedge.

See and spray in corn can work but watch out for late season morningglories – no great replacement for atrazine

Varying sensitivity to HPPD herbicides exist especially when applied POST. Screening continues

Determine off-target effects from drift rates of paraquat plus soybean and cotton residuals at various corn growth stages.



Presenter #9

Dr. Jason Davis

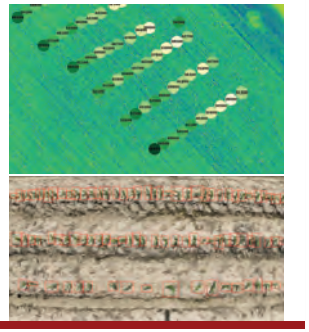
Development and verification of a stand counting application using drone imagery for research and production decision support

Development and verification of a stand counting application using drone imagery for research and production decision support

- **Dr. Jason Davis PI, Dr. Jason Kelley Co-PI**
- **Status: Year 2 of 3**
- **Budget Request: $16,360**
- **Objectives:**
  - **(1) Collect drone imagery of plant population studies (small plots) and use it to train a custom corn plant counting object detection model.**
  - **(2) Validate detection accuracy of model with considerations for research and production applications.**
  - **(3) Develop and release a user-friendly software package that leverages the validated customized model.**

Progress and Next Efforts:

- Year 1 version software and model have been developed and demonstrated
- A second year of training data is needed for model refinement in improvement in accuracy.
- Primary efforts are needed in **expanding drone model compatibility** and minimizing calculation errors from image variation.



Budget Justification:

- A corn specific algorithm requires **multiple seasons** of data collection time, processing, and annotation
- Project funds will primarily be spent on:
  - Travel
  - Technician time
  - Time collecting, annotating, and processing a second year's data.
- Reduced cost due to collaboration with already established plots.

Presenter #10

Dr. Chris Henry

- **2025 Irrigation Contest**
- **Improving Irrigation Technology for Corn Production in Arkansas**

2025 Irrigation Contest

- **C.G. Henry**
- **Status: 2025**
- **Budget Request: $10,000**
- **Objectives:**
  - **Prize money for winners, $6,000, $2,000, $1,000**
  - Spill-over effects of the contest have found that the contestants, and those that have heard about the contest but have not entered have significantly more fields using IWM than irrigators that have never heard about the irrigation contest. There are only 99 unique farmers in the contest, but the spill over effects such as social media, meetings, popular press and peer pressure have increased the adoption by our estimate between 50 and 66% of the irrigation population of 4,475 irrigators. The contest has significantly increased IWM adoption of around 2,978 irrigators in Arkansas.

Jeremy Weideman 1st Place Corn

Jeremy Weideman and Harper Summers

285.1 BPA and 13.51 Bushels Per Inch WUE

Corning, Arkansas (Clay County)

Used Pipeplanner ,Aquatrac, Surge Valve, Watermark Sensors, Watermark App, and good management

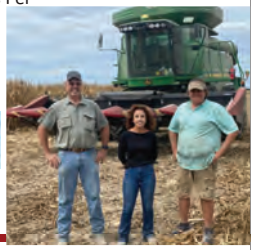
Blake, Michael, Mark, and Matthew Ahrent

Matthew Ahrent
2nd Place Corn
266.9 BPA
12.50 Bushels Per Inch WUE

Corning, Arkansas (Clay, County)

Kelby Wright
3rd Place Corn
283.7 BPA
11.66 Bushels Per Inch WUE

Weiner, Arkansas (Cross, County)



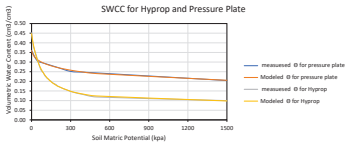
Rick Wimberley, Jenna Martin, and Kelby Wright

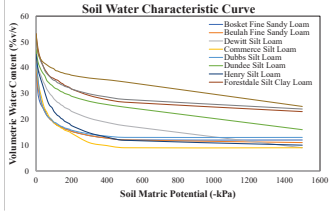
Improving Irrigation Technology for Corn Production in Arkansas

- **C.G. Henry**
- **Status: Year 3 of 3**
- **Budget Request: $185,280**
- **Objectives:**
  - **Measure sap flow in corn to develop and confirm water use in corn.**
  - **Measure irrigation water use, water use efficiency and efficacy of IWM tools through novel irrigation contest. Demonstrate Irrigation Water Management through the Irrigation Yield Contest. Pilot cloud meters in contest.**
  - **Finalize retention curves for the major soil Arkansas soil types, incorporate into mobile app and factsheets.**
  - **Conduct Irrigation schools for surge irrigation and soil moisture sensor education.**
  - **Develop prototypes for new methods and promote existing known methods to improve irrigation efficiency. Test cover crop crimper for furrow irrigation. Continue surge valve development, poly pipe printer, new soil moisture sensor and novel flowmeter and digital asset water trading system.**
  - **Pilot remote valve and pump timer technology on a working farm.**

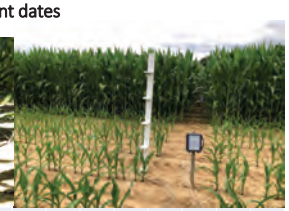
Retention Curve Results

New features in app, weather, working on importing data from commercial telemetry units. Several articles were submitted.





Sap flow/water use of corn planted on different dates



Growth stage	V12	V13	VT	R1	R2	R3	R4	R5	R5.25	R5.5	R5.75
Early planted	0.18	0.22	0.26	0.29	0.3	0.3	0.3	0.29	0.26	0.22	0.15
Middle date planted	0.26	0.28	0.3	0.3	0.31	0.31	0.3	0.27	0.25	0.23	0.14
Late planted	0.28	0.29	0.29	0.3	0.29	0.27	0.21	0.16	0.12	0.09	0.05
Current Recs	0.26	0.27	0.28	0.3	0.26	0.24	0.22	0.2	0.19	0.18	0.17

Presenter #11

Dr. Jason Kelley

- Corn and Grain Sorghum Research Verification Program
- Arkansas Corn and Grain Sorghum Research Studies Publication
- Optimizing Plant Population and Nitrogen Rate in Corn

Corn and Grain Sorghum Research Verification Program

- **Investigators:** Jason Kelley, Chuck Capps, Brian Deaton, Chris Henry, and numerous others
- **Status: (Year 2 of 3)**
- **Budget Request: $130,000**

Objectives:

1. Verify U of A research-based recommendations
2. Develop a database for economic and agronomic analysis of corn and grain sorghum production.
3. Demonstrate that consistently high yields of corn and grain sorghum can be produced economically
4. Identify specific problems and opportunities
5. Provide training and assistance to producers and county agents

2024 Corn and Grain Sorghum Research Verification Program

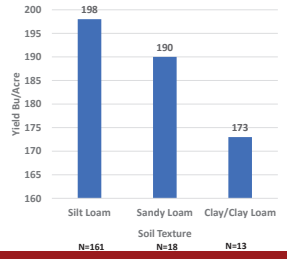
County	Hybrid	Field Size	Previous Crop	Plant Population	Plant Date	Harvest Date	Yield bu/ac
Arkansas	DKC 67-94	92	Soybean	33,000	April 3	Sept. 22	226
Clay	Pion. 14830	32	Soybean	35,400	March 30	August 19	279
Drew	DKC 68-35	40	Soybean	32,500	April 1	Sept. 4	167
Jefferson	Prog 2115	48	Soybean	30,000	April 5	August 18	222
Lonoke	DKC 65-92C	90	Soybean	34,500	April 23	Sept. 10	173
Miss.	Becks 6973	60	Soybean	34,167	April 5	Oct. 22	231
Phillips	DKC 68-35	128	Soybean	31,000	March 14	Sept. 5	217
White	Croplan 5550	40	Soybean	30,917	April 5	August 20	192
Mean		66		32,686	April 3	August 27	213

Plans for 2025 Verification Program

Program Enrollment

- 10 counties in the Program
  - Arkansas
  - Desha
  - Jefferson
  - Lonoke
  - Mississippi
  - Phillips
  - Woodruff
  - Monroe
  - Cross
  - Poinsett

Summary of Historical Agronomic Data



Arkansas Corn and Grain Sorghum Research Studies Publication

- **Investigators**:
  - Jason Kelley (co-editor)
  - Travis Faske (co-editor)
  - Nathan Slaton
- **Status**: Year 2 of 3
- **Budget Request**: $4,800
- **Objective**:
  - Publish the Arkansas Corn and Grain Sorghum Research Studies Publication

Arkansas Corn and Grain Sorghum Research Studies Publication

- Archive of previously funded Corn and Grain Sorghum Projects
- Past Issues online: (2019-https://scholarworks.uark.edu/aaesser/225/
  - Google Arkansas Corn and Grain Sorghum Research Series
- Produced annually, reports for 2024 studies are being prepared and completed in July
- University of Arkansas Communications Dept does formatting and final compilation

Optimizing Plant Population and Nitrogen Rate in Corn

- **Investigators:**
  - Jason Kelley (Agronomist), Trent Roberts (Fertility), Hunter Biram (Economist)
- **Status:** (Year 3 of 3) – Final Year
- **Budget Request:** $34,000

Objectives:

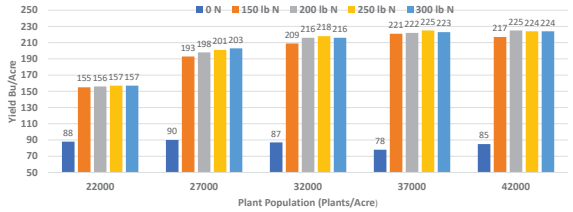
(1) Evaluate the impact of corn plant populations (populations of approximately 20k-45k plants/acre) on producer fields to compare yields, lodging potential, and economic return across diverse sites with varying yield potential and various commonly planted hybrids. (Large plots)

(2) Evaluate yield response to varying plant populations of new and commonly grown corn hybrids in combination with varying nitrogen rates (150, 200, 250, 300 lbs N) (Small Plots)

Locations: Rohwer, Marianna, Newport, Pine Tree, Fayetteville

(3) Evaluate resulting economic returns from trials (Hunter Biram)

Impact of Plant Population and Nitrogen Rate on Corn Yield, 2023, Marianna



38 Inch row spacing, silt loam soil, DKC 66-06 and Progeny 2118

2025 Plans: Optimizing Plant Population and Nitrogen Rate in Corn

- Summarize 2024 results in the Corn and Grain Sorghum Research Series publication
  - More details, plant heights, greensnap, lodging, yield components (seeds/ear, seed weight), and economic returns for all trials.
- Five Hybrid X Nitrogen Rate Trials are planned: Rohwer, Marianna, Newport, Pine Tree, and Fayetteville
  - Evaluate commonly grown and new hybrids. Proposed hybrids include:
  - DKC 68-35
  - DKC 66-06
  - Revere 1839
  - Pioneer 13777PWUE
  - Dyna-Gro 60TC45
- End of the project – 14 Population X Nitrogen Rate trials over 3 years

Presenter #12

Dr. Brittni Littlejohn

Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control

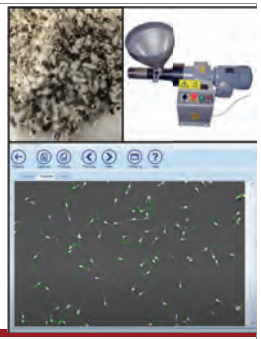
Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control

- **Investigators: B. P. Littlejohn, C. V. Maxwell, T. C. Tsai**
- **Status: Year 3**
- **Budget Request: $30,000/year from CGSB (Additional $30,000 requested from SPB)**
- **Objectives:**
  1. Using domestic hogs as a model for feral hogs, conduct a series of experiments to evaluate the use of feed containing gossypol to inhibit reproductive potential.
  2. Obtain input from 1) state and federal agencies and 2) collaborators in wildlife biology and population management to prepare for potential future phases of the project.

Year 1 & 2 Progress

- Gossypol treatments developed
  - Cottonseed oil product developed and tested in pilot study
- Pilot study:
  - Objective: to evaluate the influence of gossypol-containing cottonseed oil on semen quality, behavior, and health of domestic **boars** as a model for feral hog control
    - Live animal data collection completed
    - Data analysis in progress
  - Treatments:
    - Boars were fed diets mixed with gossypol-free or gossypol-containing cottonseed oil for a 42-day period followed by a 70-day recovery period
    - Semen quality, libido, and sickness behavior was evaluated every two weeks during the treatment and recovery period

Control (0 mg of gossypol/kg body weight) n = 16	4 mg of gossypol/kg body weight n = 16	8 mg of gossypol/kg body weight n = 16	12 mg of gossypol/kg body weight n = 18



Preliminary Results

Figure 1. Average percentage of sperm cells that were motile.

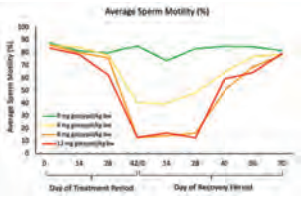
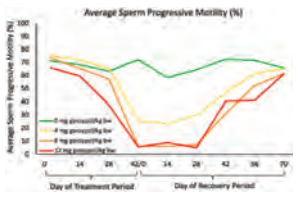


Figure 2. Average percentage of sperm cells that were progressively moving forward.



Presenter #13

Dr. Aurelie Poncet

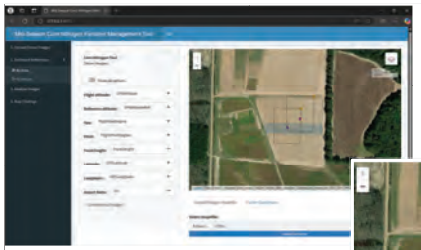
Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension

Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension

Investigators: Aurelie Poncet (PI), Trenton Roberts, Jason Kelley
Status: Year 2
Budget Request: $55,000

Objectives:

1. To create calibration curves that determine the amount of nitrogen (N) fertilizer required to recover 90% to 95% yield potential from field and high-N reference DGCI values when mid-season yield-limiting N deficiencies are identified.
2. To develop a new web-tool functionality that predicts the agronomically and economically optimum mid-season corn N fertilizer rate recommendation from raw drone images.
3. To verify that the new remote sensing-based mid-season corn N fertilizer rate recommendations can accurately predict how much N fertilizer is needed to maintain or increase yields.



Completed steps include automated delineation of high-N reference and aggregation of processed images without stitching

Determination of **optimized scouting path** and **profit-maximizing** mid-season N fertilizer rate from the collected images is in progress

Research Impacts and Projected Value

- Increased scouting efficiency
- Decision-support for optimized mid-season N fertilizer management
- Increased profitability from the use of inexpensive drone systems
- Relevant to both uniform and variable-rate N fertilizer applications
- Benefits achieved independently from operation size and technological capabilities
- Questions and feedback on tool functionalities / research objectives welcome!

Thank you for your continued support!

Presenter #14

Dr. Trent Roberts

- **Cover Crops in Corn Rotations- What Works and What Doesn't**
- **Improving Nitrogen Management for Arkansas Corn Production**
- **Fine-tuning Potassium Recommendations**

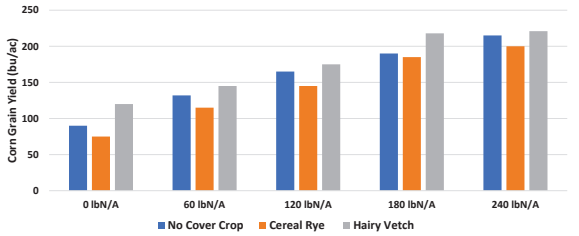
Cover Crops in Corn Rotations- What Works and What Doesn't

- **Investigators: Trenton Roberts, Gerson Drescher, Jason Kelley**
- **Status: 3**
- **Budget Request: $40,247**
- **Objectives:**
  1. **Determine the best management practices for growing corn following common cover crops**
  2. **Determine how implementing winter cover crops into a corn-soybean rotation influences nutrient cycling, soil physical properties, soil chemical properties and soil health.**

Major Changes in Soil Health Indices

- Soil Organic Matter- +0.7%
- Total N- Increased in Legume treatment
  - Seeing potential for yield maximizing N rates of 180 lb N/acre when legume cover crops are used
- Wet Aggregate Stability- greater macroaggregate stability
  - Increased water holding capacity and infiltration rates
  - Potential for greater irrigation water use efficiency

N Credits From Legume Cover Crops



Improving Nitrogen Management for Arkansas Corn Production

- **Investigators: Trenton Roberts, Gerson Drescher, Jason Kelley**
- **Status: 2**
- **Budget Request: $81,625**
- **Objectives:**
  1. **Validate the current nitrogen management strategies for irrigated Arkansas corn production in small plot and large block field trials.**
  2. **Quantify the potential nitrogen losses, primarily ammonia volatilization loss**
  3. **Evaluate the impacts of nitrogen rate and timing on corn yield components**

Table 1. Corn Response to in-season nitrogen (N) applications based on leaf tissue N concentrations at various growth stages.

Corn Leaf Tissue N (%)	Yield Increase From In-season N at Specified Growth Stage (bu./ac)	Application Rate Needed to Maximize Yield (lb N/ac)
	V10 Growth Stage	
2.0–2.5	100	120
2.5–3.0	45	120
3.0–3.5	14	60
>3.5	0	-
	V13 Growth Stage	
2.0–2.5	80	120
2.5–3.0	25	60
3.0–3.5	0	-
>3.5	0	-
	VT Growth Stage	
2.0–2.5	100	150
2.5–3.0	15	45
3.0–3.5	0	-
>3.5	0	-

N Response in CGSRVP

- Average units of N applied on silt loam soils
  - Current Rec- 220 lb N/acre

Year	Average N units applied	Mean Yield	lb N/bu grain
2021	227	233	0.97
2022	220	204	1.08
2023	219	219	1.0

Fine-tuning Potassium Recommendations

- **Investigators: Trenton Roberts, Gerson Drescher, Jason Kelley**
- **Status: Year 3**
- **Budget Request: $74,876**
- **Objectives:**

1. Establish field experiments to evaluate corn yield response to varying rates of potassium fertilizer.

a. Correlate leaf tissue potassium concentration to corn grain yield.

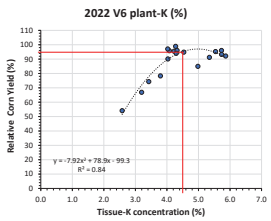
b. Measure potassium removal in the grain

c. Fine-tune existing potassium rate recommendations for corn.

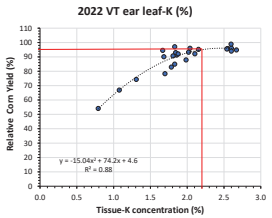
2. Validate the potash rate calculator developed in conjunction with Dr. Michael Popp

3.Determine the utility of intensive in-season tissue sampling and monitoring as a tool for high-yielding corn production systems.

Tissue K Data-V6



Tissue K Data-VT



Potassium Timing in Corn

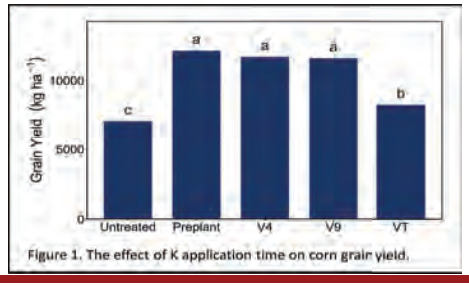


Figure 1. The effect of K application time on corn grain yield.

Presenter #15

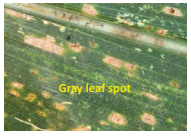
Dr. Terry Spurlock

Determining disease resistance and susceptibility of corn and grain sorghum hybrids

Determining disease resistance and susceptibility of corn and grain sorghum hybrids

- **Dr. Terry Spurlock, Dr. Jason Kelley, Dr. Camila Nicolli, and John Carlin, University of Arkansas System Division of Agriculture**
- **Status: Year 2**
- **Budget Request: $40,000**
- **Objectives: To extend disease resistance and susceptibility data of commercial corn and grain sorghum hybrids to growers annually**

DISEASES RATED IN THE TRIALS



Innvictis A1993T
Yield = 231.7 bu/A

Innvictis A1542T
Yield = 219.1 bu/A

Axis Seed 69A79 Trecepta
Yield = 190.8 bu/A

Plots at Marianna evaluated on 8/22/2024.

Presenter #16

Riley Smith Presenting for Breana Watkins

Crop Enterprise Budgets

Crop Enterprise Budgets

- **Breana Watkins - Instructor**
- **Status: (Year 3)**
- **Budget Request: $10,000**
- **Objectives:**
  - **Provide corn and grain sorghum enterprise budgets representative of production practices and inputs commonly used in Arkansas production.**
  - **The crop budgets are designed to allow for costs and returns analysis providing a method for investigating managerial decisions impacting the profitability of crop production.**

Project Details

- Corn and Grain Sorghum budgets are available at uaex.uada.edu:
  - Stacked Gene Corn
  - Conventional Corn
  - Grain Sorghum
  - Irrigated
  - Center Pivot
  - Non-Irrigated
- Estimated Farm Machinery Costs per Acre
  - Custom hire charges add ~10%

2025 Estimate of Farm Machinery Costs per Acre

Implement Name, Description	Total Field Trip Costs per Acre: Fixed Costs	Repairs	Fuel	Labor	Total	Acres per Hour	Hours per Acre
Paratill	$ 12.04	$ 1.66	$ 3.62	$ 1.93	$ 19.25	7.83	0.13
Subsoiler, 25 ft	$ 9.44	$ 1.38	$ 2.75	$ 1.47	$ 15.01	10.30	0.10
Subsoiler, 5 shank	$ 18.07	$ 2.32	$ 5.73	$ 3.06	$ 29.17	4.95	0.20
Bedder, Rip/Disk	$ 9.52	$ 1.34	$ 1.81	$ 0.96	$ 13.63	15.66	0.06
Bedder, Lister	$ 7.56	$ 1.32	$ 1.81	$ 0.96	$ 11.66	15.66	0.06
Disk	$ 8.27	$ 1.16	$ 1.56	$ 0.83	$ 11.83	18.13	0.06
Bedder, Hipper	$ 7.88	$ 1.05	$ 1.71	$ 0.91	$ 11.55	16.58	0.06
Chisel Plow	$ 8.14	$ 1.41	$ 1.72	$ 0.92	$ 12.19	16.48	0.06
Harrow	$ 2.94	$ 0.41	$ 0.83	$ 0.52	$ 4.70	28.85	0.03
Roller	$ 4.37	$ 0.40	$ 1.21	$ 0.64	$ 6.63	23.49	0.04
Bedder-Roller	$ 6.54	$ 0.62	$ 1.45	$ 0.77	$ 9.38	19.58	0.05
Ditcher	$ 0.30	$ 0.02	$ 0.09	$ 0.06	$ 0.47		
Turbo Tiller	$ 6.67	$ 1.01	$ 1.39	$ 0.74	$ 9.82	20.36	0.05
Rotary Harrow (ex. Phillips)	$ 4.50	$ 0.53	$ 0.93	$ 0.49	$ 6.45	30.55	0.03

Presenter #17

Dr. Travis Faske

Evaluate Management Options for Corn Nematodes in Arkansas

Evaluate Management Options for Corn Nematodes in Arkansas

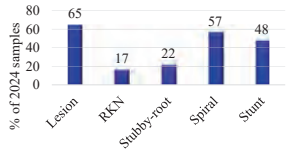
Investigators: **Travis Faske**
Amanda Greer

Status: Year 1 of 3

Budget Request: $58,383

Objectives:

1. Support sampling for corn nematodes



Evaluate Management Options for Corn Nematodes in Arkansas

Objectives:

2. Nematode distribution (vertical)
3. Nematicides efficacy: 2024
   - Two on-farm field trials
     - **>5 bu/ac above NTC:**
       - Avicta, P/V, Lumialza, Trunemco, Propulse, and Averland
     - RKN, LN, S-R, below damage threshold
   - New Nematicides: N-314, Nimaxxa, Victrato

Presenter #18

Dr. Glenn Studebaker

Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum

Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum

- **Investigators**
  - **Glenn Studebaker, Ben Thrash, Nick Bateman**
- **Status: New**
- **Budget Request: $39,964**
- **Objectives: Develop and enhance recommendations for managing insect pests in corn and grain sorghum and monitor for new invasive pests in Arkansas.**

Objective 1

- Evaluate seed treatment insecticides for their continued efficacy on established as well as potential new pests (corn leafhopper) in corn
  - Evaluate multiples rates ranging from lowest to highest labeled rate
  - Evaluate at early and late planting dates

Objective 2

- Evaluate and monitor the development of resistance in caterpillar pests to current Bt technologies
  - Corn earworm will be the primary target.
  - Southwestern and European corn borers have developed resistance in other regions of the country and will be monitored in Arkansas.

Objective 3

- Evaluate other pests as they occur
  - Corn leaf aphid infestations are becoming more commonplace
    - Data on when or if and/or when insecticide applications are economical.
    - Data on what products are effective is also lacking.
  - Other pests, such as stink bugs, corn leafhopper, armyworms, sorghum midge, and others, can occur sporadically
    - Efficacy trials will be conducted as pests occur to generate a robust data set for updating University recommendations.
    - Focus on early season stink bug infestations and scouting methods for this pest complex.

Presenter #19

Dr. Terry Spurlock presenting for Julie Robinson

Arkansas Future Ag Leaders Tour

Arkansas Future Ag Leaders Tour

- **Investigators: Julie Robinson**
- **Status: Ongoing**
- **Budget Request: $5,000**
- **Objectives:**
  - Increase participant's employability in agricultural careers.
  - Acquaint participants with the vast resources, market segments, and services available through Arkansas' number one industry.
  - Provide participants with a "bird's eye view" of current employment opportunities in the Arkansas agriculture industry.
  - Increase student's options and opportunities by networking with future employers.

Arkansas Future Ag Leaders Tour

Significant Findings for Previous Year for Current Studies or Value to Rice Industry:

1. The Arkansas Future Ag Leaders Tour helps create a more prepared and informed workforce that better understands the needs and dynamics of the farmers and producers that they will serve in their agricultural related careers across the state.
2. Addresses some job readiness skills that have been identified as deficient by employers.
3. Touring across the state makes students aware of what jobs are available in the state and in local communities all across Arkansas.
4. 15 Participants / 7 Universities / 6 Majors

Quotes:

- "I learned that there are way more ag jobs in AR than I thought."
- "I will use this experience to lead others and grow or carry this knowledge to others."
- "I will use the knowledge I have received from the many speakers on the job."
- "I learned that Ag careers are about passion for agriculture and helping people."

Presenter #20

Dr. Ali Ubeyitogullari

Generating a high-value wax material from sorghum bran using an innovative green approach

Generating a high-value wax material from sorghum bran using an innovative green approach

Investigator: Ali Ubeyitogullari

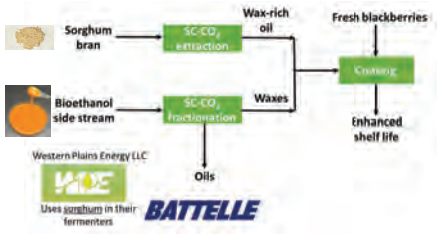
Status: Year 2 of 3

Budget Request: $42,968

Objectives:

- Extract high-value waxes from sorghum bran using supercritical carbon dioxide (SC-CO_2), optimize the extraction conditions, and create a model to describe the extraction process - ***value added products***.
- Separate and fractionate waxes from a recovered oil process stream of a bioethanol facility that uses grain sorghum in their fermenter - ***create new markets***.
- Coat fresh blackberries with the generated wax fractions to enhance their shelf life - ***create new markets + increase the utilization of grain sorghum***.

