



**DIVISION OF AGRICULTURE  
RESEARCH & EXTENSION**

*University of Arkansas System*



**Agri**

**Livestock**

**FCS - 4-H - EHC**

**Master Gardeners**

# **Lawrence County Cooperative Extension 2023 Demonstration Book**

**Bryce Baldridge**  
CEA Staff Chair

**Courteney Sisk**  
CEA Agri/4-H

**Tori Fowler**  
CEA FCS/4-H

**Sandra McGinnis**  
Administrative Specialist III

**Michelle Teague**  
4-H Program Assistant



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# Your *Lawrence County*

## Cooperative Extension Service

[www.uaex.uada.edu/counties/lawrence](http://www.uaex.uada.edu/counties/lawrence)



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## *Annual Update*

### **CONTACTS**

**Total Educational Contacts- 150,121**

**Total County Volunteer Hours- 12,883**

**Value of Volunteer Hours- \$409,679.40**

### **AGRICULTURE**

- Total Agricultural Educational Contacts- 65,810
- Farm Visits- 321
- 11 Newsletters and numerous Radio Announcements
- 2 TV interviews
- 21 Demonstrations
- Master Gardeners- 21 members
- Soil Samples- 2,770 Representing 23,226 Acres



### **NOTABLE PROGRAMS**

- Pesticide Applicator Training- 4 classes 64 trained
- Row Crop Production Meeting- 48 Total Attendance
- Summer Weed Control Program- 40 Attended
- Annie's Project- 12 Attended/ 3 Counties
- Small Ruminant Program- 17 Attended/ 4 Counties
- Forage Field Day- 26 Attended / 8 Counties
- Abandoned Pesticide Collection- 230,000 + lbs. collected
- AG Expo- 189 Attended
- Pruning Workshop- 14 Attended
- Forage Planning- 2 Presentations/ 94 Attended
- Lawn and Flower Care Program- 15 Attended

### **Community and Economic Development**

- Total CED Educational Contacts- 2,792
- Advise Williams Baptist University Farm
- Ballot Issue Presentation- 10 Attended
- 200 Voter Guides Distributed Countywide
- Countywide1 PTAC Contract generated \$11,690
- Staffed Display at local High School Career Days
- Ralph Joseph Youth Leadership- Class 28- 15 Youth Participants



## **4H**

- Total 4H Contacts- 66,318
- \*86 4H Members / 12 Volunteers
- 4H Clubs- 6
- 12 Newsletters / 134 Families



## **NOTABLE PROGRAMS**

- 4H Search for Excellence Award- Courteney Sisk
- School Programs- 23 Programs / 1,270 Students Reached in 5 County Schools
- Summer Day Camp / 50 Youth Reached
- 4 Participants in District O'Rama- (2) 1<sup>st</sup> Place and (2) 2<sup>nd</sup> Place
- WHEP- 5<sup>th</sup> Place Jr. Individual 3<sup>rd</sup> Place Jr. Team
- Greenhouse for Educational Programs
- Lawrence County Fair- 30 Total exhibitors (All Areas)
- 4H Color Run 45 Participants- Promoting Fun Healthy Lifestyle- Raised \$5,000
- One 4H'er Achieved State 4H Teen Star Status
- Overnight Camping Trip- 16 Participants

## **FAMILY AND CONSUMER SCIENCES**

- Total FCS Educational Contacts – 15,282
- 42 EHC Active Members / 4 Clubs – 11,051 Volunteer Hours
- 4 New Members
- Arkansas State EHC President-Elect and Vice President

## **NOTABLE PROGRAMS**

- Nutrition Programs– 464 Educated
- Adult Financial Education Programs – 84 Educated
- Best Care Childcare Provider Training – 19 Trained
- Other FCS Programs - 427



## **SNAP-ED**

- Arkansas Foods Education Program – 436 Youth
- Arkansas Foods Newsletter Campaign – 436 Youth
- Right Bite Displays– 120 Contacts
- SNAP-Ed Partners – 4



## **2023 FCS Programs and EHC Programs**

*Agent: Tori Fowler*

### **Nutrition**

Meal planning and prepping for a week, families are making healthier choices and saving money by not eating out as much. In addition to meal prepping, many took the time to learn about the different aspects of their diet to help make any necessary changes to improve their overall health. Over 450 people took the initiative to switch to a better lifestyle for themselves and their families.

### **Personal Finance**

To address concern for money management, multiple education opportunities occurred throughout the county. Over 250 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).

### **Program-SNAP-Education**

Through the SNAP-Ed program, I was able to educate many members of our communities through various educational 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 were hosted to teach children about the nutrition of some of their favorite foods grown right here in the state of Arkansas. Over 1,000 Lawrence County residents were able to benefit from SNAP-Ed programs.

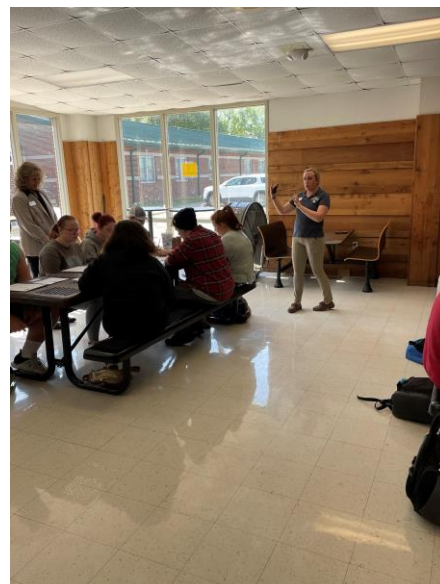
### **Extension Homemakers**

Number of Clubs – 4

Number of Members – 42

Total Number of Volunteer Hours – 11,051

Value of Volunteer Hours - \$351,421.80



## **2023 4-H Clubs**

Agents: Bryce Baldridge, Tori Copeland, Courteney Sisk, and Michelle Teague

### **Lifeskills Club**

The club started this 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, packing a healthy lunch and how to store leftovers. The camp has been a big success and hosted 30+ for its first meeting. Future topics include budgeting and balancing a checkbook, sewing, and filling out resumes and applications.



### **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 from KAIT weather. Kids learned how to launch a rocket and participated in STEAM activities. They participated in art with our Art Club leader Deb Lamb and made potato batteries with Michelle. The camp is in its 19<sup>th</sup> year and has seen more than 800 kids come through it. The camp is for kids entering grades 3<sup>rd</sup>-6<sup>th</sup> in their upcoming school year. Next year's camp will feature collaborators from Craighead Electric, Greenway Equipment, Verkler Trucking, and the Arkansas Game and Fish Commission.

### **Livestock Club**

The kids made a large jump in showing and competing at the Lawrence County Fair for 2023. We went from 15 Participants in 2022 to 30 Participants this year. We had kids showing rabbits, goats, chickens, sheep, and cattle. We also had many showing their talents in the art building with photos, drawings, Lego art, vegetables, and more. We had many bring home blue ribbons and grand champions.





## **Outdoor Club**



An Outdoor Club was formed this year, and their activities included a camping trip with eight kids and six adults at Crowley's Ridge State Park and a fishing trip at Stewart Park. So far, the club has covered geocaching, animal classification, fish species and fishing gear, and camping gear and safety. Club members competed in the Outdoor Skills Competition in Little Rock, in categories such as canoeing, archery, fishing, and fire building. They are looking to start working on archery and food plots with the club members this year. The club will also have a Wildlife Habitat Education Program team that will compete in the spring.

## **4-H School Programs**

For the 22-23 Program year we had four 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- 411 reached

Earth Day with 1 school- 218 reached

Pumpkin Program in 4 schools- 358 reached

Citizenship in 2 schools- 190 reached



### **2023 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 of a 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 Hearnese 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.

We had 12 attend the second annual session and look to continue the program in the spring of every year.



**ANNIE'S PROJECT**  
EMPOWERING WOMEN IN AGRICULTURE



## 2023 Integrated Pest Management in Soybeans

Cooperators on **Southwest Corn Borer** traps:

WBU- College City

Beary Farms- Walnut Ridge

Roger Tinsley-Portia

Clover Bend Farms/Hunter Jones- Clover Bend

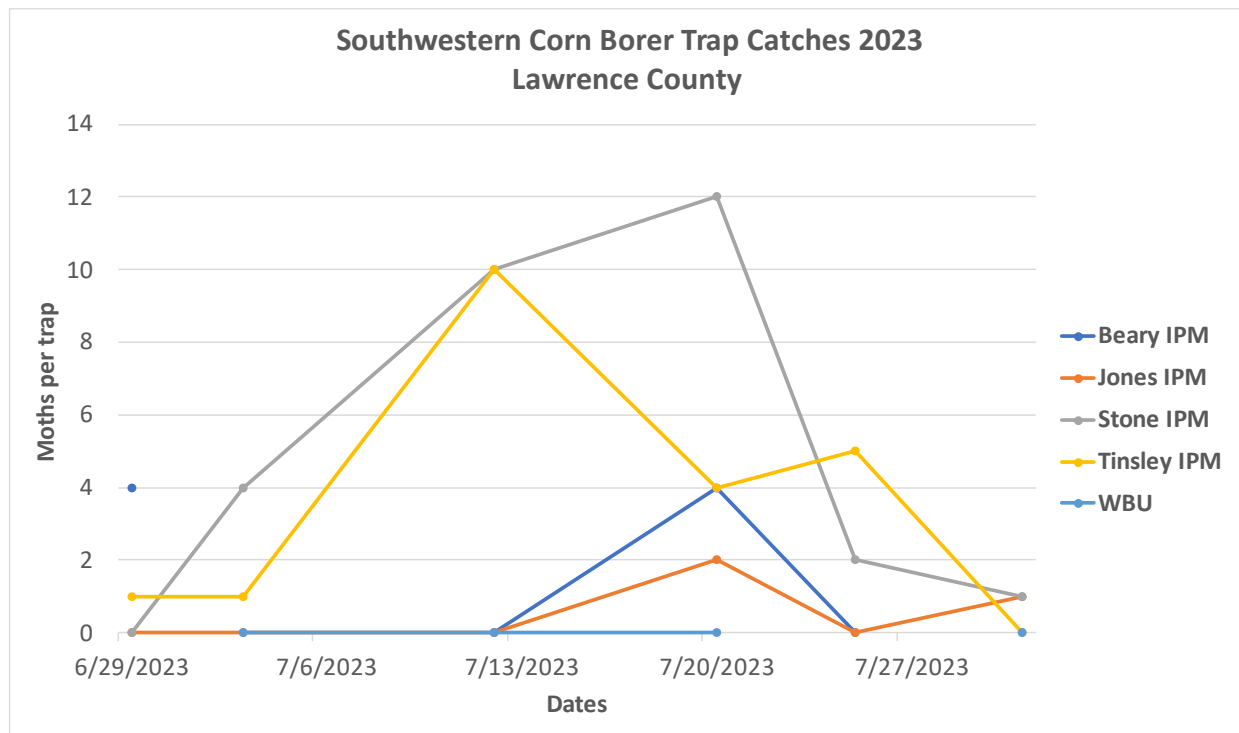
Ray Stone- Walnut Ridge

**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.



## 2023 Integrated Pest Management in Corn

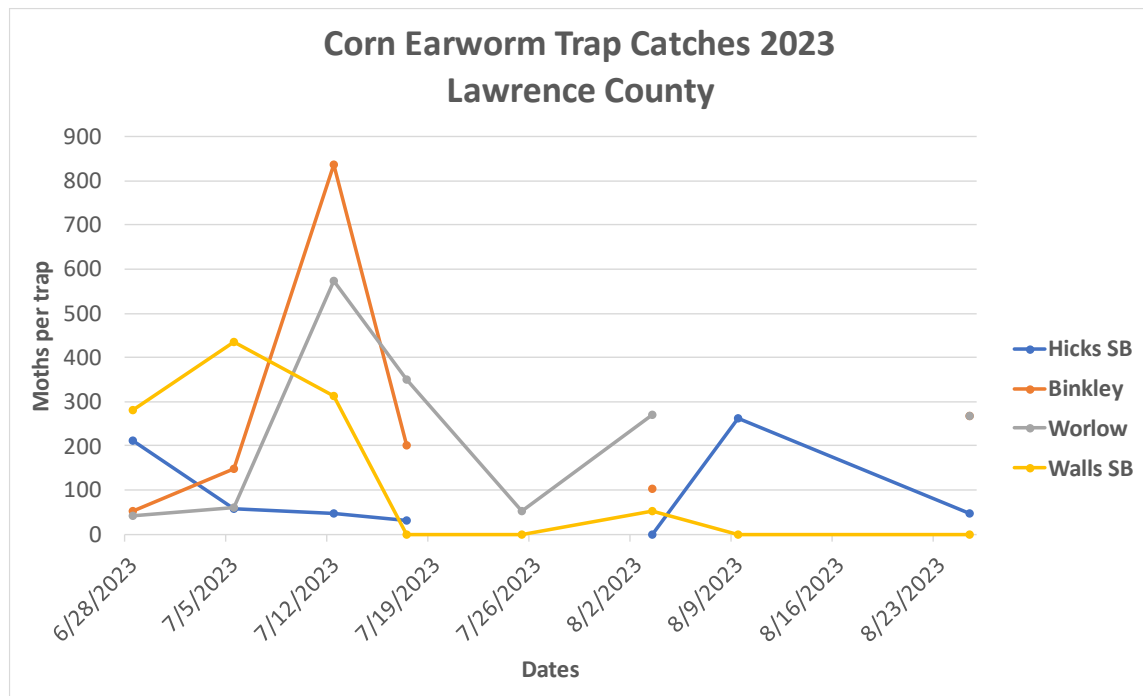
*Cooperators on **Bollworm** traps:*  
*Binkley Farms- NE of Walnut Ridge*  
*Hicks Farms- Alicia*  
*Wall Farms- Portia*  
*Worlow Farms- Sedgwick*

**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 Monitoring**

Cooperators Anthony Hawkins

Location: Hawkins (Imboden- 36 13' 00.99" N 91 11'59.07" W)

Agents: Bryce Baldrige 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 States in Georgia in 2010.

