BRYCE BALDRIDGE
CEA-STAFF CHAIR

COURTENEY SISK
CEA-AGRI/4-H

TORI COPELAND
CEA-FCS/4-H

MICHELLE TEAGUE
4-H PROGRAM ASST.

RITA TAYLOR
ADMIN SPEC. III

2024 Lawrence County Cooperative Extension Service

Crop, 4-H, Livestock Demonstrations and Projects

18 USC 707

UofA
DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

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Your
Lawrence County
Cooperative Extension Service
www.uaex.uada.edu/counties/lawrence

UofA
DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Annual Update

Contacts

Total Educational Contacts- 150,121
Total County Volunteer Hours- 12,883
Value of Volunteer Hours- $431,451.67

4-H

- **Total 4-H Contacts- 69,147**
- **101 Members / 88 volunteers (school teachers, parents and other adults)**
- **7 4H clubs11 Newsletters /910 Contacts**
-

Key Programs and Activities

- **Lake Charles Summer Day Camp-50 youth participants 12 volunteers**
- **2 New 4H clubs started**
- **12 newly recruited leaders / volunteers**
- **Conducted 7 4H summer workshops- 120 youth participants**
- **Conducted Overnight camping trip- 9 4H youth**
- **District O'Rama Participants- 5 youth (1st Place, 2- 2nd Place, 4th place)**
- **5 School Programs- 79 sessions- 3,124 youth reached**
- **2 WHEP Teams competed**
- **4H Color Run- 40 Participants- Promoting Fun Healthy Lifestyle $5000 raised**

Community and Economic Development

- **Total CED contacts 2,685**
- **Advise Williams Baptist University Farm**
- **Ralph Joseph Youth Leadership Program- 15 Participants**
- **Monitor Heritage Garden in Imboden**
- **Flower Bed project at Walnut Ridge School**
- **APEX contracts- 2 / $11,460**

Your Lawrence County Annual Update

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Agriculture and Natural Resources

- **Total Educational Contacts- 88,662**
- **Farm Visits- 256**
- **2 TV Interviews**
- **Master Gardeners- 22**
- **Soil Samples- 1876- Representing 20,593 Acres**
- **20 On-Farm Demonstrations**
- **113 varieties Tested (46 Soybean, 53 Rice, 4 Pumpkin, 10 Corn)**

Notable Programs and Achievements

- **Pesticide Applicator Training- 4 Classes 112 Trained**
- **Row Crop Production Meeting- 37 Attendees 6 Counties**
- **Annie's Project- 12 Attendees/ 5 Counties**
- **2 Field Days (Small Rum & Forage) 68 Attendees 12 Counties**
- **Ag Programs in the school- 3,124 Youth Reached**

Family and Consumer Science

- **Total FCS Educational Contacts- 15,285**
- **EHC Active Members 38 4 Clubs- 10, 000 Volunteer Hours**
- **2 New EHC Members**
- **Arkansas State EHC President**

Notable Programs

- **Nutrition Program- 588 Educated**
- **Financial Education Programs- 488 Educated**
- **Best Care Childcare Provider Training- 37 Trained**
- **Other FCS Programs- 677 Trained**
- **Youth Sewing- 324 Educated**

SNAP-ED

- **Arkansas Foods Education Program- 1,465 Youth**
- **Arkansas Foods Newsletter Campaign- 1,465 Youth**
- **Right Bite Displays- 85 Contacts**
- **SNAP-ED Partners- 4**
- **Food, Fun, and Reading- 960 Youth**
- **Cooking Schools- 410 Youth**

2024 FCS Programs and EHC Programs

Agent: Tori Fowler

Health and Well-Being

From learning how to use new kitchen appliances to taking control of their mental health, families are making better choices. Many took the time to learn about the different aspects of their overall health to help make any necessary changes to see improvement in daily life. Over 600 people decided to switch to a better lifestyle for themselves and their families.

Personal Finance

Multiple education opportunities occurred throughout the county to address concerns for money management. Nearly 450 residents were able to strengthen their personal finance skills to guide them to making better decisions. This included programs such as Annie's Project (designed to educate and empower women in agriculture) and "Get Real" (created to educate high school students on basic financial practices).

SNAP-Education

Through the SNAP-Ed program, many members of our communities were able to receive education through various opportunities. "Right Bite" Displays were set up at the local Department of Human Services (DHS) office. Patrons could read through the display and pick up an accompanying handout to take home with them! Multiple "AR Foods" education programs, "Food, Fun, and Reading," and various cooking classes were hosted to teach children about the nutrition of some of their favorite foods grown right here in the state of Arkansas. Over 2,800 Lawrence County residents were able to benefit from SNAP-Ed programs.

Extension Homemakers

Number of Clubs – 4

Number of Members – 38

Total Number of Volunteer Hours – 10,000

Value of Volunteer Hours - $277,400

The Statewide EHC President for 24-25 is Lawrence County's Deb Teague

Deb will serve as the Statewide Extension Homemakers President for the 24-25 year. Throughout her tenure this year she will serve as the chair of the fall rallies, coordinate the development of the annual report, represent AEHC on the Arkansas 4-H Foundation Board, and serve as the ex officio of the Code of Ethics Review Committee, she is in charge of all meetings, and represents AEHC at national meetings such as National Volunteer Outreach Network, Country Women's Council USA, and Associated County Women of the World. She has held past offices in AEHC of Creative Skills Chair, District Director, Vice President, and President-Elect. Deb joined EHC in Lawrence County in 2010 when the club Scrappers started. She was President of Scrappers when the club started and President at the county level for 4 years.

2024 4-H Clubs

Agents: Bryce Baldridge, Tori Copeland, Courteney Sisk
4-H Program Assistant, Michelle Teague

Lifeskills Club

The club started last year and has gone over first aid with EMTs as well as watching a Survival Flight helicopter land and look inside it, CPR and fire safety with firefighters, changing the oil in a vehicle, changing a tire, budgeting finances, packing a healthy lunch and how to store leftovers. Future topics include balancing a checkbook, sewing, and filling out resumes and applications. The club is holding elections in September for 4-H officers that will help at club meetings and assist planning events such as Color Run, the Awards Banquet, and fundraising events. The LifeSkills Club will also be assisting with planning at least 4 community service events in the coming year.

4-H Summer Camp

Lawrence County 4-H Summer Camp was a HUGE success. We had 50 kids sign up and attend. We had collaborators Arkansas State Parks that helped with educational sessions each day. Kids learned how to identify mammals and fish of Arkansas, use a fishing pole, and all about edible bugs. They participated in wildlife art projects with Michelle and EHC members. They also got to experiment with battery powered electric snap circuits. The camp is in its 20th year and has seen more than 850 kids come through it. The camp is for kids entering grades 3rd-6th in their upcoming school year.

Outdoor Club

An Outdoor Club was formed last year and has continued to grow. This year's activities included a camping trip with ten kids and nine adults at Lake Charles State Park and Wildlife Habitat Education Program competition in Hot Springs. Two junior teams and two individual cloverbuds competed and did very well in the statewide competition. So far, the club has covered geocaching, animal classification, fish species and fishing gear, camping gear and safety, navigating with a compass, and wildlife education and management. Two club leaders

will complete archery instructor training in the coming year, and plan to expand their shooting sports training to shotgun in the future. The club has plans to go on another camping trip in October and several day trips to state parks in the coming months.

4-H School Programs

For the 23-24 Program year we had five very successful programs that we took inside schools in the county. Those programs, how many schools we were in, and the number of kids reached are:

Embryology in 5 schools- 322 reached

Pollinators in 1 school- 60 reached

Pumpkin Program in 4 schools- 346 reached

Creepy Crawlies in 1 school- 60 reached

Wildlife Identification in 1 school- 72 reached

During the 24-25 program year we plan to conduct these programs again and add more including an amphibian class, Do You Know GMO class, and Living Necklaces Program.

Dog Club

Another successful club that was started this year was Dog Club. The club started in January with a 12-week obedience class where 4-H members taught their dogs basic commands such as heel, walk, sit, stay, and lay down. Club members have been meeting monthly to discuss different dog breeds and their characteristics and how to properly care for their animals. Another obedience class is planned for the fall for new members or as a refresher course for those who completed it in the spring.

Summer Workshops

This year we implemented a workshop series for youth ages 5-19. We offered 7 different workshops during the summer months and had a great turnout. These workshops were open to the public and not just 4-H members. Thanks to the help of numerous volunteers, they were a huge success. The programs offered, number of youth reached, and volunteer numbers are:

Baby Sitting Basics: 18 youth, 3 volunteer, 18 volunteer hours

Outdoor Skills: 26 youth, 2 volunteers, 6 volunteer hours

Arts and Crafts: 12 youth, 4 volunteers, 12 volunteer hours

First Aid Basics: 16 youth, 3 volunteers, 9 volunteer hours

STEM: 18 youth, 3 volunteers, 9 volunteer hours

Cooking Basics: 20 youth, 5 volunteers, 15 volunteer hours

Sewing: 10 youth, 5 volunteers, 30 volunteer hours

During the next program year, we plan to conduct these same workshops, splitting them into two age groups to better suit younger and older youth. We also plan to add more workshops such as Pet Care, a fitting clinic for Livestock Showing, and Leadership.

STEM Club

This year a club was formed focusing on robotics and engineering. The club has been very popular, gaining new members each month. The club has been working with Snap Circuits over the past few months, learning about electrical currents. During the 24-25 program year the club plans to send teams to the SeaPerch Robotics Challenge. This contest allows 4-H members to build and program a robot to perform a series of tasks underwater. Currently, we have enough members to allow 3-4 teams to compete in the upcoming competition.

Upcoming Plans

There are several events already scheduled for the upcoming program year that will expand our reach through education and community service. These include:

Tadpoles to Frogs (Hoxie Pre-K): September 13, 2024

Living Necklaces (Walnut Ridge Kindergarten): September 2024

6th Annual 4-H Color Run: October 19, 2024

Outdoor Club Camping Trip (Bull Shoals, Ozark Folk Center): October 25-26, 2024

Membership Drive Event: November 2, 2024

Dog Exhibition: Lawrence County Fair 2025

2024 Annie's Project

Agents: Tori Fowler and Courteney Sisk

We started a new program in the county in 2022 called Annie's Project. It is an educational program designed to strengthen women in the business side of agriculture. The mission of Annie's Project is to empower farm women to be better business partners through networks and by managing and organizing critical information. Annie's Project is based on the life a of farm woman who grew up in a small town in northern Illinois. Her goal was to marry a farmer and in 1947 she did. Annie spent her lifetime learning how to be an involved business partner with her farm husband.

This six-week course is a discussion-based workshop bringing women together to learn from experts in production, financial management, human resources, marketing, and the legal field. We were honored for our second annual meeting to have local speakers. For programs on FSA and NRCS, we had Brittany Schmidt and Crystal Emmons speak. Lorra Whitmire spoke on financial documents, LeeAnn Graddy spoke on insurance, Sarah Hearnes spoke on crop insurance, Doug Jones spoke on wills/estates/ trusts, James Mitchell on the cattle market, and Hunter Biram on the crop markets. From the Lawrence County extension office, Courteney Sisk spoke on programs and Excel pages available through the extension to help farmers. Tori Fowler spoke on taxes.

Our local program was awarded the Search for Excellence in Farm Business Management for Arkansas from the Arkansas County Agricultural Agents Association and the National Association of County Agricultural Agents.
We had 9 attend the third annual session and look to continue the program in the spring of every year. This brings us to 36 women taught in the course to date.

ANNIE'S PROJECT
EMPOWERING WOMEN IN AGRICULTURE

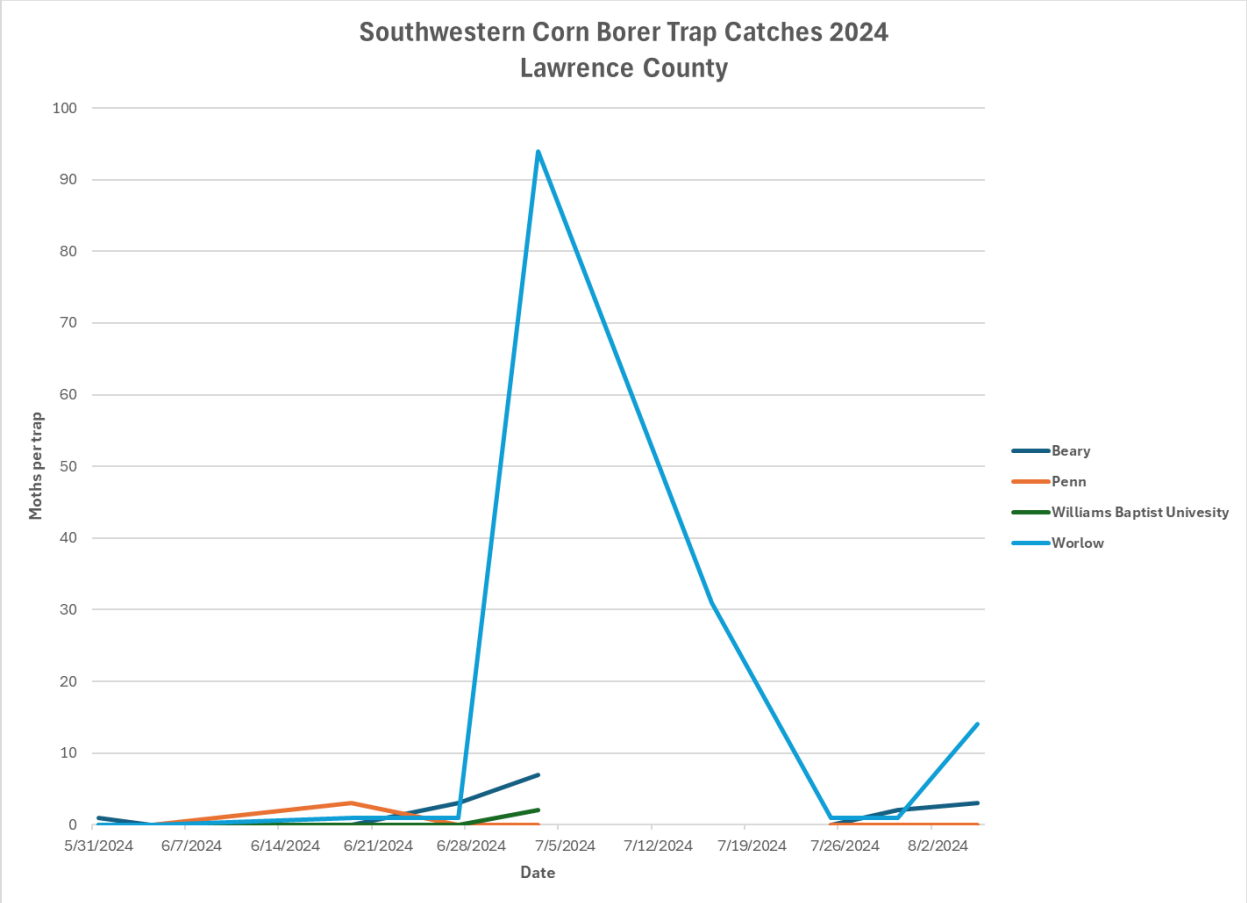
2024 Integrated Pest Management in Soybeans

*Cooperators on **Southwest Corn Borer** traps:*
WBU- College City
Beary Farms- Walnut Ridge
Penn Brothers Farms- Portia
Worlow Farms- Sedgwick

Southwestern Corn Borer- The southwestern corn borer, Diatraea grandiosella, is a moth belonging to the sub-order Heterocera. Like most moths, the southwestern corn borer undergoes complete metamorphosis developing as an egg, larva (caterpillar), pupa, and adult.