Proposed Approach and Projected Value



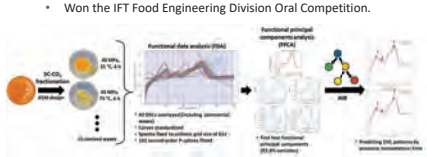
Projected Value

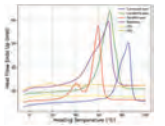
- Maximize the value of grain sorghum.
- Produce sustainable wax materials.
- Contribute to Arkansas's economy by creating new markets for grain sorghum byproducts:
  - **(1)** High-value wax materials,
  - **(2)** Bioethanol production.

Generating a high-value wax material from sorghum bran using an innovative green approach

Project update:

- A Ph.D. student was hired to work on this project.
- The experimental part of Obj. 1 has been completed.
- A manuscript is currently under review in a peer-reviewed journal.
- A patent application titled "*Processes and systems for extracting and purifying sorghum waxes from a sorghum-based feedstock*" has been filed (PCT application: PCT/US24/57330).
- Findings have been presented at the Institute of Food Technologists (IFT) Annual Event and Expo.
  - Won the IFT Food Engineering Division Oral Competition.





Mimicking commercially available waxes: carnauba, candelilla, paraffin and beeswax

Presenter #21

Dr. Brian Deaton

Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices

Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices

- **Investigator: Brian Deaton**
- **Status: New**
- **Budget Request: $6,000**
- **Objectives:**
  - Conduct an economic analysis of production practices used in the Arkansas Corn and Grain Sorghum Research Verification Program.
  - Maintain a historical database by integrating the 2024 corn verification program data with data from previous years.
  - Provide Arkansas corn market summaries for publication on the "Row Crops Blog" online newsletter.

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Proposals For Funding
Corn and Grain Sorghum
Research 2025-2026

February 3-4, 2025

Submitted to the

Arkansas
Corn & Grain Sorghum Board

Arkansas Corn and Grain Sorghum Promotion Board

Table of Contents

2025-2026 Proposals for Funding – February 3-4, 2025

53	**Arkansas corn & grain sorghum research studies series, an annual report and archival system for all board-funded research (Year 2 of 3).** *J. Kelley, T. Faske and N. Slaton*	$4,667	$4,800
57	**Optimizing plant population and nitrogen rate in corn (Year 3 of 3).** *J. Kelley and T. Roberts*	$34,000	$34,000
61	**Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 3 of 3).** *B. Littlejohn, C. Maxwell and T. Tsai*	$30,000	$30,000
65	**Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (Year 2 of 3).** *A. Poncet, T. Roberts and J. Kelley*	$56,000	$55,000
69	**Cover crops in corn rotations- What works and what doesn't? (Year 3 of 3).** *T. Roberts, J. Kelley and G. Drescher*	$39,729	$40,247
73	**Improving nitrogen management for Arkansas corn production (Year 2 of 3).** *T. Roberts, J. Kelley and G. Dresher*	$78,547	$81,625
77	**Determining disease resistance and susceptibility of corn and grain sorghum hybrids (Year 2 of 3).** *T. Spurlock, J. Kelley, C. Nicolli and J. Carlin*	$40,000	$40,000
81	**Generating a high-value wax material from sorghum bran using an innovative green approach (Year 2 of 3).** *A. Ubeyitogullari*	$42,761	$42,968
85	**Corn and grain sorghum enterprise budgets and production economic analysis (Year 3 of 3).** *Breana Watkins*	$10,000	$10,000
Research Proposals – Renewal (Completed funding cycle and resubmitted)			
90	**Economic analysis of corn and grain sorghum production and marketing practices (New, Year 1 of 1).** *B. Deaton*	$5,777	$6,000
94	**Evaluate management options for corn nematodes in Arkansas (New, Year 1 of 3).** *T. Faske, A. Greer and M. Emerson*	$55,401	$58,383
98	**Fine-tuning potassium recommendations and investigating intensive tissue analysis for sustainable corn production (New, Year 1 of 3).** *T. Roberts, J. Kelley and G. Drescher*	$56,395	$74,876
102	**Arkansas future Ag leaders tour (New, Year 1 of 3).** *J. Robinson*	$5,000	$5,000
106	**Developing effective insect pest management strategies for Arkansas corn and grain sorghum (New, Year 1 of 3).** *G. Studebaker, N. Bateman and B. Thrash*	$41,305	$39,964
Completed Projects Not Resubmitted			
	Performance crop insurance as a risk management tool for corn and grain sorghum producers in Arkansas (Year 3 of 3). *L. Connor*	$29,486	0
	Arkansas discovery farms (Year 3 of 3).	$5,000	0

	M. Daniels		
	University of Arkansas System Division of Agriculture feed kits (Year 1 of 3). *A. Harman*	$2,500	0
	Total	**$1,003,801**	**$1,232,208**
Funded Project Separately			
111	**The Arkansas irrigation yield contest (Year 8).** *C. Henry*	$10,000	$10,000

Arkansas Corn and Grain Sorghum Board – Proposal 2025-2026

Title: Exploring Plasma-Activated Water for Enhanced Biocontrol of Aflatoxins and Diseases in Corn Plants

Lead Investigator: Griffiths Atungulu

Co-Investigators: Mahfuzur Rahman, Burt Bluhm

Status: New

Research Area: Diseases

Stated Objective: A wide range of diseases can affect corn production in Arkansas, including foliar diseases, stalk rots, and ear rots. Pathogens present unique challenges for management, with issues such as fungicide resistance, evolution to overcome genetic resistance, the ability to evade management (such as Aspergillus ear rot/aflatoxin) and newly emerging diseases (such as tar spot). Thus, new disease management tools would help mitigate risks associated with the unpredictable nature of corn diseases.

Traditional biocontrol methods show promise in managing aflatoxin contamination in field conditions, but face limitations influenced by environmental factors. Integrating biocontrol with innovative approaches could enhance efficacy and sustainability in disease management, impacting grain yield and quality positively.

This research aims to evaluate the efficacy of plasma-activated water on corn plants as a novel biocontrol method for aflatoxins and other plant diseases affecting grain yield and quality. Plasma, the fourth state of matter, generates charged particles, altering atmospheric gases to create biologically active plasma-activated water. This project exploits plasma properties to combat pathogenic fungi and microbes affecting corn.

Specific Objectives:

1. Generate various plasma-activated water types using a recently acquired plasma generator and assess their efficacy against fungal pathogens of corn.
2. Evaluate plasma-activated water's ability to suppress pathogenic activity and prevent toxin accumulation when applied to corn plants.
3. Analyze traits of harvested corn treated with plasma-activated water versus untreated samples.

Methods:

Phase 1: Generate four plasma-activated water types, testing effectiveness and dosages against a wide range of corn pathogens, with emphasis on aflatoxigenic strains of *A. flavus*. For this work, the Bluhm lab has an extensive collection of pathogens causing corn diseases, including stalk rots (Fusarium stalk rot, Gibberella stalk rot, Anthracnose stalk rot, Diplodia stalk rot, Charcoal rot), foliar diseases (Gray leaf spot, Anthracnose, Northern and Southern corn leaf blight, Southern and Common rust), and ear rots/mycotoxins (Aspergillus ear rot/aflatoxin, Fusarium ear rot/fumonisins, Gibberella ear rot/vomitoxin, Diplodia ear rot/diplodiatoxins, Penicillium ear rot/ochratoxin, and Trichoderma ear rot). Multiple strains of each pathogen will be evaluated for inhibition of growth and mycotoxin production (where applicable). Experiments will be performed initially in pure culture in laboratory conditions to obtain a baseline of sensitivity to plasma-activated water. The primary variables to be explored are time and intensity of

dosage for each of the four plasma-activated water types. For *A. flavus*, a large collection (>200) isolates will be evaluated for inhibition of growth and aflatoxin production.

To generate the four different types of plasma-activated water, a plasma generator coupled with bubble and frit reactors will be used to generate cold plasma at voltages ranging from 80 to 325V, with discharge frequencies between 1-2 kHz and duty cycle range as 50-150 s. Two different gas sources, nitrogen and air at two different discharge frequencies (1000 vs 2000 Hz) will be utilized to regulate the reactive species (nitrogenous or oxygenous) and their reactivity.

Phase 2: Inoculate healthy corn plants with different pathogens, assessing treatment efficacy based on dosage and application timing. Depending on the sensitivity of pathogens to plasma-activated water (as determined in Phase 1 of the project), a subset of pathogens will be selected for further evaluation. Emphasis will be placed on pathogens of greatest concern/economic importance. Pathogens will first be inoculated on susceptible hybrids in greenhouse conditions to ensure disease development. Plasma-activated water treatments will be applied with information from Phase 1 as a guide to dosage and timing. Suppression of disease will be quantified by assessing symptoms such as lesion number and size, yield, and kernel colonization/production of mycotoxins (the details of the approach to induce and assess pathogenesis will vary depending on the specific pathogen). We will also evaluate potential negative effects on host plants, particularly with respect to kernel set/development, yield, and vigor.

Phase 3: Study treatment implications on corn traits post-treatment. Non-treated samples will serve as controls in each phase. The degradation kinetics will be evaluated with respect to different factors like kernel size, shape, composition, level of pathogen infestation and accumulation of toxins in the grain and other changes that determine suitability for food and feed applications. In future, the aim is to develop a novel and cost-effective protocol using plasma-activated water at a field scale for biocontrol of aflatoxins and diseases in corn plants.

Planned Milestones:

2025: Complete Phase 1

2026: Complete Phase 2

2027: Complete Phase 3

Projected Value:

Plasma technology offers scalability and cost-effectiveness. Leveraging existing infrastructure, like irrigation, and potential aerial application via planes or drones, could significantly reduce aflatoxin loads and combat a wide range of corn diseases. The technology also could potentially be used in sanitation (e.g., trucks, bins) to reduce post-harvest infection with *A. flavus* and other storage fungi.

Budget Justification: The budget will be allocated to three faculty members: Dr. Burt Bluhm (plant pathologist collaborator), Dr. Atungulu (grain processing systems engineer), and Dr. Rahman (plasma degeneration expert). Salaries for a research associate, a full-time graduate student, and hourly personnel are requested. The research associate will train the graduate student, oversee experiments, and troubleshoot. Out-of-state travel costs for professional conferences and expenses for laboratory supplies, chemicals, and grain quality analysis are also included.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Atungulu, Griffiths — *Exploring Plasma-Activated Water for Enhanced Biocontrol of Aflatoxins and Diseases in Corn Plants*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Atungulu, Griffiths	**Co-PI #1**	Rahman Mahfuzur	
Co-PI #2	Bluhm, Burt	**Co-PI #3**		
Department	FDSC Food Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Exploring Plasma-Activated Water for Enhanced Biocontrol of Aflatoxins and Diseases in Corn Plants			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Atungulu, Griffiths	**Rahman Mahfuzur**	**Bluhm, Burt**		**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI	AES	AES	AES				
Fulltime Personnel							
Position Title / **Name** *(if position is filled)* / **% Time**	**Salaries**				**Total**	**AES**	**CES**
Research Associate / Nikitha Modupalli / 20%		$8,333			$8,333	$8,333	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Subtotal: Salaries	$0	$8,333	$0	$0	$8,333	$8,333	$0
Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.							
Name *(if position is filled)* / **% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
Grad Student / 25%		$10,000			$10,000	$10,000	$0
Grad Student / 25%	$10,000				$10,000	$10,000	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Tuition Calculator Information	$3,398	$3,398			$6,796	$6,796	$0
Subtotal: Graduate Student	$13,398	$13,398	$0	$0	$26,796	$26,796	$0
Hourly							
	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel	$2,500	$1,500	$3,500		$7,500	$7,500	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$2,500	$1,500	$3,500	$0	$7,500	$7,500	$0
Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.							
	Benefits				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$0	$2,383	$0	$0	$2,383	$2,383	$0
Graduate Students	$510	$510	$0	$0	$1,020	$1,020	$0
Hourly Personnel	$183	$110	$256	$0	$548	$548	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$693	$3,003	$256	$0	$3,951	$3,951	$0
Personnel Total	$16,591	$26,234	$3,756	$0	$46,580	$46,580	$0
Travel							
Justify out-of-state travel in proposal.							
	Travel				**Total**	**AES Portion**	**CES Portion**
In-State	$1,000	$1,000	$1,000		$3,000	$3,000	$0
Out-of-State		$1,000			$1,000	$1,000	$0
Travel Total	$1,000	$2,000	$1,000	$0	$4,000	$4,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Atungulu, Griffiths *Exploring Plasma-Activated Water for Enhanced Biocontrol of Aflatoxins and Diseases in Corn Plants*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$2,500	$2,000	$8,000		$12,500	$12,500	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$2,500	$2,000	$8,000	$0	$12,500	$12,500	$0
	Total for Proposal	$20,091	$30,234	$12,756	$0	$63,080	$63,080	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Promotion Board – 2025-2026 Proposal

Title: Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production

Lead Investigator: Dr. Burt Bluhm

Collaborator: Dr. Kelly Cartwright

Status (i.e., New, Year 2 of 3, Year 2 of 2, etc.): New; Year 1 of 3

Research Areas: Physiology; Environment; Pathology

Stated Goal: This project is focused on discovery, evaluation and production of agricultural microbials (i.e., microbial biofertilizers, rhizobia, microbial pesticides, microbial protectants and related) specific to Arkansas crops and production environments. The ultimate goal is to create commercially viable microbials and the necessary production facilities within UADA to enable commercial production of these microbials tailored to benefit our Arkansas farmers. In this way, we could provide sound, novel technologies from within the state to increase yields and profitability for Arkansas agriculture. We propose a project that would be jointly, evenly funded by the Arkansas Corn and Grain Sorghum Promotion Board, the Arkansas Rice Promotion Board, and the Arkansas Soybean Promotion Board to launch this initiative.

Specific Objectives:

1. Evaluate the efficacy of commercial microbials in major Arkansas crops, including corn and sorghum production.
2. Isolate and develop novel, Arkansas-based agricultural microbials customized for our major crops, including corn and sorghum.
3. Obtain and evaluate pilot-scale equipment (biofermenters, bioreactors) to launch an Arkansas-based facility to serve as a scale up testing facility for microbial technologies and as a pilot level production center for commercial-scale, Arkansas-based production of agricultural microbials.

Background: A*gricultural microbials* (sometimes referred to as 'microbials' or 'biologicals') constitute a wide range of commercial products used to improve crop production. These include soil or root-dwelling microbes that act as plant biostimulants, biofertilizers, nodulators, biocontrol agents of various pests, and serve many other functions that promote crop plant health and increase/protect yield. Microbials have an excellent return on value for farmers. They are relatively inexpensive and have proven benefits including more efficient nutrient uptake, nitrogen assimilation, stress alleviation related to water, salt, heat and drought, and control of weeds, diseases and insects. Additionally, microbials are environmentally friendly due to their biological basis. Because of low cost, high returns, and overall safety, the agricultural microbials market is growing rapidly and is forecast to exceed $32 billion worldwide in 10 years, from roughly $7 billion today.

Ultimately, the vision here is to create the necessary program and infrastructure to discover, evaluate and finally produce commercially viable and scaled microbial products that are customized specifically for Arkansas crops and production environments. To our knowledge, there are currently no microbial scale up facilities in Arkansas today. Thus, any scale up work for microbials must be contracted out to facilities in other states even for early product evaluation. As a major land-grant university attached to one of the most productive crop production areas in the U.S., we have an opportunity to function as a microbial hub to service research efforts as well as our farming communities. Beyond the types of microbials described, a program and parallel facility as outlined can also be highly *valuable* to address specific challenges for Arkansas farmers, such as abiotic stress associated with mycotoxin contamination of grain, particularly aflatoxin; mitigating other biotic and abiotic stresses such as unfavorable temperatures and flooding; maximizing efficient uptake of irrigation and nutrients; and

other issues of high priority to our growers. Finally, once established, we aim to partner with the UADA and other crop breeding programs to develop variety 'packages' entailing plant genetics partnered with customized microbials to maximize and protect yield and profitability in Arkansas production conditions.

A key requirement for this project is biofermentation, the capacity for scale-up production of rhizobacteria or other beneficial organisms. This project will require at least one benchtop biofermenter (~5 L) for pilot-scale protocol development, and a larger (~50 L) fermenter to translate pilot-scale production into sufficient biological inoculum for field testing. Subsequent commercial-scale production for Arkansas growers will require additional equipment, industry partnership, or outside investment -- a situation to be addressed as this three-year project advances beyond initial stages. To our best knowledge, there is no public or commercial agricultural fermentation facility in the state of Arkansas that can support this endeavor, and thus we seek to address this critical infrastructure gap for the benefit of multiple cropping systems in the state. It should be emphasized that, as a major research land grant University, we have developed many microbial-based technologies over the years. However, pilot or scale up production has often been a stumbling block to further develop these technologies. This project will help fill that gap.

Methods: For Objective 1, we will focus on establishing a research base by evaluating the benefit of existing, commercially available agricultural microbials on the major crops in Arkansas, including corn and sorghum. These will initially focus on yield promotion and improved agronomics. Field testing will be performed at the Fayetteville research station. As the project progresses and new biologicals continually become available, we will annually select products for field testing. For Objective 2, we will collect and isolate novel potential microbials from Arkansas soils and plants, specifically from crop plants or others that appear to thrive despite obvious stressful conditions. We envision focusing primarily on beneficial rhizobacteria but will pursue other categories of microorganisms as supported by experimental data. These novel plant-associating strains will be tested in greenhouse and outdoor plots for efficacy before scaling up production for larger, field-scale evaluations. For Objective 3, we anticipate purchasing a reconditioned bench-top fermenter in Year 1, so that initial optimization experiments for strains obtained in Objective 2 can begin in the later part of Year 1. In Year 2, we anticipate purchasing a reconditioned, larger fermenter/bioreactor capable of producing sufficient inoculum for experiments in greenhouses and outdoor plots. Together, these two fermenters will provide sufficient capacity to take newly discovered biologicals from initial research & development stages to proof of concept and will provide the footprint for commercial production and market viability.

Planned Milestones: In Years 1, 2, and 3, we will evaluate commercial microbials for efficacy on corn, sorghum, and other major field crops in the state and report results to growers through presentations at meetings and other extension activities. In Year 1, we will begin to actively isolate novel, Arkansas-sourced microbials and acquire/set up the bench top fermenter so that active testing of novel microbials can commence in Years 2 and 3. In support of this process, we will acquire/set up the larger fermenter in Year 2 to enable greenhouse and outdoor testing of novel microbials on a larger scale. By Year 3, we anticipate having a fully functional R&D fermentation facility for scale-up production of microbials.

Statement of Projected Value: Agricultural microbials specifically formulated for Arkansas production conditions have the potential to save input costs and thus substantially increase grower profitability. This is particularly important in the face of lower than desired commodity prices coupled with higher input prices -- a situation expected to continue for the foreseeable future.

Budget Justifications: Funds are requested to purchase a bench-top fermenter in Year 1 and a scale-up fermenter in Year 2, required for project success. Comparable, functional equipment is not currently available within UADA or other entities within the state of Arkansas. Funds are requested for a graduate student to perform project related activities, as well as funds for lab, field, and greenhouse work. Funds are also requested for Dr. Cartwright's participation in the project as a collaborator and consultant.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Bluhm, Burt — *Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production*

Year	2025/2026	**Project Year**	New
Lead Investigator	Bluhm, Burt	**Co-PI #1**	
Co-PI #2		**Co-PI #3**	
Department	ENPL Entomology and Plant Pathology		
Commodity Board	Corn and Grain Sorghum Board		
Project Title	Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production		

Version: 7.0 (11/01/2024)

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Bluhm, Burt				Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES						

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
	33%%	$7,000				$7,000	$7,000	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information		$2,000				$2,000	$2,000	$0
Subtotal: Graduate Student		$9,000	$0	$0	$0	$9,000	$9,000	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
Graduate Students	$357	$0	$0	$0	$357	$357	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$357	$0	$0	$0	$357	$357	$0
Personnel Total	$9,357	$0	$0	$0	$9,357	$9,357	$0

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$1,000				$1,000	$1,000	$0
Out-of-State					$0	$0	$0
Travel Total	$1,000	$0	$0	$0	$1,000	$1,000	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Bluhm, Burt — *Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$3,500				$3,500	$3,500	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Partial cost of ferementer, Consu	$10,000				$10,000	$10,000	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$13,500	$0	$0	$0	$13,500	$13,500	$0
	Total for Proposal	$23,857	$0	$0	$0	$23,857	$23,857	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Greenhouse gas data summarization in a corn production system with and without cover crops

Lead Investigators: Dr. K. Brye (CSES)

Co-Investigators: Dr. D. Della Lunga (CSES)

Status: New **(**Year 1 of 1)

Research Areas: General Agronomics and Misc. Project

Stated Goal: More than 97% of greenhouse gases (GHG) in agricultural settings are accounted by carbon dioxide (CO_2, 80%), methane (CH_4, 11%), and nitrous oxide (N_2O, 6%). Soil management decisions contribute more than 49% to N_2O emissions, which are strongly associated with fertilizer applications, irrigation, and soil disturbances. Due to the substantial input of nitrogen (N) fertilizer and to large biomass production, corn (*Zea mays*) production systems are often perceived to have large N_2O and CO_2 losses, while, conversely, serving as a CH_4 sink. Agricultural practices defined as climate-smart practices can play a fundamental role in mitigating climate change through the reduction of GHG emissions and through the enhancement of storage process, such as soil carbon (C) sequestration. Among known climate-smart agricultural practices, cover crops (CC) have gained substantial interest in recent years, where various plant types or mixes are planted between growing seasons to control soil erosion and enhance soil C sequestration and N uptake, which, in turn, can reduce GHG production and release.

During the 2024 growing season, comprehensive measurement of simultaneous, continuous, in-field GHG concentrations furrow-irrigated corn grown with and without a CC mix on a silt-loam soil in the Mississippi Alluvial Plain was performed. In May 2024, just after corn planting and prior to emergence, two gas sampling base collars were installed in each CC treatment. Collars were installed on top of raised beds. Chambers were then installed atop the base collars and remained open most of the time, but closed automatically at pre-set intervals four times per day (i.e., 3 and 9 am and 3 and 9 pm) for 5 minutes every day continuously up to just before harvest using an automated multiplex system developed by Li-Cor Environmental, Inc. A multiplexer unit was connected to the four opaque, long-term chambers for a total of two chambers (i.e., replications) in each CC treatment. The multiplexer unit was also connected to a N_2O analyzer and a combined CO_2/CH_4 analyzer that remained in the field. The entire system was powered by a set of four solar panels and a series of eight rechargeable marine batteries that provided constant power to the instrumentation day and night. The system was connected to a cellular modem that allowed remote and live access to the gas concentration data collected over time for all four chambers. Sensors to measure volumetric soil water content and soil temperature were also installed adjacent to and were connected to each chamber to record environmental data at each GHG sampling time The entire system was part of the awarded project sponsored by the USDA Partnerships for Climate-Smart Commodities (award number NR233A750004G041) at a cost of over $130,000.

The resulting dataset consisted of 10 consecutive days of CO_2, CH_4, and N_2O concentration data in a furrow-irrigated corn system for two replications in each of two CC treatments on a silt-loam soil, with measurements conducted four times per day from each of the four chambers for all three gases. This GHG dataset, collected over nearly the entire corn growing season, is one of only a few similar datasets that exist in the entire United States of GHG values that have quantified daily, gaseous C and N losses continuously over time and may be the only one that exists for corn with and with CC. However, the dataset cannot be properly statistically analyzed yet, as complex datasets, such as the one generated already over the 2024 growing season, are best analyzed by a repeated-measures experimental and statistical design, where the specific structure of the residuals needs to be properly described. Consequently, the ability to appropriately analyze and summarize such complex data requires the use of specific statistical software packages that typical statistical software used for agronomic data analyses do not have. Therefore, the goal of the proposed study is to acquire and use a proper statistical analysis software package to appropriately and efficiently assess analyze the temporal trends and treatments effects for CO_2, N_2O, and CH_4 fluxes and emissions from furrow-irrigated corn production on a silt-loam soil with and without CC. This study will address numerous priorities for corn production in Arkansas, including nutrient management, plant nutrient uptake, N-fertilizer use efficiency, and specifically provide direct quantification of long-term gaseous C and N losses, while contributing to improving understanding of CC as an increasingly popular climate-smart practice in corn production systems in Arkansas.

Specific Objectives: The specific objective of this proposed study is to summarize and statistically evaluate CO_2, N_2O, and CH_4 fluxes and season-long emissions from furrow-irrigated corn grown with and without CC on a silt-loam soil. To accomplish this objective, advanced statistical software and tools are required, as typical statistical software and tools used for agronomic data evaluations are incapable of performing the needed analyses.

Methods: Since the dataset has already been generated, this study will primarily involve data analyses and statistical evaluation and summarization using a specific statistical package developed by VSN International, UK, called ASREML, which is compatible with the open-source R-studio software. The package comes with the access to an international support team that will collaborate with a research group, if necessary, to successfully analyze non-traditional, complex datasets. Due to the volume of collected data and to the complexity of the anticipated analyses, different data manipulation approaches will be required to be conducted simultaneously, thus multiple licenses, for multiple different computers, will be necessary.

In addition to the GHG data analyses, soil samples were collected from the top 15 cm (6 in) at the time of base collar installation and again before harvest. Samples were oven-dried, weighed for bulk density determination, ground, and sieved for soil chemical property analyses that have not been conducted yet. Soil pH, electrical conductivity, Mehlich-3 extractable soil nutrients, soil organic matter, total C and N, and particle-size analyses will be measured. Furthermore, aboveground, whole-plant and grain samples were collected at harvest, oven-dried, weighed, ground, and sieved for chemical analyses that also have not been conducted yet. A suite of total elemental concentrations will be measured on the aboveground whole-plant and grain samples. Soil and plant samples analyses will be used to correlate to season-long GHG emissions.

Planned Milestones: The initial milestone is the direct quantification of C and N losses from furrow-irrigated corn grown with and without CC on a silt-loam soil. A subsequent milestone is the ability to statistically analyze and summarize a unique and complex dataset. The ultimate milestone is to improve the long-term outlook, marketability, and environmental sustainability of Arkansas-grown corn with credible and reliable field research, specifically the continuous quantification of GHG fluxes and season-long emissions.

Statement of Projected Value: Analysis of GHG budgets, particularly CO_2, CH_4, and N_2O, provides important information on where over- or under-estimations are more prominent and how to improve current methods to enhance the reliability of GHG budget estimations to improve long-term sustainability of Arkansas corn production. Greenhouse gas production and emissions play a role in the perception of soil health, where soil health has been listed among the goals of climate-smart production practices in agricultural systems. Cover crops have been associated with a reduction in N_2O emissions from agricultural fields, making cover crops a potential management strategy for climate-smart agriculture and climate-change mitigation. Assessing gaseous C and N losses through the continuous measurement of GHGs will provide detailed temporal data that will result in essential information to characterize best management practices in corn systems to minimize GHG emissions. Conducting the proposed project and accomplishing the proposed objective will benefit the agricultural community in Arkansas, particularly in the row-crop-dominated region of eastern Arkansas, as the issues related to climate change are not site-specific, rather a much broader area is impacted. More generally, assessing climate-smart agricultural practices for resource conservation and future sustainability will benefit corn producers throughout Arkansas and beyond.

