ARKANSAS SOYBEAN PROMOTION BOARD MEETING
Zoom Option

Minutes

November 6th, 2025
1:00 p.m.

Members Present In-Person: Brad Doyle, Matthew Roberson, John Freeman, Royce Rogers

Members Present via Zoom: Patrick Matt Smith, West Higginbothom, Josh Cureton, Boyce Johnson

Members Absent: Donald Morton Jr.

WELCOME & INTRODUCTIONS
Introductions were made by members, guests, and Arkansas Department of Agriculture staff. With eight members present, a quorum was confirmed and established.

ADMINISTRATIVE REPORTS
FINANCIAL REPORT & PREVIOUS MEETING MINUTES
Inoussa Zaki, Chief Financial Officer for the Arkansas Department of Agriculture, provided the board with its latest financial report. **ATTACHMENT 1**

Members discussed a better yield projection for budgeting purposes, since National Agricultural Statistics Service (NASS) data was unavailable due to a federal government shutdown. Members decided a better yield estimate for the state would be around 53 bushels per acre.

Zaki mentioned that at an estimated collections value of $6.8 million, if the board continued funding projects at the same level they did last year, the board would still have $5.2 million in reserve to fund future projects.

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

Motion to approve the Department's financial report and the previous meeting minutes. Moved by John Freeman; seconded by Matthew Roberson. Motion carried.

LEGISLATIVE AUDIT REPORT
Zaki mentioned that the board's legislative audit report is set to be reviewed later this month on November 13, 2025. **ATTACHMENT 2**

FUNDING DISCUSSION
Chairman Doyle asked about carryover amounts from a year ago, prompting discussion.

Members discussed how much money they traditionally keep in reserve, with members stating they would like to keep a conservative, strong reserve.

Members asked about the types of accounts the board's funding was being held in. Zaki mentioned that since the board's funding is considered special revenue, they cannot obtain more traditional interest-bearing accounts.

Chairman Doyle instructed Zaki to investigate if the board has any interest that they are due from accounts.

Zaki went on to say that the Arkansas Department of Agriculture receives no percentage of the funding, with Arkansas Department of Finance & Administration (DF&A) receiving 3% of collections as an administrative fee.

Member Smith mentioned that since the board is collecting money on behalf of the United Soybean Board (USB), that the board is also paying that 3% fee on USB's behalf, which was confirmed by Zaki.

Discussion ensued regarding potential restructuring of funding to allow for reinvestment.

Chairman Doyle inquired the board on potential topics or areas of concern for future requests for funding (RFP) proposals to be focused on.

Member Smith mentioned the soybean cross-reference varieties list, which listed a lot of Xtend and Enlist varieties, with very few Xtend flex varieties listed. He would like to see RFPs on how to better this cross-reference list, which can help make sure a producer is not planting the same variety from two different companies.

Discussion ensued regarding variety testing.

Chairman Doyle mentioned that new uses should be a priority, for example, how to use more soybean oil or meal in the state.

Member Smith brought up variety trials, requesting an update from preliminary trials. The University of Arkansas Division of Agriculture (UADA) mentioned that the information went out to variety companies yesterday and that the information should be available on their website.

FUTURE MEETING DATES
Chairman Doyle discussed preliminary upcoming meeting dates with members.

Proposed Board Meeting Dates:

- 2-day Funding Meeting: **March 12th & 13th, 2026**
- Summer Meeting: **July 23rd, 2026**

- Winter Meeting: **November 5th, 2026**

REQUEST FOR FUNDING: FFA & 4-H OFFICERS COMMODITY CLASSIC SPONSORSHIP
Chairman Doyle launched into a discussion regarding the opportunity for the board to fund sponsorships for FFA and 4-H Officers to attend the annual Commodity Classic conference. **ATTACHMENT 3**

Taylor Wiseman with the Arkansas FFA presented the proposal opportunity to the board. Wiseman commented on the unique nature of having Arkansas FFA & 4-H Officer Jackets worn at the massive agricultural event, which is something most conference-goers are not accustomed to seeing. She mentioned that this helps represent Arkansas agriculture at a national level.

Motion to sponsor Arkansas FFA and 4-H Officers to attend the Commodity Classic Conference in 2026 for $15,000. Moved by Matthew Roberson; seconded by BJ Royce Rogers. Motion carried.

REQUEST FOR FUNDING: U.S. SOYBEAN EXPORT COUNCIL TRADE MISSION
Chairman Doyle launched into a discussion regarding the need for a board delegate at U.S. Soybean Export Council (USSEC) organized events. He went on to say that this role traditionally gets sent on mission trips with countries that are already purchasing soybeans, prompting discussion.

Members mentioned they would like the Department to investigate this situation further and report back to the board.

The board then focused on RFP deadlines for the upcoming funding cycle, with the Department mentioning the implementation of a new electronic form for RFP submissions. The board decided on a January 31st, 2026, deadline for RFP submissions.

Chairman Doyle mentioned a newer section they would like to see on the RFP submission form, stating something along the lines of: “What is the return on investment (ROI) for the farmer?”

Chairman Doyle circled back to the USSEC discussion, stating that the board needs to set a travel budget for future trade council missions, prompting discussion.

Member Freeman mentioned that two participants at $10,000 each may be enough to cover this effort.

Motion to approve $20,000 for two members or delegates to include Department’s soybean board administrative staff to attend USSEC mission trips. Moved by John Freeman; seconded by Matthew Roberson. Motion carried.

UADA DISCUSSION

Chairman Doyle discussed the confidentiality of UADA proposals and reports sent to the board, requesting that confidential watermarks be removed from submitted documents, as USB indicated they were not appropriate for checkoff commodity funding. Discussion ensued.

Chairman Doyle launched into a discussion for the need for a formal board procedure to handle UADA staff requests for letters of support on federal funding projects.

The Department's legal counsel mentioned that the board would need to meet, discuss, and decide in a public meeting format to provide these letters of support. Chairman Doyle mentioned that the best way to approach this would most likely be to call special zoom meetings.

THE COMMUNICATIONS GROUP REPORT

The Communications Group provided a marketing update to the board, referencing their presentation slides. **ATTACHMENT 4**

The group mentioned the completion of a health audit of the board's website, adding that with ongoing advances in technology, they realized the need to update some of their webpages.

They reviewed the board's paid social media campaigns, adding that the producer campaign performed the best when compared to the student and consumer campaigns.

They mentioned that they tried posting less this year on social media, which resulted in more engagement. They also addressed some of the highest performing social media posts, highlighting social media posts about Member Patrick Matt Smith as well as UADA Investigator Dr. Jeremy Ross.

The group addressed the Bean Brief emails, adding the decent email opening rate, while acknowledging room for improvement. They also addressed news coverage wins, as well as exhibition events they attended on behalf of the board.

The group addressed their next steps, as well as the "100 Years of Soybeans in Arkansas Exhibit," prompting discussion from members.

Member Smith asked the group if they have budget items listing out the costs associated with each service, and the group indicated that they do have this information. Discussion ensued regarding the procurement process.

OTHER BUSINESS

Chairman Doyle addressed the unexpected membership bill from the Clean Fuels Alliance America, noting that no RFP had been presented or approved at the board's funding meeting.

Brad Shimmens from The Clean Fuels Alliance America gave a brief presentation on their membership and the general support they provide to their membership. **ATTACHMENT 5**

Shimmens noted the membership fee of $10,000, which grants the board one primary voting delegate and three alternate representatives for the association's meetings, prompting discussion.

Motion to nominate Boyce Johnson as the board's primary delegate to the Clean Fuels Alliance America's membership service. Moved by Brad Doyle; seconded by John Freeman. Motion carried.

Motion to fund the Clean Fuels Alliance America membership for $10,000. Moved by John Freeman; seconded by BJ Royce Rogers. Motion carried.

Arkansas Secretary of Agriculture Wes Ward thanked the board for its sponsorship during the National Association of State Departments of Agriculture (NASDA) annual meeting in Fayetteville, held during his presidential term. He noted the event's record-breaking attendance and thanked the board again for their support. **ATTACHMENT 6**

The Department presented to the board what the new RFP electronic submission form looks like, prompting discussion. Chairman Doyle added that this was a similar procedure the USB uses. Member Freeman mentioned the need for a third funding category: education.

Dr. Nathan Slaton from the UADA mentioned that there were no applicants for the soybean fellowship program this year but will restart the process in the spring.

Chairman Doyle inquired about unspent carryover funds from the fellowship program. UADA responded that the money ultimately returns to the board, with specifics on how that happens addressed in the board's Memorandum of Understanding (MOU) with UADA.

ADJOURNMENT
Meeting adjourned at 3:25 pm.

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Brad Doyle, Chairman

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Brad Doyle

Brad Doyle, Chairman

ATTACHMENT 1

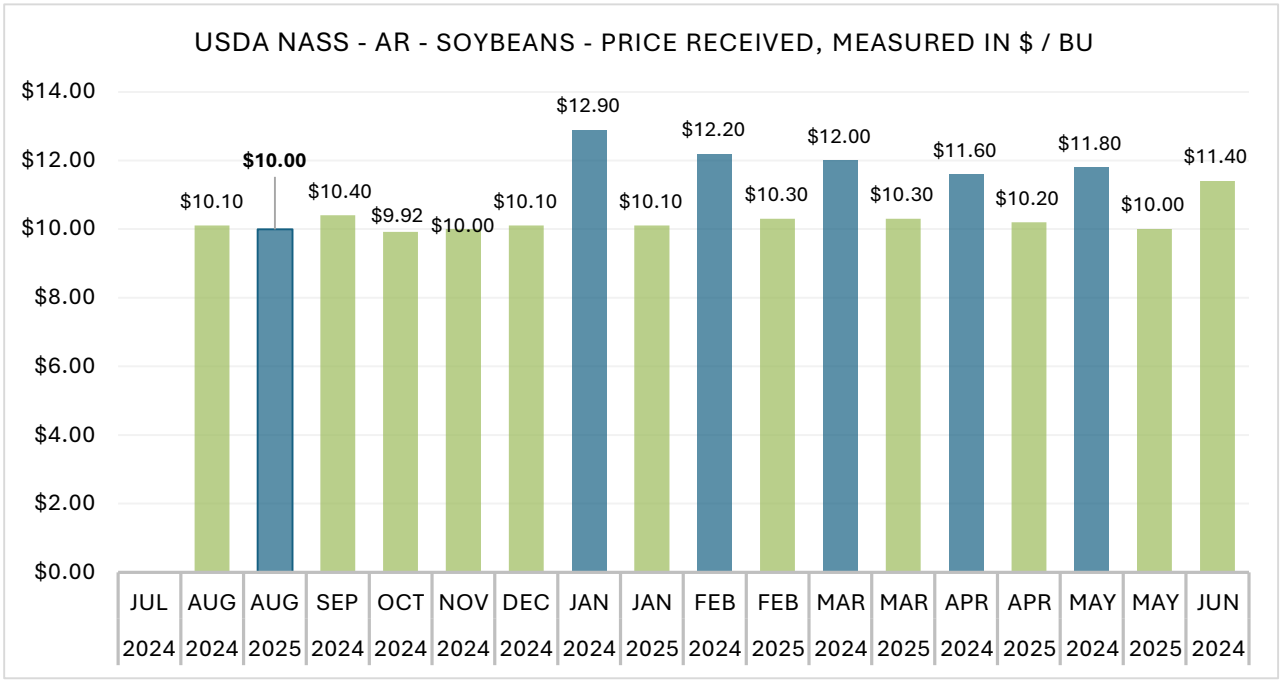
Arkansas Soybean Promotion Board
Financial Statement
For The Period July 1, 2025 - October 31, 2025

	June 2023	June 2024	June 2025	October 2025	Budget 2026
Beginning Balance	$ 6,231,490	$ 9,347,445	$ 11,110,780	$ 9,872,346	$ 8,009,262
Revenue					
Total Collections	$ 10,663,495	$ 10,364,704	$ 8,464,488	$ 1,108,372	$ 7,800,000
Less					
USB Transfer	$ 4,948,222	$ 4,688,217	$ 4,085,363	$ 633,108	$ 3,631,680
Other QSSB Transfers	$ 438,553	$ 417,200	$ 125,563	$ 17,164	$ 312,000
State Collection Fee	$ 317,198	$ 308,582	$ 250,087	$ 32,893	$ 224,640
Net Transfer to the Board	$ 4,959,521	$ 4,950,705	$ 4,003,476	$ 425,207	$ 3,631,680
Other Income	$ 4,276	$ 47,846	$ 12,315	$ -	$ 7,500
Total Revenue	$ 4,963,797	$ 4,998,551	$ 4,015,790	$ 425,207	$ 3,639,180
Expenses					
Promotion	$ 590,162	$ 519,592	$ 950,967	$ 111,988	$ 498,257
Research	$ 1,239,261	$ 2,702,160	$ 4,291,651	$ 119,089	$ 3,351,276
Board Expenses	$ 18,510	$ 13,465	$ 11,607	$ 896	$ 13,465
Total Expenses	$ 1,847,932	$ 3,235,217	$ 5,254,224	$ 231,973	$ 3,862,998
Ending Balance	$ 9,347,354	$ 11,110,780	$ 9,872,346	$ 10,065,579	$ 7,785,444
Remaining Allocation					
Other Liabilities	$ 46,691	$ 157,735	$ 106,587		$ -
Research	$ 1,485,989	$ 1,664,286	$ 1,738,182	$ 1,619,094	$ 1,619,094
Promotion	$ -	$ 83,843	$ 438,229	$ 437,224	$ 437,224
Total Remaining Allocation	$ 1,532,680	$ 1,905,864	$ 2,282,997	$ 2,056,317	$ 2,056,317
Funds Available	$ 7,814,674	$ 9,204,915	$ 7,589,348	$ 8,009,262	$ 5,729,127

Arkansas Soybean Promotion Board
Annual Collections

	June 2024	June 2025	October 2025	Budget 2026	Estimated Budget 2026		
USDA Soybean Estimates							
NASS SOYBEANS - ACRES PLANTED	2,980,000	3,050,000	3,050,000	3,000,000	3,000,000	3,000,000	3,000,000
NASS SOYBEANS - ACRES HARVESTED	2,950,000	3,020,000	3,020,000	3,000,000	3,000,000	3,000,000	3,000,000
NASS SOYBEANS - YIELD, MEASURED IN BU / ACRE	53	55	55	52	52	52	52
NASS SOYBEANS - PROD, MEASURED IN BU	156,350,000	166,100,000	166,100,000	156,000,000	156,000,000	156,000,000	156,000,000
NASS SOYBEANS - PRICE RCVD, MEASURED IN $ / BU	$ 13.10	$ 10.20	$ 10.20	$ 10.00	$ 10.00	$ 10.00	$ 10.00
NASS Value	$ 2,048,185,000	$ 1,694,220,000	$ 1,694,220,000	$ 1,560,000,000	$ 1,560,000,000	$ 1,560,000,000	$ 1,560,000,000
Implied Checkoff Based on NASS	$ 10,240,925	$ 8,471,100	$ 8,471,100	$ 7,800,000	$ 7,800,000	$ 7,800,000	$ 7,800,000
Total Soybean Checkoff Collections For Arkansas				100%	100%	95%	90%
Assessed Bushels	153,516,906	164,530,126	19,935,615	156,000,000	156,000,000	148,200,000	140,400,000
Assessed Bushels Value	2,026,794,850	1,695,606,280	222,505,692	$ 1,560,000,000	$ 1,560,000,000	$ 1,407,900,000	$ 1,263,600,000
In State Collections	$ 9,942,016	$ 8,180,403	$ 1,058,473	$ 7,487,691	$ 7,487,691	$ 6,757,641	$ 6,065,029
Out of State Collections	$ 422,688	$ 284,085	$ 49,899	$ 312,309	$ 312,309	$ 281,859	$ 252,971
Total Checkoff Collections	$ 10,364,704	$ 8,464,488	$ 1,108,372	$ 7,800,000	$ 7,800,000	$ 7,039,500	$ 6,318,000
Implied Price	$ 13.20	$ 10.31	$ 11.16	$ 10.00	$ 10.00	$ 9.50	$ 9.00
Net Collections for Arkansas Soybeans							
Total Checkoff Collections	$ 10,364,704	$ 8,464,488	$ 1,108,372	$ 7,800,000	$ 7,800,000	$ 7,039,500	$ 6,318,000
QSSB Transfer							
Alabama	$ -		$ 5,709	$ 19,173	$ 19,173	$ 17,304	$ 15,530
Colorado	$ -		$ 21	$ 90	$ 90	$ 82	$ 73
Florida	$ -			$ 132	$ 132	$ 119	$ 107
Georgia	$ -			$ 71	$ 71	$ 64	$ 57
Illinios	$ 1,092			$ 1,873	$ 1,873	$ 1,690	$ 1,517
Indiana	$ -			$ 129	$ 129	$ 117	$ 105
Iowa	$ -			$ 1,344	$ 1,344	$ 1,213	$ 1,088
Kansas	$ -			$ 213	$ 213	$ 192	$ 172
Kentucky	$ -			$ 3,379	$ 3,379	$ 3,050	$ 2,737
Louisiana	$ 11,675	$ 13,661	$ 2,693	$ 7,406	$ 7,406	$ 6,684	$ 5,999
Michigan	$ -			$ 1,786	$ 1,786	$ 1,612	$ 1,447
Minnesota	$ -			$ 70	$ 70	$ 63	$ 57
Mississippi	$ 170,846	$ 44,790	$ 854	$ 89,427	$ 89,427	$ 80,707	$ 72,435
Missouri	$ 218,283	$ 28,925	$ 3,655	$ 126,456	$ 126,456	$ 114,126	$ 102,429
Nebraska	$ -			$ 118	$ 118	$ 106	$ 95
North Dakota			$ 1,377				
North Carolina			$ 954				
Ohio	$ -			$ 3,054	$ 3,054	$ 2,756	$ 2,473
Oklahoma	$ 2,833	$ 14,995		$ 20,489	$ 20,489	$ 18,491	$ 16,596
South Dakota			$ 869				
Tennessee	$ 5,627	$ 9,251	$ 383	$ 20,045	$ 20,045	$ 18,090	$ 16,236
Texas	$ 6,844	$ 13,940	$ 649	$ 16,491	$ 16,491	$ 14,883	$ 13,358
Wisconsin	$ -			$ 255	$ 255	$ 230	$ 206
TOTAL QSSB Transfer	$ 417,200	$ 125,563	$ 17,164	$ 312,000	$ 312,000	$ 281,580	$ 252,720
United Soybean Board Payment	$ 4,688,217	$ 4,085,363	$ 633,108	$ 3,631,680	$ 3,631,680	$ 3,277,591	$ 2,941,661
Arkansas Misc Tax Collection Fee	$ 308,582	$ 250,087	$ 32,893	$ 224,640	$ 224,640	$ 202,738	$ 181,958
Net Transfer to the Board	**$ 4,950,705**	**$ 4,003,476**	**$ 425,207**	**$ 3,631,680**	**$ 3,631,680**	**$ 3,277,591**	**$ 2,941,661**
Difference from Budget							
Net Arkansas Assessed Soybean Bushels							
Gross Transfers to the Board *less QSSB Transfers*	$ 9,947,503	$ 8,338,925	$ 1,091,208	$ 7,488,000	$ 7,488,000	$ 6,757,920	$ 6,065,280
Bushels Assessed	153,516,906	164,530,126	19,935,615	156,000,000	156,000,000	148,200,000	140,400,000
Implied Price	$13.20	$10.31	$11.16	$10.00	$ 10.00	$ 9.50	$ 9.00
NASS Soybean Production Estimate	156,350,000	166,100,000	166,100,000	156,000,000	156,000,000	156,000,000	156,000,000
Bushel Difference	2,833,094	1,569,874	146,164,385	-	-	7,800,000	15,600,000
Percent of Bushels Assessed	98.2%	99.1%	12.0%	100%	100%	95%	90%
Uncollected Checkoff	$ 187,019	$ 80,894	$ 8,156,861	$ -	$ -	$ 370,500	$ 702,000
Percent Checkoff Collected	97%	98%	13%	96%	96%	87%	78%
Remainder Due to State	$ 93,509.25	$ 40,446.82	$ 4,078,430.44	$ -	$ -	$ 185,250	$ 351,000

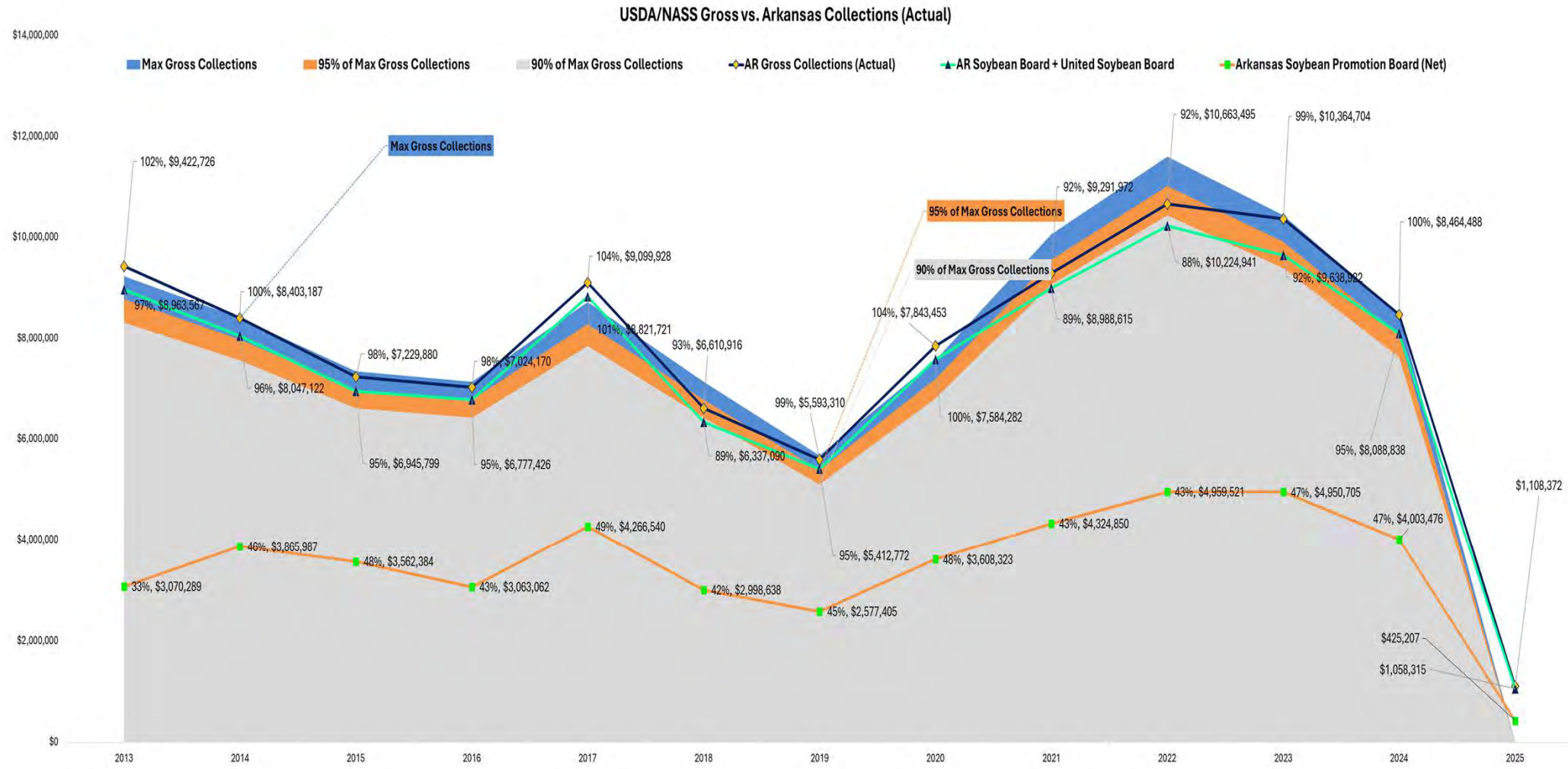
Year	Period	Data Item	Value
2024	JUL	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	
2024	AUG	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.10
2025	AUG	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.00
2024	SEP	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.40
2024	OCT	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$9.92
2024	NOV	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.00
2024	DEC	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.10
2024	JAN	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$12.90
2025	JAN	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.10
2024	FEB	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$12.20
2025	FEB	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.30
2024	MAR	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$12.00
2025	MAR	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.30
2024	APR	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$11.60
2025	APR	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.20
2024	MAY	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$11.80
2025	MAY	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$10.00
2024	JUN	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	$11.40



2025 Production #s from USDA NASS 2025 Forecast Data

Arkansas soybean acreage, yield, production, price, and check-off rate with estimated maximum gross collections for years 2013 to 2025

Production Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Fiscal Year, July 1 - June 30	FY-2014	FY-2015	FY-2016	FY-2017	FY-2018	FY-2019	FY-2020	FY-2021	FY-2022	FY-2023	FY-2024 Estimate	FY-2025 Estimate	FY-2026 Estimate
Planted Acres	3,270,000	3,230,000	3,200,000	3,130,000	3,530,000	3,270,000	2,650,000	2,820,000	3,040,000	3,180,000	2,980,000	3,050,000	0
Harvested Acres	3,240,000	3,200,000	3,170,000	3,090,000	3,500,000	3,210,000	2,610,000	2,800,000	3,000,000	3,140,000	2,950,000	3,020,000	0
Yield, measured in bushels / acre	43.5	49.5	49	47	51	50.5	49	51.5	52	52	54	55	0
Production, measured in bushels	140,940,000	158,400,000	155,330,000	145,230,000	178,500,000	162,105,000	127,890,000	144,200,000	156,000,000	163,280,000	159,300,000	166,100,000	0
Price received, measured in $ / bushels	**$13.10**	**$10.60**	**$9.46**	**$9.83**	**$9.77**	**$8.81**	**$8.87**	**$10.50**	**$12.90**	**$14.20**	**$13.10**	**$10.20**	**$0.00**
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total Estimated Value of Production	$1,846,314,000	$1,679,040,000	$1,469,421,800	$1,427,610,900	$1,743,945,000	$1,428,145,050	$1,134,384,300	$1,514,100,000	$2,012,400,000	$2,318,576,000	$2,086,830,000	$1,694,220,000	$0
Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Max Gross Collections	**$9,231,570**	**$8,395,200**	**$7,347,109**	**$7,138,055**	**$8,719,725**	**$7,140,725**	**$5,671,922**	**$7,570,500**	**$10,062,000**	**$11,592,880**	**$10,434,150**	**$8,471,100**	**$0**
95% of Max Gross Collections	$8,769,992	$7,975,440	$6,979,754	$6,781,152	$8,283,739	$6,783,689	$5,388,325	$7,191,975	$9,558,900	$11,013,236	$9,912,443	$8,047,545	$0
90% of Max Gross Collections	$8,308,413	$7,555,680	$6,612,398	$6,424,249	$7,847,753	$6,426,653	$5,104,729	$6,813,450	$9,055,800	$10,433,592	$9,390,735	$7,623,990	$0
AR Gross Collections (Actual)	$9,422,726	$8,403,187	$7,229,880	$7,024,170	$9,099,928	$6,610,916	$5,593,310	$7,843,453	$9,291,972	$10,663,495	$10,364,704	$8,464,488	$1,108,372
AR Soybean Board + United Soybean Boarc	$8,963,567	$8,047,122	$6,945,799	$6,777,426	$8,821,721	$6,337,090	$5,412,772	$7,584,282	$8,988,615	$10,224,941	$9,638,922	$8,088,838	$1,058,315
Other Qualified State Soybean Boards	$459,159	$356,064	$284,081	$246,744	$278,207	$273,826	$180,538	$268,286	$303,357	$438,553	$417,200	$125,563	$17,164
United Soybean Board (Net)	$5,597,066	$3,923,480	$3,161,306	$3,497,455	$4,281,474	$3,141,139	$2,667,418	$3,731,732	$4,385,343	$4,948,222	$4,688,217	$4,085,363	$633,108
Arkansas Soybean Promotion Board (Net)	$3,070,289	$3,865,987	$3,562,384	$3,063,062	$4,266,540	$2,998,638	$2,577,405	$3,608,323	$4,324,850	$4,959,521	$4,950,705	$4,003,476	$425,207
AR Actual Gross Collections % of MGC	102%	100%	98%	98%	104%	93%	99%	104%	92%	92%	99%	100%	#DIV/0!
AR Soybean & USB % of MGC	*97%*	*96%*	*95%*	*95%*	*101%*	*89%*	*95%*	*100%*	*89%*	*88%*	*92%*	*95%*	*#DIV/0!*
QSSB % of MGC	*5%*	*4%*	*4%*	*3%*	*3%*	*4%*	*3%*	*4%*	*3%*	*4%*	*4%*	*1%*	*#DIV/0!*
USB % of MGC	*61%*	*47%*	*43%*	*49%*	*49%*	*44%*	*47%*	*49%*	*44%*	*43%*	*45%*	*48%*	*#DIV/0!*
AR Soybean % of MGC	*33%*	*46%*	*48%*	*43%*	*49%*	*42%*	*45%*	*48%*	*43%*	*43%*	*47%*	*47%*	*#DIV/0!*


USDA/NASS Gross vs. Arkansas Collections (Actual)
Max Gross Collections
95% of Max Gross Collections
90% of Max Gross Collections
AR Gross Collections (Actual)
AR Soybean Board + United Soybean Board
Arkansas Soybean Promotion Board (Net)
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
102%, $9,422,726
97%, $8,963,567
100%, $8,403,187
96%, $8,047,122
98%, $7,229,880
95%, $6,945,799
98%, $7,024,170
95%, $6,777,426
104%, $9,099,928
101%, $8,821,721
93%, $6,610,916
89%, $6,337,090
99%, $5,593,310
95%, $5,412,772
104%, $7,843,453
100%, $7,584,282
92%, $9,291,972
89%, $8,988,615
92%, $10,663,495
88%, $10,224,941
99%, $10,364,704
92%, $9,638,992
100%, $8,464,488
95%, $8,088,838
$1,108,372
33%, $3,070,289
40%, $3,865,987
48%, $3,562,384
43%, $3,063,062
49%, $4,266,540
42%, $2,998,638
45%, $2,577,405
48%, $3,608,323
43%, $4,324,850
43%, $4,959,521
47%, $4,950,705
47%, $4,003,476
$425,207
$1,058,315

ATTACHMENT 2

ARKANSAS SOYBEAN PROMOTION BOARD

Annual Financial Report

June 30, 2025

LEGISLATIVE JOINT AUDITING COMMITTEE

ARKANSAS SOYBEAN PROMOTION BOARD
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FOR THE YEAR ENDED JUNE 30, 2025

LEGISLATIVE JOINT AUDITING COMMITTEE
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Legislative Joint Auditing Committee

Report on the Audit of the Financial Statements

Opinion{s}

We have audited the financial statements of the major fund of the Arkansas Soybean Promotion Board, a board of Arkansas state government, as of and for the year ended June 30, 2025, and the related notes to the financial statements, which collectively comprise the Arkansas Soybean Promotion Board's departmental financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the financial position of the major fund of the Arkansas Soybean Promotion Board as of June 30, 2025, and the changes in financial position for the year then ended, in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the board, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

As indicated above, the financial statements of the Arkansas Soybean Promotion Board are intended to present the financial position and the changes in financial position of only that portion of the major fund of the State that is attributable to the transactions of the Arkansas Soybean Promotion Board. They do not purport to, and do not, present fairly the financial position of the State of Arkansas as of June 30, 2025, or the changes in its financial position for the year then ended, in accordance with accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

Responsibilities of Management 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 and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatements, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the board's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the 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 GAAS and *Government 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. 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 financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risk of material misstatements of the 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 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 the board'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 financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the board'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.

Required Supplementary Information

The Governmental Accounting Standards Board requires that a Management's Discussion and Analysis be presented to supplement government-wide financial statements. However, as discussed in the "Emphasis of Matter" paragraph above, the financial statements of the Arkansas Soybean Promotion Board are only for the specific transactions and activity of the Agency and not for the State as a whole. Therefore, the Management's Discussion and Analysis is not required to be presented for the Arkansas Soybean Promotion Board individually. Our opinion on the departmental financial statements is not affected by the omission of this information.

Supplementary Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Arkansas Soybean Promotion Board's departmental financial statements. The Schedule of Expenditures by General Ledger Code is presented for purposes of additional analysis and is not a required part of the departmental 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 departmental financial statements. The information has been subjected to the auditing procedures applied in the audit of the departmental financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the departmental financial statements or to the departmental financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Expenditures by General Ledger Code is fairly stated, in all material respects, in relation to the departmental financial statements as a whole.

Other Information

Management is responsible for the other information included in the report. The other information comprises the Schedule of Selected Information, and Schedule of Budget and Actual Expenditures, but does not include the departmental financial statements, supplementary information, and our auditor's reports thereon. Our opinion on the departmental financial statements does not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audit of the departmental financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the financial statements or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

Reports on Other Legal and Regulatory Requirements

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated October 9, 2025, on our consideration of the board's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance, and the results of the testing, and not to provide an opinion on the effectiveness of the board's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the board's internal control over financial reporting and compliance.

Other Reporting Required by the Soybean Promotion, Research and Consumer Information Act of 1990 and the Soybean Promotion and Research Order

In connection with our audit, nothing came to our attention that caused us to believe the Arkansas Soybean Promotion Board failed to comply with the terms, insofar as they relate to accounting matters, of the Soybean Promotion, Research, and Consumer Information Act of 1990 and the Soybean Promotion and Research Order (the "Order") relative to the use of funds collected by the Arkansas Soybean Promotion Board; with the terms described in Section 1220.228(a) of the Order relative to the prohibited use of funds collected by the Arkansas Soybean Promotion Board; and with the provisions of Section 1220.211(j) of the Order relative to the investment of funds collected by the Arkansas Soybean Promotion Board. However, our audit was not directed primarily toward obtaining knowledge of such noncompliance.