Locations: We had 4 traps spread around the Eastern side of Lawrence County in non-Bt Corn crops.

Findings: Traps were checked weekly. Our initial counts were when the only real flight for the county seemed to come through, after that week our findings were from minimal to zero. The threshold for the moth is 100 per week. None of the county traps ever reached the threshold.



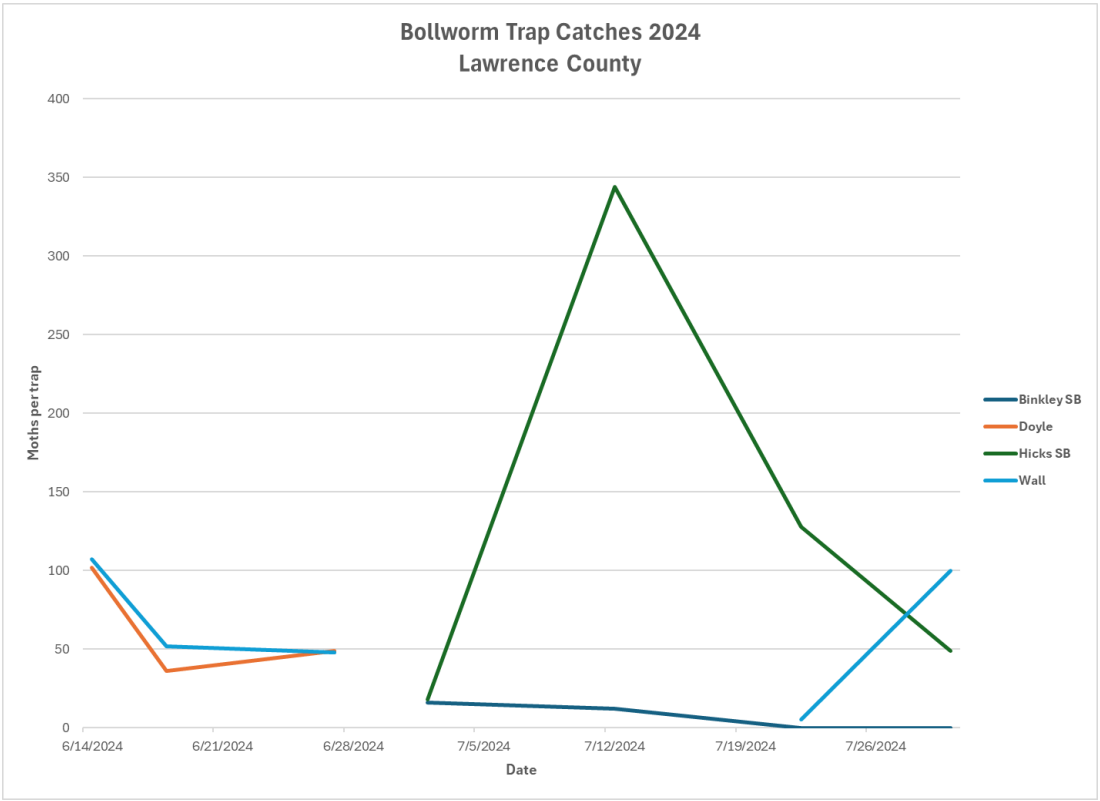
2024 Integrated Pest Management in Corn

*Cooperators on **Bollworm** traps:*
Binkley Farms- NE of Walnut Ridge
Hicks Farms- Alicia
Wall Farms- Portia
Doyle Farms- Clover Bend

Bollworm – Also known as Corn Earworm: The adult bollworm moth varies in color from reddish-brown to a whitish-green brown. A black or dark spot occurs in the center of the front wing near the forward edge. The hind wing has a dark border along the rear outer edge. Corn, soybean, or grain sorghum are all hosts for the bollworm.

Locations: Four locations were spread across the Eastern side of Lawrence County near soybean fields.

Findings: Traps were checked weekly. Overall counts in the county were low and no major flights were seen. The one field area that saw higher counts was placed near a conventional corn field that is a natural attractant to the moth, so results were somewhat skewed. The MP144 contains thresholds. The checks do not trigger a threshold but alert the farmer to check his field for worms if higher counts are being seen.



Bermudagrass Stem Maggot and Armyworm Monitoring

Cooperator: David Ponder
Location: Walnut Ridge AR
Agents: Bryce Baldridge and Courteney Sisk

Bermudagrass Stem Maggot-

The Bermudagrass Stem Maggot (BSM) has become a pest for cattlemen and hay producers alike across the Southeast. This pest only poses a problem in Bermudagrass and Stargrass. This insect is native to south Asia but was first discovered in the United State in Georgia in 2010.

The adult fly is small and yellow with dark eyes and has 4 dark spots on its abdomen. The fly lays its eggs on the bermudagrass stem near a node. After hatching from its egg, the larva works its way toward the last plant node where the leaf blade emerges into the stem. As the larva develops, it burrows into the shoot and feeds. This feeding causes the top of the plant to die, causing a "frosted" look.

Since first finding them in 2010 the insect has now made its way into Arkansas. This could lead to significant losses to local forage producers. It is estimated that damage from the Bermudagrass Stem Maggot can reach 10-80%. A study that was performed in Arkansas noted a 50% reduction in bermudagrass yield caused from the Bermudagrass Stem Maggot.

Hay production in Lawrence County averages approximately 3 tons of forage per acre. This forage would be worth an estimated cost of $300 per acre. A 50% decrease in forage production could cost the producer $150 per acre with the same input costs.

We monitored this field weekly looking for the presence of the Bermudagrass Stem Maggot. This was done by monitoring "Sticky Card Traps", sweeping, and pulling samples to look for physical damage. Fields were also evaluated for the "Frosty" appearance.

Results

The fields were visited a total of six times starting in July. Although some adult flies were trapped, they were in such small numbers that they did not pose a threat. However, the positive catches prove their existence here in Lawrence County which means producers should be diligent in checking their fields in the future.

Armyworms

There are two different types of armyworms that are significant pests in Arkansas. The True Armyworm is more of a spring pest of cool-season grasses while the fall armyworm is mainly a summer/fall pest. The fall armyworm can devastate bermudagrass pastures, but it will also target fall-seeded winter annuals.

The same field that was monitored for Bermudagrass Stem Maggot was also watched for armyworm infestations each week. Armyworms pose a huge threat to livestock producers each year. Damage from their infestations can seem to happen overnight. If infestations are not caught in time, armyworms can defoliate entire forage crops.

During our sweeps for the BSM we counted any armyworms present. If worms were found, we would go the ground to count the numbers that were present per square foot. During our counts this summer, we called for treatment one time.

2024 Corn Variety Trial

Cooperator: Beary Farms

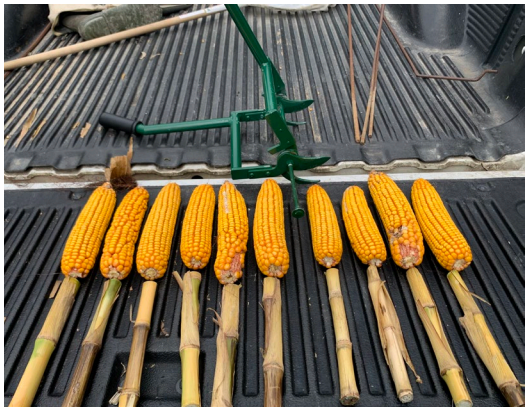
Corn Hybrid Variety trials are held in participating counties across the state each year. The program's goal is to increase knowledge of selected hybrids that are being evaluated in the University of Arkansas Corn Hybrid testing program. The trials were a collaborative effort between growers, County Extension agents, Extension specialists, and industry representatives. In the trials, producers followed the normal production practices used on their farms. Producers donate time, equipment, and hired labor to make these trials possible.

Information collected in this trial included soil type, planting date, agronomic production practices utilized by the producer, final plant population, grain moisture at harvest, plant lodging, and yield. Plots were planted with producer equipment and were eight rows wide with a length of approximately 1300 feet. Grain moisture was recorded by a Dickey John Mini Gac handheld grain moisture tester. Grain yields were adjusted to 15.5% moisture. Lodging scores were taken by the producer during harvest. The results from this demonstration will hopefully give local producers relevant information that will help them to make educated decisions when choosing their next variety of corn to grow. We would like to thank Beary Farms for their cooperation in the demonstration. The following are the results from this trial.

Hybrid	Adj. Yield	Area	Weight	Yield	% Moisture	Plant Stand	Lodging
Progeny 2118	183.85	0.298	3050	182.77	15	27 K	1
Pioneer 1767	205.3	0.298	3390	203.14	14.6	32 K	1
Dekalb 68-35	213.15	0.298	3532	211.65	14.9	32 K	1
Dynagro D56TC44	191.33	0.298	3130	187.56	13.8	32 K	3
Progeny 2215	210.36	0.298	3498	209.61	15.2	29 K	1
Pioneer 1511	205.64	0.298	3448	206.62	15.9	35 K	1
Dekalb 66-06	226.5	0.298	3740	224.11	14.6	33 k	1
Dynagro D58VC74	218.19	0.298	3624	217.16	15.1	32 K	1
Agrigold A6659VT2PRO	200.98	0.298	3346	200.5	15.3	32 k	1

Corn Multiplier Field

Cooperator: Beary Farms



This year Beary Farms cooperated with me in having a corn multiplier field. The agreement that is made in this program is the agent agrees to walk the field each week and report back the farmer things such as growth stages, any pressure from weeds, insects, or disease, soil moisture, fertilization timing, etc. The purpose of the program is to show the producer that management according to Division of Agriculture recommendations can result in increased profitability compared to standard producer practices.

The field that was chosen for this program is located 2 miles northwest of Walnut Ridge on Old Walnut Ridge Rd. The field is 39 acres consisting mostly of Beulah Sandy Loam. It was noted that the producer had problems getting water to the bottom part of this field. Soybeans had been grown in the previous year.

The field was planted on April 6th, 2024, using a John Deere 4840 tractor and a John Deere Max Emerge 1700 vacumeter planter. The rows were spaced at 30" setting on 60" beds. The variety that was chosen was Agrigold A6659VT2Pro which is a 116-day Roundup Ready tolerant variety with good yield potential. The planter was set at a 35,000 seed per acre plant rate. After planting a DD50 was run on the field to help set a time schedule.

After planting the field was sprayed with Roundup to terminate the cover crop along with Outlook to give a residual. The corn emerged 9 days later on April 15th exhibiting a good stand. Nine days after emergence the corn had already reached the V2 growth stage on April 24th. The field received was sprayed on 4-25 with Roundup to clean up the remaining cover crop and atrazine for residual. May 8th showed that the corn had reached V4, and a stand count was taken. The average stand count was 32,000 plants per acre with some sedge, and grass emerging. It was recommended to apply 3.6 pts Halex GT and a quart of Atrazine to control the flush and hopefully make it to the canopy.

The crop received three applications of fertilizer of 100 lbs Urea + 150 lbs. AMS at planting, V6, and pre-tassel. This brought the total nutrients applied to 232.5 lbs. Nitrogen and 108 lb. Sulfur. A trap was placed on the west side of the field to monitor for the Southwest Corn Borer and ran weekly. No insect pressure was observed during the year. Some Curvularia Leaf Spot was noticed but was not an issue.

The field was harvested on August 22, 2024, with an average of 200 bushels per acre at approximately 15% moisture. According to the producer this field usually averages around 175 Bu/Ac. This year we achieved a 25 Bu/Ac increase. At today's price of $3.75 per bushel, this is an increase in profit margin of $93.75 per acre.

According to the farmer, he enjoyed this project and said "*During this year you really taught me the importance of the timing of watering properly, especially at silking".*

Use of Drones in Forage Applications

Cooperator: Tim Miller Farms

With the advancements of technology, drones have become more readily used in agricultural applications. Some of the best reasons to utilize one include a timing issue on weed control, going over very rough ground, or the field being too wet for heavy equipment just to name a few.

For the drone field day, we wanted to look at seeding rates and use it as a drone spraying demonstration. Farm Service, a local Rantizo drone applicator, agreed to make the application/demonstration and Mr. Tim Miller agreed to host the event.

Seeding

We decided to use Ryegrass in the seeding demonstration for two reasons 1) its ability to germinate easily by using the broadcast method of seeding and 2) we already had the seed. We measured out three individual plots 20' x 20' in size. This would allow us to spread the seed and contain it entirely within the plot's borders. Between each plot, we skipped 10' to make sure there was no overlap with the seed.

Each plot was broadcast seeded with Ryegrass from the drone. Three different treatments were included according to the soil disturbance that was implemented. One treatment was tilled, one was harrowed, and the last treatment was mowed only. This simulates actual scenarios that could be used when seeding pastures. We seeded each plot with seed equivalent to 25 lbs. to the acre.