Budget Justifications/Explanation of Travel and Direct Costs: The acquisition of multiple licenses of the ASREML statistical tool ($5827) will allow for the summarization and analysis of unique field data with large temporal resolution for GHG fluxes and emissions. In addition, funds are requested for some replacement parts for the automated measurement system ($4800) and soil ($400) and plant ($240) samples chemical analyses. There are no funds requested for out-of-state travel associated with this project proposal.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Brye, Kristofor — *Greenhouse gas data summarization in a corn production system with and without cover crops*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Brye, Kristofor	**Co-PI #1**	Della Lunga, Diego	
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Greenhouse gas data summarization in a corn production system with and without cover crops			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Brye, Kristofor	Della Lunga, Diego			Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES	AES					

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

		Wages				Total	AES Portion	CES Portion
	Hourly-Personnel					$0	$0	$0
	Hourly-Students					$0	$0	$0
	Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.		Benefits				Total	AES Portion	CES Portion
	Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
	Graduate Students	$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
	Hourly-Students	$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits	$0	$0	$0	$0	$0	$0	$0
	Personnel Total	$0	$0	$0	$0	$0	$0	$0

Travel

Justify out-of-state travel in proposal.		Travel				Total	AES Portion	CES Portion
	In-State					$0	$0	$0
	Out-of-State					$0	$0	$0
	Travel Total	$0	$0	$0	$0	$0	$0	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Brye, Kristofor — *Greenhouse gas data summarization in a corn production system with and without cover crops*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$10,567				$10,567	$10,567	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Samples analyses	$700				$700	$700	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$11,267	$0	$0	$0	$11,267	$11,267	$0
	Total for Proposal	$11,267	$0	$0	$0	$11,267	$11,267	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas

Lead Investigators: Elvis Elli

Co-Investigators: Jason Kelley

Status: New (year 1 of 2)

Research Area: Misc. Projects (crop physiology)

Stated Goal: Delayed planting due to unfavorable weather conditions frequently challenges corn hybrids' relative maturity choices, especially in the Mid-South due to high rainfall in March through April in most years. Maize grain yield is determined by kernel number and weight at harvest, which is sensitive to environmental conditions (e.g., drought, heat, cloudy days) around silk time and during the grain fill period. High temperatures during pollination and grain filling are always a concern in Arkansas and impact corn yield potential most years. Years with moderate temperatures during June and July generally result in greater corn yields. Understanding the impact of temperatures on grain size and number is an essential first step to identifying agronomic strategies to increase yields. Using differing or earlier maturing is a possible management scheme to spread risks of high temperatures. Some areas of Arkansas are experiencing reduced availability of irrigation water, and shorter relative maturity corn hybrids may have a better fit in those situations if yield potential is still acceptable. Our proposal aims to dissect the interaction between corn relative maturity, planting date, and environmental conditions on corn yields to refine agronomic recommendations and maximize corn profitability in Arkansas.

Specific Objectives:

1) Identify the most appropriate planting window and corn relative maturity for different environmental conditions in Arkansas that provide the greatest yield potential
2) Quantify differences in yield components that result in lower grain yields from late planting or hybrid maturity differences
3) Document emergence, silking, maturity, and harvest dates across planting dates and relative maturity for planning purposes.

Methods:

Objective 1: Field experiments will be conducted using at least three hybrids (12 in total) within the following relative maturity ranges: 97-100 days, 110-113 days, 114-117 days, and 118- 121 days. We will plant the hybrids on three sowing dates: April 10, May 1, and May 20. Within each relative maturity range, we will select hybrids from different seed companies, including popular hybrids being grown currently. The experiments will be planted in three environments within the UADA research station network: Fayetteville, Rohwer, and Marianna Research Stations. Experiments will be conducted with a randomized complete block design and three replications. Field plots will consist of 4 rows, 25 feet long. Grain yields will be determined by harvesting the two central rows using a small-plot combine. The data analysis will include preliminary results already collected in the 2024 crop season (5 locations, 5 hybrids, 3 sowing dates) and 14 years of yield data across six locations from the Arkansas corn hybrid testing program to expand research findings to broader environmental conditions. The Arkansas hybrid testing accounts for relative maturities commonly ranging from 110-120 days and focuses on final yields. Our proposed trials will cover a broader range of hybrid maturities and sowing dates and quantify additional yield components and phenology information.

Objective 2: We will manually harvest five consecutive plants at physiological maturity. Ears will be shelled, and kernels will be weighed and counted. We will test different kernel count methods, including automatic seed counter and imagery analysis. We will also determine the number of rows per ear and kernels per row. Impacts of corn relative maturity, hybrids within each maturity, and sowing dates on kernel number will be initially analyzed. Subsequently, daily weather information will be retrieved from weather stations belonging to the UADA research station network and, when unavailable, obtained from the closest weather station belonging to the Southern Regional Climate Center. The association between maximum, minimum, and mean temperature and kernel number and weight will be explored. Our focus will be temperature impacts, but we will also look at additional environmental variables and crop stages that help explain yield components and final yields.

***Objective 3*:** Besides yields, we will look at seed germination and plant establishment depending on planting dates, soil types, and environmental conditions. We will also record the leaf number and emergence, silking, maturity, and harvest dates for planning purposes.

Planned Milestones:

Year 1 – Experimental plots will be established at different locations with varying soils and environmental conditions. Yield data and yield components (kernel number, weight, row number) will be collected across a range of corn relative maturities and sowing dates. At the end of year one, a new dataset will be compiled and analyzed to identify the most promising corn relative maturity and sowing date per environment that maximizes final yields.

Year 2 – Experiments will be repeated using the same set of hybrids and sowing date ranges but potentially different locations to capture more variability and environmental conditions in Arkansas. By the end of year two, we will have a robust dataset indicating the most appropriate hybrids and sowing dates for different geographical regions in Arkansas. We will quantify yield penalties due to delayed planting dates and the impacts of high temperatures on crop yields.

Statement of Projected Value:

Hybrid and relative maturity selections are among the most important management decisions affecting corn yields and farm profitability. Early sowing and well-adapted hybrids within relative maturities ranging from 113 to 118 days generally show the highest corn yields in AR. New generated data could advance current recommendations for target environments and maximize yield and economic returns without increasing farm input. Yield penalty with delayed sowing dates (% yield losses per day of delayed sowing) can vary with hybrid choice and site-specific environmental conditions. Quantifying yield penalty can help us to make better decisions when wet springs preclude sowing within an adequate season window. Our proposal aims to provide Arkansas corn growers with refined recommendations for relative maturity, hybrids, and their interaction with sowing dates across geographical regions of the state.

Budget Justifications/Explanation of Travel and Direct Costs ($32,537):

Funds are requested for 50% support of a graduate student assigned to this project ($11,000 base, $4,000 tuition, $562 benefits), and $2,000 for an hourly worker to assist with data collection ($146 benefits). In-state travel funds ($4,500) are requested for in-season data collection across the experimental sites. Out-of-state travel funds ($3,500) are requested to present preliminary research findings at the 2025 Tri-society conference in Salt Lake, Utah. Supplies expenses ($3,000) are requested for lab and field supplies (e.g., bags, stakes). A total of $3,830 is requested for research station maintenance for the three experimental sites.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Elvis Elli — *Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Elvis Elli	**Co-PI #1**	Kelley, Jason	
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Elvis Elli	Kelley, Jason			Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES	CES					

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
MS student	50%	$11,000				$11,000	$11,000	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information		$4,000				$4,000	$4,000	$0
Subtotal: Graduate Student		$15,000	$0	$0	$0	$15,000	$15,000	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel		$2,000			$2,000	$0	$2,000
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$2,000	$0	$0	$2,000	$0	$2,000

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
Graduate Students	$561	$0	$0	$0	$561	$561	$0
Hourly Personnel	$0	$146	$0	$0	$146	$0	$146
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$561	$146	$0	$0	$707	$561	$146
Personnel Total	$15,561	$2,146	$0	$0	$17,707	$15,561	$2,146

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$3,000	$1,500			$4,500	$3,000	$1,500
Out-of-State	$2,500	$1,000			$3,500	$2,500	$1,000
Travel Total	$5,500	$2,500	$0	$0	$8,000	$5,500	$2,500

University of Arkansas System Division of Agriculture
Promotion Board Budget

Elvis Elli — *Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$1,500	$1,500			$3,000	$1,500	$1,500
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$1,310	$0	$0	$0	$1,310	$1,310	$0
	CTST, Marianna	$0	$1,260	$0	$0	$1,260	$0	$1,260
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$1,260	$0	$0	$0	$1,260	$1,260	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$4,070	$2,760	$0	$0	$6,830	$4,070	$2,760
	Total for Proposal	$25,131	$7,406	$0	$0	$32,537	$25,131	$7,406

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: ***Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity***

Lead Investigators: Sun-Ok Lee, Department of Food Science, University of Arkansas

Status: New (length of project: 3 years)

Research Areas: Misc. Projects

Stated Goal: Provide important insights into the role of whole grain sumac sorghum in improving metabolic health indicators in the pathogenesis of obesity and obesity-related complications.

Specific Objectives:

Grain sorghum is gaining attention from consumers, food manufacturers, and researchers as a gluten-free grain and potential functional ingredient. Despite its potential, well-controlled clinical trials examining the health benefits of consuming grain sorghum remain limited.

1. Characterize the chemical composition and antioxidant properties of muffins made from whole grain sumac sorghum and white wheat (control)
2. Compare the effects of consuming whole grain sumac sorghum muffins (SSM) and white wheat muffins (WWM, control) on blood glucose and insulin resistance
3. Determine the effects of consuming SSM and WWM on the lipid profile (total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, triglycerides)

Methods:

Muffin Preparation

Two types of muffins will be prepared according to the recipes developed by my laboratory (Poquette et al., 2014), one with white wheat flour (control) and one with whole grain sumac sorghum flour. Two muffins (per each type) containing a total serving of 50 g of total starch will be used for each experiment.

Muffin Chemical Composition

Analyses of two types of muffins will be conducted in triplicate for moisture (AOAC Official Method 925.09), ash (AACC Official Method 08-03-01), protein (Kjeldahl, AACC 46-13), lipids (by extraction with hexane) and total dietary fiber analysis (AOAC Official method 985.29). Total starch will be measured using the assay kit (Neogen, Lansing, MI, USA), and starch fractions (rapidly digestible starch (RDS), slowly digestible starch (SDS), and resistant starch (RS)) will be determined.

Phenolic Content and Antioxidant Activity in Muffins

The extraction of phenolics from muffins will be carried out using the established method in my lab (Ashley et al., 2019). Total phenolic content of the muffins will be determined using the Folin-Ciocalteu assay according to Singleton and Rossi (1965) with minor modifications. All samples and standards will be measured in triplicate. Concentration will be determined by plotting against a gallic acid standard curve, and results will be expressed in gallic acid equivalents. Antioxidant properties of muffin extracts will be determined using the free radical 2,2- diphenyl-1-picrylhydrazyl (DPPH) assay according to Brand-Williams et al. (1995).

Human study

Ethical approval for the study protocol will be obtained from the Institutional Review Board (IRB) at the University of Arkansas. Twenty adults with obesity (body mass index (BMI) $\geq$ 30 kg/m^2**;** ages 21-60 years; 10 females and 10 males) will be recruited from the Northwest Arkansas area through campus-wide emails,

flyer distribution, social media, and public advertisements. Exclusion criteria included the following: fasting blood glucose (FBG $\geq$ 126 mg/dL); BMI < 30 kg/m^2; medications that affect glucose and lipid metabolism; cardiovascular and metabolic diseases; smoking or vaping use; habitual use of marijuana; triglycerides > 350 mg/dL and/or LDL cholesterol $\geq$ 190 mg/dL; uncontrolled hypertension (systolic and diastolic blood pressure > 140/90 mmHg); body weight change > 3 kg in the 3 months prior to study enrollment or actively trying to lose weight; more than 4 alcoholic beverages a week; dietary supplements containing bioactive compounds within grain sorghum; unwilling to maintain regular eating and physical activity habits throughout the study; dietary restrictions (e.g. vegetarians, vegans, lactose intolerance, etc.) or diet-related conditions; pregnancy and lactation; irregular bowel habits, self-reported food allergy to the food provided in this study and self-reported sleep disorders, antibiotic use within the past three months. An initial phone or virtual screening will be conducted for each interested participant, and they will be asked specific questions to determine study eligibility prior to their onset screening visit. During the onsite screening visit, participants will be required to read and sign the informed consent form. The inclusion and exclusion criteria will be confirmed through the various assessments, including anthropometric measures (height, weight, BMI, waist-to-hip ratio, blood pressure) and fasting blood glucose, insulin, total cholesterol, LDL-C, high-density lipoprotein cholesterol (HDL-C), triglycerides, medical and health history questionnaires. Those who qualified will be then scheduled for their baseline visit.

The study will be a randomized, controlled, crossover, complete clinical trial with two 3-week diet conditions. A 2-week washout separated each condition. Upon qualification, twenty adults with obesity will be randomized into one of two treatment sequences: 1) 3 weeks consuming white wheat muffin (WWM, control), 2-week washout period, 3 weeks consuming whole grain sumac sorghum muffin (SSM), or 2) 3 weeks SSM, 2-week washout period, 3 weeks WWM. Clinical data, body composition, and biochemical measurements will be measured using Lunar iDEX and assay kits. Statistical analyses will be performed with SAS software version 9.4 (SAS Institute Inc., Cary, NC, USA). Least square difference will be performed for comparisons, and the adjustment of the Tukey-Kramer's test will be used for post hoc analysis. Differences will be considered significant at $P < 0.05$.

Planned Milestones:

Month 1-12	Identify the chemical composition and antioxidant properties of muffins made from sumac sorghum and white wheat. IRB approval and recruit participants. Publish the annual progress report.
Month 12-24	Conduct the subject screening and human study to compare the effects of consuming WWM and SSM on blood glucose and insulin resistance. Analyze human samples. Publish the annual progress report.
Month 24-36	Conduct human study to compare the effects of consuming WWM and SSM on blood lipid profiles. Analyze samples and complete all data. Publish final summary report and prepare refereed publications

Statement of Projected Value:

The proposed proposal is designed to address the practical application of whole grain sorghum in enhancing metabolic health benefits in individuals with obesity, aligning with the growing consumer interest in health-promoting foods. Grain sorghum growers/farmers in the state benefit from the sales of whole grain sorghum.

Budget Justifications/Explanation of Travel and Direct Costs: Total $50,065

Support for a Ph.D. student to perform the study (5.1% fringe benefit & tuition)	$28,765
Funds for the Out-of-State travel to present results at national conference	$4,000
Supplies (glucometer, strips, lancets, blood collection supplies, muffin ingredients, etc.)	$9,500
Chemicals and reagents for muffin composition, phenolic content, antioxidant activity	$3,000
Phlebotomists, human participants' compensation,	$4,800

Lee, Sun-Ok *Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Lee, Sun-Ok	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	FDSC Food Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Understanding the impact of whole grain sumac sorghum on metabolic health in individuals with obesity			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Lee, Sun-Ok				Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI	AES						
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0
	Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
	TBA	100%	$21,000				$21,000	$21,000	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information		$6,694				$6,694	$6,694	$0
	Subtotal: Graduate Student		$27,694	$0	$0	$0	$27,694	$27,694	$0
	Hourly								
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel						$0	$0	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$0	$0	$0	$0	$0	$0	$0
	Fringe Benefits								
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$0	$0	$0	$0	$0	$0	$0
	Graduate Students		$1,071	$0	$0	$0	$1,071	$1,071	$0
	Hourly Personnel		$0	$0	$0	$0	$0	$0	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$1,071	$0	$0	$0	$1,071	$1,071	$0
	Personnel Total		$28,765	$0	$0	$0	$28,765	$28,765	$0
	Travel								
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State						$0	$0	$0
	Out-of-State		$4,000				$4,000	$4,000	$0
	Travel Total		$4,000	$0	$0	$0	$4,000	$4,000	$0
			Maintenance & Operations						
			M&O				**Total**	**AES Portion**	**CES Portion**
	Supplies		$9,500				$9,500	$9,500	$0
	Fertilizer/Chemicals		$3,000				$3,000	$3,000	$0
	Publication						$0	$0	$0
	Statistical Consulting						$0	$0	$0
Other Direct Costs	Human compensation		$4,800				$4,800	$4,800	$0
Station Maintenance	SAREC, Fayetteville		$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna		$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center		$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser		$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg		$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center		$0	$0	$0	$0	$0	$0	$0
	PTST, Colt		$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart		$0	$0	$0	$0	$0	$0	$0
	Rosen Center		$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer		$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope		$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler		$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville		$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville		$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville		$0	$0	$0	$0	$0	$0	$0
	M & O Total		$17,300	$0	$0	$0	$17,300	$17,300	$0
	Total for Proposal		$50,065	$0	$0	$0	$50,065	$50,065	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Promotion Board – 2025-2026 Proposal

Title: Better Burns Yield Better Air: Practical Implications of Implementing Voluntary Smoke Management Guidelines in Arkansas.

Lead Investigator: John Nowlin, Associate Professor, Arkansas State University

Co-Investigators: Jacob Manlove, Ag Economist, ASU, Joseph Massey, USDA-ARS and Michele Reba, USDA-ARS.

Status: New

Stated Goal: The information resulting from this CGSPB request will serve as a foundation for addressing air quality issues in a systematic, rational manner. Our goal is to provide producers and policymakers with practical and economic implications of implementing the *Arkansas Voluntary Smoke Management Guidelines for Row Crop Burning** as well as non-burn residue management practices near Arkansas cities.

Specific Objectives:

A. Use parameters and practices established in the *Voluntary Smoke Guidelines* to denote airsheds (i.e., distances to smoke-sensitive areas) around five representative cities in Eastern Arkansas.
B. Use historical wind data and various burn tools to refine these airsheds in terms of prevailing wind direction.
C. Identify fields where burning may have disproportionate negative impacts on air quality.
D. Assess economic implications of not burning these fields (i.e., how much money would be required to pay producers to participate in the voluntary burning program, to disk the fields, etc.).

Methods:

We will use GIS tools and key *Voluntary Smoke Guideline* parameters to estimate historical crop acreages and associated fuel loads, and how these are impacted by prevailing wind direction. *Category Day* classifications 1-5 from the National Weather Service are used to rank atmospheric conditions and fuel loads and are published twice daily. Historical Category Day values will be obtained and used to determine how many burning days were optimal (categories 4 and 5) versus non-optimal (categories 1-3) for fields potentially impacting smoke-sensitive areas. The ultimate goal is to rank fields that might, for example, be better disked than burned. The potential payments required for producers to participate in voluntary smoke management versus mechanical methods of residue management will be assessed. Our specific approach will be to:

A. Establish boundaries around five Eastern Arkansas cities, including Jonesboro, to match those of the Volunteer Guidelines (i.e., 0-0.19, 0.2-4.9, 5-9.9, 10-19.9, and 20+ miles).
B. Determine multi-year average crop acreages within each boundary using most recent NASS Crop Sequence Boundaries.

C. Use the fuel loading values (i.e., tons of post-harvest crop residue per each boundary described above) from the *Guidelines* to estimate fuel loads within each boundary.
D. Identify potentially problematic zones/fields using NASA burn tools, smoke models and/or National Weather Service data to determine prevailing wind directions for mid-August through November.

Planned Milestones:

May: Collect Crop Sequence Boundary (CSB) and wind direction data.

June-July: Perform geospatial analysis.

August: Write report and present results.

Statement of Projected Value:

Deliverables will include:

1. GIS maps and methods useful in delineating airsheds around five Eastern Arkansas cities.

2. Estimate acreages and associated fuel loads of crops grown within the zones around these cities.

3. Identify fields within each zone that may disproportionately impair air quality if burned.

4. Economic analysis of direct and indirect costs of burning and the required economic incentive to facilitate a change in producer practice.

5. Assess resources required (i.e., $ per ac) (a) if non-burning practices were used on fields identified in item 3. and, more generally, (b) payments necessary to incentivize producers to adopt the *Volunteer Smoke Management Guidelines.*

6. Use the requested CGSPB funds as seed funding to bring additional necessary resources to help the corn/grain sorghum growers address this issue.

Budget Explanation:

Dr. Nowlin's salary, one month	$8,545
Dr. Manlove's salary, one month	$8,912
Fringe (18%)	$3,142
Total Project Funding Request	**$20,599**

(*) Arkansas Voluntary Smoke Management Guidelines for Row Crop Burning. Available on-line: Voluntary Smoke Management Guidelines - Arkansas Department of Agriculture

Note: A mirror proposal is being submitted to the AR Rice Research and Promotion Board.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Nowlin, John W. *Better Burns Yield Better Air: Practical Implications of Implementing Voluntary Smoke Management Guidelines*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Nowlin, John W.	**Co-PI #1**	Jacob Manlove	
Co-PI #2	Joseph Massey	**Co-PI #3**	Michele L. Reba	
Department	Arkansas State University, College of Agriculture			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Better Burns Yield Better Air: Practical Implications of Implementing Voluntary Smoke Management Guidelines in Arkansas			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Nowlin, John W.	Jacob Manlove	Joseph Massey	Michele L. Reba	Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI							
		X	X	X	X			
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
PI	John Nowlin	8%	$8,545				$8,545	$0	$0
CoI	Jacob Manlove	8%	$8,912				$8,912	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$17,457	$0	$0	$0	$17,457	$0	$0
	Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0
	Hourly							
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel						$0	$0	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$0	$0	$0	$0	$0	$0	$0
	Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$3,142	$0	$0	$0	$3,142	$0	$0
	Graduate Students		$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel		$0	$0	$0	$0	$0	$0	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$3,142	$0	$0	$0	$3,142	$0	$0
	Personnel Total		$20,599	$0	$0	$0	$20,599	$0	$0
	Travel							
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State						$0	$0	$0
	Out-of-State						$0	$0	$0
	Travel Total		$0	$0	$0	$0	$0	$0	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Nowlin, John W. *Better Burns Yield Better Air: Practical Implications of Implementing Voluntary Smoke Management Guidelines*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies					$0	$0	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$0	$0	$0	$0	$0	$0	$0
	Total for Proposal	$20,599	$0	$0	$0	$20,599	$0	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	18.00%	7.30%	5.10%	0.10%
CES	18.00%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten Meal

Lead Investigators: Mahfuzur Rahman

Co-Investigators:

Status (i.e., New, Year 2 of 3, Year 2 of 2, etc.): New

Research Areas (Verification Program, General Agronomics, Diseases, Insects, Fertility, Irrigation, Weed Control, Misc. Projects): Misc. Projects

Stated Goal:

Per- and poly-fluoroalkyl (PFAS) substances are known as "forever chemicals" due to their extraordinary environmental persistence. In food packaging film, PFAS exhibits oil, grease, stain, water, and fire resistance properties. It has been widely used in fast food wrappers, pizza boxes, takeout containers, and bakery bags, but not limited to these.

PFAS can migrate from packaging films to food when it carries hot, acidic, salty, or fatty food. Moreover, it can contaminate the environment, especially soil and water, when packaging waste is disposed of in landfills and incinerated. PFAS is highly mobile in water; it easily contaminates underground and drinking water. PFAS-contaminated food and water can cause liver damage, low fertility, hormone subjugation, thyroid illness, cancer, asthma, developmental toxicity, immunotoxicity, and some other fatal health effects. There is a growing interest in biodegradable, bio-based films derived from agricultural by-products and natural polymers to address this challenge.

Corn Gluten Meal (CGM), a by-product of corn processing, offers an excellent opportunity for sustainable packaging applications. CGM is primarily composed of zein, a hydrophobic protein with film-forming properties. As zein-based films have shown promising water and oil barrier properties, CGM can be a cost-effective and scalable alternative due to its availability in the corn wet milling industry.

This proposal focuses on developing and characterizing CGM-based biodegradable food packaging films to replace PFAS films. The objectives include optimizing the formulation of CGM-based films, improving their mechanical and barrier properties and evaluating their biodegradability, recyclability, and suitability for food-contact applications.

Specific Objectives:

1. Develop corn gluten meal-based (CGM) biodegradable films for food packaging applications.
2. Comparative analysis of PFAS and CGM films to evaluate the potential of CGM as a PFAS alternative
3. Evaluate the environmental sustainability and food safety of corn gluten meal films

Methods:

The corn gluten meal will be collected and analyzed for its chemical composition of protein, cellulose, and hemicellulose contents. Our lab has developed a method to prepare biodegradable films from rice bran (See Picture 1) and the same method will be used to develop using corn gluten meals films. Compare the CGM film with FPAS-based film a series of analysis will be performed such as mechanical strength, water solubility, swelling index, and oil absorption index.

The mechanical strength and stability will be evaluated by analyzing the tensile strength of the films. FTIR spectroscopy will observe the surface chemical structures, and a scanning electron microscope will analyze the topography. The thermogravimetric analysis will be performed to understand the reactivity during heating and cooling. The differential scanning imaging will be analyzed to understand glass transition and thermal behaviors. Water vapor permeability and transmission, gas transmission, moisture and oil absorption, UV transmission, and light transmission will be evaluated. Further, contact angle, abrasion test, friction test and peeling ability will also be evaluated. This analysis will help to understand the performance of the corn gluten meal films as FPAS alternative.

To understand the environmental sustainability, the developed films will be evaluated for biodegradability using soil tests at different temperatures. The recyclability will be evaluated by depolymerization and re-polymerization of the materials.

Planned Milestones:

Year 1:

1. Optimize corn gluten meal percentage to develop a biodegradable film and analyze the mechano-functional and barrier properties. Publish the results in the Arkansas Corn and Grain Sorghum Research Studies series & a journal, and present data at the national scientific meeting.

Year 2:

2. Evaluate the potential of CGM as a PFAS alternative and establish the environmental sustainability of corn gluten meal films. Publish the results in the Arkansas Corn and Grain Sorghum Research Studies series & a journal, and present data at the national scientific meeting.

Statement of Projected Value:

Recent studies indicate that global annual releases of per- and polyfluoroalkyl substances (PFAS) exceed 100,000 tons, with significant underreporting likely due to high thresholds and limited tracking. On February 28, 2024, the Food and Drug Administration ("FDA"), announced that grease-proofing substances containing PFAS materials are "no longer being sold by manufacturers for food contact use in the U.S. market. Therefore, there is search form biodegradable material can possibly exhibit similar types of exhibits and this presents a substantial market opportunity for corn gluten meal-based biodegradable films, especially following the recent ban on PFAS in food contact applications. The ban has created a demand for safe alternatives, expanding the market scope for corn gluten meal products. With the U.S. producing approximately 110,000 tons of corn gluten meal annually from ethanol processing, focusing on Arkansas corn can boost the local agricultural economy.

Budget Justifications/Explanation of Travel and Direct Costs:

The salary of one postdoctoral research associate is requested for 6 months to complete the project. The research associate will perform biodegradable film formation, evaluation of mechanical and barrier properties, and environmental sustainability. They will run experiments, analyze data, and prepare reports. Some of the analysis will be performed in an external lab (one sample/ $40) which require specialized instruments. Out-of-state travel to present at professional conferences (IFT and AOCS conference) (PI and research associate): transportation, lodging, and registration costs. Expenses for laboratory supplies, analytical techniques, and chemicals are also requested.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Rahman Mahfuzur — *Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Rahman Mahfuzur	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	FDSC Food Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten Meal			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Rahman Mahfuzur				Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES						
Fulltime Personnel							
Position Title / **Name** *(if position is filled)* / **% Time** / **Salaries**					**Total**	**AES**	**CES**
Research Associate / Nikitha Modupalli	$25,000				$25,000	$25,000	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Subtotal: Salaries	$25,000	$0	$0	$0	$25,000	$25,000	$0
Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition. / **Name** *(if position is filled)* / **% Time** / **Wages**					**Total**	**AES Portion**	**CES Portion**
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Tuition Calculator Information					$0	$0	$0
Subtotal: Graduate Student	$0	$0	$0	$0	$0	$0	$0
Hourly							
Wages					**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0
Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above. / **Benefits**					**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$7,150	$0	$0	$0	$7,150	$7,150	$0
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$7,150	$0	$0	$0	$7,150	$7,150	$0
Personnel Total	$32,150	$0	$0	$0	$32,150	$32,150	$0
Travel							
Justify out-of-state travel in proposal. / **Travel**					**Total**	**AES Portion**	**CES Portion**
In-State					$0	$0	$0
Out-of-State	$1,000				$1,000	$1,000	$0
Travel Total	$1,000	$0	$0	$0	$1,000	$1,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Rahman Mahfuzur — *Innovative Application of Arkansas Corn: Replacement of Forever Chemicals in Food Packaging with Corn Gluten*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$12,000				$12,000	$12,000	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$12,000	$0	$0	$0	$12,000	$12,000	$0
	Total for Proposal	$45,150	$0	$0	$0	$45,150	$45,150	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn

Investigators: Dr. Tom Barber, Extension Weed Scientist, Lonoke;
Co-Instigator: Dr. Jason Norsworthy, Crop, Soil, and Environmental Sciences Dept., Fayetteville

Status: Year 3 of 3
Research Area: Weed Control
Stated Goal: To optimize season-long corn weed control through evaluation of various herbicide, technology, and cultural practice combinations.

