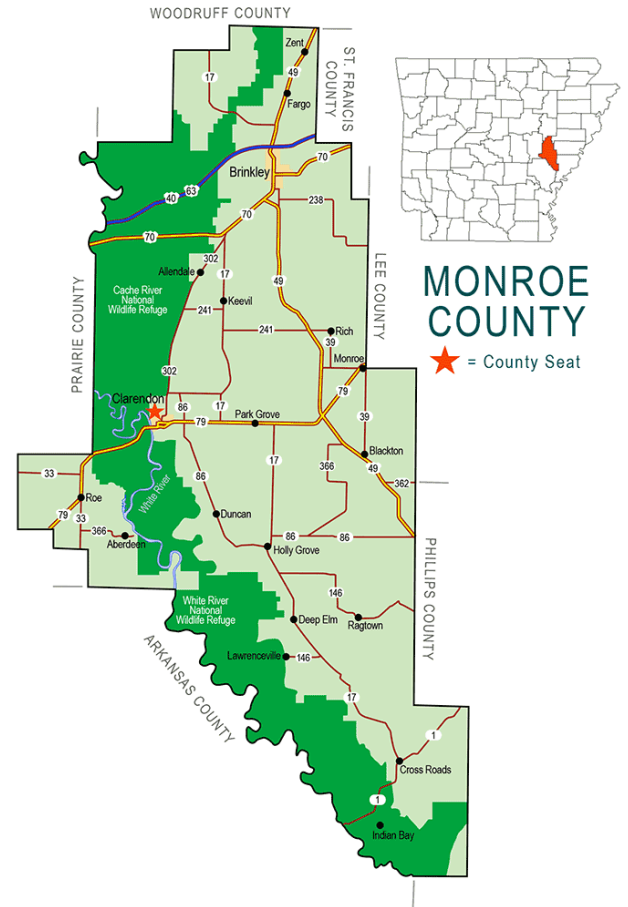


2022 Monroe County Crop Demonstrations



**DIVISION OF AGRICULTURE
RESEARCH & EXTENSION**

University of Arkansas System



Monroe County Cooperative Extension Service

Diane Cunningham – Administrative Specialist III

Valerie Turner – CEA FCS Staff Chair

Andrew Sayger – CEA Agriculture

The mission of the Cooperative Extension Service is to strengthen agriculture, communities, and families by connecting trusted research to the adoption of best practices. We not only work in agriculture, but also in 4-H youth development, Family and Consumer Sciences, Community Development, Wildlife and Nature and much more. As county extension agents, we take our research recommendations combined with practical advice and strive to improve the lives of those in our communities. We work for you.

This demonstration book is tailored to the producers of Monroe County. We conduct these demonstrations and research trials every year with a goal of helping and strengthening our local producers and crops. As the county agriculture agent, I work to serve our clientele. I hope you find the information in this report helpful to your operations. If you have any questions, comments, suggestions or would like to discuss any information, please contact me with the information below.

We would like to say a very special thank you to everyone who supports our programs. Without constant support from our clientele and volunteers it would be difficult to conduct these programs. We are sincerely grateful, and your support does not go unnoticed.

Sincerely,
Andrew Sayger

Monroe County Extension Agent – Agriculture
870-747-3397
asayger@uada.edu

Contents

Corn Hybrid Trial

Cornstalk Nitrate Testing

Corn Research Verification Program

Corn Multiplier

Rice Research Verification Program

Rice Multiplier I

Rice Multiplier II

Soybean Research Verification Program

Impact of Fungicide Application on Soybean

Soil Moisture Sensors

Zinc Sulfate in Rice

Southwestern Corn Borer Trap Catches

Bollworm Trap Catches

Monroe County Crop History

Monroe County Annual Update

Corn Standardized County Hybrid Trials Information Sheet

County: Monroe Crop: Corn

Grower: Shaun Bennett

County Agent: Andrew Sayger

Location of Field: Clarendon GPS: 34.700247, -91.182699

Soil Type: Jackport Silty Clay Loam

Previous Crop: Soybean

Planting Date: May 9, 2022

Row Width: 30"

Planting Population: 35,000

Harvest Date: September 10, 2022

Fertility: (lb/ac)	N	P	K	S	Boron
--- Preplant	42	80	108	12	1
--- Sidedress(V6)	101				
--- V 12	101				
Total Fertility:	244	80	108	12	1

Irrigation Type: Furrow

Number of Times: 6

Hybrid	Adj. Yield ¹	Area	Weight	Yield	% Moisture	Plant Stand ²	Lodging Score ³	Test Weight
Dyna-Gro 57VC53	145.26	0.222	1,870	150.42	18.4	35,000	1	58.3
AgriGold 645-16 RIB	180.98	0.225	2,330	184.92	17.3	34,000	1	57
Revere 1898TRE	195.73	0.227	2,500	196.66	15.9	35,000	1	60.5
Progeny 2015 VT2P	188.59	0.230	2,470	191.77	16.9	35,000	1	60.1
Dekalb 67-94	175.97	0.231	2,340	180.89	17.8	33,000	1	57.6
Pioneer 1222YHR	166.33	0.234	2,190	167.12	15.9	35,000	1	57.6
Dyna-Gro 55VC80	177.85	0.234	2,390	182.39	17.6	35,000	1	58.1
AgriGold 66-59 RIB	153.28	0.236	2,050	155.12	16.5	35,000	1	58.8
Revere 1307TRE	195.99	0.237	2,645	199.29	16.9	34,000	1	57.2
Progeny 2118VT2P	140.79	0.237	1,935	145.80	18.4	33,000	1	57.3
Dekalb 62-70	186.32	0.238	2,510	188.33	16.4	33,000	1	57.3
Pioneer 1718VYHR	151.09	0.238	2,060	154.56	17.4	35,000	1	58.2
Mission A1257 VT2P	177.19	0.238	2,370	177.82	15.8	34,000	1	58.3

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.

Cornstalk Nitrate Testing

Grass crops such as corn and rice often require nitrogen supplementation to achieve maximal grain yields. Due to differences in soil N availability, growing conditions, environment, and N uptake efficiency corn can be overfertilized with little to no adverse effects. When corn is overfertilized it will store N in the lower portion of the stalk in the form of nitrate. Research from Arkansas has shown that the level of nitrate in the base of the corn stalk can be used to determine if corn was over or under fertilized and help the producer make adjustments to N fertilizer in coming years.

Sampling

The county agent sampled seven fields over the past growing season. Samples are taken following R6 or blacklayer formation and before significant rainfall occurs. The ideal situation is to take samples within two weeks following blacklayer. An 8-inch sample portion of the stalk is taken between 6 and 14 inches above the soil surface.

Interpretation

Stalk nitrate concentrations between 150-1,000 ppm nitrate indicate that corn was properly fertilized.

Of the seven fields that was sampled, the test results revealed four fields were low in nitrate and three fields were optimum.

The low (<150ppm) test results indicate that there was no excess nitrogen, and the corn crop may have benefitted from more nitrogen fertilizer at the appropriate timings. The optimum results indicate that nitrate levels were in the 150-1,000 ppm range and nitrogen fertilizer was applied at the correct amounts and no adjustment is needed. There is a result of excess or overfertilization. I did not have any in that category of the seven fields that were sampled. If this occurs the test will give the amount of nitrogen that was applied in excess in pounds per acre. Granted this test does not help in the current production year. The benefit of this test is being able to make nitrogen fertilizer decisions based off historical data on a field-by-field basis. The next time the field is in corn you will know a target range of total nitrogen to apply for that field.

A report is included as an example.