The plots were visited and rated on April 4th. Although there was ryegrass found in each plot it was determined that the results were not as we had hoped for. Looking back, the results would have been much different had we seeded the plots in the fall and used a burndown application of herbicide to reduce competition.

Spraying

The farm was visited on March 1st and an area was located that had plenty of broadleaf weeds including Carolina geranium, buttercup, chickweed, and henbit. The plot was marked off roughly 100' x 60' to give the best observation of the drone and its effectiveness. The plot was sprayed with Grazon Next at a rate of 1 qt./ acre using a 3-gallon/acre application rate with an outside temp of 52˚ F.

The results from this demonstration were over 90% control on all broadleaf weeds contained within the plot. Based on observations using a drone for weed control is an effective option for producers to consider.

Enlist Soybean Variety Trial

Extension Agents: Courteney Sisk and Bryce Baldridge
Cooperator: Wall Farms
Location: Portia, AR

This trial was conducted in cooperation with Wall Farms in Portia, AR. The trial looked at various Enlist soybean varieties and compared their plant stand, lodging, and yield results. The trial in Lawrence County contained varieties that will be entered into the U of A System Division of Agriculture performance trials.

The field used in this trial was a 41-acre field located 2.5 miles southeast of Portia. The field was planted in rice during the 2023 growing season. The seedbed was prepared using conventional tillage with 30" row spacing on 60" beds. The field was planted on May 1st, 2024. The trial was planted with twenty-three varieties, 14 of which contained 6 rows and 9 Varieties containing 10 rows. Plant rate of 140K, when stands were taken on June 15th there was an average plant stand of 123K.

- Those varieties highlighted green were looked at statewide, and the remaining were looked at, at the county level.

Division	Variety	Net Weight (lbs)	Bushels	Moisture (%)	Moisture Factor (13%)	Length (ft)	Width (ft)	Acres	Bu/A
1	Gateway 477ES	1806	30.100	14.0	0.989	1230	15	0.424	**70.210**
2	Armor 49E15S	1862	31.033	16.0	0.966	1230	15	0.424	**70.703**
3	Delta Gro 49E90	1560	26.000	17.0	0.954	1230	15	0.424	**58.500**
4	Armor 45E25	1626	27.100	15.9	0.967	1230	15	0.424	**61.806**
5	Delta Gro 46E30	1830	30.500	13.8	0.991	1230	15	0.424	**71.287**
6	Gateway 465ES	1768	29.467	14	0.989	1230	15	0.424	**68.733**
7	Delta Gro 46E10	1596	26.600	12.6	1.005	1230	15	0.424	**63.050**
8	Gateway 435ES	1624	27.067	12.6	1.005	1230	15	0.424	**64.156**
9	NK42A6	1794	29.900	12.3	1.008	1230	15	0.424	**71.083**
10	Gateway 499	1538	25.633	12.6	1.005	1230	15	0.424	**60.757**
11	NK47G5	1568	26.133	13.3	0.997	1230	15	0.424	**61.450**
12	Gateway 481	1540	25.667	12.2	1.009	1230	15	0.424	**61.080**
13	NK 49U9	1830	30.500	12.7	1.003	1230	15	0.424	**72.150**
14	NK 44U5	1902	31.700	12.2	1.009	1230	15	0.424	**75.437**
15	P42A84E	3210	53.500	11.8	1.014	1230	25	0.706	**76.840**
16	P43Z44SE	3130	52.167	11.6	1.016	1230	25	0.706	**75.073**
17	P45Z75E	3566	59.433	11.3	1.020	1230	25	0.706	**85.866**
18	P45A81	3410	56.833	11.5	1.017	1230	25	0.706	**81.869**
19	P46Z53E	3152	52.533	11.3	1.020	1230	25	0.706	**75.898**
20	P47Z15	3275	54.583	10.7	1.026	1230	25	0.706	**79.323**
21	P48A14E	3200	53.333	11.8	1.014	1230	25	0.706	**76.600**
22	P49Z02E	3000	50.000	14.9	0.978	1230	25	0.706	**69.263**
23	NK49T6	2340	39.000	12.2	1.009	1124	25	0.645	**61.009**

Extend Flex Soybean Variety Trial
Cooperator: Binkley Farms

An Extend Flex Soybean Variety Trial was placed in Lawrence County for the 2024 crop year. We would like to thank Binkley Farms for cooperating with us on this trial. The field that housed this trial was 53 acres in size and is located 7 miles ENE of Walnut Ridge. Foley-Calhoun Complex makes up most of the soil type in the field. The trial was planted on May 16th into good soil moisture. The seed was planted at a rate of 120K seeds per acre. Plant stands were taken on June 14th with an average of 95K per acre over the 22 varieties. The trial was harvested on October 14th. The producer wanted to include the variety that was planted outside of the trial giving us 23 varieties total. The following table contains the results.

Division	Variety	Net Weight (lbs)	Bushels	Moisture (%)	Moisture Factor (13%)	Length (ft)	Width (ft)	Acres	Bu/A	Foreign Matter	FM Lose	Final Bu/A	Notes
1	P48Z70BLX	848	14.133	9.4	1.041	578	15	0.199	73.932		0.000	73.932	state
2	DG46XF54 STS	770	12.833	9.3	1.043	577	15	0.199	67.260		0.000	67.260	state
3	P46A90LX	836	13.933	9.5	1.040	574	15	0.198	73.183		0.000	73.183	state
4	Deltagro 48XF33	858	14.300	9.5	1.040	567	15	0.195	76.267		0.000	76.267	state
5	P45A70LX	800	13.333	9.4	1.041	570	15	0.196	70.815		0.000	70.815	Lawrence County Variety Only
6	PGY 5056XFS	788	13.133	10.2	1.032	568	15	0.196	69.149		0.000	69.149	Lawrence County Variety Only
7	PGY P4947XFS	882	14.700	10.1	1.033	572	15	0.197	77.082		0.000	77.082	Lawrence County Variety Only
8	Armor 45F65	870	14.500	9.5	1.040	579	15	0.199	75.779		0.000	75.779	Lawrence County Variety Only
9	Armor 48F55S	866	14.433	9.5	1.040	576	15	0.198	75.810		0.000	75.810	Lawrence County Variety Only
10	Gateway 461	856	14.267	9.6	1.039	575	15	0.198	74.866		0.000	74.866	Lawrence County Variety Only
11	NK 44J4	854	14.233	9.9	1.036	573	15	0.197	74.850		0.000	74.850	Lawrence County Variety Only
12	Gateway 479	848	14.133	9.6	1.039	571	15	0.197	74.539		0.000	74.539	Lawrence County Variety Only
13	Gateway 487XFS	840	14.000	10.2	1.032	569	15	0.196	73.714		0.000	73.714	Lawrence County Variety Only
14	NK49-N7XF	832	13.867	9.2	1.044	566	15	0.195	74.242		0.000	74.242	Lawrence County Variety Only
15	Gateway 463XFS	870	14.500	9.2	1.044	565	15	0.195	77.631		0.000	77.631	Lawrence County Variety Only
16	NK43-W1XFS	864	14.400	9.4	1.041	564	15	0.194	77.270		0.000	77.270	Lawrence County Variety Only
17	Gateway 457	842	14.033	9.0	1.046	563	15	0.194	75.662		0.000	75.662	Lawrence County Variety Only
18	NK 49C2XFS	832	13.867	9.6	1.039	562	15	0.194	74.267		0.000	74.267	Lawrence County Variety Only
19	Gateway 473XFS	830	13.833	9.1	1.045	561	15	0.193	74.899		0.000	74.899	Lawrence County Variety Only
20	Armor 46F15S	836	13.933	9.2	1.044	560	15	0.193	75.368		0.000	75.368	Lawrence County Variety Only
21	NK42-T5XF	858	14.300	9.1	1.045	559	15	0.192	77.831		0.000	77.831	Lawrence County Variety Only
22	Gateway 425XFS	848	14.133	9.2	1.044	558	15	0.192	76.848		0.000	76.848	Lawrence County Variety Only
23	Asgrow 47XF2	1678	27.967	9.7	1.038	581	30	0.400	72.574		0.000	72.574	Lawrence County Variety Only

2024 Commercial Rice Trial

Agent: Courteney Sisk
Cooperator: Giles Spur Farms

The Commercial Rice Trial was conducted in 11 counties across Arkansas this year. Their plots were grown in a conventional field in the counties. 30 Varieties of Rice were looked at in replication to harvest information. Information gathered included: stand counts, heading dates, canopy heights, disease assay, and harvest yields. The field that was used for Lawrence County's plot was southwest of Walnut Ridge on Hwy 230. The variety RT 7401 was grown in the field that held the plots. The plant date for the field was April 16th and was harvested on September 10th.

* The below chart on the following page is for yield for the varieties in all counties it was grown in.

Arkansas Rice Performance Trials (ARPT)

2024 Grain Yield Summary – All Locations

University of Arkansas System Division of Agriculture

Cultivar	Grain Length[1]	RREC bu/ac	PTRS bu/ac	NEREC bu/ac	NERREC bu/ac	CLAY bu/ac	DESHA bu/ac	GRE bu/ac	JAC bu/ac	LAW bu/ac	FAU bu/ac	ARK bu/ac	Mean bu/ac
Diamond	L	204	184	160	176[19]	197	171	153	198[18]	181	171[29]	193[10]	**181**
Ozark	L	200	187	131	172[17]	205	165	184	191	194	168[13]	204	**182**
ProGold L4	L	201	170[5]	126	153[28]	199	171	186	190[25]	179[39]	161[10]	189	**175**
DG263L	L	210	198[48]	171	182[25]	191	197	192	222[10]	173[31]	195[23]	186	**193**
RTv7303	L	210	188[81]	199[13]	157	204	185	175	221	168[90]	188[6]	187	**189**
CLL16	L	217	176	122	196[75]	181	161	169	187[20]	169[20]	176[36]	183	**176**
CLL18	L	220	198	142	155[43]	217	175	175	205[15]	186	178[11]	191	**186**
CLL19	L	184	181[13]	146	152[40]	205	165	166	182	179	156	203	**175**
CLHA03	L	179	167	106	155[15]	182	161	177	182	164	163[3]	193	**166**
PVL03	L	170	144	104	131	162	156	144	161	142	152	163	**148**
PVL04	L	179	177	136	163	178	171	161	195[27]	156	180[8]	187	**171**
DG563PVL	L	212	198	150	209	176	180	165	197[23]	177[83]	174[25]	196	**185**
RTv7231MA	L	183	178[15]	128	182[20]	212	168	185	208	199[4]	154	217	**183**
RT7331MA	L	224	194[25]	151	191	230	194	194	227	195[55]	196[5]	219	**201**
RT7421FP	L	238	222[16]	139	216[27]	210	198	179	236	182[88]	187[25]	227	**203**
RT7521FP	L	238	200	139	200[20]	243	200	200	223	144[81]	170[66]	195	**196**
RT7302	L	243	197[73]	141	234[7]	232	213	201	240	173[95]	182[53]	198	**205**
RT7401	L	247	216[18]	144	213[10]	218	206	191	239	188[96]	197[13]	197	**205**
RTXP753	L	211	201[10]	171	205	238	196	190	234	182[54]	193	214	**203**
DG3H2004	L	256	200[48]	142	216[30]	226	218	186	235[15]	155[91]	163[98]	204	**200**
DG3H2007	L	234	198[65]	139	169[62]	232	210	214	246	119[96]	200[83]	211	**198**
Titan	M	188	206	170	170	219	152	183	212	198[28]	173[7]	194	**188**
Taurus	M	194	188	126	102[68]	222	179	189	204	181[25]	160[25]	191	**176**
DG353M	M	218	182	132	168[30]	185	161	175	179	181	178[43]	186	**177**
ProGold M3	M	201	187	170	189	208	176	192	191	185	159[16]	191	**186**
RT3202	M	247	196[24]	127	199[20]	225	202	210	221[23]	174[72]	181[4]	214	**200**
CLM04	M	210	183[23]	128	140[65]	184	176	182	178[63]	156[79]	167[26]	186	**172**
CLM05	M	209	192	113	198	195	174	190	190[23]	190[28]	182	189	**184**
Mean	--	**212**	**190**	**141**	**178**	**206**	**181**	**183**	**207**	**174**	**175**	**197**	**186**

[1] Grain Length: L=long grain, M=medium grain.
* Numbers in superscript beside yields represent percent lodging.
** **NEREC had significant bird damage; ARK had volunteer rice present throughout; NERREC, LAW, and FAU had notable lodging affect yields for some cultivars.**

*The below chart on the following page is for milling for the varieties in all counties it was grown in.