Specific Objectives:

1. Continue to evaluate the weed control spectrum of new herbicide uses in corn such as how they might fit into a complete program.

2. Evaluate the effectiveness of weed control programs with proposed EPA guidelines on atrazine.

    a. Corn response and evaluation of weed control with various atrazine rates and mixtures at spiking
    b. Corn response to metribuzin and amicarbazone rates and mixtures PRE on various soil types

3. Evaluate state-wide Palmer amaranth populations for differing sensitivity to HPPD-inhibiting.

4. Determine off-target effects from drift rates of paraquat plus soybean and cotton residuals at various corn growth stages.

5. Determine off-target effects with Reviton and Sharpen in spring burndown applications on corn.

6. Evaluate the utility of the See & Spray Ultimate and See & Spray Premium in corn and determine the most likely number of ESA points that growers will achieve with use of the technology.

7. To rapidly transfer weed control information to growers through multiple methods such as MP44 and other extension publications, blog posts, Weeds AR Wild podcasts, videos, text messages, and others.

Methods: Field experiments will be established at Fayetteville (silt loam), Keiser (clay), Marianna (silt loam), Newport, and on-farm to evaluate weed control efficacy using new

herbicides such as Storen, Trivolt, Reviton, Maverick, and SC617. In addition, comparisons of new premixes of old herbicides will be evaluated for consistency in hybrid tolerance and weed control. Barnyardgrass is resistant to glyphosate in Mississippi and Tennessee. Studies will be conducted to evaluate barnyardgrass and other grass control alternatives in preparation for the onset of glyphosate resistance in barnyardgrass populations. Recently, the EPA has released potential guidelines for atrazine use in Arkansas, which include lowering the annual maximum use rate and requiring an annual accumulation of nine points in a mitigation effort to limit the environmental impact of the herbicide. The EPA will allow growers to choose strategies with a given point value if atrazine will be used on the acre. One tactic that could result in 2 to 3 points will be targeted spray applications such as John Deere's See & Spray technology. This technology and other strategies, which will be given points, should be evaluated for effectiveness. All experiments will be analyzed for statistical significance and presented at annual county and state-wide producer meetings. Annual publications will be developed based on results of proposed research in the Extension Publication MP-44 and MP-519.

Value to the Corn Industry

Herbicide resistance is continuing to spread through the US. Palmer amaranth (pigweed) populations in Arkansas are resistant to 6 known herbicide modes of action, most of which have been used in corn production. Initial research has shown that these pigweed populations likely differ in response to HPPD-inhibiting herbicides like Callisto, Laudis, and Armezon, commonly used in corn. Populations of barnyardgrass have also been identified as resistant to 5 herbicide modes of action. Some populations of barnyardgrass and junglerice in Mississippi and Tennessee have already been identified as resistant to glyphosate (Roundup). The costs associated with weed control in corn will likely increase due to increased resistance and the limitations placed on atrazine by the EPA. Best management practices (BMP's) for corn weed control must be determined to control weeds while minimizing further resistance economically. New technology, potential herbicide use, and cultural methods should be evaluated to determine these BMP's. Furthermore, this research will provide a highly inclusive dataset to submit as potential justification to continue atrazine registration in the state of Arkansas and if atrazine is denied further registration, these data will provide possible alternatives for weed control in Arkansas corn production systems.

Justification

New herbicide modes of action are not currently available in corn production systems. Therefore, we must evaluate the potential of new technology, new uses of registered products and cultural methods for corn weed control until new herbicide modes of action are discovered. Herbicide resistance in pigweed and barnyardgrass populations continues to increase because similar herbicide modes of action are used in current cropping systems regardless of crop planted. Other options should be evaluated to remain proactive with extension recommendations. New EPA regulations may limit the use of atrazine in

certain situations. EPA rates and guidelines for atrazine should be evaluated for value and effectiveness in Arkansas corn production systems.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Barber, Tom — *Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Barber, Tom	**Co-PI #1**	Norsworthy, Jason	
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic weeds in corn			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Barber, Tom	Norsworthy, Jason			Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES	AES					

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
Program Associate	Leah Collie		$16,000				$16,000	$0	$16,000
Program Associate	Zach Hill		$7,000				$7,000	$0	$7,000
Program Associate	Rodrigo Botelho			$18,000			$18,000	$18,000	$0
							$0	$0	$0
							$0	$0	$0
		Subtotal: Salaries	$23,000	$18,000	$0	$0	$41,000	$18,000	$23,000

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information						$0	$0	$0
Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel	$2,000	$6,000			$8,000	$6,000	$2,000
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$2,000	$6,000	$0	$0	$8,000	$6,000	$2,000

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$6,578	$5,148	$0	$0	$11,726	$5,148	$6,578
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$146	$438	$0	$0	$584	$438	$146
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$6,724	$5,586	$0	$0	$12,310	$5,586	$6,724
Personnel Total	$31,724	$29,586	$0	$0	$61,310	$29,586	$31,724

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$2,000	$6,000			$8,000	$6,000	$2,000
Out-of-State					$0	$0	$0
Travel Total	$2,000	$6,000	$0	$0	$8,000	$6,000	$2,000

University of Arkansas System Division of Agriculture

Promotion Board Budget

Barber, Tom *Evaluation of new herbicides, premixes, programs, and application methods for improved control of problematic*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies					$0	$0	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$2,850	$0	$0	$2,850	$2,850	$0
	CTST, Marianna	$4,690	$0	$0	$0	$4,690	$0	$4,690
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$2,600	$0	$0	$2,600	$2,600	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$3,350	$0	$0	$0	$3,350	$0	$3,350
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$3,350	$0	$0	$0	$3,350	$0	$3,350
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$11,390	$5,450	$0	$0	$16,840	$5,450	$11,390
	Total for Proposal	$45,114	$41,036	$0	$0	$86,150	$41,036	$45,114

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Towards a comprehensive aflatoxin solution: Creating and integrating novel aflatoxin control resources for an effective, sustainable management strategy

Lead Investigator: Dr. Burt Bluhm

Co-Investigators: Dr. Guri Johal, Purdue Univ.

Status (i.e., New, Year 2 of 3, Year 2 of 2, etc.): Year 3 of 3

Research Areas (Verification Program, General Agronomics, Diseases, Insects, Fertility, Irrigation, Weed Control, Misc. Projects): Disease, General Agronomics

Stated Goal: To provide a practical solution to aflatoxin in corn as quickly as possible (years, not decades). To this end, we are creating new genetic resources to control aflatoxin in corn, ensuring that next-generation semi-dwarf corn hybrids incorporate aflatoxin resistance, and integrating all Arkansas aflatoxin research efforts into a 'moon shot' initiative to eliminate the threat of aflatoxin in corn

Specific Objectives:

1. Identify genes in corn associated with protein misfolding during heat and drought stress
2. Create novel aflatoxin-resistance genes through transgenic approaches and genome editing
3. Incorporate aflatoxin resistance into new semi-dwarf maize hybrids
4. Acquire and organize resources to launch a comprehensive 'moon shot' among multiple institutions to control aflatoxin in corn

Methods:

Objective 1. With prior support from the Arkansas Corn and Grain Sorghum Promotion Board, we identified heat-shock response/repair pathways in modern corn hybrids as some of the most likely drivers of aflatoxin susceptibility. In the course of this project, we are identifying specific alleles of genes in this pathway that are associated with aflatoxin resistance. We will identify these alleles from tropical hybrids with known aflatoxin resistance, as well as the aflatoxin-resistant ancestor of modern maize (teosinte). It is very likely that resistance alleles are negatively associated (due to genetic linkage) with important production traits, such as yield. Thus, we will use novel approaches to introgress these alleles into modern hybrids and/or design novel transgenes based on these alleles to convey aflatoxin resistance.

Objective 2. We will utilize the information derived from Objective 1, in conjunction with information obtained in the previous project, to augment corn's response to heat stress, and thus aflatoxin resistance. We will utilize three approaches to create resistance-associated alleles. First, some alleles from tropical or ancestral germplasm are likely to be effective and can be introgressed transgenically into modern corn hybrid parental lines. Second, we anticipate that some polymorphisms will be well-suited for editing in modern hybrid parental lines, and can be directly converted into resistance alleles. Third, for some alleles, we may need to utilize a combination of genome editing and transgenic approaches to create 'custom' resistance alleles. With prior support from the Arkansas Corn and Grain Sorghum Promotion Board, we created a pipeline for genome editing in corn, and have extensive prior experience creating transgenes and transgenic corn; thus our program is well-equipped to perform the proposed work.

Objective 3. Dr. Guri Johal (Purdue University), an internationally recognized corn geneticist and long-time collaborator with our program, is pioneering the development of novel semi-dwarf corn hybrids. For decades, semi-dwarf hybrids have been pursued by corn breeding programs worldwide, due to their

improved input-to-yield ratios, increased water use efficiency, and other important traits. Dr. Norman Borlaug developed dwarf wheat in the 1960s, launching the Green Revolution in agriculture; for this, he received the Nobel Peace Prize. Dr. Johal has identified a dominant, single-gene mutation in corn that conveys dwarfing without impairing production or yield. This trait will fundamentally change corn hybrids in the U.S. and beyond. At this early stage of hybrid, semi-dwarf lines, we are collaborating with Dr. Johal to screen hybrids and parental lines for aflatoxin susceptibility, identify lines with aflatoxin/stress tolerance as parental lines, and incorporate our aflatoxin resistance transgenes into dwarf hybrids. This will ensure that aflatoxin resistance is part of the genetic foundation of semi-dwarf corn hybrids, rather than trying to catch up years after semi-dwarf hybrids have overtaken the market.

Objective 4. In the past two years, a comprehensive strategy to mitigate aflatoxin in corn has come into sharper focus. I firmly believe a 'cure' for aflatoxin in corn is achievable in years rather than decades. Achieving a cure will come in stages. First, resources have recently been created that must be deployed efficiently and effectively. For example, our program recently created transgenes that strongly suppress aflatoxin production in corn and identified novel atoxigenic *A. flavus* strains from Arkansas that 'push' native pathogen populations towards atoxigenicity. Emerging technologies such as these must be commercialized as quickly as possible and integrated into existing aflatoxin mitigation strategies. Secondly, emerging technologies need to be accelerated through federal funding and/or industry partnerships. For example, our program is actively mapping the genetic regulation of aflatoxin biosynthesis in *A. flavus* to provide new targets for transgenes in corn, and we are racing to identify the molecular signal that atoxigenic strains use to suppress aflatoxin biosynthesis in other strains; we will develop this molecule into a novel fungicide/fumigant to suppress aflatoxin production. Dr. Griffiths Atungulu has promising results with novel grain storage/drying technologies that minimize post-harvest aflatoxin production.

To organize all of these resources into a 'moon shot' initiative, we are establishing a multi-state network of aflatoxin researchers to coordinate research efforts, share results, and cooperatively secure federal and industry support for aflatoxin mitigation research. We envision that this individually funded group will essentially serve the function originally intended for the Aflatoxin Mitigation Center of Excellence.

Planned Milestones: In Years 1 and 2, we made progress on Objectives 1 and 2, and initiated the other Objectives by creating novel transgenes, screening dwarf hybrids and parentals in Arkansas production conditions and meeting with other aflatoxin researchers. We have developed 5 transgenes thus far and have begun to introgress existing transgenes into parental lines for dwarf hybrids. In 2024, PI Bluhm and his graduate student attended a corn transformation and gene editing workshop at Iowa State University so that cutting-edge techniques to create transgenic lines are in practice in Arkansas. In Year 3, we will continue creating/evaluating transgenes and genome edited lines, dwarf hybrids, and we will work to establish a formal, Arkansas-based entity to coordinate aflatoxin research across multiple states.

Statement of Projected Value: Aflatoxin is one of the most devastating disease issues facing corn producers in Arkansas. Aflatoxin reduces profits, and in extreme events, can make a given season a total loss. A cure for aflatoxin that relies heavily on genetic resistance will increase producers' profits by protecting yields and reducing management costs; it will also greatly reduce the risk of catastrophic losses associated with outbreak events.

Budget Justifications/Explanation of Travel and Direct Costs: Funds are requested for research personnel, laboratory consumables associated with transgene development, and for field trials of semi-dwarf hybrids. Funding for out-of-state travel will support collaborations with researchers at other Universities, and for personnel to present research results at international conferences within the US.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Bluhm, Burt *Towards a comprehensive aflatoxin solution*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Bluhm, Burt	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	ENPL Entomology and Plant Pathology			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Towards a comprehensive aflatoxin solution			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Bluhm, Burt				Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES						
Fulltime Personnel							
Position Title / **Name** *(if position is filled)* / **% Time**	**Salaries**				**Total**	**AES**	**CES**
Research Technician	$25,000				$25,000	$25,000	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Subtotal: Salaries	$25,000	$0	$0	$0	$25,000	$25,000	$0
Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.							
Name *(if position is filled)* / **% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Tuition Calculator Information					$0	$0	$0
Subtotal: Graduate Student	$0	$0	$0	$0	$0	$0	$0
Hourly							
	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0
Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$7,150	$0	$0	$0	$7,150	$7,150	$0
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$7,150	$0	$0	$0	$7,150	$7,150	$0
Personnel Total	$32,150	$0	$0	$0	$32,150	$32,150	$0
Travel							
Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$500				$500	$500	$0
Out-of-State	$3,000				$3,000	$3,000	$0
Travel Total	$3,500	$0	$0	$0	$3,500	$3,500	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Bluhm, Burt *Towards a comprehensive aflatoxin solution*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$9,350				$9,350	$9,350	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$9,350	$0	$0	$0	$9,350	$9,350	$0
	Total for Proposal	$45,000	$0	$0	$0	$45,000	$45,000	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-20256 Proposal

Title: Development and verification of a stand counting application using drone imagery for research and production decision support.

Lead Investigators: Jason Davis, Extension Specialist in Remote Sensing and Pesticide Application

Co-Investigators: Jason Kelley, Extension Agronomist

Status: Year 2 of 3

Research Areas: Misc. Project (Precision Agriculture)

Stated Goal: Produce and validate a user-friendly stand counting program or web-tool that can be used in conjunction with drone imagery to inform research and production replant decisions.

Specific Objectives:

(1) Collect drone imagery of plant population studies (small plots) and use it to train a custom corn plant counting object detection model.

(2) Validate detection accuracy of model with considerations for research and production applications.

(3) Develop and release a user-friendly software package that leverages the validated customized model.

Methods:

1. Drone imagery will be collected on multiple dates of Dr. Jason Kelly's small and large plot Nitrogen population evaluation study at the Jackson County Extension Center and the Pine Tree Research Station. Established treatments in large and small plots will be imaged using an automated mission flying at low altitude (2 – 3 m) and at two relative view angles to corn emergence (directly overhead and approximately 35^{o} off nadir). Imagery will be collected within a week of corn emergence and in conjunction with counting events by Dr. Kelly's team to be used as part of model validation.

2. Imagery will be converted into training data by annotating individual corn plants. Training data will be used to train a custom object detection model. Model accuracy will be validated using a combination of ground referenced results collected from Dr. Kelly's team and manual counting in raw imagery.

3. A user-friendly software package (downloadable executable program) or web-tool (hosted on UAEX website) will be developed that uses the custom trained corn counting model to produce field maps and reports with raw counts and acre population estimates.

Planned Milestones:

Year 1 **(Completed)** – Plots established, imagery collected, annotated, and initial model trained. Model accuracy will be evaluated, and results will be presented at crop production meetings, blog postings, and other avenues of information. Initial software framework to be established using Year 1 model.

Year 2 – Plots established, additional imagery will be collected, annotated and model updated as needed to reach desirable accuracy. The updated model will be embedded in a further developed software framework. If software tool and model perform to a desirable level of accuracy, they will be released. If further development is needed, Year 3 funding may be requested.

Year 3 – Model and software framework will be finalized, and tool will be made available.

Statement of Projected Value:

Optimal plant populations heavily influence yield and profitability; however, establishing robust plant population estimates at scale to inform replant or other production decisions is cumbersome and time consuming. A user-friendly and robust counting tool that leverages the automated data collection capabilities of drones could significantly facilitate these estimates. Furthermore, if population data is incorporated into machine readable maps, population estimates could inform site-specific applications of nutrients with Variable Rate Technology (VRT). A prerequisite of this, however, would be the automation of population estimates across whole fields. This project will have the initial value of building a stand counting tool for traditional production decisions and potentially be used as the foundation for a variable rate map generator for site-specific nutrient applications.

Budget Justifications/Explanation of Travel and Direct Costs:

The budget reflects personnel, travel, and some miscellaneous supplies for fieldwork and data analysis. Specifically, partial support for a program technician to assist with field work, data collection and training imagery annotation is requested. Additionally, funding for travel to and from plot locations to collect imagery and ground reference data. Miscellaneous supplies related to plot work, drone maintenance, and data storage and analysis.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Davis, Jason — *Development and verification of a stand counting application using drone imagery for research and production*

Year	2025/2026	**Project Year**	Year 2 of 3
Lead Investigator	Davis, Jason	**Co-PI #1**	Kelley, Jason
Co-PI #2		**Co-PI #3**	
Department	CSES Crop, Soil, Environmental Science		
Commodity Board	Corn and Grain Sorghum Board		
Project Title	Development and verification of a stand counting application using drone imagery for research and production decision support.		

Version: 7.0 (11/01/2024)

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Davis, Jason	Kelley, Jason			Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES	CES					

Fulltime Personnel

Position Title	Name (if position is filled)	% Time	Salaries				Total	AES	CES
Technician		25%	$10,000				$10,000	$0	$10,000
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$10,000	$0	$0	$0	$10,000	$0	$10,000

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name (if position is filled)	% Time	Wages				Total	AES Portion	CES Portion
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information						$0	$0	$0
Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$2,860	$0	$0	$0	$2,860	$0	$2,860
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$2,860	$0	$0	$0	$2,860	$0	$2,860
Personnel Total	$12,860	$0	$0	$0	$12,860	$0	$12,860

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$1,500				$1,500	$0	$1,500
Out-of-State					$0	$0	$0
Travel Total	$1,500	$0	$0	$0	$1,500	$0	$1,500

University of Arkansas System Division of Agriculture

Promotion Board Budget

Davis, Jason *Development and verification of a stand counting application using drone imagery for research and production*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$2,000				$2,000	$0	$2,000
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$2,000	$0	$0	$0	$2,000	$0	$2,000
	Total for Proposal	$16,360	$0	$0	$0	$16,360	$0	$16,360

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Improving Irrigation Technology for Corn Production in Arkansas

Lead Investigators: Chris Henry, Professor, Water Management Engineer, RREC

Co-investigators: Terry Spurlock, Extension Plant Pathologist
Jason Kelley, Associate Professor, Extension Corn and Grain Sorghum Specialist, CES
Chuck Capps, Corn and Grain Sorghum Research Verification Coordinator

Status: Year 3 of 3
Research Area: Irrigation
Goal: Provide irrigation information for corn growers on how to irrigate corn effectively and efficiently using soil moisture sensors and other schedulers. This project measures irrigation water-use in corn through the CGSRVP and the Arkansas Irrigation Yield Contest. The program works to improve furrow irrigation systems efficiency through evaluation of surge valves, computerized-hole-selection for poly pipe (CSH), and investigation of innovative tail-water recovery solutions. This project is helping growers improve yields and reduce costs.

Specific Objectives:

1. Measure sap flow in corn to develop and confirm water use in corn.
2. Measure irrigation water use, water use efficiency and efficacy of IWM tools through novel irrigation contest. Demonstrate Irrigation Water Management through the Irrigation Yield Contest. Pilot cloud meters in contest.
3. Finalize retention curves for the major soil Arkansas soil types, incorporate into mobile app and factsheets.
4. Conduct Irrigation schools for surge irrigation and soil moisture sensor education.
5. Develop prototypes for new methods and promote existing known methods to improve irrigation efficiency. Test cover crop crimper for furrow irrigation. Continue surge valve development, poly pipe printer, new soil moisture sensor and novel flowmeter and digital asset water trading system.
6. Pilot remote valve and pump timer technology on a working farm.

Methods: Currently there is some uncertainty about the crop coefficients, trigger levels, and soil moisture deficits for corn and conditions in Arkansas. Sap flow will be measured from corn by growth stage to develop water use by stage for use in irrigation recommendations within a weekly versus calendar irrigation study. A postdoc student will finish publishing the irrigated soils results on water holding capacity in early 2025 and help publish the multi-year sap flow results. This data will be used to publish a publication on sensors and finalize another version of the mobile app for sensor interpretation.

A novel flowmeter is under development that will be pilot-tested in the irrigation contest. It will allow for real-time feedback to the contestants. A novel cover crop crimper has been developed, in 2024 additional testing of design revisions will be conducted. The poly pipe printer will undergo testing using a new ink system. Another prototype of the advanced surge system is under development. The simple pump timer

is ready for pre-commercialization field testing in 2025 but we haver added remote valve and cloud connectivity and will test devices in 2025 in the field.

The contest delivers a wealth of knowledge about what is possible when the focus on production is water management. Repeat corn participants in the contest are INCREASING their Water Use Efficiencies over time and adoption of IWM is high or improving. Many farmers are using IWM to win the contest and have great stories to share with others about how to manage water and achieve very high yields. The contest resulted in a good dataset of Water Use Efficiency, water use, total water and yield. To add to the contest, we plan to provide a second meter on some of the contest fields, to provide real time water use data to their mobile device. A mobile app will be developed and a three prototype meters will be constructed and testing with contest fields.

Planned Milestones: Data will be collected on plots, through the contest, and through field observations. Sap flow results and plot results will be used to validate current irrigation scheduling thresholds for soil moisture sensors. Retention curve soil samples are nearly completed, a post-doc should finish in 2024. The mobile app for soil moisture sensors will be further developed to include weather prediction support. Meters for real-time monitoring will be deployed. Soil moisture sensors will be installed in contest and verification fields. The covercrop crimper will be tested and design modifications made to get to a finished product.

Statement of Projected Value: Based on 2012 Corn Research Verification Water use data, corn used 25 inches of irrigation water, almost as much water as rice (30 inches) in Arkansas. Based on a three year average the contest participants are only using 9.3 ac-inches/ac with an average yield of 218 bpa. Over half of Arkansas irrigators are increasing their adoption of IWM because of spill-over effects of the contest. Long term crop water needs are estimated for corn in Arkansas is between 12-18ac-in/ac, assuming 70% irrigation efficiencies, so contestants are demonstrating how corn can be sustainably grown in the mid-south. There is a critical need to provide resources and improve the current knowledge for irrigating corn in the sub-humid region. This project will also work to improve and promote irrigation efficiency tools. With such tools and better irrigation recommendations for corn, this project will greatly increase profitability for corn growers in Arkansas and allow for reduced water and energy use.

Budget Justification/ Explanation of Travel and Direct Costs: Funds will be used for supplies of crimper parts (steel, bearings, tool bar, hitch, etc.), combine parts and labor, flowmeter and surge parts, actuators, valves, custom -made components, pcb board fabrication, contractors, components for poly pipe printer and meals for irrigation schools and meetings. Meters, fittings, surge valves, sensors deployment in contest fields, labor, travel, supplies.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Henry, Christopher *Improving Irrigation Technology for Corn Production in Arkansas*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Henry, Christopher	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	BAEG Biological & Agricultural Engineering			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Improving Irrigation Technology for Corn Production in Arkansas			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Henry, Christopher				Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI	AES						
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Specialist	Shruti Vaman	50%	$30,200				$30,200	$30,200	$0
Program Associate	Russ Parker	10%	$5,000				$5,000	$5,000	$0
Program Associate	M. Ismanov	100%	$47,250				$47,250	$47,250	$0
Program Specialist	Nathan Blankenship	20%	$18,000				$18,000	$18,000	$0
							$0	$0	$0
	Subtotal: Salaries		$100,450	$0	$0	$0	$100,450	$100,450	$0
Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0
Hourly								
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel		$3,000				$3,000	$3,000	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$3,000	$0	$0	$0	$3,000	$3,000	$0
Fringe Benefits								
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$28,729	$0	$0	$0	$28,729	$28,729	$0
	Graduate Students		$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel		$219	$0	$0	$0	$219	$219	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$28,948	$0	$0	$0	$28,948	$28,948	$0
	Personnel Total		$132,398	$0	$0	$0	$132,398	$132,398	$0
Travel								
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State		$5,000				$5,000	$5,000	$0
	Out-of-State		$5,000				$5,000	$5,000	$0
	Travel Total		$10,000	$0	$0	$0	$10,000	$10,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Henry, Christopher *Improving Irrigation Technology for Corn Production in Arkansas*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$27,500				$27,500	$27,500	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication	$1,282				$1,282	$1,282	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Toolbar, combine, meals	$10,000				$10,000	$10,000	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$4,100	$0	$0	$0	$4,100	$4,100	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$42,882	$0	$0	$0	$42,882	$42,882	$0
	Total for Proposal	$185,280	$0	$0	$0	$185,280	$185,280	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Promotion Board – 2025-2026 Proposal

Title: Corn and Grain Sorghum Research Verification Program

Investigators: Dr. Jason Kelley, Wheat and Feed Grains Extension Agronomist
Mr. Chuck Capps, Program Associate

Cooperators: Dr. Travis Faske, Extension Plant Pathologist
Dr. Terry Spurlock, Extension Plant Pathologist
Dr. Trent Roberts, Soil Fertility
Dr. Tom Barber, Extension Weed Scientist
Dr. Glenn Studebaker, Extension Entomologist
Dr. Brain Deaton, Extension Economist
Dr. Chris Henry, Irrigation Specialist

Crop: Corn and Grain Sorghum

Status: Year 2 of 3

Research Area: Verification

Stated Goal:
Conduct an on-farm educational demonstration program that serves as a hands-on program to help producers, county agents, and crop consultants learn proper agronomic, pest management, and production practices that produce high-yielding and economical corn and grain sorghum grown under Arkansas conditions.

Specific Objectives:

(1) Verify research-based recommendations for profitable corn and grain sorghum production in Arkansas

(2) Develop a database for economic analysis of all aspects of corn and grain sorghum production

(3) Demonstrate that consistently high yields of corn and grain sorghum can be produced economically with the use of available technology and inputs

(4) Identify specific problems and opportunities in Arkansas corn and grain sorghum production that may require further investigation

(5) Provide hands-on training for county extension agents, consultants, and producers through weekly field visits by coordinator

Methods:
Producers enroll (or re-enroll) a field in the Corn and Grain Sorghum Research Verification Program. These producers will receive advice on all aspects of corn and grain sorghum production. The Wheat and Feed Grains Extension Agronomist and verification program coordinator will work with an Extension/Research Advisory Committee to make plans for each field.

Weather data, plant populations, growth stages, and management practices will be evaluated weekly with county extension agents' assistance to help make management decisions. In addition, cooperating producers may be asked to dedicate a portion of the field for on-farm investigations of ongoing funded corn and grain sorghum promotion board projects such as evaluating plant populations, fertility recommendations, seed treatments, pest management, irrigation type/frequency/decision making, and other production issues that may arise during the growing season that need more research.