ARKANSAS LEGISLATIVE AUDIT

Kevin William White, CPA, JD
Legislative Auditor

Little Rock, Arkansas
October 9, 2025
SA0932925

LEGISLATIVE JOINT AUDITING COMMITTEE
ARKANSAS LEGISLATIVE AUDIT

REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS

INDEPENDENT AUDITOR'S REPORT

Arkansas Soybean Promotion Board
Legislative Joint Auditing Committee

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the major fund of the Arkansas Soybean Promotion Board (the "Agency"), a board of Arkansas state government, as of and for the year ended June 30, 2025, and the related notes to the financial statements, which collectively comprise the Arkansas Soybean Promotion Board's departmental financial statements, and have issued our report thereon dated October 9, 2025.

Report on Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Agency's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements but not for the purpose of expressing an opinion on the effectiveness of the Agency's internal control. Accordingly, we do not express an opinion on the effectiveness of the Agency's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified.

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Agency's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance, and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose. However, pursuant to Ark. Code Ann. § 10-4-417, all reports presented to the Legislative Joint Auditing Committee are matters of public record, and distribution is not limited.

ARKANSAS LEGISLATIVE AUDIT

Tom Bullington, CPA
Deputy Legislative Auditor

Little Rock, Arkansas
October 9, 2025

ARKANSAS SOYBEAN PROMOTION BOARD
BALANCE SHEET – GOVERNMENTAL FUND
JUNE 30, 2025

Exhibit A

	General Fund
ASSETS	
Cash and cash equivalents	$ 9,872,346
Prepaid items	7,561
TOTAL ASSETS	$ 9,879,907
LIABILITIES AND FUND BALANCE	
Liabilities:	
Accounts payable	$ 13,161
Due to other governments	106,587
Total Liabilities	119,748
Fund balance:	
Nonspendable for prepaid items	7,561
Committed for soybean promotion and research	9,752,598
Total Fund Balance	9,760,159
TOTAL LIABILITIES AND FUND BALANCE	$ 9,879,907

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

ARKANSAS SOYBEAN PROMOTION BOARD
STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCE – GOVERNMENTAL FUND
FOR THE YEAR ENDED JUNE 30, 2025

Exhibit B

	General Fund
REVENUES	
Soybean assessments - first purchasers	$ 8,180,403
Soybean assessments - other states	284,085
Other income	7,859
Less:	
Remittances to the United Soybean Board	4,036,227
Remittances to other states	123,550
TOTAL REVENUES	4,312,570
Less: State Treasury service charge	250,087
NET REVENUES	4,062,483
EXPENDITURES	
Program expenses:	
Research	2,564,373
Producer communication	389,258
Market promotions	120,694
Consumer information	76,392
Industry information	88,547
Total program expenses	3,239,264
Administration	4,445
TOTAL EXPENDITURES	3,243,709
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	818,774
OTHER FINANCING SOURCES (USES)	
Prior-year warrants outlawed and cancelled	134
NET CHANGE IN FUND BALANCE	818,908
FUND BALANCE - JULY 1	8,941,251
FUND BALANCE - JUNE 30	$ 9,760,159

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

ARKANSAS SOYBEAN PROMOTION BOARD
NOTES TO FINANCIAL STATEMENTS
JUNE 30, 2025

NOTE 1: Summary of Significant Accounting Policies

A. Reporting Entity/History

The Arkansas Soybean Promotion Board, a board of Arkansas state government, was created by Act 259 of 1971, as amended, to promote the growth and development of the soybean industry in Arkansas through research, extension, promotion, and market development. The Board consists of nine Governor-appointed members, who shall all represent Arkansas soybean farmers at large and be practical producers of soybeans in the State of Arkansas.

As a result of Act 712 of 2023, effective July 1, 2023, the Arkansas Soybean Promotion Board was transferred to the Department of Agriculture.

B. Basis of Presentation – Fund Accounting

The accounting system is organized and operated on a fund basis. A fund is defined as a fiscal and accounting entity with a self-balancing set of accounts recording cash and other financial resources, together with all related liabilities and residual equities or balances and changes therein, which are segregated for purposes of carrying on specific activities or attaining certain objectives in accordance with special regulations, restrictions, or limitations. The following types of funds, if applicable to this Agency, are recognized in the accompanying financial statements.

Governmental Funds

General Fund – General Fund is the general operating fund and is used to report all financial resources, except those required to be accounted for in another fund.

C. Basis of Accounting

Basis of accounting refers to when revenues and expenditures or expenses are recognized and reported in the financial statements. Financial statements for governmental funds are presented using the current financial resources measurement focus and the modified accrual basis of accounting. Revenues are recognized when they become both measurable and available. "Available" means collectible within the current period or soon enough thereafter to pay current liabilities (i.e., 45 days). Expenditures are generally recognized under the modified accrual basis when the related fund liability is incurred. Revenues from federal grants and federal reimbursements are recognized when all applicable eligibility requirements and the availability criteria of 45 days have been met.

D. Cash and Cash Equivalents

Cash and cash equivalents include demand accounts, imprest accounts, cash on hand, cash in State Treasury, all certificates of deposit with maturities at purchase of 90 days or less, and all short-term instruments with maturities at purchase of 90 days or less. All short-term investments are stated at fair value.

E. Deposits and Investments

State Board of Finance Policies

Ark. Code Ann. § 19-4-805 requires that agencies holding monies not deposited in the State Treasury, other than the institutions of higher learning, abide by the recommendations of the State Board of Finance. The State Board of Finance promulgated cash management, collateralization, and investments policies and procedures, effective July 14, 2012, as referenced in the Financial Management Guide issued by the Department of Finance and Administration for use by all state agencies.

NOTE 1: Summary of Significant Accounting Policies (Continued)

E. Deposits and Investments (Continued)

State Board of Finance Policies (Continued)

The stated goal of state cash management is the protection of principal, while maximizing investment income and minimizing non-interest earning balances. Deposits are to be made within the borders of the State of Arkansas and must qualify for Federal Deposit Insurance Corporation (FDIC) deposit insurance coverage. Policy requires a minimum of four bids to be sought on interest-bearing deposits in order to obtain the highest rate possible.

Policy states that funds are to be in transactional and non-transactional accounts as defined in the Financial Management Guide. Funds in excess of immediate expenditure requirements (excluding minimum balances) should not remain in non-interest bearing accounts.

State Board of Finance policy states that cash funds may only be invested in accounts and investments authorized under Ark. Code Ann. §§ 19-3-510, -518. All noncash investments must be held in safekeeping by a bank or financial institution. In addition, all cash funds on deposit with a bank or financial institution that exceed FDIC deposit insurance coverage must be collateralized. Collateral pledged must be held by an unaffiliated third-party custodian in an amount at least equal to 105% of the cash funds on deposit.

Deposits

Deposits are carried at cost and consist of cash in State Treasury totaling $9,872,346. State Treasury Management Law governs the management of funds held in the State Treasury, and the Treasurer of State is responsible for ensuring these funds are adequately insured and collateralized.

F. Prepaid Expenses

Prepaid expenses generally represent the cost of consumable supplies on hand or unexpired services at year-end. The cost of these items is included with expenditures at the time of purchase. Prepaid expenses, as reported in the general fund financial statements, are also recorded as a nonspendable component of fund balance indicating that they do not constitute "available, spendable financial resources."

G. Fund Equity

Fund Balance

In the financial statements, fund balance is reported in one of five classifications, where applicable, based on the constraints imposed on the use of the resources.

The nonspendable fund balance includes amounts that cannot be spent because they are either (a) not in spendable form (e.g., prepaid items, inventories, long-term amount of loans and notes receivables, etc.) or (b) legally or contractually required to be maintained intact.

The spendable portion of fund balance, where applicable, comprises the remaining four classifications: restricted, committed, assigned, and unassigned.

Restricted fund balance. This classification reflects constraints imposed on resources either (a) externally by creditors, grantors, contributors, or laws or regulations of other governments or (b) by law through constitutional provisions or enabling legislation.

NOTE 1: Summary of Significant Accounting Policies (Continued)

G. Fund Equity (Continued)

Fund Balance (Continued)

Committed fund balance. These amounts can only be used for specific purposes according to constraints imposed by legislation of the General Assembly, the government's highest level of decision-making authority. Committed amounts cannot be used for any other purpose unless the General Assembly removes or changes the constraint by the same action that imposed the constraint.

Assigned fund balance. This classification reflects amounts constrained by the State's "intent" to be used for specific purposes but are neither restricted nor committed. The General Assembly has the authority to assign amounts to be used for specific purposes by legislation or approved methods of financing.

Unassigned fund balance. This amount is the residual classification for the general fund.

When more than one spendable classification is available for use, it is the State's policy to use the resources in this order: restricted, committed, assigned, and unassigned.

H. Budgetary Data

The State utilizes an annual budgeting process with budget amounts initially derived from the previous fiscal year's funded allocation. In accordance with the appropriations and funding provided by the Legislature, individual state agencies have been charged with the responsibility of administering and managing their programs as authorized by the Legislature. Agencies are also charged with the responsibility of preparing an annual operations plan as a part of the budgetary process for the operation of each of their assigned programs. State law provides for the establishment of a comprehensive financial management system that includes adequate controls over receipts, expenditures, and balances of Agency funds. It is mandated that this system include a modified accrual system, conform with generally accepted governmental accounting principles, and provide a reporting system whereby actual expenditures are compared to expenditures projected in the Agency's annual operation plan.

NOTE 2: Commitments – Approved Contracts and Projects in Process

At June 30, 2025, the Agency had commitments of $2,917,397 for approved contracts and projects in process as follows:

Description of Approved Contracts / Projects In-Process		Funds Committed	Cumulative Expended as of 6/30/2025	Balance Remaining 6/30/2025
RESEARCH				
University of Arkansas:				
Research (various)		$ 11,825,763	$ 10,162,145	$ 1,663,618
Fellowship		675,000	450,000	225,000
Total University of Arkansas [Research]		12,500,763	10,612,145	1,888,618
Midsouth Soybean Board		303,386	178,297	125,089
TOTAL RESEARCH		12,804,149	10,790,442	2,013,707
INDUSTRY INFORMATION				
University of Arkansas:				
Promotion		191,142	20,000	171,142
Irrigation Yield Contest		10,000	10,000	
Total University of Arkansas [Industry Information]		201,142	30,000	171,142
American Soybean Association:				
Promotion		71,600	40,300	31,300
WISHH (World Initiative for Soy in Human Health)		80,000	40,000	40,000
Total American Soybean Association		151,600	80,300	71,300
Clean Fuels Alliance America		20,000	20,000	
Farm Bureau		25,000	25,000	
Four States Fair & Rodeo		10,000		10,000
Southwest Soybean / AR Soybean Assoc.:				
Promotion		10,000	10,000	
Grow to the Green Yield Contest		369,540	243,605	125,935
Total Southwest Soybean / AR Soybean Assoc.		379,540	253,605	125,935
USSEC (US Soybean Export Council)		35,000	24,851	10,149
Arkansas Department of Agriculture		10,000		10,000
TOTAL INDUSTRY INFORMATION		832,282	433,756	398,526
VARIOUS EXPENDITURE CATEGORIES				
The Communications Group - Marketing		870,550	365,386	505,164
TOTALS - JUNE 30, 2025	(a)	$ 14,506,981	$ 11,589,584	$ 2,917,397

(a) Commitments and research are ongoing, but additional funding must be approved each fiscal year.

ARKANSAS SOYBEAN PROMOTION BOARD
SCHEDULE OF EXPENDITURES BY GENERAL LEDGER CODE
JUNE 30, 2025

Schedule 1

	General Fund
Communication and transportation of commodities	$ 1
Travel and subsistence	4,444
Professional services and fees	335,224
Other expenses and services	17,466
Assistance, grants, and aid	2,886,574
TOTAL	$ 3,243,709

ARKANSAS SOYBEAN PROMOTION BOARD
SCHEDULE OF SELECTED INFORMATION
JUNE 30, 2025
(UNAUDITED)

Schedule 2

	For the Year Ended June 30,				
	2025	2024	2023	2022	2021
General Fund					
Total Assets	$ 9,879,907	$ 11,115,807	$ 9,357,445	$ 6,231,580	$ 4,763,455
Total Liabilities	119,748	2,174,555	1,006,647	1,016,708	947,222
Total Fund Equity	9,760,159	8,941,251	8,350,798	5,214,872	3,816,233
Net Revenues	4,062,483	4,839,204	4,969,072	4,328,614	3,644,341
Total Expenditures	3,243,709	4,248,751	1,833,146	2,931,082	2,735,235
Total Other Financing Sources (Uses)	134			1,107	87

ARKANSAS SOYBEAN PROMOTION BOARD
SCHEDULE OF BUDGET AND ACTUAL EXPENDITURES
FOR THE YEAR ENDED JUNE 30, 2025
(UNAUDITED)

Schedule 3

	General Fund			
	Budgeted Amount			Variance With Final Budget Positive
	Original	Final	Actual	(Negative)
AASIS DISBURSEMENTS				
Operating expenses	$ 60,500	$ 175,500	$ 69,579	$ 105,921
Grants and aids		11,257,000	9,030,184	2,226,816
Professional fees and services	2,000	367,500	365,387	2,113
Research and development	8,237,500			
TOTAL AASIS DISBURSEMENTS	$ 8,300,000	$ 11,800,000	9,465,150	$ 2,334,850
Reconciliation to total expenditures:				
Net accruals			(2,061,664)	
Reclassification of expenditures to reduction of revenues			(4,159,777)	
TOTAL EXPENDITURES			$ 3,243,709	

ATTACHMENT 3

Joint Funding Proposal for Promotion of Education on Corn, Sorghum, and Soybeans for Arkansas 4-H and FFA Youth

September 25, 2025

From:	Arkansas 4-H Foundation Arkansas FFA Foundation
To:	Arkansas Corn and Grain Sorghum Board Arkansas Soybean Promotion Board
Support Level:	Up to $15,000 per commodity board
Program of Support:	2026 Commodity Classic (San Antonio, Texas)
Impact:	Arkansas State 4-H and State FFA Officers
Dates:	February 25-27, 2026

Proposal

- The Arkansas Corn and Grain Sorghum Board and the Arkansas Soybean Promotion Board jointly and equally provide funding to sponsor each state officer delegation, 4-H and FFA, including up to seven state 4-H officers and six state FFA officers, staff, or chaperones, to attend the 2026 Commodity Classic.
- Funding will cover transportation, lodging, meals, registrations, tours, admissions, and other related expenses necessary to achieve the goals of this proposal.
- The Arkansas Corn and Grain Sorghum Board and the Arkansas Soybean Promotion Board will each receive a summary and receipts of expenses incurred. These expenses will be divided equally between the boards not to exceed $15,000 per board. Unused expenses will not be transferred to the following year.
- State 4-H and State FFA officers will be available to attend each commodity board's meeting after the event to present on their time at the 2026 Commodity Classic.

2025-2026 Arkansas 4-H and FFA State Officers

2024-2025 State FFA Officers presenting to the Arkansas Soybean Promotion Board about their time at the 2025 Commodity Classic.

Importance

By supporting this proposal, the Arkansas Corn and Grain Sorghum Board and the Arkansas Soybean Promotion Board will directly invest in preparing the next generation of advocates, producers, and leaders for your industries.

Arkansas 4-H has over 130,000 Arkansas youth who participate in 4-H programs per year in all 75 counties in the state.

Arkansas FFA has over 18,000 FFA members and is in 80% of school districts in the state. Arkansas FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through agricultural education.

The Commodity Classic is unlike any other event in agriculture. Your support ensures Arkansas 4-H and FFA officers are among the select few student leaders nationwide who experience this event and return ready to share that knowledge across our state. This investment not only develops future agricultural leaders but also creates ambassadors for corn, sorghum, and soybeans who will share their Commodity Classic experiences with thousands of peers when they return to Arkansas.

4-H and FFA pride themselves in a learning by doing model, where members actively participate in projects, events, competitions, and real-world experiences. Attending the Commodity Classic provides members a rare opportunity to witness grassroots advocacy and agricultural innovation firsthand. It provides excellent networking among agricultural industries. It showcases the most up-to-date technology. This show is the premier, production agriculture focused event showcasing how an idea, need, or a problem can be addressed through partnership, collaboration, and advocacy.

According to the most recent Census of Agriculture, the average age of an Arkansas farmer is 57.6, an increase from the previous census.[1] The membership of both 4-H and FFA are increasing. These members are developing a love of agriculture and rural Arkansas. By engaging them at the Commodity Classic and having them subsequently attend the respective Commodity Board Meetings will inspire career paths in farming and agriculture—helping ensure a strong future workforce as today's farmers age.

Commodity Classic is unlike any other event in agriculture. With your support, the state officers will experience:

- **Incredible insight** through a full slate of educational sessions designed to showcase efficiency, profitability, and continual improvement.
- **Eye-opening innovation and technology** showcased in the huge trade show—where they will see the latest advancements and understand the wide variety of careers in agriculture.

[1] USDA NASS 2022 Census of Agriculture, https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/Arkansas/st05_1_052_052.pdf.

- **Visionary thought leaders** and innovators in agriculture who will challenge the way they think about and advocate for agriculture.
- **The spectacular energy** of being around thousands of positive, talented farmers who share a passion for agriculture and knowledge.

Conclusion

Thank you for your previous support, allowing the 4-H and FFA state officers to attend the 2025 Commodity Classic. We respectfully request your investment of up to $15,000 per commodity board to make this opportunity possible for 2026. Together, we can prepare the next generation of leaders who will champion Arkansas corn, sorghum, and soybean industries in Arkansas.

Respectfully Submitted,

Debbie Nistler

Taylor Wiseman

Debbie Nistler
Assistant Vice President-4-H Youth Development
University of Arkansas Division of Agriculture
2301 South University Ave.
Little Rock, Arkansas 72204
501-671-2111
dnistler@uada.edu

Taylor Wiseman
Executive Director
Arkansas FFA Foundation
301 Catherine Park Road
Hot Springs, Arkansas 71913
501-463-1417
taylor.wiseman@arkansasffa.org

ATTACHMENT 4

ARKANSAS SOYBEAN PROMOTION BOARD

Communications Report

Q1 | November 2025

Presented by The Communications Group

Overview

- Website
- Paid Social
- Organic Social
- Newsletter
- Public Relations
- Field to Film
- Exhibit

Website July 1 - Sept 30, 2025

Overview

9,292 Sessions
9,230 Sessions in 2024

Most Visited Pages:

1. Grow for the Green
2. Home
3. Taylor Wiseman*
4. Herbicide Resistance & Weed Control
5. Bioherbicides Targeting Pigweed

*Paid social media

1.52 Pages viewed per Session:
4.51 Pages viewed per session July - Sept. 2024

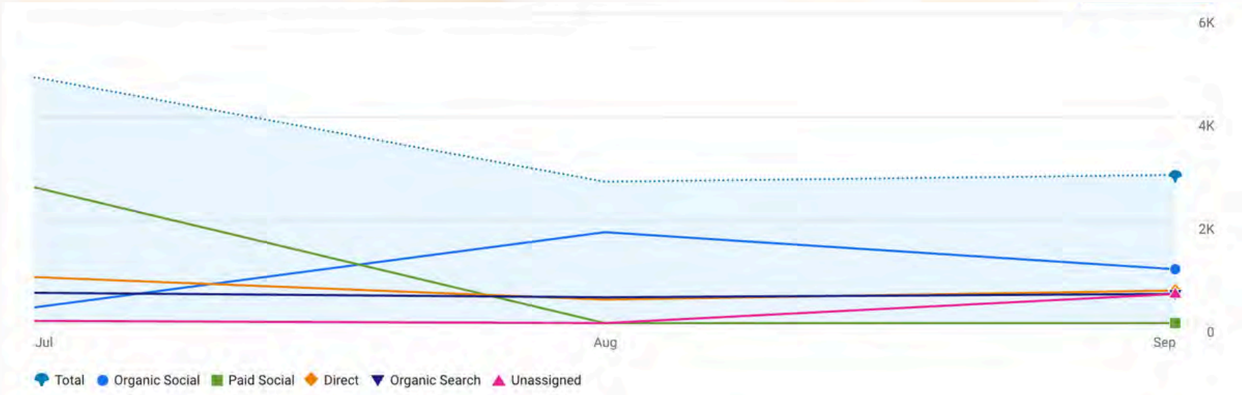
Updates:

- Articles/Newsletters added to Trending
- GFTG & 100 Bushel Club Pages

79.23% Bounce Rate - A bounce rate above 55% may indicate the need to improve visitor engagement.

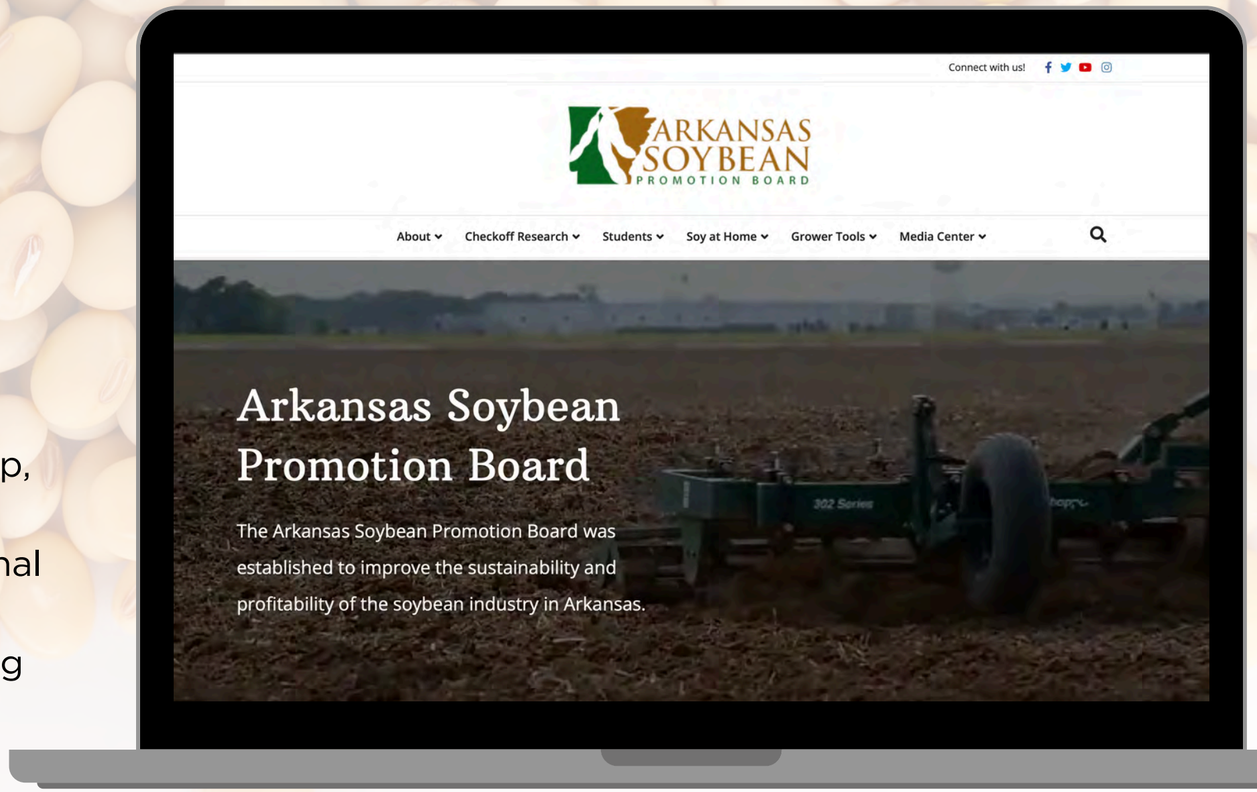
Top Sources:

1. Organic Social
2. Paid Social
3. Direct



Website

Audit Results Overview



Overview:

A comprehensive audit of TheMiracleBean.com across desktop, iOS, and Android identified several issues, including outdated content, broken links, layout inconsistencies, and non-functional media. The desktop version functions well, but mobile testing revealed display errors, missing header images, and formatting inconsistencies on team member and resource pages.

Next Steps: 3-4 weeks

- Prioritize security and contact updates to ensure visitor trust and communication reliability.
- Refresh outdated content, including research, Census data, and media updates, to maintain relevance.
- Improve mobile experience by resolving header image visibility, layout gaps, and cut-off issues.
- Restore non-functional databases and embeds for seamless access to research tools and archives.
- Perform cross-device QA to ensure uniform performance and visual presentation across desktop, iOS, and Android.

Paid Social

Overview - 3 Campaigns

July through September

478,582 Total Impressions
(July through Oct. 2024: 406,099 Impressions)

168,789 Total Reach
(July through Oct. 2024: 144,267 Reach)

30,127 Total Page Engagements
(July through Oct. 2024: 36,783)

6,226 Total Link Clicks
(July through Oct. 2024: 5,518 Clicks)

Paid Social

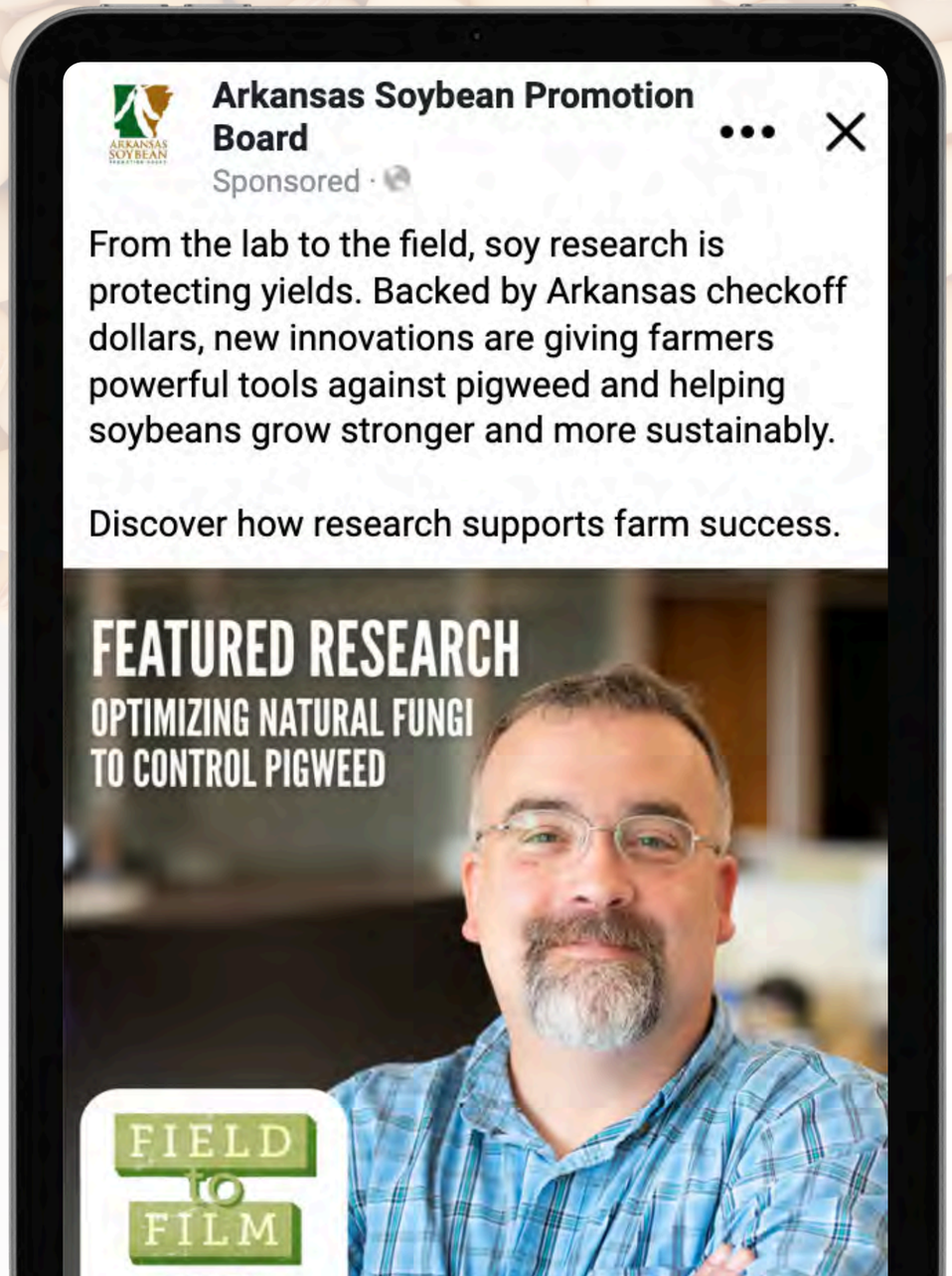
Producer Campaign

169,642 Impressions
(July through Sept. 2024: 173,667)

80,748 Reach
(July through Sept. 2024: 66,379)

18,298 Page Engagements
(July through Sept. 2024: 22,911)

2,057 Link Clicks
(July through Sept. 2024: 1,921)



Paid Social

Consumer Campaign

140,071 Impressions
(July through Sept. 2024: 141,839)
49,652 Reach
(July through Sept. 2024: 48,945)
3,777 Page Engagements
(July through Sept. 2024: 3,089)
2,956 Link Clicks
(July through Sept. 2024: 2,841)

Paid Social

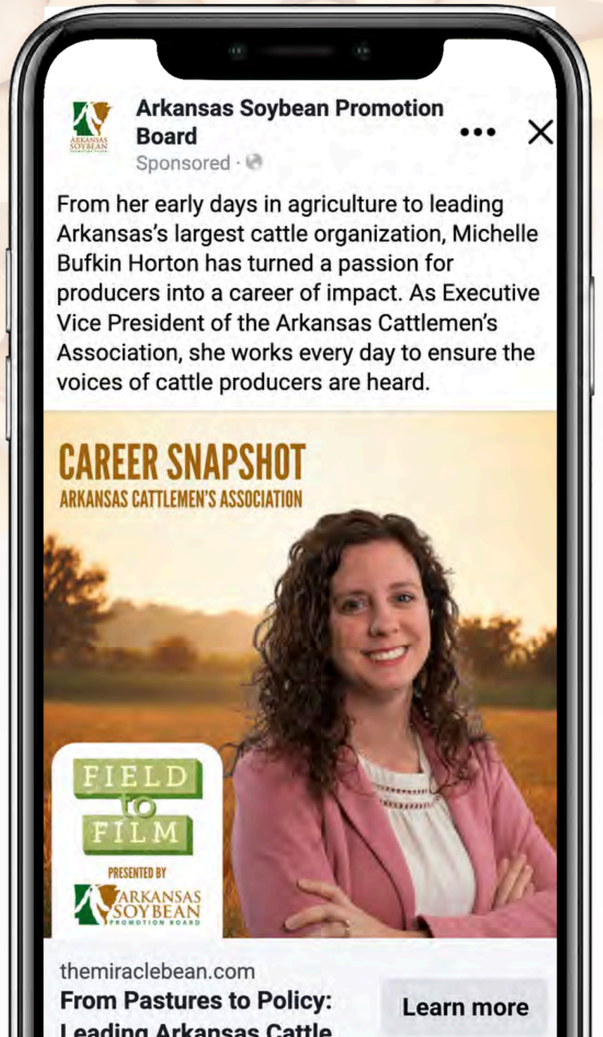
Student Campaign

168,869 Impressions
(July through Sept. 2024: 90,593)

38,389 Reach
(July through Sept. 2024: 28,943)

8,052 Page Engagements
(July through Sept. 2024: 10,783)

1,213 Link Clicks
(July through Sept. 2024: 756)



Paid Social

Soy-tenniel Campaign

315,665 Impressions

98,807 Reach

1,516 Page Engagements

1,491 Link Clicks

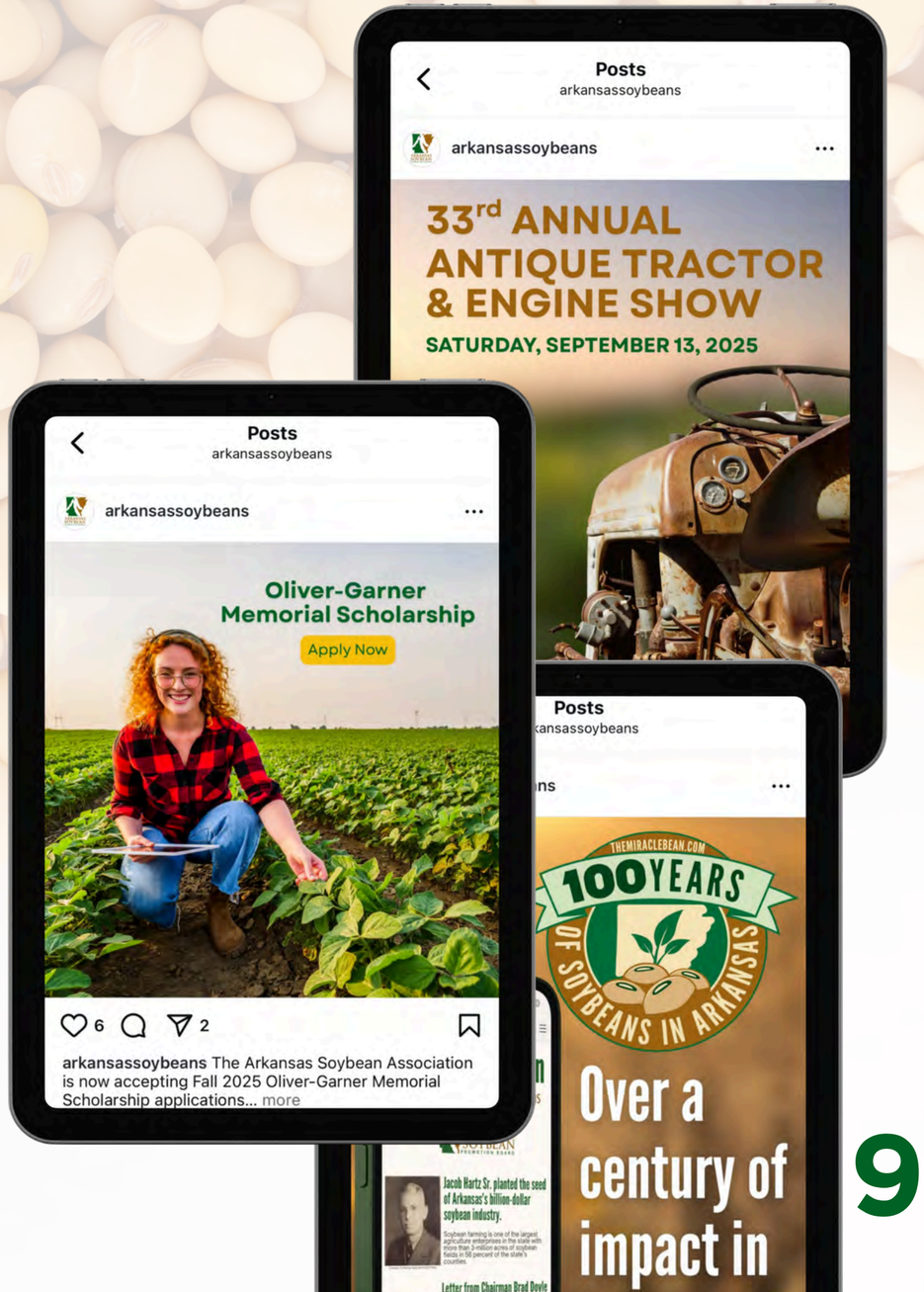
Organic Social Media

Overview

75 Posts (July-Sept. 2024: 91 Posts)

24,586 Impressions (July-Sept. 2024: 13,263 Impressions)