Corn Stalk Nitrogen Recommendation Report

N-STaR Soil Test Laboratory

1366 West Altheimer Drive
 Fayetteville, AR 72704
 479-575-6752
NSTARLAB@uark.edu

Name	Andrew Sayger	State	AR
Email	asayger@uada.edu	Zip Code	72029
Address	609 Madison st	Phone	(870 747 3397
City	Clarendon	County	Monroe

Field Name	Monroe #1 CRVP	Submit Date	9/6/2022
------------	-----------------------	-------------	-----------------

Soil Texture	Number of Samples per Field	Corn Relative Maturity
Silt Loam	25	116-118
Total Nitrogen Application Rate	217	Nitrogen Split Practice (lbs.) 35PP-113 V4-69 Tassel

Field Name	Rep Number	CSNT Value (mg/kg)
------------	------------	--------------------

Monroe #1 CRVP	1	1738.5
Monroe #1 CRVP	2	627
Monroe #1 CRVP	3	93
Monroe #1 CRVP	4	76.5
Monroe #1 CRVP	5	81
Monroe #1 CRVP	6	5094
Monroe #1 CRVP	7	337.5
Monroe #1 CRVP	8	183
Monroe #1 CRVP	9	117
Monroe #1 CRVP	10	121.5
Monroe #1 CRVP	11	111
Monroe #1 CRVP	12	90
Monroe #1 CRVP	13	88.5
Monroe #1 CRVP	14	117
Monroe #1 CRVP	15	85.5
Monroe #1 CRVP	16	88.5
Monroe #1 CRVP	17	93
Monroe #1 CRVP	18	88.5
Monroe #1 CRVP	19	85.5
Monroe #1 CRVP	20	87
Monroe #1 CRVP	21	6645

Monroe #1 CRVP	22	2700
Monroe #1 CRVP	23	503.88
Monroe #1 CRVP	24	175.8
Monroe #1 CRVP	25	112.5

CSNT Average (mg/kg)

782

Management Suggestion	Excess Nitrogen Application (lb./A)
Optimum	No Excess

*1 Proper sampling is critical to the use of Corn Stalk Nitrate Testing*1 Collect samples within 2 weeks after black layer formation.

1 Sample 10 random locations across the field to encompass field variability. Each sampling location should be kept separate for a total of 10 sample bags per 1 Collect 5 stalks from each sampling location and bag together.

1 Use the University of Arkansas CSNT sampler or use a ruler and pruning shears to collect the proper stalk segment. First, cut the corn stalk at 14 inches above ground level and discard upper stalk. Then cut again at 6 inches above ground level. The resulting 8-inch stalk segment is the sample to be collected.

• Samples should be kept cool and packaged in a paper bag, never plastic, to avoid mold and mailed immediately or refrigerated, never frozen.

Cooperator: Kevin Thompson

Agent: Andrew Sayger

Coordinator: Chuck Capps

The 29-acre CRVP field was located on Hwy 49 south of Brinkley. The soil type was a Calhoun Silt Loam and the previous crop was soybean.

After field preparation was complete, a preplant fertilizer blend of (35-70-50-0-10Zn) was applied and bedded. On May 12 the field was planted to BH8721VT2P at 36,000 seeds/acre on 30" row width. Dual was applied after planting. On May 31, 200 lbs/acre Urea + 100 lbs/acre AMS was applied at V6 growth stage. Also on May 31, Halex Gt, and Atrazine was applied. On June 27, the pre-tassel nitrogen application was made of 150 lbs/acre of Urea. An ear leaf sample was taken between V10-VT for nitrogen content. Nitrogen content was less than 3%. According to research done by Dr. Trent Roberts, we see an economical yield increase by applying a tassel shot when tissue nitrogen content is less than 3%. There was a small amount of southern rust in the field but not enough to spray for and it never spread. The corn was also past critical growth stages for treatment. The field was irrigated based off soil moisture sensors and terminated at 50% starch line. The field was irrigated 6 times. The field was harvested on September 25 yielding 174 bu/ac. Stalk samples were taken after black layer for nitrate testing in the stalk. The samples indicated that nitrogen was sufficient for the corn to achieve optimal yield.

2022 Corn and Grain Sorghum Verification Program - Data Sheet						Agent: Andrew Sayger		Acres in Verification Trial: 28				
						Cooperator: Kevin Thompson		Total Cultivated Acres in Field: 28				
						County: Monroe		Estimated Labor Cost per Hour:				
						Soil Type: Calhoun Silt Loam		Variety: BH Genetics 8721VT2P				
						Yield: 174.3		Row Width: 30"				
						GPS		Previous Crop: Soybean				
DATE	OPERATION	TRACTORS & SELF PROPELLED EQUIPMENT				MATERIAL, LABOR, OR MISCELLANEOUS						
		BRAND & MODEL NO.	HP (PTO)	EQUIPMENT WIDTH	TIMES OVER	CHEMICAL TRADE NAME OR ITEM	UNITS (pts, lbs, etc.)	TOTAL UNITS APPLIED	PRODUCT RATE PER ACRE	PRICE PER UNIT	ACRES COVERED	BAND WIDTH IF APPLICABLE (INCHES)
fall	disk		240	32'	1						28	
5/11/2022	Fertilize		215	32'	1	urea	lbs	2,100	75		28	
						triple super phosphate	lbs	1,540	155		28	
						potash	lbs	2,324	83		28	
						zinc sulfate	lbs	280	10		28	
5/11/2022	bedder/roller		220	20'	1						28	
5/12/2022	planting		220	40'	1		seed	1,008,000	36,000		28	
12-May	herbicide	custom		90'	1	dual	pt	28	1		28	
5/31/2022	fertilizer	tom/spreader truck			1	urea	lbs	5600	200		28	
						ammonium sulfate	lbs	2800	100		28	
5/31/2022	herbicide	custom		90'		Halex GT	pt	108	3.6		28	
						atrazine	qt	60	2		28	
6/27/2022	fertilizer	airplane			1	urea	lbs	4,200	150		28	
											28	
											28	
9/25/2022	combine		473	25'	1						28	
9/25/2022	tractor & grain cart		185	800 bushel	1						28	
5 irrigations	irrigation			8" electric	6						28	

Cooperator: Derrick Young
Agent: Andrew Sayger

The 83-acre corn multiplier field was located off Hwy 70 just west of Wheatley. The soil type in this field was a Grenada Silt Loam and the previous crop was soybean.

After field preparation was complete in the spring a preplant fertilizer blend of (58-40-60-10-1) (N-P-K-S-Zn) was applied and bedded. On May 7, the field was planted to NK 1523-V at 33,000 seed/acre on 30" rows. Dual was applied after planting on May 8. The field had a final plant population of 30,000 plants/acre. On June 6, at V5 growth stage, 300 lbs/acre Urea + NBPT was applied. Roundup Powermax + Atrazine + Dual was also applied on June 6. On July 12, the pre-tassel nitrogen application was made with 100 lbs/acre Urea + NBPT and irrigated. Total fertilizer for the field was (242-40-60-10-1). No significant diseases were spotted in the field. Irrigation was terminated approximately August 20 using starch line and soil moisture sensor readings. A total of 5 irrigations were used. The field was harvested on September 30 yielding 175 bu/acre at 12.7% moisture.

2022 Corn and Grain Sorghum Verification Program - Data Sheet						Agent: Andrew Sayger		Acres in Verification Trial: 83					
						Cooperator: Derrick Young		Total Cultivated Acres in Field: 83					
						County: Monroe		Estimated Labor Cost per Hour:					
						Soil Type: Grenada Silt Loam		Variety: NK 1523-V					
						Yield: 175 at 12.7%		Row Width: 30"					
						GPS		Previous Crop: Soybean					
DATE	OPERATION	TRACTORS & SELF PROPELLED EQUIPMENT				MATERIAL, LABOR, OR MISCELLANEOUS							
		BRAND & MODEL NO.	HP (PTO)	EQUIPMENT WIDTH	TIMES OVER	CHEMICAL TRADE NAME OR ITEM	UNITS (pts, lbs, etc.)	TOTAL UNITS APPLIED	PRODUCT RATE PER ACRE	PRICE PER UNIT	ACRES COVERED	BAND WIDTH IF APPLICABLE (INCHES)	
Spring	Field Cultivator		304	32'	1						83		
5/7/2022	Fertilize		215	32'	1	urea	lbs	8,300	100		83		
						MESZ	lbs	8,300	100		83		
						potash	lbs	8,300	100		83		
5/7/2022	bedder/roller		304	20'	1						83		
5/7/2022	planting		304	30'	1		seed	2,739,000	33,000		83		
8-May	herbicide	custom		90'	1	dual	pt	83	1		83		
6/6/2022	fertilizer	tom/spreader truck			1	urea	lbs	2739	300		83		
6/6/2022	herbicide	custom		90'		Roundup Powermax	oz	1,826	22		83		
						atrazine	pt	125	1.5		83		
						Dual	pt	83	1		83		
											83		
7/12/2022	Fertilizer	airplane			1	urea	lbs	8300	100		83		
9/30/2022	combine		543	25'	1						83		
9/30/2022	tractor & grain cart		304	800 bushel	1						83		
5 irrigations	irrigation			8" electric	5						83		

