2023 Annual Report

AGRICULTURAL COMPLEX FOR ADVANCED RESEARCH AND EXTENSION SYSTEMS (AG-CARES)

IN COOPERATION WITH

Texas A&M AgriLife Research Lamesa Cotton Growers Texas A&M AgriLife Extension Service

Technical Report 24-1

Texas A&M AgriLife and Research and Extension Center of Lubbock
1102 E Drew St
Lubbock, TX 79403-6603

Friends and members of Lamesa Cotton Growers:

Last year's letter which stated it would be my last time to write since retirement was planned in March turned out to be incorrect.

Our plans were changed when Dr. Dever decided she needed to remain with the cotton program, so I am still in place at this time. A search for the Lubbock Center Director was started and Dr. Todd Baughman was selected to replace me. Todd was previously at the Vernon Center from 1996 to 2011 where he served as an Extension Specialist in crop production and the statewide peanut specialist. He worked for several years at AG-CARES while at Vernon. He joined Oklahoma State University as a professor and weed scientist. He brings an experienced background with crop production in the Southern High Plains for cotton, sorghum, wheat, peanuts, and cover crops. His press release follows this letter. He will report April 1, 2024. I will work with Dr. Baughman during April and plan on retiring in early May.

We were fortunate to have made three new hires recently. Dr. Ken Lege accepted the Cotton Extension Specialist position in January. This is a 75% Extension/25% Research position. Ken was with Corteva Agriscience (PhytoGen) prior to joining us. Previously, he was a cotton extension specialist with Clemson and then worked with Monsanto, Americot, D&PL, and Sure-Grow Seed.

Dr. Joseph Burke was selected for a new position as Assistant Professor Cropping Systems/Weed Scientist (75% Research/25% Extension) and joined us in June 2023. Dr. Katie Lewis was his major professor, so Joseph is well trained and acquainted with crop production in this region. He received his B.S. and M.S. degrees at TTU and his Ph.D. with A&M.

Dr. Hope Nakabuye was hired as Assistant Professor Agricultural Engineer/Irrigation (100% Research) in September 2023. She received her Ph.D. at the University of Nebraska at Lincoln and is a native of Uganda. She worked on water management using sensor-based technologies for irrigation scheduling and managed operations on a subsurface drip irrigation system for more than 200 research zones.

Again, to all the producers and Agri-businesses associated with AG-CARES, I want to express my gratitude and thanks for your support of our AgriLife scientists and their research programs. This location (AG-CARES) allows our people to understand the issues producers face for crop production in your area and conduct studies without relying on a producer's field.

I value the friendships that have developed over the past 25 years with many of you. I hope the 2024 crop season will be much better than in the past two years. May God bring you good health and rain.

Sincerely,

Jaroy Moore

Jaroy Moore
Resident Director of Research
Texas A&M AgriLife Research and Extension Center
Lubbock

Danny Nusser
Regional Program Director
Texas A&M AgriLife Extension Service
Agriculture and Natural Resources

New director selected for Texas A&M AgriLife Research and Extension Center at Lubbock

Baughman returns to Texas and Texas A&M AgriLife

January 29, 2024

Todd Baughman, Ph.D., will return to Texas to serve as director of the Texas A&M AgriLife Research and Extension Center at Lubbock. He will begin on April 1, replacing longtime director Jaroy Moore, Ph.D., who is retiring.

Todd Baughman, Ph.D., has been selected to lead the Texas A&M AgriLife Research and Extension Center in Lubbock, beginning April 1. (Photo by Todd Johnson, Oklahoma State University Agriculture Communications)

"We are very pleased to have Dr. Baughman return to Texas A&M and lead our research efforts at Lubbock," said G. Cliff Lamb, director of Texas A&M AgriLife Research. "His leadership will be critical as the center works to strengthen agricultural systems and economies in the South Plains and address key agricultural issues through innovative research."

The Texas A&M AgriLife center at Lubbock is one of the 13 centers across Texas working to advance research, public outreach and educational programs throughout the state. Each center tailors its mission to meet the needs of the region.

Building on the successes of the Texas A&M AgriLife center in Lubbock

In taking the leadership role at the center, Baughman said his priorities will be the continued development of research and extension programs that support the agricultural industry in the Southern High Plains and ensure the success and viability of producers and agricultural industry in that region.

"The center has an outstanding history of providing useful tools to the agricultural industry, and because of that, they have tremendous community and commodity organization support, which has made it a central hub for our agricultural industry," he said. "The opportunity to work with the incredible Lubbock faculty and staff to continue building those relationships and collaborations is a great opportunity and not one that is available at a lot of other places."

Being in the center of the world's largest cotton patch, Baughman said cotton is obviously one of the commodities at the forefront of needs. However, water is also a major concern, whether that is irrigation, rainfall or water conservation.

"Among many things, water management is a priority for our faculty and our programs," he said. "We have a significant acreage of dryland, and we need to be able to help those producers manage water as a resource as well as help those who use water for irrigation."

Additionally, Baughman said Lubbock-based scientists work with other crops that are growing in the region – corn, grain sorghum, peanuts and wheat – so there will be continued research on how they integrate into the entire agricultural system of the High Plains.

Bringing skills to the leadership position

Baughman served as a professor and Texas A&M AgriLife Extension Service crop production specialist and statewide peanut specialist for 15 years, from 1996 to 2011, in the Rolling Plains before joining Oklahoma State University as a professor and weed scientist.

At Oklahoma State, he is currently responsible for research and extension activities involving weed management in summer crops and pastures for the state of Oklahoma. He is based in Ardmore, Oklahoma.

While serving in Oklahoma, Baughman has continuously connected with Texas producers in the Rolling Plains region as a speaker at the Red River Crops Conference and Wichita Falls Ranch, Farm and Hemp Expo. He previously served that region as the AgriLife Extension agronomist in Vernon, where he worked with producers on everything from cotton, wheat and peanuts to soil fertility and cover crops.

Baughman said having already worked within Texas A&M AgriLife and having an understanding of the value both AgriLife Research and AgriLife Extension bring to the state when they work in tandem will be a benefit as he assumes his new position.

"Having participated in statewide programs in both Texas and Oklahoma has provided me a different understanding of agriculture and I believe bringing those experiences will be advantageous in Lubbock," he said. "I'm very excited to be able to work with the outstanding faculty located at the center and being able to help them achieve their goals."

Baughman, a native of Cache, Oklahoma, earned his doctorate in weed science from Mississippi State University, and his master's and bachelor's degrees in agronomy from Oklahoma State University.

He is currently president of the Southern Weed Science Society, a member of the Weed Science Society of America and an American Peanut Research and Education Society Fellow. He recently served as co-chair of the joint Southern Weed Science Society and Weed Science Society of America meeting in San Antonio.

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The Lamesa Cotton Growers would like to thank the following for their contributions to the AG-CARES Project:

Americot Cotton Seed
Bayer CropScience
Cotton, Inc. – State Support Program
Sam Stevens, Inc.
Syngenta Crop Protection
BASF
Corteva
Dawson County Commissioners Court
PhytoGen Cotton Seed

TITLE:

Cotton variety performance (continuous cotton, conventional tillage) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications	
Planting Date:	May 16	
Varieties:	DP 2143NR B3XF FM 2498 GLT	
Herbicides:	Treflan 32 oz/A	4/6/2022
	Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
	Roundup 32 oz/A + Liberty 22 oz/A	6/14/23
	Roundup 32 oz/A + Liberty 32 oz/A + Warrant 48 oz/A	7/20/23
Fertilizer:	90-34-0	

Irrigation:

	Low	Base	Base Plus
Preplant/Emergence	3.3”	3.3”	3.3”
In-season	4.9”	7.0”	9.1”
Total	8.2”	10.3”	12.4”

Harvest Date: November 7

RESULTS AND DISCUSSION:

Two varieties, DP 2143NR B3XF (nematode-resistant) and FM 2498 GLT (nematode susceptible) were compared under three irrigation levels (center-pivot) in a continuous cotton/conventional tillage system. Overall yields were much below average due to heat and little to no rainfall during the growing season (Table 1). When averaged across irrigation levels, similar yields were produced with DP 2143NR B3XF and FM 2498 GLT. When averaged across varieties, lint yields averaged only 431 lbs lint/A at the highest irrigation level. Loan values and gross revenues were similar for the two varieties and both increased as irrigation level increased.

Table 1. Effect of varieties and irrigation level on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A) in a conventional tillage system.

	In-season Irrigation Levels (inches)			
Variety	**Low (4.9)**	**Base (7.0)**	**Base Plus (9.1)**	**Average**
		---------- lbs/A----------		
DP 2143NR B3XF	230	266	409	**302 A**
FM 2498 GLT	260	283	452	**332 A**
Average	**245 B**	**274 B**	**431 A**	**--**
		---------- ¢/lb----------		
DP 2143NR B3XF	47.40	43.98	48.55	**46.64 A**
FM 2498 GLT	44.52	48.50	48.67	**47.23 A**
Average	**45.96 B**	**46.24 AB**	**48.61 A**	**--**
		---------- $/A----------		
DP 2143NR B3XF	109	117	199	**142 A**
FM 2498 GLT	115	137	220	**157 A**
Average	**112 B**	**127 B**	**209 A**	**--**

TITLE:

Cotton variety performance (continuous cotton, terminated rye cover) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications	
Planting Date:	May 16	
Varieties:	DP 2143NR B3XF FM 2498 GLT	
Herbicides:	Roundup 32 oz/A	4/6/23
	Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
	Roundup 32 oz/A + Liberty 22 oz/A	6/14/23
	Roundup 32 oz/A + Liberty 32 oz/A + Warrant 48 oz/A	7/20/23
Fertilizer:	90-34-0	

Irrigation:

	Low	Base	Base Plus
Preplant/Emergence	4.25”	4.25”	4.25”
In-season	4.9”	7.0”	9.1”
Total	9.51”	11.25”	13.35”

Harvest Date: November 7

RESULTS AND DISCUSSION:

Two varieties, DP 2143NR B3XF (nematode resistant) and FM 2498 GLT (nematode susceptible) were compared under three irrigation levels (center-pivot) in a continuous cotton/terminated rye cover crop system. When averaged across irrigation levels, cotton lint yields were higher with FM 2498 GLT compared to DP 2143 NRB3XF (Table 1). When averaged across varieties, yields increased from 220 lbs lint/A to 377 lbs lint/A as irrigation level increased. Loan value was higher for DP 2143 NRB3XF, and were higher with the base and base plus irrigation levels. Gross revenues ($/A) were similar for both varieties and increased with increased irrigation as expected.

Table 1. Effects of varieties and irrigation level on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A) under continuous cotton terminated rye cover.

	In-season Irrigation Levels (inches)			
Variety	**Low (4.9)**	**Base (7.0)**	**Base Plus (9.1)**	**Average**
		----------lbs/A----------		
DP 2143NR B3XF	197	248	344	**263 B**
FM 2498 GLT	243	345	410	**333 A**
Average	**220 B**	**297 AB**	**377 A**	**--**
		----------¢/lb----------		
DP 2143NR B3XF	42.75	46.28	45.50	**44.84 A**
FM 2498 GLT	39.58	41.83	43.15	**41.52 B**
Average	**41.17 B**	**44.06 A**	**44.33 A**	**--**
		----------$/A----------		
DP 2143NR B3XF	86	116	157	**120 A**
FM 2498 GLT	96	144	177	**139 A**
Average	**91 B**	**130 AB**	**167 A**	**--**

TITLE:

Cotton variety performance (wheat-cotton rotation) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 300-700 feet, 3 replications

Planting Date: May 16, wheat planted November 2021, harvested June 2022

Varieties: DP 2143 NRB3XF
FM 2498 GLT

Herbicides:

Roundup 32 oz/A + Valor 2 oz/A	4/6/23
Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
Roundup 32 oz/A + Liberty 22 oz/A	6/14/23
Roundup 32 oz/A + Liberty 32 oz/A + Warrant 48 oz/A	7/20/23

Fertilizer: 90-34-0

Irrigation:

	Low	Base	High
Preplant/Emergence	3.3”	3.3”	3.3”
In-season	4.9”	7.0”	9.1”
Total	8.2”	10.3”	12.4”

Harvest Date: November 6

RESULTS AND DISCUSSION:

Two varieties including DP 2143NR B3XF (nematode resistant) and FM 2498 GLT (nematode susceptible) were planted under three in-season irrigation levels in a wheat-cotton rotation. Wheat was harvested in June 2022 and stubble was maintained without tillage until cotton planting in May 2023. When averaged across irrigation levels, yields were higher with FM 2498 GLT and increased with higher irrigation levels (Table). Yields were much below average, even in this system that was followed during the 2022 growing season. Loan values were similar for the two varieties but overall were low (41-45 ¢/lb). Gross revenues were higher with FM 2498 GLT.