The adult fly is small and yellow with dark eyes and has four 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 by 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 \$240 per acre. A 50% decrease in forage production could cost the producer \$120 per acre with the same input costs.

We monitored each 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 late May through July. There were no insects found by sweep, sticky card, or hand checking for the duration of the monitoring.

### **Tick Study Demonstration**

Cooperators: Lawrence County Livestock Producers

Agents: Bryce Baldrige and Courteney Sisk

#### **Objective:**

As part of our 2023 Integrated Pest Management program for Lawrence County, we included the monitoring of tick species within the county. Cattle fever ticks are agricultural pests of concern for U.S. livestock because they can cause devastating economic losses. If there was an extended tick outbreak, the overall economic impact, including control costs, could exceed \$1.2 billion. These ticks reduce animal wellness by feeding on blood and inducing anemia. Ticks also spread protozoan parasites that cause disease.



In this study, we were trying to locate a particular species of tick called the Asia Longhorned tick. The Asian long-horned tick is native to China, Japan, The Russian Far East, and Korea. It has been confirmed in several US states including Arkansas. USDA officials are concerned about the long-horned tick's impact on livestock. These ticks frequently form large infestations on warm-blooded host animals. This causes great stress in the animal, reducing its growth and production. A severe infestation can kill the animal due to blood loss. Although no cases have been confirmed in the US, this tick has been known to transmit diseases such as anaplasmosis, ehrlichiosis, babesiosis, and rickettsiosis as well as several viruses. The unique thing about this tick is that finding a male is rare. These ticks reproduce asexually meaning a male is not needed to reproduce young. An adult female tick can produce 2,000 eggs in a two-to-three-week period. This tick is considered an invasive species.

#### **Methods and Materials:**

During the year ticks were pulled from several heads of cattle in the county. The ticks were removed by using tweezers and placing the sampled ticks in individual sample bottles. Each sample bottle was labeled with the animal's identification number and farm. The samples were sent to our Entomology lab in Fayetteville for identification.

#### **Results:**

After identification was performed it was determined that all ticks that were sent in from Lawrence County were confirmed as a species other than the Asian long-horned tick. All samples were confirmed as either *Amblyomma Americanum* (Lone Star) or *Dermacentor Variabilis* (American dog tick). Both species are what we would expect to find in Lawrence County.

## **Corn Variety Trial Demonstration**

Cooperator: Roger Tinsley Farms  
Location: Clover Bend AR  
Agent: Bryce Baldridge

### **Objective:**

The goal of this trial is to increase knowledge of selected hybrids that are in the University of Arkansas Corn Hybrid testing program. In this trial, producers follow the normal production practices they use on their farms. Conducting this trial in Lawrence County allows producers to see local yield data from various varieties so that they may make educated decisions concerning future crops.

### **Methods and Materials:**

The field chosen to conduct this trial is located one mile north of Clover Bend AR. The field is thirty-four acres and consists of several soil types including Bosket Fine Sandy Loam, McCrory Fine Sandy Loam, and Patterson Fine Sandy Loam.

The field plant date was April 13<sup>th</sup>, 2023, using a John Deere 8130 tractor, pulling a 12-row Max Emerge XD planter. The seeds were planted in thirty-inch beds, each variety was planted in six rows. The seeding rate was set at 34,000 seeds per acre. The field was watered by a 10" well that is located on the Northeast corner of the field.

The corn emerged on April 18<sup>th</sup> with a good stand. Stand counts were taken on May 3<sup>rd</sup> at which point the corn was at the V2 growth stage. All stand counts taken were within the acceptable range to continue with the trial. The corn was at V5 on May 22<sup>nd</sup> and getting ready for its next round of fertilizer as the plant was about to go into a rapid growth stage. The corn reached the tassel stage on June 27<sup>th</sup>. The field was harvested on September 1<sup>st</sup>, 2023, using a John Deere S680 combine with a 30' Header. Weight and moisture samples are taken with each variety as it is cut. The moisture is checked using a handheld Dickey Johns Mini Gac Plus moisture tester. Each variety's yield is adjusted to 15.5% making the results comparable to each other. The following table contains the results from this trial. The highlighted varieties indicate Lawrence County Varieties only.





Irrigation Type: Furrow

Number of Times: 3 Irrigation

Hybrid	Adj. Yield <sup>1</sup>	Area	Weight	Yield	% Moisture	Plant Stand <sup>2</sup>
Dyna Gro D57VC53	189.80	0.211	2,151	182.04	11.9	33,000
DKC 66-06	207.70	0.211	2,460	208.19	15.7	34,750
Pioneer P1718VYHR	174.79	0.211	2,090	176.88	16.5	33,500
Progeny 2118 VT2P	191.10	0.211	2,258	191.10	15.5	34,500
Gateway 2716VT2PRO	216.23	0.211	2,540	214.96	15.0	33,750
DKC 68-35	216.06	0.211	2,550	215.81	15.4	33,250
DynaGro D57TC29	208.57	0.211	2,512	212.59	17.1	33,250
Pioneer P1511YHR	189.46	0.211	2,260	191.27	16.3	33,750
Progeny 2215TRE	171.79	0.211	2,144	181.45	20.0	34,500
Gateway 1717VT2PRO	188.37	0.211	2,402	203.28	21.7	32,250
1 Yield is adjusted to 15.5% moisture.						
2 Plant Stand is given as plants per acre.						
3 Lodging score - 1 is no lodging, 10 is completely lodged.						

## **Weed Control Using Drone Technology**

Cooperator: Jackson Farms  
Location: Smithville AR  
Agents: Bryce Baldridge and Courteney Sisk

### **Objective:**

Weed control is always a priority concern among producers in all aspects of agriculture. Pressure from uncontrolled weeds can affect yields, and quality, which hinders production goals. Timely herbicide applications are recommended for the control of said weeds. In certain instances, normal application methods cannot be used because they are either not possible or feasible. This scenario was one of those occasions.



Our office was contacted by a local producer with concerns about the weed population in his corn maze. This plot of corn is small and located some distance from the nearest airfield. After some discussion, I asked him if he would consider using a drone to spray his maze. This type of application method might be a better option for his operation, and it has produced satisfactory results.

### **Methods and Materials:**

The corn maze was sprayed on August 14<sup>th</sup>, 2023, using a DJI Agras T30 drone. This drone has a tank capacity of approximately eight gallons. The corn was sprayed with a mixture of 48 oz./Ac Atrazine, 48 oz./ Ac Glyphosate, and 6 oz. / Ac Petrichor. The Petrichor was added to reduce drift to prevent any issues with an adjacent pumpkin field. The mixture was applied at a rate of five gallons per acre.

### **Results:**

The above application provided exceptionally good control of the grass/ weeds within the corn maze. The control was not limited to the walkways but also within the corn itself. In this demonstration, this application method proved to be a viable way to control weeds and clean up the pathways within the corn maze. The producer was happy with the results.



**2 Days After Treatment**



**6 Days After Treatment**



**11 Days After Treatment**





### Enlist Soybean Variety Trial

Extension Agents: Courteney Sisk and Bryce Baldrige  
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 that was used in this trial was a 141-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 3<sup>rd</sup> & 4<sup>th</sup>, 2023. The soil survey indicated that the field consisted of 27% Beulah Sandy Loam, 30% McCrory Fine Sandy Loam, 27% Tuckerman Fine Sandy Loam, and 15% Dundee Silt Loam. The trial was planted with ten different varieties, each variety containing 6 rows. The trials were planted on May 3<sup>rd</sup> at a rate of 140 seeds per acre into good moisture. Plant stands were taken on June 15<sup>th</sup> with an average plant stand of 113K. A Pre-emerge application of Metolachlor and light rate of Metribuzin was made along with an in-season application of Roundup, Liberty, and Enlist. The field was irrigated five times throughout the growing season.

Variety	Area	Weight	Moisture	Yield	Adj. Yield	Lodging
Delta Grow 48E59	.637	2286	10.3	59.81	61.67	1
Eagle ES48E90	.637	2168	10.5	56.72	58.37	1
Pioneer P45A81E	.548	2252	11.1	68.49	70	1
Progeny P4775E35	.637	2366	10.6	61.9	63.64	1
Stine 46EE20	.637	2714	10.8	71.01	72.79	1
Pioneer P48A14E	.637	2794	10.5	73.01	75.22	1
Stine 49EG92	.637	2530	10.9	66.2	67.79	1
Eagle ES44E20	.637	2164	10.7	56.62	58.09	1
Delta Grow 47E35	.637	2256	10.4	59.03	60.8	1
Stine 47EE02	.637	2548	10.7	66.67	68.4	1

### **Extend Flex Soybean Variety Trial**

Cooperator: Bruce Manning

Location: Strangers Home AR

County Agents: Bryce Baldrige and Courteney Sisk

#### **Objective:**

The purpose of this demonstration was to compare several different varieties of soybeans with the Extend Flex technology side by side under the same growing conditions and compare yields and lodging between varieties. These demonstrations are performed each year around the state. The results from these trials give farmers an idea as to how a particular variety will perform, giving them much-needed information on picking varieties for next year.



#### **Methods and Materials:**

This trial was placed in a field located 3.5 miles west of Alicia, AR near the community of Strangers Home. The field is 42 acres in size. The soil type where the trial was located consisted of Dubbs Silt Loam. The trial consisted of 20 different varieties.

The trial was planted on May 8<sup>th</sup>, 2023, using a John Deere 8235R tractor pulling a Case 1230 12-row planter. Each variety was planted in a full 12 rows. The seed was planted into beds on 30" row centers at 1 ½" deep and into good moisture.

The trial was harvested on October 9<sup>th</sup>, 2023, using a John Deere 9770 combine. Each variety was harvested and weighed using a Par-Kan GW-150 weigh wagon. Samples were taken from each variety and measured for moisture using a Mini-Gac Plus moisture tester. These moisture readings would be used to adjust each weight to 13% moisture ensuring equality throughout the test weights. Lodging scores were also assigned to each variety.

The following table contains the results from this trial.