Arkansas Rice Performance Trials (ARPT)

2024 Milling Yield Summary – All Locations

University of Arkansas System Division of Agriculture

Cultivar	Grain Length[1]	RREC HR-TR[2]	PTRS HR-TR	NEREC HR-TR	NERREC HR-TR	CLAY HR-TR	DESHA HR-TR	GRE HR-TR	JAC HR-TR	LAW HR-TR	FAU HR-TR	ARK HR-TR	Mean HR-TR
Diamond	L	55-74	37-71	60-73	47-70	57-72	55-72	54-74	51-74	51-75	22-71	43-76	**48-73**
Ozark	L	55-74	43-71	64-73	48-70	60-73	53-71	55-74	56-73	51-75	25-71	49-76	**51-73**
ProGold L4	L	57-75	40-71	62-72	51-69	58-73	56-71	58-73	58-74	49-75	24-70	48-75	**51-72**
DG263L	L	59-72	40-69	54-69	40-68	54-71	59-70	57-72	54-72	40-72	31-69	39-74	**48-71**
RTv7303	L	62-71	41-68	61-70	45-66	53-71	59-70	59-71	56-71	46-72	28-68	47-74	**51-70**
CLL16	L	51-72	27-70	55-69	43-70	57-72	55-70	53-73	56-73	50-74	24-72	45-75	**47-72**
CLL18	L	56-73	42-70	58-71	41-68	56-71	53-70	55-72	54-73	51-74	27-69	46-75	**49-71**
CLL19	L	59-73	39-70	54-71	44-68	61-72	57-72	56-74	60-74	46-75	22-71	43-76	**49-72**
CLHA03	L	56-74	44-70	59-72	50-70	59-72	62-72	63-73	56-73	56-75	34-71	51-75	**53-72**
PVL03	L	61-75	33-70	57-71	46-70	55-74	58-73	57-75	57-74	45-76	25-72	46-73	**49-73**
PVL04	L	55-74	44-69	55-70	44-66	59-72	53-70	56-73	58-72	49-74	42-71	39-76	**50-71**
DG563PVL	L	63-73	44-69	56-68	50-68	56-71	62-70	59-70	59-73	46-72	36-70	50-74	**53-71**
RTv7231MA	L	53-72	15-70	42-68	27-67	54-74	51-70	54-72	48-73	36-74	13-68	46-75	**40-71**
RT7331MA	L	57-74	20-71	48-71	37-71	55-74	46-73	52-74	50-74	36-75	15-71	41-76	**42-73**
RT7421FP	L	50-74	32-70	55-70	41-70	51-72	50-69	52-73	46-73	26-74	14-70	50-75	**42-72**
RT7521FP	L	54-73	35-71	51-70	44-70	53-72	58-71	55-73	50-74	30-75	20-70	37-76	**44-72**
RT7302	L	59-75	21-70	50-70	43-70	55-73	51-73	54-74	50-74	24-75	18-71	39-76	**42-73**
RT7401	L	54-74	23-70	55-71	35-70	55-72	51-72	54-72	50-73	27-74	17-70	50-75	**43-72**
RTXP753	L	49-74	19-71	46-71	35-72	53-74	43-73	49-74	44-74	27-75	17-70	36-76	**38-73**
DG3H2004	L	58-74	27-70	42-68	43-70	52-72	50-71	51-71	49-74	30-74	20-66	37-75	**42-71**
DG3H2007	L	54-75	26-70	37-69	39-69	48-72	50-72	50-71	43-73	25-73	20-70	43-75	**39-72**
Titan	M	60-73	17-70	53-71	34-69	57-71	55-71	59-72	58-72	41-73	16-70	48-75	**45-72**
Taurus	M	62-74	21-70	57-71	36-69	62-72	57-72	67-73	54-73	41-75	22-69	47-76	**48-72**
DG353M	M	64-74	31-71	59-71	48-69	59-72	62-70	67-73	56-73	53-75	17-70	54-75	**52-72**
ProGold M3	M	67-74	41-70	62-70	56-68	63-71	63-68	68-72	60-73	54-73	31-70	57-74	**57-71**
RT3202	M	57-73	19-68	46-68	38-68	46-72	51-72	57-73	46-72	41-74	20-69	48-75	**43-71**
CLM04	M	64-74	29-70	62-70	47-69	59-72	64-69	69-72	56-73	42-73	22-69	66-74	**53-71**
CLM05	M	61-72	26-67	53-69	44-68	58-70	57-67	66-70	53-72	51-72	24-69	57-74	**50-70**
Mean	--	**58-71**	**31-70**	**54-70**	**43-69**	**56-72**	**55-71**	**57-73**	**53-73**	**42-74**	**23-70**	**46-75**	**46-72**

[1] Grain Length: L=long grain, M=medium grain; [2] HR-TR = % Head Rice (whole kernel) and % Total Rice (total milled rice).

Wheat Verification

Cooperator: Ron Cavenaugh Farms
Location: Walnut Ridge, AR
Agent: Bryce Baldridge & Courteney Sisk

The 30-acre field with Amagon & Dundee silt loam soil was located northwest of Walnut Ridge and followed soybeans. A pre-plant fertilizer application of 0-46-90 was applied. The field was no-till drilled and planted on October 17, 2023, with Pioneer 26R41 at 120 pounds/acre. Wheat emerged on October 27, 2023, to a stand of 23.3 plants/ ft². Anthem Flex was applied early POST at 2.75 ounces/acre for ryegrass control was made on November 7, 2024. Initial early spring fertilizer application of 50lbs/acre ammonium sulfate plus 50 pounds/acre urea was made on February 20, 2024. A second spring nitrogen application was applied on March 12, 2024, of 100 pounds/acre urea. The final spring nitrogen application of 100 pounds/acre of urea was applied on March 20, 2024, for a total spring nitrogen rate of 126 pounds/acre. On March 22, 2024, .9 ounces/acre Harmony Extra was applied for winter annual control. Miravis Ace fungicide was aerially applied at flowering on April 20 at 13.7 ounces/acre for Fusarium Head Blight suppression and leaf rust. The field was harvested on May 31 and yielded 67.7 bushels/acre adjusted to 13.5% moisture.

***tables also reflect on fields looked at in Greene and White County**

Table1. General Agronomic Information of Verification Fields in 2023-2024.

County	Variety	Acres	Planting Method	Seeding Rate lb/a	Planting Date	Previous Crop	Yield Bu/a
Greene	Delta Grow 1800	191	Drilled	120	10/18/23	Corn	73.9
Lawrence	Pioneer P26R41	30	Drilled	120	10/17/23	Soybean	67.7
White	Agri Maxx 5003	50	Drilled	120	10/12/23	Fallow	71.9
Average		**90.**		**120**	**10/15/23**		**71.2 bu/A**

Table 2. Soil Type and Fertilizer Inputs for 2023-2024 Wheat Verification Fields.				
County	**Soil Type**	**Fall Fertilizer**	**Spring Fertilizer**	**Total Spring Nitrogen**
Greene	Hillemann & Calhoun Silt loam	0-60-60	1st, 50# ammonium sulfate + 50# urea; 2nd, 100# 41-0-0-4; 3rd, 100# 41-0-0-4	116
Lawrence	Amagon &Dundee Silt Loam	0-46-90	1st; 50 # ammonium sulfate + 50 # urea 2nd; 100 # urea; 3rd 100 #urea	126
White	Calloway Silt Loam	0-0-0	1st, 75# urea + 50# ammonium sulfate; 2nd, 100 # urea	91
Average				**111 lbs N**

Table 3. Pesticide Information for the 2023-2024 Wheat Verification Fields.			
County	**Herbicide**	**Insecticide**	**Foliar Fungicide**
Greene	Spring: 1.5 pts. 2,4-D + .75 oz Harmony Extra	None	None
Lawrence	Fall: 2.75 oz Anthem Flex Spring: .9 oz. Harmony Extra	None	13.7 oz. Miravis Ace
White	Spring: 3.25 oz. Zidua	None	6.5 oz. Prosaro

2024 Brucellosis Vaccinations

Cooperators: Lawrence County Cattle Producers

Agents: Bryce Baldridge

Brucellosis Vaccinations are done twice each year in the county, for heifers 4 months to one year of age. The vaccination helps guard against a very contagious and serious disease Brucella also known as Bang's Disease. The disease causes heifers to abort calves and producers to lose money. Brucellosis Vaccinations help safeguard the heifers in the herd from the disease.

The Brucellosis vaccine is called RB51. The Arkansas Livestock and Poultry Commission supplies the vaccine and producer's signup through the local extension office. Vaccinations are offered in each Spring and Fall.

In Lawrence County, we were able to assist two producers totaling 25 heifers during the spring of 2024 (done typically in April) with vaccinations. During fall (done typically in October) we were able to assist eight producers totaling 149 heifers.

Cool Season Annuals for Small Ruminants

Cooperator: Mike Bookout

Small Ruminants have gained popularity in Lawrence County over the past few years. The advantage that small ruminants have over large ruminants is their low cost, small size, and marginal land use. Couple this with an increase in the demand of products and strong prices producing goats or sheep can be a money-making venture. The attraction of added income, generating another food source, more people reverting to a homestead lifestyle and others have brought people back into the small ruminant industry.

With anything new comes a learning curve. To help new producers that may have many questions it was decided to hold a field day and Mr. Bookout agreed to host the event. Among topics that were addressed as needing covered was planting annual forages for grazing. They wanted to showcase forages that had good growth, nutritional value, and were easy to establish as some of the new producers might be limited in the equipment that was available to them. It was decided to use Jerry Oats, Coker Oats, and Winter Wheat in our demonstration.

Each chosen variety exhibits different attributes. The Jerry oat is a spring oat with little cold tolerance. This forage if planted in the fall needs to be grazed off usually by December. Coker Oats have the coldest tolerance and can be grazed from March through May. Winter Wheat can be grazed a little earlier than Oats in February. All these varieties can produce grazeable forage within 45-60 days after planting.

To prepare the plot site Mr. Bookout disturbed the soil by disking. Three 10’ x 20’ plots were measured out and marked with flags. Mr. Bookout broadcast the seed over the prepared seedbed on March 18th, 2024. The plots were fertilized on April 15th with Urea equivalent to 60 lbs. Nitrogen/acre.

This demonstration showed producers how annual forage can be used in conjunction with one another to increase the number of grazing days while still providing good quality forage to their animals. These practices can save them time and money by decreasing the amount of hay they feed in a year. These forages can also help with the overall health of their herd by decreasing the parasite load and increasing gains on younger animals.

Hay Multiplier
Cooperator: Scotty Dail and David Ponder

Hay is an important commodity here in Lawrence County. Some producers bale hay strictly to feed their own animals and some sell a portion or all of it for added income. In either instance, producing a quality forage at the least cost is a priority.

I was approached by Mr. Ponder with an initial question of how to control Buckhorn Plantain in his hayfield. This conversation led to other topics including soil fertility, sustained weed control, and harvest height. After some conversation, I agreed to help Mr. Ponder by making suggestions as the growing season progressed.

A soil sample was taken in July 2023 which revealed a shortage of soil Potassium. The soil sample was sent in with the soil code of "132- Hay warm season grasses 2 ton/acre. The recommended rate for fertilizer was 100-0-200.

To address the issue with the Buckhorn Plantain Mr. Ponder applied 30 oz/acre of Grazon P+D. We received very good control of most of the broadleaves within the field. A Fertilizer blend of 17-0-34 was applied at 300 lbs./acre. This was half of the recommended rate according to the soil test results. After the first cutting, Urea was applied at 100 lbs./acre. The total fertilizer applied achieved the Nitrogen goal and ½ of the potash recommendation for the year.

The field was visited every week to monitor progress. Traps were placed on the field to check for populations of the Bermuda Stem Maggott and to watch for armyworm damage. There was no damage observed from the BSM, however, it was recommended to spray the field one time for armyworms. Based on the inputs supplied by Mr. Ponder the following table was generated showing the results. There was an increase of $277/ acre over 2023 income. They did receive a better price for the hay this year than in 2023 but if you use the 2023 price this still shows an increased profit of $126.70/ acre.

YEAR	# BALES	FERTILIZER	HERBICIDE	TOTAL COST	$/BALE	TOTAL INCOME	$/ACRE
2023	320	$2400	$600	$3000	$28	$8,960	$224
2024	501	$3200	$600	$3800	$40	$20,040	$501

Building Potassium Levels in Forages

Cooperator: David Ponder / Scotty Dail

Nitrogen is widely used to increase yields in forages, especially in hay production. Most producers are unaware that Potassium is just as important as nitrogen. It is estimated that for every ton of forage produced, it takes approximately 45-50 lbs. of both Nitrogen and Potassium. Producers frequently apply nitrogen in the form of urea to their hayfields but neglect the plant's need for Potassium.

Potassium is a vital plant nutrient that can't be replaced with any other nutrient. It is taken up by the plant through the soil and is essential for plant growth. Potassium is vital for plant photosynthesis, essential in protein synthesis, fruit formation, and improving winter hardiness. Potassium can also increase disease suppression within the plant.

Mr. Ponder approached us concerned with the increasing weed pressure in his hayfield. After observing the field and listening to the cooperator's management practices it was suggested that we take a soil sample to check for any deficiencies within the soil. As expected, the results indicated a very low level of soil Potassium.

It was decided that we would place a demonstration plot and monitor it over multiple years to evaluate the increase of soil Potassium over time. This plot consisted of four 5' x 5' individual plots replicated four times. A soil test was taken to determine the needs of this area. The results indicated a need for 120 lbs. Potash/acre.

The individual treatments within this plot included a control, a full rate of K applied in the spring, a split application after the 1st and 2nd cutting, and a full rate applied in the fall. 55g of muriated Potash was applied to each full-rate plot and 27.5g was applied to the split application. Mistakenly a full rate was applied to the split application plots in the fall giving that area a double rate for the year. Soil samples will be taken every spring within each plot to monitor the changes in soil potassium over time. The following is a diagram of the plot layout.

FULL SPRING	SPLIT	FULL FALL	CONTROL
SPLIT	FULL FALL	CONTROL	FULL SPRING
FULL FALL	CONTROL	FULL SPRING	SPLIT
CONTROL	FULL SPRING	SPLIT	FULL FALL

Ergovaline Levels in Novel Fescue

Cooperator: Mitch Baltz

Tall Fescue is a very important forage for livestock producers in Arkansas, our most common cultivar being *Kentucky 31*. It is grown on approximately two million acres in Arkansas. Tall Fescue is adapted to a wide range of conditions including tolerating short-term flooding, moderate drought, heavy livestock and machinery traffic, responding well to fertilizer, and maintaining itself under limited fertility conditions. It can produce up to 4 tons of dry matter per acre if managed correctly.

With all these benefits it does have a downside. The variety common in Arkansas contains a toxic fungus known as Endophyte. This toxin can be located throughout the plant but the seedheads can contain a large amount. This toxin negatively affects animal performance through reduced animal gain, elevated body temperatures, reduced conception rates, and high respiration rates.

Fescue is a "Necessary Evil" when it comes to a cool season forage option in Arkansas. Several things can be done to combat this toxicity including clipping seedheads, using legumes such as clover to help minimize the amount of fescue consumed, mixing with other grassed such as bermudagrass, and do not graze fescue in the summer when levels tend to be elevated. The best option, however, is to use is to plant an "Endophyte Friendly" or Novel variety. Novel Fescue contains the endophyte fungus but it does not negatively affect the animal. The reason that this option is not used more widely is two main reasons: establishing procedures and cost.

Mr. Baltz has spent the last three years converting his toxic fescue fields to a novel variety. He has planted two different varieties including *Estancia* and *Tower*. There have been concerns as to how long the stand will last with the lower endophyte levels. The suspected cause of Novel fescue fields with elevated endophyte levels is the fields becoming contaminated with the Kentucky 31 variety from other fields by grazing or feeding hay with E+ fescue contained within the bale.