1,827 Engagements (July-Sept. 2024: 493 Engagements)



Organic Social Media

Facebook

24 Posts (July-Sept. 2024: 37 Posts)

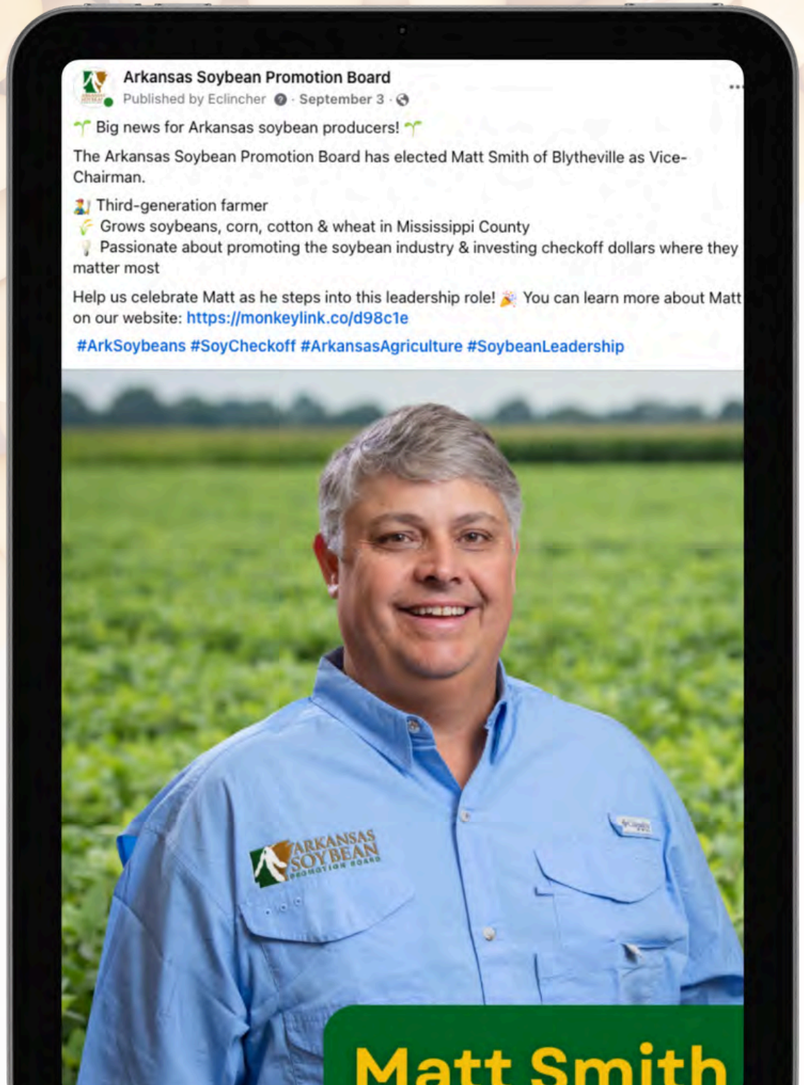
116,873 Impressions (July-Sept. 2024: 9,409 Impressions)

1,668 Engagements (July-Sept. 2024: 252 Engagements)

Top Performing Post:

4,626 Reach

18.94% Engagement Rate



Organic Social Media

Instagram

23 Posts (July-Sept. 2024: 26 Posts)

5,378 Impressions (July-Sept. 2024: 3,854 Impressions)

120 Engagements (July-Sept. 2024: 167 Engagements)

Top Performing Post:

279 Reach

5.02% Engagement Rate

Organic Social Media

X (Twitter)

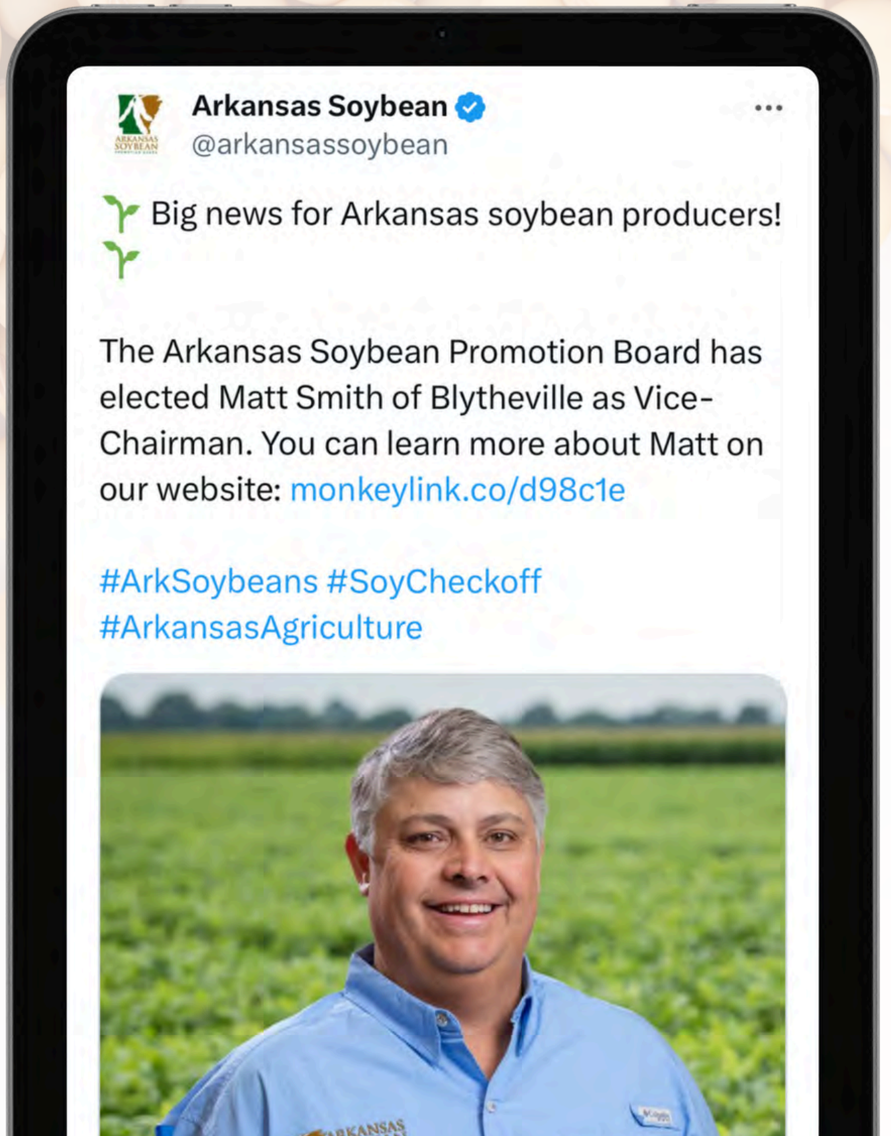
28 Posts **(July-Sept. 2024: 28 Posts)**

2,335 Impressions **(July-Sept. 2024: N/A)***

39 Engagements **(July-Sept. 2024: 74 Engagements)**

Top Performing Post:

333 Impressions



*Data not available

Bean Brief

July

Subject Line: Don’t Miss Out: Grow for the Green Deadline is August 1

- 1,100 Sends
- 409 Opens
- 37.90% Open Rate
- 17 Clicks

August

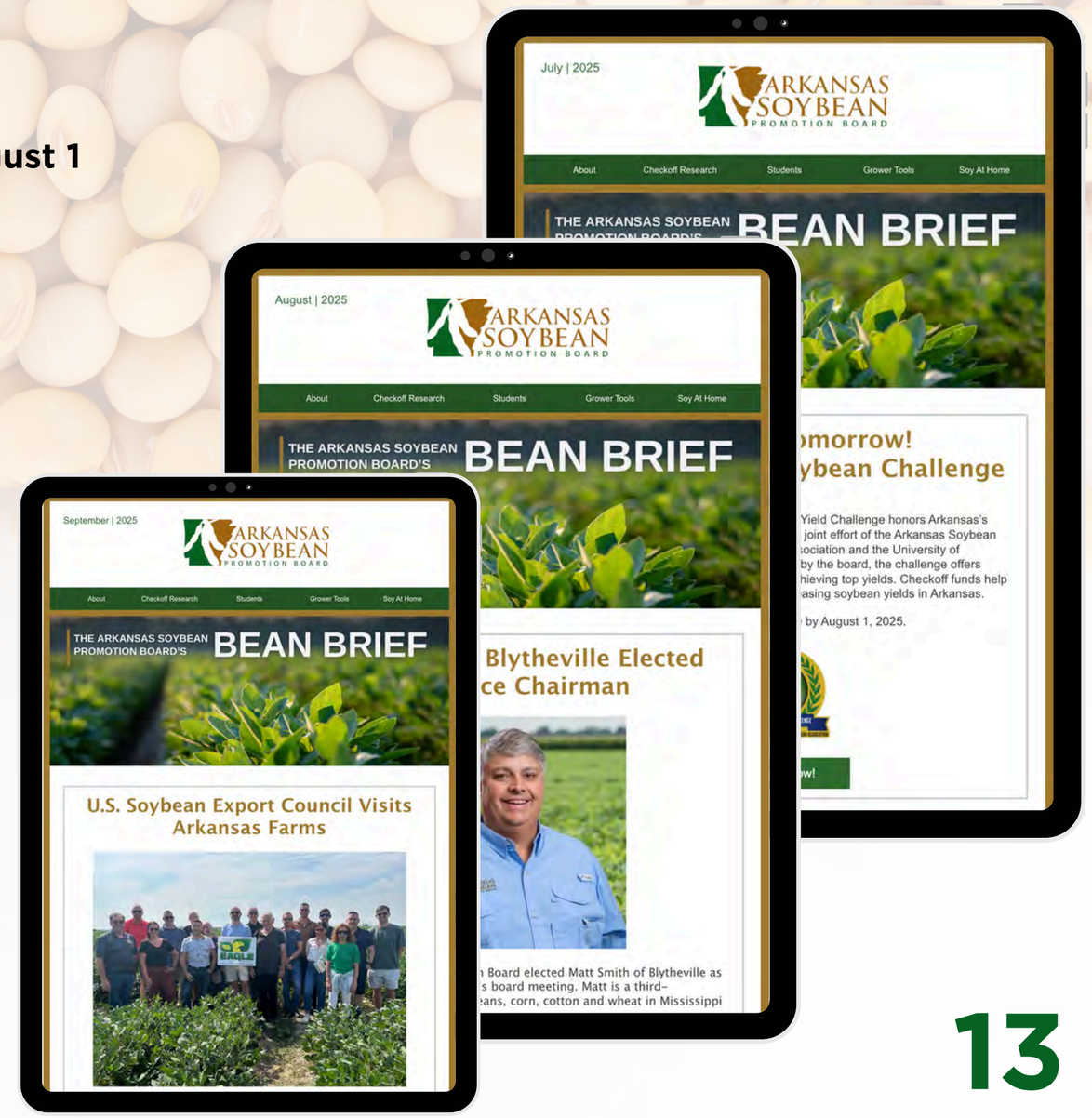
Subject Line: Matt Smith of Blytheville Elected ASPB Vice Chair

- 1,104 Sends
- 459 Opens
- 32.90% Open Rate
- 25 Clicks

September

Subject Line: Arkansas Hosts USSEC Visitors from Europe

- 1,097 Sends
- 448 Opens
- 41.90% Open Rate
- 19 Clicks



Public Relations

Media Coverage Wins

- **47 stories generated | 26 media outlets | 8,313,787 potential impressions**
- 3 news releases distributed and monitored:
  - Soybean Science Challenge Winners
  - Matt Smith Elected Vice-Chairman
  - Soybean Science Challenge 2026 Open

Events Attended

- Arkansas Cattlemen's Association Convention
- Antique Tractor and Engine Show

Prepared for What's Next

- Planned Arkansas Soybean Month, collaborating with the Arkansas Department of Agriculture for the Governor's proclamation and scheduling segments on KATV Good Morning Arkansas
- Drafted Jim Carroll's nominations for the Tom Oswald Legacy Award and Arkansas Agriculture Hall of Fame, emphasizing his contributions to the soybean industry

Field to Film

Career Snapshot & 100 Bushel Club Highlight

Career Snapshot

- Mike Freeze - Keo Fish Farm
  - Scheduled to film
- Daniel Russell - Cunningham Bros. Logging LLC
  - Scheduled to film
- TBD

100 Bushel Club Highlight

- David Strohl - Filmed
- Bubba Sink - Filmed
- Taylor Burdette - Scheduled to film

The Miracle Bean

100 Years of Soybeans in Arkansas Exhibit

Schedule

- Museum of the Arkansas Grand Prairie
  - November 2025 - May 2026
- Arkansas State Capital Museum
  - October - November 2026

In addition,

- Will coordinate with Museum of the Arkansas Grand Prairie to determine permanent home for exhibit

COMMUNICATIONS GROUP
Marketing | Public Relations
POWERING INSIGHT

Carson Horn, APR
chorn@comgroup.com
501-515-0849

ATTACHMENT 5

Clean Fuels
ALLIANCE AMERICA

October 16, 2025

Col. Corey Seats / Amy Lyman
Arkansas Department of Agriculture (Arkansas Soybean Promotion Board (ASPB))
1 Natural Resources Drive
Little Rock, AR 72205

Dear Corey/Amy,

Thank you for being a member, the mission of Clean Fuels Alliance America (Clean Fuels) is to advance the interests of its members by creating sustainable biodiesel, renewable diesel and sustainable aviation fuel industry growth. Clean Fuels serves as the industry's central coordinating entity and is the single voice for its diverse membership base. Industry growth will be achieved through public affairs, communications, technical and quality assurance programs. We are dedicated to inclusiveness and integrity. This will give your board an idea of the membership and level of talent we are putting together to move this industry forward.

Thank you,

Brad Shimmens
Director of Operations and Membership
Clean Fuels

PROJECT DESCRIPTION

Clean Fuels Alliance America FY2026 Membership - $10,000

At Clean Fuels, we're working toward a future of clean energy now that will make our members proud. We serve as the clean energy industry's primary organization for technical, environmental, and quality assurance programs and are the strongest voice for its advocacy, communications and market development. Serving as the coordinating body for research and development in the U.S., the member driven organization represents the entire renewable fuels supply chain and is comprised of state, national and international feedstock and feedstock processor organizations, biodiesel, renewable diesel and sustainable aviation fuel producers/suppliers, fuel marketers, distributors, and technology providers.

Mission Statement
Representing biodiesel, renewable diesel and sustainable aviation fuel, Clean Fuels Alliance America will advance the interests of its members by supporting sustainable biodiesel, renewable diesel and sustainable aviation fuel industry growth. Clean Fuels serves as the industry's central coordinating entity for technical, environmental and quality assurance programs and will be the strongest voice for its advocacy, communications and market development.

Vision
Biodiesel, renewable diesel and sustainable aviation fuel will be recognized as mainstream low-carbon fuel options with superior performance and emission characteristics. In on-road, off-road, air transportation, electricity generation and home heating applications, use will exceed 6 billion gallons by 2030, avoiding over 50 million metric tons of CO2 equivalent greenhouse gas emissions annually. With advancements in feedstock, use will reach 15 billion gallons by 2050.

To accomplish this mission and vision, Clean Fuels needs the soybean Industry's help to perform both core member services that are needed every year, industry technical research, and our program roles, which change as the needs of industry change.

How does this project benefit Arkansas soybean farmers?

Clean Fuels has 141 members paying dues, 32 of those Clean Fuels Ag & Industry members pay a flat of $10,000 per year. 25 producer members pay volume dues that total approximately $4 million dollars per year. Other members are Marketers and Organization members.

ASPB has been a member of Clean Fuels since December 1, 2002, and has had representation on the Elected Governing Board in previous years, with Robert Stobaugh. ASPB is one of 28 Qualified State Soybean Boards to be members and supporters of Clean Fuels.

Growth of biodiesel and renewable diesel use has been key to increasing net income at the soybean producer level as well as throughout the value chain. As a soybean producing state, Arkansas has benefited directly from increased production and use of biodiesel and renewable diesel. The United Soybean Board (USB), calculation reviewed by USDA-Agricultural Marketing Service, conducted an enterprise value analysis to uncover the share of the value of United States (U.S.) soybean production that can be attributed to biodiesel and renewable diesel over time. It utilized data from the USDA for crop production and prices and the USB on the breakdown of meal and oil consumption by end use. It took a top-down approach to allocate the value of the crop production to soybean oil sold into biodiesel and renewable diesel production. Of the $52.6 billion in total value in marketing year 2023/24, $17.8 billion was generated from soybean meal production, $11.5 billion was generated from production of soybean oil and remaining amounts for the export and other markets. Since approximately 47% of the soybean oil produced in the U.S. was used for biofuels in MY2023/24, biodiesel and renewable diesel accounted for about 10% of the total production value generated by U.S. soybean farmers. Stated differently, biodiesel and renewable diesel accounted for $1.30 of the value of a bushel of soybeans in marketing year 2023/24. This estimate attributes a portion of the soybean oil's value to biofuel demand, highlighting the significant role of biofuels in soybean pricing. However, this $1.30 is an attribution rather than a direct causal effect; if biofuel demand were to cease, soybean prices would not automatically decrease by this amount. Market dynamics such as supply adjustments and demand elasticity would instead lead to a new price equilibrium.

In 2024, Arkansas produced approximately 166 million bushels. Based on this, biodiesel and renewable diesel accounted for $215.9 million in value for Arkansas producers. At the farm level, biodiesel and renewable diesel accounted for almost $35,750 of value for a grower with 500 acres of soybeans. In addition, the U.S. biodiesel and renewable diesel industry now supports more than 107,000 jobs nationwide. In Arkansas, this translates to $672 million in economic activity, almost 1,700 jobs supported, and more than $94 million in wages.

Looking forward, this project, and others being proposed by Clean Fuels, will help ensure year-over-year growth needed to meet the Clean Fuels vision to use six billion gallons by 2030 with significant increases in the use of soybean oil as the industry's primary feedstock for production biodiesel, renewable diesel, sustainable aviation fuel and Bioheat® fuel. The planned outcome of the overall Clean Fuels effort will be to increase 2026 soybean oil use in these markets by more than 800 million pounds from 2025 usage, as benchmarked by federal data sources such as USDA and DOE's Energy Information Administration.

Other Membership Benefits

- Access to an expert Clean Fuels team, along with contractors from across the country.
- Opportunity to impact the future direction of the industry by attending industry development meetings and receiving member-only communications.

• Opportunity to represent Clean Fuels at strategic meetings, hearings, trade shows and other events.
• Receive frequent updates on state & federal biodiesel, renewable diesel and/or sustainable aviation fuel legislation.
• Be listed on the Clean Fuels website.
• Networking opportunities.
• Fuel suppliers are provided with leads & updated distribution lists of fuel Producers & Distributors from the Clean Fuels website.
• Access to Clean Fuels promotional materials such as publications, information kits, signs and tradeshow materials at cost.
• Marketing & technical support through expert advice.
• Industry/petroleum coordination support.

Budget – $10,000 Annual Dues

ATTACHMENT 6

ARKANSAS DEPARTMENT OF AGRICULTURE

Sarah Huckabee Sanders
Governor

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

Wes Ward
Secretary of Agriculture

October 7, 2025

Brad Doyle
Arkansas Soybean Promotion Board
1 Natural Resources Drive
Little Rock, AR 72205

Dear Mr. Doyle,

On behalf of the Arkansas Department of Agriculture, I want to thank you for your support of the 2025 National Association of State Departments of Agriculture (NASDA) Annual Meeting in Rogers, Arkansas. With your sponsorship, the event was a huge success, drawing record-breaking attendance.

We were honored to host Governor Sarah Huckabee Sanders as she welcomed United States Secretary of Agriculture Brooke Rollins as well as agricultural leaders from across the nation to Arkansas. Attendees consistently shared how much they enjoyed their time in our state, leaving with a deeper appreciation for Arkansas, our producers, and our agriculture industry.

As part of the meeting, we were also pleased to host a group of 33 foreign agriculture attachés from 23 countries plus the European Union and United Kingdom. This provided a valuable opportunity for tours and building partnerships focused on international agricultural trade.

I am proud to have had the opportunity to service as NASDA President, and your support made it possible to highlight Arkansas on a national stage. I am truly grateful for your investment not only in this meeting but also in the future of agriculture in our state and across the country.

Thank you again for your generous support and for helping make the 2025 NASDA Annual Meeting one of the most memorable in the organization's history.

Respectfully,

Wes Ward
Secretary of Agriculture
State of Arkansas

DIVISION OF AGRICULTURE

RESEARCH & EXTENSION

University of Arkansas System

Arkansas Soybean Promotion Board
Fall Report
2025

Soybean Promotion Board 2025-2026 Report **Date of Report:** 10/10/2025

Title: Development, Evaluation and Production of Agricultural Biologicals for Arkansas Crop Production
Lead Investigator: Dr. Burt Bluhm
Co-Investigator: Dr. Kelly Cartwright
Status: New; Year 1 of 3
Objectives:

1. Evaluate the efficacy of commercial microbials in major Arkansas crops, including soybean production.
2. Isolate and develop novel, Arkansas-based agricultural microbials customized for our major crops, including soybean.
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.

Progress/Accomplishments:

In Year 1 of this project, we have initiated work on all three project objectives. For Objective 1, we were faced with the challenge of sorting through/prioritizing a large number of microbial products currently on the market, as field testing all of them is not feasible. To obtain an initial idea of which products should be evaluated at a field scale, preliminary greenhouse testing is underway. Greenhouse testing is not feasible to assess yield, but other important parameters that can be assessed such as stand establishment, seedling vigor, and plant health in vegetative stages are likely to translate well to field conditions. Conversely, lack of plant responsiveness in greenhouse conditions is a reasonable predictor that the product is less likely to be effective in field conditions. For Objective 2, we have made substantial progress in the development of a biological control agent for Hemp sesbania (coffeeweed). This fungal pathogen specifically targets and infects Hemp sesbania, with no effect on soybean or other common row crops grown in Arkansas. The pathogen kills juvenile plants extremely effectively, and can kill more mature plants as well as infecting/destroying seeds/pods during reproductive development. For Objective 3, we leveraged funds from this project and obtained a state-of-the-art, pilot-scale 5L biofermenter. We are currently setting up the biofermenter and anticipate it to be fully ready for use later this fall.

Upcoming Actions/Activities:

Through the fall and winter, we will continue efforts on all three objectives. We will use the findings from the greenhouse evaluations to prioritize commercial agricultural biologicals and this winter we will design field experiments in multiple locations throughout the state to evaluate existing products. For the second objective, we are preparing Invention Disclosure paperwork regarding the potential mycoherbicide targeting Hemp sesbania, and we will continue working to develop and optimize the organism for biological control. For the third objective, we will continue to build physical capacity for the development of novel agricultural biologicals by sourcing needed, gently-used equipment at a fraction of retail price.

Soybean Promotion Board 2025-2026 Report **Date of Report:** 10/10/2025

Title: Optimization of fungal pathogens AF22 and AF24 as bioherbicides for Palmer amaranth (pigweed)
Lead Investigator: Burt Bluhm, UADA-Fayetteville
Co-Investigator: Kelly Cartwright, Agricultural Research Initiatives, Inc.
Status: Year 3 of 3
Objectives:

1. Develop isolates AF22 and AF24 as biological control agents/bioherbicides of pigweed.
2. Identify host-specific toxins produced by isolates AF22 and AF24 for bioherbicide development.
3. Actively pursue commercialization of bioherbicide products derived from AF22 and AF24.

Progress/Accomplishments:

Since the last report, we have been working to advance all three project objectives. For the first objective, greenhouse and outdoor microplot experiments have been performed (and are currently underway) to evaluate the most effective ways to apply/formulate AF22 and AF24 as potential mycoherbicides targeting Palmer pigweed. We are focusing on optimizing both the lethality and consistency of AF22 and AF24 as mycoherbicides across genetically diverse populations of Palmer pigweed. For the second objective, we have been working with the Arkansas Statewide Mass Spectrometry Facility to define the structure of the phytotoxin. Samples prepared thus far require additional purification before structural analysis can be performed. Thus, we have refined the process to purify the putative phytotoxin (based on bioactivity) to a level that is suitable for structural characterization. We are also using computational biology approaches to study the AF22 and AF24 genomes in order to identify the biosynthetic gene cluster responsible for toxin production. For the third objective, we are finalizing an Invention Disclosure with the UADA intellectual property team to advance the commercialization process and have been in communication with several potential industry partners who specialize in the development and commercialization of agricultural biologicals.

Upcoming Actions/Activities:

We recently partnered with Dr. Ahmad Fakhoury, Professor at Southern Illinois University, to accelerate progress and expand the scope of the research. We are working this fall with Dr. Fakhoury's group to collect additional strains of the AF22 and AF24 pathogens from Illinois and other states. We will collaborate to evaluate the efficacy of AF22, AF24, and novel strains on water hemp, a close relative of Palmer pigweed. We will continue to work on all three project objectives throughout the fall and winter, with a goal of obtaining a preliminary structural identification of the phytotoxin before the end of calendar year 2025. We will also work to organize a multi-state project focused on creating mycoherbicides targeting Palmer pigweed.

Title: Arkansas Soybean Performance Trials
Lead Investigators: John Carlin
Co-Investigators:
Status: Year 3 of 3
Objectives:

1. **To evaluate the performance of soybean varieties and breeding lines across eight locations within the State of Arkansas**
2. **To measure protein and oil composition of soybean varieties entered into the Arkansas Soybean Performance Trials**
3. **To enable abiotic (chloride and metribuzin) and biotic (disease screening) screening of the varieties by collaborating PIs.**

Progress/Accomplishments:

Soybean Performance Trials were well maintained by the Research Station and ACVIP staff throughout the growing season. Plots were visited regularly, and any irregularities were noted. Watermark® soil moisture sensors were installed at each test location, with soil moisture monitored daily and any irrigation needs communicated promptly to the research station's Directors and staff. Pre-Harvest notes (plant height, maturity, lodging, and shattering) are underway and will be completed by October 17th.

The Full Season Early MG4 tests (conventional and non-conventional) were harvested at Keiser on October 3rd, and the preliminary data are shown in Tables 1 and 2 below:

Table 1. Preliminary Yields (bu/ac) of Non-Conventional Early Maturity Group IV Soybean Cultivars in Arkansas Performance Tests, 2025.

		Irrigated						
Variety/Experimental Line	Herbicide Technology	Relative Maturity	Keiser	Kibler	Newport	Pine Tree	Stuttgart	Mean
AG43XF5	XtendFlex	4.3	86.7					
AG44XF4	XtendFlex	4.4	85.1					
AG45XF3	XtendFlex	4.5	68.3					
Armor 44-F46S	XtendFlex	4.4	85.5					
Armor 45-E56	Enlist E3	4.5	80.4					
Armor 45-F86S	XtendFlex	4.5	83.6					
Dyna-Gro S43XF85S	XtendFlex/STS	4.3	81.1					
Gateway 457XFS	XtendFlex	4.5	80.6					
Innvictis A4534XF	XtendFlex	4.5	89.6					
Innvictis B4553E	Enlist E3	4.5	83.6					
Integra XF4454S	XtendFlex	4.4	80.0					
Integra XF4585S	XtendFlex	4.5	81.0					
Pioneer P43Z44SE	Enlist E3/STS	4.3	69.5					
Pioneer P44Z67BE	Enlist E3/Bolt	4.4	83.2					
Pioneer P45Z75E	Enlist E3	4.5	82.0					
R23PR-00036E	Enlist E3	4.5	57.6					
R23PR-00043E	Enlist E3	4.3	66.0					
R23PR-00045E	Enlist E3	4.4	66.6					
R23PR-00055E	Enlist E3	4.5	64.6					
R23PR-00091E	Enlist E3	4.4	71.1					
R23PR-00100E	Enlist E3	4.4	69.6					
Revere 39-F94	XtendFlex/STS	3.9	79.1					
Revere 44-F44	XtendFlex/STS	4.4	87.2					
USG 7435XFS	XtendFlex/STS	4.3	78.5					
		Grand Mean	**77.5**					
		LSD	**4.4**					
		C.V.	**4.2**					

Table 2. Preliminary Yields (bu/ac) of Conventional Early Maturity Group IV Soybean Cultivars in Arkansas Performance Tests, 2025.

		Irrigated						
Variety/Experimental Line	Herbicide Technology	Relative Maturity	Keiser	Kibler	Newport	Pine Tree	Stuttgart	Mean
Confluence Genetics BH39A150	Conventional	3.9	67.4					
Confluence Genetics BH39A232	Conventional	3.9	68.6					
Confluence Genetics BH45Q208	Conventional	4.5	60.4					
Confluence Genetics BX39C784	Conventional	3.9	71.0					
Confluence Genetics N44D923S	Conventional	4.4	66.3					
R18C-1877:0017	Conventional	4.2	51.7					
R19C-1035	Conventional	4.5	52.3					
R20C-1516	Conventional	4.3	57.7					
R21C-02295	Conventional	4.3	65.8					
R22KB-00989	Conventional	4.4	64.9					
R22KB-02989	Conventional	4	59.5					
R22KB-07724	Conventional	4	70.5					
R22KB-09998	Conventional	4.5	64.7					
R22KB-17158	Conventional	4	51.3					
S21-11102	Conventional	4.5	66.8					
S21-20276	Conventional	4.2	61.8					
S21-22067	Conventional	4	67.6					
		Grand Mean	**62.8**					
		LSD	**4.5**					
		C.V.	**5.1**					

Upcoming Actions/Activities:

The early-planted tests at Harrisburg and Stuttgart will be harvested early in the week of October 13th. Harvest of the full-season tests at Keiser will resume on Monday, October 13th, with harvest of the full-season tests projected to begin at Rohwer, Mariana, Harrisburg, and Newport during the week of the 13th. Full-season soybean plots at Stuttgart, Kibler, and Pinetree are continuing to mature, and harvest is anticipated the week of October 20th.

Data will be analyzed immediately following harvest, with preliminary yields posted on the website and emailed to test participants, with a target date of October 31st. Envelopes have been prepped for protein and oil composition sampling at Kibler. Samples will be collected at harvest and analyzed after the publication of preliminary yield data. Afterwards, yield, and abiotic and biotic screening data will be compiled and published in a Research Series report.

Title: Evaluating Planting Date Decisions in the Soybean/Rice Rotation
Lead Investigators: Justin Chlapecka
Co-Investigators: Jeremy Ross, Jarrod Hardke, Brad Watkins
Status: New
Objectives:

1. To evaluate the agronomic effect of planting date on different soybean maturity groups in Arkansas, including plant height and yield.
2. To determine the total return of planting soybean at different planting dates.
3. To examine the economic cost/benefit of planting decisions in the soybean/rice rotation system when utilizing hybrid rice any inbred varieties.

Progress/Accomplishments: The trial has been fully implemented at the Northeast Rice, Research, and Extension Center (NERREC). Three varieties are being used for the trials: Becks 3997XF, 4661XF, and 4991XF, with the maturity group denoted by the first two numbers of the variety. The soybean were planted approximately every two weeks, with exact planting dates being March 24, April 1, April 17, May 1, May 15, and June 2. Rice was also planted within one day of the soybean planting for analysis between the two crops. The March 24 soybean are at R5 while the June 2 soybean are at R2. All herbicide applications have been made and the soybean have been irrigated twice in July.

Samples were gathered from each strip plot to determine yield components including branches per plant, reproductive nodes per plant, pods per plant, seeds per pod, and seed weight. Height measurements were also taken from ten random plants in each plot. The first three planting dates were harvested on September 29, the fourth planting date was harvested on September 30, the fifth planting date was harvested on October 2, and the sixth planting date was harvested on October 3. A preliminary analysis of the data suggests that mid-April was the best time to plant soybean in 2025. The MG 4.6 soybean produced numerically more yield than both the MG 3.9 and the MG 4.9 across all planting dates other than the June planting, where the MG 3.9 yielded greatest.