Cooperator: Lance Gray
Agent: Andrew Sayger
Coordinator: Ralph Mazzanti

The Monroe County furrow irrigated rice field was located on Hwy 49 between Henderson corner and Blackton on a silt loam soil. The field consisted of 44 acres and the previous crop was soybean. The cultivar grown was DG263L treated with the company's standard seed treatment. Following conventional spring tillage practices the field was drill seeded at 45 lbs/ac on April 12 at 7.5" row spacings on 60" beds. Prior to planting, 80 lbs/acre of potash and 150 lbs/acre of MESZ was applied based on soil test analysis. At planting, Command, Sharpen, and Glyphosate were applied for preemergent and burndown weed control. On April 27 Prowl herbicide was applied. Emergence was observed on April 28 at 10 plants per sqft. Facet L, Permit Plus, and Crop oil was applied on May 5. N-STaR (nitrogen soil testing for rice) was taken on the field in the spring. The first nitrogen application was made on May 17 with 50 lbs Urea + 50 lbs AMS per acre. 100 lbs Urea + NBPT was applied on May 21 and May 31. Another 100 lbs Urea + NBPT was applied on June 2 and June 20 at late boot. A fungicide of Propiconazole was applied on July 11 due to a history of smuts in the field. Rice stink bugs were above threshold and Lamba-Cy was applied on August 9. The field was harvested on August 29 yielding 170 bu/ac dried. The milling yield was 55/63. Rainfall during the growing season was 3.95". Total irrigation was estimated at 26".

2022 Research Verification Program - Data Sheet						Agent: Andrew Sayger		Acres in Verification Trial: 44				
						Cooperator: Lance Gray		Days to 3				
						County: Monroe		Moisture: 18%				
						Soil Type: Silt Loam		Variety: DG 263 L				
						Yield: 170 bu Milling 55/63		Row Width: 7.5				
						Levees/Water Source: Row-Rice		Electric Well		Previous Crop: Soybean		
DATE	OPERATION	TRACTORS & SELF PROPELLED EQUIPMENT				MATERIAL, LABOR, OR MISCELLANEOUS						
		BRAND & MODEL NO.	HP (PTO)	EQUIPMENT WIDTH	TIMES OVER	CHEMICAL TRADE NAME OR ITEM	UNITS (pts, lbs, etc.)	TOTAL UNITS APPLIED	PRODUCT RATE PER ACRE	PRICE PER UNIT	ACRES COVERED	BAND WIDTH IF APPLICABLE (INCHES)
Spring	DMI	JD 8320R	320	34'	1						44	
Spring	Hipper	JD 8320R	320	26'	1						44	
Spring	Fertilizer	JD 4720	275	90'	1	0-0-50 + MEZ	lbs/lbs	3520/6600	80/150		44	
4/12/2022	Planting/Drill	JD 8320 R	320	42'	1	DG 263 L	lbs	1980	45		44	
4/12/2022	Herbicide	JD 4720	275	90'	1	Command/Sharpen/Glyphos	oz/oz/qt	704/88/44	16/2/1		44	
4/27/2022	Herbicide	JD 4720	275	90'	1	Prowl	pts	93	2.1		44	
4/28/2022	Emergence					10 plants ft2					44	
5/17/2022	Herbicide	JD 4720	274	90'	1	acet L/Permit Plus/Crop	qt/oz/pt	44/33/44	1/.75/1		44	
5/17/2022	Fertilizer	Airplane			1	Urea + Ammonium Sulfat	lbs/lbs	2200/2200	50/50		44	
5/21/2022	Fertilizer	Airplane			1	Urea + NBPT	lbs	4400	100		44	
5/31/2022	Fertilizer	Airplane			1	Urea +NBPT	lbs	4400	100		44	
6/2/2022	Fertilizer	Airplane			1	Urea + NBPT	lbs	4,400	100		44	
6/20/2022	Fertilizer	Airplane			1	Urea + NBPT	lbs	4400	100		44	
7/1/2022	Herbicide	Airplane			1	Clincher/Crop Oil	oz/qt	300/20	15/1		20	
7/11/2022	Fungicide	Airplane			1	Propiconazole	oz	264	6		44	
8/9/2022	Insecticide	Airplane			1	Lambda-Cy	oz	88	2		44	
8/29/2022	Harvest	JD S 680	350	28'	1						44	

Cooperator: Derrick Young
Agent: Andrew Sayger

The 25-acre straight levee rice field was located just east of Brinkley on a silt loam soil. The field had been fallow the previous year with precision grade dirt work. After spring tillage, RiceTec 7521 FP was planted at 24 lbs/acre with the company's standard seed treatment on May 12. 100 lbs MESZ, 100 lbs Topchoice, and 100 lbs Potash was applied based off soil test reports. Command + Facet L was applied at planting for preemergent weed control. Emergence was observed on May 30 with 7 plants/sq foot and the field was flushed to help remaining seedlings emerge and grow. A second herbicide application of Command + Preface was applied for pre and post emerge weed control on June 6. Pre flood Nitrogen application of 260 lbs/acre Urea + NBPT was applied on June 25 and flooded in 3 days. 65 lbs/acre Urea was applied at early boot on August 4. Rice stinkbugs reached threshold on August 30 and was sprayed with Endigo ZC. The field was harvested on October 1 yielding 195 bu/acre.

Producer: Will Coleman
Agent: Andrew Sayger
Coordinator: Chad Norton

The 60-acre field was located NE of Holly Grove on 366. The soil type was a Foley-Calhoun-Bonn complex. Corn was the previous crop.

Field prep was completed the previous fall and no field tillage was done prior to planting in the spring. A burndown was applied on April 4 of 22 oz Roundup PowerMax, 8 oz Dicamba, and 1 oz First Shot. The field was planted on April 29 with Progeny 4604XF at 125,000 seed/acre on 30" row spacing. An herbicide application was made on April 30 with 24 oz Devour, 3.2 oz Zidua SC, and 8 oz Derive. Final plant stand was determined on May 11 at V1 at 95,000 plants/acre. A fertilizer blend of 0-23-90 was applied on May 12. Another herbicide application was made on June 4 with 36 oz Liberty and 1.2 pints of Charger Basic. The field never reached threshold for insects and no fungicides were applied.

The field was harvested on October 9 yielding 68.8 bu/acre adjusted to 13% moisture. The field was irrigated 6 times by an electric well based off readings gathered from soil moisture sensors placed at 6, 12, and 18 inches in the root zone.