At the end of the growing season, results will be compiled into a report that includes economic analysis, production practices implemented, and performance of each field in the program.

Statement of Projected Value:
Many Arkansas corn and grain sorghum producers can improve yields and profit by implementing research-based practices in a timely manner. Likewise, extension recommendations are designed to improve yields and profits based on unbiased research results. The research verification program integrates all available information and technology into a comprehensive demonstration of profitable corn and grain sorghum production in Arkansas.

Additionally, the verification program provides advanced training for county extension agents and cooperating producers. The information gained by county extension agents can then be applied to corn and grain sorghum producers statewide. Cooperators participate in the verification program for two successive years to obtain multi-year data and increase the county agents and cooperators' confidence in the program.

Planned Milestones: Each year, an annual report, which will include inputs, yields, and economic analysis, will be prepared and published in the Arkansas Corn and Grain Sorghum Research Studies Reports. Results from the program will also be presented at county production meetings, in newsletters, blog postings, and other avenues of information dissemination.

Budget Justification of Direct Costs and Out of State Travel: $2,870 for upgrading aging weather stations, irrigation water flow meter, and soil moisture sensors and telemetry units. The $750 out-of-state travel requested would partially cover the costs of attending a professional meeting, such as the National Conservation Tillage Conference or the American Society of Agronomy meetings. Attending a professional meeting would serve as an opportunity to present results from the verification program to a larger audience and gain new ideas for the program.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Kelley, Jason *Corn and Grain Sorghum Research Verification Program*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Kelley, Jason	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Corn and Grain Sorghum Research Verification Program			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Kelley, Jason				Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES						
Fulltime Personnel							
Position Title / **Name** *(if position is filled)* / **% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate / Chuck Capps / 100%	$80,000				$80,000	$0	$80,000
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Subtotal: Salaries	$80,000	$0	$0	$0	$80,000	$0	$80,000
Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.							
Name *(if position is filled)* / **% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Tuition Calculator Information					$0	$0	$0
Subtotal: Graduate Student	$0	$0	$0	$0	$0	$0	$0
Hourly							
	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0
Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$22,880	$0	$0	$0	$22,880	$0	$22,880
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$22,880	$0	$0	$0	$22,880	$0	$22,880
Personnel Total	$102,880	$0	$0	$0	$102,880	$0	$102,880
Travel							
Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$21,000				$21,000	$0	$21,000
Out-of-State	$750				$750	$0	$750
Travel Total	$21,750	$0	$0	$0	$21,750	$0	$21,750

University of Arkansas System Division of Agriculture
Promotion Board Budget

Kelley, Jason *Corn and Grain Sorghum Research Verification Program*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$2,500				$2,500	$0	$2,500
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	weather station upgrade	$2,870				$2,870	$0	$2,870
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$5,370	$0	$0	$0	$5,370	$0	$5,370
	Total for Proposal	$130,000	$0	$0	$0	$130,000	$0	$130,000

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Promotion Board – 2025-2026 Proposal

Title Arkansas Corn & Grain Sorghum Research Studies Series Publication

Lead Investigator: Dr. Jason Kelley, Extension Agronomist

Co-Investigators: Dr. Travis Faske, Extension Plant Pathologist, Dr. Nathan Slaton, Associate Director, University of Arkansas Experiment Station

Status: Year 2

Research Areas: Miscellaneous Project

Stated Goal: Publish the Arkansas Corn and Grain Sorghum Research Studies Publication

Prior to establishing the Arkansas Corn & Grain Sorghum Research Studies Series in 2020, there was no formal mechanism for capturing, distributing, and archiving the knowledge gained from research projects funded by the Arkansas Corn & Grain Sorghum Board. The Research Studies Series is an annual publication of research results that provides details beyond the extent communicated in shorter formats and serves as a lasting and citable literature source documenting statistically analyzed results of research projects funded by the Board. The Arkansas Corn & Grain Sorghum Research Studies Series was initiated in 2020 and is published online yearly at https://scholarworks.uark.edu/aaesser/

Specific Objective:

Publish all annual research reports and project final reports in a reviewed publication that will be posted online, allowing access by all Arkansas farmers, County Extension Agents, consultants, industry representatives, and researchers on an annual basis.

Methods and Milestones:

1. The Arkansas Agricultural Experiment Station has publication guidelines for literature classified as Research Series. The Arkansas Rice Checkoff Program, Soybean Checkoff Program, and Fertilizer Tonnage Fees all require researchers to publish their annual research results in Research Series publications named the B.R. Wells Arkansas Rice Research Studies, Arkansas Soybean Research Studies, and Wayne E. Sabbe Arkansas Soil Fertility Studies, respectively. These documents are prepared by researchers, reviewed and edited by a technical editor, and formatted for online publication by the Division of Agriculture Communications Services.
2. The process of publication begins with a call for Annual Progress or End-of-Project Reports issued to all lead investigators, along with instructions for preparing Research Series reports. Each funded project is required to submit at least one report that typically consists of 4 to 6 double-spaced pages with tables and figures showing statistically analyzed research results.
3. A tentative timeline for the reports is:
    a. Call for Reports in mid-December
    b. Report submission date of March 1
    c. Editing and formatting reports, March-July
    d. Online publication available by mid-July of each year
4. Dr. Jason Kelley and Dr. Travis Faske will serve as technical editors for reports, with assistance sought from other investigators as needed.
5. The publication is intended to be accessed online, but a limited number of hard copies may be printed upon request.

Statement of Projected Value: The data and conclusions arising from each project will be readily available to all interested parties. The Arkansas Corn & Grain Sorghum Research Studies Series will be organized by subject/year and edited for uniform format and style, thus making the reports easy to find and read. The intended audience will include:

- Farmers and their advisors. They may access the Research Series in a timely manner to aid in decision-making and planning.
- Current investigators. They may use the Research Series to inform their programs and to plan 'next steps'.
- Future researchers. The archival value can provide a background of prior funded research to help future researchers avoid duplicating past research and provide insight for developing next-generation research ideas.

The Research Series will serve as a vehicle for publishing applied research that is of high interest to Arkansas farmers, but not always publishable in refereed journals.

Budget Justifications/Explanation of Travel and Direct Costs: A format and style editor is needed to format all reports into a consistent format for publication. The budget is requested to pay a style editor on an hourly basis and to print a limited number of hard copies as needed.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Kelley, Jason *Corn and Grain Sorghum Research Studies Series*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Kelley, Jason	**Co-PI #1**	Faske, Travis	
Co-PI #2	Slaton, Nathan	**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Corn and Grain Sorghum Research Studies Series			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Kelley, Jason	Faske, Travis	Slaton, Nathan		Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI	CES	CES	AES				
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0
	Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0
	Hourly								
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel		$4,318				$4,318	$0	$4,318
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$4,318	$0	$0	$0	$4,318	$0	$4,318
	Fringe Benefits								
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$0	$0	$0	$0	$0	$0	$0
	Graduate Students		$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel		$315	$0	$0	$0	$315	$0	$315
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$315	$0	$0	$0	$315	$0	$315
	Personnel Total		$4,633	$0	$0	$0	$4,633	$0	$4,633
	Travel								
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State						$0	$0	$0
	Out-of-State						$0	$0	$0
	Travel Total		$0	$0	$0	$0	$0	$0	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Kelley, Jason *Corn and Grain Sorghum Research Studies Series*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies					$0	$0	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Printing	$167				$167	$0	$167
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$167	$0	$0	$0	$167	$0	$167
	Total for Proposal	$4,800	$0	$0	$0	$4,800	$0	$4,800

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Promotion Board - 2025-2026 Proposal

Title: Optimizing Plant Population and Nitrogen Rate in Corn

Lead Investigator: Jason Kelley, Extension Agronomist

Co-Investigators: Trent Roberts, Soil Fertility, Hunter Biram, Extension Economist

Status: Year 3 of 3

Research Areas: Agronomics, Fertility, Economics

Stated Goal: Evaluate corn yield response and resulting economic returns to varying plant populations and plant population x nitrogen rate combinations.

Specific Proposed Objectives:

(1) Evaluate the impact of corn plant populations (populations of approximately 20k-45k plants/acre) on producer fields to compare yields, lodging potential, and economic return across diverse sites with varying yield potential and various commonly planted hybrids. (Large plots)

(2) Evaluate yield response to varying plant populations of new and commonly grown corn hybrids in combination with varying nitrogen rates (Small Plots)

(3) Evaluate resulting economic returns from trials

Methods and Procedures:

1. Large plot trials will be established on cooperating producer fields with the assistance of county agents. An approximate range of plant populations will be 20k-45k plants/acre but will vary depending on the producer. The hybrid (s) evaluated will be based on what the producer is planting. Grain yield, lodging, and economic returns will be evaluated.

2. Replicated small plots evaluating corn plant population X nitrogen rate of 2 or more hybrids will be conducted at five locations, including the Rohwer Research Station at Rohwer, the Lon Mann Cotton Research Station near Marianna, the Pinetree Research Station near Colt, the Jackson County Extension Center, near Newport, and the Milo Shult Agriculture Research and Extension Center at Fayetteville. Anticipated plant populations to be evaluated include 22k, 27k, 32k, 37k, and 42k plants/acre. Nitrogen rates anticipated include 0, 150, 200, 250, and 300 lbs N/ac. Tissue sampling will be conducted to evaluate potential differences in nutrient concentrations among varying plant populations. Yield, lodging, and economic returns will be evaluated.

3. Economic returns will be determined from Objectives 1 and 2 using resulting corn yields from treatments and actual input prices to determine the most economical production practices.

Planned Milestones: Results will be published in the Arkansas Corn and Grain Sorghum Research Studies publication. Relevant information obtained from these trials will be presented at crop production meetings, in newsletters, blog postings, and other avenues of information dissemination to assist Arkansas corn growers in making sound production decisions to increase the profitability of their farms.

Statement of Project Value: These trials will provide Arkansas corn growers with unbiased, local, and up-to-date information on how plant populations and nitrogen fertilizer rate combinations may impact corn yield and economic returns on their farms. Arkansas corn yields have increased dramatically over the last 30 years, with an approximate 70+ bu/acre increase in the state average yield from 1992-2023 (110 to 180 bu/acre). Management practices such as increasing plant populations and more efficient nitrogen management have played a large role in increasing yields and will continue to be important in future years.

Many Arkansas corn growers can grow 200-240 bu/acre corn when proper management practices are implemented timely, followed by weather that is conducive for high yields. Although the record state average yield is 187 bu/acre, there is still room for improvement for much of our corn acreage. The National Corn Growers Yield Contest winner from Arkansas in 2024 had a yield of 332 bu/acre, indicating extremely high yields are possible, but economic return is not a factor in achieving yield contest yields. Economic returns for inputs to "normal" corn fields are critical and will be highlighted in this research.

In past research, plant population and nitrogen fertilizer are two inputs that typically have large impacts on overall yield, and with seed and fertilizer being the two greatest input costs to grow corn, obtaining the optimum plant population and nitrogen rate combination is critical for profitability. As new higher-yielding hybrids become commercially available, determining the economic optimum plant population and nitrogen fertilizer rate of newer hybrids is needed to keep our producers up to date on management.

Out-of-State Travel Justification: $1500 to partially cover travel costs to attend the American Society of Agronomy National meeting (Fall 2025, Salt Lake City, UT) to present results from this project and gain new ideas from colleagues across the country.

University of Arkansas System Division of Agriculture

Promotion Board Budget

Kelley, Jason — *Optimizing Plant Populations and Nitrogen Rates in Corn*

Year	2025/2026	**Project Year**	Year 3 of 3
Lead Investigator	Kelley, Jason	**Co-PI #1**	Roberts, Trenton
Co-PI #2	Biram, Hunter	**Co-PI #3**	
Department	CSES Crop, Soil, Environmental Science		
Commodity Board	Corn and Grain Sorghum Board		
Project Title	Optimizing Plant Populations and Nitrogen Rates in Corn		

Version: 7.0 (11/01/2024)

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Kelley, Jason	Roberts, Trenton	Biram, Hunter		Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES	CES	CES				

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
Program Tech		15%		$5,250			$5,250	$0	$5,250
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$5,250	$0	$0	$5,250	$0	$5,250

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information						$0	$0	$0
Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel	$3,000				$3,000	$0	$3,000
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$3,000	$0	$0	$0	$3,000	$0	$3,000

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$0	$1,502	$0	$0	$1,502	$0	$1,502
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$219	$0	$0	$0	$219	$0	$219
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$219	$1,502	$0	$0	$1,721	$0	$1,721
Personnel Total	$3,219	$6,752	$0	$0	$9,971	$0	$9,971

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$4,444	$1,500			$5,944	$0	$5,944
Out-of-State	$1,500				$1,500	$0	$1,500
Travel Total	$5,944	$1,500	$0	$0	$7,444	$0	$7,444

University of Arkansas System Division of Agriculture

Promotion Board Budget

Kelley, Jason — *Optimizing Plant Populations and Nitrogen Rates in Corn*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$500	$500			$1,000	$0	$1,000
	Fertilizer/Chemicals	$1,800	$1,000			$2,800	$0	$2,800
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Tissue Sampling	$700	$400			$1,100	$0	$1,100
Station Maintenance	SAREC, Fayetteville	$0	$2,385	$0	$0	$2,385	$0	$2,385
	CTST, Marianna	$2,325	$0	$0	$0	$2,325	$0	$2,325
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$2,325	$0	$0	$0	$2,325	$0	$2,325
	PTST, Colt	$0	$2,325	$0	$0	$2,325	$0	$2,325
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$2,325	$0	$0	$0	$2,325	$0	$2,325
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$9,975	$6,610	$0	$0	$16,585	$0	$16,585
	Total for Proposal	$19,138	$14,862	$0	$0	$34,000	$0	$34,000

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control

Lead Investigators: B. P. Littlejohn

Co-Investigators: C. V. Maxwell, T. Tsai

Status: Year 3 of 3

Research Areas: Misc. Projects

Stated Goal: To evaluate the use of gossypol to inhibit reproduction in domestic hogs for development of a bait for feral hog control

Specific Objectives:

1. Using domestic hogs as a model for feral hogs, conduct a series of experiments to evaluate the use of feed containing gossypol to inhibit reproductive potential
2. Obtain input from 1) state and federal agencies and 2) collaborators in wildlife biology and population management to prepare for potential future phases of the project

Methods:

Objective 1. Gossypol from cottonseed has been found to impede reproductive function in various species, including swine. Gossypol consumption has been associated with decreased sperm production and quality in males, suppressed fertility in females, and disruption of pregnancy leading to increased rates of abortion. Our *long-term goal* is to assess the potential for gossypol administration in the form of baiting to reduce wild hog populations in the state of Arkansas. To accomplish this goal, our laboratory group proposes the continuation of a series of trials evaluating the use of gossypol to suppress fertility in sexually mature boars. Trials will be sequential and conditional on each previous trial. Projects will be repeated and adjusted as necessary prior to starting subsequent trials to improve the effectiveness of methods. Our recently completed pilot study (conducted in Year 2) evaluated the use of gossypol-containing cottonseed oil added as a top dress to a standard swine diet on semen quality and health of domestic boars. Preliminary data from this pilot study showed decreased motility of sperm from boars that consumed gossypol-containing cottonseed oil for a 42-day period, with a number of boars reaching 0% motility. Due to the success of our initial pilot study, we plan to focus efforts of Year 3 on continuing this line of research in boars to improve methods and treatment effectiveness. Specifically, two primary areas requiring improvement were identified from the pilot study. Palatability issues were determined in the treatment group receiving the highest dose of gossypol-containing oil (12 mg gossypol/kg of body weight). To address this, we have started working with a commercial company to design an additive that could be mixed with the cottonseed oil to both improve palatability and attract hogs to the bait. Oil production limitations were also identified in the pilot study. We are currently pressing the oil from the cottonseed ourselves because a commercially available cottonseed oil product containing gossypol is not available, resulting in limited yields. Therefore, we are pursuing collaborations to scale up oil production capacity. We are also working to develop methods to produce an oil product with a higher concentration of gossypol. Pending implementation of necessary improvements identified in the pilot study, we plan to conduct a larger scale study in boars using these improved methods. Ultimately, novel preliminary results suggest the potential for gossypol-containing cottonseed oil to be used as a contraceptive in feral hogs and support continued research in this area. While Year 3 will focus on further developing methods to successfully use gossypol-containing cottonseed oil as a contraceptive in boars, future studies should evaluate the potential for gossypol-containing cottonseed oil to be used as a contraceptive in nonpregnant females, as well as its potential to disrupt pregnancy and offspring survival.

Objective 2. Historically, the use of toxicants as methods of feral hog control have not been well accepted by the public and regulatory agencies of the state of Arkansas. Preliminary data support the potential for gossypol-containing cottonseed oil added to feral hog bait as a viable method to reduce populations of feral hogs. Therefore, as we move forward in this line of research it is essential to have support from state and federal regulatory agencies for future product approvals for the state of Arkansas. It is important to note that *Objective 1*, seeks to establish the *proof-of-concept phase* of this project. We will seek funding for future phases of this research to be conducted in the field with collaborators in wildlife biology and population management. Our lab group has established working relationships with these collaborators and with the Arkansas Feral Hog Eradication Task Force. We have been obtaining input from these contacts throughout the research process. Early input from collaborators in wildlife biology and population management have increased the potential for our methods to translate to field conditions, and early input from the Arkansas Feral Hog Eradication Task Force have helped ensure that there might be a place for such a product in the state of Arkansas.

Planned Milestones: Year 1 and 2 of funding have established a successful line of research supporting the use of gossypol-containing cottonseed oil as a contraceptive in boars. The third year of funding will allow us to address issues identified in the pilot study and further develop a product that can be used in a field setting. In Year 3, a palatability study will be conducted to evaluate potential feed additives to increase palatability and consumption of feed containing higher doses of gossypol-containing cottonseed oil. Oil production improvements will be evaluated with the goal to increase oil yields and increase gossypol concentrations in the oil. Pending successful implementation of necessary improvements, we plan to conduct a larger scale study in boars incorporating these modifications. As stated above, trials conducted in Years 3 will be sequential and conditional on each previous trial. Trials will be repeated and adjusted as necessary prior to starting subsequent trials to improve the effectiveness of methods. Additionally, we will continue to seek input from state and federal agencies and collaborators in wildlife biology and population management as a part of *Objective 2*. Ongoing results will be reported to the Arkansas Corn and Grain Sorghum Board on a regular basis.

Statement of Projected Value: Feral swine are an invasive species reported in at least 35 states in the U.S., a range that has continuously expanded over the past decades. Total estimated damages to crops, habitat, and private property are valued at over 1.5 billion dollars per year in the U.S., and total estimated damage and loss of crops in the state of Arkansas is valued at over 20 million dollars per year. There is an estimated feral hog population of 200,000 head in Arkansas, and the state would need to eliminate around 70% of the population (140,000 head) each year to halt population growth. Hunting, trapping, and shooting are common control practices, but are not effective enough to control the population of feral hogs. It is also important to note that currently, Arkansas law only allows poison bait for rodent control. Furthermore, it is imperative that control measures not cause harm to humans, other wildlife, or scavengers. Gossypol is an orally active polyphenolic compound naturally found in cottonseed that has been found to inhibit male reproduction in various species including humans.

Budget Justifications/Explanation of Travel and Direct Costs: The budget for Year 3 includes funds to support salary and benefits for a postdoctoral associate to assist in conducting the proposed research. In-state and out-of-state travel will be necessary for *Objective 2* to maintain communication with state and federal agencies and collaborators in wildlife biology and population management. Out-of-state travel will also include travel to professional meetings to disseminate research results. Maintenance and operations costs will include the cost of animals, feed, sampling supplies, laboratory supplies, feed analyses, semen analyses, and laboratory analyses. Pending the need for study replication, Year 3 is estimated to require up to 50 hogs at an estimated cost of $300 per animal in feed and maintenance costs. Publication fees are included to disseminate research results.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Littlejohn, Brittni — *Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Littlejohn, Brittni	**Co-PI #1**	Maxwell, Charles	
Co-PI #2	Tsung C. Tsai	**Co-PI #3**		
Department	ANSC Animal Sciences			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Littlejohn, Brittni	Maxwell, Charles	Tsung C. Tsai		Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI		AES	AES	AES				
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Technician	Jordan Crawford	5%	$1,500				$1,500	$1,500	$0
Postdoctoral Associate		25%	$12,000				$12,000	$12,000	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$13,500	$0	$0	$0	$13,500	$13,500	$0
	Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0
	Hourly								
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel		$1,155				$1,155	$1,155	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$1,155	$0	$0	$0	$1,155	$1,155	$0
	Fringe Benefits								
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$3,861	$0	$0	$0	$3,861	$3,861	$0
	Graduate Students		$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel		$84	$0	$0	$0	$84	$84	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$3,945	$0	$0	$0	$3,945	$3,945	$0
	Personnel Total		$18,600	$0	$0	$0	$18,600	$18,600	$0
	Travel								
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State		$200				$200	$200	$0
	Out-of-State		$200				$200	$200	$0
	Travel Total		$400	$0	$0	$0	$400	$400	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Littlejohn, Brittni — *Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$5,000				$5,000	$5,000	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication	$1,000				$1,000	$1,000	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs		$5,000				$5,000	$5,000	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$11,000	$0	$0	$0	$11,000	$11,000	$0
	Total for Proposal	$30,000	$0	$0	$0	$30,000	$30,000	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension.

Lead Investigators: Aurelie Poncet

Co-Investigators: Trenton Roberts, Jason Kelley

Status: Year 2 of 3

Research Areas: General Agronomics, Fertility

Stated Goal: The current corn nitrogen (N) fertilizer recommendations account for soil texture and yield goal, and the recommended amounts are applied in two or three-split applications. Three-split applications are preferable when unexpected environmental conditions increase early-season N loss because they provide a better match of fertilizer delivery to crop needs. However, the need for a third application and the optimum mid-season N fertilizer rate are difficult to predict without additional information about site-specific crop health. Ongoing research emphasizes the use of tissue sampling and remote sensing to collect the needed information and fine-tune mid-season corn N fertilizer recommendations. Research conducted by the NSTaR program demonstrated that yield-limiting N deficiency is expected if the corn leaf N concentration before tasseling (VT) is smaller than 3%. In that case, additional N fertilizer should be applied to minimize losses, and calibration equations were developed to identify the optimum agronomic mid-season N fertilizer rate from leaf N concentration. However, these equations should only be used if the collected samples are representative of field conditions, and remote sensing can help inform tissue sampling. Previous research demonstrated that mid-season corn N status can be assessed from canopy greenness using inexpensive small unmanned aerial systems (sUAS, or drones). Canopy greenness is quantified using the dark green color index (DGCI). Calibration curves were established to relate pre-tassel field and high-N reference DGCI values to mid-season corn N status. The image processing steps were automated and integrated into a web-tool prototype that uses raw drone images (no stitching required) to determine whether a crop would be responsive to a third N fertilizer application, and where tissue samples may be collected to determine the optimized N fertilizer rate(s). However, no mid-season N fertilizer rate is provided directly from the images. The proposed research goal is to develop remote sensing-based mid-season N fertilizer recommendations and integrate them into the created web-tool to further inform ground-truthing using tissue sampling and optimize Arkansas corn production.

Specific Objectives:

1. To create calibration curves that determine the amount of N fertilizer required to recover 90% to 95% yield potential from field and high-N reference DGCI values when mid-season yield-limiting N deficiencies are identified.
2. To develop a new web-tool functionality that predicts the agronomically and economically optimum mid-season corn N fertilizer rate recommendation from raw drone images.
3. To verify that the new remote sensing-based mid-season corn N fertilizer rate recommendations can accurately predict how much N fertilizer is needed to maintain or increase yields.

Methods:

Objective 1: Drone images and tissue samples were collected at V8, V10, and V13 in five NSTaR N response trials established from 2020 to 2023 at the Milo J. Shult Agricultural Research and Extension

Center (Fayetteville, AR) and Pine Tree Research Station (Colt, AR). Treatments with different pre-planting, sidedress, and mid-season N fertilizer rates were applied to create a gradient of mid-season corn N status and evaluate crop response to different mid-season N fertilizer rates across the established gradient. Leaf samples were collected immediately before the mid-season N fertilizer application and analyzed for total N. Flight height was 200 ft. The treatment with the maximum total amount of N fertilizer applied will be used as high-N reference. The DGCI values for the high-N reference and other treatments were determined from the collected drone images. At maturity, grain yield was harvested from a bordered section of each plot. Data were summarized across site-years and will be regressed in 2025 to determine the amount of N required to recover 90% and 95% yield potential based on the measured field and high-N reference DGCI.

Objective 2: In 2024, new functionalities were added to the web-tool: automated delineation of high-N reference from the drone image metadata, raw image combination into a single georeferenced image, utilization of create image for directed sampling, and download of recommended sampling coordinates into CSV and shapefile format. In 2025, the calibration curves created under objective 1 will be added into the tool. Tissue sampling results will also be used to post-calibrate the created single georeferenced image and improve web-tool recommendation accuracy.

Objective 3: Drone images, tissue samples, and yield data will be collected in an on-station and on-farm trial established during project year 3 for preliminary validation of the calibration curves created under objective 1. The created tool will be used to determine the predicted optimum mid-season N fertilizer rate. Statistical analysis of the leaf N and yield data will be conducted to identify the true optimum mid-season N fertilizer rate. The predicted and true results will be compared to validate the created remote sensing-based mid-season corn N fertilizer recommendation. In 2026, a federal proposal will be submitted to support broader validation across varieties, seeding rates, and field conditions.

Planned Milestones: We anticipate that objectives 1 and 2 will be completed during project year 2, and objective 3 will be completed during project year 3.

Statement of Projected Value: Corn uses more N than any other crop cultivated in Arkansas and optimal N fertilizer use in corn is a critical component of farm profitability. Optimal N fertilizer use matches the crop needs, but the current recommendations do not account for the potential of early season N losses due to leaching and denitrification caused by unpredictable weather patterns. Previous research demonstrated that mid-season corn N status can be assessed using inexpensive drones and the DGCI index, providing that a high-N reference is established in a small portion of the field. A web-tool prototype was also created to automate image processing and make research findings accessible to Arkansas producers. However, further research is needed to predict the optimum mid-season N fertilizer rate from drone images when yield-limiting N deficiencies are identified in the field. The proposed research will address this gap and help increase corn N fertilizer use efficiency using inexpensive drone technology.

Budget Justifications/Explanation of Travel and Direct Costs: Personnel funds were requested for 35% support of a program associate and 50% support of a graduate student. Graduate student support includes stipend and tuition. Personnel funds were also requested for support of hourlies. All personnel will help with data analysis and web tool development. Travel funds were requested for data collection and participation in relevant conferences including the 2025 ASA-CSSA-SSSA Annual International Meeting. Supply funds and other direct costs were requested to participate with remote sensing equipment maintenance and manuscript publication fees.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Poncet, Aurelie — *Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension.*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Poncet, Aurelie	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension.			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Poncet, Aurelie				Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI	AES						
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate	Wesley France	35%	$17,500				$17,500	$17,500	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$17,500	$0	$0	$0	$17,500	$17,500	$0
Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
	MS Student	50%	$11,500				$11,500	$11,500	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information		$2,700				$2,700	$2,700	$0
	Subtotal: Graduate Student		$14,200	$0	$0	$0	$14,200	$14,200	$0
Hourly								
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel		$1,250				$1,250	$1,250	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$1,250	$0	$0	$0	$1,250	$1,250	$0
Fringe Benefits								
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$5,005	$0	$0	$0	$5,005	$5,005	$0
	Graduate Students		$587	$0	$0	$0	$587	$587	$0
	Hourly Personnel		$91	$0	$0	$0	$91	$91	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$5,683	$0	$0	$0	$5,683	$5,683	$0
	Personnel Total		$38,633	$0	$0	$0	$38,633	$38,633	$0
Travel								
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State		$4,500				$4,500	$4,500	$0
	Out-of-State		$4,000				$4,000	$4,000	$0
	Travel Total		$8,500	$0	$0	$0	$8,500	$8,500	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Poncet, Aurelie *Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension.*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$3,867				$3,867	$3,867	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication	$4,000				$4,000	$4,000	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$7,867	$0	$0	$0	$7,867	$7,867	$0
	Total for Proposal	$55,000	$0	$0	$0	$55,000	$55,000	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Cover Crops in Corn Rotations- What Works and What Doesn't?