Soybean Planting Date Study - behind rice						
Variety	March 24	April 1	April 17	May 1	May 15	June 2
	bu/ac					
Beck's 3997XF	41	44	64	62	62	57
Beck's 4661XF	77	66	83	73	65	50
Beck's 4991XF	60	42	74	51	48	49

Upcoming Actions/Activities: Economic analysis will follow the yield results, which are still being formally analyzed. Plant sample analysis will also begin over the fall/early winter to determine the effect of planting date on yield and agronomic characteristics.

Title: Investigating the Effect of Growth Regulators on Soybean Plant Architecture and Yield
Lead Investigators: Justin Chlapecka
Co-Investigators: Jeremy Ross
Status: New
Objectives:

1. To evaluate the effect of foliar application of different growth regulators on the yield of MG IV soybean.
2. To examine the utility of foliar application of different growth regulators in decreasing plant height of soybean while maintaining yield potential.
3. To determine the effect of foliar application of different growth regulators on the plant architecture of soybean.
4. To evaluate the optimum timing of growth regulator foliar spray to maximize the intended effect of each compound.
5. To identify if a particular growth regulator deserves additional attention and research on its utility in optimizing soybean production in Arkansas.

Progress/Accomplishments: The trial has been established at the Northeast Rice Research and Extension Center (NERREC) and the Jackson County Extension Center (JCEC). The trial at the NERREC was planted on May 10 with Becks 4777XF soybean at 137,000 seeds per acre and the V3 application of growth regulators was made on June 9. Within a few weeks after application there were visual differences, specifically with the gibberellic acid and TIBA treatments. The trial at the JCEC was planted on June 5 with an MG IV XtendFlex variety at 130,000 seeds per acre and the V3 application of growth regulators was made on June 30. No visual observations have been recorded.

The R3 growth regulator application was applied on July 18 at the NERREC and August 11 at the JCEC. Plant samples were taken at maturity for the NERREC trial on October 1 and 2, with samples taken from the first four replications. The samples will be analyzed for yield components including the number of brancher per plant, pods per plant, seeds per pod, and seed weight. Plant heights were also gathered from ten random plants in each plot. The trial at the NERREC was harvested on October 3 and is pending formal analysis.

Upcoming Actions/Activities: The trial at JCEC is at mid-R7 and we plan to collect plant samples in the week of October 13. Harvest will follow shortly after.

Arkansas Soybean Promotion Board

Project Progress Report - Arkansas Discovery Farm

October 2025

Submitted by Mike Daniels

Summary: The Arkansas Soybean Promotion granted money in 2025 to the Arkansas Discovery Farm Program that partially funds a full time Row Crop Discovery Farm Technician. The Arkansas Discovery Farm program is currently collecting water quantity and quality data from both inflow from rain and irrigation and in outflow as runoff from several row crop farms. In addition to monitoring for N and P, we are also looking at potassium (K) and sulfate. In addition to water quality and water use, we are collecting data on soil health and in 2024 soil carbon and greenhouse gas emissions at selected locations. We are investigating the effect of the addition of biochar at three locations around the state on soil water as measured by soil moisture sensors at different depths. We have added a new Discovery Farm in Desha County to investigate the effect of biochar at the field scale on runoff quality. Additionally, we installed a water quality monitoring station at the 4-H Center to foster youth educational opportunities in natural resources.

Discovery Farm Progress:

During calendar year 2025 to date, we have collected over 200 runoff samples. We continue to build a database on soybean production and runoff water quality and will be working to getting this data published and circulated via fact sheets and websites. We have developed a data analysis team of Mike Daniels, Dr. Shannon Speir and Dr. Rebecca Muenich to analyze and summarize trends of more than decade of sampling. The following Discovery Farm publications include:

- Sulfate Losses in Agriculture. UADA Fact sheet – In Review
- Sulfate-Sulfur Runoff Dynamics from Various Arkansas Agricultural Production Systems – Journal Article, draft in Internal Review
- Della Lunga, D. K.R. Brye, M.J. Mulvaney, M. Daniels, T. de Oliveira, B. Baker, T. Bradford Jr., and C.M. Arel. 2025. Cover crop effects on greenhouse gas emissions and global warming potential in furrow-irrigated corn in the Lower Mississippi River Valley. Atmosphere 16:Article 498.
- Della Lunga, D., K.R. Brye, C. Arel, and M. Daniels. 2025. Soil respiration and climate change. University of Arkansas System Division of Agriculture, Factsheet 2214, Little Rock, AR.
- Brye, J.B., K.R. Brye, D. Della Lunga, C. Seuferling, C. Arel, M. Daniels, and K. Greub. 2025. Climate-change and greenhouse gas basics. University of Arkansas System Division of Agriculture, Factsheet 2217, Little Rock, AR.

Educational Activities (Field Days / Conferences / Webinars)

- Joint Discovery Farm field day with Anheuser Busch in June with over 450 in tendance
- Climate Change Field Day held at Haak Discovery Farm in April
- NASDA Field Tour of Marley Poultry Farm (September)
- Spoke at South Central NACD conference in Hot Springs in September
- Edge-of-field In Service Training held at NERREC Center for NRCS Personnel in September
- Delivered 1-hour webinar as part of the Virtual Soil and water Field Trip in September

Summary

The Arkansas Discovery Farm programs continues to serve Arkansas Farmers by promoting stewardship efforts of Arkansas Farmers supported by data collected from real, working farms and sharing these results with producers, policy makers, and professionals that serve Arkansas. The support provided by the Arkansas Soybean Promotion Board is greatly appreciated.

Title: Development of a turn-row soybean vegetative health analysis software tool using UAS imagery for production decision support.
Lead Investigators: Jason Davis, Extension Specialist in Remote Sensing and Pesticide Application

Co-Investigators:
Status: New, Year 2 of 3

Objectives:

(1) Collect drone imagery of production fields in parallel with the verification program efforts.

(2) Correlate remotely sensed measurements with ground referenced information already being collected with the verification program.

(3) Develop and release a user-friendly software package that leverages the validated workflow for producers, consultants, and agents to use.

Progress/Accomplishments:

1. Drone imagery has been collected throughout (June – August) in 3 - 4 verification fields in conjunction with verifications programs scouting events used as part of workflow validation.
2. A user-friendly software package (downloadable executable program) developed last year has had continued development to produce turn-row field maps and reports for field health as measured by canopy closure and relative vegetative health.
3. 40-acre flights have been reduced from 30 min to less than 3 with the proposed workflow and processing has been reduced from 1+ hours to less than 30 seconds providing true turn-row processing.
4. Targeted mapping analysis has highlighted relative variations in crop canopy estimates, analysis of variations in canopy closure and vegetative health across fields which inform real-time scouting efforts.

Upcoming Actions/Activities:

1. A quantitative analysis of year 2 data will be conducted to validate the accuracy of maps produced by processing in both the proposed “turn-row” workflow and in a traditional workflow to compare the accuracies, computing requirements, and time demands of each.
2. I will be working with UADA IT department over the winter regarding required accessibility compliance and modifying program accordingly.

Soybean Promotion Board 2025-2026 Report Date of Report: 10-10-2025

Title: **Economic Analysis of Soybean Production and Marketing Practices**
Lead Investigators: **Dr. Brian Deaton, Associate Professor**
Co-Investigators:
Status: **Active**

Objectives: The overall objective is to provide an economic analysis for proposed projects and other SPB funded projects that would benefit from economic analysis. Specific objectives are:
A. Conduct an economic analysis of production practices used in the Arkansas Soybean Research Verification Program that impact profitability and verify Extension recommendations.
B. Standardize the economic analysis by integrating the 2024 soybean verification program data with data from previous years. This will continue to document the long-term benefits of the Arkansas Soybean Research Verification Program.
C. Provide Arkansas soybean market summaries for publication on the "Row Crops Blog" online newsletter.

Progress/Accomplishments:
A. The economic analysis process for the 2025 ASRVP is ongoing. Data is being gathered for the fields that are in production. This data includes soybean varieties, herbicides, insecticides, fungicides, fertilizers, and additives/adjuvants. We are waiting to receive final field data from the verification coordinators. Arkansas soybean market price data is continuing to be collected, processed, analyzed, and distributed weekly via the Arkansas Row Crops blog.
B. The 2024 verification data is being merged into a historical database that contains data back to 1983.
C. Ongoing

Upcoming Actions/Activities:

- Record yield and remaining input data as the SRVP coordinators disseminate it.
- Gather price data for input prices.
- Arkansas soybean weekly market price reports containing both cash market and new crop booking prices will continue to be published on the "Row Crops Blog" online newsletter throughout the remainder of the year.

Soybean Promotion Board 2025-2026 Report **Date of Report: Oct 10, 2025**

Title	Comprehensive Disease Screening of Soybean Varieties in Arkansas
Lead Investigator	Travis Faske
Co-Investigator(s)	Terry Spurlock and Daniel Rivera
Status	Continuous, renewed annually
Objectives	1. Screen all entries in the University of Arkansas Official Variety Testing (OVT) program for frogeye leaf spot (Faske). 2. Screen all entries for southern stem canker (Spurlock). 3. Screen all entries for southern root-knot nematode in a field (Faske). 4. Provide a complete package of screening information to CES personnel by mid-November (All).

Progress/Accomplishments:

1. Some 133 OVT entries were planted in a 1-row, 11-ft long, replicated (n = 4) plot on June 4 for the frogeye leaf spot screen in a farmer's field near Kerr. Frogeye leaf spot severity was rated on September 10 (R5 growth stage). There were several plots rated as an "8" on a 0 to 9 scale.

2. The same location used for the FLS screen will be used to determine entry susceptibility to the southern root-knot nematode. The NDL is currently in the process of hiring a new diagnostician, who will assist in the greenhouse screening for RKN (Riveria); however, the field screen has been very good the past few years. Three roots from each entry were evaluated for southern root-knot nematode susceptibility on September 9/10 (R5 growth stage).

3. A trial was planted at Rohwer Research Station near Kelso, AR, on 4 Jun with 68 Xtend Flex entries of the 2025 official variety test. The trial was planted into 38-inch beds on silt-loam soil. Plots were 2-rows wide by 10-feet long and replicated 3 times. The field plots were inoculated with stem canker on 7 Jul at V4-V6 growth stage using toothpicks infested with the fungus that causes stem canker. Toothpicks were inserted through the main stem, and wounds sealed with petroleum jelly. Plots were evaluated on 9 Sep for stem canker, frogeye leaf spot, target spot, Septoria brown spot, Cercospora leaf blight, and soybean vein necrosis. All diseases except stem canker were re-evaluated on 17 Sep.

   A growth chamber trial has been tested and proven to produce favorable results and was utilized for the 66 non-Xtend Flex varieties that were included in the variety trial list. Due to space constraints, the varieties grown in the growth chamber were split into 2 groups, grown, inoculated with infested toothpicks, and the presence of stem canker was determined. Images were collected of the inoculation sites, disease lesions, and recorded by variety.

   Stem canker was present in both field and growth chamber trials.

Upcoming Actions/Activities:

1. For all diseases: Data entry and analysis. Ratings to be posted on the Variety Testing website and in the Arkansas Row Crops Blog.

Project Title	Integrated Management of Soybean Nematodes in Arkansas
Lead Investigator	Travis Faske
Co-Investigator(s)	Asia Kud and Daniel Rivera
Status	Year 3 of 3
Objectives	1. Determine the efficacy and practicality of labeled nematicides for nematode management. 2. Evaluate the field performance of available and new soybean cultivars against RKN. 3. Promote the importance of sampling soybean fields for soybean nematodes. 4. Assess and extend the use of cultural practices to manage soybean nematodes. 5. Extend and educate clientele on the distribution of important soybean nematodes in the state.

Progress/Accomplishments:

1. One seed-applied and two soil-applied nematicide trials were planted on June 3 in a field with a history of southern root-knot nematode. All of the seed-applied and soil-applied nematicides being evaluated are registered for use in soybean in Arkansas. All seed were treated at the Lonoke Extension Center by the Lonoke Plant Pathology Program. Six root systems from each treatment were sampled at 48 DAP in July to assess the percent of root system galled – protection provided by the nematicides
2. Some 40 MG IV and 30 MG V cultivars that are marketed as resistant to the southern RKN and tolerant to glyphosate, dicamba, or 2,4-D choline were planted on June 3 in a field with a history of southern root-knot nematode. Due to the number of entries, the experiments were divided into six groups (i.e., experiments). Appropriate susceptible and resistant controls were added to each group. Six roots from each entry were dug in September (R4 to R5 growth state) to evaluate for susceptibility to southern RKN (Fig. 1).

Figure 1. Root galling caused by southern RKN in the 2025 field screen.

3. Most of the ASPB-supported nematode assay samples come in at the end of the cropping season. A temporary diagnostician is currently reading soil samples. Interviews are

underway to identify a diagnostician. Ag agents have been informed about the SPB supporting nematode assays.

Upcoming Action/Activities:

1. Waiting on harvest for field experiments. Data will be analyzed and reports compiled.
2. Information on varieties will be posted on the Arkansas Row Crops Blog and shared with county Ag agents.
3. Nematode soil sample assays will continue into the winter months.
4. Data will be shared with farmers and consultants at winter production meetings and crop management conferences.

Project Title	Monitor and Management of Fungicide-Resistant Soybean Diseases in Arkansas
Lead Investigator	Travis Faske
Co-Investigator(s)	Terry Spurlock
Status	Year 1 of 3
Objectives	1. Evaluate the efficacy and timing of fungicides, labeled and experimental, to control S-R FLS and other foliar diseases (Faske). 2. Investigate the risk and existence of fungicide-resistance in *Cercospora* spp. and other foliar diseases to DMI and SDHI fungicides (Faske). 3. Determine the distribution of QoI-resistant *Phomopsis longicolla, Septoria glycines* (Spurlock). 4. Develop fungicide-resistance management strategies to delay or prevent fungicide-resistant diseases (Faske & Spurlock).

Progress/Accomplishments:

1. A frogeye leaf spot susceptible cultivar, Progeny 'P4806XFS', was planted on June 4 in a commercial field near Kerr to evaluate labeled and experimental fungicides to control FLS and other fungal diseases. Fungicides were applied at R3 growth stage on August 10 with an average severity of 0.5% frogeye leaf spot. Disease severity was collected at 14 and 28 days after treatment, with the last timing when soybean plants were lodged.

2. A few isolates of frogeye leaf spots were collected in several fields across the state.

3. Soybean leaves with symptoms of brown spot, caused by the fungus Septoria glycines, have been collected from soybean fields in Arkansas, Chicot, Desha, Drew, Jefferson, Lee, Lincoln, Lonoke, and White Counties. Approximately 25 leaflets were collected from each location and fungal isolates believed to be *Septoria glycines* have been collected from the leaves. Isolates will be verified as *Septoria glycines* using molecular and morphological methods.

   Numerous grain samples have been collected from soybean fields in 2024 and 2025 and fungal isolates identified as *Phomopsis longicolla,* the fungus that causes Phomopsis seed decay, have been isolated and stored. A subset of these isolates have been grown in pure culture for further laboratory testing.

Upcoming Actions/Activities:

1. Harvest of field experiments.
2. Isolated are currently being collected in the lab at the Lonoke Extension Center.
3. For both *Septoria* and *Phomopsis* isolates, a prescreening procedure will be conducted in the laboratory. Collected isolates will be placed in Petri dishes containing fungicide-amended growth medium with various concentrations of technical grade azoxystrobin, and growth rates recorded. DNA primers will also be used to determine if the isolates contain the G143A mutation, which is associated with QoI resistance.

Title: Phenotypic Selection Assisted by Seed-Level Near-Infrared Information
Lead Investigators: Samuel B Fernandes
Co-Investigators: Caio Canella Vieira
Status: Year 2 of 3
Objectives: i) determine the efficiency of phenotypic prediction assisted by seed-level near-infrared information; ii) develop a pipeline that incorporates the near-infrared information in the selection process.

Progress/Accomplishments: The QSorter® instrument is currently being used by the UARK Soybean Breeding, and we are currently working on processing the NIR information to connect it with the phenotypic data from each cultivar. The NIR measures were collected in part of the lines we initially proposed to collect. While this information was unavailable, we have been developing models in sorghum for which we already have spectral data, such as NIR. These models should be directly applicable to soybeans once the spectral data is available. We have successfully included linear combinations derived from spectral data in multi-trait models. Currently, we are working on functional models that utilize the whole spectrum in prediction models. For instance, we grouped the curves for each line using k-means clustering and were able to identify that some variables are much more important for prediction than others (Figure 1). While this strategy is in preliminary stages, as soon as the soybean NIR information is available, it will be ready to be validated along with the multivariate approach reported in year 1 of the project. We expect that, combined, these approaches currently developed in the Fernandes Lab will produce solid results in soybean, as they have been producing in the alternative data sets we have been using (i.e., sorghum). These developments are major contributions to the second objective of our proposal, which is to develop a pipeline that incorporates the near-infrared information (a type of spectral data) in the selection process. We are at a stage where we can plug the NIR information after having it processed into the models we have developed and obtain soybean predictions.

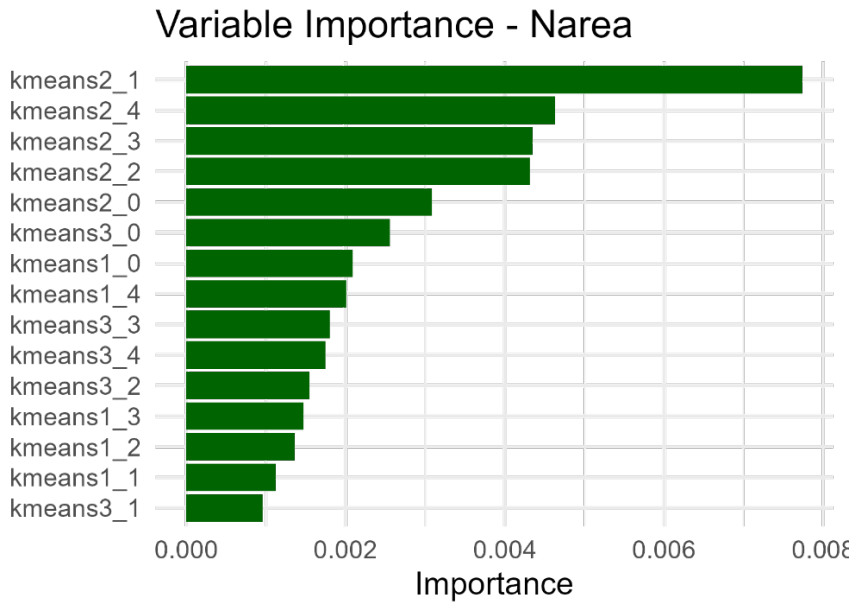


Figure 1. Variable importance obtained from random forest with variables being different (1-4) clusters coming from three distinct regions in the spectra.

Upcoming Actions/Activities:

- Collect the near-infrared (NIR) information from an additional 800 Process, which will be used for soybean breeding lines from seasons 2023 and 2024, ranging from maturity groups 3 to 5. The NIR information will be used in predicting the performance of soybean lines.
- Different models that have been developed in the Fernandes lab using data from other crops, such as sorghum, will be validated in soybean to identify the best approach to utilize NIR data in the UARK Soybean Breeding program, i.e., multi-trait or functional models.

Title: Testing the Range of Soybean Cultivars that Can Benefit from Plant Elicitor Peptide Treatment
Lead Investigators: Fiona L. Goggin
Co-Investigators:
Status: Year 1
Objectives: The overall objective is to assess whether responsiveness to the growth and defense activator GmPEP3 (soybean Plant Elicitor Peptide 3) might vary among soybean cultivars based on variation in receptor(s) for it. To do this, we propose to:

- Compare the DNA sequence of PEPRs (PEP receptors) in diverse soybean accessions
- Measure the effects of GmPEP3 seed treatment on seedling heights (an indicator of response to the peptide) in a panel of diverse soybean accessions
- Assess the effects of GmPEP3 treatment on nematode infection on any germplasm that differs from Williams82 in growth responses (1a) and/or PEPR sequences (1b).

Soybean has three possible receptors for plant elicitor peptides (so called PEPRs), and determining which one binds to GmPEP3 is a critical first step in determining whether the critical receptor for GmPEP3 varies among soybean germplasm. In the first 3 months of the project, we used DNA sequences for soybean PEPRs, x-ray crystallography data from a related species, and a computational tool called Alpha-Fold2 to identify GmPEPR1b as the most likely candidate for the GmPEP3 receptor. In the second 3 months of the project, we have established a collaboration with a Biomolecular Simulations laboratory (Dr. M. Moradi, U. Arkansas) to use molecular dynamics simulations to predict the physical the interactions between GmPEPR1b and GmPEP3. As we complete this molecular modelling process in the next quarter, this will help us 1) validate that GmPEPR1b is the correct receptor for GmPEP3; and 2) determine with greater accuracy which regions of GmPEPR1b are most important to this interaction, and need to be conserved among soybean lines in order for them to respond to GmPEP3 treatment.

Based on our preliminary results from computational modeling, we have also screened a soybean germplasm collection of over 500 lines and identified some novel soybean accessions that have variation in the GmPEPR1b receptor. Each of the accessions listed in **Table 1** have modifications in the *GmPEPR1b* gene that could potentially modify the function of the receptor by a) making large structural changes in the protein (e.g. missense mutations or in-frame deletions); b) altering the specific region of the receptor (the LRR region) that binds to GmPEP3, or c) modifying the region of the receptor (the kinase region) that is responsible for its enzymatic activity (**Table 1**). In the second quarter of the project, we have acquired seeds for these accessions from seed repositories and initiated greenhouse trials to test their responsiveness to GmPEP3 treatments.

Table 1. List of Novel Soybean Accessions Acquired for Testing

Accession	*GmPEPR1b* Modification with Potential Impact on GmPEP3 Perception
PI567346	Disruptive in-frame deletion
PI407729	Kinase-domain missense mutation plus a disruptive in-frame deletion
PI587804	Disruptive in-frame deletion

PI274453	LRR-domain missense mutation plus a disruptive in-frame deletion
PI504228	Kinase-domain missense plus a disruptive in-frame deletion
PI549017	Disruptive in-frame deletion
PI378684	*G. soja* wild soybean line with two high-impact frameshift mutations
Magellan	No gene variation in GmPEPR1b. Acts as control
William82	Reference cultivar (no GmPEPR1b variation). Acts as control

In addition to the progress above, we also submitted and revised a manuscript about using rhizobacteria to deliver GmPEP3 to soybean seeds for growth promotion. This manuscript was recently accepted by the journal *Plants* and should be published shortly.

This work will provide tools to predict the effectiveness of GmPEP3 as a treatment for different soybean germplasm.

Title: Site-specific assessment of soybean response to in-field variability using remote sensing.
Lead Investigators: Mike Hamilton
Status: Year 2 of 3
Objectives:

1. To quantify and compare in-field soybean yield variability under different irrigation systems.
2. To model relationships between site-specific soybean yield and remote sensing-based vegetation index history.
3. To compare the performance of data collection platforms and evaluate the use of drone remote sensing as an alternative to missing satellite images.

Update on PI: Dr Poncet and her program associate wesley have left mid to late summer and I am continuing the data collection on irrigation parameters and will overlay the irrigation data with the irrigation data we are collecting. Since her departure and my workload, I am focusing my efforts on irrigation variability throughout the fields I am learning research but appreciate the SPB for all your support.

Progress/Accomplishments:

- We are collecting data in two production soybean fields:
  - Field 1 (approx. 88 ac) is located on-farm near Harrisburg, AR (Poinsett Co.) and is furrow irrigated.
  - Field 2 (approx. 26 ac) lost… Dr Poncet left as did her associate Wesley.
  - Field 3 (approx. 290 ac) is located near Greenfield, AR (Poinsett, Co.) amd is flood irrigated.
- Field 1 was planted on May 7; Field 2 was planted on June 15; Field 3 was planted on May 24.
- I wasn't even informed in the field in Corning and some don't have any data what-so ever on it.
- I and my part time worker, Walker Harris, hired with SBPB funds, have installed the sensors on both fields 1 and 3.
- I will concentrate on these fields where I have data collected for the 2025 growing season.
- Field 3 has terminated irrigation, and we have removed the irrigation moisture sensors in preparation for harvest.
- Field 1 is reaching or reached R6.5 and we will remove sensors very soon. As we removed them, we are learning the drawbacks with these sensors and may move to total telemetry next year for ease of collection if possible.
- Yield monitor data will be collected at harvest. The yield monitoring equipment will be calibrated by the manufacturer (Legacy Equipment) prior to harvest.

Upcoming Actions/Activities:

- Complete data collection and assemble the irrigation moisture level in each zone to compare to yield monitor data when harvested.
- Hopefully I will get access to Dr Poncet and her associate Wesley's computer to see if pertinent data can be salvaged for early 2025 data. They are needed to have access to some of the 2 versions of moisture sensors installed.

Title: Irrigation Water Management for Soybeans: Moving the Needle.

Principle Investigators: C. G. Henry, U of Arkansas, T. Spurlock, UAEX; **Collaborators:** A. Ponchet, U of Arkansas - Fayetteville
Production System: All
Status: Year 2 of 3
Objectives: The objective of this project is research, document and demonstrate irrigation water management practices on working soybean farms through an Irrigation Yield Contest Demonstration. These practices include the implementation of Computerized Hole Selection, Surge irrigation, soil moisture monitoring, ET based scheduling, irrigation initiation and irrigation termination.

1. Document water savings, yield improvements, profitability improvements using an Irrigation Contest. Compare yield and water use differences to document the efficacy and improved profitability of conservation practices.
2. Deliver irrigation schools in the winter months.
3. Further develop recommendations for surge irrigation and soil moisture sensors. Improve soil water information about Arkansas soils and paper and mobile app development for sensors. Test new ideas on how to improve water retention curve development methods.
4. Improve ability to measure and document water use through new cloud meter telematics delivered to the irrigator during the season.
5. Improve implementation of CHS, through poly pipe printer development.
6. Improve cover crop crimper design for furrow irrigation.
7. (New) Test pit-less tailwater recovery water savings on paired soybean fields at NERREC

Progress/Accomplishments/ Upcoming Actions/Activities:
Projects objective progress is reported as project activities.

Objective 1

In 2025, a total of 39 field entries were entered into the Most Crop Per Drop irrigation yield contest. Of the 39 entries, 11 entries were entered into the soybean category. The soybean entries accounted for 9 counties represented in Arkansas. One soybean entry was withdrawn. In 2024, a total of 18 soybean fields were entered into the contest. Poor planting conditions due to frequent rainfall events likely reduced the number of soybean contest fields in 2025. Currently, two fields are waiting to be judged and harvested. Final yield and water use data for each entry is pending.

Objective 2

One irrigation school was delivered in 2025, in Prairie County in Hazen Arkansas. Arkansas hosted the National Master Irrigator meeting in Petite Jean in September 8-10. It was well attended and represented by 11 states. There is momentum to develop a Arkansas Master Irrigator program. The irrigation schools serve as the foundation for this program. There has not been any funding for a Master Irrigator Program.

Objective 3

A new version of the soil sensor calculator app was released in November 2024 and another test version is under review that includes additional soils based on the research results from retention curve and imports sensor data from telemetry units. A paper has been submitted the irrigation science journal and is expected to be accepted. This paper is the foundation of the new soils recommendations for matric potential sensors used in the mobile app. This version is being tested by the team and one of the companies that have provided an API to access units. Three other companies have requested to be included in this project, so a guidance document is in progress on how to make connections we can access data through our app. Two of the three companies are also in the evaluation version of the app and under testing this summer.

Dorsa Darikendeh, a post doc paid on this project. The retention curve article was accepted for publication.

Objective 4

Backend of the cloud meter has been completed and most of the interface programming is done and ready for field testing. A new display, over five revisions, has been completed and prototypes manufactured. When the boards were assembled the miniaturization of the buttons did not result in usable components, so we have moved to a previous design to fix the issue. We are not sure if it is an assembly problem or a component problem or the heat from soldering damage the components. So we are backing up on the display board. The power board should be finished by July 12, this was slowed because the engineer working on this had a death in the family and stalled finishing the board design. This set the project back at least 60 days. We still anticipate being able to test meters in August, but we have had many challenges in the final designs to overcome.

Objective 5

Research into improved ink for the printer did not result in a better solution than the solvent ink currently being used in the design. Research into alternative cartridge on-going.

Objective 6

Shop drawings are in progress on this objective, we are still struggling with the new design. Work continues on adapting plans for an improved crimper design.

Objective 7

In 2025, research trials were established at NERREC to compare traditional furrow irrigation (control field-farmer standard) to the use of a pitless tailwater recirculating pump system (tailwater field). Two side-by-side fields with similar soil types were selected for comparison. The control field was 44 acres and the tailwater field was 49 acres. On June 4th and 5th, Progeny 4947XFS was planted at 150,000 seeds/acre on the control field and tailwater pump field, respectively.

Watermark soil sensors with telemetry units were installed in each field to determine irrigation timing. Soil sensors were installed at 6", 12", 18" and 30". Flow rates of 1650 gallons per minute (gpm) and 1800 gpm were applied to the control field and tailwater field, respectively. These rates were used to deliver approximately 2 ac-in/acre in 24 hours for each irrigation event. Irrigation scheduling was determined by entering soil moisture sensor data into the AR Soil Calculator app based on a 50% allowable depletion. Flow meters were installed on each field inlet and the tailwater pump to calculate water applied from each source.

Season total precipitation for the study (from planting date to R7 growth stage) was 9.67". The tailwater field received a season total of 9.09 ac-in/acre compared to the control field receiving 13.21 ac-in/acre (Table 1.). The tailwater field had an irrigation reduction of 4.12 ac-in/acre or 31% compared to the control field. The reduction in irrigation use occurred due to the tailwater pump recirculating the ponded water at the field bottom and distributing water to the top and middle of the field. The use of the tailwater pump resulted in a more uniform wetting of the soil profile. Specifically the control field required additional irrigations and is the main reason for the water use difference. The control field required 2 additional irrigations as called for by the soil moisture sensors, so the tailwater system appears to help with infiltration or more water stayed on the field and is likely the reason for the difference.

There was also a slight difference in maturity between fields. The tailwater field had visually more yellow leaves than the control field after reaching r7 growth stage. Yield results will be calculated pending harvest, approximately two weeks from the date of this report. We believe the more effective irrigation may be the reason for the maturity difference, that more soil water may have been available at critical times.

A wireless hub and two automated valve system was tested during the study, the valve failed during the first event tested, then was modified for the second event. After the second event the pressure compensating valve performed as expected. The first event, the valve was not available to use for the irrigation, but using the tailwater pump can be accomplished by simply reducing the flow about halfway through an irrigation event. During the last two events the drainage valve was also tested, for communication and operation and performed as expected. It was not actually used, because fitting necessary to install the valve in the drain pipe did not arrive in time to install. The very last irrigation event the inflow was completely shut off before the set time so the tailwater pump could complete the irrigation, this approach worked well.

Table 1. Irrigation dates and ac-in/acre applied for the control field and tailwater field.

Control Field		**Tailwater Field**		
Irrigation Date	**Ac-in/acre applied**	**Irrigation Date**	**Ac-in/acre applied**	**Recirculated water from tailwater pump (acre inches total)***
07/23/2025	1.97	07/24/2025	1.79	5.10
08/06/2025	2.27	07/29/2025	1.84	5.25
08/21/2025	1.6	08/18/2025	1.92	3.10

08/28/2025	2.03	09/02/2025	1.71	6.93
09/03/2025	1.96	09/15/2025	1.85	13.9
09/11/2025	1.35			
09/18/2025	2.04			
Total applied	**13.21**		**9.09**	

*During the last irrigation on 09/23/2025, the inlet booster pump was turned off. Therefore, the tailwater pump was not competing with head pressure from the supply source, allowing for more gpm delivery from the tailwater pump. Additionally, the depth of water present in the tailwater pump was higher than previous events, increasing tailwater pump flow.

Developing scouting, threshold, and management practices for stinkbug complex (Red banded, Green, and Brown) in Arkansas soybean

Investigator(s): *Drs. Rupesh Kariyat, Neel Joshi, Ben Thrash, Glenn Studebaker, and Nick Bateman*

Year 3 of 3:

Fall Report:

Ongoing field surveys across soybean plots at the University of Arkansas farm aimed to assess the abundance and species composition of stink bugs, key agricultural pests that pose significant threats to crop yields. These surveys, conducted from late summer through mid-October, utilize sweep net sampling and visual observations across multiple study plots to track seasonal population trends and support informed pest management strategies. Preliminary results show a noticeable decline in overall stink bug abundance compared to the previous growing seasons. Among the species recorded, the Southern Green Stink Bug (*Nezara viridula*) remains the most dominant, accounting for over 80% of all specimens collected. This species also showed significantly higher average counts per sweep than other species. Two additional species of concern were present in lower numbers: the Brown Stink Bug (*Euschistus spp.*) and the Brown Marmorated Stink Bug (*Halyomorpha halys*). While their populations were relatively small, their continued presence in soybean plots is notable, especially for *H. halys*, an invasive species that has become increasingly problematic in some agricultural regions due to its broad host range and potential to cause late-season damage to various agricultural crops. Continued monitoring of all stink bug species will be critical for refining pest management approaches and better understanding the environmental and ecological drivers of these shifting population dynamics.