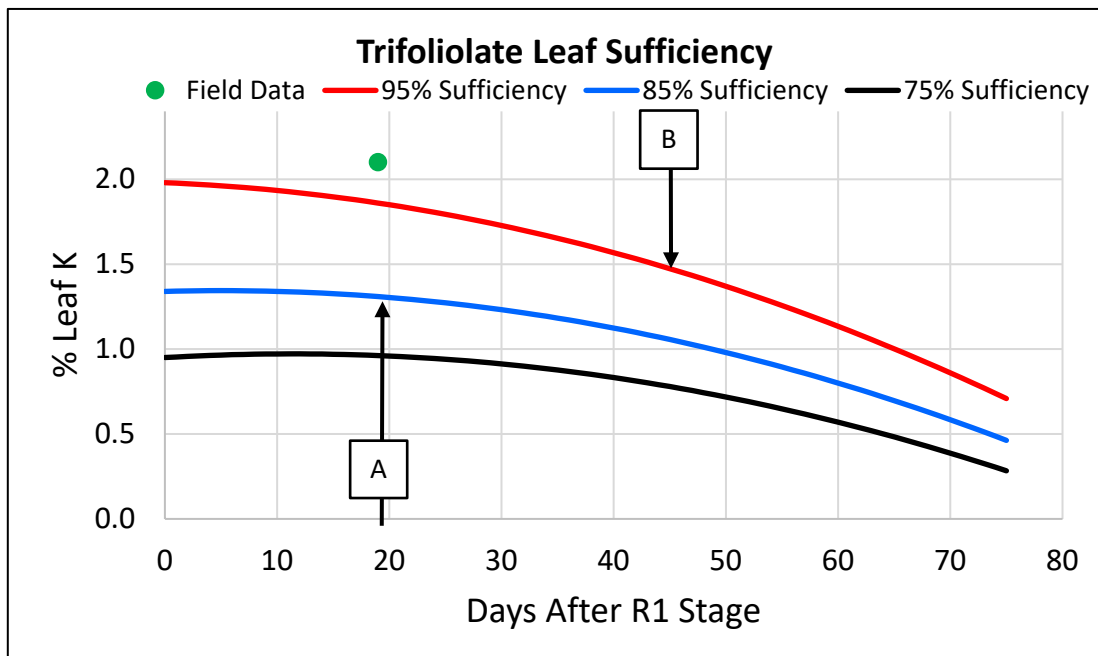
2022 Soybean Research Verification Program Budget Data Sheet						County: Monroe		Acres in Verification Trial: 60			
						Agent: Andrew Sayger		Row Spacing: 30"			
						Cooperator: Will Coleman		Variety: Progeny 4604XF			
						Soil Type: Foley-Calhoun-Bonn Compl		Previous Crop: Corn			
						Yield: 68.8 bu/ac					
DATE	OPERATION	TRACTORS & SELF PROPELLED EQUIPMENT				MATERIAL, LABOR, OR MISCELLANEOUS					
		BRAND & MODEL NO.	HP (PTO)	EQUIPMENT WIDTH	TIMES OVER	CHEMICAL TRADE NAME OR ITEM	UNITS (pts, lbs, etc.)	TOTAL UNITS APPLIED	PRODUCT RATE PER ACRE	PRICE PER UNIT	ACRES COVERED
Fall	Field Cultivator	NH T8 330	285	28'	1						60
Fall	Bedder/Roller	NH T8 330	285	30'	1						60
Spring	Fertilizer	Custom			1	P2O5 +	lbs	1380	23		60
Spring						K2O	lbs	5400	90		60
Spring	Burndown	Custom			1	RoundUp PowerMax +	oz	1320	22		60
						dicamba +	oz	480	8		60
						First Shot	oz	60	1		60
4/29/2022	Plant	NH T8 330	285	30'	1	Progeny 4604XF +	K seeds	7500K	125K		60
						Cruiser Maxx	oz	96	1.6		60
4/30/2022	Herbicide	JD 4038R		120'	1	Devour +	oz	1440	24		60
						Zidua SC +	oz	192	3.2		60
						Derive	oz	480	8		60
6/4/2022	Herbicide	JD 4038R		120'	1	Liberty +	oz	792	36		60
						Charger Basic	pt	72	1.2		60
6/18/2022	Lay polypipe	NH T8 330	285		1						60
	Irrigate				5	Electric well					60
10/5/2022	Pickup Polypipe	NH T8 330	285		1						60
10/9/2022	Harvest	JD 9770		25	1						60
	Grain Cart	NH T8 410	340		1	750 bu capacity					60
68.8 bushels/acre adjusted to 13% moisture											

Below is an example of the soybean tissue K monitoring tool used in our SRVP field. This is used to diagnose deficiencies and hidden hunger of K in the plant tissue. We used this on the SRVP field. The leaf K concentration was above the 95% relative grain yield line which indicated a K application was not needed. Many soybean fields suffer from hidden hunger where no deficiency symptoms appear, but the plant would benefit in yield from a K application. We can use this simple tool to diagnose K deficiencies and achieve maximal grain yield as it relates to potassium.

Soybean Tissue K Monitoring Tool

Grower Name	<input type="text" value="Will Coleman"/>	Field Name	<input type="text" value="SRVP"/>
Variety Name	<input type="text" value="Progeny 460XF"/>	Maturity Group	<input type="text" value="4.6"/>
County	<input type="text" value="Monroe"/>	State	<input type="text" value="AR"/>
Planting Date	<input type="text"/>	R1 (Flowering) Date	<input type="text"/>

Sample	Sample Date (Enter data)	Leaf % K (Enter data)
1	27-Jun	2.1



This soybean tissue K monitoring tool was designed to help easily diagnose in-season K deficiencies with trifoliolate leaf lab results. Only trifoliolate leaf (not including petioles) from the uppermost fully expanded leaf should be compared to the critical concentrations shown.

Instructions:

1. Enter planting date (required)
2. Enter date of R1 or first flower (required)
Use SoyStage to estimate R1 date if unknown:
3. Enter date each sample was taken (required)
4. Enter leaflet K concentration from lab analysis (required)
5. Green dot will appear on the figure
6. Symbols below the red line are K deficient

Understanding Your Results:

The graph shows the dynamic critical potassium (K) concentration thresholds for reproductive soybean. Critical concentrations determine the nutrient status at which below is considered deficient and yield limiting, and above which is considered sufficient. The three lines indicate the critical concentration for relative grain yield goals of 95% (red), 85% (blue), and 75% (black). **Any point below the red 95% relative grain yield goal critical concentration is deficient and yield limiting.** The 85% and 75% grain yield lines are shown to help the user understand the potential yield loss if left unmanaged. If a field is deficient, an in-season corrective application of granular K fertilizer can correct the deficiency and prevent yield loss when applied correctly.

Fertilizer Timing:

The granular K fertilizer must be applied and incorporated with irrigation or rainfall within 20 days after R1 (A) in severely deficient situations and within 44 days after R1 (B) for hidden hunger to prevent yield loss. After this point, yield loss is anticipated and a corrective application can only minimize the loss, not prevent it.

Fertilizer Rate:

60-120 lbs K₂O per acre depending on the severity of the situation. Ongoing research intends to improve this rate and calibrate it to the leaf K concentration.



Dr. Terry N. Spurlock
Extension Plant Pathologist
tspurlock@uada.edu
(501) 412-7983

DETERMINING THE IMPACT OF FUNGICIDE APPLICATION ON SOYBEAN

AGENT

ANDREW SAYGER

COUNTY

MONROE

METHODS

A large block fungicide trial was arranged in a randomized complete block design, planted on 38 inch rows with each fungicide treatment replicated three times, and a non-treated control included in each replication. Fungicides were applied at R3 on 2022-07-29 with a 30ft boom mounted on a ground-driven sprayer in a total water volume of 10 gal/A at 40 psi using TeeJet XR11002VS tips at 5.0 mph. Five points were georeferenced approximately equidistant throughout each block for disease assessments. Disease severity was based on visual observation where 0 = no disease and 9 = severe disease. Data were collected at a

1.5m radius around each point. Diseases were assessed prior to treatment and through R6. The grain was harvested 2022-09-29 with a commercial combine and yield monitor. Yields were adjusted to 13% moisture content for comparison. Georeferenced yield and disease data was cleaned, averaged within each fungicide block, and analyzed by ANOVA followed by means separation of fixed effects using Tukey's honest significant difference test (HSD) at $P=0.05$.

RESULTS

- TARGET SPOT and FROGEYE LEAF SPOT were rated at growth stage R6. Product efficacy against these diseases can be seen in Tables 1 & 2.
- Overall, disease incidence and severity were low in the test area throughout most of the year. Foliar disease developed late after rains.
- The levels of target spot were generally not severe. However, in some areas it had advanced very high in the canopy which may account for the differences in yield between treatments.
- Yield averaged 102.62 across the test and was significantly different ($P = 0.0001$) among treatments (Figure 1.). Yield comparisons can be seen in Table 3.
- Based on these results, a fungicide application did add value to the crop above the application cost. However, the other product did not.