When comparing effects of irrigation levels among the three cropping systems, average cotton lint yields were increased 17% in the wheat-cotton rotation and decrea 5% in the terminated rye cover crop system compared to conventional tillage, continuous cotton (Table 2).

Table 1. Effects of varieties and irrigation level on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A) in a wheat cotton rotation in 2023.

	In-season Irrigation Levels (inches)			
Variety	**Low (4.9)**	**Base (7.0)**	**Base Plus (9.1)**	**Average**
	---------- lbs/A----------			
DP 2143NR B3XF	254	272	408	**311 B**
FM 2498 GLT	355	428	504	**429 A**
Average	**304 B**	**350 B**	**456 A**	**--**
	---------- ¢/lbs----------			
DP 2143NR B3XF	42.15	45.23	44.75	**44.04 A**
FM 2498 GLT	41.03	42.37	46.30	**43.23 A**
Average	**41.59 A**	**43.80 A**	**45.53 A**	**--**
	---------- $/A----------			
DP 2143NR B3XF	107	123	185	**138 B**
FM 2498 GLT	146	185	235	**189 A**
Average	**126 B**	**154 B**	**210 A**	**--**

Table 2. Effects of cropping systems and irrigation level on cotton lint yield averaged across two varieties in 2023.

	In-season Irrigation Levels			
Variety	**Low (4.9)**	**Base (7.0)**	**Base Plus (9.1)**	**Average**
	---------- lbs/A----------			
Continuous Cotton-Conv Tillage (>30 yr)	245	274	431	**317**
Continuous Cotton-Rye Cover	220	297	377	**298 (-5%)**
Wheat-Cotton rotation	304	350	456	**370 (+17%)**
Average	**257**	**307**	**421**	**--**

TITLE: Soil Water Dynamics in Semi-Arid Cotton Conservation Agroecosystems, AG-CARES, Lamesa, TX 2023

AUTHORS:
Christopher Cobos- Senior Research Associate
Katie Lewis- Associate Professor
Joseph Burke- Assistant Professor
Nicholas Boogades- Ph.D. Student
Wayne Keeling- Professor

MATERIALS AND METHODS:

Location:	AG-CARES, Lamesa, TX
Plot Size:	24 rows by the center pivot span length
Design:	Split plot design with cropping system as the main plot and irrigation level as the sub-plot
Row Spacing:	40”

Irrigation

Base:	60% estimated ET replacement; W7:10.3”, W9:11.25”, W1:10.3”
Low:	30% estimated ET replacement; W7:8.2”, W9:9.51 ”, W1:8.2”

Cover Crop

Seeding Date:	November 2022
Termination:	5 April 2023

Cotton

Planting Date:	16 May 2023
Cotton Harvest:	7 November 2022
Variety:	DP 2143; FM 2498
Fertility:	90-34-0

Wheat

Planting Date:	November 2022
Harvest Date:	June 2023

Experimental plots established in 2014 at the Lamesa site are located on a 0.8 km diameter center pivot separated into nine equivalent wedges, each consisting of a different cropping system. The center pivot encompasses eight spans of 48 rows (1.02 m centers) span^{-1}. All treatments were replicated within wedges and arranged as a split-plot design with the cropping system as the main plot and irrigation levels as the subplot. The following cropping systems were evaluated: (1) continuous cotton with conventional tillage at base irrigation level (60% estimated ET replacement); (2) continuous cotton with conventional tillage at low irrigation level (30% estimated ET replacement); (3) continuous cotton with no-tillage and winter rye (*Secale cereal*) cover crop at base irrigation level (60% estimated ET replacement); (4) continuous cotton with no-

tillage and winter rye (*Secale cereal*) cover crop at low irrigation level (30% estimated ET replacement); (5) cotton – wheat – summer cover (60% sudangrass [*Sorghum drummondii*] and 40% cowpea [*Vigna unguiculata* L.] seeded at 45 kg ha^{-1}) rotation with no-tillage at base irrigation level only (60% estimated ET replacement); (6) cotton – wheat – fallow with no-tillage at base irrigation level (60% estimated ET replacement) and (7) cotton – wheat – fallow with no-tillage at low irrigation level (30% estimated ET replacement). Wheat will be planted following cotton harvest with a summer cover mix planted into wheat stubble following wheat harvest in system (5) only. Systems (5), (6), and (7) will be replicated on two wedges with alternating wheat/cotton planting years to allow a cotton crop to be grown at all times during the duration of the study. Soil core samples were collected following cover crop termination in 2022 to a depth of 41 inches from each plot and analyzed for soil texture, total C and N, organic C, nitrate-N, Mehlich III extractable macronutrients, and sodium (Na), and pH and electrical conductivity (EC). Cotton was planted 16 May 2023 at a seeding rate 53,000 seed/acre. Cotton was harvested on 7 November 2023. After cotton harvest the no-till plots were drilled with cover.

Soil moisture measurements were collected via field-calibrated neutron attenuation with access tubes installed within each plot to a depth of approximately 41 inches. Readings were taken at 5.9-inch increments every two weeks throughout the year unless rainfall inhibited our ability to get into the field.

RESULTS AND DISCUSSION

Soil Moisture

Starting in 2023, total profile soil moisture was greatest in the cotton (’23)-wheat (’22)-fallow system in both the base and low irrigation systems compared to other cropping systems at AG-CARES (*Figure 1*). The increased soil water storage was most likely a result of the previous fallow period following the 2022 wheat harvest (June 2022). Adequate soil surface coverage from the wheat stubble and minimal soil disturbance allowed for a significant soil profile recharge in the system in the summer of 2022 that continued until cotton planting in 2023. The continuous cotton with a no-tillage and rye cover system showed lower profile soil moisture than the conventional system after August of 2022. A slow recharge in total profile soil moisture was seen until approximately April 5, 2023 (cover crop termination date), at which point a rapid recharge is seen in soil moisture in the system. The cotton (’22)-wheat (’23)- fallow system follows the same trend as the cotton (’23)-wheat (’22)- fallow system, with lower soil moisture concurrent with wheat biomass growth and development in the summer of 2023 followed by a rapid significant recharge in soil moisture in both the base and low irrigation systems as the cropping system moves into a fallow period. For both 2022 and 2023, the C-W-F system shows the lowest soil profile water during summer wheat growth with a significant soil recharge during the fallow season, allowing both systems to have the greatest total soil profile moisture content at the start of the subsequent cotton growing season.

The continuous cotton systems (both conventional tillage with winter fallow and no-tillage with rye cover crop), without the significant fallow period with soil coverage, are most likely highly more dependent on environmental conditions in terms of soil moisture status and recharge in semi-arid deficit irrigation systems. In year two of this study, data seems to suggest evidence of a significant soil moisture “carry-over” effect between years, with greater soil moisture at the start

of the 2023 cotton growing season in the conventional system compared to the 2022 cotton growing season. Subsequently, the conventional cotton system soil moisture was more comparable to the no-tillage with rye cover system at the start of 2023. Extreme drought in 2022, lower cotton plant establishment in 2022, and more timely precipitation in 2023 are the most probable factors contributing to this effect. More data is needed to confidently state that the no-tillage with rye cover system is better able to conserve and sustain soil moisture during extreme drought conditions compared to the conventional cotton system. Greater soil moisture in the conservation systems can most likely be attributed to increased soil physical properties such as infiltration and percolation via reduced disturbance from no-tillage and decreased evapotranspiration from greater plant biomass ground cover. Plant emergence and subsequent cotton lint yields are reflective of the increased early season soil moisture (F*igure 2*). Soil volumetric water content at depth can be seen in *Figure 3* for all systems from April 2022 - November 2023.

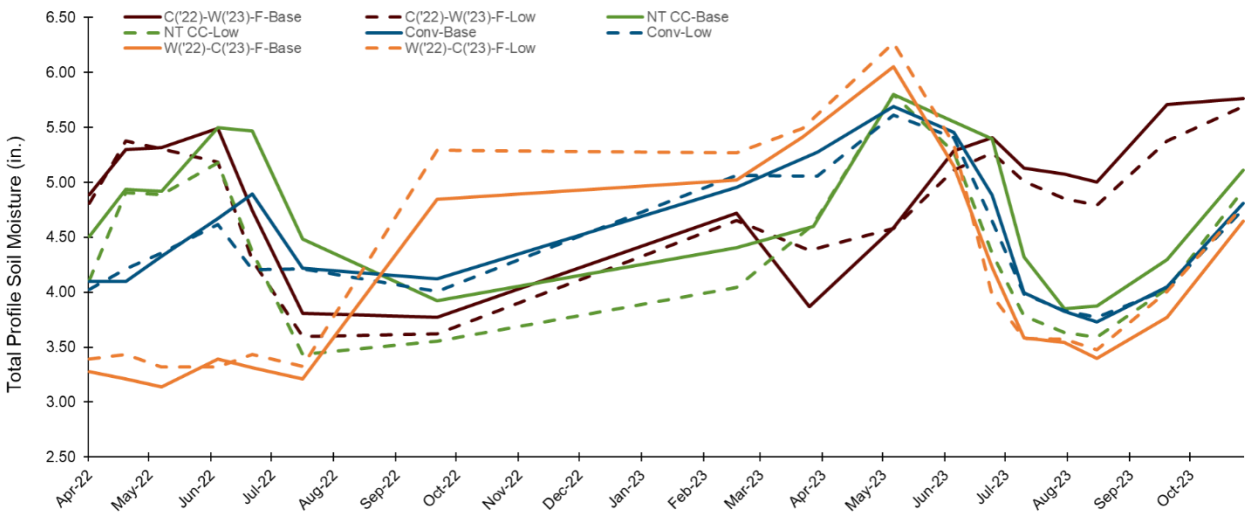

Figure 1. Total profile (0-41 in.) soil moisture in inches of all cropping systems at the Lamesa, TX AG-CARES site in 2022 and 2023 for continuous cotton with conventional tillage and winter fallow (Conv; blue), continuous cotton with no-tillage and winter rye cover crop (NT CC; green), cotton (’23) – wheat (’22) – fallow with no-tillage (orange), and cotton (’22) – wheat (’23) – fallow with no-tillage (marron). Solid lines indicate base irrigation at 60% estimated ET replacement (Base) and dotted lines represent low irrigation treatments at 30% estimated ET replacement (Low). Moisture readings were taken every other week from April 2022 - November 2023.

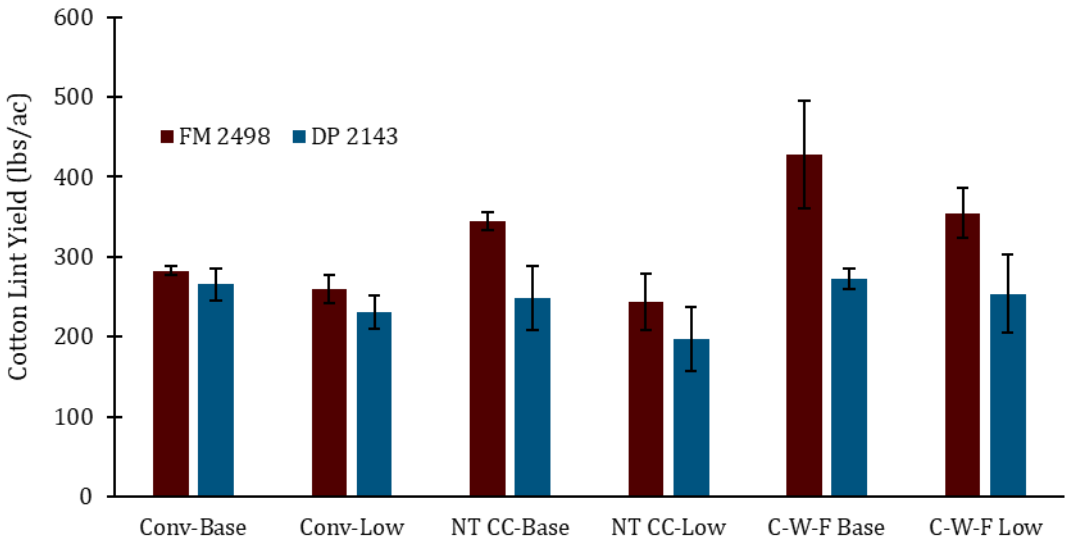

Figure 2. Cotton lint yields in pounds/acre for continuous cotton with conventional tillage and winter fallow (Conv), continuous cotton with no-tillage and winter rye cover crop (NT CC), cotton (’23) – wheat – fallow with no-tillage (C-W-F) in 2023 for both base (Base) and low (Low) irrigation. Cotton varieties are indicated by color (marron: FM 2489; blue: DP 2143). Error bars represent standard deviation of the sample mean.