Using eco-physiological approach for screening soybeans under drought and insect herbivory

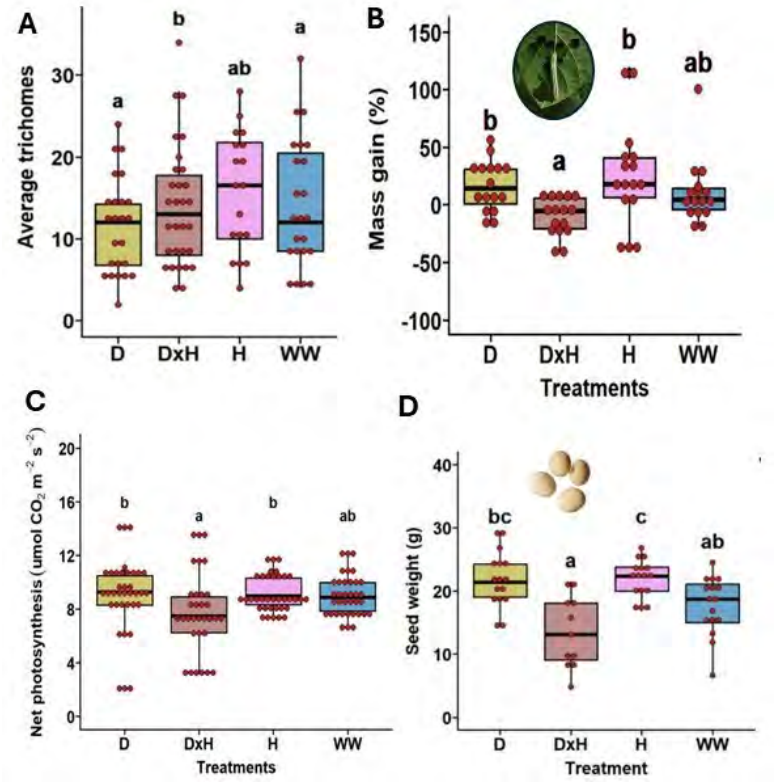
Drought and Insect herbivory have been a constant threat either in a sequence or in tandem affecting crop growth, physiology, and overall yield of soybean. However, no studies have quantified the physiological parameters of soybeans under dual stress of drought and insect herbivory. My Ph.D. students Manish Gautam and Insha Shafi (both 3rd year) have completed experiments leading to few publications from the lab which explored the impact of drought and herbivory in soybean. Here are some findings based on our recent studies.

From a meta-analysis, we showed that soybean photosynthesis and stomatal conductance were negatively affected by drought whereas herbivory has negative effects on photosynthesis but neutral effects on stomatal conductance (Gautam and Kariyat 2025).

In a previous experiment, we had found that during drought x herbivory, physiological parameters were markedly elevated in soybean plants, suggesting compensation. Additionally, soybean loopers favored well-watered plants in choice assays and a higher trichome density

was observed under drought and herbivory interaction, indicating that the plants were allocating more resources for better defense, hence the yield was reduced (Gautam et al., 2024). We retained the seeds harvested from this experiment and conducted another set of experiments to understand the transgenerational effects of drought and herbivory in soybean.

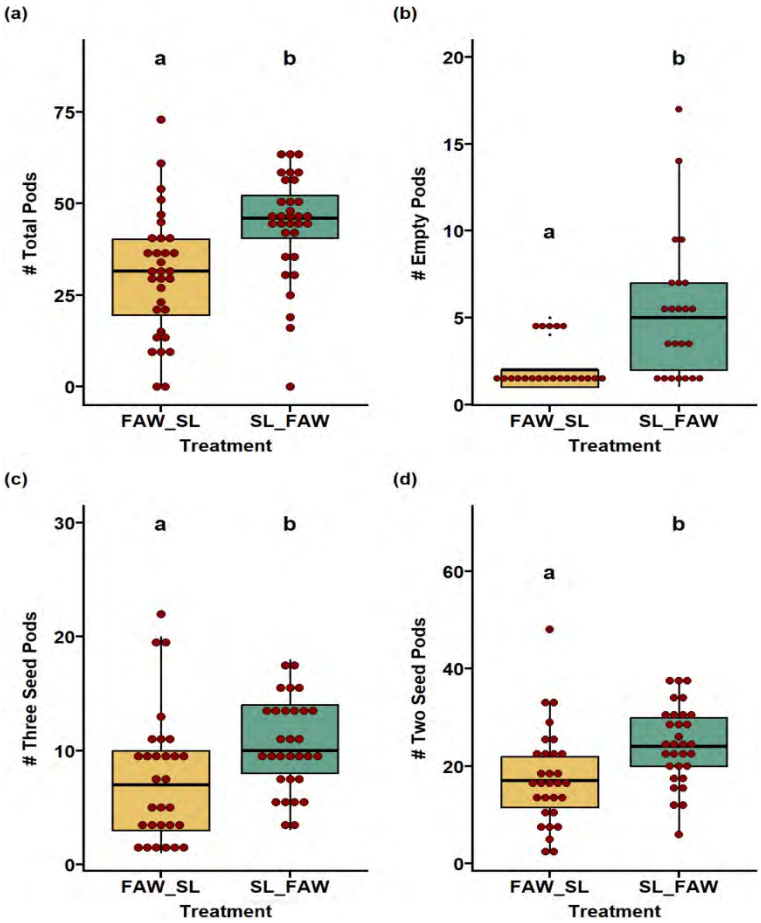
Interestingly, the effects of these stressors were inherited by the offsprings, as a reduction in net photosynthesis rate, stomatal conductance and transpiration rate were observed for transgenerational plants whose parents were under DxH and the same plants had increased defenses – higher trichome density even though they were not under any stressors themselves. And as expected, we observed reduced yield and fitness in the transgenerational plants (Gautam and Kariyat 2025). This is a classic example of tradeoff between growth-defense-fitness in soybean, and it is of great importance for smallholder farmers who practice "seed saving" for soybean cultivation.



Transgenerational effects of drought and herbivory. Effect on (A) average trichomes (B) mass gain of soybean looper, (C) net photosynthesis rate, and (D) weight of seeds per plant from transgenerational plants whose parents were exposed to drought (D), drought and herbivory interaction (D × H), herbivory (H) and well-watered (WW) treatments. Different letters in treatments indicate significant differences at the 5% level of significance.

Moreover, we also found that soybean plants can inherit memories of sequential herbivory attacks. Our results show that a significant increase in yield traits (number of flowers, early and

final pod number, two-and three seeded pods, total seed number) was recorded in progeny derived from SBL-FAW (soybean looper damage followed by fall armyworm damage) parents compared to progeny where fall armyworm was the initial attacking herbivore (FAW-SBL) (Shafi and Kariyat 2025).



Transgenerational effects of sequential herbivory on pod traits. Effect on (a) total pod number (b) number of empty pods per plant, (c) number of three seeded pods per plant, and (d) number of two seeded pods per plant from transgenerational plants whose parents were exposed to sequential attack of FAW and SL in two sequences; (i) FAW-SL which represents treatment where FAW as initial attacker and SL as sequential attacker and (ii) SL-FAW treatment where sequence of attacking herbivore was reversed. Different letters in treatments indicate significant differences at the 5% level of significance.

Collectively, we continue to explore resistance traits against herbivory by soybean looper and fall armyworm and how these traits manifest under drought as an abiotic stress.

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- Gautam, M., Shafi, I., & Kariyat, R. (2024). Compensation of physiological traits under simulated drought and herbivory has functional consequences for fitness in soybean (Glycine max (L.) Merrill). *Environmental and Experimental Botany*, *226*, 105944.
- Shafi, I., & Kariyat, R. (2025). Transgenerational Imprints of Sequential Herbivory on Soybean Physiology and Fitness Traits. *Plant-Environment Interactions*, *6*(4), e70070.

Title: Effects of inclusion of soybean oil in beef heifer diets on heifer development, reproductive function, and calf growth performance
Lead Investigators: Beth Kegley, Jeremy Powell, Charles Looney, Brittni Littlejohn, Robin Cheek, and Kirsten Midkiff
Co-Investigators:
Status: Year 3 of 3
Objectives:

Progress/Accomplishments:

This study is using bred heifers that were developed on a supplement containing soybean oil (ASPB funded project for 2024). The heifers used are from a trial with 80 heifers assigned randomly to 1 of 2 treatment groups (n = 4 pastures/treatment), being 1) control group fed an isonitrogenous and isocaloric grain supplement with no soy product; and 2) treated group fed grain supplemented with soybean oil at 2% of total diet dry matter intake. Supplements were offered beginning approximately 30 days after weaning (June 2024) and continued through the breeding season (February 2025).

43 heifers (21/39 heifers on control diet; 22/39 heifers on soybean oil diet) were confirmed pregnant by artificial insemination (AI) at 40 days of gestation. In February 2025, an ultrasound was performed on heifers that were bred by AI to determine blood perfusion and an area measurement of the corpus luteum at day 57 of gestation. In April 2025, an ultrasound was used to obtain uterine artery hemodynamic measurements on the AI bred heifers for both the left and right uterine arteries. Measurements were gathered on day 141, 142, or 143 of gestation, with ultrasounds performed on 1/3 of the heifers from each treatment group each day. A total of 40 heifers (20/40 heifers on control diet; 20/40 heifers on soybean oil diet) had an ultrasound performed for uterine blood flow measurements, and 3 of the heifers were determined to be not pregnant. Of the remaining heifers on the study, there were 30 heifers (14/39 heifers on the control diet; 16/39 heifers on the soybean oil diet) that were bred by natural service (bull-bred). There were 8 total open heifers (5/39 heifers on the control diet; 3/39 heifers on the soybean oil diet) that were sold.

Calving began in August 2025. There are 38 calves that were born to AI bred dams that remained on the study, with 1 calf being removed due to a broken leg. There was also 1 heifer that was deemed not pregnant in the group, as she lost her pregnancy between ultrasounds and calving. Within 24 hours of birth, all AI bred calves had body weights and morphometric measurements (head length, head circumference, curved crown rump length, heart girth circumference, abdominal girth circumference, hip height, cannon bone length, and cannon bone circumference) recorded. From the heifers bred by AI, a colostrum sample was collected shortly after birth for immunoglobulin and fatty acid concentrations. Also, the calves from these dams were at 48 hours after birth for serum immunoglobulin concentrations. As of October 8, 2025, all of the heifers that were bred by AI have calved. Calving began for the natural service heifers as well, with 10 heifers left to calve. Birth weights and morphometric measurements have been recorded on the calves born to dams bred by natural service.

Upcoming Actions/Activities:

Calculations for corpus luteum blood perfusion, corpus luteum area, and uterine artery hemodynamics will be completed and analyzed using SAS 9.4®.

All calves from cows on the study will remain with their dams until weaning. In April 2026, calves will be weaned from their dams, and body weights and morphometric measurements will be

recorded. All data from Year 1 and Year 2 of the heifer development studies will be combined, analyzed, and an abstract submitted to the American Society of Animal Science (ASAS) National Meeting in 2026 to present the findings.

Soybean Promotion Board 2025-2026 Report Date of Report: 10/10/25

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 (deceased), T. Tsai
Status: Year 3 of 3
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.

Progress/Accomplishments:

The live animal data and sample collection portion of the pilot study evaluating the influence of gossypol-containing cottonseed oil on semen quality, behavior, and health of domestic boars as a model for feral hog control has been completed. The data and sample analysis portion of the pilot study is currently in progress. Mature domestic boars were assigned to one of four treatment groups: control (fed diets mixed with gossypol-free cottonseed oil) or one of three treatments fed diets mixed with cottonseed oil containing either 4, 8, or 12 mg of gossypol/kg body weight. Treatments were administered over a 42-day treatment period, followed by a 72-day recovery period in which boars received control diets without cottonseed oil. Semen was collected from boars every two weeks during both the treatment and recovery period. While data analysis is currently in progress, a major novel preliminary finding to report is the average number of sperm cells that were motile (Figure 1) and the average number of sperm cells that were progressively moving forward (progressive motility; Figure 2). Most noteworthy, after the 42-day treatment period, average sperm motility decreased to approximately 12% while progressive motility decreased to approximately 6% in both the 8 and 12 mg of gossypol/kg of body weight treatment groups (Figure 1 and 2, respectively). Further, it is important to note that multiple boars from these two treatment groups reached 0% motility after the 42-day treatment period. Palatability issues were identified in the 12 mg of gossypol/kg of body weight treatment group, resulting in the majority of boars

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

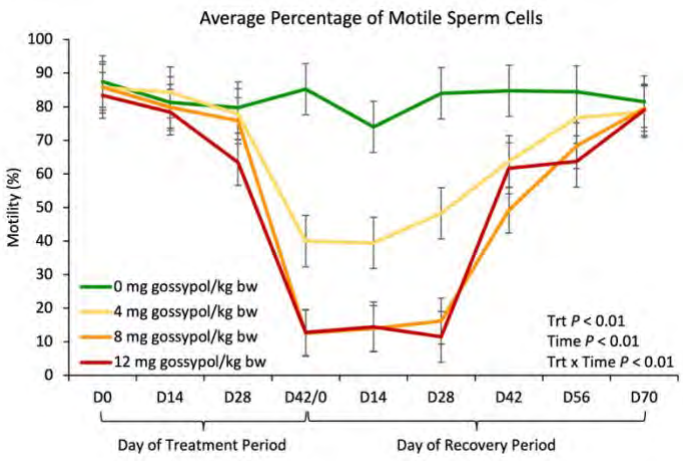
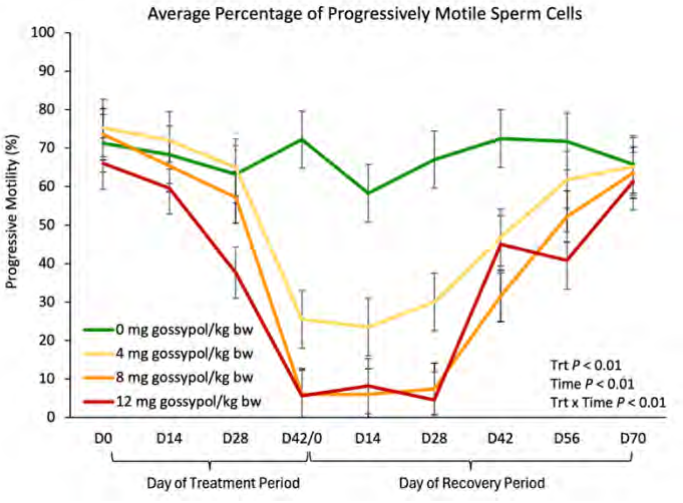
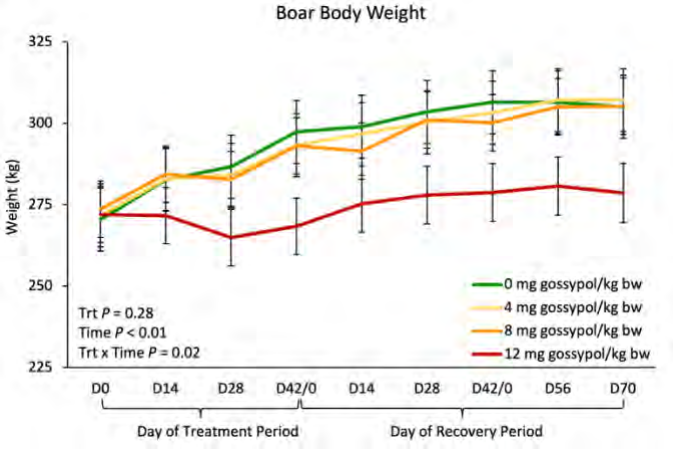


Figure 2. Average percentage of sperm cells that were progressively moving forward.



failing to consume the full gossypol dose each day. Therefore, boars in the 8 and 12 mg of gossypol/kg of body weight treatment groups might have received similar doses of gossypol due to decreased consumption in the 12 mg/kg of body weight group. Further, body weights of boars in the 12 mg/kg of body weight group were decreased relative to the remaining treatments (Figure 3). It has been established that nutrient restriction in boars has negative impacts on semen quality. Assessment of health parameters are ongoing, but preliminary results showed no impact of treatment on sickness behavior scores.

Figure 3. Boar body weight.



These results have been presented to the Arkansas Feral Hog Eradication Task Force and were recently presented at the 2025 American Society of Animal Science-Canadian Society of Animal Science Joint Annual Meeting in Hollywood, Florida on July 8, 2025.

Upcoming Actions/Activities:

Data analysis is currently in progress from the pilot study. Changes in the following variables during the treatment and recovery period will be assessed.

- Sperm motility
- Sperm progressive motility
- Sperm concentration
- Semen volume
- Sperm morphology
- Body weight
- Feed refusals (as an indicator of diet palatability)
- Sickness behavior scores
- Complete blood count data (white and red blood cell measures as an indicator of health)
- Libido scores

Potential next steps include the following.

- A palatability study will be conducted in the Spring of 2026 to evaluate potential additives to increase palatability and consumption of feed containing higher doses of cottonseed oil.

- Product development improvements are needed to increase gossypol concentration and scale up oil production. We are currently pressing the oil from the cottonseed ourselves because a commercially available product is not available. Due to the nature of cottonseed oil production in the U.S., it has been challenging to identify a partner to work with on the objective of scaling up oil production with the necessary specifications to maintain adequate gossypol concentrations. We recently identified a potential source of gossypol-containing oil produced in Peru and are moving forward with efforts to evaluate gossypol concentrations in this oil.

- We are continuing discussions with state/federal agencies and collaborators in wildlife biology and population management as we determine the next phases of the project. Due to the success of our initial pilot study in boars, we plan to improve and conduct a larger scale study in boars based on knowledge acquired from both the pilot study and the future palatability study.

- We have been invited to discuss our work in this topic area at the 10th International Conference on Wildlife Fertility Control hosted by the Botstiber Institute for Wildlife Fertility Control (BIWFC) in Barcelona, Spain April 23-24, 2026. This should be a great opportunity to foster further collaborations to accomplish our objectives.

Novel preliminary results suggest the potential for gossypol-containing cottonseed oil to be used as a contraceptive in feral hogs and provide strong support to continue this line of research.

Title: Screening for Soybean Tolerance to Metribuzin
Lead Investigators: Jason K. Norsworthy
Co-Investigators: Jeremy Ross
Status: Year 1 of 3
Objectives: To assess the tolerance to metribuzin of soybean varieties entered in the Arkansas OVT and to provide rapid transfer of information regarding the level of tolerance or sensitivity of Arkansas grown soybean varieties to metribuzin

Progress/Accomplishments:
The screening was planted the last week of September, and the soybean plants are starting to emerge. The round of assessments will likely occur on October 10th. Assuming that the susceptible check as sufficient injury, I would expect the screening to be completed by late October. If sufficient injury does not occur, the test will be replanted.

Title: Screening Arkansas Soybean Cultivars for Protein Quality as a Novel Food Preservative
Lead Investigators: Mahfuzur Rahman
Co-Investigators: Caio Canella Vieira
Status: Stated Goal New Proposal Year 2
Objectives:

1. Conduct a comprehensive screening of soybean varieties to fractionate protein-derived bioactive peptides suitable for application as food preservatives.
2. Utilize fractionated peptides to enhance the shelf life of processed food by preventing lipid oxidation and inhibiting microbial growth.
3. Develop breeding materials with improved seed composition to be used as food preservatives.

Our previous work focused on the lipid oxidation inhibitory properties of soybean protein hydrolysates; however, to effectively utilize these hydrolysates in food systems, it is essential to understand the fundamental functional, nutritional, and antinutritional properties of the native proteins. Therefore, this phase of the study investigated eight Arkansas soybean varieties to establish their baseline characteristics.

Table 1. Solubility (%), water-holding capacity (WHC), oil-holding capacity (OHC), foaming capacity, foaming stability, and nutritional and antinutritional properties of soy protein from eight soybean cultivars.

Sample ID	Code	Solubility (%)	WHC (g water/g protein)	OHC (g oil/g protein)	Foaming Capacity (%)	Foaming Stability (%)	Protein Digestibility (%)	Trypsin Inhibitor (TIU/mg)	Phytic Acid (g/kg)
R11-7999	SP1	53.13^{b}	4.82^{a}	1.37^{a}	122^{a}	15.32^{a}	82.63^{c}	3.65^{a}	0.56^{abc}
R18-10491	SP2	45.88^{c}	5.64^{ab}	1.45^{a}	122^{a}	13.67^{a}	81.61^{c}	3.33^{b}	0.53^{bc}
R98-1821	SP3	38.09^{de}	4.42^{bc}	1.21^{a}	128^{a}	19.30^{a}	82.11^{c}	3.42^{b}	0.62^{a}
R05-1772	SP4	34.25^{e}	2.82^{e}	1.32^{a}	128^{a}	14.84^{a}	84.59^{abc}	3.34^{b}	0.61^{ab}
R09-3789	SP5	45.56^{c}	3.57^{cde}	1.52^{a}	124^{a}	16.48^{a}	87.58^{a}	3.60^{a}	0.59^{abc}
R21C-02304	SP6	61.84^{a}	3.84^{cd}	1.68^{a}	130^{a}	17.83^{a}	83.10^{bc}	3.42^{b}	0.58^{abc}
R21C-02304	SP7	40.53^{de}	4.16^{bcd}	1.47^{a}	134^{a}	17.10^{a}	83.82^{bc}	3.42^{b}	0.52^{c}
R18-14147	SP8	16.94^{f}	3.36^{de}	1.31^{a}	128^{a}	14.90^{a}	86.21^{ab}	3.69^{a}	0.58^{abc}

Values with the different superscript letters in the same row are significantly different ($p < 0.05$).

SP6 showing the highest solubility (61.8 ± 1.8%) and SP8 the lowest (16.9 ± 2.9%). WHC ranged from 2.8 to 4.8 g water/g protein, with SP1 exhibiting the highest value, while no significant differences were found in OHC, foaming capacity, or foam stability. *In vitro* protein digestibility (IVPD) ranged from 81.6% to 87.6%, with SP5 showing the highest digestibility. Trypsin inhibitor activity was relatively low and consistent (3.33–3.36 TIU/mg protein), while phytic acid content varied between 0.52 and 0.62 g/kg, with SP3 showing the highest and SP7 the lowest levels. From this data, SP1, SP6 and SP5 demonstrated superior protein quality, showing the highest solubility and digestibility among the eight varieties, making them ideal for functional food applications. On the contrary, SP8 and SP2 had relatively poorer profiles, with lower solubility and nutritional value, indicating less suitability for high-quality protein products. Overall, these findings indicate distinct varietal differences in protein functionality, digestibility, and antinutritional factors, providing a critical foundation for selecting soybean varieties with superior protein quality for further hydrolysis and functional food applications.

Upcoming Actions/Activities:
We will prioritize the use of superior soybean varieties found in this study, such as SP1, SP5 and SP6, to ensure the production of high volume of hydrolysates which will be incorporated in the food products for replacing synthetic preservatives.

Title: Potassium and Chloride Field Monitoring
Lead Investigators: Trenton Roberts and Jeremy Ross
Co-Investigators: Gerson Drescher
Status: Year 3
Objectives:

1. Identify the magnitude and extent of potassium deficiency, including hidden hunger, across a wide range of Arkansas soybean production systems and estimate the associated yield loss.
2. Identify the magnitude and extent of chloride toxicity across a wide range of Arkansas soybean production systems and estimate the associated yield loss.

Progress/Accomplishments: Our goal was to provide each county with at least the opportunity to sample 1-2 fields and include them within this monitoring project. More of the younger agents are submitting samples this season, which is a positive sign. We currently have 8 counties that are participating and are expecting at least 4 more to enter their field information as the soybean crop gets closer to the R2 growth stage. There are several counties with multiple submissions and by the end of the season we expect to have 16-20 fields participating across the state. We encouraged agents to seek out fields or situations that were suboptimal or areas that had previous low yields to try and determine if these areas were suffering from nutrient deficiencies or hidden hunger. To date we have seen several fields with low K and low B suggesting that these two nutrients are limiting soybean yield. This is also the first season where we have multiple reports and at least two confirmed fields with manganese (Mn) deficiency, one in Poinsett County and one in Lincoln County. Within the samples collected over the course of this project there do appear to be some “hotspots” where chloride toxicity may be of increasing concern. Chloride interpretation continues to be a concern as the data provided for many of the cultivars is not sufficient or does not clearly define if the cultivar is an includer, excluder, or mixed. Of all the samples submitted so far this season there have only been 1 where the Cl levels appeared to be an issue. However, the R4 growth stage is the critical growth stage to assess Cl toxicity and many of the fields have not reached that sampling stage. Early observations also indicate that samples can be collected, submitted and the data in hand within a week in most cases. In total we had 16 fields that submitted leaf samples for analysis at both the R2 and R4 growth stages. Additionally, there were a few fields that only submitted leaf samples at the later R4 growth stage. There was a good cross section of counties and production systems represented in this year’s submission including at least 2 double-cropped soybean fields.

Upcoming Actions/Activities: We have begun working with Dr. Shannon Speir (Assistant Professor of Water Quality) to identify areas across the state where high levels of chloride may be found in either groundwater or surface water. We will be compiling the data from 2025 to generate heat maps of where chloride appears to be most concerning.

Title: Fertilization of Soybean
Lead Investigators: Trenton Roberts
Co-Investigators: Gerson Drescher and Jeremy Ross
Status: Year 3
Objectives:

1. Continue long-term P and K fertilizer rate trials established at the Pine Tree Research Station in 2000 (PTRS) and Rice Research Experiment Station in 2007 (RREC) to examine soil-test trends and crop yield responses to fertilization rates.
2. Continue to evaluate existing and develop new correlation calibration relationships between soil-test P (or K) alone and soybean yield and leaf nutrient concentration in response to P (or K) fertilization.
3. Evaluate novel remote sensing platforms using unmanned aerial vehicles to detect hidden hunger and potential K deficiencies before visible symptoms occur.
4. Determine field scale variability in tissue K concentrations and develop sampling protocols for in-season assessment of K nutritional status in soybean.

Progress/Accomplishments: During this growing season we are focused on gathering more data related to calibration of the in-season potassium (K) applications. Two new trials have been initiated that focus on validating the in-season potassium rates generated using the newly developed calibration model. The first trial was developed to test our model that is designed to use the days after R1 and the current tissue-K concentration to predict the site and growth stage specific K fertilizer rate that is needed to maximize yield potential. The second trial will compare various in-season application rates of K fertilizer to investigate the impacts on soybean yield as well as K removal in the harvested grain. The rationale behind these two studies is based on the fact that our calibration model may predict in-season K fertilizer rates that are well below or above the current recommended mitigation strategy of applying 60 lb K_2O/acre. Currently, we have six field trials located at the NERREC, SAREC, and PTRS experiment stations over a range of soil test K values but mostly in the very low or low soil test K category. Our goal was to try and place these trials in situations and on soils where we might expect the biggest yield response to in-season K applications. The long-term phosphorus (P) and potassium trials have also been established at the PTRS and RREC locations. At the RREC location, a poor stand due to heavy rainfall and waterlogged soils forced us to replant in late June. The K calibration/validation trials were all sampled and only 2 of the 5 sites identified the need for fertilization at the R2 growth stage. The leaf samples from the other 3 locations indicated that the soil and fertilization program were sufficient and that additional K was not required to maximize soybean grain yield.

Upcoming Actions/Activities: We are preparing the plot locations for harvest and will be collecting grain subsamples. The grain subsamples will be ground and prepared for further analysis.

Title: Field-based determination of chloride tolerance in soybean
Lead Investigators: Trenton Roberts
Co-Investigators: Jeremy Ross and John Carlin
Status: Ongoing
Objectives:

1. Implement a field-based leaf sampling protocol for rating soybean varieties as an includer or excluder.
2. Provide annual evaluation of soybean cultivar reaction to chloride both as a categorical response of includer, excluder and mixed as well as a numerical rating system that indicate the relative degree of chloride tolerance amongst varieties.
3. Rate the degree of mixed reaction soybean populations so that producers can make informed cultivar selections that best fit their production systems and desired soybean characteristics.

Progress/Accomplishments: The field-based determination of chloride tolerance project relies on the soybean Official Variety Trial (OVT) as the foundational source of data. Our methods require us to sample the entries in the soybean OVT to determine the variations in chloride tolerance amongst new and recently released soybean cultivars. Previous research has indicated that the OVT located at the Rohwer Research Station provides the highest levels and greatest separation of tissue chloride concentrations. The OVT that we will sample was planted on June 3, 2025, emerged on June 8, 2025 and has an optimal stand. There are currently 137 entries in the trial and run the gamut from early IV's to late V's and a wide array of herbicide traits. This is a decrease from the previous year (160 in 2024) which is a slight drop but within the range of entries within the past 5 seasons. The majority of the entries are found in the maturity group IV section (Early 4- 44 and Late 4- 79). The soybeans are nearing the R2/R3 growth stage and leaf samples will be collected for chloride analysis when the respective maturity groups reach the R4 growth stage. The standard chloride excluder check "Osage" continues to be used as it performs very well and consistently exhibits one of the lowest chloride concentrations of all the cultivars tested over the last 6 years. All soybean plots were sampled when they reached the R4 growth stage. The samples have been dried, ground, extracted and are waiting for analysis. There were no obvious chloride toxicity symptoms in the field when leaf samples were collected, but there were some noticeable differences in plant height which may be attributed to varying chloride tolerance.

Upcoming Actions/Activities: Chloride analysis of the leaf tissue should be complete by mid-October. Data will be analyzed and the classifications assigned. Once this is complete the data will be shared with the Arkansas Crop Variety Improvement team as well as Dr. Ross for inclusion in the Soybean updates and other materials.

Title: Influence of Cover Crops and Soil Health on Soybean
Lead Investigators: Trenton Roberts
Co-Investigators: Jeremy Ross
Status: Year 3
Objectives:

1. Determine how implementing winter cover crops into a corn-soybean rotation influences N fertilizer needs for corn and N use efficiency.
2. Identify how winter cover crop species influences corn and soybean yield performance and soil physical characteristics related to water holding capacity and irrigation.
3. Monitor soil physical and chemical parameters related to soil health and productivity as influenced by a corn and soybean rotation with varying winter cover crop species.

Progress/Accomplishments: Field trials have been established and are progressing nicely. Planting was delayed due to the excessive rain this spring at all locations. In plot areas with large amounts of cover crop residue the water drained (infiltrated) better than the plots that did not have significant residue. However, the high residue plots also maintained a high and consistent soil moisture that delayed planting in some locations. Although there are many benefits from high residue cover crops, one drawback is that moisture retention can be problematic during planting when environmental conditions result in high levels of precipitation or cloudy cool days that prevent soil drying. The cover crop trials were established on May 6, May 13 and May 14, 2024, at the Rohwer, Pinetree and Kibler research stations respectively. Soybean were established using no-till production practices and all emerged to an adequate stand within roughly 6 days after planting. The soybean cultivar AG43XF5 was seeded at roughly 150,000 seeds/acre and was chosen for its herbicide trait package and earlier maturity to facilitate timely planting of the cover crops this fall. At the Rohwer location we began working with Dr. Brye to monitor greenhouse gas emissions in the no cover crop vs. cereal rye cover crop treatment. Instrumentation equipped to monitor greenhouse gases such as carbon dioxide, methane, and nitrous oxide was installed following cover crop planting in the fall of 2024 and will remain in the field taking measurements at least until soybean harvest in the fall of 2025. Soil samples were collected from selected treatments and have been sent for a suite of soil health analyses. The timing of soil sample collection was selected to determine if time of year has a significant impact of soil health values.

Upcoming Actions/Activities: Cover crop seed has been acquired, and we are currently waiting on soybean harvest to conclude so that winter cover crops can be established. We are also waiting for the results of various soil samples that were submitted for soil health analysis.

Soybean Promotion Board 2025-2026 Report Date of Report: September 19, 2025

Title: Arkansas Future Ag Leaders Tour
Lead Investigators: Julie Robinson
Co-Investigators: Jeremy Ross
Status: Ongoing
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.**

The 2025 Arkansas Future Ag Leaders Tour was originally scheduled during the week of May 12 – 16, 2025. Due to low enrollment, the tour was cancelled for that week. The tour was marketed to the following Arkansas in-state institutions that have colleges of agriculture:
Institutions:

- Southern Arkansas University
- University of Arkansas – Pine Bluff
- University of Arkansas – Monticello
- Arkansas State University – Jonesboro
- University of Arkansas – Fayetteville
- Arkansas Tech University

The reasons for low enrollment are being investigated. Efforts are being made to reschedule the tour for later in the year. The tour may not be a full week in length and due to scheduling conflicts may be university/college specific. Due to a potential shortened tour length, the tour may only focus on more specific areas of the state. The original objectives are still being prioritized.

Many institutions take a Fall Break or a Mid-Semester Break. This break, no matter the name, usually lasts for two days and for Arkansas institutions take place sometime during the week of October 12 – 14 week. Meetings are being conducted to discuss students that might be interested and what would realistically be possible during a shorter time-frame with faculty and administrators in ag colleges in Arkansas.

Efforts are also being made to investigate the process by which future tours participation could result in participants receiving academic credit for participation. This idea has been encouraged as a marketing and recruitment method to avoid low enrollment in future years.