Lead Investigators: Trenton Roberts

Co-Investigators: Jason Kelley, Gerson Drescher, and New Soil Borne Plant Pathologist

Status: Year 3

Research Areas: General Agronomics

Stated Goal: To investigate the short-term and long-term benefits of cover crop implementation on corn yield, disease pressure, and soil health.

Specific Objectives:

1. Determine the best management practices for growing corn following common cover crops such as cereal rye and Austrian winter pea.
2. Determine how implementing winter cover crops into a corn-soybean rotation influences nutrient cycling, soil physical properties, soil chemical properties and soil health.
3. Determine how implementing winter cover crops into a corn-soybean rotation influence incidence and severity of soil-borne and foliar diseases.
4. Determine the changes of soil microbial seedbank and the microbes associated with roots of corn in response to the use cover crops as indicators of soil health.

Methods:

1. Field-scale strip trials will be developed to compare corn germination, establishment and yield following fallow and various cover crops including cereal rye and Austrian winter pea. To increase corn germination and establishment following cereal rye cover crops we will implement several strategies to look at the method and timing of cereal rye termination to determine how to best grow corn following cover crops. In addition to termination method and timing we will look at early season fertilization broadcast or in-furrow to boost early season corn growth Various rates of nitrogen (N) and phosphorus (P) fertilizer will be applied to determine if these early season applications can help overcome the early season vigor and grain yield lag of corn following cereal rye.
2. Field-scale, large-block trials will be implemented to look at the influence of cover crop species on soil health, soil physical and chemical characteristics specifically related to soil water holding capacity and irrigation. Implementation of cover crops and no-till production practices will influence the amount of soil organic matter and ultimately the crop performance and water use efficiency. Soil samples will be taken annually within the trial to gain baseline information of characteristics such as soil texture, organic C, organic N, soil organic matter via weight loss on ignition and basic soil fertility levels. During the initiation of the trial samples will be taken prior to cash crop planting each season to monitor the effects of the cover crop treatments within the corn and soybean rotations.
3. Within large blocks, transects will be established to determine plant stand and incidence and severity of economically important diseases. The number of points will be adjusted by field trial and based on block size. A subset of points will be chosen to collect soil samples at cover stage and corn seedling stage (V2-V6) for nematode counting and pathogen incidence. From these samples, populations of free-living and plant parasitic nematodes will be quantified by treatment. Free-living nematode populations offer an indication of soil health.

As describe in section 3 of methods, within the blocks, a subset of points will be selected to obtain soil subsamples for bioassays to establish pathogen incidence and DNA extraction from the soil samples and examining soil microbe populations, mainly bacteria and fungi. The characterization of the taxa will be used to determine the ratio of potential pathogenic organisms versus beneficial or saprophytic organisms present in the soil and how cover crops affect those shifts and ratios. Plants seedlings (V2-V6) will be sample to determine associated microbes with roots and potential presence of pathogens or beneficial microbes.

Planned Milestones:

Data will be collected annually and compiled over time to compare the short-term and long-term effects of winter cover crop species selection. It may take several years for these systems to reach equilibrium due to the changes of both cover cropping and no-till management practices. Our goal is to monitor these changes to help aid producers in N management for corn through the implementation of cover crops into a corn soybean rotation and explain performance of the overall field system by describing diseases and indicators of soil health such as free-living nematodes and soil microbial communities. Results will be reported each year at county and regional meetings and in the refereed scientific literature at the completion of the study.

Statement of Projected Value: Winter cover crops have been promoted based on the environmental benefits of reduced erosion and nutrient loss. Limited work has been done to date on species selection and cultural management practices for effective use of winter cover crops in Arkansas corn and soybean rotational systems. Identifying the correct species, planting date and fertilization needs are essential for effective cover crop use and continued profitability of our corn production systems. Costs and challenges of winter cover crops will be easily offset by: 1) the potential decrease in fertilizer needs 2) improved soil conditions that lead to better growth or reduced irrigation needs and 3) reduction in environmental impacts that threaten the long-term sustainability of Arkansas corn production. Inclusion of winter cover crops can have both short-term and long-term impacts on corn and soybean production. Understanding how cover crop species selection and cultural management practices influence corn grain yield and influence soil health, is one of the most important steps in realizing the benefits of their effective use.

Budget Justifications/Explanation of Travel and Direct Costs: The out of state travel included in this proposal is to cover a portion of the cost for graduate students to attend professional scientific meetings which in this calendar year will include the international annual agronomy meetings in Salt Lake City, UT. The attendance at these meetings allows presentations to be made concerning the research work conducted and also for increased education by attending other scientific presentations and workshops. In-state travel and salary are budgeted for field data collections.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Roberts, Trenton *Cover Crops in Corn Rotations- What Works and What Doesn't?*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Roberts, Trenton	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Cover Crops in Corn Rotations- What Works and What Doesn't?			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Roberts, Trenton				**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI	AES						
Fulltime Personnel							
Position Title / **Name** *(if position is filled)* / **% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate / Joe Shafer / 25%	$15,000				$15,000	$15,000	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Subtotal: Salaries	$15,000	$0	$0	$0	$15,000	$15,000	$0
Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition. / **Name** *(if position is filled)* / **% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
					$0	$0	$0
Tuition Calculator Information					$0	$0	$0
Subtotal: Graduate Student	$0	$0	$0	$0	$0	$0	$0
Hourly							
	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students	$2,000				$2,000	$2,000	$0
Subtotal: Hourly	$2,000	$0	$0	$0	$2,000	$2,000	$0
Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$4,290	$0	$0	$0	$4,290	$4,290	$0
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$2	$0	$0	$0	$2	$2	$0
Subtotal: Fringe Benefits	$4,292	$0	$0	$0	$4,292	$4,292	$0
Personnel Total	$21,292	$0	$0	$0	$21,292	$21,292	$0
Travel							
Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$3,500				$3,500	$3,500	$0
Out-of-State	$1,500				$1,500	$1,500	$0
Travel Total	$5,000	$0	$0	$0	$5,000	$5,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Roberts, Trenton *Cover Crops in Corn Rotations- What Works and What Doesn't?*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$1,500				$1,500	$1,500	$0
	Fertilizer/Chemicals	$1,000				$1,000	$1,000	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Analysis	$4,000				$4,000	$4,000	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$7,455	$0	$0	$0	$7,455	$7,455	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$13,955	$0	$0	$0	$13,955	$13,955	$0
	Total for Proposal	$40,247	$0	$0	$0	$40,247	$40,247	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Improving Nitrogen Management for Arkansas Corn Production

Lead Investigators: Trenton Roberts

Co-Investigators: Jason Kelley and Gerson Drescher

Status: Year 2

Research Areas: Fertility and General Agronomics

Stated Goal: Investigate proper nitrogen management in irrigated corn production systems and provide producers with effective management strategies.

Specific Objectives:

1. Validate the current nitrogen management strategies for irrigated Arkansas corn production in small plot and large block field trials. The nitrogen management tools that will be investigated in the systems approach include:
   a. Preplant and in-season soil tests
   b. In-season tissue analysis
   c. Aerial imagery
   d. Post-season cornstalk nitrate test
2. Quantify the potential nitrogen losses, primarily ammonia volatilization loss, from treatments that include surface broadcast and banded applications of urea and urea ammonium nitrate.
3. Evaluate the impacts of nitrogen rate and timing on corn yield components including rows per ear, kernels per row and 1000 count seed weight.

Methods:

1. Trials will be established on experiment stations in a range of sizes from standard small plots all the way to large scale block trials. Preplant soils samples and soil samples collected at V4-V6 will be used to refine sidedress nitrogen application rates. Following sidedress nitrogen applications leaf samples will be collected weekly to identify whether additional top dress or pretassel nitrogen applications are warranted. From the V6-VT growth stages, aerial imagery will be collected to assess the need for in-season nitrogen applications. The aerial images will be compared to the tissue concentration data, but treatments will be made based on each assessment to compare if one is more feasible or accurate than the other. At the conclusion of the season cornstalk nitrate samples will be taken to assess the season long nitrogen management approach and provide an report for each of the strategies that were implemented.
2. Within the trials listed above and independent trials ammonia volatilization will be quantified using semi-static chambers that will capture the ammonia loss over a series of days to identify the daily and cumulative nitrogen loss from each of the treatments. The semi-static chambers will contain foam sorbers saturated in a phosphoric acid/glycol mixture that will effectively capture the ammonia gas before it escapes to the atmosphere. The foam sorbers will be changed periodically and the phosphoric acid mixture extracted and the ammonium nitrogen it contains quantified. Once the potential loss from each treatment combination is identified subsequent years of the study will use the same methodology to quantify the effectiveness of urease inhibitors on reducing nitrogen losses via ammonia volatilization using these treatment strategies.
3. Nitrogen rate trials will be implemented that include a single application of 220-280 lb nitrogen per acre applied at one of the following growth stages: preplant, V2, V6, V8, V10,

V12, V14, VT and R2. A standard nitrogen management plan of 30 lb nitrogen preplant followed by 190 lb nitrogen per acre applied sidedress will be included for comparison. At R6 or physiological maturity a minimum of five ears will be collected from each plot. The number of rows per ear, kernels per row and 1000 count seed weight will be collected.

Planned Milestones:

1. Data will be collected annually and compiled over time to compare how the various nitrogen management tools can be optimized to produce not only maximal yield but in the most profitable way possible. These trials will be conducted at multiple locations with varying soils and potential nitrogen needs locations may be altered each year to fill in knowledge gaps. At the end of three growing seasons the dataset should be robust enough to identify any potential differences in the nitrogen assessment tools and inform producers on the best management practices moving forward.
2. Initial trials will be established to identify the ammonia volatilization loss potential of the various source and application strategy combinations identified in objective one. Once the principal investigators are able to identify the ammonia volatilization loss potential the will test mitigation strategies in year 2 and 3 to identify what potential fertilizer additives might be used to protect nitrogen from ammonia volatilization using the various application strategies. By year 3 we hope to have clearly identified best management practices to prevent ammonia volatilization losses.
3. Initial plans are to implement nitrogen response trials at three locations and assess how variety, environment, and response to nitrogen impact corn yield components. Based on the first year of data the nitrogen rates and timings may be adjusted to ensure that we are able to generate a robust dataset.

Statement of Projected Value: Nitrogen fertilizer and its application represent the largest single item expenditure for most corn producers and accounts for as much as 20% of the total operating cost. Nitrogen is the most yield limiting factor in Arkansas corn production and offers the largest yield gains when used at the correct rates and timings. There are a variety of rates, sources and timings that can be used to maximize corn yield and a better understanding of how to best make these decisions is needed. Nitrogen use efficiency in Arkansas irrigated corn production can be very high when the proper combination of rates, sources and timings is implemented and can provide a very high rate of return on the nitrogen fertilizer investment. Development of a web-based decision support tool that allows producers to input their production parameters and economic factors to determine the best course of action is needed. The results of this research project will help provide the basis for the development and implementation of this tool.

Budget Justifications/Explanation of Travel and Direct Costs: The out of state travel included in this proposal is to cover a portion of the cost for graduate students to attend professional scientific meetings which in this calendar year will include the international annual agronomy meetings in Salt Lake City, UT. The attendance at these meetings allows presentations to be made concerning the research work conducted and also for increased education by attending other scientific presentations and workshops. In-state travel and salary are budgeted for field data collections.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Roberts, Trenton *Improving Nitrogen Management for Arkansas Corn Production*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Roberts, Trenton	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	CSES Crop, Soil, Environmental Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Improving Nitrogen Management for Arkansas Corn Production			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Roberts, Trenton				**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI	AES						

Fulltime Personnel

Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate	Joe Shafer	25%	$15,000				$15,000	$15,000	$0
Program Associate	Dave Smith	25%	$15,000				$15,000	$15,000	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$30,000	$0	$0	$0	$30,000	$30,000	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
	New PhD	50%	$12,500				$12,500	$12,500	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information		$3,300				$3,300	$3,300	$0
	Subtotal: Graduate Student		$15,800	$0	$0	$0	$15,800	$15,800	$0

Hourly

	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students	$2,500				$2,500	$2,500	$0
Subtotal: Hourly	$2,500	$0	$0	$0	$2,500	$2,500	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$8,580	$0	$0	$0	$8,580	$8,580	$0
Graduate Students	$638	$0	$0	$0	$638	$638	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$3	$0	$0	$0	$3	$3	$0
Subtotal: Fringe Benefits	$9,220	$0	$0	$0	$9,220	$9,220	$0
Personnel Total	$57,520	$0	$0	$0	$57,520	$57,520	$0

Travel

Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$5,500				$5,500	$5,500	$0
Out-of-State	$1,500				$1,500	$1,500	$0
Travel Total	$7,000	$0	$0	$0	$7,000	$7,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Roberts, Trenton *Improving Nitrogen Management for Arkansas Corn Production*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$2,000				$2,000	$2,000	$0
	Fertilizer/Chemicals	$1,000				$1,000	$1,000	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Analysis	$5,000				$5,000	$5,000	$0
Station Maintenance	SAREC, Fayetteville	$2,385	$0	$0	$0	$2,385	$2,385	$0
	CTST, Marianna	$1,920	$0	$0	$0	$1,920	$1,920	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$4,800	$0	$0	$0	$4,800	$4,800	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$17,105	$0	$0	$0	$17,105	$17,105	$0
	Total for Proposal	$81,625	$0	$0	$0	$81,625	$81,625	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Determining disease resistance and susceptibility of corn and grain sorghum hybrids

Lead Investigators: Dr. Terry Spurlock**,** Dr. Jason Kelley, Dr. Camila Nicolli, and John Carlin

Status: Year 2

Research Areas: Diseases

Stated Goal: To extend disease resistance and susceptibility data of commercial corn and grain sorghum hybrids to growers annually

Specific Objectives:

1. Establish a 'late-planted' version of the official corn hybrid variety trial at Rohwer Research Station (Spurlock), Lon Mann Cotton Research Station (Kelley), and Rice research and Extension Center (Nicolli).
2. Evaluate each grain sorghum official hybrid trial and determine the two (of the five normally planted) that have the highest disease pressure and determine the amount of disease on each hybrid. (Spurlock and Nicolli)
3. Extend the results to growers and consultants at county and regional row crop production meetings and post the results on the Arkansas Variety Testing web site annually. (Spurlock, Kelley, Nicolli, Carlin).

Methods: Seed from each entry of the official corn hybrid variety trial will be planted at each of three locations: Rohwer Research Station in Kelso, Lon Mann Cotton Research Station in Marianna, and Rice Research and Extension Center in Stuttgart. Trials will be planted to 2-row plots on 30- or 38-inch row spacings (depending on station) with each hybrid replicated three times and plot lengths 20 ft long. **Each trial will be planted late to help increase foliar disease pressure, particularly southern rust pressure.** Disease incidence and severity will be determined for each location at growth stage R5.5 – R6 with each disease present rated on a 0-9 scale where a rating of '9' would indicate the disease was severe. Diseases that will be rated should include southern rust, northern corn leaf blight, southern corn leaf blight, gray leaf spot, stalk rot, and others if they are present and at high enough levels to be rated. Drone images will also be collected of each plot at each location for extension outreach and training purposes. At maturity, plots in all tests will be harvested with a plot combine and the results subjected to appropriate statistical analyses (ANOVA and means separation of fixed effects using Tukey's honest significant difference test).

Grain sorghum hybrid trials are planted each year as part of the variety testing program. Here, we propose to scout each trial and choose at least one, or possibly two trials, with significant disease pressure and rate the trials for incidence and severity of foliar and head diseases just prior to maturity. Drone images will be collected of all plots in the trials that are rated for disease and be used for extension outreach and training purposes.

Planned Milestones: Trials will be planted at each location by mid-May. Summer and annual reports will be provided as requested to the Corn and Grain Sorghum Promotion Board. The results of each test location will be summarized and submitted to Arkansas Variety Testing by December 1.

Statement of Projected Value: At present, Arkansas Variety Testing does not generate foliar disease data for corn or grain sorghum for the official hybrid trial locations. These data would be valuable for producers to select high yielding corn and grain sorghum hybrids that are also resistant to the diseases that impact

yield and grain quality in Arkansas. By selecting resistant hybrids, producers can save thousands of dollars on input costs for their own farms by not having to apply fungicides for foliar disease control.

Budget Justifications/Explanation of Travel and Direct Costs: The budget includes personnel costs for time spent planting and maintaining the trials and assisting in collection of disease data. There are also costs included for plot supplies, fertilizer, and herbicide to be used for plot maintenance. Travel costs are included for investigators and staff to travel to trial locations.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Spurlock, Terry — *Determining disease resitance and susceptibility of corn and grain sorghum hybrids*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Spurlock, Terry	**Co-PI #1**	Kelley, Jason	
Co-PI #2	Nicolli, Camila	**Co-PI #3**		
Department	ENPL Entomology and Plant Pathology			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Determining disease resitance and susceptibility of corn and grain sorghum hybrids			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Spurlock, Terry	Kelley, Jason	Nicolli, Camila		Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES	CES	CES				

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
Program Technician	Robert Hoyle	20%	$8,000				$8,000	$0	$8,000
Program Technician		20%			$8,000		$8,000	$0	$8,000
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$8,000	$0	$8,000	$0	$16,000	$0	$16,000

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information						$0	$0	$0
Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel		$3,500			$3,500	$0	$3,500
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$3,500	$0	$0	$3,500	$0	$3,500

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$2,288	$0	$2,288	$0	$4,576	$0	$4,576
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$256	$0	$0	$256	$0	$256
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$2,288	$256	$2,288	$0	$4,832	$0	$4,832
Personnel Total	$10,288	$3,756	$10,288	$0	$24,332	$0	$24,332

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$1,000	$2,500	$1,000		$4,500	$0	$4,500
Out-of-State					$0	$0	$0
Travel Total	$1,000	$2,500	$1,000	$0	$4,500	$0	$4,500

University of Arkansas System Division of Agriculture
Promotion Board Budget

Spurlock, Terry — *Determining disease resitance and susceptibility of corn and grain sorghum hybrids*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$1,488	$2,500	$1,200		$5,188	$0	$5,188
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$2,270	$0	$0	$2,270	$0	$2,270
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$2,020	$0	$2,020	$0	$2,020
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$1,690	$0	$0	$0	$1,690	$0	$1,690
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$3,178	$4,770	$3,220	$0	$11,168	$0	$11,168
	Total for Proposal	$14,466	$11,026	$14,508	$0	$40,000	$0	$40,000

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Generating a high-value wax material from sorghum bran using an innovative green approach

Lead Investigators: Ali Ubeyitogullari

Status: Year 2 of 3

Research Areas: Misc. Projects

Stated Goal: Grain sorghum is a drought-resistant cereal, making it a valuable crop to cope with the changing climate. However, the potential of grain sorghum is underestimated as its use in food and bioethanol production is still minimal. Another distinguishing feature of grain sorghum, setting it apart from other grains, is its notable high wax content found in the bran. Sorghum bran waxes have a high melting point, which makes them a potential alternative to commercial carnauba wax, which has sustainability issues. Carnauba wax production is confined to Brazil, with notable concerns surrounding deforestation. Therefore, there is a great opportunity for grain sorghum for the generation of wax material as an alternative to commercial carnauba wax. Thus, our overall objective for this application is to extract and fractionate grain sorghum waxes using a green approach based on supercritical carbon dioxide (SC-CO_2) for both food and non-food industrial applications.

SC-CO_2 is a green solvent for the extraction of various nonpolar compounds since CO_2 is non-toxic, environmentally friendly, inexpensive, abundant, and has a mild critical temperature (31 °C) and pressure (7.4 MPa). In addition, the use of grain sorghum in bioethanol production results in a lipid slurry that is rich in waxes. Nevertheless, this side stream is currently underutilized due to the limitation of hexane fractionation. Therefore, the proposed project will add value to grain sorghum by increasing its use both in food and ethanol production due to its high wax content. In addition, bioethanol manufacturers will increase the use/ratio of sorghum in their fermenters due to high-value wax in their byproducts. Overall, this study will enable the extraction and fractionation of waxes from other lipids using SC-CO_2 owing to its tunable solubility, density, and diffusivity properties.

In the first year of the project, a PhD student was hired to work on this project. This PhD student started conducting the SC-CO_2 extraction and fractionation experiments. Sorghum wax was collected using different SC-CO_2 conditions, including temperature (35 - 75 °C), pressure (8 - 40 MPa), and time (2 - 6 h). Optimal conditions for maximizing oil yield (46.9%) with minimal wax co-extraction were achieved at 35 °C, 40 MPa, and 4.1 h. Functional data analysis (FDA) along with machine learning algorithms were conducted to examine the differential scanning calorimetry (DSC) profiles of waxes obtained. A manuscript describing the findings has been submitted for publication in the *Journal of Food Engineering*. A patent application titled "*Processes and systems for extracting and purifying sorghum waxes from a sorghum-based feedstock*" has been filed (PCT application: PCT/US24/57330). An efficient valorization of sorghum side streams can be achieved by eco-friendly SC-CO_2 along with advanced statistical and machine learning techniques, ultimately reducing time and energy consumption. These findings will be included in our Arkansas Corn and Grain Sorghum Research Series report. By the end of the project's first year, we plan to complete Objective 1.

Specific Objectives:

1. Extract high-value waxes from sorghum bran using SC-CO_2, optimize the extraction conditions, and create a model to describe the extraction process.
2. Separate and fractionate waxes from a recovered oil process stream of a bioethanol facility that uses grain sorghum in their fermenter.
3. Coat fresh blackberries with the generated wax fractions to enhance their shelf life.

Methods:

Objective 2: The bioethanol production side streams (i.e., lipid slurries) will be obtained from Western Plains Energy. The bioethanol facility uses different ratios of corn/sorghum in their fermenter, where, depending on the availability, they could use over 90% grain sorghum. Lipid slurries obtained from 30, 50, and 70% grain sorghum used during fermentation will be used for the separation and fractionation of waxes using the same SC-CO_2 extractor (SFT-120, Supercritical Fluid Technologies, Inc., DE, USA). Differential scanning calorimetry (DSC, Model Diamond, Perkin-Elmer, Norwalk, CT, USA) will be performed to measure the melting points of the extracts/fractions collected. The composition of the waxes will be characterized using a GC-MS method. The melting profiles will be compared with commercially available waxes such as carnauba, shellac, beeswax, and candelilla. The DSC data will be fed into machine learning algorithms to optimize the SC-CO_2 extraction conditions to generate waxes with properties similar to the commercially available ones.

Objective 3: The purified waxes will be used to generate nanoemulsions, which will be applied to the fresh blackberries to increase their shelf life. The wax nanoemulsions will be characterized for their droplet size, zeta potential, stability, and viscosity. The coating will be achieved by spraying onto the fruit or dipping them into the emulsion solutions. The thickness of the coating materials will be analyzed using scanning electron microscopy. Based on the modeling data, wax fractions with similar properties to carnauba and candelilla wax will be applied, and they will be compared with the commercially available waxes. The texture, color, weight, total phenolic content, and decay of the blackberries will be determined over a storage period of 21 days.

Planned Milestones:

Separation, fractionation, and predictive modeling of waxes from bioethanol side streams will be completed in the second year. In the third year, the collected wax fraction will be used to produce coating materials, and they will be tested on fresh blackberries to increase their shelf life.

Statement of Projected Value:

The utilization of grain sorghum in bioethanol and food applications is limited; thus, the full value of grain sorghum is underestimated. The proposed research will highlight the advantages of grain sorghum by creating high-value wax materials from sorghum bran and byproducts of bioethanol production using a green process based on SC-CO_2 technology. This process will maximize the value of grain sorghum, add value to the lipid side stream in bioethanol production, and minimize waste generation. Considering the grain sorghum production in Arkansas, this research will contribute to Arkansas's economy by generating premium waxes from grain sorghum and, in turn, increase the acreage of grain sorghum in Arkansas. Finally, the proposed project has great potential for patent application and licensing, which can increase the demand for grain sorghum and its profitability.

Budget Justifications/Explanation of Travel and Direct Costs:

Funds are requested to support a graduate student and cover tuition for the graduate student. Out-of-state travel is requested to present findings at professional conferences (e.g., IFT, AOCS) in the U.S., to increase the visibility of the University and attract high-quality people to the state. Also, funds are requested for direct expenses like materials and supplies (i.e., high-pressure tubing and valves, glassware, chemicals, digestive enzymes) in the lab, and service lab usage fees (GC, FTIR, SEM, XRD service fees).

University of Arkansas System Division of Agriculture
Promotion Board Budget

Ubeyitogullari, Ali — *Generating a high-value wax material from sorghum bran using an innovative green approach*

Year	2025/2026	**Project Year**	Year 2 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Ubeyitogullari, Ali	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	FDSC Food Science			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Generating a high-value wax material from sorghum bran using an innovative green approach			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Ubeyitogullari, Ali				Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	AES						

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
		100%	$23,000				$23,000	$23,000	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information		$6,795				$6,795	$6,795	$0
	Subtotal: Graduate Student		$29,795	$0	$0	$0	$29,795	$29,795	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
Graduate Students	$1,173	$0	$0	$0	$1,173	$1,173	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$1,173	$0	$0	$0	$1,173	$1,173	$0
Personnel Total	$30,968	$0	$0	$0	$30,968	$30,968	$0

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State					$0	$0	$0
Out-of-State	$3,000				$3,000	$3,000	$0
Travel Total	$3,000	$0	$0	$0	$3,000	$3,000	$0

University of Arkansas System Division of Agriculture
Promotion Board Budget

Ubeyitogullari, Ali — *Generating a high-value wax material from sorghum bran using an innovative green approach*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$7,000				$7,000	$7,000	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	User fees	$2,000				$2,000	$2,000	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$9,000	$0	$0	$0	$9,000	$9,000	$0
	Total for Proposal	$42,968	$0	$0	$0	$42,968	$42,968	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Corn and Grain Sorghum Enterprise Budgets and Production Economic Analysis

Lead Investigators: Breana Watkins, Instructor, Agricultural Economics & Agribusiness

Status: Year 3 of 3

Research Areas: Economics and Conservation

Stated Goal: The goal of this project is to provide corn and grain sorghum enterprise budgets that are flexible for representing alternative production practices of Arkansas producers. Table 1 provides a look at a stacked gene corn budget that is furrow irrigated. Aside from the stacked gene, furrow irrigated corn budget, there are conventional seed type corn budgets and grain sorghum budgets for each irrigation type (furrow, center pivot, and non-irrigated) and a 20% crop share lease example for furrow irrigated corn and grain sorghum. With commodity prices retreating, remaining profitable will take due diligence in tracking all financial statements. Costs and returns analysis with the budgets are developed by economists to provide research results for a variety of projects. The research verification coordinators utilize production economics analysis to investigate factors impacting farm profitability. The crop enterprise budgets are designed to evaluate the feasibility of various field activities associated with crop production and provide comparison of field crops profitability in order to make sound financial decisions on-farm.