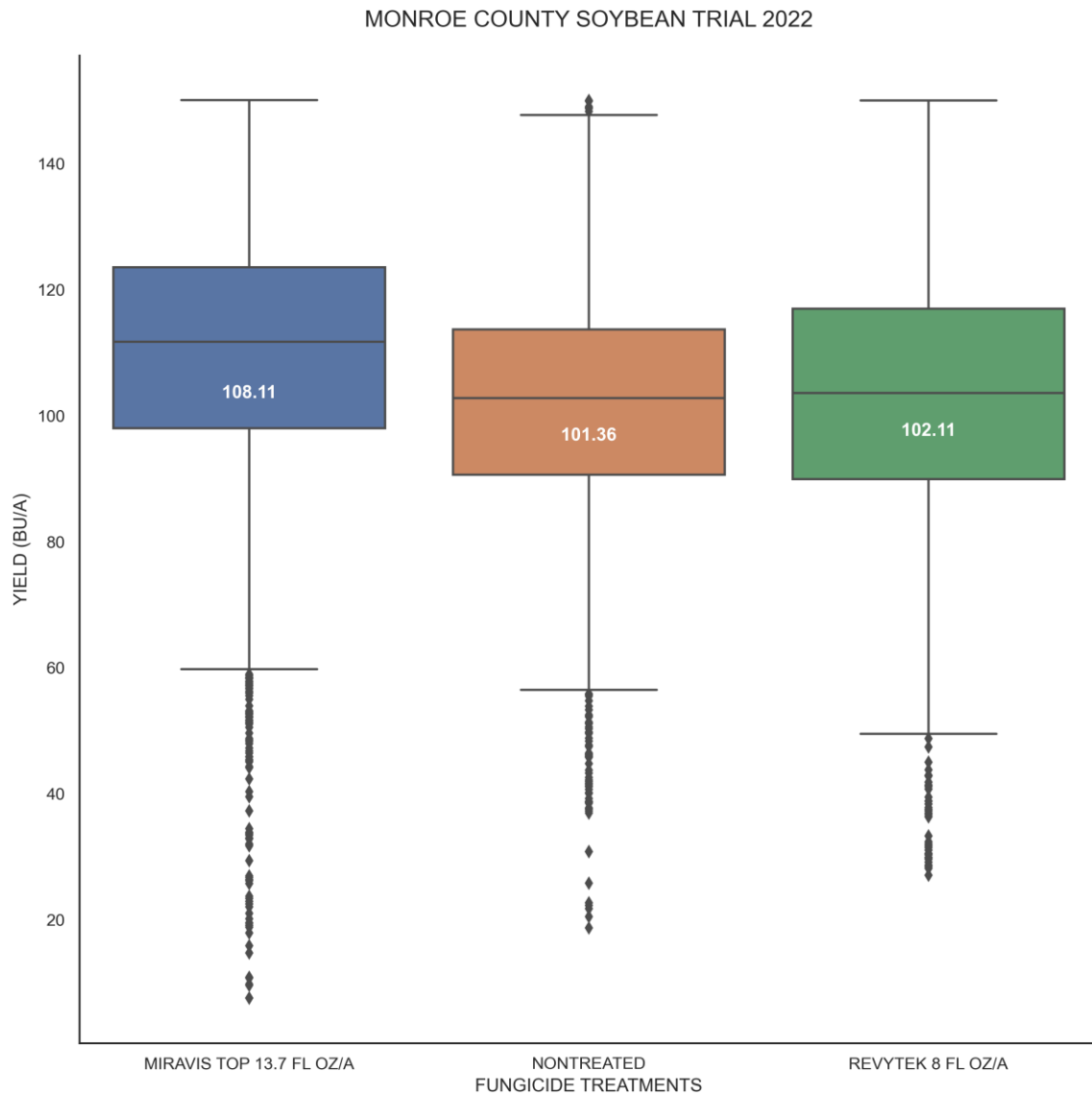


Figure 1.Yield impact of foliar fungicides replicated in large blocks. The boxplot indicates the median yield and variability within each treatment. Mean yields are printed inside of the boxes just below the median line.

ACKNOWLEDGEMENTS

We thank CURTIS NASH for providing a field location for the trial and the Arkansas Soybean Promotion Board for generously providing funding for this project. We also thank the MONROE County Extension Agent-Agriculture, Andrew Sayger, for assistance with the trial.

Table 1. Response of TARGET SPOT to fungicides applied to soybean (R6 rating).

TREATMENT A	TREATMENT B	Q-VALUE	P-VALUE
NONTREATED	MIRAVIS TOP 13.7 FL OZ/A	0.775	0.84
NONTREATED	REVYTEK 8 FL OZ/A	1.549	0.551
MIRAVIS TOP 13.7 FL OZ/A	REVYTEK 8 FL OZ/A	2.324	0.3

Mean efficacy of fungicide treatments are compared to each other. Means having the same letter are not significantly different using Tukey's honest significant difference test $P = 0.05$. P-values less than 0.05 are different. A positive q-value rating indicates the first listed treatment is higher than the second. A negative value indicates it is less than the second.

Table 2. Response of FROGEYE LEAF SPOT to fungicides applied to soybean (R6 rating).

TREATMENT A	TREATMENT B	Q-VALUE	P-VALUE
NONTREATED	MIRAVIS TOP 13.7 FL OZ/A	+	0.001
NONTREATED	REVYTEK 8 FL OZ/A	+	0.001
MIRAVIS TOP 13.7 FL OZ/A	REVYTEK 8 FL OZ/A	0.0	0.9

Mean efficacy of fungicide treatments are compared to each other. Means having the same letter are not significantly different using Tukey's honest significant difference test $P = 0.05$. P-values less than 0.05 are different. A positive q-value rating indicates the first listed treatment is higher than the second. A negative value indicates it is less than the second.

Table 3. Yield response of soybean to fungicides applied at R3.

TREATMENT A	TREATMENT B	Q-VALUE	P-VALUE
MIRAVIS TOP 13.7 FL OZ/A	NONTREATED	13.423	0.001
MIRAVIS TOP 13.7 FL OZ/A	REVYTEK 8 FL OZ/A	11.961	0.001
NONTREATED	REVYTEK 8 FL OZ/A	1.477	0.546

Mean efficacy of fungicide treatments are compared to each other. Means having the same letter are not significantly different using Tukey's honest significant difference test $P = 0.05$. P-values less than 0.05 are different. A positive q-value rating indicates the first listed treatment is higher than the second. A negative value indicates it is less than the second.



Figure 2. Disease images. [A] Target spot from leaflet from the lower canopy. [B] & [C] Pod rot and abortion from the lower canopy. [D] Frogeye leaf spot from the top third of the canopy.