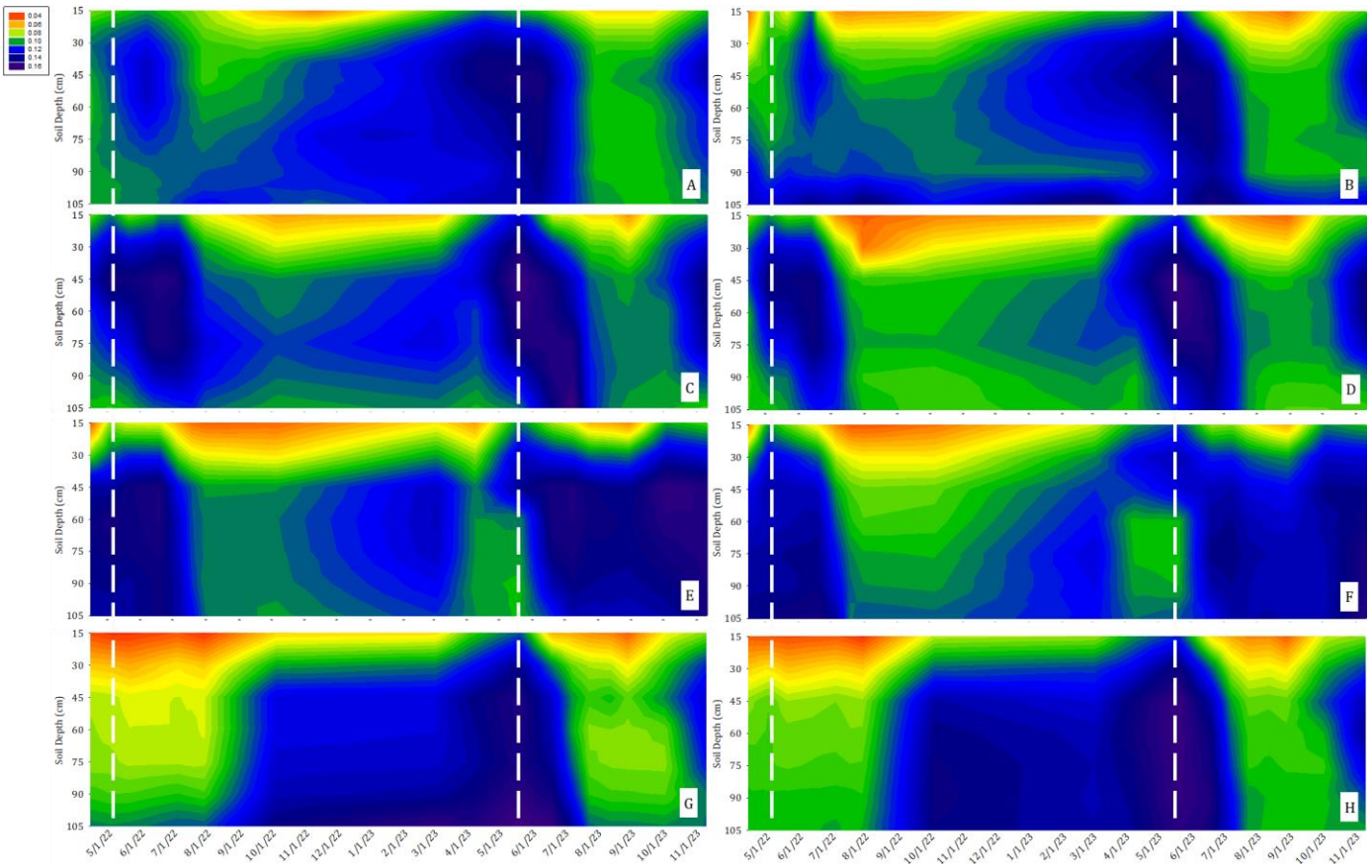

Figure 3. Volumetric water content measured down to 105 cm depth from April 2022 to November 2023 for continuous cotton with conventional tillage and winter fallow (A, B), continuous cotton with no-tillage and winter rye cover crop (C, D), cotton (’22) – wheat (’23) – fallow with no-tillage (E, F), and cotton (’23) – wheat (’22) – fallow with no-tillage (G, H). Base irrigation systems are indicated on the left column (A, C, E, and G) with low irrigation systems in the right column (B, D, F, and H). White dotted lines indicate approximate cotton planting dates for 2022 and 2023.

TITLE: Cropping system impact on carbon dioxide emissions, AG-CARES, Lamesa, TX 2023

AUTHORS:
Katie Lewis – Associate Professor
Nick Boogades – PhD Student
Joseph Burke - Associate Professor
Christopher Cobos – Senior Research Associate
Wayne Keeling – Professor

METHODS:

Location:	AG-CARES Lamesa, TX
Irrigation:	Base: 60% ET Replacement; Low:<30% ET Replacement
Rainfall:	11”
Cover Crop Planting Date:	10 November 2022
Cover Crop Termination Date:	3 April 2023
Wheat Planting:	November 2022
Wheat Harvest :	June 2023
Row Spacing:	40”
Cotton Planting Date:	16 May 2023
Varieties:	DP 2143 and FM 2498 planted at 53,000 seeds/acre
Harvest Date:	7 November 2023

Cropping systems included conventionally-tilled, winter fallow (CC, standard practice); reduced-till rye (*Secale cereale*) cover crop (CR, regenerative practice); reduced-till cotton-wheat-fallow rotation (CWF-C in cotton phase, CWF-F in fallow/wheat phase, regenerative practice).

Carbon Dioxide emissions:
Carbon dioxide emissions occurred approximately monthly in each system from June to February using the chamber method. Briefly, an infrared analyzer connected to a sampling chamber was deployed on 8-inch PVC collars placed into the ground in each system for 8 mins, with a 20 sec sampling interval to allow gases to accumulate in the headspace of the chamber. Carbon dioxide flux rate was determined by plotting concentration data from the analyzer versus time and fitted with a linear regression model. Between collars, CO_2 levels were allowed to return to ambient concentrations before beginning the next measurement. Each cropping system and irrigation level combination contained 4 collars.

RESULTS AND DISCUSSION:
Carbon Dioxide Emissions
Emissions in all systems at both irrigation levels peaked in July, corresponding to increased cotton growth and microbial activity (Figure 1). Wheat harvest in the CWF-F rotation occurred

in late June, so peak emissions in July were likely due to peak wheat residue decomposition. Emissions from CC spiked relative to other systems in December due to a tillage event to burry cotton stalks. After wheat harvest, the CWF-F system consistently had the lowest CO_2 emission rate under both irrigation levels (Figure 1). CR was the system that consistently had the greatest CO_2 flux rate, with rates significantly greater than at least one other system at every sampling event under base irrigation (Figure 1a). When comparing regenerative systems in the cotton phase, CR had significantly greater CO_2 flux rates than CWF-C at three of seven sampling events (6/7, 8/23 and 12/20) at base (Figure 1a) and one of seven (6/7) events at the low irrigation rate (Figure 1b). CWF-C flux rate was never significantly greater than CR during any event. Cumulative emissions in the CC, CR, CWF-C and CWF-F systems were 2,791, 3,635, 2,886 and 2,227 lbs CO_2-C per acre, respectively under base irrigation (Figure 2a) while at the low irrigation level they were 2,690, 2,873, 2,554 and 2,118 lbs CO_2-C per acre (Figure 2b). At both irrigation levels the CR system was significantly different from CWF-C due to the nature of the additional carbon (C) input in those systems. Terminated rye biomass in CR was from immature plants, had a low relative C:N, and greater labile C compared to wheat stubble from the CWF system. As a result, rye biomass was decomposed quicker and converted to CO_2 while the wheat stubble was slower to decompose, preventing CO_2 emissions from the CWF-C system from exceeding those of CC. At the base irrigation level CWF-C and CC were not different from each other and at low, CC was significantly greater than CWF-C. The shows the ability of the rotation to mitigate increases in CO_2 emissions compared to CC, despite increased C input. Again, the high C:N ratio and 9-11 month fallow period likely contribute to reductions in CO_2 emissions from CWF-C compared to CC. Differences in CO_2 emissions in these systems are likely to contribute significantly to soil organic C accumulation rates.

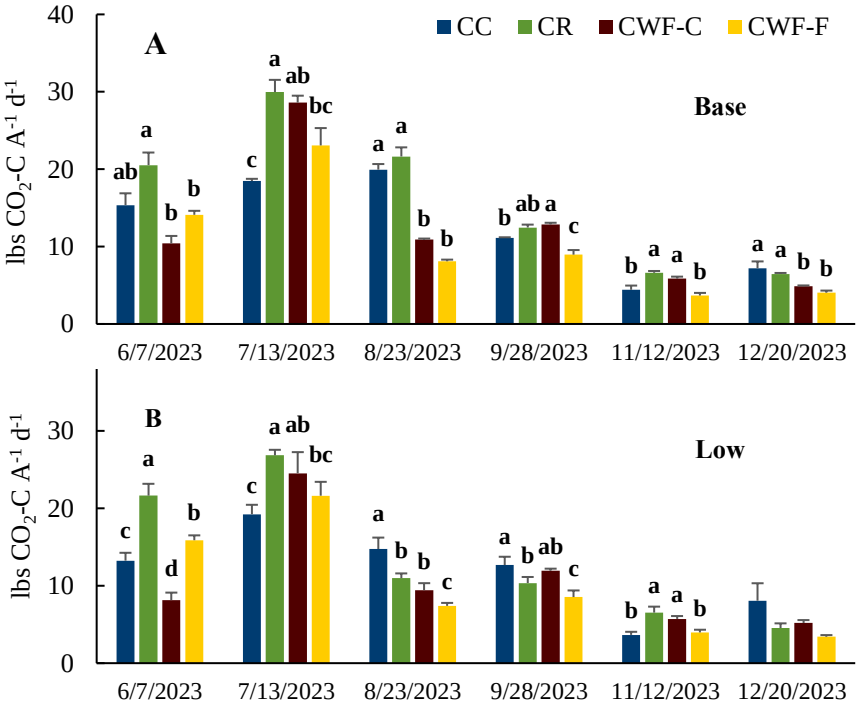

Figure 1. CO_2-C flux rates from June 7, 2023 to Feburary 4, 2024 at base (a) and low (b) irrigation levels. Bars with the same letters within irrigation level and sampling event are not significantly different ($p<0.1$). Error bars are standard errors.