Specific Objectives:

(1) Determine base representative production activities of the most common production practices of corn and grain sorghum in Arkansas.
(2) Collect data for input prices and equipment costs associated with the base representative production activities.
(3) Establish and maintain a computational budget calculator for base representative production practices. The budget calculator is interactive and flexible in order to represent alternative production methods. A total of 9 corn and grain sorghum budgets are produced for fall release and are updated on an as needed basis.
(4) Finalize the crop budget and irrigation costs applications for public availability.
(5) Update farm budget program for financial management and public policy analysis. The farm budget program includes an interactive calculator for users to represent unique farm situations and determine breakeven prices and yields for each individual budget.
(6) Create a cost estimate of various farm activities to show the expenses that are incurred for each field activity associated with production.
(7) Investigate the economics of conservation practices in Arkansas, specifically in concern to irrigation, cover crops, and carbon sequestration.

Methods: Crop enterprise budgets will be developed in collaboration with crop and soil science specialists, weed scientists, agronomists, pathologists, and entomologists. Production procedures for base budgets will represent University of Arkansas System Division of Agriculture recommendations. Unique budgets will be customized for individuals based on Extension recommendations and information from producers.

Planned Milestones: Crop budgets based on Extension recommendations are standards for Arkansas crop production. Individual producers will utilize interactive computational capabilities for representing alternative production practices and determining profit potential with a range of commodity prices and yields. Producers and financial institutions will apply crop enterprise budgets in evaluating costs and returns for aspects of each production year. Public policies affecting producers are investigated by government organizations with crop enterprise budgets that are representative of Arkansas production.

Projected Value to the Corn and Grain Sorghum Industry: The benefits provided by the economic analysis of alternative corn and grain sorghum production methods provide a significant reduction in financial risk inherent in agricultural production. Arkansas producers will benefit from economic analyses of their individual production activities. Unique crop enterprise budgets developed for individual farms are useful for determining credit needs when seeking financial assistance and planning crop rotations for the upcoming crop seasons. Flexible crop enterprise budgets are beneficial for planning that determines production methods with the greatest potential for financial success. Flexible budgets enable farm financial outlooks to be revised during the production season as inputs, input prices, yields, and commodity prices change. Thoroughness of computational methodology and straightforward application will facilitate use of the budget calculator by research and extension specialists conducting economic analysis of water use efficiency, weed control, insect management, cover crops, and many other aspects of production practices. The crop enterprise budget system is being utilized by economists currently working on the development of the upcoming Farm Bill.

	ACGSPB	CES
	dollars	
Personnel Salaries		
Breana Watkins		7,776.00
Other Personnel	7,776.00	
Benefits	2,224.00	2,224.00
Total Personnel	**10,000.00**	**10,000.00**
Total	**10,000.00**	**10,000.00**

Table 1. 2025 Corn Enterprise Budget, Stacked Gene, Furrow Irrigation

CROP VALUE	Grower %	Unit	[1]Yield	Price/Unit	Revenue
Crop Value, Enter Expected Farm Yield & Price	100%	Bu.	215.00	4.45	956.75
OPERATING EXPENSES		**Unit**	**Quantity**	**Price/Unit**	**Costs**
Seed, Includes Applicable Fees	100%	Thous	32	4.19	134.08
Urea (46-0-0),	100%	Lbs	435	0.26	112.01
Phosphate (0-46-0)	100%	Lbs	175	0.35	60.38
Potash (0-0-60)	100%	Lbs	130	0.25	32.50
Ammonium Sulfate (21-0-0-24)	100%	Lbs	100	0.26	26.00
Zinc Sulfate 33%	100%	Lbs	29.00	1.73	50.05
DAP (18-46-0)	100%	Lbs	0.00	0.40	0.00
Herbicide	100%	Acre	1	61.79	61.79
Insecticide	100%	Acre	1	0.00	0.00
Fungicide	100%	Acre	1	0.00	0.00
Other Chemical	100%	Acre	1	0.00	0.00
Other Chemical	100%	Acre	1	0.00	0.00
Custom Chemical & Fertilizer Applications					
Ground Application: Fertilizer & Chemical	100%	Acre	5	8.50	42.50
Air Application: Fertilizer & Chemical	100%	Acre	0	10.00	0.00
Air Application: Lbs.	100%	Lbs	100	0.100	10.00
Other Custom Hire, Air Seeding	100%	Acre	0	9.00	0.00
Machinery and Equipment					
Diesel Fuel, Pre-Post Harvest	100%	Gallons	2.757	2.80	7.72
Repairs and Maintenance, Pre-Post Harvest	100%	Acre	1	5.96	5.96
Diesel Fuel, Harvest	100%	Gallons	3.082	2.80	8.63
Repairs and Maintenance, Harvest	100%	Acre	1	12.47	12.47
Irrigation Energy Cost	100%	Ac-In	14	3.31	46.30
Irrigation System Repairs & Maintenance		Ac-In	14	0.26	3.70
Supplies (ex. polypipe)	100%	Acre	1	16.25	16.25
Other Inputs	100%	Acre	1	0.00	0.00
Labor, Field Activities and Irrigation	100%	Hrs	0.760	14.53	11.05
Scouting/Consultant Fee	100%	Acre	1	6.00	6.00
Survey and Mark Levees (Rice)	100%	Acre	1	0.00	0.00
Crop Insurance	100%	Acre	1	34.00	34.00
Interest, Annual Rate Applied for 6 Months	100%	Rate %	9.00	681.39	30.66
Custom Harvest	100%	Acre	0.00	0.00	0.00
Post-Harvest Expenses					
Drying	100%	Bu.	215.00	0.19	40.85
Hauling	100%	Bu.	215.00	0.25	53.75
Check Off, Boards	100%	Bu.	215.00	0.01	2.15
Cash Land Rent		Acre	1	0.00	0.00
Total Operating Expenses					**$808.80**
Returns to Operating Expenses					**$147.95**
CAPITAL RECOVERY & FIXED COSTS					
Machinery and Equipment		Acre	1	91.40	91.40
Irrigation Equipment		Acre	1	31.61	31.61
Farm Overhead; See Note 2		Acre	1	4.57	4.57
Total Capital Recovery & Fixed Costs					**$127.58**
TOTAL SPECIFIED EXPENSES					**$936.38**
NET RETURNS					**$20.37**

Note 1: Yield and inputs are based on Extension research data. Enter expected farm yield and inputs.
Note 2: Estimate based on machinery and equipment.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Watkins, Breana *Crop Enterprise Budgets and Production Economic Analysis*

Year	2025/2026	**Project Year**	Year 3 of 3	**Version: 7.0 (11/01/2024)**
Lead Investigator	Watkins, Breana	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	AEAB Agricultural Economics & Agribusiness			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Crop Enterprise Budgets and Production Economic Analysis			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Watkins, Breana				**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI		CES						
Fulltime Personnel								
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Instructor	Breana Watkins	20%	$7,776				$7,776	$0	$7,776
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$7,776	$0	$0	$0	$7,776	$0	$7,776
	Graduate Student								
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0
			Hourly						
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel						$0	$0	$0
	Hourly-Students						$0	$0	$0
	Subtotal: Hourly		$0	$0	$0	$0	$0	$0	$0
			Fringe Benefits						
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$2,224	$0	$0	$0	$2,224	$0	$2,224
	Graduate Students		$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel		$0	$0	$0	$0	$0	$0	$0
	Hourly-Students		$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits		$2,224	$0	$0	$0	$2,224	$0	$2,224
	Personnel Total		$10,000	$0	$0	$0	$10,000	$0	$10,000
			Travel						
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State						$0	$0	$0
	Out-of-State						$0	$0	$0
	Travel Total		$0	$0	$0	$0	$0	$0	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Watkins, Breana *Crop Enterprise Budgets and Production Economic Analysis*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies					$0	$0	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$0	$0	$0	$0	$0	$0	$0
	Total for Proposal	$10,000	$0	$0	$0	$10,000	$0	$10,000

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

ARKANSAS CORN AND GRAIN SORGHUM BOARD
2025-2026 PROPOSAL

Title: Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices

Lead Investigator: Dr. Brian Deaton, Associate Professor

Status: New

Research Area: Verification Program

Stated Goal: The project will assist producers as they continue to seek opportunities for increasing incomes, decreasing costs, and reducing risks.

Specific Objectives: The overall objective of this study is to provide an economic analysis for the following proposed projects and other Corn and Grain Sorghum Promotion Board funded projects that would benefit from economic analysis. Specific objectives are:

(1) Conduct an economic analysis of production practices used in the Arkansas Corn and Grain Sorghum Research Verification Program that impact profitability and verify Extension recommendations. (J. Kelley and C. Capps)

(2) Standardize the economic analysis by integrating the 2024 corn verification program data with data from previous years. This will continue to document the long-term benefits of the Arkansas Corn and Grain Sorghum Research Verification Program. (J. Kelley and C. Capps)

(3) Provide Arkansas corn cash market summaries for publication on the "Row Crops Blog" online newsletter.

Methods: The economic feasibility of various production management decisions suggested in the Corn and Grain Sorghum Research Verification Program will continue to be analyzed using enterprise budgets. Specific information related to field operations, inputs, irrigation, and yield will be entered into a computerized budget generator to estimate production costs. The results of this analysis will be presented at county/state/regional/national meetings.

Planned Milestones: **[Objectives 1 & 2 – Kelley and Capps]**

April 10 - Integrate the 2024 corn verification program data into the historical database that contains data from previous years.

July 15 - Begin electronic coordinator data submission through planting for all cooperators in the Arkansas Corn and Grain Sorghum Research Verification Program from each respective field.

November 1 - Receive final CGSPB production input data reports and begin computer entry. CGSPB Coordinator will check items for accuracy after initial entry.

November 15 - Receive final CGSPB harvest data reports and begin computer entry. CGSPB Coordinator will check added items after initial entry.

December 22 - Complete first draft of CGSPB economic analysis tables. CGSPB Coordinator will check items after completion.

January 15 - Finish economic analysis for CGSPB Report publication and distribution.

[Objective 3]

Weekly - Provide continued Arkansas corn cash market summaries for publication through "Row Crops Blog" online newsletter outlet in cooperation with the Arkansas State Corn and Grain Sorghum Agronomist. Work with the Communication Group to provide

additional national exposure for the Arkansas corn and grain sorghum industry.

Monthly - Provide corn and grain sorghum economic presentations to county/regional meetings, state research verification tour, and research center field days in-state and otherwise as requested.

Statement of Projected Value: This project extends previous CGSPB work to address agronomic issues. Benefits from economic analysis of alternative corn and grain sorghum production strategies assist producers in identifying opportunities to adjust individual costs and incomes while providing a significant reduction in the risk levels that producers face. Maintenance of a historical database of annual CGSPB data provides valuable time series corn data for extended research. The results of this analysis enable producers to make management decisions based on profit maximization rather than just maximizing yield.

Budget Justifications/Explanation of Travel and Direct Costs: Activities with state specialists, county agents, and corn producers within the Mid-South states require the requested funding for travel.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Brian Deaton — *Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Brian Deaton	**Co-PI #1**		
Co-PI #2		**Co-PI #3**		
Department	AFRC			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Brian Deaton				**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI	AES						

Fulltime Personnel

Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel	$4,000				$4,000	$4,000	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$4,000	$0	$0	$0	$4,000	$4,000	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$292	$0	$0	$0	$292	$292	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$292	$0	$0	$0	$292	$292	$0
Personnel Total	$4,292	$0	$0	$0	$4,292	$4,292	$0

Travel

Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$500				$500	$500	$0
Out-of-State	$500				$500	$500	$0
Travel Total	$1,000	$0	$0	$0	$1,000	$1,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Brian Deaton *Economic Analysis of Corn and Grain Sorghum Production and Marketing Practices*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$708				$708	$708	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$708	$0	$0	$0	$708	$708	$0
	Total for Proposal	$6,000	$0	$0	$0	$6,000	$6,000	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Evaluate Management Options for Corn Nematodes in Arkansas

Lead Investigators: Travis Faske

Co-Investigators: Amanda Greer and Michael Emerson

Status: Year 1 of 3

Research Area: Diseases

Goal: To assess the diversity and impact of corn nematodes in Arkansas. This includes gaining better understanding of the distribution and impact of corn nematodes on corn production. Additionally, the study aims to evaluate nematode management tactics to protect corn yield potential and promote nematode sampling by offering free soil nematode assays.

Objectives:

1. Evaluate the changes in nematode population dynamics in corn (Faske)

2. Evaluate the efficacy of commercially available and experimental seed- and soil-applied nematicides for control of corn nematodes. (Faske)

3. Promote the importance of sampling corn fields for nematodes and identify the key nematode species impacting corn production by offering "free" nematode soil assays, sponsored by the GSPB. (Greer)

4. Educate farmers and consultants on the distribution of important corn nematodes in the state and provide management strategies developed through this project. (Faske)

Methods:

Objective 1: The stubby-root nematode is one of several corn nematodes for which little is known about its vertical distribution over time and the implications for management strategies. To address this gap, fields with a history of the pest will be monitored and sampled every 30 days for changes in nematode population densities. Data on rainfall, soil types, temperatures, and cropping systems will be used to investigate the practicality of cultural management practices. For instance, if the stubby-root nematode exerts greater damage in cooler soils that delay corn emergence, a practical recommendation would be to plant those fields later, once the soil has warmed.

Objective 2: Evaluate the effectiveness of seed- and soil-applied nematicides in both greenhouse and field settings. In the greenhouse, trials at the Lonoke Extension Center (LEC) will provide initial efficacy data using a uniform density of southern root-knot nematodes. Field evaluations will include small-plot on-farm trials to assess the impact of nematicides on protecting corn yield potential. These trials will also explore the practical application of nematicides across various corn nematode densities and soil textures. Two locations will be used each year to maximize

efficiency and collect sufficient data for meaningful publications. These on-farm experiments will be conducted in Jackson and Pulaski counties, where corn nematode issues are known to occur.

Objective 3: Early detection and monitoring corn nematodes is important to develop management guidelines. To encourage sampling and way to give back to the farmer, we will promote a "free" nematode soil sample assays conducted by the Nematode Diagnostic Lab (NDL) in Hope. This information will also help researchers determine what species of corn nematodes are the most problematic in the state.

Objective 4: Education platform will consist of but not limited to the traditional approach with fact sheets and production meetings, but also electronic delivery through webinars and blog articles.

Planned Milestones: Each year, corn nematode densities and distribution will be assessed in fields with a history of corn production. This will coincide with field trials evaluating the effectiveness of nematicides in suppressing nematode populations and protecting corn yield potential. A statewide survey will establish a baseline of significant nematode species and provide guidance to consultants and farmers on proper sampling methods for corn fields. At the conclusion of the study, a fact sheet on corn nematode management will be published, and survey data may be featured in *Plant Health Progress*. Additionally, findings on the efficacy of nematicides for managing corn nematodes will be submitted for publication in the *Journal of Nematology*.

Statement of Projected Value: Determining the impact of nematodes on any crop is a long-term process due to factors such as crop rotation and the uneven presence of nematodes in trial locations. The proposed research is entirely on-farm, requiring several years to accumulate data from trials conducted under similar conditions. Currently, limited information exists on the biology of stubby-root, root-knot, and lesion nematodes affecting corn in Arkansas. Thus, any insights into their biology or the efficacy of commercial nematicides would provide valuable guidance for managing these pests. This study will also establish a foundation of practical experience and an experimental database on the use and effectiveness of nematicides for corn nematode management. Additionally, the research will explore novel chemicals and innovative strategies to enhance the efficacy of existing nematicides.

Budget Justification: The budget supports full- and part-time personnel at the Lonoke Extension Center (LEC) who will actively participate in sampling and establishing field trials statewide, as well as staff at the Nematode Diagnostic Laboratory (NDL) responsible for processing soil nematode assays. The travel budget covers mileage for on-farm field trials, sampling, and transporting soil samples to the NDL, and overnight travel, if necessary. The supplies budget will fund field and greenhouse materials, including plot stakes, hoses, bags, tags, pesticides, and other essentials. Additionally, direct costs will support soil nematode assays submitted to the NDL by Arkansas consultants and farmers.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Faske, Travis *Evaluate Management Options for Corn Nematodes in Arkansas*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Faske, Travis	**Co-PI #1**	Greer, Amanda	
Co-PI #2		**Co-PI #3**		
Department	ENPL Entomology and Plant Pathology			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Evaluate Management Options for Corn Nematodes in Arkansas			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

		Faske, Travis	Greer, Amanda			Total Board Funding Requested	AES Portion	CES Portion
	Select "AES" or "CES" for each PI	CES	CES					
Fulltime Personnel								
Position Title	**Name** *(if position is filled)* **% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate		$20,000				$20,000	$0	$20,000
Program Technician			$10,000			$10,000	$0	$10,000
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
	Subtotal: Salaries	$20,000	$10,000	$0	$0	$30,000	$0	$30,000
	Graduate Student							
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)* **% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
	Tuition Calculator Information					$0	$0	$0
	Subtotal: Graduate Student	$0	$0	$0	$0	$0	$0	$0
	Hourly							
		Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel	$8,000	$3,000			$11,000	$0	$11,000
	Hourly-Students					$0	$0	$0
	Subtotal: Hourly	$8,000	$3,000	$0	$0	$11,000	$0	$11,000
	Fringe Benefits							
Fringe benefits are calculated when salary and wage amounts are entered above.		**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel	$5,720	$2,860	$0	$0	$8,580	$0	$8,580
	Graduate Students	$0	$0	$0	$0	$0	$0	$0
	Hourly Personnel	$584	$219	$0	$0	$803	$0	$803
	Hourly-Students	$0	$0	$0	$0	$0	$0	$0
	Subtotal: Fringe Benefits	$6,304	$3,079	$0	$0	$9,383	$0	$9,383
	Personnel Total	$34,304	$16,079	$0	$0	$50,383	$0	$50,383
	Travel							
Justify out-of-state travel in proposal.		**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State	$2,000				$2,000	$0	$2,000
	Out-of-State					$0	$0	$0
	Travel Total	$2,000	$0	$0	$0	$2,000	$0	$2,000

University of Arkansas System Division of Agriculture

Promotion Board Budget

Faske, Travis *Evaluate Management Options for Corn Nematodes in Arkansas*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$3,000	$1,000			$4,000	$0	$4,000
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs	Nematode Assays - NDL		$2,000			$2,000	$0	$2,000
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$3,000	$3,000	$0	$0	$6,000	$0	$6,000
	Total for Proposal	$39,304	$19,079	$0	$0	$58,383	$0	$58,383

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Fine-tuning Potassium Recommendations and Investigating Intensive Tissue Analysis for Sustainable Corn Production

Lead Investigators: Trenton Roberts

Co-Investigators: Jason Kelley and Gerson Drescher

Status: New (Renewal)

Research Areas: Fertility and General Agronomics

Stated Goal: The goal of this proposal is to fine-tune current potassium fertilizer recommendations for corn and investigate the utility of intensive in-season tissue nutrient monitoring to aid in corn production.

Specific Objectives:

1. Establish field experiments to evaluate corn yield response to varying rates of potassium fertilizer.
    a. Correlate leaf tissue potassium concentration to corn grain yield.
    b. Measure potassium removal in the grain
    c. Fine-tune existing potassium rate recommendations for corn.
    d. Develop post-season tissue-K test to assess K adequacy during the season, similar to corn stalk nitrate test.
2. Assess corn response to in-season potassium applications to maximize yield or salvage yield potential.
3. Determine the utility of intensive in-season tissue sampling and monitoring as a tool for high-yielding corn production systems.

Methods:

1. Potassium rate trials will be established on experiment station sites with varying levels of soil test K (STK). The K rates included in these trials will range from 0-200 lb K_2O/acre and should encompass the yield maximizing K rate for all locations included. Starting at the V6 growth stage whole aboveground plant samples will be collected to determine tissue-K concentration. During the V10-VT growth stages the uppermost collared leaf will be sampled and from VT-R2 the earleaf (leaf subtending the ear) will be sampled and analyzed for tissue-K concentration. The whole plant or leaf tissue-K concentration will be correlated with corn grain yield to determine the critical tissue-K concentration from the V6-R2 growth stage. During harvest grain samples will be collected from selected K rates to determine the grain K concentration to determine the K content and nutrient removal which can be scaled for yield. Samples will also be collected within 2 weeks of black layer and analyzed for nitrate and tissue-K concentration. The results will be correlated with relative grain yield to determine if a relationship exists that might be used to identify potential K deficiencies post-harvest.
2. A series of K timing trials will be implemented across a wide range of soil test K values. The purpose of these treatments will be to identify the "window of opportunity" to make potash applications without compromising yield in a standard irrigated corn production system. In-season applications will be made from the V9/V10 growth stage through R2 and compared to a yield-maximizing preplant incorporated K fertilizer rate. Tissue samples will be taken prior to and at least 2 weeks post potash fertilizer application to determine the probability of

response to K fertilization and to confirm that the K fertilizer was taken up in a timely manner.

3. Corn verification fields and selected producer fields will be identified with the help of Dr. Kelley and Chuck Capps. These fields will be sampled at the V6, V10, V14 VT, R1, and R2 growth stages using the recommended sampling procedure as it relates to the specific corn growth stage. Samples will be submitted for rapid diagnostic analysis (48 hr turnaround time) to mimic what a producer might implement for an intensive in-season sampling program. The resulting tissue analysis will be compared to currently published critical concentration values to determine if any nutrients are limiting corn grain yield. In producer fields where a potential nutrient deficiency is identified small-scale strips will be implemented to determine if the application of the deficient nutrient resulted in a significant yield increase. Concurrently, data will be collected to modify current critical concentrations for major corn nutrients across the growth stages sampled. A report will be provided to the producers regarding the nutrient sufficiency of their crop throughout the season.

Planned Milestones: Field trials will be established at varying locations in 2025 that have a wide range of soil test K values. Progress reports will provide updates on the status of the project and year-end findings will be published in the Arkansas Corn and Grain Sorghum Research Studies. The intensive tissue monitoring program will be modified as needed throughout the season and across years as more data is collected and we are able to refine how that needs to be implemented. At the end of the three-year study, data collected from these trials will strengthen potassium recommendations for corn and could change overall potassium fertilizer recommendations.

Statement of Projected Value: The Corn and Grain Sorghum Promotion Board has provided funding in past years to support the development and validation of existing potassium (K) recommendations. Results were recently summarized and found that there were areas across the range of soil test K values that would benefit from additional data. However, we know that the response to K fertilization progressively decreases as soil test K level increases until a point where no response to K fertilization is observed. Current Extension recommendations for K range from 160 lb K_2O per acre for K levels under 61 ppm K to no K recommended for soil test levels above 175 ppm K. There is a lack of data at very low soil test K and very high soil test K values limiting the robustness of the current recommendations. Adding data from soils testing "optimum" and "above optimum" and “very low” would allow us to properly define the soil test level at which no response is expected and modify recommendations as needed.

Budget Justifications/Explanation of Travel and Direct Costs: The out of state travel included in this proposal is to cover a portion of the cost for PI, Co-PI, and graduate students to attend professional scientific meetings which in this calendar year will include the international annual agronomy meetings in Salt Lake City, UT. The attendance at these meetings allows presentations to be made concerning the research work conducted and also for increased education by attending other scientific presentations and workshops. In-state travel and salary are budgeted for field data collections.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Roberts, Trenton — *Fine-tuning Potassium Recommendations and Investigating Intensive Tissue Analysis for Sustainable Corn*

Year	2025/2026	**Project Year**	New
Lead Investigator	Roberts, Trenton	**Co-PI #1**	Drescher, Gerson
Co-PI #2		**Co-PI #3**	
Department	CSES Crop, Soil, Environmental Science		
Commodity Board	Corn and Grain Sorghum Board		
Project Title	Fine-tuning Potassium Recommendations and Investigating Intensive Tissue Analysis for Sustainable Corn Production		

Version: 7.0 (11/01/2024)

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

			Roberts, Trenton	Drescher, Gerson			Total Board Funding Requested	AES Portion	CES Portion
		Select "AES" or "CES" for each PI	AES	AES					
Fulltime Personnel									
Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
Program Associate	Dave Smith	15%	$9,300				$9,300	$9,300	$0
Program Associate	Stephanie Williamson	10%	$7,000				$7,000	$7,000	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$16,300	$0	$0	$0	$16,300	$16,300	$0
Graduate Student									
Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
	new PhD student	50%		$12,500			$12,500	$12,500	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information			$3,993			$3,993	$3,993	$0
	Subtotal: Graduate Student		$0	$16,493	$0	$0	$16,493	$16,493	$0
Hourly									
			Wages				**Total**	**AES Portion**	**CES Portion**
	Hourly-Personnel						$0	$0	$0
	Hourly-Students		$2,000	$2,000			$4,000	$4,000	$0
	Subtotal: Hourly		$2,000	$2,000	$0	$0	$4,000	$4,000	$0
Fringe Benefits									
Fringe benefits are calculated when salary and wage amounts are entered above.			**Benefits**				**Total**	**AES Portion**	**CES Portion**
	Fulltime Personnel		$4,662	$0	$0	$0	$4,662	$4,662	$0
	Graduate Students		$0	$638	$0	$0	$638	$638	$0
	Hourly Personnel		$0	$0	$0	$0	$0	$0	$0
	Hourly-Students		$2	$2	$0	$0	$4	$4	$0
	Subtotal: Fringe Benefits		$4,664	$640	$0	$0	$5,303	$5,303	$0
	Personnel Total		$22,964	$19,132	$0	$0	$42,096	$42,096	$0
Travel									
Justify out-of-state travel in proposal.			**Travel**				**Total**	**AES Portion**	**CES Portion**
	In-State		$3,000	$3,000			$6,000	$6,000	$0
	Out-of-State			$2,000			$2,000	$2,000	$0
	Travel Total		$3,000	$5,000	$0	$0	$8,000	$8,000	$0

University of Arkansas System Division of Agriculture

Promotion Board Budget

Roberts, Trenton *Fine-tuning Potassium Recommendations and Investigating Intensive Tissue Analysis for Sustainable Corn*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$2,000	$2,000			$4,000	$4,000	$0
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs		$5,500	$7,500			$13,000	$13,000	$0
Station Maintenance	SAREC, Fayetteville	$2,020	$0	$0	$0	$2,020	$2,020	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$1,920	$0	$0	$0	$1,920	$1,920	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$3,840	$0	$0	$0	$3,840	$3,840	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$15,280	$9,500	$0	$0	$24,780	$24,780	$0
	Total for Proposal	$41,244	$33,632	$0	$0	$74,876	$74,876	$0

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Arkansas Future Ag Leaders Tour

Lead Investigators: Julie Robinson

Status (i.e., New, Year 2 of 3, Year 2 of 2, etc.): 1 of 3

Research Areas: Misc. Projects

Stated Goal:

A five-day professional development opportunity for undergraduate juniors and seniors enrolled in Colleges of Agriculture or are pursuing agriculture related majors across the state of Arkansas. Agriculture and agriculture related professions are the number one employer in the state. This one-week experience will enhance students' leadership and employability skills, provide first-hand networking opportunities with potential employers, and highlight the vast resources, services, and careers available through Arkansas' agriculture industry. Participants will get to interact with farmers, producers, vendors, and many others that support the agricultural industry in Arkansas. The goal of this tour is to better prepare and inform new graduates. The tour helps participants discover jobs across the state, keeping homegrown talent in-state, and local.

Specific Objectives:

- Increase participant's employability in agricultural careers.
- Acquaint participants with the vast resources, market segments, and services available through Arkansas' number one industry.
- Provide participants with a "bird's eye view" of current employment opportunities in the Arkansas agriculture industry.
- Increase student's options and opportunities by networking with future employers.