PLOT MAP AND DRONE DATA

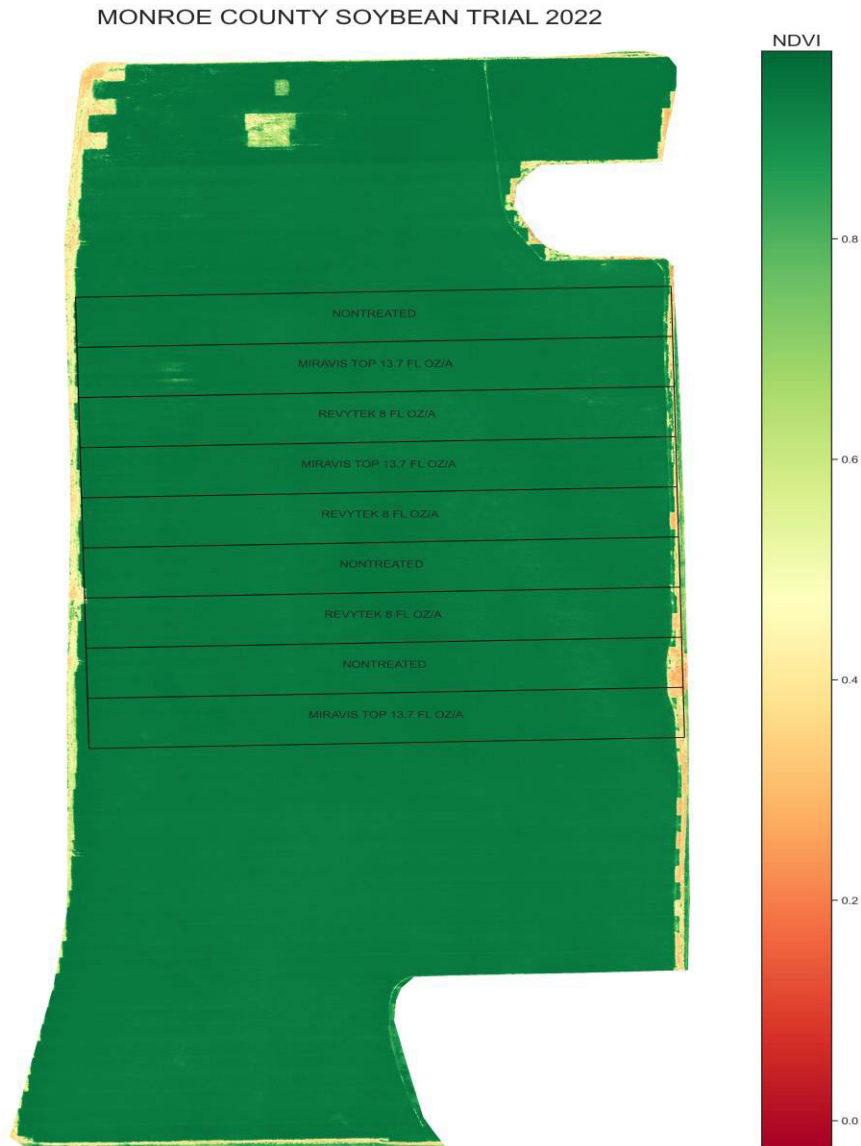
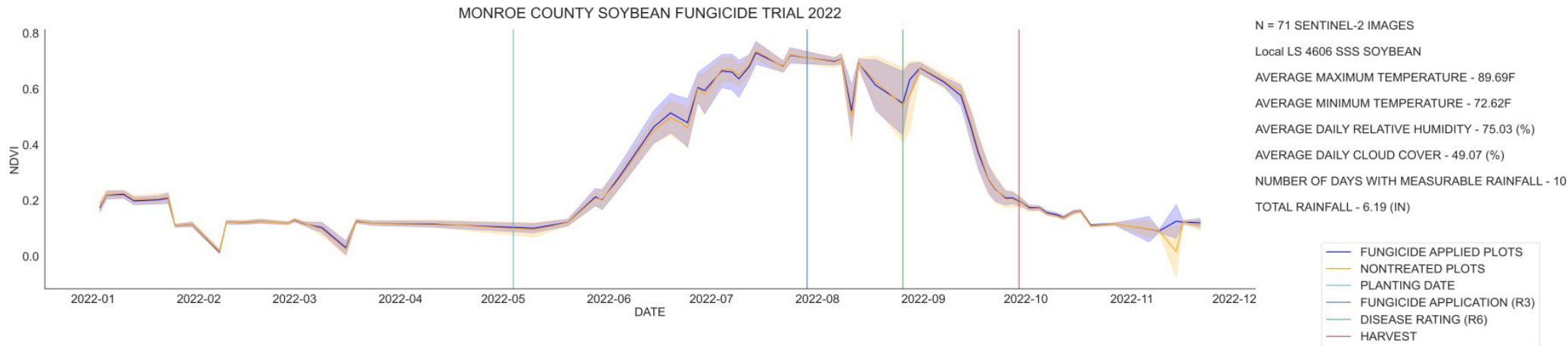


Figure 3. Imagery collected at the time of disease evaluations (R6) using a drone and multi- spectral sensor. The NDVI image indicates the health of the field plots at the time of disease evaluations. At times, fungicides can induce a stay green condition where soybean matures more slowly than if the crop had been left untreated. The true impact to plant health of this condition is not well understood.



FIELD GROWTH CURVE AND WEATHER DATA

Figure 4. Growth curve generated from Sentinel-2 satellite data with date of planting, fungicide application, disease evaluation, and harvest timepoints represented. Using the near infrared band and visible red band, a normalized difference vegetation index (NDVI) was calculated. The NDVI is a ratio that correlates to the amount of green plant material in the field. The growth curve of the plots where the fungicide standard treatment was applied (Miravis Top 13.7 fl oz/acre) and the nontreated control plots have been separated on the chart. Differences in the NDVI values between these two curves may indicate differences in plant health between the two treatments. Abrupt downward progress of the curve indicates cloud cover over the field at the time the image was acquired.

SOILS DATA

MONROE COUNTY SOYBEAN TRIAL SOILS MAP

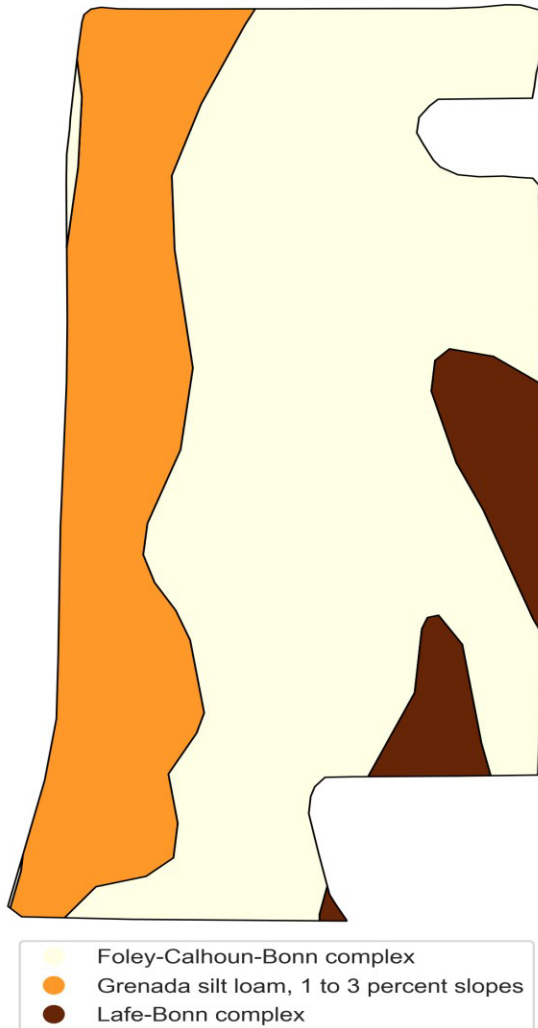


Figure 5. Soils map of the field. Complete descriptions of these soil series can be found at <https://soilseries.sc.egov.usda.gov>.

Producer: RP George
Producer: Kevin Thompson
Agent: Andrew Sayger

Introduction:

Soil moisture sensing is an invaluable tool for understanding agronomic practices and improving irrigation water management. Soil moisture sensors provide a measure of plant available water. Sensor trends can also provide information about irrigation efficiency problems, infiltration, deep percolation, and water stress. Sensors will not always save water or save irrigations. At times we discover that we should irrigate more often to maximize crop potential.

We used the Watermark sensors in these field demonstrations. Sensors are placed in the root zone of the crop at various depths such as 6", 12", 18", and 30". The sensors measure the soil moisture that is available to the plant in the soil profile at the various depths. Sensors should be placed 2/3 down the row from the water source in the soil that is most representative of the field. These sensors were manually read with a handheld device every week or when necessary. Readings from each sensor are then averaged based on the percentage of roots at each depth. This can easily be done by hand, but the Soil Moisture Sensor Calculator App developed by the Division of Agriculture was used to determine these values.

Fields and Discussion:

The first three fields were with R. P. and Ronnie George. The first field was located on Highway 17 north of Holly Grove. Sensors were placed in the field near the end of May and read weekly. Sensors were placed 2/3 down the row and in the most common soil profile which was a sandy loam. A total of 4 irrigations were triggered on this field beginning June 15th and ending the end of July. This light soil typically needed irrigating 2-3 days earlier than a silt loam. Stress would occur on the plant above 70 cb on this soil type so our typical trigger point for irrigation was about 40cb at peak irrigation needs based on the amount of time it took water to get across the farm. The trigger would vary depending on growth stage. We determined irrigation termination at 50% starch line

with adequate soil moisture. The sensors helped determine how much moisture was available in the soil. At termination there was 3.2" moisture available in the soil and the plant only required 2" to finish. Based on this information we terminated irrigation and did not irrigate.