Our goal with this demonstration is to monitor these Novell Fescue fields to evaluate both the level of endophyte in the forage samples and the variety of fescue contained with the sample. Two fields were sampled, and 100 stalks were harvested and sent to forage labs at the University of Kentucky and North Carolina State University. Each lab received 50 stalks to determine their results. The University of Kentucky reported that the Ergovaline levels in the forage were not detected. (*as of the date of article results not received from NCSU)

Buckhorn Plantain Control Demonstration

Cooperator: David Ponder Farms

I was approached by Mr. Ponder last fall to identify a weed that was taking over his hayfield. In his words, it started with a weed here and there and eventually spread throughout the hayfield. He desired to know how to control it. After identifying the weed as Buckhorn Plantain I suggested that Mr. Ponder allow me to place a demonstration on his property to illustrate the effectiveness of different products in controlling this weed.

Buckhorn Plantain is an erect cool-season perennial plant that may grow up to 2 ft tall. The leaves are elongated while the flowers can be up to 4 inches long with tiny white to brown flowers. Although Buckhorn Plantain is not toxic to cattle and somewhat palatable it can increase in density and compete with desirable forages over time. Older plants can become drought tolerant due to a long taproot which they can regenerate from even when cut off at or below the soil surface. This is one reason Buckhorn Plantain has become well-established and difficult to control in pastures.

This demonstration was set up to allow for three different application times including a fall-only application, a fall + spring application, and a spring-only application. The chemicals and rates that were chosen to evaluate were Grazon Next @ 30 oz./acre, Patriot @ .5 oz./acre, and Surmount @ 24 oz./acre. Each treatment received an additional pre-emerge product called Prowl @ 2 qt./ acre to give added residual. A non-ionic surfactant was also added to each treatment at ¼%.

The fall application was applied on November 29th, 2023, with the spring application being applied on March 5th, 2024. Each plot was evaluated and rated for effective control. The plots were rated at 4,6,8, and 12 weeks after treatment.

Results from this demonstration showed that a fall + spring application of herbicide remained the most effective at controlling Buckhorn Plantain with all products having a control rating of 90%-100% control. Grazon Next and Patriot had the best control ratings throughout the test at 90%-100% control maintained through 8 weeks after treatment. Patriot was the product with the lowest cost per. Costs per acre are as follows: Grazon Next $12.93, Patriot $2.09, and Surmount $13.88.

		Fall Applications			*Fall + Spring*			*Spring Applications*	
Time on Rating	Grazon Next	Patriot	Surmount	Grazon Next	Patriot	Surmount	Grazon Next	Patriot	Surmount
4 Week	95%	90%	80%	95%	95%	90%	95%	90%	80%
6 Week	100%	95%	80%	100%	100%	90%	95%	90%	95%
8 Week	95%	90%	70%	95%	95%	90%	95%	95%	95%
12 Week	70%	80%	70%	70%	90%	90%	95%	95%	95%
	*percentages reference effectiveness in control								

Utilization of Oats and Ryegrass to Extend Grazing Season

Cooperator: Tim Miller
Agents: Bryce Baldridge and Courteney Sisk
Specialist: Kenny Simon

Objective: This demonstration aimed to demonstrate how fall-planted cool season annuals could be used to extend the grazing season. When planned properly, cool season annuals can be utilized in a way to provide not only an early source of forage but one that is also very palatable and nutritious.

Methods and Materials: The field where this demonstration was to be held is located 0.9 miles SW of the town of Strawberry and is made up of a soil type of Portia Fine Sandy Loam. The varieties that were selected to be used were winter oats (Bob) and Winterhawk Ryegrass. The field was planted on October 10th, 2023, with a rate of 75 lbs./acre of oats and 25 lbs./acre of ryegrass. The planted area equaled six acres in size. The producer did not want to use commercial fertilizer and instead opted to use poultry litter which was spread at a rate of one ton per acre.

The site was visited again on December 8th, 2023, to evaluate the stand that was achieved before going into winter. The stand looked very good at that time. We elected to come back and evaluate the stand again in the spring. Growth progressed through the spring. Twenty calves weighing an average of 650 lbs. were turned into graze on April 5th and allowed to graze for a total of 49 days. The last four days were grazed by 11 calves as 9 were taken out and sold.

Results: Table 1 shows the total costs incurred from this demonstration.

Table 1. Total costs associated with grazing demonstration.

Input	Cost / 50lb. bag	Cost/ lb.	Total Cost	Cost/AU
Bob Oats	$44.99	$0.90	$404.91	$12.19
Ryegrass	$23.99	$0.48	$71.97	$2.16
Poultry Litter			$400	$12.05
			$876.88	$26.40

Based on the number of animal units in the demonstration (33.2) and number of days grazing (49) it was estimated that to replace the forage consumed a producer would need to feed 33 bales of hay to the same number of animals. Assuming a price of $60 per bale, this would bring the total cost of hay to $1980. Assuming these animals would be supplemented with additional feed for $350/ton this brings the total cost for hay and supplementation to $2,330.

Of course, one could plug their numbers in here to conform costs to their operation. The following shows the comparison of the total costs of grazing vs. using hay and supplementation.

Comparison costs=	$2,330	$70.18/ AU
Actual Costs=	$876.88	$26.41/ AU
Savings=	$1453.12	$43.77/ AU

Discussion: The fact remains that animals will need to be supplemented in some way, always, during the year. How these animals are fed is left up to the producer. Costs will vary from operation to operation. This demonstration showed that it is possible with a little planning to provide animals with a grazing option with cost savings. Samples were not taken during this demonstration for forage analysis. Based on values from a reputable forage lab oats average 17%CP and 63% TDN while Ryegrass can yield forage averaging 20%CP and 67%TDN. It would be hard to find hay with this kind of nutritional value.

Influence of Timing Nitrogen Applications on Cool Season Forages

Cooperator: Tim Miller
Agents: Bryce Baldridge and Courteney Sisk
Specialist: Dr. Bronc Finch

Objective: To establish the most effective time to apply nitrogen to cool-season forages for maximum growth.

Background: Historically, producers have depended on hay reserves to get their herds through the winter months. Feeding hay until their grass starts growing used to be the norm. Recently producers have seen the need to invest more in their forages. Introducing the 300 Days of Grazing program has brought attention to practices such as stockpiling forages, proper ways to store and feed hay, and planting cool season annuals to stretch grazing days and decrease the amount of hay being fed. These practices can help a producer decrease labor needed and ultimately input costs.

There seems to be a growing number of producers that are incorporating cool season forages into their operations. These forages are usually planted into warm-season pastures that have been grazed or cut for hay for the last time of the season. Planting these cool season forages in this way will give the producer a viable source of grazing earlier during the next spring. These forages are not only more palatable but provide more nutrition than hay.

Input costs remain high each year with fertilizer being one of those costs. To maximize profits, producers must be effective managers of input costs. If a producer takes the time, effort, and money to implement a production practice they want that practice to be most effective. This demonstration was set up to demonstrate the best time to apply nitrogen to cool-season forages to get the most growth.

Methods: A mixture of winter oats (Bob) and ryegrass (Winterhawk) was planted in late October 2023. This 7-acre field on Portia Fine Sandy Loam soil is located 0.8 miles SW of Strawberry AR.

Six individual Plots were marked for our demonstration, each being 10'(W) x 20' (L). Table 1 lists the plot plan used. Each plot was fertilized with urea equivalent to 60lbs./acre every 2 weeks starting February 1 with treatment six receiving two applications 1 month apart. Treatment one was our check and did not receive any nitrogen.

The forage heights were measured at each visit to monitor progress. Table 2 lists the average plant heights throughout the test.

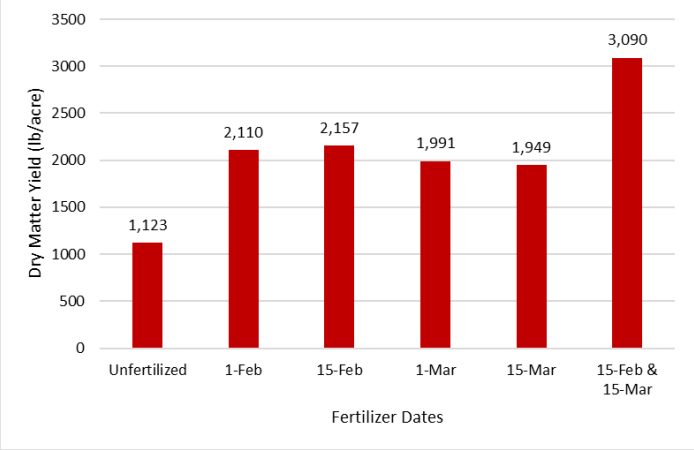
Table 1: N Timing Plot Plan

TRT	Treatment Description	Nitrogen Rate (lb/ac)
1	Check 0N	0
2	Feb. 1st	60lb N
3	Feb 15th	60lb N
4	March 1st	60lb N
5	March 15th	60lb N
6	Feb. 15th & Mar 15th	60lb N at both

Table 2: Average Plant Heights during N timing Demonstration

Treatment	2-6-24	2-15-24	3-1-24	3-15-24	4-15-24
Check	3.33”	4.3”	4.33”	8”	21.3”
February 1	3.5”	4.6”	5.33”	8”	25.3”
February 15	3.6”	3.6”	4.33”	9.6”	23.3”
March 1	3.33”	4”	3.66”	8.3”	26.3”
March 15	4”	3.33”	3.33”	5.6”	25.6”
Feb 15 & Mar 15	4”	4”	6”	11.3”	25.6”

Results: The plots were harvested on April 15th, 2024, by collecting all biomass that was greater than 3” in a 1 sq. ft. area. Each plot was harvested in three areas for replication and to achieve an average total yield. Each sample was air-dried for a minimum of 7 days to represent air-dried biomass yield before being weighed. The chart below shows the adjusted forage yield related to N application dates.



Discussion: All treatments that received Nitrogen were well above the check indicating a need for fertilization. Treatments that were fertilized in February yielded slightly more than those fertilized in March. This suggests that fertilizing cool season forages in February is not detrimental but will help to jump-start growth over a March application alone. The largest difference was in treatment six which received two applications of N, one in February and one in March. This treatment yielded 933 lbs. more forage than the nearest average.

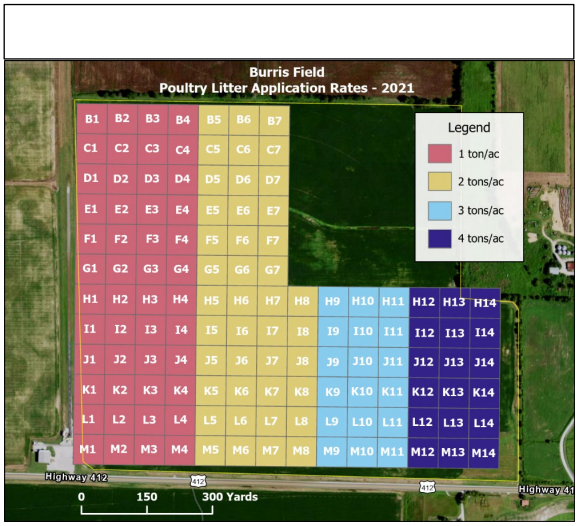
The price of urea during this time was $460/ ton or $.50 per pound of actual Nitrogen. At this price, each application of Nitrogen costs the producer $30 per acre. For a $30/acre investment, if the producer fertilized on February 15th the difference produced was 1,034 lbs. of forage vs. no fertilization at all. A second application of N produced an average of 933 lbs. of forage vs. a February application alone. This brings the total to 1,967 lbs. of forage over the unfertilized check. A $60/acre investment for 1,967 lbs. of forage that is more palatable and higher in nutrition than harvested hay.

This demonstration represents a single location and year, and these results may vary by location and conditions. However, based on these results a February or March application of Nitrogen is beneficial to your cool season forages but if looking for a “sweet spot” February 15 date would be a good target date.

Soil Health Demonstration
Cooperator: Hunter Yates
Location: Walnut Ridge AR
Agents: Bryce Baldridge and Courteney Sisk

Introduction: Soils have many functions, including a medium for plant growth, a key component of the water cycle, a habitat for organisms, and an engineering medium**.** Soil is not considered a renewable resource as it takes an estimated 500 to 1,000 years to form one inch of topsoil. For this reason, stewards of the land must do everything possible to maintain a healthy and sustainable soil. This demonstration aimed to observe how the Phosphorus (P) and Potassium (K) levels change after years of poultry litter application.

Methods and Materials: For this demonstration and study, the Yates farm was split into four strips that each received a different amount of poultry litter annually each spring. The Field was split into West, Central West, Central East, and East strips and received 1, 2, 3, and 4 tons of poultry litter per acre, respectively (Figure 1).



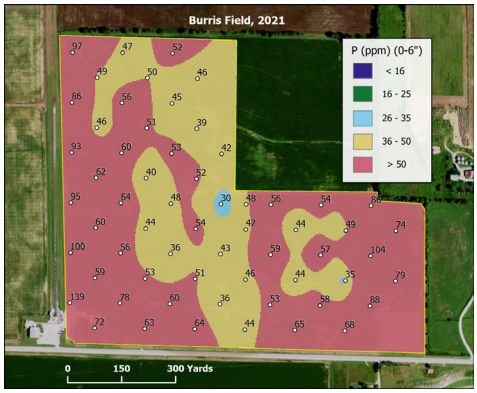
In 2021 the entire field was split into 1-acre grids and routine (Mehlich III) soil samples were collected using the Falcon Soil Sampling machine. In 2022 each strip was analyzed using a Haney soil heath test. For these samples, each of the strips was divided into 5-acre grids. Within each 5-acre grid 10-15 soil samples were collected and then combined into one composite soil sample for each of the four variable application strips. The Haney Soil test extracts nutrients through different methods than a routine test and attempts to utilize these metrics to generalize overall soil health. There are three main components to a Haney Soil test: 1) soil respiration (a general indication of aerobic microbial activity in the soil measured through CO_2 production), 2) water-soluble fractions of organic carbon and nitrogen (WEOC/ WEON), 3) the ratio between the measured WEOC and WEON. While this may sound complicated the Haney method has defined optimal and suboptimal ranges for each one of these metrics and uses that guidance to create an easy-to-read composite “soil health” number that ranges from 0-50 but rarely exceeds thirty. In general, higher scores indicate better soil health, however scores can vary widely depending on the soil types and regional constraints. Thus, the most effective way to utilize the soil health score is to see if the number on your farm increases over time due to specific management practices, like applying poultry litter or implementing no-till and cover crops.