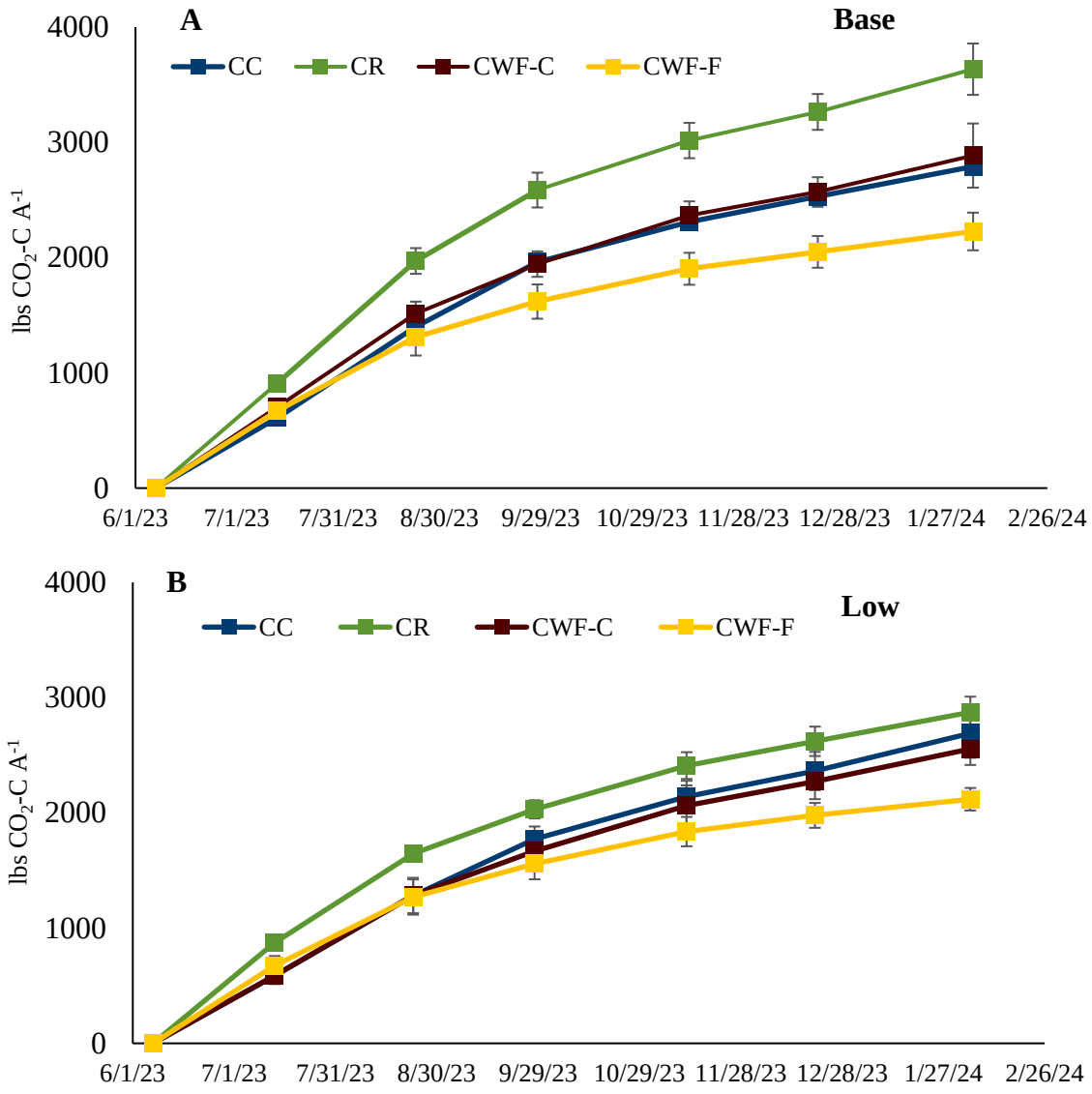

Figure 2. Cummulative CO_2-C flux from June 7, 2023 to Feburary 4, 2024 at base (a) and low (b) irrigation levels. Error bars are standard errors.

TITLE:

Results of the National Cotton Variety Standards Trial at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Jane K. Dever – Professor
Carol M. Kelly – Research Scientist
Valerie M. Morgan – Research Specialist
Reagan Heinrich – Research Associate

MATERIALS AND METHODS:

Test:	National Cotton Variety Standards, pivot irrigated – low level	
Planting Date:	May 17th	
Design:	Randomized complete block, 4 replications	
Plot Size:	2-row plots, 24ft	
Planting Pattern:	Solid	
Herbicide:	Treflan 32 oz/A	04/06/2023
	Caparol 24 oz/A + Gramoxone 22 oz/A	05/17/2023
Fertilizer:	90-34-0	
Irrigations:	Pre-Plant: 3.3” In Season: 4.9” Total: 8.2”	
Harvest Date:	November 7th	

RESULTS AND DISCUSSION:

The National Standards trial was planted at the low level irrigation site at AG-CARES as a part of a long standing, twenty location, national variety testing program. Texas A&M AgriLife Research in Lubbock, in conjunction with the AG-CARES location in Lamesa, provides an important service to seed companies, researchers, and producers in small-plot replicated performance trials. This service allows varieties from different companies and seed developers to be tested together by an independent source. The small plot replicated trials are intended to evaluate the genetic performance of lines independent of biotechnology traits, so the trials are managed as conventional varieties as opposed to utilizing herbicide or insecticide systems. Every effort is made to minimize the effects of insect and weed pressure. This same trial was also planted at an irrigated location in Lubbock as another High Plains location included in the National Cotton Variety Testing program.

Lint yield is determined by the stripper-harvested plot weight and pulled lint percent. Boll size and pulled and picked lint percent are determined from a random 50-boll sample obtained from two replications of each entry. Relative maturity and storm resistance ratings are a visual assessment of

percent open bolls on a given date and a 1 (very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating. Seed index is the weight in grams of 100 fuzzy seeds.

Every three years, varieties are selected by the National Cotton Variety Testing Committee as standards in U.S. cotton production. The eight currently selected varieties from six seed brands were submitted for small plot trials at two Texas High Plains locations, including the low level irrigation trial at AG-CARES in Lamesa, Texas. The AG-CARES location was subject to the rapid accumulation of rain during the planting season. The summer months were hot, dry, and windy with little rain into the fall months. Stands were ideal due to the early season rain. Weed and insect management was maintained throughout the growing season.

Participating brands of the trial included Deltapine, Armor, Dyna-Gro, Stoneville, NexGen, and FiberMax, each entering commercial varieties intended to represent various production regions across the United States. The growing regions represented by varieties in the trials spanned from the far west to the far east United States, including North Carolina, Texas, and Tennessee. Deltapine entered three of the eight varieties and each of the other brands had a single entry. Of the eight entries, seven contained the B3XF technology package. The FiberMax variety represented the GLT technology package (Table 1).

The average yield of the trial was 315 pounds of lint per acre with a 12.6% test coefficient of variation and a 48 pound least significant difference. Yields ranged from 189 pounds of lint per acre to 401 pounds of lint per acre (Table 1). The highest yielding variety was Deltapine DP 2127 B3XF with a micronaire of 5.4, length of 0.99 inches, uniformity of 79.2%, strength of 23.9 grams per tex., and an elongation of 5.8%. There was a significant difference between the highest yielding variety and the next top performing varieties. The seed index for the trial ranged from 6.8 grams to 8.7 grams. The average micronaire for the trial was 4.7 with a least significant difference of 0.02. Trial strength ranged from 21.3 grams per tex. to 28.1 grams per tex., fiber length ranged from 0.97 inches to 1.07 inches, and fiber elongation ranged from 5.5% to 6.1%. Plant height ranged from 21 inches to 26 inches. Storm tolerance ranged from 4 to 7. The average relative maturity was 82%, ranging from 79% to 88% for the 2023 season (Table 1).

Table 1. Yield, agronomic, and fiber quality data from the irrigated, low level, national standards cotton performance trial at the AG-CARES research farm Lamesa, 2023.

Designation	Yield	Lint % Picked	Lint % Pulled	Boll Size	Seed Index	Seed per Boll	% Open Bolls 5-Oct	Height	Storm Ratings	Mic	Length	Unif-ormity	Strength	Elong-ation	Color Grade	Leaf
DP 2127 B3XF	401	41.8	31.1	3.8	8.1	19.3	80	26	4	5.4	0.99	79.2	23.9	5.8	21-1,21-3	2
ARMOR 9371 B3XF	347	39.8	29.7	3.5	7.8	16.9	79	24	4	5.0	1.01	79.5	24.0	5.8	11-1,1-2,21-1	2
DG 3519 B3XF	342	37.9	27.2	3.5	7.9	17.4	81	24	6	4.4	1.07	80.5	28.1	6.0	21-1,21-2,21-4	3
DP 2239 B3XF	338	41.1	30.8	3.6	7.0	17.9	85	22	6	5.0	1.02	79.0	23.8	5.9	11-2,11-3,21-3	2
FM 2498GLT	313	40.3	29.8	4.3	8.7	23.0	88	25	7	4.9	1.04	79.9	25.0	5.5	11-2,21-1	2
ST 5091 B3XF	300	37.4	27.7	3.6	7.4	18.7	79	24	4	4.4	0.97	77.5	21.3	5.6	11-2,21-1	2
DP 2012 B3XF	294	36.5	26.1	3.1	6.8	18.3	88	21	5	4.3	1.00	78.1	22.3	5.5	11-1,11-2	2
NG 4936B3XF	189	36.2	26.7	3.5	7.6	19.8	85	21	5	4.4	1.03	78.8	23.5	6.1	21-1	2
Mean	315	38.9	28.6	3.6	7.7	18.9	82	23	5	4.7	1.01	79.0	24.0	5.8		2
c.v.%	12.6	2.4	2.6	6.8	3.0	8.1	6.9	7.4	18.3	3.0	1.8	0.8	3.2	2.2		18.5
LSD 0.05	48	1.1	0.9	0.3	0.3	1.9	7	2	1	0.2	0.02	0.7	0.9	0.2		1

TITLE:

Results of the Irrigated, Base Level, Cotton Variety Performance Trial at AG-CARES, Lamesa, TX, 2023

AUTHORS:

Jane K. Dever – Professor
Carol M. Kelly – Research Scientist
Valerie M. Morgan – Research Specialist
Reagan Heinrich – Research Associate

MATERIALS AND METHODS:

Test:	Cotton Variety Performance Trial, pivot irrigated- base level	
Planting Date:	May 10th	
Design:	Randomized complete block, 3 replications	
Plot Size:	2-row plots, 24ft.	
Herbicide:	Treflan 32 oz/A	04/06/2023
	Caparol 24 oz/A + Gramoxone 22 oz/A	05/17/2023
Fertilizer:	90-34-0	
Irrigations:	Pre-Plant: 3.3” In Season: 7.0” Total: 10.3”	
Harvest Date:	November 6th	

RESULTS AND DISCUSSION:

The Texas A&M AgriLife Research in Lubbock and the AG-CARES location in Lamesa, provide an important service to producers and commercial seed companies through fee-based, field evaluation of commercial and pre-commercial cotton varieties in replicated small plot trials. This service allows for the unbiased, third-party comparison of varieties, intended for the public analysis of performance in an environment similar to most local commercial production. This small plot trial is managed with conventional practices so the evaluations of the performance of these varieties can be independent of biotechnology traits. Every effort is made to minimize the effects of insect and weed pressure. The same varieties are tested in four locations across the Southern High Plains, including the base level irrigation site at AG-CARES.

Lint yield is determined by the stripper-harvested plot weight and pulled lint percent. Boll size and pulled and picked lint percent are determined from a random 50-boll sample obtained from the replications of each entry. Relative maturity and storm resistance ratings are a visual assessment of percent open bolls on a given date and a 1 (very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating. Seed index is the weight in grams of 100 fuzzy seeds.

Fifty-five cotton varieties and experimental breeding lines from eight different brands were submitted for small plot variety trials at four locations, including the base irrigation location at AG-CARES in Lamesa, TX. The emergence of the trial was good due to the early season rainfall. The remainder of the season had higher than normal temperatures and limited rainfall. Weeds and insects were managed thoroughly.

Brownfield Seed and Delinting had three commercial entries and Seed Source Genetics had two commercial entries. BASF entered six FiberMax varieties including two new commercial varieties. PhytoGen had the most entries at 17 (12 commercial varieties and five pre-commercial varieties). Americot, NexGen and Deltapine also entered multiple commercial varieties into the trial. There were nine BRS entries in 2023 (Table 2). There were multiple technology packages represented in the trial, however 14 of the entries did not include a technology package. There were 15 entries with the W3FE package and 10 representing the B3XF technology. Other represented technology included B3TXF, GLTP, GLT, GL, and W3E1 (Table 2).

The average yield under the base irrigation level was 416 pounds of lint per acre with a coefficient of variation of 15.8% and a least significant difference of 77 pounds. The highest yielding entry was the PhytoGen pre-commercial line PX 1124B236-04W3FE with 657 pounds of lint per acre. There was not a statistical difference between the highest yielding entry and the following entry PhytoGen PHY 545W3FE with a yield of 588 pounds of lint per acre (Table 2). The average micronaire was 4.9 with a range of 4.0 to 5.5. fiber length ranged from 0.98 inches to 1.16 inches. The average fiber strength was 29.7 grams per tex. Relative maturity taken on September 9th ranged from 40% open bolls to 89% open bolls. plant height ranged from 18 inches to 24 inches (Table 2).

Table 2. Yield and fiber quality data from the irrigated, base level, regional cotton variety performance trial at AG-CARES farm, Lamesa, 2023.