The second field was located with the Georges at Crossroads. Sensors were placed in the field at the desired location about the end of May and read weekly. This field was a silt loam soil type. A total of 4 irrigations were triggered on this field beginning June 15th and ending the end of July. Readings indicated that the roots were in the top 18" of soil through June but the first reading in July showed that roots were starting to pull water from 30". According to the Soil Moisture Sensor Calculator app, stress would occur on the plant at 123 cb. Our trigger for irrigations typically occurred at 80cb from emergence-tasseling, 65cb from tasseling-dent, and 90 cb from dent-black layer. We determined irrigation termination at 50% starch line with adequate soil moisture. A reading on August 4th indicated that there was 2" of moisture available in the soil profile to the plant and only 1" of moisture was needed to finish the crop. Therefore, irrigation was terminated.

The third field was located with the Georges at Crossroads in soybeans. Sensors were placed in the field at the desired location about the end of May and read weekly. This field was a silt loam soil type. A total of 4 irrigations were triggered on this field beginning June 15th and ending August 15th. According to the Soil Moisture Sensor Calculator app, stress would occur on the plant at 134 cb. The trigger for irrigation was around 90cb. A reading on August 15th indicated that there was 1.3" of moisture available in the soil profile to the plant and 4" of moisture was needed to finish the crop. This was the last irrigation.

The fourth field was located on Kevin Thompsons at Brinkley in soybeans. Sensors were placed in the field at the desired location about the end of June and read weekly. This field was a silt loam soil type. A total of 4 irrigations were triggered on this field beginning July 5th and ending September 8th. According to the Soil Moisture Sensor Calculator app, stress would occur on the plant at 134 cb. The trigger for irrigation was around 90cb. A reading on September 15th indicated that 1.3" of moisture was needed to finish the crop. We monitored moisture until the plants reached termination and did not need to irrigate again.

Producer: Chad Hornsby

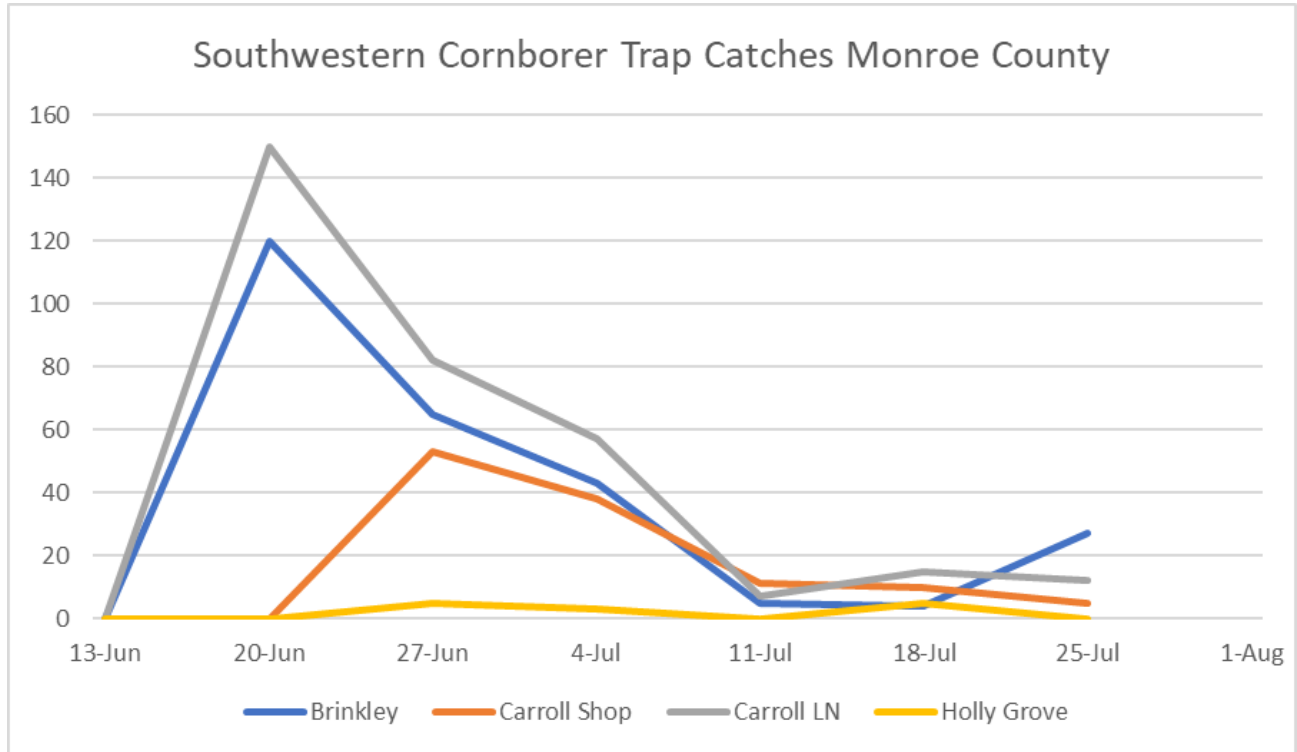
Agent: Andrew Sayger

Introduction

Zinc (Zn) deficiency in rice normally occurs on silt and sandy loam soils or on fields that have been precision graded. Plant available Zn is reduced when soil pH is increased either from calcareous irrigation water, over-liming and/or exposure to Zn deficient sub soils. Zinc fertilizer recommendations are based on soil texture, soil test Zn less than 4.0 ppm (approximately 8 lbs./acre), and soil pH greater than 6.0. Zinc deficiency symptoms are typically observed shortly after flooding but can appear on seedling rice. Zinc fertilizer is recommended as a precautionary measure on suspect soils at rates of 5-10 lbs./acre of actual Zinc. Zinc fertilizer sources should have a minimum of 50% water solubility for optimum effectiveness.

Discussion

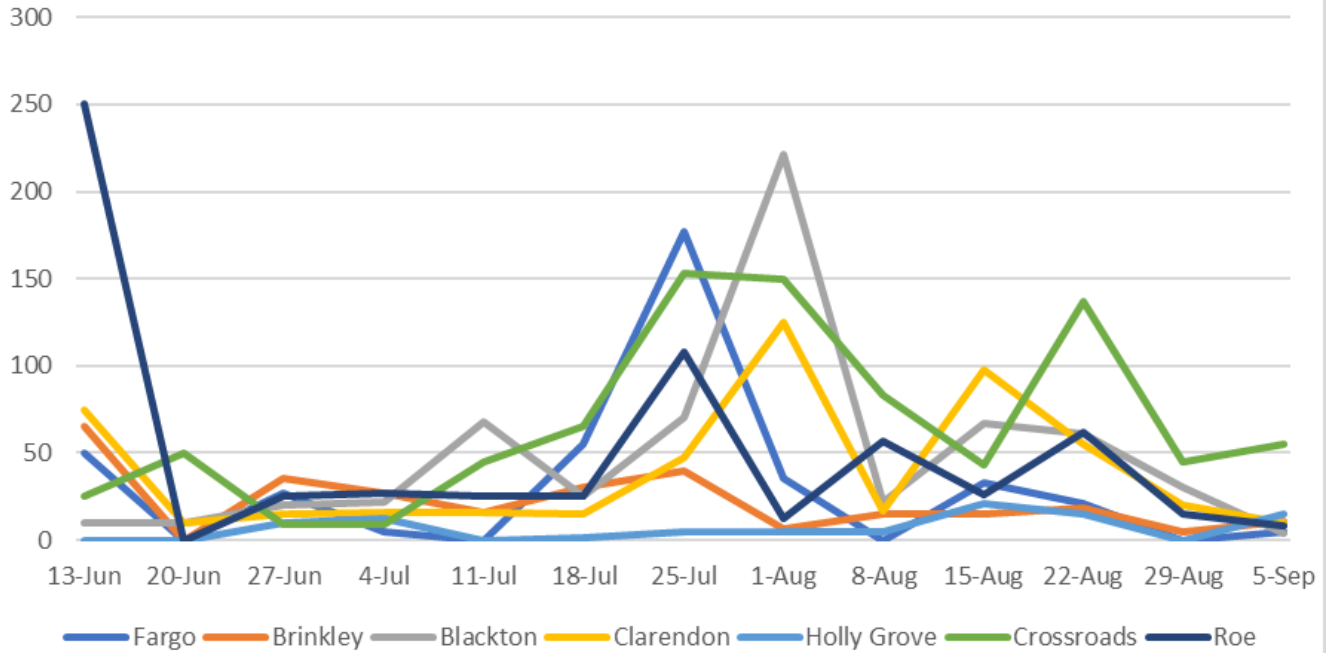
A 35-acre field was selected matching the criteria for a zinc sulfate application. Soil samples taken in February of 2022 had results of 6.5 soil pH, 1.6 ppm of soil test zinc which recommended 10 pounds of actual zinc per acre be applied to prevent zinc deficiency in rice and yield loss. Zinc sulfate was applied to the field at 30 lbs/acre along with phosphorous and potassium according to soil test recommendations. A 90-foot swath was not fertilized with zinc sulfate to allow for a check. Phosphorous and potassium was applied to the check at the same rate as the rest of the field. All other production practices were the same for the check and whole field. At harvest, there was no significant difference in yield from the check compared to the rest of the field. There were some underlying conditions that we feel altered the outcome of the test. Timely irrigation was difficult to achieve due to small water compacity and the abnormally dry year. There were also symptoms of potassium deficiency that showed up later in the year that may have influenced yield as well. Plant tissue samples taken throughout the growing season in the field averaged 4 ppm higher in zinc concentration compared to the check indicating there was zinc available to the plant. A late tissue sample also indicated that potassium was insufficient in the plant tissue.