Variety	Net Weight (lbs.)	Bushels	Moisture	Length	Width	Area	Bu/Acre	Adj. Bu/Ace	Lodging
<b>Pioneer 45A70</b>	3830	63.833	11.2	1210	30	0.833	76.631	78.239	5
<b>Delta Grow 49XF29</b>	2892	48.2	11.6	1210	30	0.833	57.863	58.789	3
<b>Progeny 4604XFS</b>	3528	58.8	11.2	1210	30	0.833	70.588	72.071	6
<b>Pioneer P46A90LX</b>	3706	61.767	11.2	1210	30	0.833	74.15	75.707	2
<b>Gateway 467XFS</b>	3746	62.433	10.7	1230	30	0.847	73.711	75.627	3
<b>Progeny P4798XF</b>	3214	53.567	11.1	1230	30	0.847	63.243	64.635	5
<b>Gateway 473XFS</b>	3706	61.767	10.7	1230	30	0.847	72.924	74.82	3
<b>Delta Grow 48XF33</b>	3300	55	10.8	1230	30	0.847	64.935	66.558	4
<b>Eagle 4875</b>	3554	59.233	11.9	1210	30	0.833	71.108	*72.032	3
<b>Gateway 469XF</b>	3370	56.167	11.2	1210	30	0.833	67.427	*68.843	6
<b>Asgrow 46XF3</b>	3244	54.067	11.4	1210	30	0.833	64.906	*66.075	5
<b>Gateway 461XFS</b>	3744	62.4	11.3	1230	30	0.847	73.672	*75.145	2
<b>Asgrow 48XF3</b>	3196	53.267	11.2	1230	30	0.847	62.889	*64.21	1
<b>Asgrow 46X0</b>	3468	57.8	11.1	1230	30	0.847	68.241	*69.742	1
<b>Gateway 457XFS</b>	3428	57.133	11	1230	30	0.847	67.454	*69.005	4
<b>Stine 50FD99</b>	3196	53.267	10.7	1230	30	0.847	62.889	*64.524	1
<b>Asgrow 47XF2</b>	3516	58.6	10.9	1230	30	0.847	69.185	*70.846	2
<b>Gateway 471XFS</b>	2982	49.7	10.7	1230	30	0.847	58.678	*60.203	2
<b>Stine 46FD29</b>	3488	58.133	10.4	1230	30	0.847	68.634	*70.693	3
<b>Dynagrow S47XF23</b>	3974	66.233	11.8	1210	30	0.833	79.512	*80.625	2

\* Lawrence County Varieties Only  
 Yield adjusted to 13% Moisture  
 Lodging Score- 1=No Lodging 10= completely Lodged



## 2023 Lawrence County Soybean Research Verification Program

**Cooperator:** Hicks Family Farms

**Extension Agents:** Bryce Baldrige and Courteney Sisk

**Location:** Alicia



### Field Summary:

The 73-acre field, Bosket fine sandy loam and Crowley silt loam was located west of Alicia and followed the previous year's rice crop. Following spring tillage and fertilizer application of 0-70-120, the field was planted on April 11 with Stine 46EE20, Stine XP treated seed with inoculant, at 140,000 seed/acre on 30" seed spacing. On April 11, 1 quart/acre Gramoxone plus 1.5 pints/acre Boundary was applied for pre-emerge weed control. The field emerged on April 24 with a plant population of 129,000 seeds/acre. A single post emerge herbicide application was made on June 1 of 1 quart/acre glyphosate plus 2 pints/acre Enlist One plus 1 pint/acre s-metolachlor. Disease and insect pressure remained below the threshold and no treatment was recommended. The field was furrow irrigated 3 times and harvested on October 12 yielding 78 bushels/acre adjusted to 13%.

### **2023 Rice Large Block Variety Trial**

Cooperator: Greenwing Farms, Bryan, and Fred Schmidt

Agents: Courteney Sisk and Bryce Baldrige

Location: Hoxie, AR

The Large Block Variety Demonstration takes a look at 4 varieties Ozark, CLL16, CLL18, and Diamond. The field was a no-till field and on a strict Rice/Soybean rotation. The field is split with 75% Crowley Silt Loam and 25% Jackport Silty Clay. The results of the demonstration are below.



### **2023 Arkansas Rice Variety Demonstration Lawrence Co.**

County	Cultivar	GT <sup>1</sup>	HT <sup>2</sup>	Harvest Moisture (%)	Grain Yield (bu/acre)	Milling Yield <sup>3</sup>
Lawrence	CLL16	L	CL	13.8	217.8	51-66
Lawrence	CLL18	L	CL	12.8	223.4	56-67
Lawrence	Diamond	L	C	12.9	210.6	56-69
Lawrence	Ozark	L	C	13.1	206.4	58-69
<b>Mean</b>	--	--	--	<b>13.1</b>	<b>214.6</b>	<b>55-68</b>

<sup>1</sup> Grain Types: L = long-grain, M = medium-grain; <sup>2</sup> Herbicide Technology: C = conventional; CL = Clearfield;

<sup>3</sup> Milling yield: HR = head rice, TR = total rice.

**Trial type:** Large Block  
**# Replications:** 3 Replications  
**Planted Plot Width:** 32 ft  
**Planted Plot Length:** 300 ft  
**Harvested Plot Width:** 24 ft  
**Harvested Plot Length:** 298 ft  
**Planting Date:** April 14, 2023  
**Harvest Date:** September 6, 2023

## 2023 Commercial Rice Trial

Agent: Courteney Sisk  
Cooperator: Giles Spur Farms

The Commercial Rice Trial was conducted in 10 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 northeast of Walnut Ridge on County Road 604. The variety Titan was grown in the field that held the plots. The plant date for the field was April 12th and was harvested on September 5<sup>th</sup>.

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

### Arkansas Rice Performance Trials (ARPT)

#### 2023 Grain Yield Summary – All Locations

University of Arkansas System Division of Agriculture

Cultivar	Grain Length <sup>1</sup>	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	ARK bu/ac	Mean bu/ac
Diamond	L	156	178	162	174	170	176	182	166	193	175	173
Ozark	L	168	188	174	178	177	172	202	187	208	189	184
DG263L	L	170	198	165	203 <sup>23</sup>	215	187	202	181	210	178	191
CLL16	L	163	174	156	165	177	184	198	172	186	188	176
CLL18	L	170	185	169	184	188	190	197	186	196	201	187
CLL19	L	164	184	161	162	186	187	196	163	207	207	182
PVL03	L	146	163	126	161	155	176	167	151	158	200	160
PVL04	L	135	174	153	162	157	151	192	144	180 <sup>20</sup>	176	162
RTv7231 MA	L	170	185	171	170 <sup>15</sup>	196	191	178	180	197	175	181
RT 7331 MA	L	210	212	197	200 <sup>10</sup>	215	204	213	191	235	226	210
RT 7431 MA	L	207	216	190	207 <sup>8</sup>	201	202	200 <sup>20</sup>	209	201	207	204
RT 7321 FP	L	211	209	194	219	223	213	211 <sup>23</sup>	210	237	223	215
RT 7421 FP	L	219	229	210	217	205	203	219	215	223	204	214
RT 7521 FP	L	215	226	171	209	241	230	229 <sup>29</sup>	187 <sup>16</sup>	211 <sup>30</sup>	228	215
RT 7523 FP	L	208	212	190 <sup>13</sup>	210	195	204	188 <sup>21</sup>	219	231	201	206
RT 7302	L	232	222	221	230	231	229	219	225	236	228	227
RT 7401	L	206	218	203	214	194	201	201 <sup>10</sup>	211	218	213	208
RT XP753	L	215	209	200	217	208	211	220	213	231	218	214
Jupiter	M	118	146	149	150	147	159	166	175	167	146	152
Titan	M	130	167	132 <sup>10</sup>	155 <sup>19</sup>	171 <sup>7</sup>	155	173	169	195	159	161
Taurus	M	169	180	153 <sup>15</sup>	178	187	197	200	185	206	207	186
DG353M	M	118	160	128	151	132	163	173	184	172	149	153
ProGold M3	M	158	173	193	172	172	190	204	186	181	196	183
RT 3202	M	211	220	207	229	218	201	224	204	230	225	217
CLM04	M	128	169	135	163 <sup>25</sup>	167	177	169	181	165	165	162
CLM05	M	151	173	146	179	204	175	183	168	199	201	178
ARoma22	LA	121	151	131	145	--	--	--	--	--	--	137
MEAN	--	172	189	168	184	189	189	196	186	202	195	186

<sup>1</sup> Grain Length: L=long grain, M=medium grain, LA = long grain aromatic.

\* Numbers in superscript beside yields represent percent lodging.



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

## Arkansas Rice Performance Trials (ARPT)

### 2023 Milling Yield Summary – All Locations

University of Arkansas System Division of Agriculture

Cultivar	Grain Length <sup>1</sup>	RREC HR-TR <sup>2</sup>	PTRS HR-TR	NEREC HR-TR	NERREC HR-TR	CLAY HR-TR	DESHA HR-TR	GRE HR-TR	JAC HR-TR	LAW HR-TR	ARK HR-TR	Mean HR-TR
Diamond	L	59-71	54-72	60-72	57-71	51-69	50-69	58-72	51-71	59-71	60-72	56-71
Ozark	L	63-72	54-71	57-71	61-72	55-70	51-68	61-73	57-72	61-71	58-72	58-71
DG263L	L	61-70	55-69	56-69	59-70	49-67	54-68	61-70	49-70	53-68	64-71	56-69
CLL16	L	62-71	52-70	61-71	57-70	47-68	47-68	59-71	49-71	55-70	61-71	55-70
CLL18	L	61-70	55-70	58-70	61-72	54-69	44-68	59-72	52-71	56-69	55-71	55-70
CLL19	L	64-71	56-71	53-69	60-71	58-70	53-69	62-72	46-70	59-70	66-73	58-71
PVL03	L	65-72	60-72	58-71	63-72	57-72	48-71	63-73	51-72	59-71	62-73	59-72
PVL04	L	61-71	58-71	60-71	59-69	55-70	51-69	62-72	58-71	58-70	63-72	59-71
RTv7231 MA	L	60-72	42-71	54-71	59-72	48-70	52-70	55-71	29-71	52-72	61-72	51-71
RT 7331 MA	L	63-72	44-71	54-71	60-72	44-71	54-71	60-73	38-72	56-71	64-73	54-72
RT 7431 MA	L	62-72	48-71	52-71	61-72	52-71	55-70	57-73	43-72	57-71	63-73	55-72
RT 7321 FP	L	56-71	40-70	55-71	55-71	38-70	50-70	53-72	34-72	52-71	57-72	49-71
RT 7421 FP	L	59-72	48-70	55-71	61-72	50-70	51-69	59-72	45-72	52-71	63-72	54-71
RT 7521 FP	L	63-71	56-69	52-69	60-71	52-69	49-69	59-72	49-71	55-69	64-72	56-70
RT 7523 FP	L	62-71	49-70	55-70	59-72	40-70	51-70	55-71	43-71	47-71	63-73	52-71
RT 7302	L	63-72	49-70	54-71	58-72	41-69	51-70	55-72	39-72	50-70	66-73	53-71
RT 7401	L	59-71	49-70	56-71	57-72	49-70	50-69	53-72	44-72	59-71	57-73	53-71
RT XP753	L	61-72	52-71	51-70	54-72	42-71	53-71	54-73	34-72	51-72	62-74	51-72
Jupiter	M	67-70	64-69	60-67	65-70	58-66	58-66	68-71	63-70	61-69	68-71	63-69
Titan	M	63-70	47-70	60-70	62-71	59-69	57-69	65-72	43-71	58-71	67-72	58-70
Taurus	M	62-72	55-72	61-70	63-71	62-69	59-70	66-73	48-72	62-71	66-73	60-71
DG353M	M	67-71	59-72	58-70	65-71	61-69	54-68	68-72	59-72	60-70	68-73	62-71
ProGold M3	M	67-71	65-71	62-69	67-71	61-67	62-70	69-72	61-71	61-69	69-72	65-70
RT 3202	M	67-71	52-70	46-70	61-71	49-70	59-70	63-72	40-71	58-71	67-72	56-71
CLM04	M	68-71	65-71	58-69	64-69	63-68	61-69	68-72	61-72	64-70	69-72	64-70
CLM05	M	64-69	60-69	54-67	65-70	57-66	51-68	66-70	55-70	56-68	68-71	60-69
ARoma22	LA	63-70	52-69	56-69	61-70	--	--	--	--	--	--	58-70
MEAN	--	63-71	54-71	56-70	61-71	52-69	53-69	61-72	48-71	57-70	64-72	57-71

<sup>1</sup> Grain Length: L=long grain, M=medium grain, LA = long grain aromatic; <sup>2</sup> HR-TR = % Head Rice (whole kernel) and % Total Rice (total milled rice).

### **2023 Brucellosis Vaccinations**

Cooperators: Lawrence County Cattle Producers

Agents: Bryce Baldridge and Courteney Sisk

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 six producers totaling 109 heifers during the spring of 2023 (done typically in April) with vaccinations. During fall (done typically in October) we were able to assist eight producers totaling 172 heifers.



## **Fecal Egg Counts in Sheep**

Cooperator: Bookout Farms

Location: Strawberry AR

County Agents: Bryce Baldrige and Courteney Sisk

### **Objective:**

The presence and control of internal parasites in small ruminants is one of the major concerns within the industry. The ability to identify your herd's parasite load, identify problem animals, and determine the efficacy of wormers are all crucial factors to consider when making effective management decisions. The purpose of this demonstration was to identify potential parasite loads within this herd.

Dr. Eva Wray, Post Doctoral Fellow in Animal Science for the University of Arkansas, offers this service to producers who wish to take advantage of it.



### **Methods and Materials:**

On March 27<sup>th</sup>, 2023, Courteney and I visited the Bookout Farm to take fecal samples. A total of twenty-six adult female sheep were sampled. Each sample was taken and labeled according to the individual animal. The samples were placed in a cooler along with ice packs to keep cool and maintain the integrity of the sample. That same afternoon the samples were taken overnight to the lab so that egg counts could be made.