Soybean Promotion Board 2025-2026 Report Date of Report: September 19, 2025

Title: **Soybean Science Challenge**
Lead Investigators: **Dr. Julie Robinson**
Co-Investigators: **Dr. Jeremy Ross**
Status: **Ongoing**
Objectives:

1. **Develop and deliver original educational resources/curriculum to Arkansas junior high and high school students.**
2. **Increase awareness and knowledge of the value of soybeans to the Arkansas economy and potential careers supporting Agricultural sustainability.**
3. **Increase knowledge of the diversity of soy products and uses.**
4. **Increase participation in applied research by Arkansas junior high and high-school students supporting soybean production.**
5. **Development of state-wide educational partnerships to leverage ASPB resources.**
6. **Actively engage students in the "co-creation" of knowledge and reward outstanding student researchers through the Soybean Science Challenge research awards.**
7. **Reach out to science teachers to consider using Soybean Science Challenge online education resources and curriculum in their classroom.**
8. **Encourage teachers, schools, and districts to develop/expand school and community-based gardens where students learn about agricultural crops and practices, nutrition, environmental stewardship, and sustainability.**
9. **Working with regional and national education and teacher organizations to bring Arkansas soybean research and education into classrooms across the USA.**

Progress/Accomplishments:

- Promoted the SSC courses and teacher resources through monthly Constant Contact email to more than 400 Arkansas agricultural science and general science teachers.
- Updated/revised the SSC program regional fair sponsorship and student awards to encourage increased participation in and excitement about the program.
- Sent sponsorship letters to all regional and state science fair directors.
- Updated the SSC trifold brochure and table display.
- Developed a forensics lesson plan that utilizes plant pollen.
- Received and fulfilled four (4) requests for research seeds from teachers for their students to conduct soybean research.
- School and Community Gardens – received and fulfilled four (4) requests from teachers/schools for Arkansas soybean seeds and "Grow Your Own Protein" garden signs.
- SSC director and coordinator interviewed by KATV about the SSC and 2025 student awards, July 1, 2025.
- Hosted an exhibitor booth at the Arkansas Department of Education Summit, July 14-17, 2025. Approximately 1,700 attendees (teachers, school and district administrators, support staff, university faculty, etc.).
- Conducted an SSC virtual meeting with science fair directors to provide updates on the program, August 5, 2025.

- Coordinator promoted the SSC at the Arkansas STEM Ecosystem virtual meeting, September 2, 2025. Approximately 40 people representing K-12 education, higher education institutions, and STEM organizations participated.
- SSC provided program information and resources for the School & Community Garden Growth Program at UAPB on September 20, 2025.

Upcoming Actions/Activities:

- SSC Coordinator is scheduled to present at the Northwest Arkansas Regional Science and Engineering Fair Teacher Orientation Workshop via Zoom, October 3, 2025. Anticipating 40 attendees.
- SSC is sponsoring/hosting an exhibit/booth at the Arkansas Public School Resource Center's 2025 Fall Conference at the Hot Springs Convention Center on October 21, 2025.
- SSC is planning to be an exhibitor at the Arkansas Association of Educational Administrators 2025 Fall Conference, Benton Event Center on November 13, 2025.
- SSC is planning to participate in the Arkansas Farm Bureau Convention in December 2025.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Development of data-driven recommendations for variable soybean seeding rate in Arkansas
Lead Investigators: Jeremy Ross
Co-Investigators: Aurelie Poncet
Status: 2 of 3
Objectives:

1. **To develop an algorithm that computes the economic optimum seeding rate from the predicted site-specific yield response to seeding rate, cost of soybean seeds, and crop prices.**
2. **To evaluate the temporal stability and variability of a posteriori VRS prescription maps created from data collected in the same commercial fields and a minimum of two growing seasons.**
3. **To generalize findings across locations selected to bracket the typical range of field conditions found in Arkansas.**

Progress/Accomplishments: Two commercial soybean fields were included in this project for 2025. One field is in Poinsett County, and the other is in Clay County. Due to the wet spring, planting was delayed in both fields. Both fields had excellent plant emergence, and initial stand counts have been taken along with gird soil samples across both fields. Both fields were managed by the soybean producer.

Soil samples from each field have been obtained and sent to the soil testing laboratory for textural analysis and nutrient content.

Upcoming Actions/Activities: Once fields reach maturity, the replicated strips will be harvested separately. Raw harvest data will be obtained from John Deere. Planting data, harvesting data, and results from soil analysis will be used to improve our current database. Data from this project will be used to create recommendations for soybean producers wanting to use variable seeding rates on their farms.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Investigating Emerging Production Recommendations for Sustainable Soybean Production
Lead Investigators: Jeremy Ross
Co-Investigators: Ben Thrash
Status: Year 3 of 3
Objectives:

1. **Replicated research trials will be established to evaluate the performance of soybean varieties of the different herbicide technologies compared to popular varieties. These tests will consist of MG IV and MG V varieties at two locations. Measurements will include grain yield, lodging, shatter, and canopy structure.**
2. **Replicated research trials will be established to investigate the profitability of foliar applications of plant growth regulators, fertilizers, and fungicides to determine their impact on soybean yield and plant health. These data will be used in production meetings and production newsletters to either validate or refute the claims made by the manufacturer.**
3. **Initiate preliminary studies to determine the impact of insect pest in GMO and conventional production systems. Attempts will be made to expedite sweep sampling evaluation of various pest measures for improved pest management strategies. Additional trials evaluating new and existing insecticides and seed treatments will also be initiated. Trials evaluating the possible interaction between insecticides and commonly used herbicides will also be conducted.**

Progress/Accomplishments:

Agronomy

Research trials were planted at the Jackson County Extension Center (JCEC) and at the Pine Tree Research Station (PTRS). Due to the wet spring, plantings were delayed compared to the last few years. Initial plant stands have been conducted, and early season treatments have been applied. Overall, all studies at the JCEC have excellent plant stands and good emergence. Studies at the PTRS initially had good stands, but light deer damage has been noted. The Soybean Official Variety Test was planted at the JCEC. Initial plant stands have been taken, and all varieties have good stands. All treatments have been applied. Harvest has begun and will continue through October. Pre-harvest data is being collected and post-harvest data will be collected after harvest.

Entomology

We currently have 2 insecticide seed treatment trials being conducted behind a legume cover crop. These trials are evaluating both currently available and experimental seed treatments. We have soybean location planted at Tillar and are waiting for insect pests, typically loopers or bollworms, to show up. Extremely low numbers of redbanded stink bug are being found in south Arkansas. But the number is so low that I doubt they will be an issue this year, especially with the cold we had this winter. Acephate is currently under EPA review, and the agency is recommending a complete ban of this product in all row crops. This product is critical for control of redbanded stink bug in Arkansas and we are working diligently with multiple organizations to ensure that this does not happen. Other stink bugs are starting to be treated in some parts of the state, and other insect pests have been low so far this year.

Upcoming Actions/Activities:

Data will be analyzed, and presentations and publications will be developed this winter.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Science for Success – Arkansas Support for National Soybean Research and Extension Program
Lead Investigators: Jeremy Ross
Co-Investigators:
Status: Year 3 of 3
Objectives:

1. **Participate in national soybean research protocols to contribute data for BMP's.**
2. **Contribute data and expertise for Extension publications, social media releases, videos, and webinars to deliver BMP's at the local, regional, and national level.**
3. **Attend and participate in Science for Success virtual and in-person meetings to develop common-theme localized research efforts, Extension educational materials, and team-building activities.**

Progress/Accomplishments:
During the 2025 growing season, our Science for Success group conducted three studies that were established in multiple states in the US. These studies that were conducted in Arkansas are listed below. All three studies were planted at the Jackson County Extension Center (JCEC) and Study 1 and 3 were planted at the Pine Tree Research Station (PTRS). Initial plantings for Study 1 were in late-April at JCEC and PTRS; however, the second planting was delayed due to wet field conditions until early-June. Initial plantings for Study 2 and 3 at JCEC and for Study 3 at PTRS were in early-June. Initial plant stands have been conducted for all studies with adequate plant stands observed. All treatments have been applied and we have started harvesting.

1. Management strategies that reduce late-season yield loss and protect seed quality
2. Determining N-credit of soybean
3. Validating In-Season Potassium Management Opportunities in United States Soybean

We developed our own website (https://soybeanscienceforsuccess.org/) where all of the educational content we have developed can be found.
This spring, our Science for Success group hosted two webinars:

1. Climate Challenges in Soybean Production Webinar
    a. https://youtu.be/iKvmDX5Tzco
2. Economic Insights for Uncertain Times Webinar
    a. https://youtu.be/EsVpEpQuHM4

We also developed several factsheets and journal articles this spring that can be found on our new website. Our "Content Development" was held in Madison, WI on June 24-26. During this meeting, we worked on professional documents and had a workshop on having a better presence on social media.

Upcoming Actions/Activities:
We will meet as a group in late-February in San Antinio, TX at Commodity Classic to discuss this years results and plan for the 2026 season. We are continuing to have monthly virtual meetings to discuss research protocols and production issues.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Soybean Research Verification Program
Lead Investigators: Jeremy Ross
Co-Investigators:
Status: Year 3 of 3
Objectives:

1. To conduct field trials to verify that high yields can be profitably produced by coordinating the implementation of all research-based recommendations.
2. To aid researchers in identifying areas of soybean production and marketing that need further study.
3. To improve recommendations which contribute to profitable soybean production utilizing both irrigated and non-irrigated production of both early season (indeterminate) and conventional (determinate) varieties into economically sustainable soybean production systems for the Arkansas farmers.
4. To utilize the Soybean Research Verification Program (SRVP) concept to maintain and improve producers, County Extension Agents' and other crop advisors' soybean production and marketing expertise.

Progress/Accomplishments:
For the 2025 growing season, there are ten fields enrolled in the Soybean Research Verification Program (SRVP). Planting dates ranged from mid-March to late-June, with fields ranging in size from 30 to 100 acres. Three herbicide technologies were represented in the SRVP including XtendFlex and Enlist. Fields are scouted on a weekly schedule, and recommended application and production practices will be applied when needed. Agronomic practices have been completed on many of the SRVP fields, and we are waiting for harvest.

Upcoming Actions/Activities:
Yield and economic data will be analyzed, and presented at County, state, and regional meetings and publications will be developed to report the 2025 SRVP findings.

2025 SRVP Field Information as of September 26, 2025

General	By Chris Elkins. Prairie County is almost finished, and insect pressure remains well below threshold. The field received .95" rain and soil moisture sensors are showing adequate moisture to finish pod fill. Field continues to progress quickly. This will be the final weekly SRVP update until all yields are posted. Refer to table below for field specific information.		
County	**Variety**	**Stage**	**General Information**
Arkansas 1	NK 42T5XF	R8	Done. waiting on harvest.
Arkansas 2	Pioneer P49Z02E	R8	Done. waiting for harvest.
Clay	Pioneer P48Z70BLX	R8	Done. waiting for harvest.
Craighead	Asgrow AG47FX2	R6	Done, waiting on harvest.
Jefferson	NK 43-W1XFS	R8	Done, waiting on harvest.
Mississippi	Becks 4999XF	R7	Done, waiting on harvest.
Poinsett	Pioneer P48Z70BLX	R6	Done, waiting on harvest.
Prairie	Pioneer P48A14E	R6	Received .95" rain, Ranges from R6- late R6, 1/25 green stinkbugs, moderate frogeye, soil sensor show adequate moisture to finish.
White	Pioneer P46A90LX	R8	Harvested 9/16. Preliminary yield 79 bu/acre.
Woodruff	Asgrow AG46XF3	R8	Harvested 9/12.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Improving Technology Transfer for Profitable and Sustainable Soybean Production
Lead Investigators: Jeremy Ross
Co-Investigators:
Status: Year 3 of 3
Objectives:

1. To ensure timely development and distribution of the Soybean Update publications as well as update computer assisted variety selection program.
2. To improve the rate of technology transfer and adaption by the implementation of educational programs that impart critical decision-making information at advisory and producer level for improved profitability for sustainable soybean production systems (non-irrigated and irrigated), including the use of weekly electronic soybean reports (e-mail and blog) and timely newsletters such as Arkansas Weekly Soybean Report.
3. Continue to coordinate state and regional meetings to facilitate the latest soybean production updates. These will include the Arkansas Soybean Research Summit, Tri-State Soybean Forum, as well as other events deemed necessary by emerging production problems.
4. To increase the awareness of county extension agents, consultants, agribusiness representatives, concerned producers of the status, direction, and value of current soybean research and Extension efforts.
5. Publication of the Soybean Research Series, which will be an on-line archive of yearly reports of the projects funded by the Arkansas Soybean Promotion Board.

Progress/Accomplishments:
University of Arkansas System Division of Agriculture's Soybean Performance Trials have been planted at eight different locations (Jackson County Extension Center, Lon Mann Cotton Research Station, Northeast Rice Research & Extension Center, Northeast Research & Extension Center, Pine Tree Research Station, Rice Research & Extension Center, Rohwer Research Station, and Vegetable Research Station). Yield data, agronomic data from these trials along with additional varietal information obtained from each seed company will be used to develop the 2025 Soybean Update. Company data for each soybean variety is being collected for the 2025 Soybean Update.

Over 25 articles were submitted for publication in the 2024 Arkansas Soybean Research Studies. Articles for the 2024 Arkansas Soybean Research Studies are being reviewed and are being formatted for publication. The 2024 Arkansas Soybean Research Studies will be completed later this year.

The 2026 Tri-State Soybean Forum will be held on January 9, 2026, in Dumas, Ar. The final planning meeting was held on October 3, 2025, and topics/speakers were finalized.

Upcoming Actions/Activities:
Once yield data and other data for the Soybean Update is obtained this fall, the 2025 Soybean Update will be developed and published. Additional publications are being developed with collected data from the past few years. We will also continue to develop the agenda for the 2026 Tri-State Soybean Forum and solicit donations.

Soybean Promotion Board 2025-2026 Report - Fall Date of Report: October 10, 2025

Title: Arkansas Soybean College
Lead Investigators: Jeremy Ross
Co-Investigators:
Status: 1 of 1
Objectives:

1. Educate clientele on the latest agronomic recommendations for soybean production in Arkansas.
2. Increase awareness of the impact of soybean insects and diseases can have on soybean production.
3. Provide producers, consultants, and other decision-makers with the proper tools to make decisions on insect and disease pest in their fields.
4. Overall improvement of soybean insect and disease pest management in soybean production in Arkansas and increase the adoption of IPM in soybean production.

Progress/Accomplishments:
The 2025 Arkansas Soybean College was held July 29 & 30, 2025, at the Jackson County Extension Center near Newport, AR. Over 60 County Agents and UADA employees participated on July 29 and over 35 crop consultants, industry personnel, and farmers participated on July 30. Sign-in for the Soybean College started at 7:30 am, and the College began at 8:00 am and concluded at 3:00 pm. The registration fee was $100, and participants registered before the event.

Count Agents, crop consultants, industry personnel, and producers saw current research and demonstrations on many of the production challenges Arkansas soybean producers are experiencing today. Faculty from the University of Arkansas System Division of Agriculture led the demonstrations, and participants had the opportunity to take part in the hands-on demonstrations. Paid participants received a complementary sweep net, hand lens, and other items. Lunch was provided. CEU's were available for Certified Crop Advisers and Agriculture Consultants.

Demonstration stops for the Soybean College include:

- Herbicide Symptomology/Weed Control
- Insect Scouting Demo
- Soybean Disease Identification/Control
- Nutrient Deficiency Identification
- Irrigation Technology
- New Technology/Spray Drone Demo

Upcoming Actions/Activities:
All objectives for this project have been completed.

Soybean Promotion Board Summer Report Date of Report: 10/9/25

Project Title	Soybean Weed Management: A Team Approach for Improved Control and Profitability
Lead Investigator	Bob Scott
Co-Investigator(s)	Tom Barber, Jason Norsworthy, Nilda Burgos
Status	Year 2 of 3
Objectives	1) To continue testing suspected resistant weed biotypes sent from county agents and soybean producers for herbicide resistance, particularly for glufosinate and auxin herbicide resistance, documenting the level of resistance and distribution, and determining the effectiveness of alternate herbicide modes-of-action on resistant biotypes 2) To quantify the potential of multiple herbicide-resistant Palmer amaranth and other confirmed resistant weeds to spread in Arkansas by determining control programs, ecological fitness, and geographic distribution of resistant biotypes, and resistance and dispersal mechanisms likely to cause population expansion 3) To identify and evaluate effective management programs (both short-term and long-term) for multiple herbicide-resistant Palmer amaranth including glufosinate and auxin herbicide resistance 4) To evaluate the effectiveness of various agronomic practices (double crop, cover crop, etc.) for suppressing problematic weeds of Arkansas soybean production systems 5) To determine how herbicide performance and selectivity are affected by environmental conditions (such as planting date, soil texture, climatic conditions), application procedure, application technologies (nozzles & adjuvants), herbicide tank-mixture, weed species, and growth stage to develop more efficient and reliable herbicide weed management strategies 6) To evaluate long term programs (chemical and cultural) to reduce the soil weed seedbank. These programs will include trials designed to study methods of destroying weed seed post-harvest and evaluate new weed seed destruction equipment as it becomes available 7) To evaluate the viability of new technologies (herbicides, traits, application tech, etc.) as they emerge for efficacy and the ability to safely apply in the agricultural and external environment 8) To evaluate fall-applied residual herbicides effectiveness on problematic Arkansas weeds (i.e., Italian ryegrass) and the resulting impact on spring burndown applications 9) To evaluate herbicide program costs and resulting soybean yields to determine profitability potential of weed management options 10) To develop RNAi technology for potential use as a novel tool for integrated weed management 11) To provide rapid transfer of weed control information to growers through multiple outreach methods such as publications, blog posts, Weeds AR Wild podcasts, videos, text messages, and many others

Progress/Accomplishments/Upcoming Activities:

The team has implemented 10 greenhouse studies and over 50 total soybean field trials this year that were planted at multiple locations, including: Fayetteville, Keiser, Lonoke, Marianna, Newport, Pine Tree, Rohwer, Stuttgart and Harrisburg, AR. We are evaluating best management practices and program approaches across soybean systems, including Enlist, Liberty Link, experimental, and conventional soybean. Including a new formulation of Liberty-Liberty Ultra and several new rabid burndown

herbicides. We have continued to investigate metabolic resistance in Palmer amaranth to the PPO-inhibitors, VLCFA-inhibitors, and other herbicide chemistries, and the impact this resistance mechanism has for soybean growers. We are evaluating production practices; such as row spacing and irrigation, and alternative chemistry for pigweed control, considering the increase in pigweed resistance to soil-applied PPO-inhibitors. These resistant plants all harbor target site mutations. A total of 6 trials were conducted on populations of pigweed collected from two counties evaluating PPO resistance mechanism. In additions two trials were conducted evaluating populations resistant to the auxin herbicide dicamba. Resistance to auxinic herbicides is difficult to sort out because of multiple genes controlling response to 'auxin mimics'. We are going to use genomics approach to generate more information. Research evaluating alternative cropping practices like crop rotation, cover crops, use of fall residuals and varying row widths are being conducted to assist with the suppression of problematic weed species through the implementation of integrated weed management (IWM) strategies. Studies utilizing sUAS imagery and See & Spray (Blue River Technology) are established to determine their viability for remote sensing and remote applications, as well as evaluating cutting-edge technologies. Additional studies evaluating weed control from both a weed seedbank management and profitability standpoint are underway. Thus far results indicate the See and Spray technology can reduce pesticide use by up to 25% depending on weed populations. Weed seeds are currently being identified from suspected resistant populations in fields where herbicide failures occurred. They will be evaluated relative to known susceptible standards for resistance under controlled conditions during this fall and winter, and if failure still occurs, dose response experiments will be conducted to confirm resistance, determine the level of resistance, and update our distribution maps. Studies are also underway to evaluate Bolt® soybean tolerance to ALS inhibitors used in rice (Gambit, Permit, Regiment etc.), this and other work is in response to the increase this year in resistant and difficult to control sedges. Bolt soybean offers significant tolerance to ALS-rice herbicide chemistry drift. Additionally, studies will be implemented this fall to evaluate fall burndown and residual options for the effective control of Italian ryegrass. Multiple avenues have been and will continue to be used to quickly disseminate generated information including blog posts, publications, face-to-face interactions, the SlickText mass texting service, and the Weeds AR Wild podcast series. Planting is complete for the 2025 research season. Studies have been established that include fall and spring residual treatments combined with other agronomic issues to determine effectiveness on Palmer amaranth and other weeds. The weed science group also established several educational trials at the Jackson County Extension Center used in the Soybean College this summer. These trials are on going and soybean harvest is underway.

Value to Soybean Industry:

Proper weed control accounts for a significant portion of annual budgeted production expenses. The rapid adoption and widespread use of soybean weed control information has been of great value to Arkansas growers. This project allows growers to closely follow the discovery of herbicide-resistant and new problematic weed species through timely information and assist with the management of these weeds on their farms. The discoveries of multiple glyphosate-resistant weed species and other herbicide resistance such as PPO-inhibitor, VLCFA-inhibitor-, glufosinate-, and auxin-resistant pigweed in Arkansas soybean fields have been a direct result of Soybean Board Funding. Failure to adequately control these weeds can result in total crop loss resulting in millions of dollars lost for Arkansas soybean producers. The identification of IWM opportunities to enhance program approaches and determine best use practices of new precision technologies can also aid in weed control and grower profitability. If the introduction of diverse strategies and scientifically supported recommendations generated from this research can save even $10/acre of input costs, that would provide an annual savings of $35 million total for Arkansas soybean growers.

Soybean Promotion Board 2025-2026 Report Date of Report:10/8/25

Title: Developing a satellite-based field scouting tool

Lead Investigators: Dr. Terry Spurlock**,** Extension Plant Pathologist**,** Department of Entomology and Plant Pathology, Division of Agriculture

Co-Investigators: Dr. Jeremy Ross, Extension Soybean Agronomist, Department of Crop, Soil, and Environmental Sciences, Division of Agriculture

Status: Year 3

Research Areas: Plant Pathology, Precision AG, IPM

Stated Goal: To develop a tool that uses publicly available satellite imagery to increase scouting efficiency by locating areas in fields that should be scouted

Specific Objectives:

1. Work with farmers, consultants, and county agents to locate test fields each year. Most of these fields will be Arkansas Soybean Verification fields. We expect to scout approximately 10 fields per year.

2. Run the tool weekly on each verification field and scout areas of fields the tool locates at least once prior to V6, once at R3/R4 and once at R6.

3. Collect relevant data relating to soybean health and productivity (stand, weed populations, diseases present, insect counts, etc.) at each area the tool locates as well as soil samples from areas the tool frequently locates.

4. Test different vegetation indexes and mathematical models to determine the best single model or combination of models for field scouting.

5. Year 3 – deploy the beta version of the tool to be used by county agents, consultants, scouts, and/or farmers.

Progress/Accomplishments: Field scouting was completed in seven total fields in Arkansas, Chicot, Drew, Jefferson, Lincoln, and White Counties. For each field, 12 vegetation indices were calculated and the spatial variability of plant health determined by the scouting tool model. In each field, points were marked in four categories of plant health, high, medium-high, medium-low, and low for each individual index. Points were merged where they were in the same position. For each category a maximum of 5 points were chosen per field and data collected at each point at the time of scouting. In each field and at each scouting point the row closure (lapped), plant height, weed infestation, insects, and incidence and severity of frogeye leaf spot, Cercospora leaf blight, and Septoria brown spot were determined. Analysis is ongoing but initial results indicate increased row closure, plant height, frogeye leaf spot and Cercospora leaf blight where the model placed scouting points in relatively healthier areas of fields. Septoria brown spot was more severe where low-category and medium-low category scouting points were placed.

Upcoming Actions/Activities: Soil samples will be collected from select fields and sent to the Arkansas Soil Testing Lab for analysis. The first version of the dashboard to mark fields for scouting is under construction.

Title: Determining the value of fungicide application using on-farm trials
Lead Investigators: Dr. Terry Spurlock**,** Extension Plant Pathologist**,** Department of Entomology and Plant Pathology, Division of Agriculture
Co-Investigators: Dr. Jason Davis, Application Technology Specialist, Division of Agriculture
Status: Year 3
Research Areas: Plant Pathology, Precision AG, IPM

Stated Goal: To cooperate with farmers, consultants, and county agents to determine when and where a **fungicide application or fungicide + product(s) marketed to improve plant health** protects a soybean crop and adds value above the input cost.

1. **Specific Objectives: Work with farmers or consultants on their farms** to determine the value of product applications if applied across the entirety of their soybean acreage. **This project is targeted to early-career farmers that may struggle with these decisions.**
2. **Test products that the farmer and consultants would like to see.** They guide the test. Products will be applied within label specifications. However, individual rates will be determined by the manufacturers' and retailers' representatives. Products will be applied as they are sold.
3. **Utilize strip trials combined with spatial analysis to** allow integration of whole-field product efficacy with remote sensing technology (aerial imagery via UAVs and satellites, soil maps, and yield monitor data) to answer additional questions regarding within-field product efficacy, disease spread, and within-field difference in impacts of foliar diseases.
4. **Utilize drones** to apply products and determine efficacy against traditional ground applications both site-specifically and whole-plot.

Progress/Accomplishments: Ten fungicide trials have been completed at locations in Jefferson, Arkansas (2), Chicot, Lonoke, Drew, Ashley (2), Lincoln, and White Counties at growth stage R3. Products applied at each were 3 replications of Miravis Top at 13.7 fl oz/A, a nontreated control and either Revylok at 5.5 fl oz/A, Domark at 5.0 fl oz/A, Lucento at 5.5 fl oz/A, or a biological product called Bio Health at 32 fl oz/A with a ground-driven sprayer applying 10 gallons of water/A. Fields were rated for foliar diseases at R5.5. Some fields had the most frogeye leaf spot that has been observed in almost a decade. Aerial imagery was collected for some locations at the time of disease rating. Yield has been or will be either collected using a weigh wagon or the farmer's combine yield monitor at harvest. Grain samples have been collected at one of the Arkansas County locations and at the Drew and Jefferson County trials.

Upcoming Actions/Activities: An automated report detailing field specifics such as product impact to yield and foliar diseases, as well as soil type, field imagery, and a brief technical explanation of the trial and findings will be provided to each cooperating grower and county agent. Additionally, findings will be reported to the Arkansas Soybean Promotion Board and summarized in the Arkansas Soybean Research Series and in county and regional production meetings.

Title: Understanding Taproot decline and orange leaf spot; soybean diseases of increasing importance in Arkansas

Lead Investigators: Dr. Terry Spurlock, UA System Division of Agriculture
Co-Investigators:
Status: Year 3
Stated Goal: To determine management strategies for taproot decline and determine the causal agent for orange leaf spot, a disease generating questions by consultants and industry representatives

Specific Objectives:

1. Determine the regional distribution of taproot decline and determine the disease's impact on yield.
2. Determine management strategies for taproot decline (variety, seed treatment, and in-furrow fungicides).
3. Determine the causal agent of orange leaf spot and its impact on yield.
4. Train a master's student in applied plant pathology and pest management.

Progress/Accomplishments:
Six variety trials were planted at Jerome on April 18th, three behind soybean and three behind row rice. In total, the trials contained 22 soybean varieties but were divided by maturity groups into six separate trials. Each trial was arranged in a randomized complete block design with 6 replications in the trials behind row rice and 12 replications in the trials behind soybean. The trials placed behind soybean were intended to have an in-furrow fungicide treatment but complications with the in-furrow system on the planter prevented application on the day the trials were planted, and significant rain was forecasted in the following several days. Trials were not inoculated as severe taproot decline has been observed in the field over many years. Stand and vigor data have been collected through 42 days after planting. Aerial imagery has been collected weekly since emergence. The trials were rated for taproot decline and damage by root-knot nematode at R5.

An in-furrow and seed treatment fungicide trial was planted with AG48XF0, a soybean variety known to be susceptible to taproot decline, at Rohwer Station on June 5th. The trial had nine treatments and a nontreated control arranged in a randomized complete block design with 6 replications. Half of each plot was inoculated with the fungus that causes taproot decline at planting and the other half was not. Stand and vigor data have been collected through 42 days after planting. Aerial imagery was collected weekly since emergence. The trial was rated for taproot decline at R5.5.

Three variety trials were planted at Rohwer Station on June 4th and June 5th. In each trial, plots were inoculated with the fungus that causes taproot decline. Trials were arranged in a randomized complete block design with 8 replications. Stand and vigor data were collected through 42 days after planting. Aerial imagery has been collected weekly since emergence. Trials were rated for taproot decline at R5.5-R6 as well as frogeye leaf spot, Cercospora leaf blight, septoria brown spot and other foliar diseases.

Upcoming Actions/Activities:
Taproot decline will continue to be monitored at the county level throughout the season and the state-wide distribution updated and made available at season's end. Trials will be analyzed and data made available to county agents and industry cooperators by the end of the year. All trials will be included in the Arkansas Soybean Research Series and the most relevant results reported to producers at county production meetings throughout the winter.

Title: Determining factors associated with poor grain quality in soybean and management options
Lead Investigators: Terry Spurlock, Nick Bateman, John Rupe
Status: Year 1
Objectives:
Determine the major factors affecting soybean seed quality and develop management strategies for growers to avoid quality losses

Specific Objectives:

1. Determine differences in grain quality caused by fungal diseases and disorders among varieties in the official variety trial at Rohwer Station annually (Spurlock).

2. Establish an early and a late planted fungicide trial at Rohwer Station each year based on data collected from the previous season's official variety trial. Varieties with significantly higher diseases impacting grain quality will be chosen for these trials. The aim will be to determine the impact of various fungicide timings on varieties that have shown susceptibility to diseases and disorders negatively impacting grain quality (Spurlock).

3. Samples will be taken from on-farm fungicide trials (4 – 5 trials annually) at harvest and sent to Riceland Foods in Stuttgart for grading and the Spurlock Lab to determine levels of diseases and disorders that impact grain quality (Spurlock).

4. Grain will be sampled from multiple stink bug trials throughout the state with significantly different levels of stinkbug or other insect feeding and grain quality determined. Additionally, samples will be sent to Fayetteville for fungal pathogen identification that may be related to damage caused by insect feeding (Bateman).

Progress/Accomplishments: Two trials were planted at Rohwer Research Station. One in NK44Q5E3S and the other in NK54J9XFS planted on June 4, into plots 6-rows wide, 20' long and replicated 4 times. Aerial imagery has been collected weekly. Plots were sprayed with Priaxor 8 fl oz/A, Quilt Xcel 14 fl oz/A, Miravis Top 13.7 fl oz/A, Lucento 5.5 fl oz/A, Revytek 15 fl oz/A, Thiophanate-Methyl 20 fl oz/A, Domark 5 fl oz/A, Revylok 6.5 fl oz/A or untreated at R3 on 8 Aug (MG4) and 20 Aug (MG5). Diseases were assessed on 9 and 17 Sep for MG4 and MG5, respectively for target spot, Cercospora leaf blight, and Septoria brown spot.

Upcoming Actions/Activities:
At maturity, two rows of each plot will be harvested, and grain samples collected from each plot. Two to three weeks later, another two rows will be harvested, and grain samples collected from each plot. Purple seed stain, Phomopsis seed decay, and other measures of grain quality will be determined from each sample and the impact of delayed harvest on grain quality determined.

Farmers are reporting poor grain quality, and some have brought in samples. Data will be collected from grain samples and the results reported back to the farmers that submitted them. Grain exhibiting purple seed stain and Phomopsis seed decay will be selected from these samples and tested for fungicide resistance. Harvest samples will also be collected from the soybean OVT. Purple seed stain, Phomopsis

seed decay, and other measures of grain quality will be determined from each sample and reported by variety.

Harvest samples have been collected from three of four on-farm fungicide trials that were harvested with a weigh wagon. Purple seed stain, Phomopsis seed decay, and other measures of grain quality will be determined from each sample and reported by fungicide treatment. The samples will also be sent to Riceland Foods in Stuttgart for determination of grain quality using their standardized scale.

Soybean Promotion Board 2025-2026 Report Date of Report:10/9/2025

Title: Educating Growers and Consultants on Insect Monitoring and Control

Lead Investigators: Ben Thrash
Co-Investigators: Nick Bateman, Glenn Studebaker
Status: Year 1 of 3
Objectives:
Objective 1. Increase awareness of the impact soybean insects can have on production

Objective 2. Provide growers and other decision-makers with the proper tools to make decisions on insect pest populations in their fields

Objective 3. Overall improvement of soybean insect pest management in Arkansas and increased adoption of IPM in soybean production.

Progress/Accomplishments:

Objective 1 Weekly insect updates have been delivered on Arkansas Row Crops Radio.

Objective 2 75 sweep nets were ordered and received. Sweepnets have been assembled and stickers with the Arkansas Soybean Promotion Board Logo were placed on the handles of the nets. Many have been handed out to growers, consultants, and county agaents.

Objective 3 Proper sweepnet technique and an overview of insect treatment thresholds were taught at trainings at the Rice Research and Extension center, Faulkner County Field Day, agent training at Lon Mann Cotton Branch experiment station and the Soybean College at the Newport Research Station.

Soybean Promotion Board 2025-2026 Report Date of Report:10/9/2025

Title: Economics of Automatic Insecticide Applications in Arkansas Soybean
Lead Investigators: Ben Thrash
Co-Investigators: Nick Bateman, Glenn Studebaker
Status: Year 1 of 3
Objectives:
Objective 1. Apply insecticides at R3 growth stage on soybean planted at various times and various locations across the state and monitor for insect populations. Compare automatic application profits to the profitability of an IPM approach of only spraying when thresholds are reached.

Objective 2. Record yields and determine the profitability of automatic insecticide applications.

Objective 3. Determine if there are specific circumstances when and where an automatic insecticide application may be warranted.

Progress/Accomplishments:

Objective 1 - Twelve randomized strip trials with containing a treat only when needed, automatic lambda-cyhalothrin, automatic Vantacor, and automatic Heligen application were conducted this year. Each trial has been sampled weekly since they have been sprayed. We have harvested one of these trials and are currently working on the others.

Objective 2 – One trial has been harvested, we are awaiting harvest on the others.

Objective 3 – This will be determined at the end of the year.

Soybean Promotion Board 2025-2026 Report Date of Report:10/9/2025

Title: Refining Insect thresholds in Arkansas soybean
Lead Investigators: Ben Thrash
Co-Investigators: Nick Bateman, Glenn Studebaker
Status: Year 1 of 3
Objectives:
Objective 1. Verify/refine thresholds for corn earworm, soybean looper, and the stink bug complex in Arkansas soybean

Objective 2. Evaluate slug control methods for efficacy and cost effectiveness in Arkansas soybean.

Objective 3. Determine the more efficient sampling methods for wide row, narrow row, and drilled soybean for multiple pests.