Designation	Yield	Lint% Picked	Lint% Pulled	Boll Size	Seed Index	Seed per Boll	% Open Boll 9-Sept	Storm Rating	Height	Mic	Length	Unif-ormity	Strength	Elong-ation	Color Grade	Leaf
PX 1124B236-04W3FE	657	37.9	27.8	4.4	8.8	20.7	50	5	22	5.4	1.07	80.7	33.1	6.0	21-1,21-2	3
PHY 545W3FE	588	43.9	32.6	3.6	8.2	16.6	68	5	21	5.0	1.01	80.3	30.0	6.8	21-4,32-1	2
PHY 480W3FE	578	42.7	31.2	4.0	7.9	21.3	58	5	21	4.9	1.05	81.9	30.7	6.7	21-4,32-1	3
PHY 136W3E1	556	39.5	28.7	3.3	7.7	16.4	70	7	20	4.9	1.09	80.4	30.4	6.6	22-2	2
PHY 475W3FE	546	38.6	27.8	3.5	7.9	17.8	73	6	22	5.2	1.01	79.7	30.1	6.3	22-2,31-3	3
PX 1125B234-04W3FE	515	39.8	28.7	3.9	8.3	20.1	80	5	20	5.3	1.02	79.5	28.2	5.9	31-3,32-2	3
NG 4098 B3XF	505	38.3	28.8	4.0	10.0	20.6	65	4	22	4.6	1.13	79.7	33.0	5.9	31-3	3
PHY 411W3FE	502	39.1	29.0	3.4	7.8	16.6	80	5	20	5.1	1.01	80.0	28.7	6.2	31-1,31-3	3
PHY 415W3FE	499	35.7	26.3	3.7	8.8	19.9	70	5	22	5.0	1.12	81.5	32.5	6.4	31-3,32-1	2
NG 3930 B3XF	489	35.5	26.6	3.9	8.5	21.6	64	5	21	5.1	1.10	81.1	28.9	6.0	31-3,32-1	2
FM 1621GL	486	36.7	27.8	4.4	9.7	19.8	50	7	22	5.1	1.06	81.1	29.1	5.7	31-3,31-4	4
DP 2317 B3TXF	469	41.7	30.0	3.4	7.8	21.7	89	4	22	4.7	1.09	79.7	27.5	5.8	21-1,31-1	2
PHY 390W3FE	464	41.1	30.6	3.9	7.7	19.4	84	6	19	4.7	0.98	78.0	26.4	6.0	31-4,32-1	3
AMX21COO5B3TXF	454	36.4	26.7	3.0	8.3	14.8	75	4	24	4.3	1.07	80.2	29.3	6.4	31-3	3
PHY 137W3E1	451	37.7	27.6	3.4	9.2	15.8	68	5	21	4.9	1.14	82.3	33.8	6.7	32-1	3
PHY 443W3FE	449	39.4	27.5	3.7	8.9	18.7	65	5	21	5.4	1.06	81.1	31.5	6.3	32-1	2
AMX160030-AB3XF	447	43.0	30.9	3.8	8.8	18.8	80	6	20	5.0	1.08	81.4	30.3	6.2	21-4,32-1	2
PX 1122A214-04W3FE	442	38.7	29.1	3.7	8.3	18.8	83	6	18	4.2	1.00	78.6	28.3	6.3	21-4,31-3	2
AMX160030-BB3XF	441	38.0	29.2	4.5	8.9	22.5	83	6	22	5.1	1.05	81.3	29.7	6.0	21-4	2
DP 2335 B3XF	435	38.1	28.7	4.0	8.0	20.2	60	6	22	4.6	1.06	79.3	28.2	5.5	21-1	2
PHY 332W3FE	433	36.7	25.2	3.3	8.4	16.6	70	6	21	5.0	1.07	79.7	29.0	6.4	32-1	3
DP 2436NR B3TXF	432	39.7	28.7	3.2	8.7	15.8	68	3	22	4.9	1.16	81.1	32.4	7.3	32-1,32-2	3
DP 2141NR B3XF	426	37.6	28.3	3.7	8.7	18.1	60	4	22	5.5	1.09	80.1	29.9	6.5	31-3,41-1	2
PHY 250W3FE	424	37.6	26.8	3.6	8.7	18.0	65	6	19	4.9	1.02	79.9	27.1	5.9	21-4,31-3	2
FM 823AXTP	418	42.3	31.3	3.9	8.9	19.5	86	4	20	4.8	1.05	81.1	30.0	6.2	31-1,31-3	2
DP 2239 B3XF	417	40.1	30.5	4.4	8.0	22.1	73	4	21	5.1	1.10	80.4	28.4	6.1	21-4	2
PHY 400W3FE	413	39.2	27.8	3.7	8.3	19.2	74	7	19	5.0	1.04	79.9	28.5	6.4	32-1	3
DP 2012 B3XF	408	37.5	27.1	3.6	7.7	21.3	85	3	22	4.9	1.08	79.3	26.5	5.6	31-1,31-3	2
BRS 335	403	35.7	26.6	3.5	8.7	19.6	60	4	20	4.9	1.04	80.1	28.8	5.9	21-2,31-1	2
DP 2143NR B3XF	389	37.5	27.0	3.6	9.0	17.7	65	2	22	5.5	1.13	81.3	32.3	6.3	31-3	3
BRS 1294	388	37.7	26.5	3.4	8.9	18.1	43	4	22	5.3	1.07	83.3	31.5	5.3	21.4	2
AMX20T157B3XF	383	37.4	26.0	3.5	8.5	19.5	70	5	20	4.9	1.10	81.4	29.9	6.7	22-2,32-1	3
FM 2398GLTP	381	42.6	31.0	4.2	9.1	19.8	73	5	19	5.5	1.07	80.9	29.5	5.9	21-2,21-4	2
BRS 293	377	36.2	26.5	3.7	9.3	19.2	40	3	19	5.2	1.06	81.1	31.2	6.3	21-4,3,-1	2
PHY 205W3FE	377	40.2	28.7	3.5	8.8	18.7	88	7	19	4.7	0.99	79.5	27.2	6.1	31-3	3

Table 2 (continued). Yield and fiber quality data from the irrigated, base level, regional cotton variety performance trial at AG-CARES farm, Lamesa, 2023.

Designation	Yield	Lint% Picked	Lint% Pulled	Boll Size	Seed Index	Seed per Boll	% Open Boll 9-Sept	Storm Rating	Height	Mic	Length	Unif-ormity	Strength	Elong-ation	Color Grade	Leaf
PHY 210W3FE	376	39.0	27.2	3.2	8.9	15.7	88	6	18	5.1	1.03	80.5	28.4	5.8	21-4,32-1	2
SSG UA 222	374	37.1	28.4	3.8	9.0	19.6	68	4	19	5.1	1.07	80.6	29.9	6.6	32-1	3
FM 868AXTP	371	39.1	28.5	4.5	10.2	22.4	84	5	20	4.9	1.10	81.2	31.9	6.3	22-1,32-1	2
BRS 1382	367	38.6	27.4	3.5	9.3	16.3	53	4	19	5.3	1.08	82.2	31.7	5.9	31-1,31-3	2
NG 4335 B3TXF	367	39.1	28.2	3.7	8.1	20.0	84	6	22	4.8	1.13	82.6	31.7	6.1	31-1,32-1	3
BRS 1754	364	38.5	27.8	2.9	8.1	16.2	40	5	21	5.2	1.14	81.6	33.3	6.5	21-2,31-3	2
BSD 4X	360	33.8	23.9	3.5	9.9	17.6	58	6	20	4.5	1.04	79.3	27.5	5.6	21-4	3
AMX20T079B3XF	359	37.8	27.2	3.4	8.5	18.4	83	4	19	4.9	1.05	79.3	27.9	6.0	32-1	2
SSG UA 248	359	38.8	27.7	3.1	9.0	17.9	59	4	19	5.0	1.09	80.1	29.6	6.5	21-4,32-1	2
BRS 416	357	35.6	25.3	4.3	10.1	23.1	50	4	23	4.8	1.13	79.9	30.9	5.6	21-2,31-1	2
BSD 9X	353	37.8	27.3	4.4	10.6	20.9	40	5	20	5.2	1.06	80.9	31.6	5.6	21-4	2
BSD Ton Buster Magnum	351	36.0	25.9	3.7	9.5	19.7	53	5	20	4.5	1.03	78.8	26.7	5.8	21-4	3
BRS 286	348	36.9	26.6	4.2	9.5	22.8	58	3	19	5.0	1.04	80.6	29.7	5.9	31-1	2
BRS 1299	348	40.9	27.9	3.1	8.3	16.6	40	5	20	5.2	1.05	82.2	29.1	5.2	21-2,21-4	2
FM 1730GLTP	337	37.4	27.4	3.2	7.7	17.9	75	4	21	4.2	1.01	79.9	26.8	5.5	31-1,31-3	3
FM 2498GLT	333	39.3	28.5	3.9	10.3	17.7	80	5	21	5.0	1.03	80.2	27.0	5.8	31-3,32-1	3
DP 2211 B3TXF	313	41.2	28.6	3.2	8.3	16.3	83	5	19	4.7	1.04	79.8	25.6	5.8	21-4,31-1	2
NG 4350 B3TXF	309	36.4	25.5	3.1	8.2	19.1	78	7	20	4.0	1.12	81.5	31.1	6.0	31-3,32-1	3
AMX20T114B3XF	303	38.2	25.0	3.0	7.8	17.7	78	4	22	5.2	1.10	81.4	30.4	6.9	31-3,32-1	3
BRS 2353	208	36.2	23.5	2.6	8.7	13.1	38	5	20	4.5	1.12	81.5	30.3	6.0	31-,31-3	3
Mean	416	38.5	27.8	3.9	8.1	18.8	68	5	20	4.9	1.07	80.5	29.7	6.1		2
c.v.%	15.8	1.9	2.5	7.1	4.2	8.5	18.0	21.2	10.2	4.0	1.8	0.9	14.1	2.7		19.0
LSD 0.05	77	1.2	1.1	0.4	0.6	2.7	14	1	2	0.3	0.03	1.2	2.0	0.3		1

TITLE:

Results of the Irrigated, Low Level, Cotton Variety Performance Trial at AG-CARES, Lamesa, TX, 2023

AUTHORS:

Jane K. Dever – Professor
Carol M. Kelly – Research Scientist
Valerie M. Morgan – Research Specialist
Reagan Heinrich – Research Associate

MATERIALS AND METHODS:

Test:	Cotton Variety Performance Trial, pivot irrigated- low level	
Planting Date:	May 17th	
Design:	Randomized complete block, 4 replications	
Plot Size:	2-row plots, 24ft.	
Herbicide:	Treflan 32 oz/A	04/06/2023
	Caparol 24 oz/A + Gramoxone 22 oz/A	05/17/2023
Fertilizer:	90-34-0	
Irrigations:	Pre-Plant: 3.3” In Season: 4.9” Total: 8.2”	
Harvest Date:	November 7th	

RESULTS AND DISCUSSION:

The Texas A&M AgriLife Research in Lubbock and the AG-CARES location in Lamesa, provide an important service to producers and commercial seed companies through fee-based, field evaluation of commercial and pre-commercial cotton varieties in replicated small plot trials. This service allows for the unbiased, third-party comparison of varieties, intended for the public analysis of performance in an environment similar to most local commercial production. This small plot trial is managed with conventional practices so the evaluations of the performance of these varieties is independent of biotechnology traits. Every effort is made to minimize the effects of insect and weed pressure. The same varieties are tested in four locations across the Southern High Plains, including the limited irrigation site at AG-CARES.

Lint yield is determined by the stripper-harvested plot weight and pulled lint percent. Boll size and pulled and picked lint percent are determined from a random 50-boll sample obtained from two replications of each entry. Relative maturity and storm resistance ratings are a visual assessment of percent open bolls on a given date and a 1 (very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating. Seed index is the weight in grams of 100 fuzzy seeds.

Fifty-five cotton varieties and experimental breeding lines from eight different brands were submitted for small plot variety testing at four locations, including the low level irrigation location at AG-CARES in Lamesa, TX. The emergence of the trial was good due to the early season rainfall. The remainder of the season had higher than normal temperatures and limited rainfall. Weeds and insects were managed thoroughly.

Brownfield Seed and Delinting had three commercial entries and Seed Source Genetics had two commercial entries. BASF entered six FiberMax varieties including two new commercial varieties. PhytoGen had the most entries at 17 (12 commercial varieties and five pre-commercial varieties). Americot, NexGen, and Deltapine also entered multiple commercial varieties into the trial. There were nine BRS entries in 2023 (Table 3). There were multiple technology packages represented in the trial, however 14 of the entries did not include a technology package. There were 15 entries with the W3FE package and 10 representing the B3XF technology. Other represented technology included B3TXF, GLTP, GLT, GL, and W3E1 (Table 3).