### **Results:**

If enough animals were identified with high counts a wormer efficacy demonstration was to be started. After the results were obtained by the lab it was determined that there were not enough animals to proceed with the wormer test. However, several animals were identified with high egg counts and problem animals to cull. Mr. Bookout was pleased with the information that he received and plans to continue this evaluation in the future by incorporating his entire herd. The following are the results that we obtained:



<u><b>Animal ID</b></u>	<u><b>Feces Wt.</b></u>	<u><b>Side #1</b></u>	<u><b>Side #2</b></u>	<u><b>Calculated EPG</b></u>
105	.4	0	0	0
102	.5	29	29	5800
110	.4	1	3	500
122	.5	0	0	0
112	.5	7	9	1600
067	.4	0	0	0
106	.5	0	0	0
125	.8	0	0	0
089	.4	5	6	1375
095	.4	2	2	500
077	.4	0	0	0
124	.5	7	9	1600
115	.6	1	0	83
026	.4	0	0	0
107	.5	2	0	500
114	.6	0	1	83
034	.5	1	1	200
111	.8	74	92	10,375
052	.7	3	4	500
087	.7	37	49	6143
039	.7	11	14	1786
083	.5	1	1	200
086	.6	22	26	4000
059	.8	4	6	625
109	.5	1	1	200
056	.5	2	4	600

\*Fecal **E**ggs **P**er **G**ram (EPG) of Feces = ((Side 1 + Side 2) x 50) / Weight of Feces

## **Summer Annual Forage Demonstration**

Cooperator: Mitch Baltz

Location: Powhatan AR

Agent: Bryce Baldrige

### **Objective:**

The purpose of this demonstration served two purposes. The first was to evaluate the productiveness of a summer annual in a grazing operation. Over the years, annuals have been evaluated as forage option at a much higher rate as fall annuals rather than summer annuals. This study is being used to provide producers with information that might be useful for them if they are considering using summer annuals in their operation.



Secondly, this forage was planted as part of the process in establishing Novel Fescue. Tall Fescue is the most predominate cool season grass that is found on farms in Arkansas. The old standard variety of fescue in Arkansas is known as Kentucky 31 or “KY 31”. The variety, however, does have a downside, it produces a toxic alkaloid known as “endophyte.” This endophyte has been proven to negatively affect cattle performance. It reduces gain in growing calves and breeding performance in adult cattle. Another demonstration will be conducted on the practices used to establish this novel fescue.

### **Methods and Materials:**

The field was initially sprayed on May 17<sup>th</sup>, 2022, with 2 quarts of Glyphosate per acre as “burndown” application. This application was made with the purpose of killing all existing vegetation for two reasons 1) to reduce the amount of competition in the field to improve establishment of the summer annuals and 2) as part of the “Spray, Smother, Spray” method needed for establishing the novel fescue this fall.

On May 24<sup>th</sup>, 2023, I visited the farm to help Mr. Baltz calibrate his seeder. The field was planted with a variety of Sorghum Sudangrass called Super Sugar at a rate of 32 lbs. per acre. The seed was planted at a depth of  $\frac{3}{4}$ ” into good moisture.

On May 25<sup>th</sup>, 2023, the field was initially fertilized with 120 lbs. of Urea per acre according to soil test recommendations. On June 6<sup>th</sup>, the field was evaluated and determined to have achieved a good stand. The forage had reached an approximate height of 18” on June 16<sup>th</sup>, 2023. The field was fertilized once more on August 5<sup>th</sup>, 2023, with 100 lbs. Urea/Acre. The grazing records for the field are listed below.

Table 1. Grazing Records for Sorghum Sudangrass Field

# Grazing	Start Date	Finish Date	# Days Grazing
1 <sup>st</sup> Turn In	6-23-23	6-29-23	6
2 <sup>nd</sup> Turn In	7-20-23	7-26-23	6
3 <sup>rd</sup> Turn In	8-17-23	8-22-23	5
4 <sup>th</sup> Turn In	10-3-23	10-7-23	4
<b>Total Days</b>			21

Mr. Baltz received a total of 21 grazing days through 4 grazing rotations. The costs and savings generated from this project are listed below. By utilizing Sorghum Sudangrass as a warm season annual we were able to save this producer a total of \$1707.32. These savings were generated from the absence of feeding hay during the same amount of time that the field was grazed.

**Comparison to hay and/or supplement that would have been fed**

Bale wt. (lbs.)	% Dry Matter of Hay	Daily Hay as Fed Req. (lbs.)	Estimated grazing period (days)	Grazing Period Hay as Fed Req. (lbs.)	% Utilization	Hay Analysis
800	88	1115	21	23,410	80	% CP, % TDN

**Hay Cost**

Cost/bale	Bales required				Total Cost	Cost/AU
\$60.00	36.6				\$2,194.71	\$60.96

**Supplement Cost**

Cost/ton	Cost/lb.	Pounds fed per day	Number of days fed	Total pounds fed	Total Cost	Cost/AU
	\$0.00			0	\$0.00	\$0.00

**Savings**

Comparison Cost			Actual Cost		Total Savings	Total Savings/AU
\$2,194.71			\$487.39		\$1,707.32	\$47.43
Comparison Cost/AU/D			Actual Cost/AU/D		Savings/AU/D	
\$2.90			\$0.64		\$2.26	



## **Winter Annual Forage Demonstration**

Cooperator: Tim Miller  
Farm Location: Strawberry AR  
County Agent: Bryce Baldridge

### **Objective:**

Every year I get tons of calls from producers asking advice on which forages to plant on their farms. This is not a question that has a turn-key answer. There are many factors to consider when making these types of decisions.

I had a conversation with Mr. Miller last summer regarding this very subject. He told me of his intentions, that he wanted to plant something that would give him an excellent quality forage to graze the following spring as he would have calves to put on those forages by then. I set up a meeting to discuss his options. Mr. Miller told us of his desire to try Austrian Winter Peas in whatever blend that we decided on. He explained that by the spring he would have some bigger calves that would be grown for replacements, sale calves, and freezer beef.



### **Methods and Materials:**

After the initial discussion, it was determined that the field would be planted in Winter Coker Oats, WinterHawk Ryegrass, and Austrian Winter Peas. The mix that was determined to be used was 60 Lbs. /Acre of Coker Oats, 20 lbs. / Acre of Winterhawk Ryegrass, and 25 lbs. /Acre of Austrian Winter Peas.

The field is a total of 6.6 Acres and was planted on October 18<sup>th</sup>, 2022, using a John Deere 2355 tractor pulling a 5512 Esch No till Drill. The drill was calibrated and set at a planting depth of ½." The field was split into two sections allowing us to plant the seed at two different rates. This was done at Mr. Miller's request as he wanted to see if the seeding rate could be reduced while achieving the same yields. The planting rates that were used were

105 lbs./ AC for the high rate while the lower rate received 80 lbs./Ac. As the seed was mixed to put in the planter the Austrian Winter Peas were coated with an inoculant at a rate of 4 oz./ 100 lbs. of seed to ensure adequate formation of nitrogen fixating nodules.

The field was fertilized by Mr. Miller in November of 2022 with 1 ton/AC of poultry litter. In February of 2023 Lawrence County received some extremely low temperatures. I visited the field on February 10<sup>th</sup>, 2023, to inspect any damage that may have occurred. During my visit I observed that there was not much damage.

The oats were damaged slightly on the tips, the ryegrass was unaffected, and the winter peas had not incurred any damage and had started to spread across the ground slightly.

Table 1. Plot Fertilizing Plan

TRT	Nitrogen (lb/ac)	Phosphorus (lb/ac)	Potassium (lb/ac)
1	0	0	0
2	0	40	0
3	0	0	60
4	0	40	60
5	30	0	0
6	30	40	0
7	30	0	60
8	30	40	60

The field was not visited again until March 1<sup>st</sup>, 2023. At that time, the plots were fertilized according to the plot plan that was supplied by Soils Extension Specialist Dr. Bronc Finch. The fertilizer rates were determined by using recommendations from a soil test that was taken in the spring of 2022. The code used for this project was Forages for Pastures "204" Legumes or cool season grass/ legume mixture. According to the soil results the recommendations of this code were 30N-40P-60K at the full rate. The plots were broken into 8 different treatment areas according to the side chart. Plots were placed in both fields that contained the different planting rates.

### **Results:**

On March 29<sup>th</sup>, 2023, a field day was held to allow producers to see the results. There were 24 producers in attendance representing 8 counties. The plots were harvested on April 11<sup>th</sup>, 2023, after reaching full maturity. Each plot was harvested down each center to minimize error, weighed, and a sample was sent off for quantity analysis. Tables 3 and 4 illustrate the DM yields that were harvested from each plot.

According to Mr. Miller he turned 22 calves into the field to start grazing the side that received the higher planting rate on March 29<sup>th</sup>, 2023. The animals were moved to the lighter planted side on April 12<sup>th</sup> and grazed for an additional 5 days. This provided a total of 13 grazing days during the first trip through.

The second grazing started on May 28<sup>th</sup>. A total of 47 cows, 10 (800-900lbs.) calves, and 20 baby calves were turned in. Animals grazed this area until June 4<sup>th</sup>, 2023. This second time provided an additional 8 days of grazing bringing the total grazing days to 21 days. According to our harvest records there is no benefit to reducing the seeding rate to achieve alike yields. The following are the costs of the project. We achieved a total savings of \$1,466.23 from grazing than by traditional winter-feeding practices.

Table 3. DM Yield on Normal Seeding Rate

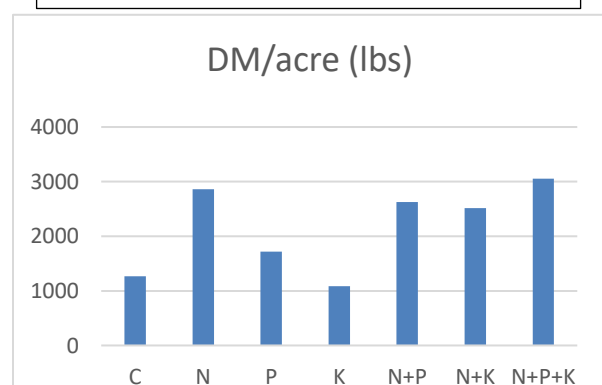
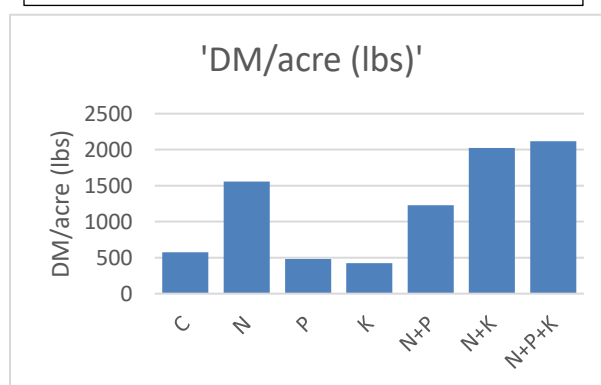


Table 4. DM Yield on Light Seeding Rate



<b>Seed</b>			<b>Actual Cost</b>			
Seed Type/Variety	Rate/ac (lbs)	Cost/50 lb bag	Cost/lb	Cost/ac	Total Cost	Cost/AU
Winter oat, RG, & Peas	97			\$64.50	\$425.70	\$13.61
Planting date	18-Oct					
Seeding method	No-till drilled					
<b>Fertilizer</b>						
Fertilizer Type	lbs/Ac	Cost/ton	Cost/lb of N	*Cost/Ac	Total Cost	Cost/AU
Litter	1 ton	\$50.00		\$50.00	\$330.00	\$10.55

<b>Comparison to hay and/or supplement that would have been fed</b>						
Bale wt (lbs)	% Dry Matter of Hay	Daily Hay as Fed Req. (lbs)	Estimated grazing period (days)	Grazing Period Hay as Fed Req. (lbs)	% Utilization	Hay Analysis % CP, % TDN
800	88	909	22	20,005	80	
<b>Hay Cost</b>						
Cost/bale	Bales required				Total Cost	Cost/AU
\$60.00	31.3				\$1,875.43	\$59.97
<b>Supplement Cost</b>						
Cost/ton	Cost/lb	Pounds fed per day	Number of days fed	Total pounds fed	Total Cost	Cost/AU
\$350.00	\$0.18	90	22	1,980	\$346.50	\$11.08
<b>Savings</b>						
Comparison Cost			Actual Cost		Total Savings	Total Savings/AU
\$2,221.93			\$755.70		\$1,466.23	\$46.89
Comparison Cost/AU/D			Actual Cost/AU/D		Savings/AU/D	
\$3.23			\$1.10		\$2.13	



## **Effect of Seeding Rate in Austrian Pea Population**

Cooperator: Tim Miller  
Location: Strawberry AR  
County Agent: Bryce Baldridge

### **Objective:**

After holding conversations with Mr. Miller about options for spring grazing his desire was to include Austrian Winter Peas in with his forage mix to be planted. The peas were to be planted along with both Winter Oats and Ryegrass. The discussion turned to the correct planting rates to use and at what rate the peas would perform better in. This demonstration was conducted to determine if the peas would compete with the other types of forage when planted at normal rates or if it was necessary to reduce rates to allow a better environment for the peas to flourish.