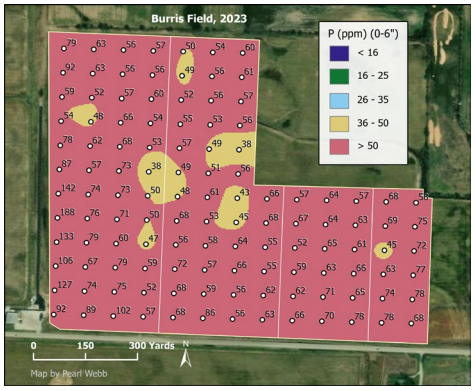
You may be asking yourself why these soil health metrics are important to my farm management practices and how they relate to poultry litter application to row crops or forage. The simple answer is improving soil health has the potential to sustainably increase crop yield while also saving farmers money on inorganic nutrient applications. The more complex answer is that soil can store organic nutrients as soil organic matter (SOM), and microbes in the soil can utilize these inputs over time to convert nutrients into plant-available forms as well as build soil structure. Organic soil amendments like litter can increase soil organic nitrogen and reduce

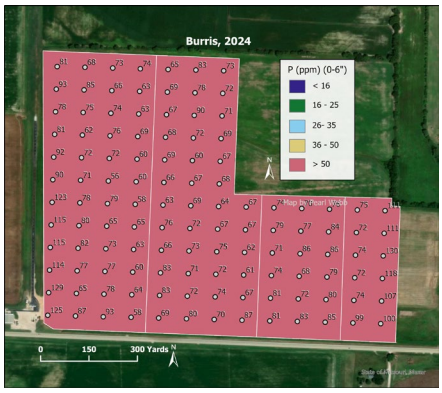
the soil's C: N leading to increases in microbial activity. The substances excreted during the life cycle of the decomposing microorganisms can feed plants over time and function as binding agents for soil aggregates improving structure, root penetration, and water infiltration/retention. Organic nitrogen is not as readily available to plants as inorganic nitrogen. However, the organic nutrients present in the OM can be thought of as a bank where withdrawals can be made over time or as needed. The Haney test, as part of the Water Extractable Organic Nitrogen section, details soil organic N release and organic N reserve. These numbers can be directly converted into lbs./acre of N made available in your soil-by-soil microbes for your next crop. While this may not mean you can completely exclude the use of inorganic fertilizer, it could be utilized (withdrawn) by a pragmatic farmer to save money (especially in a year with high fertilizer prices) by reducing the amount of fertilizer applied and then refilling the reserve bank with organic fertilizer during a year with lower prices.

The following maps showcase the change in soil P levels over the years. After three years of applications (2024) all application rates achieved optimum soil test P levels as depicted by all the maps shaded pink with treatment averages over 50 PPM.

Field P levels 2021	Field P levels 2023	Field P levels 2024

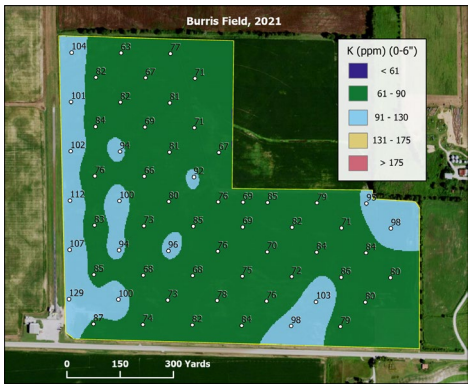


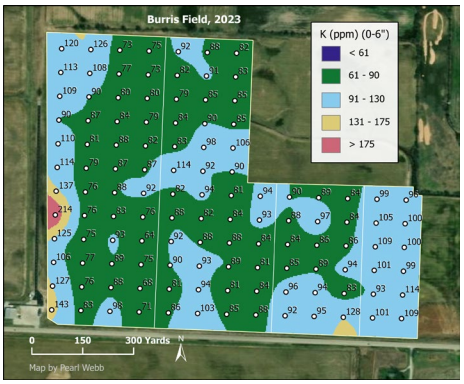


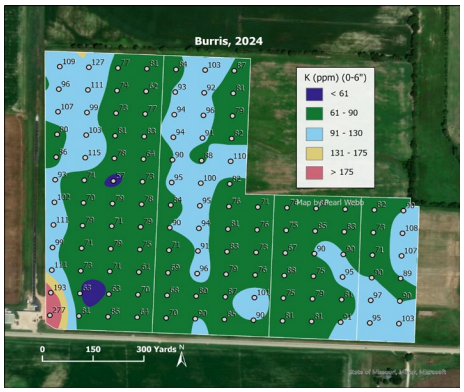


The maps below suggest an increase in Soil K levels since the project started in 2021. The areas on the left shaded in pink and gold reprresent areas where the litter was stacked prior to application. However, there has been some improvement in soil K over the years. We expected soil K levels to rise slower than Phosohorus levels because of the under utilization of phosphorus compared to potassium.

Field K levels 2021	Field K levels 2023	Field K levels 2024







The table below shows the average values of soil pH and individual major soil nutrients. Organic Matter (OM) and Cation Exchange Capacity were taken in 2023 and 2024. The table shows improvement in most every category in field 4 indicating that soil health is improving. The field numbers also indicate the amount of litter that was applied to the treatment area.

Field	Year	Average of pH	Average of P (ppm)	Average of K (ppm)	Average of Ca (ppm)	Average of Mg (ppm)	Average of Na (ppm)	Average of S (ppm)	Average of OM (%)	Average of CEC (cmolc/kg)
1	**Combined**	**5.908**	**64.711**	**80.544**	**400.378**	**70.944**	**9.011**	**6.722**	**1.028**	**5.667**
1	**2021**	5.872	56.111	80.389	390.056	65.722	9.556	7.778		
1	**2023**	6.053	63.139	82.889	382.861	69.500	9.167	6.028	1.094	5.278
1	**2024**	5.781	70.583	78.278	423.056	75.000	8.583	6.889	0.961	6.056
1x	**Combined**	**5.873**	**102.767**	**120.900**	**376.433**	**78.033**	**8.500**	**9.300**	**0.863**	**5.833**
1x	**2021**	5.943	107.429	113.143	366.857	73.000	11.000	8.286	0.800	5.000
1x	**2023**	5.900	99.545	124.636	386.364	81.727	9.455	8.273	0.873	6.000
1x	**2024**	5.808	103.000	122.000	372.917	77.583	6.167	10.833	0.858	5.750
2	**Combined**	**6.139**	**60.885**	**85.404**	**493.904**	**81.567**	**9.317**	**6.577**	**0.943**	**5.655**
2	**2021**	6.005	46.800	77.550	509.400	81.050	10.450	8.150		
2	**2023**	6.302	57.429	88.429	452.643	75.976	9.357	5.738	0.810	5.19
2	**2024**	6.040	71.048	86.119	527.786	87.405	8.738	6.667	1.076	6.119
3	**Combined**	**5.889**	**67.689**	**85.822**	**394.689**	**66.733**	**8.133**	**7.022**	**0.936**	**5.528**
3	**2021**	5.689	54.444	83.222	374.778	58.111	8.667	8.556		
3	**2023**	6.039	63.889	91.333	369.000	64.222	8.444	5.833	0.839	5.06
3	**2024**	5.839	78.111	81.611	430.333	73.556	7.556	7.444	1.033	6.000
4	**Combined**	**5.831**	**79.719**	**93.563**	**427.094**	**75.250**	**10.125**	**8.906**	**0.979**	**6.000**
4	**2021**	5.575	72.875	84.125	379.500	64.000	10.000	9.750		
4	**2023**	6.000	68.750	102.167	426.417	76.083	12.083	8.583	0.892	5.67
4	**2024**	5.808	103.000	122.000	372.917	77.583	6.167	10.833	0.858	5.750
Total Average w/o 1x		**5.985**	**65.509**	**84.823**	**438.480**	**74.830**	**9.114**	**6.974**	**0.974**	**5.676**
Total Average w/ 1x		**5.973**	**69.223**	**88.419**	**432.296**	**75.150**	**9.053**	**7.206**	**0.963**	**5.692**

Note: The 1x values were separated as they were samples that were taken from where the litter was stacked prior to application.

NSTAR samples were collected each year of the demonstration to evaluate Nitrogen levels as time progresses. NSTAR differs from ordinary soil samples in that the NSTAR samples are taken at a greater depth than regular samples. They are taken at 12”-18” instead of the normal 6”. As the table below shows Nitrogen values from 2021 to 2023 did not differ much from year to year. This suggests that most of the nitrogen that is contained in the litter is being used up each year.

NSTAR Composite Soil Samples

Field	Year	Average of N Content (ppm)
1	**Combined**	**68.32**
1	**2021**	66.29
1	**2023**	65.33
1	**2024**	73.33
2	**Combined**	**73.39**
2	**2021**	73.16
2	**2023**	69.67
2	**2024**	77.33
3	**Combined**	**72.09**
3	**2021**	70.78
3	**2023**	69.50
3	**2024**	76.00
4	**Combined**	**68.19**
4	**2021**	71.56
4	**2023**	68.00
4	**2024**	65.00
	Total Average	**70.50**

Influence of Nitrogen Loss Inhibitors in Warm-Season Perennial Forages

Objective: Evaluate the need for nitrogen inhibitors in warm-season perennial forage biomass production across Arkansas.

County Agents: Adam Willis, Newton Co.; Jerri Dew, Lafayette Co.; Bryce Baldridge, Lawrence Co.; Kevin Lawson, Faulkner Co.; Gerald Hewitt, Montgomery Co.; Jerry Clemons, Hot Spring Co.; Amy Simpson, Clark Co.

Specialist: Bronc Finch, Soil Fertility Extension Specialist UADA

Background:

Nitrogen (N) is typically one of the nutrients used in the highest quantities in the plant, and it is highly susceptible to environmental losses. Environmental nitrogen loss pathways are leaching, the downward movement through the soil, runoff, movement from the surface with the flow of water, or gaseous losses through volatilization or denitrification. In forage production, the typical loss concern is volatilization due to the conditions in which this occurs, and the use of Urea. Volatilization is a natural process where N in the gas form of Ammonia NH_3 is lost to the atmosphere and occurs when soil pH is ≥ 7.0 and the temperature is ≥ 50°F. For efficient use of urea-based fertilizers this is an important process to limit in order to prevent loss. As urea is broken down it undergoes a natural process called “Urea Hydrolysis” which is simply the transformation of urea to ammonia (Figure 1). This reaction is increased by an naturally occurring enzyme “urease”, which can result in a saturation of NH_3 in the soil, which will then need to be transformed in the ammonium (NH_4) through ammonification, which is a much slower process.

Equation 1. Simplified urea hydrolysis equation.

$$\underset{\text{(urea)}}{CO(NH_2)_2} + \underset{\text{(water)}}{H_2O} \xrightarrow[\text{(}10^{14}\text{ times Faster)}]{\text{urease enzyme}} \underset{\text{(ammonia x2)}}{2NH_3} + \underset{\text{(carbon dioxide)}}{CO_2}$$

During the ammonification process, the ammonia is susceptible to volatilization, which means the more ammonia there is the greater chance for losses there can be. By slowing the process of urea hydrolysis, there can be less ammonia in the soil available for volatilization at one time. Unfortunately, the process of transforming urea to ammonia and the to ammonium is necessary to provide the plant the nitrogen in a form that it can take up. Therefore, the target of most ammonia volatilization inhibitors is to reduce the activity of the urease enzyme. There are many different urease inhibitors available and testing all of them would be very time consuming and costly, therefore this study is looking to identify the impact of a few commonly available nitrogen loss inhibitors on warm-season forage production. This study will focus on evaluating a liquid additive containing a single urease inhibitor, a liquid additive containing two urease inhibitors, and a pre-coated urea fertilizer that has the same urease inhibitor as the liquid products, as well as a denitrification inhibitor.

Methods:

Research trials were established across Arkansas on producer-owned farms.

- 1 location of predominantly Bermudagrass
- 1 location of predominantly Crabgrass
- 1 location of predominantly Bahia grass
- 4 locations of mixed warm-season grasses.

Micro-plot research trials were established by applying the four Urea treatments at 100 lb. N per acre (table 1).

Table 1.Nitrogen stabilizer treatments, applied at 100 lb. N per acre.

Treatment
Urea + No inhibitor
Urea + NBPT†
Urea + NBPT† + Duromide
Urea + NBPT† + DCD‡

†N-butyl thiophosphoric triamide

‡Dicyandiamide

Figure 1. Harvesting Grass Sample

Fertilizer was applied after a hay-cutting or grazing event.

Plots were harvested at least 28 days after fertilization by collecting all biomass greater than 3 inches in a 1 sq. ft. area from each plot.

Biomass was air-dried for a minimum of 7 days to represent air-dried biomass yield.

Statistical analysis was conducted in SAS 9.4.

Results

Biomass yield results from each county were analyzed for responses to nitrogen stabilizers. There was no interaction between location and treatment, meaning yield responded similarly to treatments across all locations. Air-dry forage biomass yield averages from each location and across the state are found in Table 2.

Table 2. Average air-dry biomass yields (tons acre^{-1}), for each treatment from each location and statewide.

	Nitrogen Loss Inhibitor			
Location	None	NBPT	NBPT + Duromide	NBPT + DCD
	(tons acre^{-1})			
Montgomery†	0.14	0.08	0.10	0.16
Newton	2.58	2.64	2.47	2.42
Faulkner	3.01	3.07	2.36	3.28
Lawrence	1.46	1.38	1.44	1.51
Hot Spring 1	0.66	0.72	0.65	0.61
Hot Spring 2	0.90	0.97	1.16	1.04
Clark	1.29	1.41	1.82	1.43
Statewide	1.44	1.47	1.43	1.49

†Location was removed from statewide means.