Methods:

The fourth annual Arkansas Future Ag Leaders Tour was hosted in May 2024. Ten students from six universities across the state participated. The tour was successful in connecting students with employers. To continue to provide this same professional development for future agricultural professionals, project coordinators are planning a five-day state-wide tour for undergraduate students who are in their junior and senior year of college. The call for applications will go out to all colleges with agriculture-related academic departments, including Arkansas State University, Arkansas Tech University, Southern Arkansas University, University of Arkansas – Fayetteville, University of Arkansas – Little Rock, University of Arkansas – Monticello, and University of Arkansas – Pine Bluff. The tour will begin at the Arkansas 4-H Center in Little Rock, on Monday, May 12, 2025. Participants will engage in leadership and team building activities to get to know each other and the coordinators. Participants will also participate in professional development activities related to networking, key tips for snagging the job of their dreams, and career advancement strategies. Each day, participants will travel across the state to pre-arranged tour sites to visit facilities and network with professionals. This will allow students to experience first-hand the diversity of opportunities within Arkansas' agriculture industry. Growers, producers, processors, manufacturers, educators, and research facilities will host students across Arkansas.

Planned Milestones:

1. Formalization of a detailed project management and evaluation plan: February
2. Creation and dissemination of marketing resources: February.
3. Applications open: March
4. Coordination of the tour, scheduled for May 12 – 16, including arrangement and confirmation of tour stops including North East Arkansas, North West Arkansas, South East Arkansas, Southwest Arkansas, and Central Arkansas.
5. Communication with participants leading up to the tour: April
6. Conduct the Arkansas Future Ag Leaders Tour: May 12 – 16
7. Collaboration with news media and community partners to leverage resources. Management and utilization of program evaluation data to improve participation experience and outcomes.

Statement of Projected Value:

The Arkansas Future Ag Leaders Tour helps create a more prepared and informed workforce that better understands the needs and dynamics of the farmers and producers that they will serve in their agricultural related careers across the state. This professional development program addresses some job readiness skills that have been identified as deficient by employers. Other states, such as Georgia and South Carolina, offer similar opportunities for undergraduates for a significant cost. By providing this opportunity for free, many students who would not be able to otherwise afford to pay their way can participate, in addition to missing a week of work in order participate. The greatest value to the corn and grain sorghum industry is that this provides an opportunity to inform and educate future agriculture industry professionals and leaders about challenges facing farmers and producers. In addition, touring across the state makes students aware of what jobs are available in the state and in local communities all across Arkansas.

Budget Justifications/Explanation of Travel and Direct Costs:

Coordination will be provided by the University of Arkansas System Division of Agriculture project team, led by Community, Professional, and Economic Development faculty and staff. Monetary support for this project totals in the amount of $20,000. Program coordinators are requesting $5,000 from the Corn and Grain Sorghum Board and seeking additional contributions from other commodity and industry groups to fund the total. The greatest expenses for this program are lodging, meals, and bus rental. Funds will support meals for participants and guest speakers, vehicle usage and mileage, lodging, and materials and supplies. Program coordinators will utilize a coach bus to transport participants across the state. While several meals are usually donated by some of the companies visited, not all meals are covered and there are still mileage and fuel expenses, lodging, and supplies that need to be budgeted.

University of Arkansas System Division of Agriculture
Promotion Board Budget

Robinson, Julie *Arkansas Future Ag Leaders Tour*

Year	2025/2026	**Project Year**	
Lead Investigator	Robinson, Julie	**Co-PI #1**	
Co-PI #2		**Co-PI #3**	
Department	CES Community, Professional, & Economical Development		
Commodity Board	Corn and Grain Sorghum Board		
Project Title	Arkansas Future Ag Leaders Tour		

Version: 7.0 (11/01/2024)

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Robinson, Julie				**Total Board Funding Requested**	**AES Portion**	**CES Portion**
Select "AES" or "CES" for each PI	CES						

Fulltime Personnel

Position Title	**Name** *(if position is filled)*	**% Time**	**Salaries**				**Total**	**AES**	**CES**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Subtotal: Salaries		$0	$0	$0	$0	$0	$0	$0

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.	**Name** *(if position is filled)*	**% Time**	**Wages**				**Total**	**AES Portion**	**CES Portion**
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
							$0	$0	$0
	Tuition Calculator Information						$0	$0	$0
	Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				**Total**	**AES Portion**	**CES Portion**
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.	**Benefits**				**Total**	**AES Portion**	**CES Portion**
Fulltime Personnel	$0	$0	$0	$0	$0	$0	$0
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$0	$0	$0	$0	$0	$0	$0
Personnel Total	$0	$0	$0	$0	$0	$0	$0

Travel

Justify out-of-state travel in proposal.	**Travel**				**Total**	**AES Portion**	**CES Portion**
In-State	$4,500				$4,500	$0	$4,500
Out-of-State					$0	$0	$0
Travel Total	$4,500	$0	$0	$0	$4,500	$0	$4,500

University of Arkansas System Division of Agriculture
Promotion Board Budget

Robinson, Julie *Arkansas Future Ag Leaders Tour*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$500				$500	$0	$500
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$0	$0	$0	$0	$0	$0
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$0	$0	$0	$0	$0	$0	$0
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$0	$0	$0	$0	$0
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$500	$0	$0	$0	$500	$0	$500
	Total for Proposal	$5,000	$0	$0	$0	$5,000	$0	$5,000

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum

Lead Investigators: Glenn Studebaker

Co-Investigators: Ben Thrash, Nick Bateman

Status (i.e., New, Year 2 of 3, Year 2 of 2, etc.): New

Research Areas (Verification Program, General Agronomics, Diseases, Insects, Fertility, Irrigation, Weed Control, Misc. Projects): Insects

Stated Goal: Develop and enhance recommendations for the management of insect pests in corn and grain sorghum and monitor for new invasive pests in Arkansas.

Specific Objectives: Numerous insect pests can lead to significant economic losses for corn and grain sorghum crops in Arkansas. These pests are generally categorized into two groups: soil/seedling pests and whorl/ear-feeding or head-feeding pests. Soil-borne pests typically attack the seeds shortly after planting or attack the crop's roots. Yield losses of over 50% have been reported under heavy infestations. The soil-borne pest complex includes seed corn maggots, southern corn rootworms, wireworms, and white grubs. Insects that attack young, newly emerged seedlings which are often the most detrimental to yield are the stink bug complex, cutworms, and chinch bugs. Among these, stink bugs have been the most damaging pest in recent years. The corn leafhopper was detected in some late-planted corn late in the growing season in Arkansas in 2024. This pest is damaging in that it is known vector of the red stunt disease complex. Yield loss of up to 30% was reported in southern Texas in 2024. It is believed that this pest is unable to overwinter in Arkansas.

Objective 1: Preventative seed treatment insecticides are common on nearly all corn seed sold in the US. Seedling and soil insect pest pressure is unpredictable. In years when pressure is low, insecticide seed treatments may not pay off. However, in years when high pressure is experienced the benefits can be great. The standard rate commercially available is most often the low rate of 0.25 mg ai/kernel (250). However, growers can request rates of up to 1.25 mg ai/kernel. It is important to know what rates are most effective for the pest complex.

Objective 2: Resistance to Bt technologies has been documented to multiple caterpillar pests. Corn earworm resistance is now commonplace across the US. European corn borer resistance has been documented in the northeastern US and Canada while resistance in southwestern corn borer has been documented in Arizona and New Mexico. Currently none of these species show resistance to the VIP Bt protein. It is important to monitor for potential resistance development in these and other species such as fall armyworm in Arkansas.

Objective 3: Insect pest pressure is often sporadic and new invasive species are occurring with increasing frequency. The corn leafhopper is an example of a recently documented new pest in Arkansas in 2024. Data on which seed treatment rates or what foliar insecticides are most effective is lacking in Arkansas. Corn leaf aphid has also begun to occur in higher numbers with increasing frequency. While it is considered to have minimal effect on yield, when high populations occur during pollination, yield loss can occur. Again, data is lacking on what insecticides are most effective is lacking. Efficacy trials will be conducted in corn and grain sorghum as pests occur to generate a data set for updating University recommendations.

Methods:

Objective 1: The effectiveness of insecticide seed treatments will be evaluated for reduction of insect pest pressure and yield preservation. Insecticide seed treatments at low (standard), medium and high rates listed below in Table 1, will be evaluated in replicated small plot trials in three locations across the corn growing regions of the state. If possible, trials will be evaluated under two planting dates (one normal planting date, one planting late). Insect pest (stink bugs, cutworms, corn leafhopper, etc.) incidence and damage will be rated weekly for the first 4 to 6 weeks after emergence. All treatments will also be taken to yield.

Table 1. Insecticide seed treatments and rates on corn.

Insecticide	**Rate**
Poncho 5 FS	0.25 mg ai/kernel
Poncho 5 FS	0.5 mg ai/kernel
Poncho 5 FS	1.25 mg ai/kernel
Cruiser 5 FS	0.25 mg ai/kernel
Cruiser 5 FS	0.5 mg ai/kernel
Cruiser 5 FS	1.25 mg ai/kernel
Avicta	0.22 mg ai/kernel
Lumivia 5.21 FS	0.25 mg ai/kernel
Lumisure 5 FS + Lumivia 5.21 FS	0.25 mg ai/kernel + 0.25 mg ai/kernel
Untreated	

Objective 2: The Bt hybrid technologies listed below will be evaluated for their effectiveness against ear feeding caterpillars (corn earworm, fall armyworm, corn borers). Trials will be planted in replicated small plot trials at three locations across the state. Two planting dates, one normal and one late, will be conducted. Treatments will be evaluated identifying the species present as well as the level of feeding damage inflicted on each technology. Plots will also be taken to yield.

Bt hybrid technologies.

1. Non-Bt hybrid
2. Double Pro
3. Viptera
4. Trecepta
5. Intrasect

Objective 3: Presence of corn leafhopper will be monitored across multiple locations throughout the state. Monitoring will be accomplished using sticky cards as well as periodic sampling of corn plants for the presence of the leafhopper. If populations are detected, efficacy trials will be conducted to determine what products are suitable for managing this new pest.

Efficacy trials on other pests that occur in corn and/or grain sorghum will be conducted as they occur to generate data to enhance and update University recommendations.

Planned Milestones:

1. Determine the efficacy of various insecticide seed treatments on established and new invasive pests in Arkansas corn.

2. Determine the efficacy of Bt technologies against caterpillar species and monitor for potential resistance.
3. Determine the efficacy of various insecticides against corn leafhopper, corn leaf aphid and other insect pests in corn and grain sorghum.

Statement of Projected Value: This project will provide needed information to update current recommendations on insecticide seed treatments, Bt technologies, and foliar insecticides for current and new invasive pest species. This information will provide growers up-to-date information on the best practices to minimize losses to insect pests during the growing season.

Budget Justifications/Explanation of Travel and Direct Costs:

Salaries.....$30,864

Supplies (sampling tools, products for testing)…….....$1,500

Travel……$1,500

Research Station Fees…….$7,600

Total.....$39,964

University of Arkansas System Division of Agriculture
Promotion Board Budget

Studebaker, Glenn — *Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum*

Year	2025/2026	**Project Year**	New	**Version: 7.0 (11/01/2024)**
Lead Investigator	Studebaker, Glenn	**Co-PI #1**	Thrash, Ben	
Co-PI #2	Bateman, Nick	**Co-PI #3**		
Department	ENPL Entomology and Plant Pathology			
Commodity Board	Corn and Grain Sorghum Board			
Project Title	Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum			

Budgets are requested in separate columns if separate Worktags for AES and CES will be needed.

Budget for Personnel

	Studebaker, Glenn	Thrash, Ben	Bateman, Nick		Total Board Funding Requested	AES Portion	CES Portion
Select "AES" or "CES" for each PI	CES	CES	CES				

Fulltime Personnel

Position Title	Name *(if position is filled)*	% Time	Salaries				Total	AES	CES
Program Associate	Matthew Mann	10%	$8,000				$8,000	$0	$8,000
Program Associate	Andrew Plummer	10%		$8,000			$8,000	$0	$8,000
Program Associate	Garrett Felts	10%			$8,000		$8,000	$0	$8,000
							$0	$0	$0
							$0	$0	$0
		Subtotal: Salaries	$8,000	$8,000	$8,000	$0	$24,000	$0	$24,000

Graduate Student

Tuition to be budgeted in the same ratio as GA stipend time, e.g., full time GA stipend, full year's tuition.

Name *(if position is filled)*	% Time	Wages				Total	AES Portion	CES Portion
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
						$0	$0	$0
Tuition Calculator Information						$0	$0	$0
Subtotal: Graduate Student		$0	$0	$0	$0	$0	$0	$0

Hourly

	Wages				Total	AES Portion	CES Portion
Hourly-Personnel					$0	$0	$0
Hourly-Students					$0	$0	$0
Subtotal: Hourly	$0	$0	$0	$0	$0	$0	$0

Fringe Benefits

Fringe benefits are calculated when salary and wage amounts are entered above.

	Benefits				Total	AES Portion	CES Portion
Fulltime Personnel	$2,288	$2,288	$2,288	$0	$6,864	$0	$6,864
Graduate Students	$0	$0	$0	$0	$0	$0	$0
Hourly Personnel	$0	$0	$0	$0	$0	$0	$0
Hourly-Students	$0	$0	$0	$0	$0	$0	$0
Subtotal: Fringe Benefits	$2,288	$2,288	$2,288	$0	$6,864	$0	$6,864
Personnel Total	$10,288	$10,288	$10,288	$0	$30,864	$0	$30,864

Travel

Justify out-of-state travel in proposal.

	Travel				Total	AES Portion	CES Portion
In-State	$500	$500	$500		$1,500	$0	$1,500
Out-of-State					$0	$0	$0
Travel Total	$500	$500	$500	$0	$1,500	$0	$1,500

University of Arkansas System Division of Agriculture
Promotion Board Budget

Studebaker, Glenn — *Developing Effective Insect Pest Management Strategies for Arkansas Corn and Grain Sorghum*

		Maintenance & Operations						
		M&O				Total	AES Portion	CES Portion
	Supplies	$500	$500	$500		$1,500	$0	$1,500
	Fertilizer/Chemicals					$0	$0	$0
	Publication					$0	$0	$0
	Statistical Consulting					$0	$0	$0
Other Direct Costs						$0	$0	$0
Station Maintenance	SAREC, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	CTST, Marianna	$0	$2,000	$0	$0	$2,000	$0	$2,000
	Lonoke County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	NERE, Keiser	$0	$0	$0	$0	$0	$0	$0
	NERREC, Harrisburg	$2,000	$0	$0	$0	$2,000	$0	$2,000
	Jackson County Ext. Center	$0	$0	$0	$0	$0	$0	$0
	PTST, Colt	$0	$0	$0	$0	$0	$0	$0
	RIRE, Stuttgart	$0	$0	$2,100	$0	$2,100	$0	$2,100
	Rosen Center	$0	$0	$0	$0	$0	$0	$0
	SEST, Rohwer	$0	$0	$0	$0	$0	$0	$0
	SWRE, Hope	$0	$0	$0	$0	$0	$0	$0
	VGSS, Kibler	$0	$0	$0	$0	$0	$0	$0
	FRSS, Clarksville	$0	$0	$0	$0	$0	$0	$0
	LFST, Batesville	$0	$0	$0	$0	$0	$0	$0
	CSES Greenhouse, Fayetteville	$0	$0	$0	$0	$0	$0	$0
	M & O Total	$2,500	$2,500	$2,600	$0	$7,600	$0	$7,600
	Total for Proposal	$13,288	$13,288	$13,388	$0	$39,964	$0	$39,964

Budget errors delay submission of your proposal. Any proposal submitted with errors in the budget cannot be guaranteed accurate presentation for funding. Please check budgets for accuracy.

Fringe Benefit Rates (as of 7/1/2022)				
Campus	Fulltime	Temp/Hourly	Graduate	Student
AES	28.60%	7.30%	5.10%	0.10%
CES	28.60%	7.30%	5.10%	0.10%

Arkansas Corn and Grain Sorghum Board – 2025-2026 Proposal

Title: The Arkansas Irrigation Yield Contest

Lead Investigators: Chris Henry, Professor, Water Management Engineer, RREC

Status: Year 8

Goal: The University of Arkansas Division of Agriculture has been demonstrating irrigation Water Management Practices on cooperator farms for five years. Experience has shown that when applied effectively water use can be reduced by 24% on average with no yield penalty. Reductions in water use of around 40% have been documented. The adoption rate of Computerized Hole Selection is over 40% indicating that this is now a mainstream practice in Arkansas. However, a significant need still exists to secure the sustainability of irrigated agriculture in Arkansas. It is still unknown and not well documented how much irrigation water use is needed for crops in Arkansas. A critical need is the documentation of the irrigation water use that is possible with a combination of IWM practices and the ingenuity of Arkansas farmers.

Approach: An irrigation yield contest is proposed. No such contest exists that incorporates the competitive nature of maximizing yield with maximizing water use efficiency. Many growers are familiar with the state and National Corn Growers Contest, National Wheat Growers contest and Arkansas's own "Go for the Green" soybean yield contest. The contest would be operated using the existing proposal supporting irrigation water management projects previously and currently proposed to these boards. Current yield contests focus only on yield, where this contest would highlight Arkansas farmer's efforts to improve sustainability and profitability, which are paramount to the future of agriculture.

Planned Milestones: What is proposed is funding directly from each commodity board of $10,000 to fund the first place award the corn irrigation contest. Essentially each commodity board would support the award for its commodity. The boards would provide the award directly to the first place winner, $6,000, $3,000 for second place, and $1,000 for third place. The rules are similar to existing commodity yield contests, with the additional requirement of a propeller flow meter, sealed by the program and that the yield must exceed the county average irrigated yield for the county (to eliminate dryland or severe deficit entries). Contestants will be announced at the annual Arkansas Soil and Water Conservation Conference in Jonesboro, Arkansas in late January 2025.

Request: $10,000 in awards and credits payable directly to winners. Support for the contest logistics, advertising, meter loaning, and operation of the contest will be done under the irrigation project.

-----No land use spreadsheet or routing form is used for this request as funds come directly from board to contest winners---

ATTACHMENT 11

Corn and Grain Sorghum Board Financials
Total Annual Collections

	June 2019	June 2020	June 2021	June 2022	June 2023	June 2024	December 2024	Forecast 2025
Beginning Fund Balance	**$ 611,975**	**$ 540,103**	**$ 787,097**	**$ 1,386,425**	**$ 2,156,313**	**$ 2,483,014**	**$ 1,792,074**	**$ 1,792,074**
Revenue								
Gross Collections	$ 1,068,141	$ 1,155,588	$ 1,257,966	$ 1,516,473	$ 1,050,172	$ 1,295,693	$ 541,514	$ 1,070,077
Corn	$ 1,060,950	$ 1,141,977	$ 1,244,519	$ 1,450,919	$ 1,044,635	$ 1,288,120	$ 525,817	$ 1,063,230
Grain Sorghum	$ 7,191	$ 13,611	$ 13,447	$ 65,554	$ 5,538	$ 7,574	$ 15,697	$ 6,847
Rev. & Treas. Dept. 3%	$ 34,181	$ 36,979	$ 40,255	$ 48,527	$ 33,606	$ 40,521	$ 16,245	$ 33,172
Other Income	$ 1,770	$ 2,642	$ -	$ 5,538	$ -	$ 22,843		$ -
Transfers to CGSPB (Net)	**$ 1,035,730**	**$ 1,121,251**	**$ 1,217,711**	**$ 1,473,485**	**$ 1,016,567**	**$ 1,278,016**	**$ 525,268**	**$ 1,036,905**
Total Revenue	**$ 1,647,706**	**$ 1,661,355**	**$ 2,004,807**	**$ 2,859,909**	**$ 3,172,880**	**$ 3,761,030**	**$ 2,317,342**	**$ 2,828,979**
Expenses								
Payments to Research	$ 943,000	$ 764,633	$ 482,275	$ 492,117	$ 965,315	$ 1,292,298		
Payments to Research					$ 492,117	$ 10,000		
Payments to Research					$ 351,470	$ 600,000	$ 403,801	$ 421,996
Preapproved Research								
AMCOE								
U S Grains Council								
Membership	$ 58,000	$ 63,800	$ 66,352	$ 67,679	$ 68,525	$ -	$ 71,266	$ 142,532
Export Exchange-Medallion Sponsorship			$ 12,000			$ -	$ 8,074	$ 15,000
U.S. Grains Meeting					$ 1,169			
National Corn Growers Association								
Membership	$ 11,500	$ 11,500	$ 12,000	$ 22,000	$ 28,000	$ 28,000		$ 56,500
Promotion			$ 10,000					
Commodity Classic	$ 8,306	$ 4,506			$ 2,438			$ 8,000
Arkansas Farm Bureau Foundation								
County Meetings			$ 3,228	$ 10,000				$ 5,001
Ag in the Classroom	$ 60,000			$ 10,000	$ 10,000	$ 9,000		$ 10,000
Producer Conference								$ 5,001
Other Promotion	$ 22,250	$ 23,000	$ 30,000	$ 94,000	$ 271,500		$ 500	$ 4,500
Total Promotion	**$ 160,056**	**$ 102,806**	**$ 133,580**	**$ 203,679**	**$ 381,632**	**$ 37,000**	**$ 79,840**	**$ 246,534**
Board Travel Lodging	$ 1,677	$ 3,348	$ 528	$ 6,301	$ 4,133	$ 6,718	$ 3,790	$ 7,001
Board Travel Meals	$ 1,858	$ 1,971			$ 1,771	$ 3,995	$ 749	$ 10,001
Board Travel Other						$ 5,438	$ 4,661	
Board Travel Mileage						$ 811	$ 529	
Office Supplies						$ 45		
Postage						$ -		
Admin Expenses						$ 4,423	$ 33	
Board Exp.	**$ 3,535**	**$ 5,318**	**$ 528**	**$ 6,301**	**$ 5,904**	**$ 21,430**	**$ 9,762**	**$ 17,002**
Website	$ 1,011	$ 1,500	$ 2,000	$ 1,500	$ 9,000	$ 8,229	$ 3,000	$ 17,000
Total Board Exp.	**$ 4,547**	**$ 6,818**	**$ 2,528**	**$ 7,801**	**$ 14,904**	**$ 29,659**	**$ 12,762**	**$ 34,002**
Total Expenditures	**$ 1,107,602**	**$ 874,258**	**$ 618,383**	**$ 703,597**	**$ 2,205,438**	**$ 1,968,956**	**$ 496,403**	**$ 702,532**
Outstanding Commitment							$ 128,521	
Ending Fund Balance	**$ 540,103**	**$ 787,097**	**$ 1,386,425**	**$ 2,156,313**	**$ 967,442**	**$ 1,792,074**	**$ 1,692,418**	**$ 2,126,447**

$ 1,274,276.00 2025-2026 Approve

$ 418,142.01 Reserve Fund Balan

Text1	Text2	Text3	2025-2026 Board Funding	2025-2026 Proposals	25-26 Board Approvals
Promotion	Promotion	Arkansas Department of Agri	Arkansas Department of Agriculture - 2025 NASDA Annual Meeting	2,500.00	5,000.00
Promotion	Promotion	Four States & Fair Rodeo	Four States & Fair Rodeo - Ag Learning Center - **Kristen Larey**	20,000.00	-
Promotion	Promotion	Arkansas Farm Bureau	Arkansas Farm Bureau - Ag in the Classroom - **Donnette**	15,000.00	15,000.00
Promotion	Promotion	NCGA	National Corn Growers Association	28,500.00	28,500.00
Promotion	Promotion	The Communications Group	The Communications Group - **Carson Horn**	15,000.00	-
Promotion	Promotion	US Grain Council	US Grain Council	74,117.00	74,117.00
Promotion	Promotion	UofA	The Arkansas irrigation yield contest (Year 8).	10,000.00	10,000.00
Promotion	Promotion		Promotion Board Building Maintenance UofA	10,000.00	10,000.00
Promotion	Promotion		Commodity Classic FFA and 4-H	15,000.00	15,000.00
Research Proposals	New	UofA	Exploring plasma-activated water for enhanced biocontrol of Aflatoxin and	63,080.00	-
Research Proposals	New	UofA	Development, evaluation and production of agricultural biologicals for Arkansas crop production (New, Year 1 of 3).	23,857.00	23,857.00
Research Proposals	New	UofA	Greenhouse gas data summarization in a corn production system with and without cover crops (New, Year 1 of 1).	11,267.00	11,267.00
Research Proposals	New	UofA	Refining recommendations of corn hybrid relative maturity and planting dates in Arkansas (New, Year 1 of 2).	32,537.00	32,537.00
Research Proposals	New	UofA	Understanding the impact of whole grain sumac sorghum on metabolic health in	50,065.00	-
Research Proposals	New	UofA	Better burns yield better air: Practical implications of implementing voluntary	20,599.00	-
Research Proposals	New	UofA	Innovative application of Arkansas corn: Replacement of forever chemicals in	45,150.00	45,150.00
Research Proposals	In Progress	UofA	Evaluation of new herbicides, premixes, programs, and application methods for	86,150.00	86,150.00
Research Proposals	In Progress	UofA	Towards a comprehensive aflatoxin solution: Creating and integrating novel	45,000.00	45,000.00
Research Proposals	In Progress	UofA	Development and verification of a stand counting application using drone imagery	16,360.00	16,360.00
Research Proposals	In Progress	UofA	Improving Irrigation technology for corn production in Arkansas (Year 3 of 3).	185,280.00	185,280.00
Research Proposals	In Progress	UofA	Corn and grain sorghum research verification program (Year 2 of 3).	130,000.00	130,000.00
Research Proposals	In Progress	UofA	Arkansas corn & grain sorghum research studies series, an annual report	4,800.00	4,800.00
Research Proposals	In Progress	UofA	Optimizing plant population and nitrogen rate in corn (Year 3 of 3).	34,000.00	34,000.00
Research Proposals	In Progress	UofA	Use of gossypol to inhibit reproduction in domestic hogs as a model for feral hog control (Year 3 of 3).	30,000.00	30,000.00
Research Proposals	In Progress	UofA	Remote sensing-based mid-season corn nitrogen fertilizer rate recommendations and web-tool extension (Year 2 of 3).	55,000.00	55,000.00
Research Proposals	In Progress	UofA	Cover crops in corn rotations- What works and what doesn't? (Year 3 of 3).	40,247.00	40,247.00
Research Proposals	In Progress	UofA	Improving nitrogen management for Arkansas corn production (Year 2 of 3).	81,625.00	81,625.00
Research Proposals	In Progress	UofA	Determining disease resistance and susceptibility of corn and grain sorghum hybrids (Year 2 of 3).	40,000.00	40,000.00
Research Proposals	In Progress	UofA	Generating a high-value wax material from sorghum bran using an innovative green approach (Year 2 of 3).	42,968.00	42,968.00
Research Proposals	In Progress	UofA	Corn and grain sorghum enterprise budgets and production economic analysis (Year 3 of 3).	10,000.00	10,000.00
Research Proposals	Renewal (Com	UofA	Economic analysis of corn and grain sorghum production and marketing practices (New, Year 1 of 1).	6,000.00	6,000.00
Research Proposals	Renewal (Com	UofA	Evaluate management options for corn nematodes in Arkansas (New, Year 1 of 3).	58,383.00	58,383.00
Research Proposals	Renewal (Com	UofA	Fine-tuning potassium recommendations and investigating intensive tissue	74,876.00	74,876.00
Promotion	Promotion	UofA	Arkansas future Ag leaders tour (New, Year 1 of 3).	5,000.00	5,000.00
Research Proposals	Renewal (Com	UofA	Developing effective insect pest management strategies for Arkansas corn and grain sorghum (New, Year 1 of 3).	39,964.00	39,964.00
Research Proposals	In Progress	Dean Robinson Seed Co Inc.	Dean Robinson Seed Co Inc. Sequestered Carbon	18,195.00	18,195.00

Row Labels		Sum of 25-26 Board Approvals
Promotion	**$**	**162,617.00**
Promotion	$	162,617.00
Research Proposals	**$**	**1,111,659.00**
In Progress	$	819,625.00
New	$	112,811.00
Renewal (Completed funding cycle and resubmitted)	$	179,223.00
Grand Total	**$**	**1,274,276.00**