### **Methods and Materials:**

The field was planted on October 18<sup>th</sup>, 2022. At this time, the field conditions were very dry, but we concluded that it would be better to go ahead and plant and hope for rain as time was running out. The field was planted using a John Deere 2533 tractor pulling a 10' Esch No-Till Drill. The seed mixture consisted of 60 lbs. of Coker Oats, 20 lbs. of Winterhawk Ryegrass, and 25 lbs. of Austrian Winter Peas. This mixture was drilled at a depth of ½." The seed was planted at full rate of 105 lbs./acre while the smaller rate was reduced by 20% at a rate of 80lbs./acre.

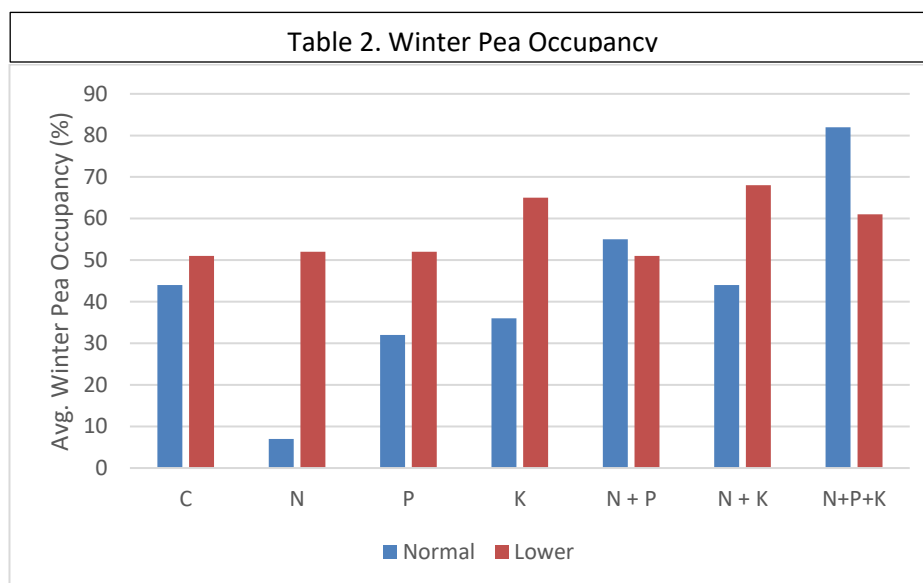
### **Results:**

The field was checked periodically throughout the year to monitor growth and prevalence of the Winter Pea population. We received an incredibly good initial stand and that stand remained throughout the winter. The plot achieved approximately 3" of growth that winter. We received a long cold spell during the first of February. The plot was observed on February 10<sup>th</sup>, 2023, to check for freeze damage. The Coker Oats received some damage on the leaf tips, but the Ryegrass and Winter Peas were unharmed.

The field was fertilized with poultry litter in November 2022 at a rate of 1 ton/acre. We revisited the field to fertilize our forage plots on March 1<sup>st</sup>, 2023. Table 1 shows how each of the plots were fertilized. We returned to the field on April 11<sup>th</sup>, 2023, to determine the population of the Austrian Winter Peas. It was determined by our counts that the peas performed better in most of the plots at the lower planting rate than they did the full rate. This difference is due to the higher competition of the Oats and Ryegrass at the higher planting rates.

Table 1. Plot Fertilizing Plan

TRT	Nitrogen (lb/ac)	Phosphorus (lb/ac)	Potassium (lb/ac)
1	0	0	0
2	0	40	0
3	0	0	60
4	0	40	60
5	30	0	0
6	30	40	0
7	30	0	60
8	30	40	60



## **Liquid Fertilize Forage Demonstration**

Cooperator: Ron King  
Farm Location: Annieville, AR  
County Agent: Bryce Baldrige

### **Objective:**

Producers are continually trying to improve their operations. This can be either through increasing efficiency, increasing production, or decreasing costs, just to name a few. Sometimes producers try products in hopes of achieving one of these goals. Earlier this year I was approached by a producer as he was contemplating the idea of using a liquid fertilizer in his hay operation in hopes of increasing total yield. He asked me if I thought that it would work and if it would be cost effective. I had never heard of the product but told the producer that we could construct a demonstration this summer to see if we could see a difference. The product that was to be evaluated is called Surge Pro.

I contacted Dr. Bronc Finch, Soil Extension Specialist for the University of Arkansas Division of Agriculture, to discuss this project with him and to ask for his help. Dr Finch agreed to provide guidance and help with the harvest and analysis of the plots. This was done to ensure that the demonstration was performed correctly and without any bias.

### **Method and Materials:**

After some discussion with Dr. Finch, it was determined that the demonstration plots would consist of 8 separate plots each measuring 8' X 25'. This would give each plot a total of 200 sq. ft. A copy of the plot design is pictured on the right. It was determined that the plot would include 3 treatments of fertilizer only including both commercial fertilizer and the Surge Pro product alone. Two plots would include commercial fertilizer plus Surge Pro. Two plots would include commercial fertilizer plus Surge Pro plus a reapplication of the Surge Pro product two weeks later. Commercial fertilizer was applied according to soil test recommendations. We included both full and ½ treatments of

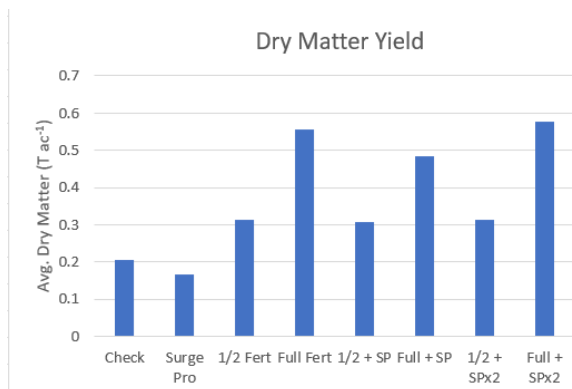
fertilizer to compare if there were any differences and if one could save money by reducing fertilizer applications. According to the soil test recommendations the plot required 60N-30P-90K. The half treatment consisted of 30N-15P-45K. The amount of Surge Pro that was applied the first time was 8 oz./ AC. The Surge Pro was applied to the plots using our handheld research back sprayer. This sprayer is pressurized to ensure constant pressure during operation. This ensures against any bias between the plots. According to a letter that I received from a representative of the company; the product was to be applied at a rate of 5 Gallons per acre.

TRT	Treatment ID	Rate	Timing
1	Check		
2	Surge Pro	8 oz	GU/1 <sup>st</sup> Harvest
3	½ Fertilizer	30N/15P/45K	GU/1 <sup>st</sup> Harvest
4	Full Fertilizer	60N/30P/90K	GU/1 <sup>st</sup> Harvest
5	½ Fert + SP	30N/15P/45K + 8 oz	GU/1 <sup>st</sup> Harvest
6	Full Fert + SP	60N/30P/90K + 8oz	GU/1 <sup>st</sup> Harvest
7	½ Fert + SP2	30N/15P/45K + 8oz per App	GU/1 <sup>st</sup> Harvest + 2 weeks post
8	Full Fert + SP2	60N/30P/90K + 8oz per App	GU/1 <sup>st</sup> Harvest + 2 weeks post

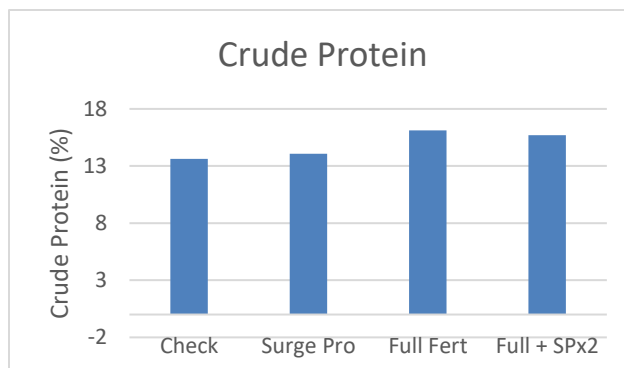


This could not be achieved with my sprayer. I calibrated out sprayer to 8 Gallons per acre. This product, according to its label, has a nutrient percentage rating of 7-14-7. The results of the first harvest are below. TDN values were also higher for the plots that had commercial fertilizer applied to them.

**DM Yield of samples for first cutting of hay**



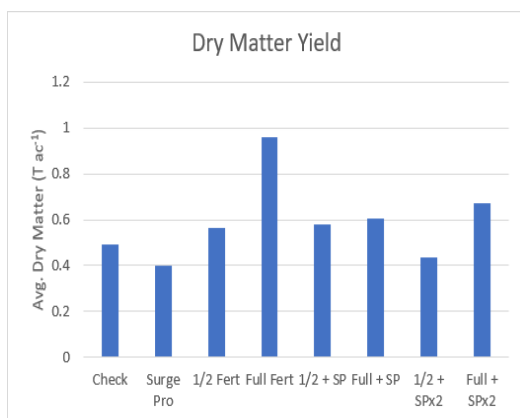
**Crude Protein of samples for first cutting of hay**



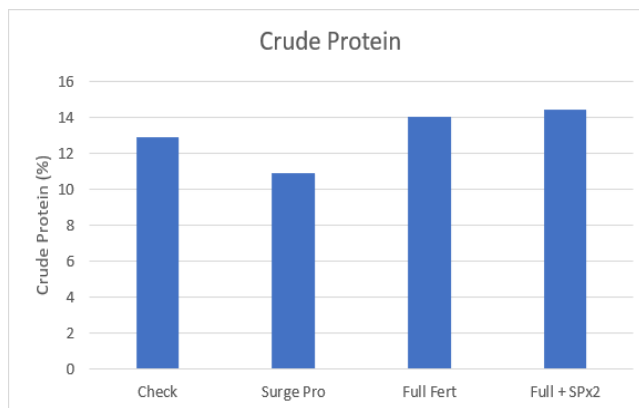
It should be noted that during the first application of Surge Pro there was a mistake made during the process where the gas was not turned on. This allowed for decreased pressure as more applications were made.

After the first cutting of hay the plots were left idle to regrow some of the leaf matter before making the application for the second cutting. It was discovered at this time that the previous rate of 8 oz. per acre as determined by the representative of the company did not match the recommendations on the label. The label recommended 16 oz. / acre so for those reasons the application rates of the Surge Pro product were increased during the second test. The results of the second cutting are included below.

**DM Yield of Second Cutting of Hay**



**Crude Protein of Second Cutting of Hay**



## Results:

According to the harvest results during the first harvest, the treatment with the highest DM yield was the plot with a full rate of commercial fertilizer only. Crude Protein was no different between treatments that received a full rate of commercial fertilizer and the one that received fertilizer plus Surge Pro.

The second harvest brought comparable results. DM yield was identical between the commercial fertilizer only treatment and the fertilizer plus Surge Pro treatment. According to the findings in this trial, there was no significant difference in DM Yield or Crude Protein between treatments that received commercial fertilizer alone or treatments that received fertilizer and Surge Pro. Based on the results that were found in this trial the \$10.56 / Acre cost for this product does not compensate for any yield or nutritional differences in the forage.

### Associated Costs with Surge Pro Demonstration

Product	Price	Price/ Unit	Price / Acre
Urea	\$510 / Ton	\$.55	\$33
Triple Super Phosphate	\$737 / Ton	\$.80	\$24
Muriate of Potash	\$593 / Ton	\$.49	\$44.10
Surge Pro	\$212.50 / 2.5 Gallon	\$.66 / Oz.	\$10.56
Totals			\$111.66

## **Buckhorn Plantain Control**

Cooperator: David Ponder

Location: Walnut Ridge AR

County Agent: Bryce Baldridge

### **Objective:**

The purpose of this demonstration was to measure the effectiveness of different herbicides in controlling the population of Buckhorn Plantain. Buckhorn plantain, also known as English plantain, narrow-leaved plantain, and ribwort plantain, is an erect cool-season perennial plant that is a member of the plantain family (Plantaginaceae).

Buckhorn plantain is native to Europe and can be found throughout Arkansas in cultivated areas, hay fields, pastures, and roadsides.

Although buckhorn plantain is not toxic to cattle and palatable, it can increase in density over time and compete with desirable forages. Older plants can become drought-tolerant due to the long taproot. Due to its persistence and short growth habit, buckhorn plantain can become well established and difficult to control in pastures. As this field is Bermudagrass that is sold for hay the producer was looking for a method to control the Buckhorn Plantain before it took over the hay pasture and decreased the value of his hay.