	Brinkley	Carroll Shop	Carroll LN	Holly Grove
13-Jun	0	0	0	0
20-Jun	120	0	150	0
27-Jun	65	53	82	5
4-Jul	43	38	57	3
11-Jul	5	11	7	0
18-Jul	4	10	15	5
25-Jul	27	5	12	0



Bollworm Trap Catches Monroe County



	Fargo	Brinkley	Blackton	Clarendon	Holly Grove	Crossroad	Roe
13-Jun	50	65	10	75	0	25	250
20-Jun	0	0	10	10	0	50	0
27-Jun	27	35	20	15	10	9	25
4-Jul	5	27	22	16	12	9	27
11-Jul	0	16	68	16	0	45	25
18-Jul	55	30	25	15	1	65	25
25-Jul	177	40	70	47	5	153	108
1-Aug	35	6	221	125	5	150	12
8-Aug	0	15	22	17	5	83	57
15-Aug	33	15	67	98	21	43	26
22-Aug	21	18	61	55	15	137	62
29-Aug	0	5	30	20	0	45	15
5-Sep	5	11	4	10	15	55	8



Monroe County Crop History					
	2017	2018	2019	2020	2021
Rice					
County Acres	36,000	45,900	34,000	46,200	33,700
County Avg yield	168.4	166.6	155.3	164.8	164.2
State Acres	1,104,000	1,422,000	1,126,000	1,441,000	1,198,000
State Avg yield	166.4	167.1	166.2	166.6	169.5
Corn					
County Acres	29,000	26,500	30,600	20,800	32,200
County Avg yield	182.1	173.2	169.6	169.7	173.8
State Acres	595,000	645,000	735,000	605,000	830,000
State Avg yield	183	181	175	184	184
Cotton					
County Acres	2,712	5,260	15,400	14,100	12,700
County Avg yield	na	na	1,184	1,130	1,157
State Acres	438,000	480,000	610,000	520,000	470,000
State Avg yield	1,177	1,133	1,185	1,179	1,248
Soybean					
County Acres	118,500	98,300	73,000	79,200	83,200
County Avg yield	47.2	47.3	47.7	50.9	42.6
State Acres	3,500,000	3,210,000	2,610,000	2,780,000	3,010,000
State Avg yield	51	50.5	49	51.5	51
Wheat					
County Acres	5,500	4,900	na	1,200	4,500
County Avg yield	63.1	59	na	61.4	59
State Acres	125,000	95,000	50,000	75,000	155,000
State Avg yield	52	55	52	55	58

Cooperative Extension Service

www.uaex.uada.edu/counties/monroe

Annual Update

2022 Monroe County Extension Education Outreach

Total Educational Contacts: 39,592 Total County

Volunteer Hours: 1,176

Value of Volunteer Time (# of Hours X \$29.95): \$35,221.20

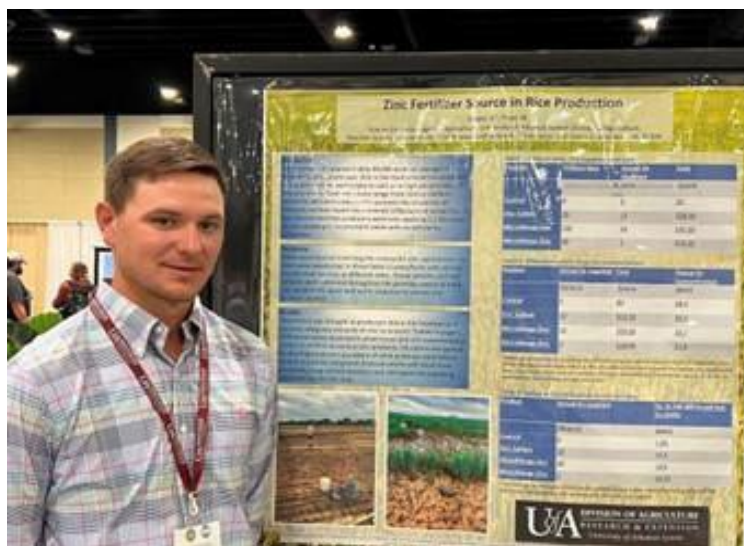
Agriculture & Natural Resources

Overview of Programs:

- 8,624 Total Educational Contacts
 - 3,540 were Direct Contacts
- 960 Farm / Site Visits
- 13 On-Farm Demonstrations
- 672 Volunteer Hours at a \$20,126.40 value to County
- 23 Master Gardeners
- 2 Master Gardener Projects
- 1,161 Volunteer Master Gardener hours at a \$33,134.94 value to County

Key Programs & Activities Conducted:

- 27 producers adopting Integrated Pest Management practices representing 34,000 acres.
- Over 31 million gallons of water saved on irrigation demonstration fields.
- 13 pest updates reaching a total of 1,274 producers.
- 9 producers stated their knowledge increased by attending the soil fertility meetings representing 17,520 acres. 5,620 acres of which they have adopted best management practices.
- 29 producers stated their knowledge increased by attending crop production meetings representing 90,028 acres. 44,528 acres of which they have adopted best management practices.



Community & Economic Development

Overview of Program:

- 1,929 Total Educational Contacts
 - 560 were Direct Contacts
- 1 Volunteer Hours at a \$29.95 Value to the County

Key Programs & Activities Conducted:

- Voter Education – displays, handouts
- Dissemination of information pertaining to Funding Opportunities, Tax Schools, & training opportunities related to all aspects of Community & Economic Development
- Leadership opportunities with 4-H members



DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Arkansas is
Our Campus

Monroe County 4-H

Overview of Program:

- 15,737 Total Educational Contacts
 - 5,217 were Direct Contacts
- 25 4-H Members
- 3 4-H Clubs and 2 Project Groups
- 7 4-H Volunteer Leaders
- 471 Volunteer Hours at a \$14,106.45 Value to the County



Key Programs & Activities Conducted:

- 3 Ross Photo Contest Participants
- 2 State Camp participants
- County Monthly Service Projects
- State Rice is Nice Contest 2 1st place winner (6 county participants)
- State BBQ Contest Participant (4 County, 2 District)
- 4 Dairy Foods Contest Participants
- Bass Fishing Tournament "Fishing with Kids for Community and The Cure"



Family & Consumer Science

Overview of Program:

- 13,302 Total Educational Contacts
 - 2,423 were Direct Contacts
- 14 Volunteer Hours at a \$658.90 Value to the County
- 1,949 SNAP-Ed Contacts
 - 1,039 were Direct Contacts
- 12 Community Partnerships

Key Programs & Activities Conducted:

- Preschool & Elementary Nutrition Education (84 class participants)
- Adult Nutrition Education (29 class participants)
- Powerful Tools for Caregivers
- Grown-Up U: Facts for Success Podcast
- ServSafe Manager Certification
 - 20 Certifications Earned