Average yield for the trial under limited irrigation was 366 pounds of lint per acre with an 18.5% coefficient of variation and a least significant difference of 92 pounds of lint per acre. The highest yielding variety was PhytoGen PHY136W3E1 at 511 pounds of lint produced per acre. There was not a significant difference between the top yielding variety and the following 15 entries (Table 3). PhytoGen PHY136W3E1 had a micronaire of 4.7, fiber length of 1.01 inches, fiber uniformity of 79.0%, fiber strength of 27.5 grams per tex., and fiber elongation of 6.7%. The relative maturity of the trial ranged from 57% open bolls to 92% open bolls on September 9th. Storm tolerance ranged from 2 to 7 with a trial average of 5. The average micronaire for the trail was 4.7, the average fiber length was 1.01 inches, and the average fiber strength was 26.9 grams per tex. (Table 3).

Table 3. Yield and fiber quality data from the irrigated, low level, regional cotton variety performance trial at AG-CARES farm, Lamesa, 2023.

Designation	Yield	Lint% Picked	Lint% Pulled	Boll Size	Seed Index	Seed per Boll	% Open Boll 9-Sept	Storm Rating	Height	Mic	Length	Unif-ormity	Strength	Elong-ation	Color Grade	Leaf
PHY 136W3E1	511	38.8	28.6	3.8	7.4	20.1	73	7	22	4.7	1.01	79.0	27.5	6.7	22-2,32-1	3
PHY 480W3FE	492	40.1	30.1	4.5	7.6	21.8	67	6	20	4.8	0.98	79.8	27.6	7.1	32-1	3
AMX20T157B3XF	471	41.1	30.6	2.9	7.4	18.5	70	5	22	4.8	1.02	80.0	27.3	6.9	32-1,32-2	2
DP 2335 B3XF	463	39.8	30.2	3.9	7.4	18.5	87	6	23	4.4	0.98	78.2	24.6	5.8	21-2,21-4	2
PHY 545W3FE	457	44.5	32.3	3.4	7.6	16.6	67	5	22	4.9	0.98	79.2	27.0	6.6	32-1	3
DP 2239 B3XF	454	40.8	30.5	3.5	7.3	17.2	87	5	21	4.9	1.03	79.4	25.4	6.0	31-3,32-1	2
AMX160030-BB3XF	444	35.7	26.8	4.2	8.4	21.7	77	6	24	4.8	1.02	79.9	27.8	6.1	32-1	2
PHY 332W3FE	441	36.6	25.8	3.3	8.3	15.5	80	6	22	4.6	1.05	79.0	27.7	6.5	22-2,32-1	2
PHY 475W3FE	439	37.9	28.0	3.7	7.3	17.9	87	5	21	4.9	0.97	78.4	27.1	6.4	32-1,32-2	2
PX 1124B236-04W3FE	438	37.6	26.6	4.6	8.8	20.9	73	5	23	5.3	1.02	80.4	29.6	6.1	31-3	3
PHY 390W3FE	435	39.4	28.4	3.5	7.7	18.4	83	6	21	4.6	0.98	78.5	25.6	6.1	32-1	3
PHY 210W3FE	434	40.1	27.7	3.6	8.1	19.5	87	7	22	4.6	1.00	79.0	25.8	5.9	31-3,32-1	2
AMX21COO5B3TXF	426	37.4	26.9	2.8	7.3	14.3	83	4	24	4.5	1.01	79.6	26.5	6.5	31-1,31-4	3
NG 4098 B3XF	426	36.0	27.5	3.8	8.6	21.3	83	4	21	4.3	1.04	77.8	28.4	6.1	32-1	3
DP 2012 B3XF	423	37.5	27.9	3.1	7.1	16.6	90	4	22	4.4	1.00	78.9	23.9	5.7	31-2,31-3	3
AMX20T079B3XF	423	35.6	25.8	3.2	8.1	17.7	73	4	23	4.5	1.01	79.5	25.3	6.0	32-1,32-2	2
PX 1122A214-04W3FE	413	41.1	29.4	3.3	7.7	15.5	77	6	21	4.1	0.95	77.6	26.1	6.0	31-3,32-1	2
PX 1125B234-04W3FE	403	38.2	26.5	2.9	8.0	15.9	83	5	23	5.0	0.97	78.7	25.8	5.7	31-3,32-1,32-2	3
NG 3930 B3XF	395	36.0	26.3	3.5	7.8	19.3	82	3	21	4.4	1.03	79.8	25.2	6.1	32-1,33-1	3
BRS 335	394	35.5	27.9	3.9	7.9	21.2	67	4	22	4.6	0.99	78.6	25.7	6.0	31-1	3
BRS 1299	393	40.9	28.5	2.9	7.0	17.1	57	6	22	5.2	0.99	80.1	26.5	5.5	32-1	2
PHY 400W3FE	392	37.2	27.3	3.6	7.4	19.1	85	5	21	4.6	0.99	78.3	26.2	6.3	22-2,31-3,32-1	2
SSG UA 222	384	37.2	27.8	3.2	9.0	15.8	80	4	23	4.7	1.01	79.8	27.8	6.6	31-3,32-1	3
FM 1730GLTP	383	36.7	28.5	4.2	7.6	20.4	88	6	20	4.1	0.98	78.4	25.7	5.5	31-1,31-2,31-3	3
AMX160030-AB3XF	383	39.9	29.6	4.5	7.8	23.8	70	6	23	4.7	1.03	79.3	27.2	6.5	32-1	2
PHY 411W3FE	378	38.7	27.8	3.1	7.0	13.9	80	5	20	5.1	0.97	79.5	26.8	6.3	31-3,31-4	3
DP 2211 B3TXF	369	39.9	28.4	2.6	7.2	13.4	80	3	21	4.7	1.00	78.4	24.4	5.9	31-3,32-1	2
NG 4335 B3TXF	369	39.6	27.1	3.0	7.1	16.8	87	6	21	4.5	1.03	80.4	27.1	6.1	32-1,32-2	3
PHY 137W3E1	369	35.6	25.7	3.1	7.7	15.2	77	5	21	4.5	1.05	80.7	30.3	6.7	32-1	3
BSD 4X	362	32.7	23.7	4.0	8.8	21.7	72	7	21	4.3	0.97	77.4	24.5	5.6	21-4,22-2	2
FM 2498GLT	360	37.9	27.7	4.0	9.0	19.7	77	5	23	4.7	1.02	78.9	25.0	5.9	31-3,32-1,32-2	3
PHY 250W3FE	359	37.0	26.3	3.4	8.6	18.2	82	7	21	4.4	0.98	78.2	25.0	5.9	31-3,32-1	3
BRS 416	350	32.1	23.5	3.4	9.2	17.9	70	4	23	4.8	1.07	79.7	29.2	5.6	31-1,31-2,31-3	2
BRS 1382	349	37.1	27.9	3.7	7.6	17.5	67	3	22	5.2	1.02	79.9	29.2	5.7	31-1,31-4	2
PHY 205W3FE	345	33.2	23.0	3.4	8.2	18.3	80	7	22	4.2	0.96	78.6	25.5	5.9	31-3,32-1	3

Table 3 (continued). Yield and fiber quality data from the irrigated, low level, regional cotton variety performance trial at AG-CARES farm, Lamesa, 2023.

Designation	Yield	Lint% Picked	Lint% Pulled	Boll Size	Seed Index	Seed per Boll	% Open Boll 9-Sept	Storm Rating	Height	Mic	Length	Unif-ormity	Strength	Elong-ation	Color Grade	Leaf
DP 2143NR B3XF	344	39.2	28.7	3.2	8.2	15.5	68	3	22	5.5	1.03	80.0	29.0	6.1	31-4,32-1,32-2	2
FM 1621GL	339	34.9	25.4	4.1	8.8	18.1	73	6	20	4.8	0.99	79.5	26.6	5.7	31-1,31-3	3
FM 868AXTP	337	37.0	27.4	3.9	8.9	20.6	82	5	21	4.4	1.01	79.9	27.9	6.0	32-132-1	2
AMX20T114B3XF	336	36.9	26.0	3.5	7.4	18.2	83	3	23	5.1	1.01	80.6	26.7	7.0	32-2,42-1	3
PHY 443W3FE	335	38.2	26.9	3.6	8.0	17.7	70	5	23	5.1	0.98	80.5	27.4	6.0	32-1	2
DP 2141NR B3XF	334	37.4	27.5	3.1	8.3	15.6	77	3	22	5.4	1.02	78.8	26.8	6.2	32-2,41-3	3
DP 2317 B3TXF	334	40.8	26.9	3.0	6.7	15.8	92	2	22	4.5	1.00	78.9	24.4	5.9	31-2,31-3,31-4	2
PHY 415W3FE	321	37.1	27.1	3.9	8.4	20.2	77	5	22	4.7	1.05	80.4	28.8	6.3	32-1	3
FM 2398GLTP	295	37.4	27.4	3.5	7.8	18.9	85	6	20	4.5	1.01	79.5	25.3	6.0	31-3,32-1	2
BSD Ton Buster Magnum	290	32.7	23.6	3.7	8.6	20.1	78	4	19	4.7	0.99	78.4	25.0	6.0	31-3,32-1	2
BSD 9X	281	35.6	25.5	3.4	9.1	16.7	73	4	20	4.6	0.97	78.0	25.2	6.1	32-1	2
FM 823AXTP	281	37.9	27.6	3.3	7.3	19.7	87	5	19	4.3	1.00	78.8	27.1	6.1	31-3,32-1	3
SSG UA 248	277	33.3	25.0	3.0	7.8	17.5	80	4	21	4.8	0.99	78.7	26.4	6.2	31-4,32-1	2
BRS 286	276	36.3	26.9	3.4	8.2	17.7	73	3	21	4.6	0.95	77.9	25.3	5.9	31-3	2
NG 4350 B3TXF	262	33.9	23.7	2.7	7.1	18.3	83	6	21	3.6	1.05	79.5	28.2	6.0	32-1	2
DP 2436NR B3TXF	260	39.9	28.7	2.7	7.1	14.2	80	2	19	4.5	1.03	79.4	28.6	6.8	32-1,32-2	3
BRS 1294	256	38.0	26.6	3.0	7.6	16.9	67	3	23	5.0	1.01	81.1	27.7	5.6	31-1,32-2	2
BRS 293	232	32.1	23.6	3.4	8.5	18.5	77	3	21	4.9	1.02	80.0	28.7	6.1	32-1	2
BRS 1754	228	34.1	23.5	2.8	7.7	14	67	4	20	5.2	1.08	80.7	30.9	6.5	31-3,32-2	3
BRS 2353	200	35.0	22.8	2.9	8.5	14.8	63	6	22	4.4	1.09	81.0	30.7	5.8	31-1,31-2,32-1	2
Mean	366	37.3	27.0	3.4	7.9	17.9	77	5	21	4.7	1.01	9.3	26.9	6.1		3
c.v.%	18.5	2.4	4.2	9.7	5.6	10.7	11.4	23.4	8.8	3.7	2.0	1.0	4.1	2.6		21.0
LSD 0.05	92	1.2	1.5	0.5	0.6	2.6	12	2	3	0.2	0.03	1.1	1.5	0.2		1

TITLE:

Results of the Root-Knot Nematode (RKN) Cotton Variety Performance Trial at AG-CARES, Lamesa, TX, 2023

AUTHORS:

Jane K. Dever – Professor
Carol M. Kelly – Research Scientist
Valerie M. Morgan – Research Specialist
Reagan Heinrich – Research Associate

MATERIALS AND METHODS:

Test:	Root-Knot Nematode Variety, Pivot irrigated- high level	
Planting Date:	May 17th	
Design:	Randomized complete block, 4 replications	
Plot Size:	2-row plots, 24ft	
Herbicide:	Treflan 32 oz/A	04/06/2023
	Caparol 24 oz/A + Gramoxone 22 oz/A	05/17/2023
Fertilizer:	90-34-0	
Irrigations:	Pre-Plant: 3.3” In Season: 9.1” Total: 12.4”	
Harvest Date:	November 7th	

RESULTS AND DISCUSSION:

Root Knot Nematodes are a prevalent pathogen on the Texas High Plains and significantly damaging in cotton production. The field at AG-CARES provides an opportunity to evaluate commercial, pre-commercial and public breeding material for production under pressure of Root-Knot Nematodes (RKN). The cotton breeding program at Texas A&M AgriLife offers a fee-based testing service to evaluate, without bias, varieties from various sources, providing producers access to independently generated performance data in production circumstances that mimic commercial production challenges, including Root Knot Nematode pressure.

Lint yield is determined by the stripper-harvested plot weight and pulled lint percent. Boll size and pulled and picked lint percent are determined from a random 50-boll sample obtained from two replications of each entry. Relative maturity and storm resistance ratings are a visual assessment of percent open bolls on a given date and a 1 (very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating. Seed index is the weight in grams of 100 fuzzy seeds.