### **Methods and Materials:**

The farm was visited, and a site was located that contained a good population of Plantain within its perimeters. The site was broken into 7 individual plots measuring 10' X 50'. Each plot was sprayed with different chemicals and rates. A control plot was included to compare the other plots with. The plots were initially sprayed on July 11<sup>th</sup>, 2023. Yellowing within the plots was noticed on July 24<sup>th</sup> and they were given a final rating on July 31<sup>st</sup>, 2023. The plots were sprayed using an R and D Pressurized Backpack Sprayer.

### **Results:**

All the plots exhibited an acceptable amount of control except for the cut rate of Patriot. This suggests that all options are viable options when pursuing control of Buckhorn Plantain but at the fully recommended rates. This demonstration will be performed again during recommended spraying times to see if the results will be duplicated. The following chart contains the chemical used, rates, % control and cost / Ac.

<b><u>Product</u></b>	<b><u>Rate</u></b>	<b><u>% Control</u></b>	<b><u>Cost / Acre</u></b>
Patriot	.25 oz.	60%	\$1.05
Grazon Next	30 oz.	80%	\$13.13
Weedmaster	3 pts.	90%	\$18.75
Patriot/Grazon Next	.5 oz / 30 oz.	95%	\$15.22
Surmount	24 oz.	90%	\$14.81
Patriot	.5 oz.	95%	\$2.09



## **Influence of Sulfur Application Rate on Bermudagrass Forage Demonstration**

### **Specialist:**

Bronc Finch

### **Cooperating County Agents:**

Danny Griffin, Bryce Baldridge, Amy Heck, Tyler Caston, Kevin Van Pelt, Clyde Fenton

### **Objective:**

To investigate the influence of sulfur application on yield and quality production of forage Bermudagrass.

### **Background:**

Hay production is known for the large uptake of nutrients from the soil, with emphasis on nitrogen (N), phosphorus (P), and Potassium (K). Although N, P, and K are the primary focus of nutrient management in hay production this large amount of uptake extends to other nutrients as well. Sulfur is a secondary nutrient, taken up in lesser amounts than N, P, and K, but like N is dependent upon plant need. Current management of S is to address the need when deficiency is found, rather than based upon plant uptake, due to the lower amount of uptake. This demonstration investigates the relationship between S application and bermudagrass forage yield, and the need for increased S applications.



### **Methods:**

Two demonstration trials were established across northern Arkansas in Van Buren Co. and Lawrence Co. These two small-plot demonstration trials received 50 lbs. N per acre and varying rates of Sulfur at 10 lbs., 5 lbs., 3.3 lbs., 2.5 lbs., and 2 lbs. per acre. These application rates were set to achieve N to S ratios of 5:1, 10:1, 15:1, 20:1, and 25:1 (Table 1). Fertilizer applications were made following the first and second harvests at each location, with the second and third harvests being collected for trial data.

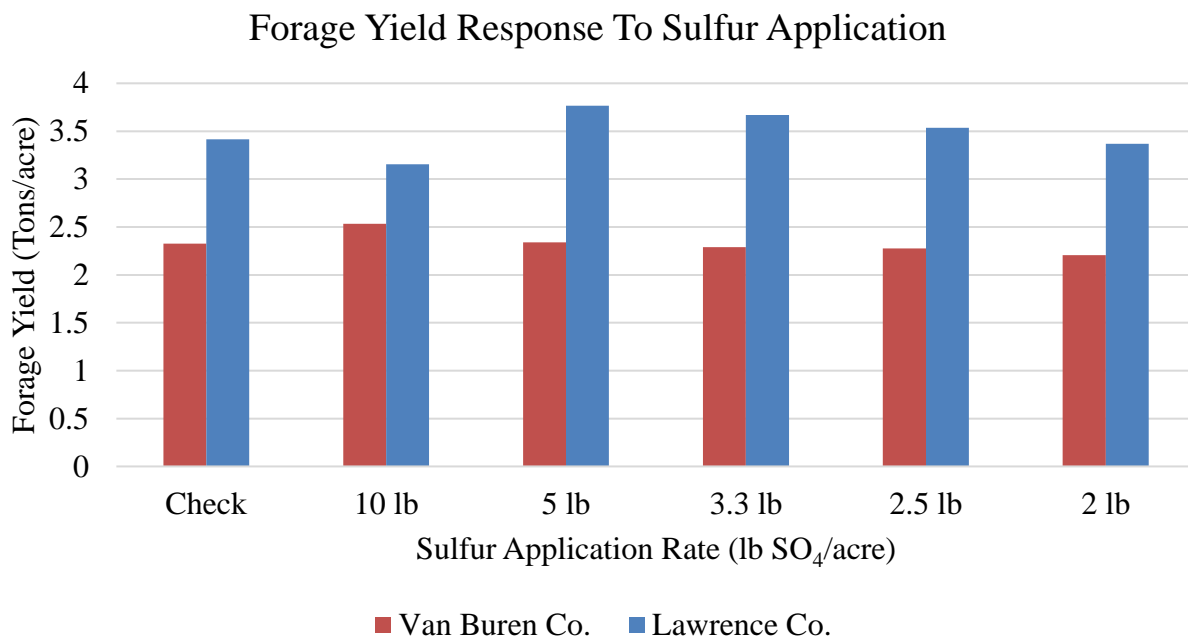
Treatment	Applied (lb./ac)		N to S Ratio
	Nitrogen	Sulfur	
Check	50	0	0
10 S	50	10	5:1
5 S	50	5	10:1
3.3 S	50	3.3	15:1
2.5 S	50	2.5	20:1
2 S	50	2	25:1

## Results:

These results are from two un-replicated trials that show differing responses to sulfur application by location. Forage dry matter (DM) yield at the Van Buren Co. location had a slight increase of 0.2 Tons (400 lb.) of DM per acre from an application of 10 lbs.  $\text{SO}_4$  per acre, yielding a total of 2.5 Tons of (5000 lbs.) DM. While all other application rates of sulfur were like the total yield of the check, 2.3 Tons (4,600 lbs.) DM per acre.

At the Lawrence Co. location total yield was maximized at 3.8 Tons (7,600 lbs.) per acre, with the application of 5 lbs.  $\text{SO}_4$  per acre. The application of 3.3 lbs.  $\text{SO}_4$  yielded the next highest at 3.7 Tons (3,400 lbs.) DM per acre. The other two lower application rates yielded like the check, with all three averaging 3.4 Tons (6,800 lbs.) DM per acre. The application of 10 lbs.  $\text{SO}_4$  per acre resulted in a decreased yield at 3.1 Tons (6,200 lbs.) per acre.

The varied responses in this demonstration trial may be attributed to differing soil types, growing conditions, or other limiting factors not within the scope of this demonstration. From these results it can be concluded that more investigation on sulfur application requirements may be needed, but current management strategies of 20 lbs.  $\text{SO}_4$  per acre when soil test levels are low may be sufficient for reducing yield loss.



## Soil Health Demonstration

Cooperator: Hunter Yates

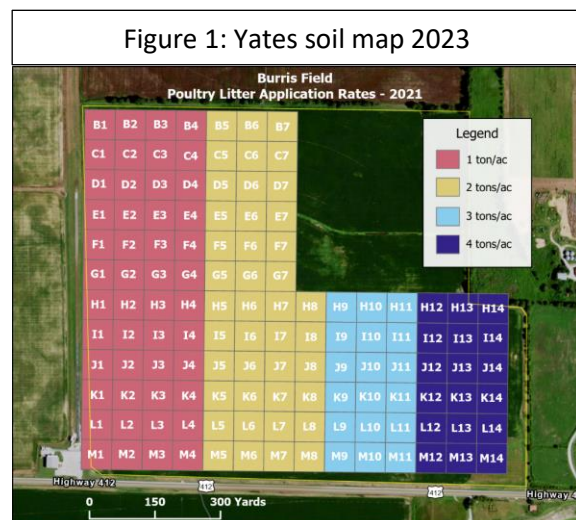
Location: Walnut Ridge AR

Agents: Bryce Baldridge and Courteney Sisk

**Objective:** 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, it is imperative that we as stewards of the land do everything possible to maintain a healthy and sustainable soil. The purpose of this demonstration was to observe how the Phosphorus and Potassium levels rose after years of both poultry litter and commercial fertilizer.

**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. 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. Each soil sample yielded results for P, K, pH, OM, and micronutrients. In 2022 each strip was analyzed using a Haney soil health test. For these samples each of the strips were 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<sub>2</sub> 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.

Figure 1: Yates soil map 2023



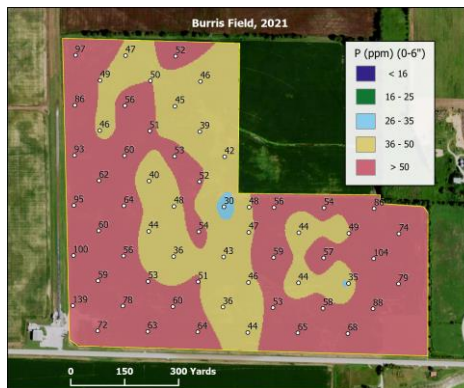
You may be asking yourself why these soil health metrics are important to my farm management practices and how does it relate to poultry litter application to row crops or forage? The simple answer is improving soil health has the potential to sustainably increase crop yield while also saving farmers money on inorganic nutrients applications. The more complex answer is that soil has the ability to 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 overtime 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. As I stated earlier, the field received four different treatments of litter each year from one ton per acre to four tons per acre. The following maps indicate how the field has improved its Phosphorus and Potassium levels since 2021.

As you can see from the adjacent maps the Soil P levels have increased over two years. The increase in the pink color from 2021 to 2023 illustrates this.

Field P levels 2021



Field P levels 2023

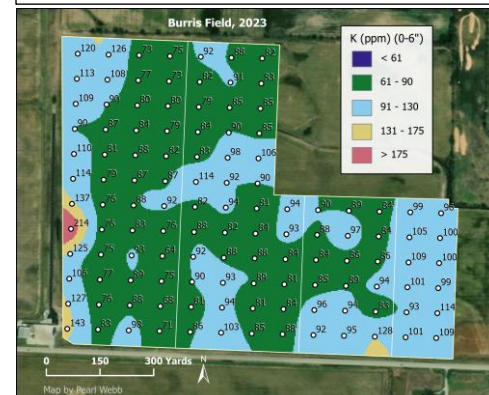


The maps to the right suggest an increase in Soil Potassium level since 2021 as indicated by the higher shading of blue.

Field K levels 2021

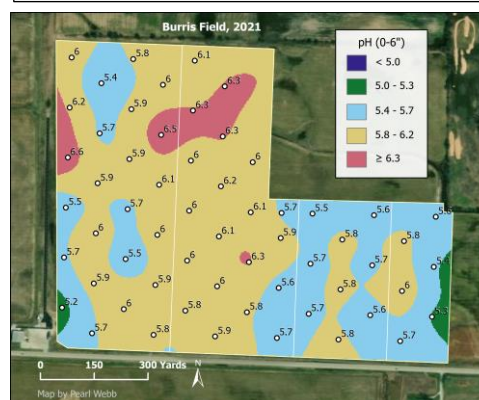


Field K levels 2023

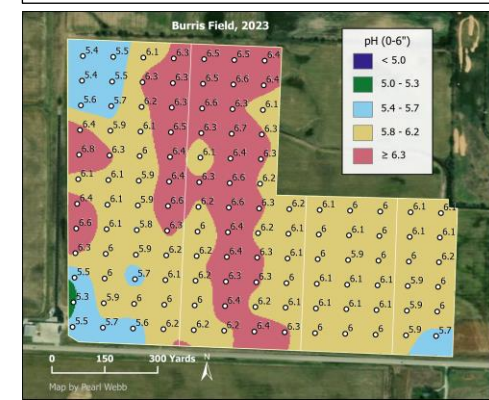


Soil pH levels have also increased since the project started in 2021. This is illustrated by the higher shading of pink and gold.