Progress/Accomplishments:

Objective 1

Two corn earworm trials, three looper trials, and one stink bug trial were conducted this year. Plots are near ready to harvest.

Objective 2

No locations of slugs could be found this year.

Objective 3

Wide row and narrow row soybean have been sampled this year and data is being combined from this trial. Insect numbers were low in these plots.

Title: An innovative approach to generate porous soy proteins with enhanced flavor for the plant-based food industry

Lead Investigator: Ali Ubeyitogullari

Status: Year 3 of 3

Objectives:

1. Extract off-flavors (*i.e.,* polyunsaturated fatty acids, aldehydes, ketones, and alcohols) from defatted soybean flour using a sequential pure supercritical carbon dioxide (SC-CO_2) and ethanol-modified SC-CO_2.
2. Extract soy protein isolate from off-flavor-removed, defatted soybean flour using an alkaline extraction method, and generate soy protein micro-and nanoparticles using an SC-CO_2-assisted particle formation system.
3. Load model dairy flavoring compounds into the microstructure of the produced protein particles using SC-CO_2, and generate alternative cream cheese using the functionalized soy protein isolates and 3D food printing.

Progress/Accomplishments:

Progress has been made on the second and third objectives. The Ph.D. student hired in the first year of the project continued to work on this project. This Ph.D. student will continue conducting the experiments, collecting & analyzing the data, and writing manuscripts. The findings from Objective 1 have been published in the journal *Future Foods*.

In the second year of the project, we dried soy proteins using an innovative SC-CO_2 drying. The dried proteins were characterized for their rheological properties, textural properties, morphology, crystallinity, chemical structure, thermal stability, and solubility. The resulting soy protein aerogels upon SC-CO_2 drying showed outstanding properties, such as surface areas of 222-278 m^2/g, pore sizes of 8-11 nm, and pore volumes of 1.88-3.13 cm^3/g. Their densities were ~0.21 g/cm^3 with high porosities of ~83%. This study was published in the journal *Sustainable Food Proteins*. Currently, we are finalizing the analysis of these proteins, specifically their volatile compounds affecting aroma. These samples included the proteins obtained following these processing steps: (i) SC-CO_2 treatment at 40 MPa, 60 C for 4h, (ii) a sequential SC-CO_2 treatment at 40 MPa, 60 °C for 4h followed by 15 MPa, 60 °C for 2 h, (iii) hexane extraction at room temperature, and (iv) Soxhlet extraction. We are planning to submit this study for publication in a peer-reviewed journal soon. We have started working on the third objective; we are currently finalizing the experimental design for the study.

Upcoming Actions/Activities:

Over the next reporting period, we plan to complete the experimental part of the third objective on the encapsulation of model flavoring compounds into soy protein isolates using SC-CO_2 and characterize the loaded samples.

Soybean Promotion Board 2024-2025 Report Date of Report: 10/10/2025

Title: Development of High-yielding Soybean Cultivars with Broad Resilience to Stressors
Lead Investigators: Caio Canella Vieira
Co-Investigators:
Status: Year 2 of 3
Objectives: i) Hybridization with purpose based on genetic characterization of parental lines; ii) Aggressive off-season nursery population development; iii) Broad phenotypic and genotypic characterization of breeding lines for biotic and abiotic stressors tolerance; and iv) Selective testing footprint across target environments within the University research stations' network.

Progress/Accomplishments, October 10, 2025, Season Update: The 2025 soybean season in Arkansas is in its final stages. Yield trials are progressing, with most plots nearing physiological maturity and preparing for harvest. Throughout the season, canopy remained dense, ensuring good plant development, and initial yield data look promising across many testing sites. Favorable early-season rainfall supported strong stand establishment across locations, and scattered rains during the summer minimized stress, allowing trials to progress without major setbacks. Overall, the conditions were favorable for conducting field trials, ensuring data quality and uniform plot development. Irrigation schedules are being scaled back in accordance with crop maturity. Recent breeding efforts have focused on morphological notes, breeders' selections, and preparing fields and equipment for harvest, along with some locations that are nearing completion of harvest progress. Genotypic information was successfully processed and will be integrated with phenotypic information to develop genomic prediction models, supporting the identification of superior breeding lines. The aggressive pursuit of data quality and the intense focus on increasing testing capacity during this season will support the proper assessment of yield potential, as well as stability and adaptability, which in turn will support the development and release of high-yielding, stable soybean cultivars tailored for Arkansas's growers.

2025 Tentative Releases:

The advanced breeding line R19C-1035 (MG 4.7) is being considered for tentative release in 2025 based on multi-environment yield results. It is being extensively tested across 34 environments during the 2025 yield trials. In the 2024 Arkansas Variety Testing (ARVT) early plating trials, R19C-1035 showed consistent yield performance, with a relative yield of 109.6% compared to the test average. Under flooding conditions, R19C-1035 outperformed the test mean with a relative grain yield advantage of 143%, highlighting its high yield potential under irrigated conditions and resilience to flooding stress.

2025 Yield Trials:

The 2025 growing season employed an aggressive testing strategy, with pre-commercial breeding lines evaluated across 30-34 environments in ten states (Alabama, Arkansas, Georgia, Kansas, Louisiana, Mississippi, Missouri, North Carolina, Tennessee, and Virginia) (Figure 2). This broad network provides strong environmental coverage to assess yield potential, stability, and adaptability. The trials emphasize both conventional and Enlist-E3® herbicide-resistant lines, expanding the program's capacity to identify and release high-yielding, resilient cultivars for Arkansas growers.

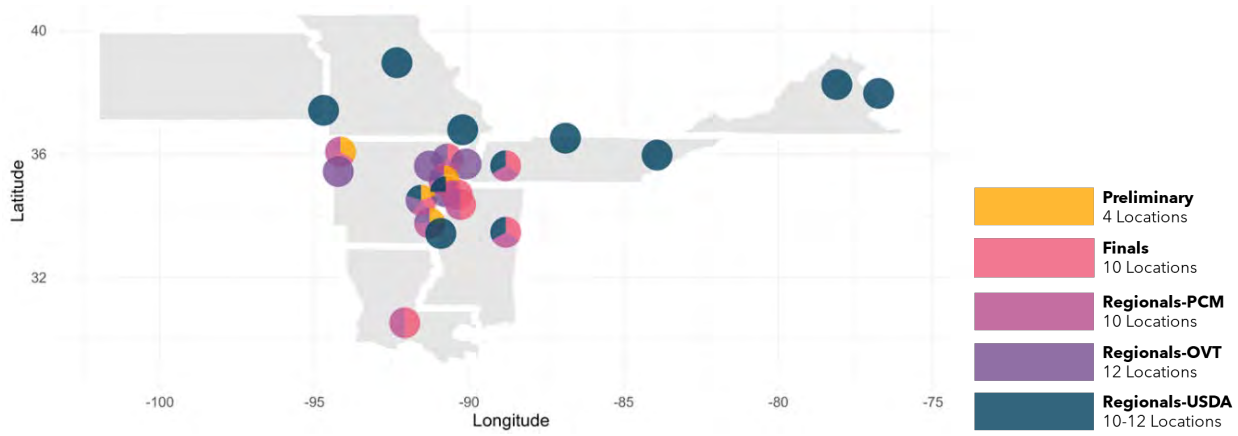


Figure 2. Geographic distribution of the Arkansas Soybean Breeding Program's 2025 multi-environment yield trials.

Enlist-E3® Yield Trials: The 2025 season represented a comprehensive assessment of Enlist-E3® herbicide-resistant soybeans in the program. Nine pre-commercial Enlist-E3® lines are being tested in the USDA Southern Regional Test and the Arkansas Variety Testing Program in 30-34 environments across 10 states. These lines consistently demonstrated good yield performance and stability across diverse environments in 2023 and 2024. In the Arkansas Finals, 60 additional Enlist-E3® lines are being tested in 10 environments, while 665 lines completed preliminary evaluations at 4 environments.

Preliminary Yield Trials: A total of 1,055 conventional breeding lines were planted and evaluated across four environments in Arkansas. DNA samples collected earlier in the season were processed at the Soybean Genomics and Improvement Laboratory, Beltsville Agricultural Research Center, USDA-ARS, and genotyping was conducted using the SoySNP6K BeadChip.

Phenotypic and genotypic information from each breeding line, including conventional and herbicide-resistant backgrounds, will be utilized in genomic prediction models to support the identification of promising genotypes for advancement.

Progeny Rows: Nearly 19,000 progeny rows from 291 biparental populations were evaluated at Stuttgart, AR. Breeder's selection is currently in progress, with superior rows to be harvested to ensure genetic purity and germination quality. Seeds will be cleaned and packaged for the 2026 Preliminary Yield Trials.

Crossing Block: The 2025 crossing block consisted of 193 crossing combinations in Fayetteville, AR, with a total of 10,000 attempts, resulting in an average of at least 50 attempts per crossing combination. Crosses were derived from 59 unique advanced breeding lines carrying multiple biotic and abiotic stress-resilient traits. Within this set, five high-yielding Enlist-E3® herbicide-resistant Arkansas elite breeding lines were used as parents in a *forward* crossing strategy. This approach focuses on crossing the program's own Enlist-E3® advanced breeding lines as the E3 donors rather than relying on standard trait introgression from external sources. By doing so, the program ensures that herbicide resistance is combined directly with Arkansas elite genetics, stacking high-yield potential with resilient traits. The harvest of the F_1 seeds is currently underway and will be promptly processed and prepared for shipment to the off-season winter nursery in Puerto Rico, thereby accelerating breeding cycles for subsequent Progeny Row Trials.

Harvest Progress:

The internal trials harvest is progressing as planned, with no major logistical or agronomic issues reported to date. The progress varies by location due to differences in maturity and environmental conditions

(Figure 3). Washington, LA (WAS) leads with a 95% completion rate, followed by Rohwer, AR (ROH) at 80%, Marianna, AR (MAR) at 40%, and Stuttgart, AR (STU) at 30%. Starkville, MS (STA), Pine Tree, AR (PTR), Leland, MS (LEL), Jonesboro, AR (JON), Clarksdale, MS (CLA), and Brownsville, TN (BRO) have not yet started harvesting. Post-harvest processing (seed cleaning, packaging, data analysis) begins immediately after harvest.

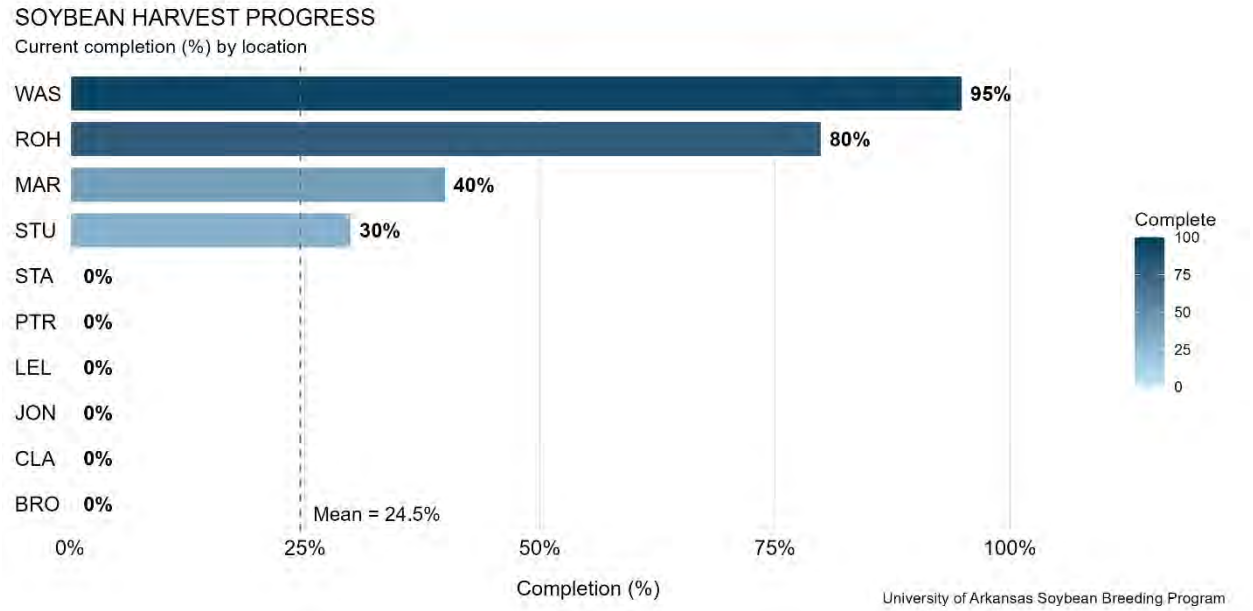


Figure 3. Harvest progress for the University of Arkansas Soybean Breeding Program across internal locations. Location abbreviations: ROH = Rohwer, AR; WAS = Washington, LA; STU = Stuttgart, AR; MAR = Marianna, AR; PTR = Pine Tree, AR; STA = Starkville, MS; LEL = Leland, MS; JON = Jonesboro, AR; CLA = Clarksdale, MS; BRO = Brownsville, TN.

Upcoming Actions/Activities

- Harvest of yield trials across all locations is underway.
- Seeds will be cleaned, labeled, and stored for future yield trials.
- Seeds of selected breeding lines will be packaged, while non-selected lines will be stored appropriately.
- Crossing block harvest is underway, and seeds will be promptly cleaned and shipped to the off-season winter nursery in Puerto Rico.
- DNA samples from breeding lines undergoing 2026 preliminary yield trials will be extracted and shipped to the Soybean Genomics and Improvement Laboratory, Beltsville Agricultural Research Center, USDA-ARS, to be processed with the Soy6K SNP BeadChip.
- Equipment will be serviced after harvest for readiness for the next season.
- Student training in breeding operations as well as laboratory techniques is underway.
- Scientific Manuscripts: five peer-reviewed papers have been published, four are under review, and several others are in the final stages of preparation for submission.

Title: Fast-tracking MG4 and early MG5 cultivars with Southern root-knot nematode resistance
Lead Investigators: Caio Canella Vieira
Co-Investigators: Travis Faske
Status: Year 1 of 3
Objectives: i) Characterize the response to SRKN of breeding lines in the Arkansas Soybean Breeding Program using molecular markers, greenhouse pot assays, and field screenings; ii) Develop breeding populations derived from SRKN-resistant parental lines.

Progress/Accomplishments: October 10th, 2025 - Season Update:
Note-taking for the 2025 growing season has concluded. The second round of breeder's notes was completed for approximately 80% of the yield trials across all locations. Harvest activities are underway, with several sites already harvesting early maturing materials, while others are applying desiccants to begin harvest as soon as conditions permit. Harvest of purity plots in Fayetteville, AR, has also begun, and progeny row harvest is scheduled to start this week. Hand harvest of crossing block materials is expected to begin by mid-October.

Advance Yield Trials: Maturity notes for final, pre-commercial, and USDA Uniform yield trials across selected locations have been completed. Two rounds of breeder notes for all yield trials across the ten experimental locations were finalized during the first week of October. Data collection for maturity, pubescence, pod color, and growth habit is currently underway in the purity plots in Fayetteville, AR. Harvest of the early maturity groups is ongoing across several locations.

Early Generation Stages: A total of 1,000 progeny rows were selected during the first round of breeder's selections. Hand harvest of these materials is currently underway in Stuttgart, AR. Two additional rounds of selection will occur as the remaining material reaches maturity, followed by immediate hand harvest. Threshing activities will be conducted simultaneously, and all harvested materials will be weighed, cleaned, and inventoried. Near-infrared (NIR) data will be collected for each line.

2025 Potential Release: The early maturity group V (MG V) line R19-45980 continues growing in the 2025 USDA Southern Uniform Trials and the Arkansas Official Variety Testing (OVT) without any major issues. Results from the line's performance will be presented in the next report.

2025 Pre-Commercial Stage: SRKN-resistant lines R21KB-05522 (MG V) and R22KB-16609 (MG IV) continue under evaluation at five Arkansas locations. Both lines are being converted to Enlist-E3® and XtendFlex®, similarly, SRKN-resistant lines R21KB-03720 and R20-1429 continue evaluation in the 25 PCM yield trials. Yield performance data will be presented in the next report.

2025 Final Stage: Ten high-yielding SRKN-resistant lines continue to grow in the 2025 Finals yield trials across five Arkansas locations. Three of these lines—R23KB-03901, R23KB-03934, and R23KB-03985—are also being tested at out-of-state sites in Mississippi, Tennessee, and Louisiana. These trials build upon the progress reported in the summer update and remain on schedule for harvest and data collection this fall.

2025 Biotic/Abiotic Stress Panel: A total of 976 lines from the 2025 preliminary yield trials were submitted for screening against 22 biotic and abiotic stressors, including iron deficiency chlorosis, soybean cyst nematode, southern root-knot nematode (SRKN), PPO herbicide tolerance, and stem canker, among others. From these, approximately 4% (43 lines) were identified as carrying the SRKN-resistant trait. These results highlight the importance of continued large-scale screening for major stress factors early in the breeding process, particularly for SRKN resistance. They also underscore the challenge of expanding the genetic base for resistance. As previously noted, more than 50% of the progeny row populations

developed this year include at least one parent line with confirmed SRKN resistance, supporting ongoing efforts to diversify and strengthen resistance within our breeding program. Yield performance of the identified lines will determine whether they advance to the 2026 Final Yield Trial stage. Lines that are not advanced will be used as parental material, in combination with genomic prediction results, to design the most promising cross combinations for the next breeding cycle.

2025 Research/Publication: This study evaluated 76 soybean breeding lines to assess genetic resistance to the southern root-knot nematode (SRKN) and its impact on reducing nematode density in the soil. Resistant lines carrying the QTL on chromosome 10 had significantly fewer nematodes than susceptible ones, confirming the QTL's effectiveness. However, prolonged off-target dicamba exposure increased nematode populations across all lines, while dicamba-tolerant lines consistently showed lower nematode densities. These results indicate that additional genetic factors beyond the major QTL may influence SRKN resistance and highlight the need for further genomic studies to strengthen durable nematode resistance in soybean. This publication is currently in production with Crop Science: Soybean Resistance to Southern Root-Knot Nematode Reduces Nematode Population Density Under Field Conditions (Vieira et al., 2025). DOI: 10.1002/csc2.70183.

2025 SRKN Screening Protocol: We continue working on the standardization of the new greenhouse facility in Fayetteville, AR, for in-house screening of soybean lines against SRKN. An initial trial including 43 lines with three replications was established in July 2025. Plants were inoculated with 5,000 SRKN eggs and grown for 45 days, after which they were evaluated for galling score using the susceptible check Williams 82 as a reference. As expected, the susceptible check showed clear galling symptoms, while most evaluated lines exhibited low or no galling. However, this outcome may be attributed to factors such as small root systems, nematode movement within the soil, or slower nematode development, rather than true genetic resistance. To confirm these results, a second screening trial with the same design is underway to verify reproducibility and assess potential environmental effects. Galling evaluations are scheduled for late November 2025, and results will be presented in the next report. These ongoing efforts aim to refine and standardize the SRKN screening protocol to ensure accurate differentiation between resistant and susceptible genotypes, ultimately supporting more reliable resistance evaluation within the same growing season.

2025 SRKN-UAV Trial: Field trials were conducted across three locations in Arkansas—Kerr, Stuttgart, and Pine Tree—to investigate the response of 15 soybean genotypes to southern root-knot nematode (SRKN) pressure. The experiment followed a randomized complete block design (RCBD) with two replications per location. Two contrasting environments were established to represent different nematode pressures: a highly infested SRKN field in Kerr and non-infested control sites in Stuttgart and Pine Tree. A total of 10 soil samples were collected from each two-row plot in Kerr using a soil probe, combined into a single bulk sample, and sent to a specialized nematode diagnostic laboratory to quantify soil nematode population density. Soil samples were also collected in Stuttgart and Pine Tree to confirm the non-infested condition of the fields at these two locations. Baseline nematode populations were quantified through initial soil sampling at the beginning of the season, followed by a second sampling at 70 days after planting to assess changes in soil nematode density among the tested genotypes. Unmanned Aerial Vehicle (UAV) imagery was applied as high high-throughput phenotyping tool with potential to enhance early detection of nematode-induced stress, even before disease symptoms become visible to breeders. UAV flights were conducted five times throughout the season—twice during the vegetative stage and three times during the reproductive stage—to monitor genotype responses and differentiate between resistant and susceptible lines using UAV-derived image features.

Publications:

Soybean Resistance to Southern Root-Knot Nematode Reduces Nematode Population Density Under Field Conditions (Vieira et al., 2025). Crop Science. DOI: 10.1002/csc2.70183. *In production*.

Upcoming Activities:

- Compile and analyze yield and maturity data from the 2025 trials across all stages and finalize selections for 2026 material advancement.
- Complete the second SRKN greenhouse screening trial.
- Include the 2025 genotypic and phenotypic data, combined with genomic prediction results, to guide the design of the 2026 crossing block and optimize parental combinations targeting SRKN resistance and yield stability.

Title: Genomic Prediction to Enhance the Efficiency of Soybean Breeding
Lead Investigators: Caio Canella Vieira
Co-Investigators: Samuel Fernandes
Status: Year 2 of 3
Objectives: i) Establishment of a well-curated training set based on historical multi-environment data from the UARK Soybean Breeding program to develop and validate prediction models; ii) Development of prediction models to be implemented early in the breeding pipeline to select promising genotypes.

Progress/Accomplishments:

Since the first year of the genomic prediction initiative, we have established and followed a structured yearly methodology with the primary goal of genotyping all materials entering the testing stages of our breeding pipeline. In addition, previously released high-yielding and historical lines with key traits of interest, such as flood tolerance, soybean root-knot nematode (SRKN) resistance, and drought tolerance, have been genotyped using the Soy3KSNP, and more recently, the Soy6KSNP chip. The main objective of this initiative is to integrate genotypic and phenotypic data to apply genomic prediction and statistical modeling for the continuous improvement of selection methods within our breeding program. Furthermore, breeder-selected lines with desirable traits have also been genotyped to introduce new genetic diversity and further broaden the program's genetic base.

During the 2025 planting season, 1,043 lines in the preliminary yield trials were successfully genotyped, bringing the total number of lines with genotypic information to 3,211 across the preliminary, advanced, and pre-commercial stages. All lines have also been screened for biotic and abiotic stressors using the proprietary disease panel. At the progeny row stage, selected plants are systematically genotyped and screened with this panel. Although not all genotyped lines are advanced to the next generation, capturing data from every genotype, including those not selected, ensures a more complete understanding of pedigree structure and genetic diversity within the breeding program. In addition to yield performance, and in combination with genotypic data, we evaluate pedigree combinations to better understand combining ability. This information is crucial for identifying promising new cross combinations in future breeding cycles, ensuring that resources are directed toward the most favorable outcomes. Moreover, it allows us to track past combinations and refine our strategy by prioritizing those with the highest potential based on genomic prediction.

As a result, the effectiveness of genomic prediction has improved over time as the models are continuously refined with each year's new data. This process has enabled us to identify high-yielding materials more efficiently while integrating genomic tools into our decision-making process. Building on these efforts, we continue to advance three specific projects that apply and validate genomic prediction across key traits and breeding objectives. These projects were previously reported, and here we provide updated results and progress achieved during the current season.

Optimizing Cross Combinations through Genomic Prediction: Using genomic information from the 2023 and 2024 datasets, we simulated and evaluated more than two million soybean crosses, estimating population mean yield, genetic variation, and top-performing potential. General Combining Ability was

calculated for each parent to identify superior lines and cross combinations that maximize genetic gain in future breeding cycles. Based on these predictions, selected crosses were made during the 2025 crossing block in Fayetteville, AR. The resulting material will be hand-harvested and inventoried before being advanced in the winter nursery. In addition, Soy6KSNP genotyping data from the 2025 season have been received and will be integrated into the full dataset. Combined with this year's phenotypic data, including yield performance and breeder evaluations, these data will be used to refine models, identify the most promising cross combinations, and guide cross-prediction efforts for the 2026 season.

Assessing Genomic Prediction for Early Yield Stability: The objective of this study was to identify high-yielding soybean lines early in the breeding cycle and to evaluate whether genomic prediction models could reliably support this process. We tested 1,382 genotypes from maturity groups III to V across six environments in 2023 and 2024, combining yield data with the 2023 and 2024 SoySNP3K marker data. Using a Modified Selection Index (MSI), genotypes were classified as high or low-yielding, and two models (Random Forest (RF) and Generalized Linear Model via Elastic Net Regularization (GLMNet)) were compared. RF performed slightly better, achieving higher balanced accuracy (0.78 vs. 0.76) and F1-score (0.70 vs. 0.68). Balanced accuracy measures how well the model identifies both high- and low-yielding lines, while the F1-score reflects the balance between correctly predicting top performers and avoiding false positives. RF also achieved a stronger negative predictive value (0.86), indicating greater reliability in excluding poor performers. These results demonstrate that genomic prediction can be successfully applied in early yield classification, improving selection accuracy and resource allocation within our breeding program.

Improving Prediction Accuracy and Expanding Genetic Diversity for Flood Tolerance: A total of 254 genetically diverse soybean accessions from 14 countries were evaluated under controlled flooding conditions to study genetic responses to early-season stress. Our objective was to identify high-yielding, flood-tolerant lines and to assess the effectiveness of genomic prediction models in improving selection accuracy. We compared a traditional whole-genome model (RR-BLUP) with a stepwise Random Forest approach that selects the most informative markers while reducing redundancy. The Random Forest model achieved its highest accuracy with a small subset of 29 markers, nearly doubling the prediction accuracy compared to models using all available markers. These results demonstrate that targeted marker selection can enhance genomic prediction of complex traits like flood tolerance, providing a more efficient and reproducible framework to guide early-stage selection and accelerate genetic gain. Importantly, this study also identified new, diverse soybean material with resistance to flooding at the early vegetative stage, offering novel sources of tolerance distinct from those previously reported at reproductive stages. Results from this work have been peer-reviewed and published in The Plant Genome (Vieira et al., 2025).

Publications:

Vieira, C. C., Wu, C., Harrison, D., Marmo, R., Florez-Palacios, L., Acuna, A., Rogers, D., Fernandes, S. B., Fernandes, I., Shannon, G., Ye, H., & Nguyen, H. T. (2025). Genomic prediction and association mapping of early season flood tolerance in soybean. The Plant Genome, 18(4), e70128. https://doi.org/10.1002/tpg2.70128

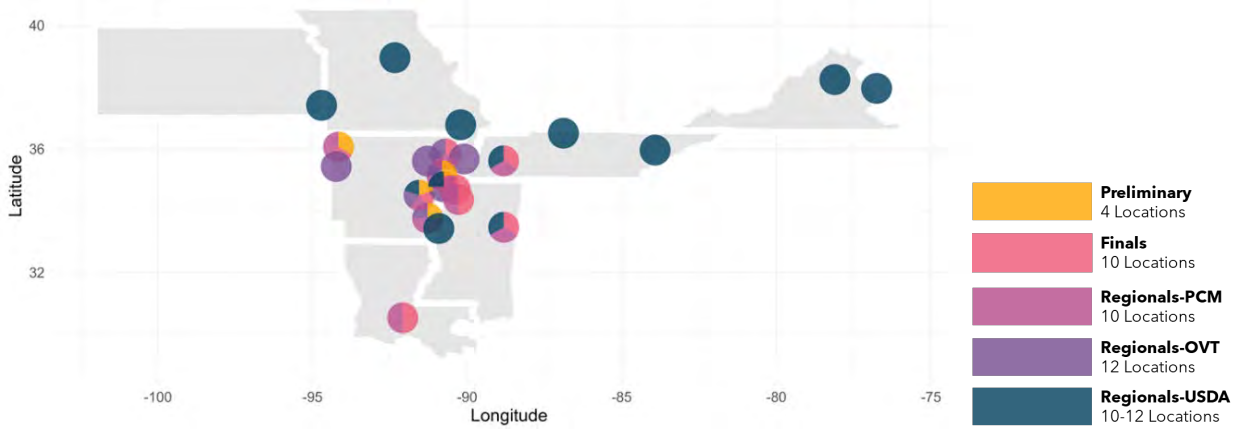


Figure 2. Geographic distribution of the Arkansas Soybean Breeding Program's 2025 multi-environment yield trials.

Enlist-E3® Yield Trials: The 2025 season represented a comprehensive assessment of Enlist-E3® herbicide-resistant soybeans in the program. Nine pre-commercial Enlist-E3® lines are being tested in the USDA Southern Regional Test and the Arkansas Variety Testing Program in 30-34 environments across 10 states. These lines consistently demonstrated good yield performance and stability across diverse environments in 2023 and 2024. In the Arkansas Finals, 60 additional Enlist-E3® lines are being tested in 10 environments, while 665 lines completed preliminary evaluations at 4 environments.

Preliminary Yield Trials: A total of 1,055 conventional breeding lines were planted and evaluated across four environments in Arkansas. DNA samples collected earlier in the season were processed at the Soybean Genomics and Improvement Laboratory, Beltsville Agricultural Research Center, USDA-ARS, and genotyping was conducted using the SoySNP6K BeadChip.

Phenotypic and genotypic information from each breeding line, including conventional and herbicide-resistant backgrounds, will be utilized in genomic prediction models to support the identification of promising genotypes for advancement.

Progeny Rows: Nearly 19,000 progeny rows from 291 biparental populations were evaluated at Stuttgart, AR. Breeder's selection is currently in progress, with superior rows to be harvested to ensure genetic purity and germination quality. Seeds will be cleaned and packaged for the 2026 Preliminary Yield Trials.

Crossing Block: The 2025 crossing block consisted of 193 crossing combinations in Fayetteville, AR, with a total of 10,000 attempts, resulting in an average of at least 50 attempts per crossing combination. Crosses were derived from 59 unique advanced breeding lines carrying multiple biotic and abiotic stress-resilient traits. Within this set, five high-yielding Enlist-E3® herbicide-resistant Arkansas elite breeding lines were used as parents in a *forward* crossing strategy. This approach focuses on crossing the program's own Enlist-E3® advanced breeding lines as the E3 donors rather than relying on standard trait introgression from external sources. By doing so, the program ensures that herbicide resistance is combined directly with Arkansas elite genetics, stacking high-yield potential with resilient traits. The harvest of the F_1 seeds is currently underway and will be promptly processed and prepared for shipment to the off-season winter nursery in Puerto Rico, thereby accelerating breeding cycles for subsequent Progeny Row Trials.

Harvest Progress:

The internal trials harvest is progressing as planned, with no major logistical or agronomic issues reported to date. The progress varies by location due to differences in maturity and environmental conditions

(Figure 3). Washington, LA (WAS) leads with a 95% completion rate, followed by Rohwer, AR (ROH) at 80%, Marianna, AR (MAR) at 40%, and Stuttgart, AR (STU) at 30%. Starkville, MS (STA), Pine Tree, AR (PTR), Leland, MS (LEL), Jonesboro, AR (JON), Clarksdale, MS (CLA), and Brownsville, TN (BRO) have not yet started harvesting. Post-harvest processing (seed cleaning, packaging, data analysis) begins immediately after harvest.

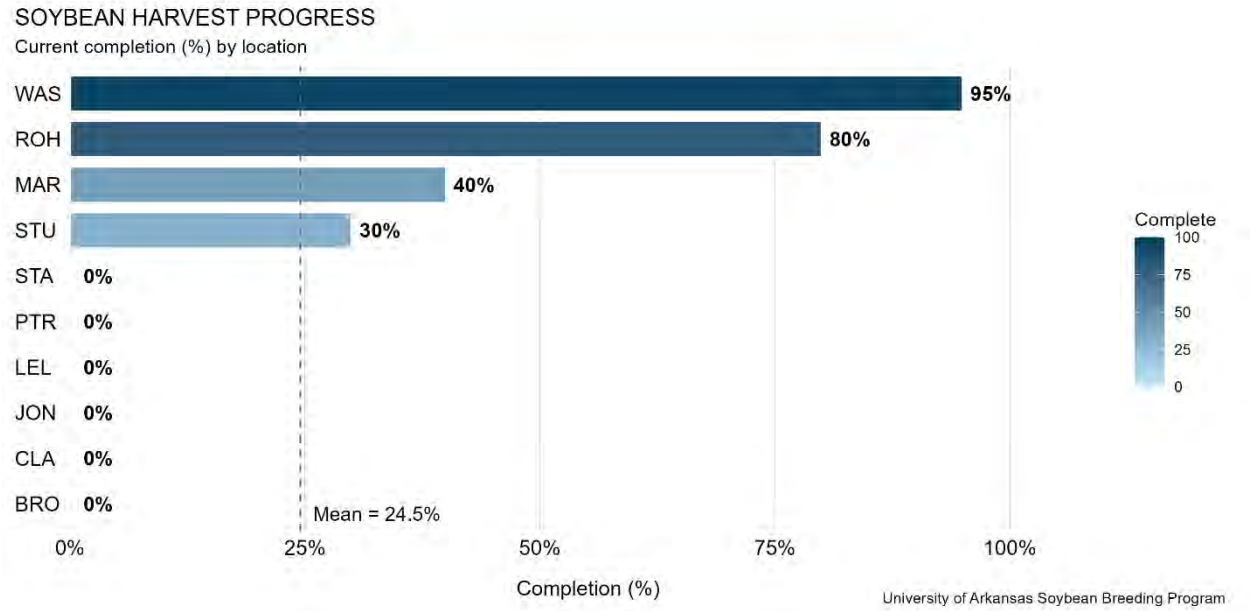


Figure 3. Harvest progress for the University of Arkansas Soybean Breeding Program across internal locations. Location abbreviations: ROH = Rohwer, AR; WAS = Washington, LA; STU = Stuttgart, AR; MAR = Marianna, AR; PTR = Pine Tree, AR; STA = Starkville, MS; LEL = Leland, MS; JON = Jonesboro, AR; CLA = Clarksdale, MS; BRO = Brownsville, TN.