The 2023 RKN trial consisted of a total of 47 commercial varieties and pre-commercial breeding lines sourced from six seed brands, planted in a location with known RKN presence (Table 4). The trial was planted on May 17th, heavy rainfall accumulated into early June. The remainder of the growing season consisted of high temperatures and little precipitation. The trial was pivot irrigated at the highest

possible water rate, applying a total of 9.1 acre-inches of water over the growing season. Weed and insect management persisted throughout the summer. In November, a 50-boll sample was hand harvested, followed by stripper harvest on November 7th.

Of the 47 varieties and lines tested, 19 were found susceptible to RKN and 28 displayed resistance to RKN. Yields ranged from 836 pounds of lint per acre to 430 pounds of lint per acre. The highest yielding variety, PhytoGen PHY 480W3FE, also showed resistance to RKN, 4.9 micronaire, 1.03-inch fiber length, and a fiber strength of 29.2 grams per tex. (Table 4). The average trial micronaire was 5.0 with a least significant difference of 0.3. Fiber lengths ranged from 0.97 inches to 1.10 inches. Fiber uniformity ranged from 78.8% to 81.8%. The average fiber strength was 29.3 grams per tex. Storm tolerance ranged from 3 to 7 with an average storm tolerance rating of 5. Relative maturity spanned from 96% open bolls to 84% open bolls on September 25th. Plant height (a trait often impacted by nematode tolerance) ranged from 18 inches to 25 inches, with a trial coefficient of variation of 8.4% and least significant difference of two inches (Table 4).

Table 4. Yield, agronomic, fiber quality, and nematode ratings from the irrigated, high level, root-knot nematode cotton variety performance trial at the AG-CARES farm, Lamesa, 2023.

						Seed	% Open									Nematode Rankings				
		% Lint		Boll	Seed	per	Boll	Storm				Unif-		Elong-					Wal-	
Designation	Yield	Picked	Pulled	Size	Index	Boll	9/25	Rating	Height	Mic	Length	ormity	Strength	ation	CG	Leaf	RK	LRK	ler	Ratings*
PHY 480W3FE	836	40.8	29.5	4.4	8.7	19.2	91	6	22	4.9	1.03	80.6	29.2	7.1	22-2,32-1	3	30	0.52	opq	R
PX1150D445-03W3E1	794	40.6	30.1	3.9	8.4	19.4	88	6	20	4.7	1.05	80.3	30.5	6.4	21-4,31-3	2	75	1.46	k-p	R
PHY 475W3FE	789	39.5	29.3	3.8	7.8	18.7	90	5	22	5.0	1.00	79.2	28.2	6.3	21-4,32-1	2	1505	0.94	l-q	R
PHY 136W3E1	772	41.8	31.0	3.9	8.0	22.0	86	7	20	4.9	1.07	80.0	29.9	6.7	21-4,22-2,32-1	3	1468	3.01	a-g	S
PX1150D490-04W3FE	739	39.9	29.9	4.0	7.9	19.1	84	6	21	5.0	1.07	80.3	30.7	6.3	21-4,31-3,32-1	2	455	2.61	d-k	R
PX1140A385-04W3FE	736	41.7	31.0	3.4	7.8	17.0	88	6	23	5.3	1.01	81.3	30.2	7.1	32-1	2	26	0.85	m-q	R
PX1130D303-04W3FE	731	40.9	29.9	3.8	7.5	18.0	90	7	23	5.3	1.01	80.5	28.3	5.9	31-3,31-4,32-1	2	26	0.51	opq	R
PHY 545W3FE	717	42.8	31.0	3.7	8.4	18.3	93	6	21	5.2	1.00	81.0	29.2	6.7	31-3	3	0	0.00	q	R
PX1125B234-04W3FE	708	38.9	28.0	3.8	8.7	20.8	89	5	22	5.4	1.00	79.2	27.4	5.9	31-3,42-1	2	10	0.40	pq	R
PX1125D251-03W3E1	703	40.1	29.0	3.7	8.5	18.4	88	7	20	5.1	1.02	80.0	29.0	6.6	22-2,32-1	3	60	0.60	n-q	R
PX1124B236-04W3FE	696	38.3	27.6	4.3	9.5	18.9	88	5	20	5.2	1.04	80.6	31.5	6.2	21-4,22-1,31-3	3	18	0.46	opq	R
PHY 415W3FE	693	39.3	29.9	3.8	8.4	20.2	86	6	22	5.0	1.06	80.6	30.7	6.3	32-1	2	80	1.09	l-q	R
PHY 137W3E1	692	39.9	29.1	3.1	8.1	13.9	89	5	21	4.6	1.07	80.8	30.5	7.0	31-3,32-1	3	2695	3.34	a-e	S
FM 1621GL	688	40.5	30.7	4.5	9.1	18.8	88	6	21	5.0	1.02	80.4	28.4	5.7	31-1,31-1	3	11215	3.82	abc	S
FM 868AXTP	681	40.8	31.0	5.1	9.5	26.0	93	5	21	4.7	1.06	80.7	30.3	6.3	22-2,31-3,32-1	2	825	2.71	c-j	R
PX1124D252-03W3E1	681	38.4	27.8	3.4	8.4	17.8	95	7	19	5.2	1.07	81.7	32.1	6.5	22-1,31-4,32-1	3	1375	2.96	a-h	S
PX1130B333-04W3FE	679	37.3	27.0	3.3	8.2	16.5	91	7	21	4.9	1.03	81.3	30.0	6.5	32-1,32-2	2	0	0.00	q	R
PX1150D446-03W3E1	661	39.9	29.2	4.2	8.1	19.2	84	6	19	5.0	1.06	80.5	31.1	6.3	21-4,31-3	2	420	2.05	f-l	R
PHY 400W3FE	661	40.2	29.2	3.8	8.2	19.1	90	6	18	4.8	1.01	79.4	28.0	6.3	21-4,32-1	3	2090	2.70	c-j	R
PX1140D326-03W3E1	659	38.9	27.2	3.5	8.5	17.0	88	6	19	5.0	1.04	81.8	30.9	6.5	21-4,32-1	3	50	1.00	l-q	R
PX1140D328-04W3FE	648	39.1	29.1	4.0	8.6	20.9	89	6	22	4.9	1.08	79.8	30.4	6.4	21-4,31-3	3	625	1.85	g-m	R
PHY 443W3FE	647	40.1	28.6	4.0	8.8	19.0	88	5	24	5.2	1.02	80.0	29.7	6.3	32-1	2	84	1.01	l-q	R
AMX20T079B3XF	625	39.7	28.6	3.6	8.1	19.0	91	3	22	5.1	1.04	79.9	26.9	6.2	32-1,32-2	2	3538	3.17	a-f	S
PX1122A214-04W3FE	624	38.3	28.1	3.8	8.3	18.7	91	7	20	4.3	0.97	78.8	27.4	6.2	212,21-4,31-1	2	7778	3.80	abc	S
AMX20T157B3XF	618	39.3	30.1	4.6	8.2	22.7	88	5	23	5.1	1.06	81.0	29.4	7.0	22-2,31-3	2	2938	3.36	a-e	S
AMX21COO5B3TXF	597	37.7	26.9	3.3	7.1	19.9	94	5	23	4.7	1.05	81.2	28.2	6.6	31-1,31-3	2	3905	3.56	a-e	S
NG 3930 B3XF	597	38.2	28.4	3.8	8.3	20.8	89	6	21	5.0	1.04	80.5	26.9	6.3	32-1	3	3588	3.37	a-e	S
BX 2359AXTP	595	40.3	30.1	3.7	9.3	18.3	89	4	25	5.0	1.09	81.5	29.7	6.3	21-4,31-3	2	773	2.77	b-i	R
FM 1730GLTP	592	39.2	29.5	3.9	8.3	18.5	96	4	19	4.7	1.03	80.2	27.8	5.6	31-2,31-2	3	2430	2.42	e-k	R
BX 2451AXTP	591	40.6	30.4	4.2	8.2	20.7	88	5	22	5.0	1.06	79.4	27.5	6.3	21-4,31-3	2	1638	1.59	j-o	R
PHY 332W3FE	585	40.0	27.6	3.8	8.4	17.8	88	6	20	4.9	1.06	80.6	29.4	6.5	22-2,32-1	2	58	1.01	l-q	R
AMX160030-BB3XF	584	38.2	28.5	4.3	9.4	23.0	91	6	21	4.8	1.04	80.3	28.3	6.2	21-4,32-1	1	15288	4.01	a	S
PX1140B373-04W3FE	579	38.1	27.8	3.1	7.9	17.3	91	6	20	4.9	1.01	80.2	29.9	7.2	32-1	2	11176	2.88	a-h	S
PHY 411W3FE	579	40.4	29.2	3.3	7.3	14.3	91	7	20	5.2	0.97	79.2	28.0	6.4	21-4,31-1,31-3	2	18	0.46	opq	R
DP 2141NR B3XF	573	38.9	28.2	3.5	9.2	16.6	86	5	21	5.5	1.07	79.9	29.8	6.2	32-1	2	0	0.00	q	R
AMX20T114B3XF	559	38.6	28.2	4.0	8.0	21.0	93	3	24	5.4	1.08	81.6	29.8	7.2	31-3,32-1,42-1	3	1970	3.05	a-f	S
PHY 205W3FE	550	36.3	26.2	3.5	8.9	17.9	93	6	19	4.5	0.99	79.6	27.6	6.1	31-3	3	613	1.82	h-m	R
NG 4335 B3TXF	546	38.5	27.0	3.3	7.5	16.6	95	5	21	4.7	1.06	81.4	29.2	6.1	31-3,32-1,32-2	2	3733	3.46	a-e	S

Table 4 (continued). Yield, agronomic, fiber quality, and nematode ratings from the irrigated, high level, root-knot nematode cotton variety performance trial at the AG-CARES farm, Lamesa, 2023.

		% Lint				Seed per	% Open Boll	Storm				Unif-		Elong-			Nematode Rankings			
Designation	Yield	Picked	Pulled	Boll Size	Seed Index	Boll	9/25	Rating	Height	Mic	Length	ormity	Strength	ation	CG	Leaf	RK	LRK	Wal-ler	Ratings*
FM 2334GLT (check)	530	39.8	29.7	3.7	8.3	18.8	96	4	20	4.9	1.04	79.7	27.4	5.7	31-2,31-3	2	8915	3.88	ab	S
DP 2436NR B3TXF	510	41.5	29.8	3.2	8.3	15.9	91	4	21	4.7	1.10	80.7	31.8	7.1	32-1,32-2	2	1168	2.83	b-i	R
PX1127D245-04W3FE	510	36.4	26.6	3.2	8.1	16.9	91	6	18	4.7	1.02	80.2	28.0	5.9	31-1,31-2	3	263	1.68	i-n	R
DP 2143NR B3XF	490	37.7	27.7	3.7	8.1	16.5	88	4	22	5.6	1.05	80.2	29.4	6.2	31-3,32-1,32-2	3	13	0.43	opq	R
FM 823AXTP	481	40.6	29.8	3.8	7.9	19.4	95	4	18	4.5	1.05	79.8	29.7	6.2	31-1,31-3	2	2283	3.35	a-e	S
AMX160030-AB3XF	480	38.8	29.5	4.6	8.9	22.9	93	6	22	4.8	1.04	80.0	28.9	6.2	31-3,32-1	2	10528	3.65	a-d	S
BX 2362AXTP	464	38.5	28.6	3.3	8.1	17.0	89	4	21	4.8	1.08	80.9	29.5	6.4	21-4,31-3	3	1235	2.97	a-h	S
ST 6000AXTP	448	42.7	31.9	4.5	8.6	21.3	88	5	22	5.1	1.07	81.5	31.2	6.2	31-1,31-1	2	3413	3.39	a-e	S
NG 4350 B3TXF	430	34.5	24.5	3.3	8.1	20.8	95	7	20	4.3	1.06	80.1	28.9	6.1	31-3,31-4,32-1	3	2210	3.29	a-e	S
Mean	624	39.4	28.9	3.8	8.3	18.9	90	5	21	5.0	1.04	80.4	29.3	6.4		2	0.001	0		
c.v.%	16.1	1.6	2.6	9.3	4.4	7.1	4.0	14.8	8.4	3.1	2.0	0.9	3.1	2.3		21.3		1.16		
LSD 0.05	118	0.9	1.0	0.5	0.6	2.3	4	1	2	0.3	0.04	1.3	1.7	0.3		1				

* R - resistant, S - susceptible

TITLE:

The effect of root-knot nematode on commercial varieties at AG-CARES, Lamesa, TX, 2023

AUTHORS:

Terry Wheeler – Professor
Robert Ballesteros – Research Associate
Marcus Labay – Research Technician

MATERIALA AND METHODS:

Plot size: 35 feet long, 2-rows wide, four replications arranged in a randomized complete block design.
Planted 4 seed/foot row (52,324 seed/acre). There were 32 cultivars planted.
Planted on May 8th but replanted on May 31. Harvested on 2 November.