Field pH Levels 2021



Field pH levels 2023





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. The table shows improvement in most every category 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)
<b>1</b>	<b>Combined</b>	<b>5.974</b>	<b>71.250</b>	<b>91.583</b>	<b>383.639</b>	<b>70.764</b>	<b>9.486</b>	<b>7.028</b>	<b>1.038</b>	<b>5.44</b>
<b>1</b>	<b>2021</b>	5.871	67.500	87.583	383.792	67.833	10.083	7.917		
<b>1</b>	<b>2023</b>	6.025	73.125	93.583	383.563	72.229	9.188	6.583	1.038	5.44
<b>2</b>	<b>Combined</b>	<b>6.206</b>	<b>54.000</b>	<b>84.919</b>	<b>470.952</b>	<b>77.613</b>	<b>9.710</b>	<b>6.516</b>	<b>0.810</b>	<b>5.19</b>
<b>2</b>	<b>2021</b>	6.005	46.800	77.550	509.400	81.050	10.450	8.150		
<b>2</b>	<b>2023</b>	6.302	57.429	88.429	452.643	75.976	9.357	5.738	0.810	5.19
<b>3</b>	<b>Combined</b>	<b>5.922</b>	<b>60.741</b>	<b>88.630</b>	<b>370.926</b>	<b>62.185</b>	<b>8.519</b>	<b>6.741</b>	<b>0.839</b>	<b>5.06</b>
<b>3</b>	<b>2021</b>	5.689	54.444	83.222	374.778	58.111	8.667	8.556		
<b>3</b>	<b>2023</b>	6.039	63.889	91.333	369.000	64.222	8.444	5.833	0.839	5.06
<b>4</b>	<b>Combined</b>	<b>5.830</b>	<b>70.400</b>	<b>94.950</b>	<b>407.650</b>	<b>71.250</b>	<b>11.250</b>	<b>9.050</b>	<b>0.892</b>	<b>5.67</b>
<b>4</b>	<b>2021</b>	5.575	72.875	84.125	379.500	64.000	10.000	9.750		
<b>4</b>	<b>2023</b>	6.000	68.750	102.167	426.417	76.083	12.083	8.583	0.892	5.67
	<b>Total Average</b>	<b>6.03</b>	<b>63.68</b>	<b>89.23</b>	<b>414.30</b>	<b>71.88</b>	<b>9.61</b>	<b>7.03</b>	<b>0.91</b>	<b>5.32</b>

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 six". As the table below shows Nitrogen values from 2021 to 2023 did not differ much from year to year. This suggests that 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	69.63
1	2021	66.19
1	2023	66.29
2	Combined	65.33
2	2021	72.68
2	2023	73.16
3	Combined	69.67
3	2021	70.55
3	2023	70.78
4	Combined	69.50
4	2021	71.20
4	2023	71.56
Total Average		68.00

## Randolph/Lawrence County Lime demonstration

Cooperator: Rorex Farm since 2021

Agents: Mike Andrews, Bryce Baldrige, and Courteney Sisk

Field Name	Acres	Tons lime/acre		Total tons for field	Lime lbs/acre recommended on soil test 1/21
CR1	2.5	0	0	0	0
CR2	2.5	1.8	3600 lbs	4.5	5000
CR3	2.5	2.4	4800 lbs	6.0	5000
TR1	1.5	3.0	6000 lbs	4.5	5000
TR2	1.5	3.0	6000 lbs	4.5	5000
TR3	1.5	2.4	4800 lbs	3.6	4000
TR4	1.3	0		0	0

### Soil pH by date

Field Name	1/6/21	5/3/21	8/2/21	11/9/21	2/14/22	4-18-22	8-1-22	11-17-22	3-6-23	12-11-23
CR1	6.5	7.1	6.0	6.3	6.5	6.5	5.8	6.4	6.2	6.4
CR2	5.1	6.2	5.6	5.7	6.1	5.6	5.7	6.1	5.8	6.2
CR3	5.2	6.3	5.4	5.8	5.9	5.7	5.8	5.7	5.7	6.3
TR1	4.7	5.8	5.3	5.5	5.7	5.3	5.5	5.5	5.6	5.7
TR2	4.9	5.5	5.4	5.4	5.9	5.4	5.6	5.8	5.9	5.5
TR3	5.5	5.8	6.7	5.8	6.0	5.8	5.6	6.1	5.8	6.3
TR4	6.1	5.9	5.8	5.9	6.3	5.9	6.0	6.0	6.1	5.8

The lime demonstration was put in place since there is little information on how much lime is needed to raise soil pH in pastures and hay fields using local lime sources. Two fields were identified (low pH) on the Rorex Farm and were utilized in the Demonstration. Fields were soil sampled every three months, with a final sample December 2023. Areas TR1 and TR2 received 1,000 pounds more lime than recommended, but the pH of these two areas is still calling for additional lime. More work needs to be completed on these two areas to determine why the pH has not come up to recommended levels. All other areas sampled has reached a pH level acceptable to grow our typical forages.

### Lime Quality

CCE	88%
10 Mesh	90.0
60 Mesh	27.5
100 Mesh	20.8
Moisture	0.9

## **Crop Per Drop Demonstration**

Cooperator: Binkley Farms/ Stone Farms

Location: Walnut Ridge

Agents: Bryce Baldridge and Courteney Sisk

**Objective-** Each year brings more challenges that farmers need to navigate 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 2023 Lawrence County had two fields that participated in the Crop per Drop yield contest. One field was planted in Soybeans while the other was in Rice. The soybean field that was picked for this demonstration was located five miles NE of Walnut Ridge on Highway 34. This field is thirty-two acres in size and consists of a soil type of Hillemann Silt Loam. The variety of soybean that was grown was an Extend Flex variety Asgrow 48XF3 and was planted on 4-11-2023.



The Rice field that was picked to place into the contest is located one mile south of Lawrence County Seed on Highway 91. The field is seventy-five acres in size consisting of Crowley Silt Loam and Jackport Silty Clay soil types.

The soybean field was irrigated by an 8" well that was measured to have a flow rate of 900 gallons/ minute. The rice field was irrigated by a 10" well that had a flow rate of 1300 GPM. This field also has a recirculatory pump installed in it that allows tailwater to be pumped back to the top of the field and reused. This field was planted in row rice. A flowmeter was installed at both wells 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 farm log 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 an irrigation 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 28<sup>th</sup>, 2023. There were three members of the University of Arkansas Division of Agriculture present to verify all rules were followed and that the harvest weights were accurate. Prior to 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 rice field was harvested on September 7<sup>th</sup>, 2023, using the same harvest procedures as was used when harvesting the soybean field.

The following table shows the results from this demonstration. These demonstrations have been conducted in Arkansas for five years. This table also compares these fields with 5-year averages in soybean and rice 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	89.5	11.3	10.36	21.66	4.13
Soybean 5yr, Avg,	78	9.4	15.2	24.8	3.27
Rice Field	194.3	27.7	12.11	39.81	4.88
Rice 5yr. Avg.	197	28.8	14.4	43.6	5.01

The soybean field produced 11.5 bushels / acre more than the statewide average. These yields were achieved using 3.14" total inches of water less than the statewide average. The increased profits from this trial were assuming soybean price at \$14 x 11.5-bushel increase= \$161/ acre increase in profit X 32 acres= \$5,152.

The rice field saw yields that met statewide averages. However, these yields were achieved using 3.79" less water than the statewide 5 yr. avg. These results demonstrate that it is possible to achieve yields equal to or better than state averages when using water saving techniques.

## **2023 Five River Master Gardeners**

Agent: Courteney Sisk

Five River Master Gardeners are comprised of members from Lawrence and Randolph Counties. There are currently 21 members, and we always welcome more to join. To join the Master Gardeners, one must attend a Master Gardening training course and in their first year complete 40 work hours and 20 education. 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
- \* The club hosted 2 meetings/seminars that were open to the public at no cost. The first is a Pruning Seminar in March and the second is a Lawn and Flower care 4-part meeting in June.
- \* 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.
- \*Held a club interest meeting open to the public in April.
- \*For the first time 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 of annuals from June until the first frost. The trial was planted along the main road in Hoxie, AR, and marked with signs for all to see.
- \*The club was asked to start working with Lawrence Memorial Hospital on designing an updated and more aesthetically pleasing flowerbed around the facility. Agent Courteney Sisk submitted their first design to Josh Conlee- LMH Director in late May.



## **2023 Annual Arkansas Diamond Plant Trial**

Agent: Courteney Sisk

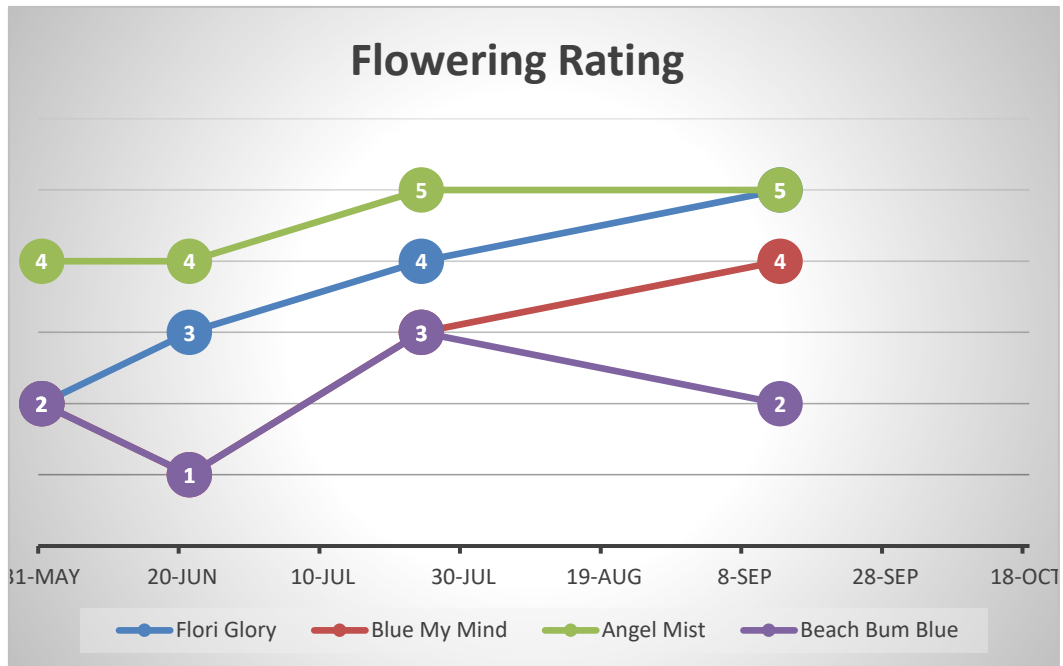
Cooperator: Sandy Barrington-Yard, and Five River Master Gardeners



The Trial was conducted in Arkansas 22 counties total participated. We looked at 4 Varieties throughout the year from spring to the first frost. Varieties looked at are FloriGlory (Mexican Heather), Blue My Mind (Blue Daze), Angelmist (Angelonia), and Beach Bum Blue (Blue Daze). 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. Results as Follows:

<b><u>Heights</u></b>	<b><u>31-May</u></b>	<b><u>21-Jun</u></b>	<b><u>24-Jul</u></b>	<b><u>13-Sep</u></b>	<b><u>18-Oct</u></b>
Flori Glory	5	3	6	7	4
Blue My Mind	4	3	5.5	6	4.5
Angel Mist	4.5	6	8	9	5
Beach Bum Blue	2.5	3	4	6	2.5

<b><u>Widths</u></b>	<b><u>31-May</u></b>	<b><u>21-Jun</u></b>	<b><u>24-Jul</u></b>	<b><u>13-Sep</u></b>	<b><u>18-Oct</u></b>
Flori Glory	8.75	10	12	11	8
Blue My Mind	8.5	10	8	11	8.5
Angel Mist	8	15	11"	13	8.75
Beach Bum Blue	6	9.5	12	13	6



**Rating for Flowers is:**

- 1 = 0%
- 2 = 1% to 25%
- 3 = 26% to 50%
- 4 = 51% to 75%
- 5 = 76% to 100%



## 2023 County Agent Pumpkin Demonstration Results

by Aaron Cato and Ryan Keiffer - November 13, 2023

In 2023, the state-wide county agent horticulture demonstration shifted away from sweet corn and sought to investigate 3 pumpkin varieties within the Cucurbita pepo species.

We wanted to investigate new pumpkin varieties of varying colors and assess potential varietal resistance to melonworms and powdery mildew (Table 1). 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 varieties to enhance grower profitability. The Google Maps image in Figure 1 shows the location of many 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.

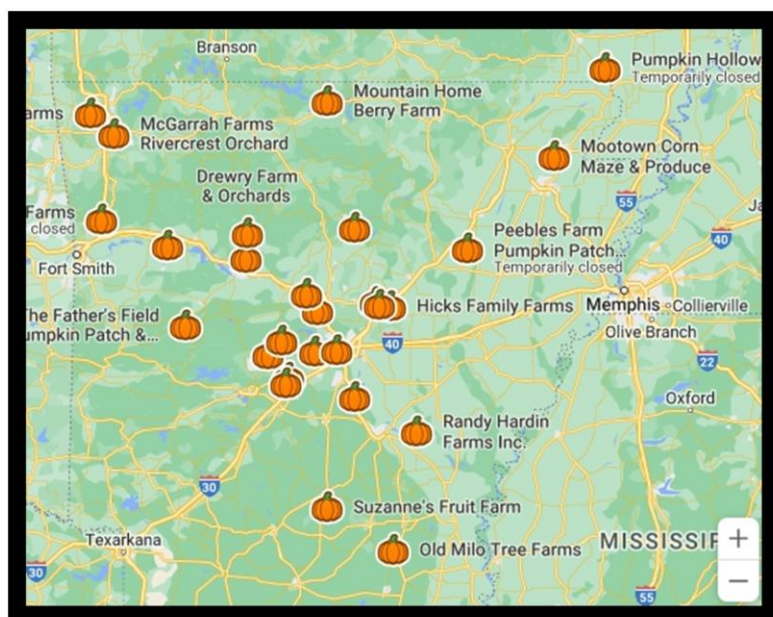


Figure 1. A festive Google Maps image of some, but not all, of the pumpkin patches found in Arkansas.