Nitrogen stabilizers did not influence forage biomass yield, which was an average of 1.5 tons per acre (Figure 2). Air-dried biomass yields ranged by approximately 3 tons per acre (6000 lb.) between locations; however, this did not impact the response to the stabilizers.

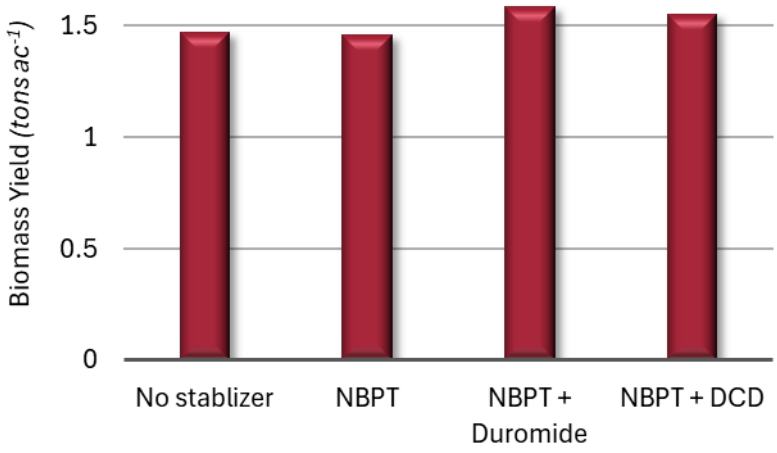


Figure 2. Average air-dry forage yield (tons ac^{-1}) by nitrogen stabilizer treatment across all locations.

Average precipitation 7 and 14 days after fertilization and the total received in the harvest cycle from weather stations in each respective county is shown in Table 3. Every location received at least 0.25 inches of rainfall during the first 14 days after fertilization, while only three locations received less than 0.1 inches of rainfall in the first 7 days after fertilization.

Table 3. Cumulative precipitation (inches) 7 and 10 days after fertilizer application, and the producton cycle for each location. Data was collected from NOAA weather stations located in respective counties.

	Average Precipitation		
Location	7 – Day	14 – Day	Total
	(inches)		
Montgomery†	0.66	0.68	0.85
Newton	0.00	0.35	4.35
Faulkner	0.59	0.89	11.78
Lawrence	0.02	1.48	2.32
Hot Spring 1	0.10	0.72	3.39
Hot Spring 2	2.47	2.65	2.70
Clark	0.00	3.10	3.65

Discussion

Incorporation of Nitrogen is the key to reducing the chances of ammonia volatilization losses. In many pastures precipitation is the only option for incorporating N fertilizer applied to the surface of the soil, all locations received at least 0.25 inches of precipitation by 14 days after application. Additionally, all but one location received 2 inches or more precipitation during the production cycle. These precipitation patterns observed in the early and mid-summer 2024 create favorable conditions for incorporating N fertilizer and reducing the chances of gaseous losses. Additionally, as observed from other N studies conducted across a similar timeframe, the rate of 100 pounds N per acre may have been sufficient enough to mask any yield reductions by nitrogen loss.

Although the single year results of this study show no need for nitrogen volatilization losses, this is a single year with favorable precipitation. Continued research over several varying conditions is required to identify the need or lack thereof for volatilization inhibitors. Future work will continue to research the need for nitrogen stabilizers, across rates and management strategies.

Crop Per Drop Demonstration

Cooperator: Binkley Farms
Agents: Bryce Baldridge and Courteney Sisk
Location: Walnut Ridge

Objective- Each year brings more challenges that farmers need to negotiate in order to make a productive crop. With input costs increasing from year to year, it is imperative that producers be as efficient as possible to maximize profits. Environmentally speaking there are growing concerns about the usage of groundwater. The goal of this demonstration is to monitor a field to see if equal yields can be achieved using less water.

Methods and Materials- In 2024 Lawrence County had one field that participated in the Crop per Drop yield contest. The field that was picked for this demonstration was located three miles NE of Walnut Ridge on Highway 34. This field is thirty-five acres in size and consists mainly of the soil type Crowley Silt Loam. The variety of soybean that was grown was an Extend Flex variety Asgrow 47XF2 and was planted on 4-1-2024.

The soybean field is irrigated by an 8" well that was measured to have a flow rate of 900 gallons/ minute. A flowmeter was installed at the well and sealed by a supervisor of the contest to ensure that the flowmeter was not tampered with during the contest and that the readings taken from the flowmeter were accurate. Readings were taken after each irrigation and then a final reading was taken at the end of the year to calculate total irrigated acre inches. Rainfall data was collected using a farmlog and was tabulated along with irrigation water to figure the total acre inches used.

Irrigation decisions in the soybean field were made according to information received from soil moisture sensors that were installed in the field. This information was fed into the Arkansas Soil Moisture Sensor Calculator app that helps determine when irrigation is needed. This app allows us to determine how quickly to start irrigation and how much water the crop needs to finish producing its yield potential.

The soybean field was harvested on September 25th, 2024. There were two members of the University of Arkansas Division of Agriculture present to verify all rules were followed and that the harvest weights were accurate. Before harvesting, a section was laid out and measured to give us the total acres in the plot. The

plot was then harvested and dumped into a truck that had been verified empty. Officials accompanied the truck to the elevator to receive an official weight.

The following table shows the results of this demonstration. These demonstrations have been conducted in Arkansas for five years. This table also compares these fields with 5-year averages in soybean crop per drop trials to date from across that state.

	Yield (Bu/ Ac)	Applied Irrigation (Ac-In/ Ac)	Adjusted Rainfall (Inches)	Total Water (Inches)	Water Use Efficiency (Bu / Inch)
Soybean Field	88.4	9.7	13.3	23	3.84
Soybean 5yr, Avg,	78	9.5	15.2	24.7	3.23

The soybean field produced 10.4 bushels /acre more than the statewide average. These yields were achieved using 1.7" total inches of water less than the statewide average. The increased profits from this trial were, assuming soybean price at $14, x 10.4-bushel increase= $145.60/ acre increase in profit X 35 acres= $5,096.

Integrated Water Management

Cooperator: Ronald Cavenaugh

Location: College City, AR

In the business of commercial agriculture today, it is imperative that farmers manage their inputs as best they can. Thin profit margins require farmers to constantly evaluate their decisions during the growing season. A wrong decision could mean the difference between profit-making and losing money.

Along with managing inputs and their respective costs, farmers must also remain good stewards of the ground that they farm. These resources provide the farmer and their families with a livelihood. One of the areas with the greatest concern is water management. Preserving underground water sources will play a vital role in continuing to produce high-yielding crops.

To educate local farmers on this issue this office purchased some monitoring equipment. After some discussion with Mr. Cavenaugh, he agreed to let us install this equipment in one of his fields. The purpose of this demonstration was to showcase this equipment, its capabilities, and ease of use.

It was agreed that we would install this equipment in a cotton field located 2.75 miles NE of Walnut Ridge. This field is roughly 21 acres in size consisting of mostly a Foley Calhoun soil type.

We installed four Watermark soil moisture sensors at 6”,12”,18”, and 30” in depth. The soil moisture sensors were hooked up to an Aqua Trac Pro Telemetry unit. This telemetry unit allows the moisture levels to be checked remotely from one’s phone. After the equipment was installed in the field, I helped Mr. Cavenaugh and one of his employees download the necessary apps on their phones. I showed them how to log into the Ag Sense app and the AR Soil Moisture Sensor Calculator and use the information that was given to them.

For the remainder of the growing season, I checked in with Mr. Cavenaugh to discuss what the sensors were telling us and when to plan the next irrigation. We discussed how this technology would be useful in other areas of his farm, especially in his fields furthest away from his base of operations. This would save him time from having to drive to the field and physically check to see if he needed to irrigate or not.

After the end of the demonstration, I asked Mr. Cavenaugh what he thought about this technology. He said “He really liked having that information available at his fingertips and was amazed at how easy it was to learn. He would be looking into purchasing equipment like this for his personal use”.

2024 Five River Master Gardeners

Agent: Courteney Sisk

Five River Master Gardeners are comprised of members from Lawrence and Randolph Counties. There are currently 22 members, and we always welcome more to join. To join the Master Gardeners, one must attend a Master Gardening training course and complete 40 work hours and 20 education in their first year. In the second year, it decreases to 20 work and 20 education hours. They meet once a month.

This year the club members have been busy in 2023.
* Projects at Imboden-Heritage Gardens, WR School-Flowerbeds, Randolph County Fair- Containers, and Law. Co Ext- Container
* An annual Plant Sale was conducted in April and was held at the Randolph County Fairgrounds this year. The club members grew and sold herbs, annuals, perennials, fruits, and vegetables. They also helped shoppers with expert advice and aided many in the best selection for areas they were working in.
*The group worked with The Arkansas Department of Agriculture, Forestry Division on a tree handout conducted at the Lawrence County Extension office in March.
*For the second year the club participated in an Arkansas state trial called the Annual Arkansas Diamond Plant Trial. We along with 22 other counties in the state are collecting data on 4 varieties 2 of which were perennials and 2 annuals from June until the first frost. The trial was planted behind the office in coordination with the Lawrence County 4-Hers.

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

MASTER GARDENER

2024 Annual Arkansas Diamond Plant Trial

Agent: Courteney Sisk

Cooperator: Lawrence County 4-H, and Five River Master Gardeners

The trial was conducted in Arkansas, and 22 counties total participated. We looked at 4 Varieties throughout the year from spring to the first frost. Two Of the Varieties were Annuals Vinca “Tattoo Black Cherry” and Coleus (Pictured above on top row left to right). The other two varieties looked at were perennials Verbenia “Homestead Purple” and Liatris “Blazing Star” (Pictured above on bottom row left to right. None of our plants in the county suffered insect issues and stayed in great health throughout. There were monthly measurements of Height, Weight, and Flowering Rating completed on all 4 varieties that went into the statewide study.

Lawrence County
Cooperative Extension Service

2024 County Agent Pumpkin Demonstration Results

by Aaron Cato and Ryan Keiffer – November 25, 2024

2024 County Agent Pumpkin Demonstration Results

In 2024, agents were again asked to investigate new and known pumpkin varieties within two different *Cucurbita* species: *Cucurbita pepo* and *Cucurbita maxima* to assess potential varietal resistance to melonworms and powdery mildew (**Table 1)**. In 2023, the state-wide county agent horticulture demonstration focused on 3 pumpkin varieties within *Cucurbita pepo* that featured three different colored rinds. Many specialty crop growers in the state are planting pumpkins to capitalize on the fall agritourism market and this demonstration aimed to give both growers and agents insight on new and proven varieties to enhance grower profitability. This Google Maps image in **Figure 1** shows the location of many, **but not all**, of the pumpkin patches found across the state. It gives some insight into the rapid expansion of agritourism in Arkansas and the part that pumpkins play in getting the public out on the farm.

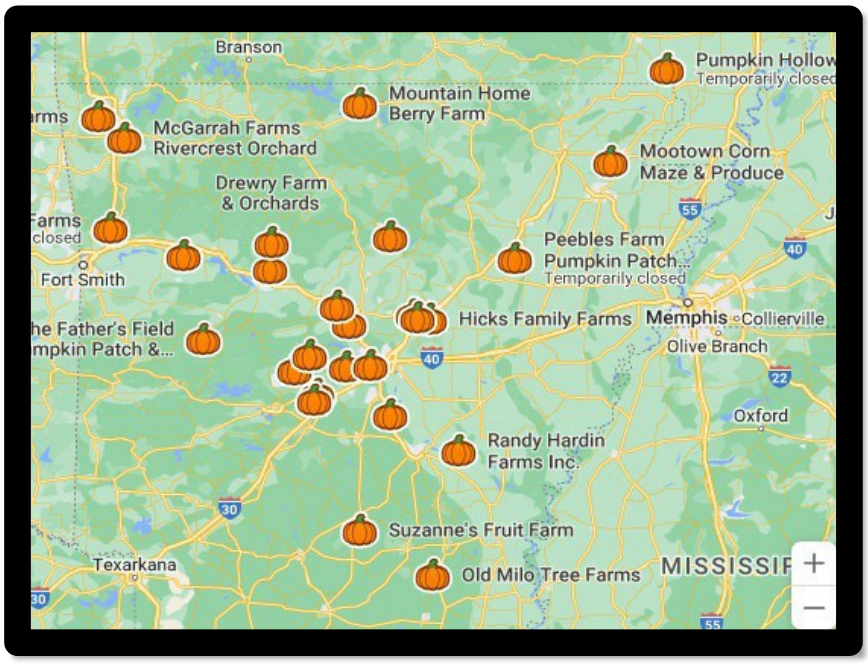


Figure 1. A festive Google Maps image of some, **but not all**, of the pumpkin patches found in Arkansas.

With the increasing amount of pumpkin acreage comes additional pest and disease concerns for growers, which inspired us to look at pumpkins again for this year's agent demonstration. The table below highlights some of the attributes of the four pumpkin varieties we demonstrated in 2024.

Table 1. A table showing the four varieties of pumpkins in the demonstration, their different characteristics, and advertised size from seed companies.

Variety	Days to Harvest	Species	Color	Characteristics	Powdery Mildew Resistance
Gumdrop	100	*Cucurbita pepo*	Orange	New Johnny's Seeds orange variety. Medium 11 to 13 lbs. with a rich orange color, whimsical shape, and a sturdy handle.	Intermediate
Carbonado Gold	100	*Cucurbita pepo*	Orange	New Rupp orange 40 count bin variety with very uniform shape. Large 15 to 20 lbs. with a strong handle.	Intermediate
Jarrahdale	100	*Cucurbita maxima*	Green	Popular green/blue and deeply ribbed stacker. Medium-Large 12 to 18 lbs. long storage	-
Cinderella	95-115	*Cucurbita maxima*	Red	Classically beautiful, unique stacker red fairytale shape. Medium-Large 12-25 lbs.	-

This year we decided to use seeds instead of transplants (**Figure 2**) and shipped them out to county agents in early June for a targeted planting of around June 20 - July 4th. Most agents received 5 seeds per variety, but some agents received as many as 10 seeds per variety if they had a larger planting space available with collaborators. Agents were given enough seed of each variety to plant "2 seeds per hill" and then thin to "one seed per hill" if desired or to start all seeds as transplants. We felt like this gave agents and collaborators the freedom to plant the demo to match their schedules. The vines were to be spaced 3 feet apart in-row with at least 10-feet row spacing if necessary (**Figure 3**). Grower standard practices for irrigation and fertility were suggested. Data collection and growing information was given out to agents in April's What's Up Wednesday webinar by Aaron Cato.