Upcoming Actions/Activities

- Harvest of yield trials across all locations is underway.
- Seeds will be cleaned, labeled, and stored for future yield trials.
- Seeds of selected breeding lines will be packaged, while non-selected lines will be stored appropriately.
- Crossing block harvest is underway, and seeds will be promptly cleaned and shipped to the off-season winter nursery in Puerto Rico.
- DNA samples from breeding lines undergoing 2026 preliminary yield trials will be extracted and shipped to the Soybean Genomics and Improvement Laboratory, Beltsville Agricultural Research Center, USDA-ARS, to be processed with the Soy6K SNP BeadChip.
- Equipment will be serviced after harvest for readiness for the next season.
- Student training in breeding operations as well as laboratory techniques is underway.
- Scientific Manuscripts: five peer-reviewed papers have been published, four are under review, and several others are in the final stages of preparation for submission.

Soybean Promotion Board 2025-2026 Report **Date of Report: October 10, 2025**

Title: Overcoming Soybean Yield Plateau by Leveraging Physiology-Efficient and Yield-Formation Traits
Lead Investigators: Caio Canella Vieira
Co-Investigators: Ellis Eli
Status: Year 2 of 3
Objectives: i) Characterization of genetically diverse soybean accessions and modern cultivars based on yield-formation and physiology-efficient traits; ii) Characterization of the genetic architecture of yield-formation and physiology-efficient traits; iii) Development of breeding populations derived from high-yielding elite modern cultivars and diverse accessions.

Progress/Accomplishments:

A panel of 215 soybean genotypes (including checks) from maturity groups III and IV is being evaluated for the second year at two Arkansas locations (Fayetteville and Stuttgart) in a randomized complete block design (RCBD) with two replicates. Measurements included biomass weight for 1 m^2, seed weight of the biomass harvested, and grain yield. Harvest index (HI) was calculated from the ratio of the seed weight and the biomass harvested. The results from 2024 showed a wide phenotypic variation: grain yield (1868.97 – 2924.06 kg/ha), seed weight (1387.45 – 2584.55 kg/ha), biomass weight (1868.97 – 2924.06 kg/ha), and harvest index (38.49 – 53.06%). In addition, the relationship among these traits reinforces the hypothesis that grain yield may be improved with targeted breeding efforts to maximize biomass and harvest index, each with individual genetic pathways.

Key findings:

Pearson correlation across locations reveals strong and significant relationships among several yield-related traits. Grain yield showed positive correlations with biomass weight (r = 0.531***), seed weight from biomass (r = 0.670***), harvest index (r = 0.352***), and test weight (r = 0.782***), indicating that improvements in these traits generally contribute to higher yield (**Figure 1**). Although biomass and harvest index are highly correlated with grain yield, there is no correlation between these two traits (r = –0.009), confirming that greater biomass production does not necessarily translate into more efficient partitioning into grain.

The independence of biomass weight and HI suggests opportunities to breed lines that combine vigorous growth with efficient resource partitioning, reflecting untapped physiological variation and independent genetic control. By targeting biomass for resource capture and HI for allocation efficiency, we aim to enhance yield potential and resilience in soybean breeding.

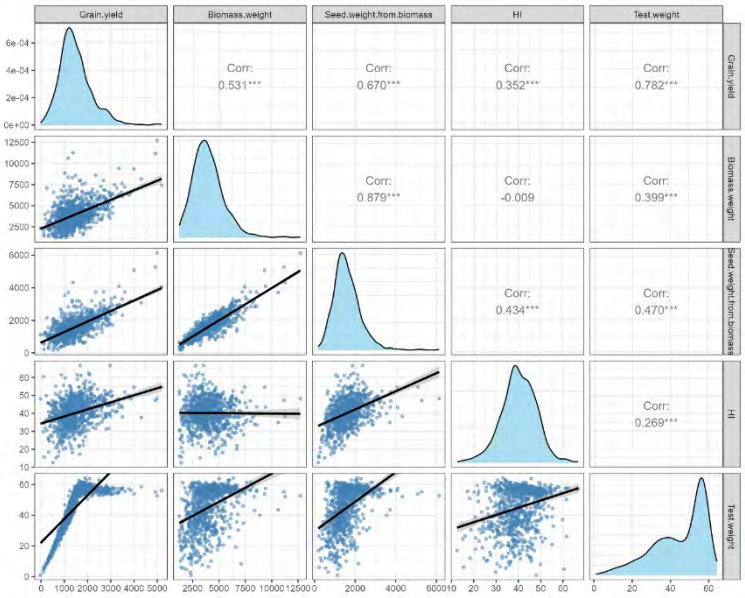


Figure 1. **Pearson correlation among yield-related phenotypic traits.** Biomass accumulation and HI do not correlate, although both are highly correlated with grain yield.

The principal component analysis (PCA) biplot explained 81% of total variation (Dim1: 60.3%, Dim2: 20.6%) and revealed clear trait associations. Grain yield, test weight, and seed weight from biomass clustered together, while biomass and HI vary independently, confirming their lack of correlation. Both maturity groups (III and IV) showed similar trait patterns, though Group IV exhibited greater variability, suggesting more diversity for selection (**Figure 2**)

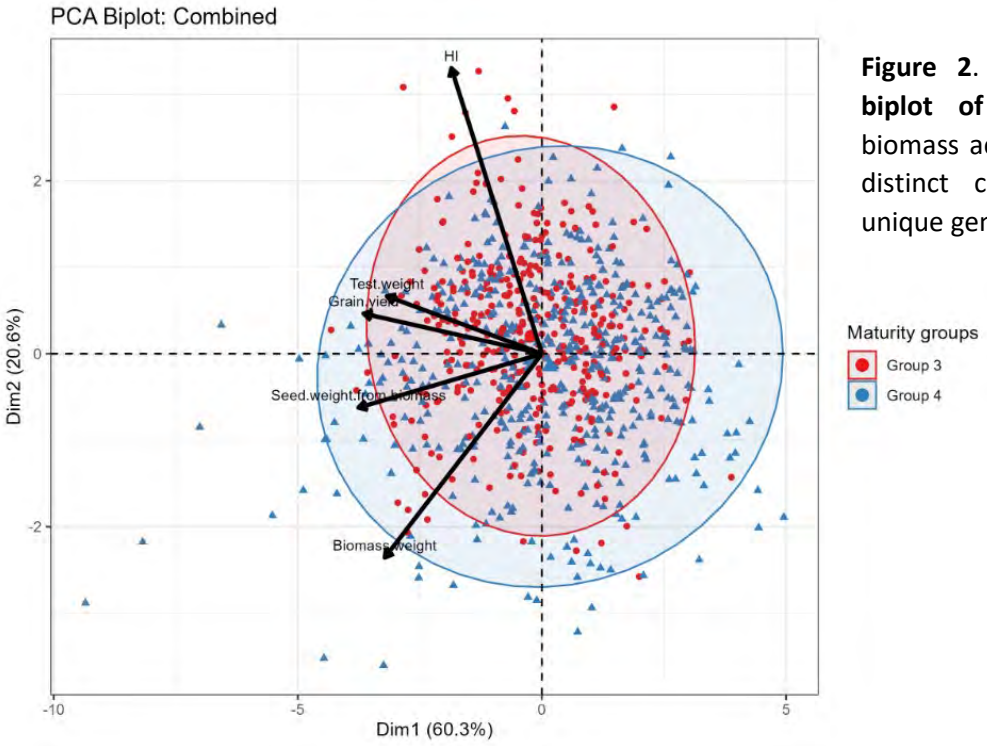


Figure 2. Principal component analysis biplot of yield-related traits. HI and biomass accumulation are shown in highly distinct clusters, indicating their likely unique genetic regulation.

Unmanned Aerial Systems (UAS) were deployed in 2024 at two research sites in Arkansas, Fayetteville and Stuttgart, to assess canopy development and physiological traits in diverse soybean germplasm. Flights were conducted at multiple growth stages to capture high-resolution RGB and multispectral imagery, from which traits such as canopy height, canopy coverage, and vegetation indices (e.g., NDVI, EVI, NDRE) were derived at key developmental stages. While UAS flights were conducted at both locations, the findings presented here are based on data from the Stuttgart site. UAS-derived traits were integrated with ground-based measurements of biomass, grain yield, and HI. Preliminary analyses revealed substantial phenotypic variation and significant correlations between UAS-based canopy traits and yield-related traits, highlighting the potential of UAS phenotyping for predicting soybean performance. A correlation analysis was conducted among key soybean traits, including grain yield, biomass, HI, and UAS-derived mean canopy traits: NDVI, canopy cover, and canopy height (**Figure 3**).

Grain yield was positively and significantly correlated with biomass ($r = 0.60$, $p < 0.001$), HI ($r = 0.32$, $p < 0.001$), NDVI ($r = 0.48$, $p < 0.001$), canopy cover ($r = 0.43$, $p < 0.001$), and canopy height ($r = 0.28$, $p < 0.001$), indicating that higher biomass and canopy traits were associated with increased yield. Biomass showed strong positive correlations with NDVI ($r = 0.65$, $p < 0.001$), canopy cover ($r = 0.57$, $p < 0.001$), and canopy height ($r = 0.50$, $p < 0.001$), while its correlation with HI was low and not significant ($r = 0.04$). HI was negatively correlated with canopy height ($r = -0.28$, $p < 0.001$) and showed weak or non-significant associations with NDVI, canopy cover, and biomass, suggesting that HI is partially independent of canopy growth. NDVI was strongly positively correlated with canopy cover ($r = 0.73$, $p < 0.001$) and canopy height

(r = 0.68, p < 0.001), reflecting that NDVI effectively captured the canopy structure. Canopy cover and canopy height were highly correlated with each other (r = 0.73, p < 0.001), indicating that taller plots also tended to have denser canopies. These results collectively suggest that NDVI and canopy structural traits are strongly associated with biomass and yield, whereas HI is less directly related to canopy characteristics. Data processing for 2024 flights is complete, and the trial is being repeated in 2025 with standardized UAS protocols across the same locations to ensure temporal consistency and to further evaluate the relationships between physiological traits and yield.

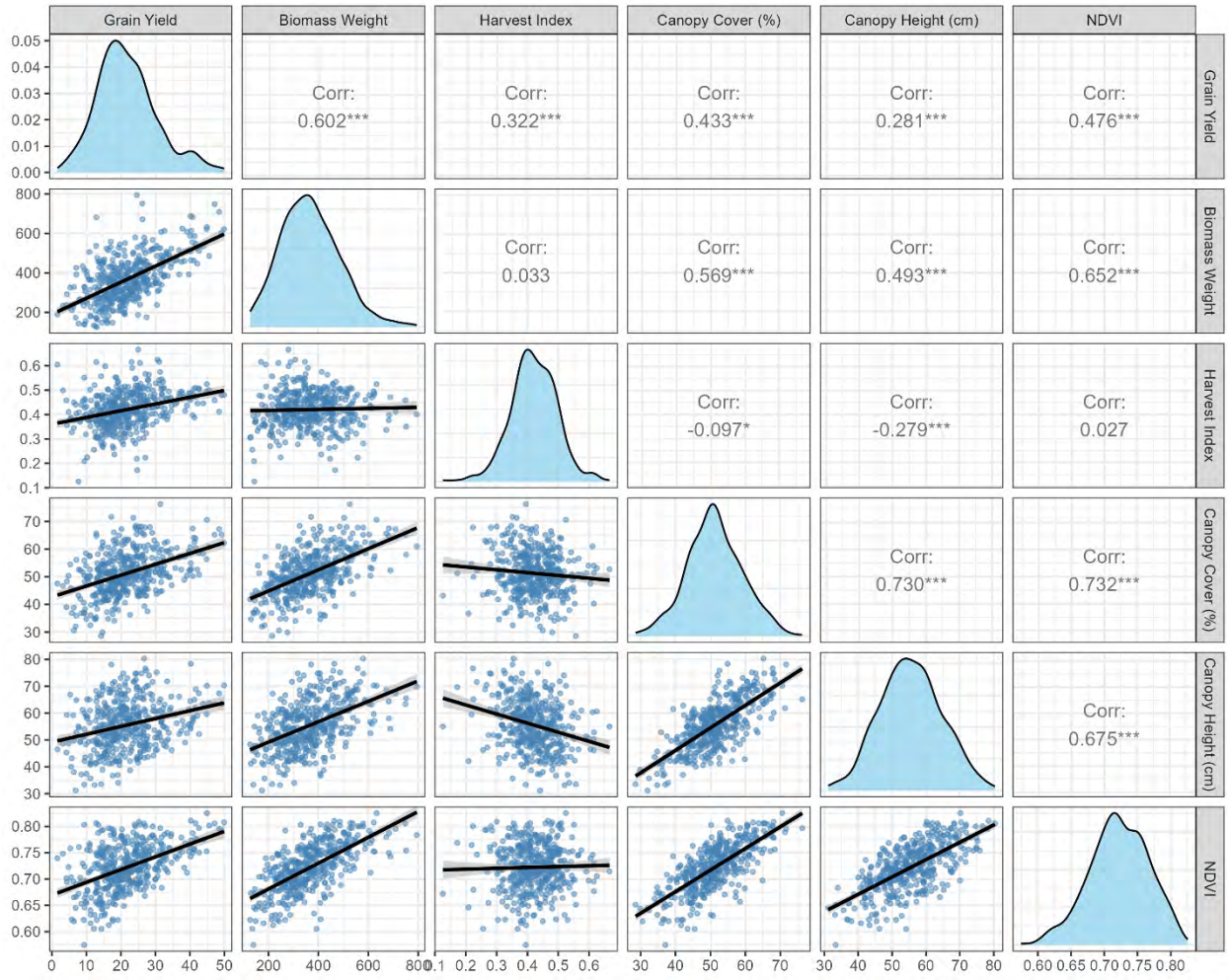


Figure 3. Pearson correlation for yield and UAS traits at Stuttgart. The upper triangle shows correlation coefficients with significance levels ($p < 0.05$, $*p < 0.01$, $p < 0.001$), while the lower triangle displays scatterplots with fitted trend lines.

The genetic diversity of the accession panel, consisting of 2,535 soybean breeding lines developed by the University of Arkansas and 8,410 USDA soybean germplasms belonging to maturity groups 3 to 5, was evaluated through PCA using 2,546 SNP marker data (**Figure 4**). Around 11,000 soybean accessions were divided into seven clusters based on genetic similarity (**Figure 4A**). The University of Arkansas soybean breeding lines from 2022 to 2024 showed considerably narrow genetic diversity (**Figure 5B**). Notably, the diversity panel showed a broad distribution, with accessions present in all seven clusters, although they were largely from clusters 2 and 7 (**Figure 5C**). Superior lines identified in the diversity panel will be

incorporated into the breeding pipeline to enhance genetic diversity for yield-related traits, which will ultimately maximize yield potential.

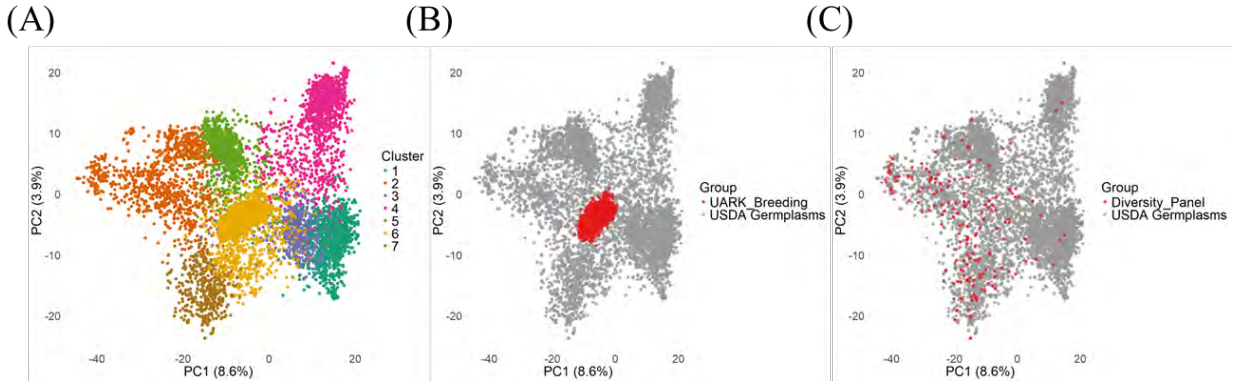


Figure 4. PCA of genetic diversity in soybean using 2546 SNP marker data. The analysis shows (A) the seven clusters of ~11,000 accessions, including University of Arkansas breeding lines and USDA germplasms. Subsets are highlighted to show (B) breeding lines developed at the University of Arkansas from 2022 to 2024 and (C) the diverse panel selected for this project.

Upcoming Actions/Activities:

In 2025, a second yield trial is being conducted at both Fayetteville and Stuttgart, following the same RCBD and parameters as in 2024. Planting was completed on June 3 in Stuttgart and June 23 in Fayetteville. As in the previous season, one-meter biomass samples will be collected to quantify fresh biomass, which will then be dried and weighed to determine total dry biomass. At harvest, seed weight, moisture content, and threshed grain weight will be recorded to calculate HI for each entry. UAS imagery is being collected at 10-day intervals beginning June 1 and processed to extract canopy-level data for physiological analysis. This trial is designed as a direct repeat of the 2024 experiment to validate and strengthen preliminary findings. In parallel, genome-wide association study (GWAS) analysis of the 2024 dataset is underway to identify genomic regions associated with key traits and inform trait-based selection strategies. UAS-based image analysis for the Fayetteville location is also currently in progress.

Soybean Promotion Board 2025-2026 Report Date of Report: October 10th, 2025

Title: Soybean Germplasm Enhancement Using Genetic Diversity
Lead Investigators: Caio Canella Vieira
Co-Investigators:
Status: Year 3 of 3
Objectives: i) Introduction of novel genetic background from plant introductions (PIs) and elite germplasm from other growing regions to help build a strong and sustainable genetic pool in Arkansas; ii) incorporation of unique economically important traits including grain quality and composition, as well as biotic and abiotic stressors tolerance using various breeding and selection schemes.

Progress/Accomplishments: October 10th, 2025 - Season Update: Most tests are approaching maturity, with some already harvested. Maturity notes are being recorded, and breeder selections are taking place at different locations. Harvest of soybean trials, including nursery, preliminary, advanced, and pre-commercial trials, has started or is about to start. So far, approximately 30% of trials have been harvested in Stuttgart, AR; 40% in Marianna, AR; over 80% in Rohwer, AR; and 95% in Washington, LA. Harvest will start in Pine Tree and Fayetteville the week of October 6, while the remaining locations, including Jonesboro, AR; Starkville, Clarksdale, and Leland, MS; and Brownsville, TN have not started yet. Breeding populations continue to advance at the off-season nursery in Puerto Rico.

Regional and Pre-commercial: In 2025, a total of 25 high-yielding lines, including both conventional and Enlist-E3® converted materials with diverse genetic and/or geographic backgrounds ranging from maturity group 3 to 5, were evaluated in regional trials. These trials included the USDA Southern Uniform Trials, the Soybean Official Variety Trials, and Arkansas pre-commercial tests, and were conducted at 30 to 34 locations across 10 states. Lines with superior yield performance across multiple environments may be further tested and released as commercial varieties.

At the same time, the 16 conventional lines are being converted to Enlist-E3® and XtendFlex® products. BC0F1 Enlist-E3® populations were planted in mid-September, and BC1F1 seeds are expected to be harvested by the first week of January 2026. BC0F1 seeds from the XtendFlex® populations are currently being harvested and will be planted immediately to initiate the new backcross cycle.

Advanced: In 2025, a total of 89 high-yield lines, including both conventional and Enlist-E3® converted materials with genetic and/or geographic diverse backgrounds ranging from maturity group 3L to 4L, were evaluated in advanced yield trials. Maturity group 4 materials were tested at five locations in Arkansas, three in Mississippi, one in Tennessee, and one in Louisiana. Harvest is currently underway, and advancement decisions will be made in late November based on performance across environments. Lines selected from these trials will enter regional and pre-commercial testing in 2026.

Preliminary: In 2025, a total of 1,095 lines, including conventional and Enlist-E3® converted materials derived from genetically and/or geographically diverse bi-parental populations, were evaluated in Pine Tree, Stuttgart, and Rohwer in AR. Seed composition data were determined using NIR prior to planting. The entire set was genotyped using a proprietary molecular marker panel for multiple diseases and abiotic stress tolerance in collaboration with Corteva Agriscience, and with a genome-wide marker panel in collaboration with the USDA-ARS. Phenotypic and genotypic data will be used for genomic prediction to identify superior genotypes. Lines selected for further testing will enter advanced trials in 2026.

Progeny Rows: In 2025, 15,319 $F_{4:5}$ progeny rows derived from genetically and/or geographically diverse parental lines were grown in Stuttgart. During the first week of October, the breeder conducted the first round of visual selections specifically to identify superior genotypes in maturity group 4E. The second round of selections will focus on MG 4L, followed by a third round for MG 5E. All newly selected lines will enter preliminary yield testing in 2026.

Crossing Block: In 2025, the summer crossing block included conventional and Enlist-E3® converted elite parental lines. Over 87% of these lines were genetically and/or geographically diverse. Lines from other public breeding programs and plant introductions from the germplasm bank were incorporated to introduce resistance to biotic and abiotic stresses and improve seed composition, supporting the diversification of Arkansas germplasm.

A total of 192 crossing combinations were conducted this summer, including 113 with genetically and/or geographically diverse pedigrees. An average of 50 pollinations was performed in each combination. A predictive model using existing grain yield and genotypic data was used to identify superior populations based on their predicted population mean and genetic variance. Some of the crossing combinations conducted this summer were designed to capture these superior populations.

Harvest of F1 seeds has started in Fayetteville. After processing, the seeds will be sent to an off-season nursery in Puerto Rico, where populations will be advanced from the F1 to F4 stage in over approximately 18 months. At that stage, individual plants will be harvested, and the resulting seed will be sent back to Arkansas to be grown as progeny rows.

Comprehensive Analysis of Genetic Diversity: A genetic diversity analysis was conducted between 8,410 materials from the USDA Soybean Germplasm Collection (maturity groups 3 to 5) and 2,535 Arkansas soybean breeding lines using a principal component analysis (PCA) (Fig. 1). In total, seven clusters were identified among 10,945 soybean accessions (Fig. 1A). The Arkansas soybean breeding lines used in this PCA were those entered in the preliminary yield trials from 2022 to 2024 and exhibited much narrower genetic diversity compared to USDA germplasm lines (Fig. 1B). Approximately 1,000 USDA germplasm lines were in the same cluster (Cluster 6) as Arkansas soybean breeding lines (Fig. 1C).

Based on their distance from the centroid of Cluster 6, the most genetically distant USDA germplasm lines were identified, comprising about 4,700 accessions originating from 21 countries, including South Korea, Japan, China, Vietnam, and the U.S. (Fig. 1D). Further analysis will be conducted to select approximately 400 USDA germplasm lines from the pool of 4,700 genetically distant accessions, aiming to capture the greatest genetic diversity. This diversity panel will ultimately be incorporated into the Arkansas soybean breeding pipeline to enhance genetic diversity and introduce valuable exotic genetic sources.

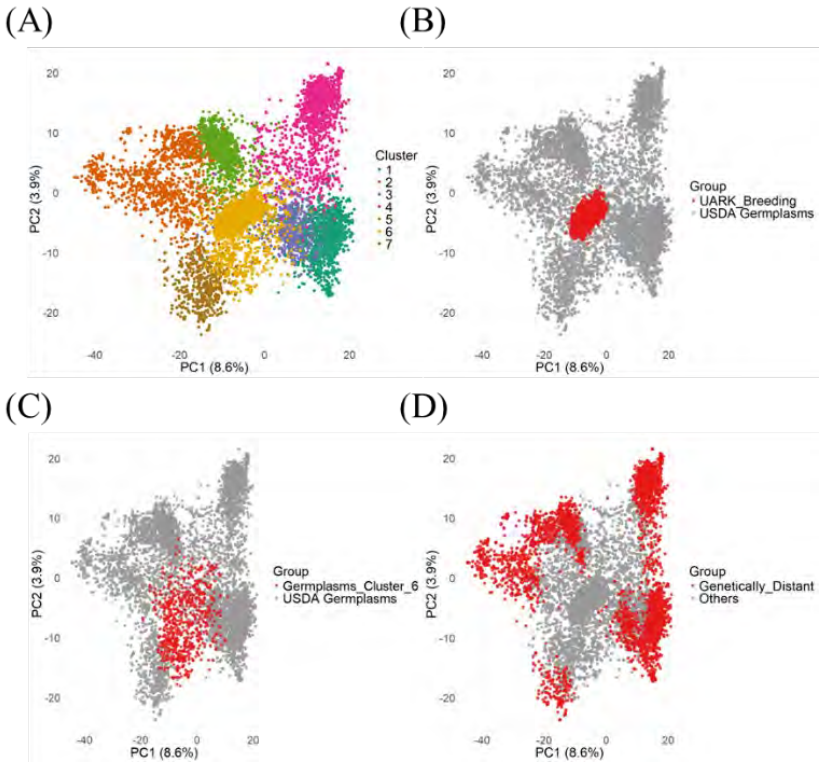


Figure 1. Principal component analysis (PCA) of genetic diversity between the USDA Soybean Germplasm Collection and the Arkansas soybean breeding lines. The analysis shows (A) the seven clusters of 10,945 accessions, including 8,410 USDA germplasms and 2,535 Arkansas breeding lines. Subsets are highlighted to show (B) Arkansas breeding lines, (C) USDA germplasms in the same cluster as Arkansas breeding lines, and (D) approximately 4,700 genetically distant USDA germplasms from Arkansas breeding lines.

Upcoming Actions/Activities:

- Complete maturity and breeder notes before harvest.
- Complete yield trial harvest across all locations.
- Complete the harvest and processing of F1 seeds for subsequent shipment to the off-season nursery.
- Make advancement decisions based on overall performance, marker data, and breeder selections.
- Design the 2026 yield trials based on advancement decisions.
- Conduct further genetic diversity analysis to select around 400 genetically diverse USDA germplasm lines to incorporate into Arkansas soybean germplasm.

Title: Utilization of Winter Nursery for Soybean Line Development through Backcrossing
Lead Investigators: Caio Canella Vieira
Co-Investigators:
Status: Year 1 of 3
Objectives Leverage off-season nursery to convert breeding lines into Enlist-E3® and XtendFlex® to support a steady breeding pipeline of herbicide-resistant varieties.

Progress/Accomplishments: October 10th, 2025 – Season Update:
The backcross programs for both Enlist E3® and XtendFlex® continue progressing at the off-season nursery in Puerto Rico. Two conversions, from 2023 and 2024, are currently ongoing for each program at different stages. In general, the programs begin by backcrossing elite breeding lines with trait donors to produce BC0F1 seeds, followed by additional backcross cycles with herbicide applications and molecular marker confirmation. Populations are advanced to the BC2F3 generation for Enlist E3® and BC3F3 for XtendFlex®. At F3, 30 to 50 plants with strong pod load are harvested individually, threshed, and grown as progeny rows. The following season, these newly converted lines enter multi-environment yield testing in Arkansas. We expect to evaluate the first products of these conversions in 2026 and the remaining products in 2027 and 2028.

1. Harvest is underway for the Arkansas pre-commercial tests, which included nine Enlist E3 converted lines. These lines were also evaluated in the 2025 USDA Southern Regional Tests and the Arkansas Official Variety Trials, with a total of 30 to 34 testing locations across all trials. Release decisions on the five most advanced lines will be made based on performance.
   The 0.1-acre pre-foundation seed increase for these five lines was rogued for off-types at flowering and will be rogued again for pubescence and pod color, maturity, and overall uniformity. These increases will be harvested by the third week of October in Kibler. Twenty pounds from each will be sent to an off-season nursery in Puerto Rico for increase during the winter 2025–26, then provided to Corteva for evaluation in their yield testing network. These results will then be shared with potential seed dealers.

   Harvest is also ongoing for the 38 Enlist-E3® converted lines evaluated in the 2025 Advanced trials at five locations in Arkansas, three in Mississippi, one in Tennessee, and one in Louisiana. Lines with outstanding performance will be advanced for further testing in 2026.

2. BC2F2 seeds from two Enlist-E3® populations and BC2F1 seeds from 15 Enlist-E3® populations, developed from advanced lines that entered the conversion pipeline at the end of 2023, were harvested during the second week of August and planted two weeks later to grow a new cycle. BC2F3 and BC2F2 seeds will be harvested by the last week of November.

   In addition, 14 conventional lines that were selected for the 2025 USDA Uniform Test, the Arkansas Official Variety, and pre-commercial tests also entered the Enlist-E3® conversion pipeline at the end of 2024. BC0F1 seeds from these populations were harvested at the beginning of September and planted to grow a new cycle in mid-September. BC1F1 seeds will be harvested by the first week of January 2026.

All Enlist-E3® populations will continue advancing to the BC2F3 stage, at which point individual plant selections will be harvested separately and grown as progeny rows. Most advanced converted Enlist-E3® lines are expected to enter preliminary testing in Arkansas in 2026, and the remaining lines will enter testing in 2027.

3. XtendFlex® populations, developed from 19 advanced lines that entered the conversion pipeline at the end of 2023, are currently moving from BC0 to BC2 stages. Leaf samples were taken from male plants and sent to a commercial laboratory for molecular confirmation. Plants with positive results for the dicamba, glyphosate, and glufosinate markers were crossed with the recurrent parents. Harvest will begin by October 10th, and seeds will be planted afterward to start a new backcross cycle.

   In addition, 14 conventional lines that were selected for the 2025 USDA Uniform Test, the Arkansas Official Variety, and pre-commercial tests entered the XtendFlex® conversion pipeline at the end of 2024. Harvest of BC0F1 seeds from these populations is now underway, and the seeds will be planted next to begin a new backcross cycle.

   XtendFlex® populations will continue advancing to the BC3F3 stage, where individual plants will be selected, harvested separately, and grown as progeny rows. The newly converted XtendFlex® lines are expected to enter preliminary testing in Arkansas in 2028.

Upcoming Actions/Activities:

Enlist-E3® Backcross Program

- Harvest BC2F3 seeds from two populations and BC2F2 seeds from 16 populations developed in the 2023 conversion 2023 by late November 2025.
- Harvest BC1F1 seeds from 14 populations developed in the 2024 conversion 2024 in the first week of January 2026.
- Advance all Enlist-E3® populations to the BC2F3 stage, where individual plants will be selected and grown as progeny rows.
- Evaluate Enlist-E3® converted lines in preliminary testing in Arkansas in 2026 and 2027.

XtendFlex® Backcross Program

- Continue backcrossing of 19 populations currently between BC0 and BC2 stages that were developed in the 2023 conversion.
- Complete harvest of BC0F1 seeds from 14 populations developed in the 2024 conversion by October 10th.
- Advance all XtendFlex® populations to the BC3F3 stage, where individual plants will be selected and grown as progeny rows.
- Evaluate XtendFlex® converted lines in preliminary testing in Arkansas in 2028.

Soybean Promotion Board 2025-2026 Report Date of Report: 10-10-2025

Title: Poinsett County Ag Day
Lead Investigators: Christie Wagley, Family & Consumer Science/4-H Youth Development
Co-Investigators: Craig Allen, Staff Chair Poinsett County Extension
Status: In Progress
Objectives: Ag Day provides the children of Northeast Arkansas the chance to participate in an informal, hands-on experience. (1) This allows us to educate our youth about the products our agricultural commodities provide and the role that the agricultural industry plays in our local economy (including soybeans). (2) Promote the Arkansas soybean industry and its positive impact on the region, state and nation. Youth participants will receive a t-shirt and reusable water bottle with Ag Day, 4-H marketing and soybean promotional messaging.

Progress/Accomplishments:

- Registered youth participant count: 531 (registration # up from appx 200 last year).
- Additional sponsorship obtained to cover additional costs due to increased participant number.
- Poinsett County Ag T-Shirts and water bottles designed, ordered, received, inventoried and delivered to participating schools.

Upcoming Actions/Activities:

- Submit t-shirt invoice for payment.
- Pictures & publicity day of the event.

Soybean Promotion Board 2025-2026 Report Date of Report: Oct. 10, 2025

Title: Soybean Enterprise Budgets and Production Economics Analysis
Lead Investigators: Breana Watkins, Instructor
Status: Year 3 of 3
Objectives: The goal of this project is to provide soybean enterprise budgets which are easily adaptable and allow evaluation of costs and returns associated with production. The budget system allows users to compare crop net returns for aid in deciding which planted crops will maximize profit potential for their individual operation.

Progress/Accomplishments:
The 2026 crop enterprise budgets will be released in the upcoming weeks. There are currently 10 soybean budgets developed based upon seed technology, irrigation method, and land ownership (crop-share). Tools to calculate the cost of irrigation for conservation practices, machinery costs, energy costs, as well as the cost/benefit analysis of cover crops will be available once the updated website is released. Whole-farm planning aids and summary comparisons are also in development to be released alongside the budgets.

Upcoming Actions/Activities:
Thin margins make financial planning for the upcoming season an important aspect of production agriculture. This update will move material to a new webpage, (farmplanning.uada.edu) and include a budget calculator. An irrigation cost estimator will be released soon after. Cost/benefit analysis of conservation practices in Arkansas is underway. The benefits provided by the economic analysis of alternative soybean production methods provide a significant reduction in financial risk inherent in agricultural production. The current volatility faced in our input supply chains and lack of available replacements will make budgeting important in the upcoming crop seasons. Flexible crop enterprise budgets are beneficial for planning production methods to provide the greatest potential for financial success. The crop enterprise budgets allow economists to create impact statements useful for policy makers and shareholders when showing the importance of assistance for producers in Arkansas in times of dire need. A preview of the upcoming Farm Planning webpage is below.