With the increasing amount of pumpkin acreage comes additional pest and disease concerns for growers, which inspired us to look into this Agent demonstration. The table below highlights some of the attributes of the 3 Jack O' Lantern pumpkin varieties we demonstrated in 2023.

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

Variety	Days to Harvest	Color	Characteristics	Powdery Mildew Resistance
Justify	100	Orange	Traditional orange with pronounced ribbing. Large to 20 lbs. with a heavy, dark handle.	Intermediate
Moonshine	100	White	White and slightly ribbed. Small-medium to 8 lbs. with long green handle.	-
Spicy Mocha	100	Tan	Tan and deeply ribbed. Medium-Large to 15 lbs. with thick handles.	Intermediate

### **Preparation**

Seeds were started in a greenhouse at the Southwest Research & Extension Center (SWREC) on June 1<sup>st</sup>. The pumpkin starts were moved outside to a high tunnel in mid-June (Figure 2) in preparation for getting them to County Agents for a target planting of around July 1<sup>st</sup>. Pumpkin starts were delivered to the Little Rock State Office (LRSO) for agents to pick up on June 20<sup>th</sup> (Figure 3). Other agents were able to pick up their plants at SWREC during the Horticulture Field Day on June 28<sup>th</sup> or were hand delivered by Horticulture IPM staff to the Fruit Research Station (FRS) and the Vegetable Research Station (VRS) for convenient pick-up. Most Agents received 5 plants per variety, but some Agents received as many as 15 plants per variety if they had a larger planting space available with collaborators. The plants were to be spaced 3 feet apart in- row with a 10-foot row spacing if necessary. Grower standard practices for irrigation and fertility were suggested but not required.

### **Reporting**

We asked county agents to report their results in two ways. First, agents reported their observations on growth and harvest characteristics of the pumpkin varieties. For the harvest metrics, we asked agents to record the yield, the number of pumpkins per plant, and percent marketable fruit in terms of what percentage of pumpkins they thought they could sell. In terms of pests and diseases, the agents scouted for melonworm and powdery mildew. Melonworm (Figure 4) is a tropical moth species that infests cucurbit fields in early September and can cause serious damage to pumpkins by feeding on the rind and burrowing into the handles causing them to fall off. One of the worst outbreaks of melonworm was in the fall of 2021. Cucurbit Powdery Mildew (Figure 5) is caused by two different fungal pathogens and is identified by white powdery fungal growth on leaves and stems of all cucurbits and if left unchecked, can cause defoliation, fruit quality, and size issues. Luckily, some resistance has been included into certain commercially available varieties including two-thirds of the demonstration varieties. Secondly, agents posted progress of the demonstration on social media using the hashtag #uaexHORT. Below are some examples of social media posts made by agents that really helped to highlight this work and get the community interested (Figures 6-8).

### **Results**

Overall, we had 19 counties submit usable data. The table and charts below show the average of the measured pumpkin characteristics across the 10 to 13 counties that reported yield data for the demonstration (Table 2). Data collection by variety differed in the number of responses received due to crop failures such as deer, ground hogs, weed control, heat, irrigation, or squash bugs. That information was helpful to receive as well, as it enables us to identify future outreach efforts for specialty crop protection. On average, each variety produced 2-3 pumpkins per vine with Moonshine having the highest average of 2.8 pumpkins per vine. The average weight of each variety was lower than advertised size descriptions from Table 1. Spicy Mocha and Justify were similar in all metrics, with an average of about 2 pumpkins per vine with an approximate weight of 7.5 lbs. each. Moonshine pumpkins averaged 4.1 lbs. per pumpkin but set almost one more fruit per vine compared to Justify and Spicy Mocha. Overall, the percent marketability of the pumpkins was good with all three varieties near 85 percent. However, we would have expected many more pumpkins in

a summer that didn't have record heat. One large grower in Northwest Arkansas reported that Moonshine was "a tough sell because several never ripened properly due to powdery mildew and didn't sell a high percentage of because they do not hold their color well." Moonshine was reported to have powdery mildew by 18% of counties who reported on that category compared to 8% for Justify and Spicy Mocha (Charts 1).

Many other factors might have contributed to reduced size or % marketability when compared to advertised weight, but the most likely culprit was drought conditions during flowering and/or water delivery issues.

Variety	Avg. # of pumpkins/vine	Avg. Weight (Lbs.)	Percent Marketable Fruit
Justify	2.0	7.3	85.3
Moonshine	2.8	4.1	84.9
Spicy Mocha	2.0	7.7	84.7

Table 2. Results from the 2023 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 and ranged from 10 to 13 responses.

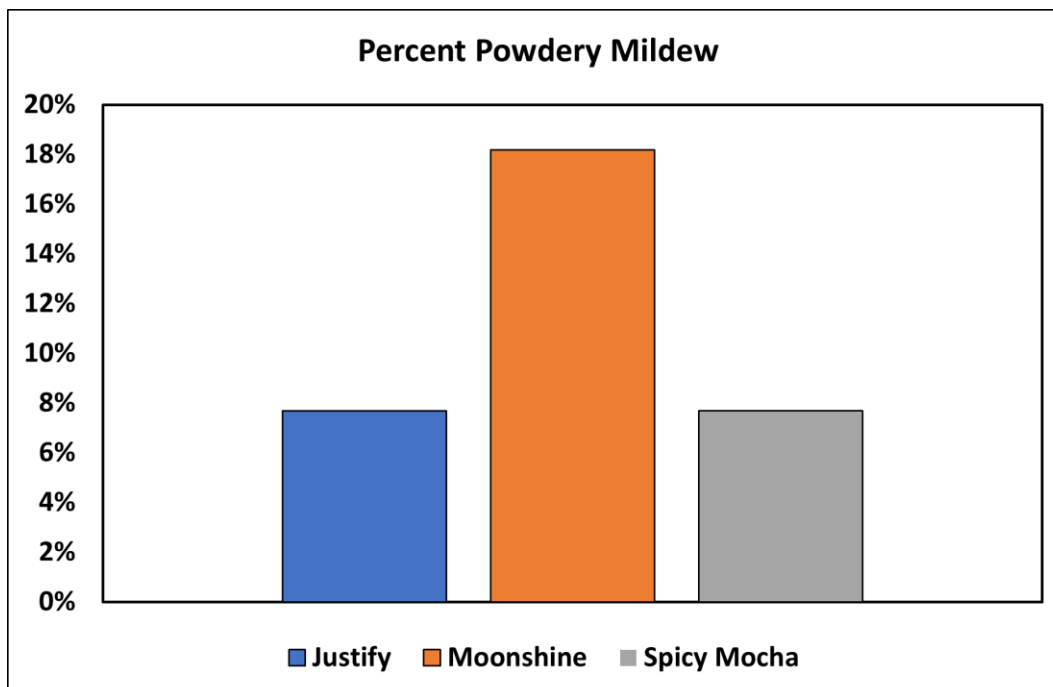


Chart 1. Powdery mildew can break through fungicide spray programs in Arkansas when conditions are favorable. This year (2023) was an extremely hot and relatively dry summer, which meant that we saw powdery mildew later than we would normally. Powdery mildew was observed on Spicy Mocha and Justify even though they have an intermediate amount of powdery mildew resistance. Moonshine lacks powdery mildew resistance and was observed in 18% of reporting counties compared to 8% for the other two varieties.

### Conclusions

One of the main objectives of this demonstration was to evaluate melonworm resistance in pumpkin varieties, however we failed to observe melonworm across much of the state. Because melonworm larvae can quickly defoliate plants, as well as feed on the rind and handles of pumpkins, we urged frequent scouting of pumpkins to detect this pest. Melonworm was found in research trials at the SWREC in Southwest Arkansas in late August. This indicated that the pest may be detected in county agent demonstrations, but melonworm wasn't observed anywhere else in the state until the pest was found again in research trials at the VRS in Kibler on October 10<sup>th</sup>. Thus, we were unable to evaluate the susceptibility of the demonstration varieties to melonworm this year; although research trials are still being conducted by state specialists to determine cucurbit species susceptibility to melonworm. However, this demonstration highlighted the importance of scouting when considering insecticide applications, as none were warranted for melonworm this year, unlike several previous years. Other issues presented themselves when agents reported their data, and Chart 2 shows some of the common issues that impacted demonstration success or failure. Luckily there are some good resources available to combat some of these issues, such as [FSA9111](#) and [FSA6160](#).

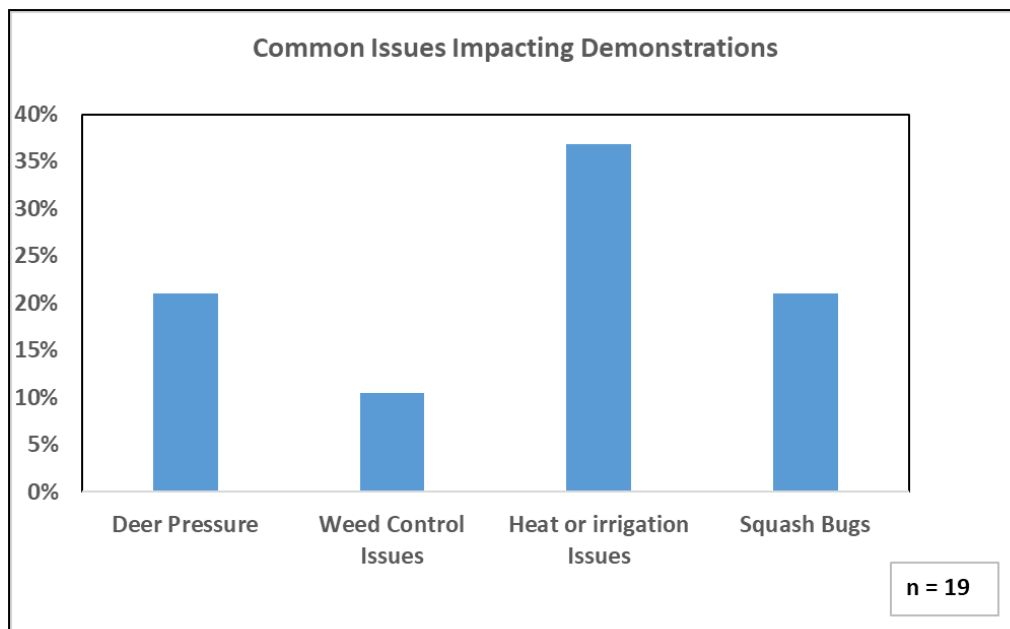


Chart 2. Heat and irrigation issues were the number one issue impacting demonstration success. Additionally, deer pressure and squash bug damage were the second biggest issues for agents.



Statewide, Agents harvested 397 pumpkins for a weight of 1842 lbs.! We were also thrilled to see agents working with their growers and enriching their communities. See Figures 9-11 for additional pictures of agent demonstrations and special thanks to all the participating agents who contributed data and their collaborators on the 2023 Horticultural Demonstration.

Agents:

Name	County
Dawson Bailey	Howard
Bryce Baldridge	Lawrence
Rachel Bearden	Hot Spring
Kurt Beaty	Chicot
Grant Beckwith	Arkansas
Tyler Caston	Stone
Jerri Dew	Lafayette
John Farabough	Lincoln
Clyde Fenton	Searcy
Dave Freeze	Greene
Herb Ginn	Crawford
Cindy Ham	Clark
Amy Heck	Cleburne
Shaney Hill	Union
Allison Howell	Clay
Colin Massey	Washington
Codie McAlister	Pike
Brad McGinley	Grant
Michelle Mobley	Independence
Ryan Neal	Benton
Nicole Nichols	Saline
Bob Powell	Yell
Krista Quinn	Faulkner
Derek Reed	Pulaski
Kim Rowe	Hempstead
Jaret Rushing	Calhoun
Kyle Sanders	Lonoke
Sherri Sanders	White
Jennifer Sansom	Little River
Amy Simpson	Clark
Jesse Taylor	Johnson
Cory Tyler	Fulton
Timothy Wallace	Jefferson
Keri Weatherford	Ouachita
David West	Cleveland
Adam Willis	Newton