Results

In 2024, 37 agents signed up for this year's demo, but overall we had 19 counties submit usable data to analyze. Horticulture IPM staff also participated and had two site locations, one in Crawford County and one in Hempstead County which are included in the 19 counties with data. Many agents faced various crop failures from drought, drift, weed pressure, vandalization, or disease. These data are still useful so we thank those agents for letting us know why the demonstration wasn't a success. The table and figures below show the average of the measured pumpkin characteristics across the 17 to 18 counties that reported yield data for the demonstration **(Table 2)**. Data collection by variety differed in the number of responses received due to some agents having issues with Jarrahdale not setting fruit for them. **On average, each variety produced 1.5-2 pumpkins per vine with Cinderella having the highest average of 2.1 pumpkins per vine. The average weight of the two *Cucurbita pepo* varieties were lower than advertised size descriptions, while the two *Cucurbita maxima* varieties were at the lower end of size descriptions from Table 1. Overall, the percent marketability of the pumpkins was good with all four varieties above 80 percent.** Powdery mildew was especially bad in 2024 late in the season when we got some warm rains in August and September. **Cinderella was reported to have powdery mildew by 44% of counties who reported on that category (n=16) compared to 40% for Jarrahdale (n=15). These are the two varieties that we expected to be a little higher in their risk to Powdery Mildew. The two *Cucurbita pepo* varieties showed a lower risk to Powdery Mildew with Carbonado Gold at 35% (n=16) and Gumdrop at only 24% (n=17) (Figure 1)**. Many other factors might have contributed to reduced size or % marketability when compared to adverstised weight, but the most likely culprits were drought conditions during flowering and/or water delivery issues.

Table 2. Results from the 2024 Horticultural Agent Pumpkin Demonstration, showing average number of pumpkins per vine, average weight per pumpkin (Lbs.), and percent marketable fruit. Data collection by variety varied in the number of responses mainly due to crop failure of Jarrahdale for some agents and ranged from 17 to 18 responses.

Variety	Avg. # of pumpkins/vine	Avg. Weight (Lbs.)	Percent Marketable Fruit
Gumdrop	2.0	6.2	89.8
Carbonado Gold	1.7	8.9	92.2
Jarrahdale	1.6	11.6	82.2
Cinderella	2.1	12.2	89.3

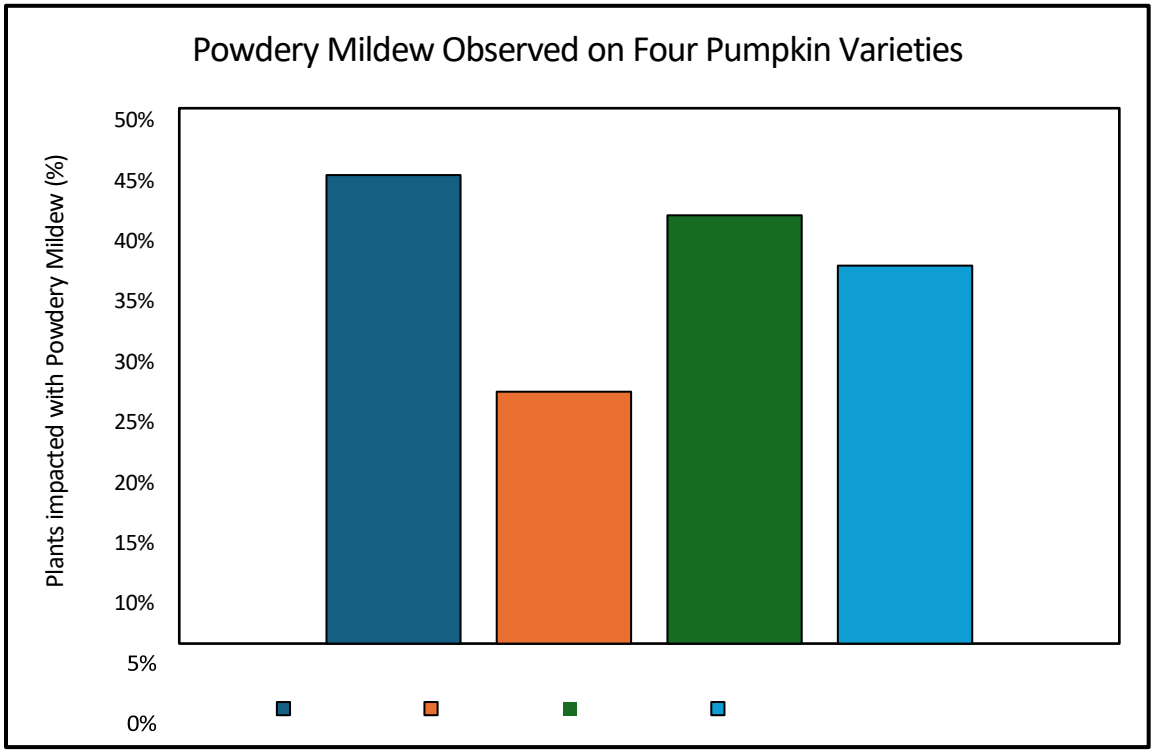


Figure 10. Powdery mildew observed on 4 varieties of pumpkin in two different *Cucurbita* species across 19 counties. Gumdrop and Carbonado Gold were reported to have an intermediate amount of powdery mildew resistance while Cinderella and Jarrahdale lack powdery mildew resistance.

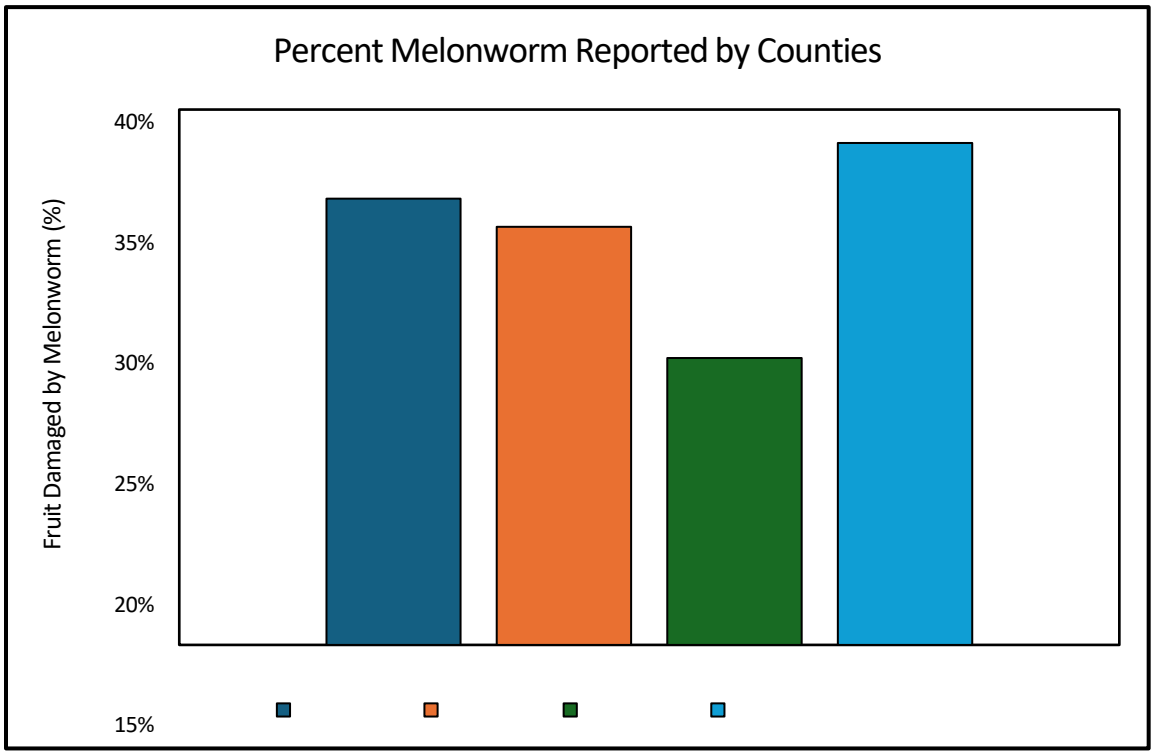


Figure 11. The percentage of fruit impacted by melonworm on 4 varieties of pumpkin in two different *Cucurbita* species across 19 counties. Jarrahdale exhibited less observations of melonworm (21%) compared to the other 3 varieties of pumpkins which were above 30% of observations.

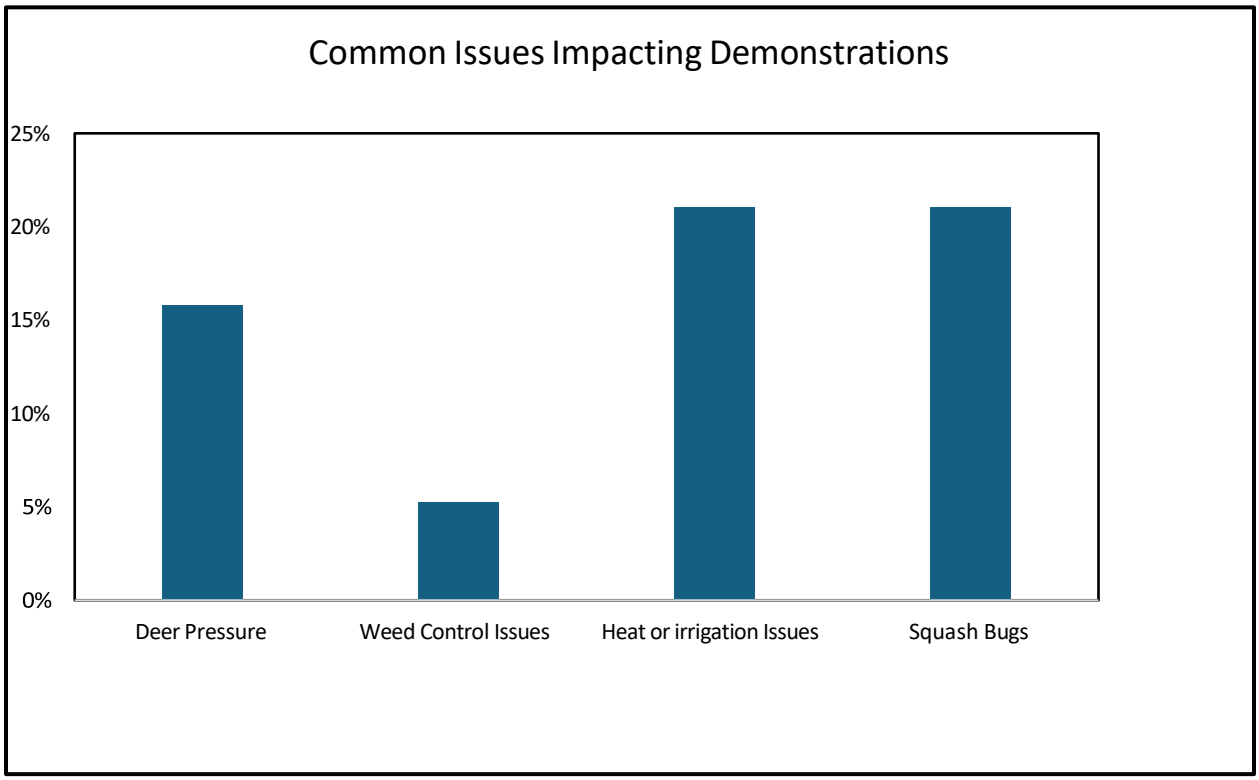


Figure 12. Common issues resulting in loss of data in pumpkin demonstrations.

Conclusions

One of the main objectives of this demonstration was to evaluate melonworm resistance in pumpkin varieties (Figure 11). Because melonworm larvae can quickly defoliate plants, as well as feed on the rind and handles of pumpkins, we urge frequent scouting of pumpkins to detect this pest. Melonworm was found in research trials at the VRS in Northwest Arkansas in early August and about a week later in Southwest Arkansas. This early arrival indicated that the pest might be detected in county agent demonstrations, and some melonworm damage was observed by county agents and Horticulture IPM staff across the state. *Cucurbita pepo* has been observed to be much more susceptible than *Cucurbita maxima* in replicated trials. Data from this demonstration suggests that susceptibility would be equal and is likely a result of over reporting melonworm in some varieties and under reporting in others. Several other sources of variance shown also obfuscated data. Luckily there are some good resources available to combat some of these issues, such as FSA9111 and FSA6160.

Statewide, **agents harvested 1017 pumpkins for a weight of 7123 lbs.!** It's safe to say that the statewide demonstration was a smashing (Pumpkins) success! We were also thrilled to see agents working with their growers, enriching their communities, and sharing their results.

Name	County
Dawson Bailey	Howard
Bryce Baldridge	Lawrence
Katrina Boyd	Crittenden
Tyler Caston	Stone
Brent Clark	Sebastian
Jerry Clemons	Hot Spring
Jerri Dew	Lafayette
Clyde Fenton	Searcy
Cindy Ham	Clark
Scott Hayes	Drew
Amy Heck	Cleburne
Darrin Henderson	Madison
Shaney Hill	Union
Ben Holcomb	Clay
Phil Horton	Arkansas
Jenna Martin	Cross
Colin Massey	Washington
Codie McAlister	Pike
Brad McGinley	Grant
Michelle Mobley	Independence
Ryan Neal	Benton
Dustin North	Monroe
Bob Powell	Yell
Derek Reed	Pulaski
Shaun Rhoades	Scott
Brad Runsick	Baxter
Kyle Sanders	Lonoke
Sherri Sanders	White
Jennifer Sansom	Little River
Amy Simpson	Clark
Greg Simpson	Poinsett
Amanda Spradlin	Sebastian
Sarah Stone	St. Francis
Jesse Taylor	Johnson
Timothy Wallace	Jefferson
Adam Willis	Newton
SWREC	Hempstead
VRS	Crawford