RESULTS AND DISCUSSION:

Results: The highest yielding variety was PHY 415 W3FE with 1,053 lbs of lint/acre, which is a new variety in 2023 and had a loan value of ¢53.30/lb for an overall top value/acre of $561.12 (Table 1). The top seven yielding entries all had some level of nematode resistance, before the top yielding susceptible variety (FM 2498GLT). Low plant stand may have affected the ability of some cultivars to yield well at this location. The top 10 yielding cultivars all had stands of at least 2 plants/foot of row. For the cultivars with lower ranked yields, 45% had stands of < 2 plants/foot row. Loan value of cultivars ranged from ¢47.25/lb to 55.03/lb (DP 2335 B3XF). The nematode resistant Phytogen varieties averaged 21% higher yield (820 lbs lint/acre) than the susceptible cotton varieties (677 lbs of lint/acre). In terms of fiber properties, micronaire was high overall with the majority of entries being in the discount range (Table 2). The fiber length averaged between 1.02 to 1.13 inches, with the top four highest fiber lengths being associated with the new Avant Flex cultivars. Fiber strength averaged between 27.0 to 32.6 grams/tex, with the top four entries DP 2143NR B3XF, DP 2141NR B3XF, ST 6000AXTP, and PX1124B236-04.

Table 1. Root-knot nematode (RK) variety trial.

Variety[a]	Lint yield[d] (lbs/a)	Value ($) /Acre[b]	Plants /ft row	RK[c]	LOG_{10} (RK+1)	Turnout (%)	Loan (¢/lb)	RK[f] Rating
PHY 415 W3FE	**1,053**	**561.12**	2.43	1,405	3.04	30.7	53.30	R
PX1124B236-04	**917**	**462.19**	2.38	908	2.27	29.2	50.43	R
PHY 475 W3FE	**912**	**440.89**	2.34	1,650	2.50	30.7	48.33	R
FM 1621GL	**902**	**445.61**	2.01	8,846	3.63	32.0	49.43	R
PX1122A214-04	**885**	**441.00**	2.12	11,453	3.84	30.7	49.83	U
PHY 350 W3FE	**837**	**432.02**	2.29	5,400	3.47	30.0	51.63	R
PHY 443 W3FE	**826**	390.05	2.38	3,998	3.20	30.4	47.25	R
FM 2498GLT	**804**	**403.21**	2.38	11,018	3.47	30.4	50.15	S
PX1125B234-04	**796**	387.25	2.92	2,353	2.82	28.2	48.68	U
DP 2239 B3XF	**782**	**414.20**	2.37	2,128	2.50	33.2	52.95	S
PHY 411 W3FE	**773**	367.71	2.04	1,480	2.24	30.9	47.60	R
DP 2349NR B3XF	**768**	374.75	2.34	1,611	2.25	32.3	48.78	R
DP 2038 B3XF	**768**	367.37	2.29	1,358	2.70	34.6	47.85	S
DP 2335 B3XF	**754**	**414.93**	2.09	2,420	2.95	32.2	55.03	S
PHY 332 W3FE	**745**	**398.21**	2.20	7,305	2.66	30.6	53.45	R
FM 868AXTP	**743**	375.93	1.94	5,274	3.70	32.7	50.63	R
BX2359AXTP	**734**	**393.93**	2.22	746	2.15	31.0	53.65	R
PHY 400 W3FE	719	365.93	2.35	4,223	1.74	29.9	50.93	R
PHY 205 W3FE	695	338.24	2.56	2,321	2.03	28.3	48.65	R
DP 2141NR B3XF	695	347.25	1.94	746	1.59	30.2	50.00	R
DP 2127 B3XF	692	331.45	2.22	3,751	2.51	32.0	47.88	S
NG 3299 B3XF	672	334.95	1.86	13,878	3.91	32.6	49.88	S
DP 2123 B3XF	664	345.69	1.83	16,055	4.03	28.8	52.10	S
BX2451AXTP	645	332.18	1.83	1,750	3.04	31.1	51.48	U
ST 4993B3XF	631	305.16	1.93	7,295	3.81	32.3	48.40	S
FM 823AXTP	618	326.75	1.72	3,206	2.63	31.2	52.85	R
BX2362AXTP	605	322.47	1.82	2,698	3.21	29.7	53.30	U
ST 6000AXTP	600	320.40	2.05	410	2.50	32.1	53.40	R
FM 1730GLTP	590	288.27	2.10	1,534	2.94	31.3	48.90	R
DP 2143NR B3XF	560	286.61	1.69	135	1.61	29.6	51.18	R
NG 3195 B3XF	525	266.34	2.17	898	2.85	30.5	50.78	S
NG 5711 B3XF	482	257.26	1.74	605	1.38	31.4	53.40	S
Prob>F	0.007	0.008	0.327	0.027	0.063	0.003	0.0004	
MSD[e] (0.05)	330	168.98		12,754		2.3	3.62	

[a]BX and PX are experimental lines for BASF and PhytoGen.

[b]Value/acre was the loan value (/lb) x lint yield/acre.

[c]Root-knot nematode eggs + J2/500 cm^3 soil.

[d]Black bolded numbers are not significantly different than the top yielding or top valued variety.

[e]MSD is minimum significant difference at P=0.05, using the Waller-Duncan k-ratio t test.

[f]R=resistant, S=susceptible, U=experimental line, where more data is required.

Table 2. Fiber quality (HVI) ratings for a root-knot nematode trial near Lamesa.

Variety[a]	Mic	Length (“)	Unif	Strength (g/tex)	Elon-gation	Rd %	+b	Leaf
BX2359AXTP	**5.03[b]**	1.13	82.6	30.2	6.0	73.9	8.8	3.5
BX2362AXTP	**4.95**	1.13	81.7	30.7	5.9	74.3	8.8	3.5
BX2451AXTP	**5.17**	1.13	81.1	29.4	5.8	74.3	8.9	4.0
DP 2038 B3XF	**5.20**	1.04	**79.5**	28.4	5.8	75.8	8.7	3.0
DP 2123 B3XF	4.81	1.09	81.1	28.3	5.5	74.2	8.5	4.0
DP 2127 B3XF	**5.43**	1.05	80.4	27.0	6.0	76.5	8.9	2.5
DP 2141NR B3XF	**5.31**	1.09	80.6	31.3	5.8	74.8	9.2	3.0
DP 2143NR B3XF	**5.58**	1.11	81.1	31.6	5.8	74.4	9.0	3.5
DP 2239 B3XF	**5.00**	1.11	80.9	28.3	6.0	76.4	9.1	3.0
DP 2335 B3XF	4.74	1.10	80.7	30.4	5.3	77.1	8.7	2.5
DP 2349NR B3XF	**5.30**	1.06	80.6	28.3	5.8	75.4	8.5	3.0
FM 823AXTP	**5.06**	1.10	81.4	30.6	6.1	75.0	8.7	4.0
FM 868AXTP	4.99	1.07	80.8	29.9	5.8	75.6	9.2	2.5
FM 1621GL	**5.28**	1.06	81.2	29.5	5.4	74.4	8.5	4.5
FM 1730GLTP	**5.09**	1.05	81.4	28.8	5.1	75.8	8.2	3.5
FM 2498GLT	**5.47**	1.10	81.9	29.4	5.7	75.3	8.8	3.0
NG 3195 B3XF	4.92	1.05	**79.3**	27.5	5.4	75.5	8.9	3.0
NG 3299 B3XF	**5.31**	1.09	81.1	29.7	5.6	75.1	9.1	3.5
NG 5711 B3XF	4.89	1.08	80.0	28.7	6.2	76.1	8.9	2.0
PHY 205 W3FE	4.96	1.02	**79.8**	27.85	5.5	75.1	9.1	3.5
PHY 332 W3FE	4.92	1.10	81.0	29.10	6.1	74.0	9.1	3.0
PHY 350 W3FE	**5.01**	1.09	81.2	28.50	5.9	75.1	9.2	3.5
PHY 400 W3FE	4.91	1.06	80.8	30.25	5.8	74.4	9.5	3.5
PHY 411 W3FE	**5.02**	1.03	80.5	29.30	6.0	76.5	8.4	3.0
PHY 415 W3FE	4.83	1.11	80.5	30.90	6.3	74.5	9.1	3.5
PHY 443 W3FE	**5.17**	1.07	80.6	30.00	6.0	74.0	9.6	3.0
PHY 475 W3FE	**5.07**	1.04	**79.4**	29.60	6.1	74.2	9.1	3.0
PX1122A214-04	4.58	1.03	**79.0**	28.60	5.8	75.4	8.8	3.5
PX1124B236-04	**5.17**	1.08	81.3	31.25	6.0	74.5	8.8	4.0
PX1125B234-04	**5.54**	1.06	80.9	29.00	5.5	74.6	9.0	4.0
ST 4993B3XF	**5.17**	1.04	81.1	29.70	5.9	75.6	8.4	3.5
ST 6000AXTP	**5.07**	1.12	81.5	32.60	6.1	75.5	9.2	2.5
Prob>F	0.0001	0.0001	0.096	0.004	0.0001	0.005	0.001	0.068
MSD[c] (0.05)	0.22	0.04		2.65	0.3	1.8	0.5	

[a]BX and PX are experimental lines for BASF and PhytoGen.
[b]Red bolded values are in the discount range for micronaire and fiber length uniformity.
[c]MSD is minimum significant difference at *P*=0.05, using the Waller-Duncan k-ratio t test.

TITLE:

Performance of FiberMax and Stoneville varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 35 feet, 3 replications

Planting Date: May 17

Varieties:

BX 2330AXTP	BX 2359AXTP
BX 2362AXTP	BX 2423AXTP
BX 2451AXTP	BX 2453AXTP
FM 1621GL	FM 1730GLTP
FM 2398GLTP	FM 2498GLT
ST 4990B3XF	ST 4993B3XF

Herbicides:

Roundup 40oz/A+XtendiMax 16oz/A+Valor 2oz/A	4/21/23
Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
Liberty 32 oz/A + Roundup 32 oz/A	6/15/23
Liberty 32 oz/A + Roundup 32 oz/A + Warrant 48 oz/A	7/20/23

Fertilizer: 92-0-0

Irrigation:

	Low	Base	High
Preplant/Emergence	4.5”	4.9”	4.6”
In-season	6.8”	10.6”	13.9”
Total	11.3”	15.6”	18.4”

Harvest Date: October 18

RESULTS AND DISCUSSION:

Six commercial FiberMax and Stoneville varieties and six experimental varieties were compared under three levels of subsurface drip irrigation. When averaged across varieties, yields were similar for the base and high irrigation levels (Table 1). When averaged across water levels, yields were similar for eleven of the twelve entries. Loan values increased with higher irrigation levels and varied from 51.99 to 56.97 ¢/lb. Gross revenues increased for the base and high irrigation levels compared to the low. When averaged across water levels, gross revenues ranged from $463 to $574/A. The six experimental varieties in the test all contain Axant (HPPD), dicamba, glyphosate, and glufosinate herbicide tolerance as well as TwinLink technology.

Table 1. Effects of FiberMax and Stoneville varieties and subsurface drip irrigation level on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A).

	In-season Irrigation Levels (inches)			
Variety	**Low (6.8)**	**Base (10.6)**	**High (13.9)**	**Average**
		---------- lbs/A----------		
BX 2330AXTP	771	979	1117	**955 AB**
BX 2359AXTP	637	998	1112	**915 AB**
BX 2362AXTP	821	1045	1155	**1007 A**
BX 2423AXTP	723	1038	951	**904 AB**
BX 2451AXTP	658	987	1096	**913 AB**
BX 2453AXTP	689	915	1049	**884 AB**
FM 1621GL	693	959	1107	**919 AB**
FM 1730GLTP	711	1041	1008	**919 AB**
FM 2398GLTP	655	962	1161	**925 AB**
FM 2498GLT	810	913	951	**891 AB**
ST 4990B3XF	734	896	1008	**879 B**
ST 4993B3XF	737	958	1112	**935 AB**
Average	**720 B**	**974 A**	**1069 A**	**--**
		----------¢/lb----------		
BX 2330AXTP	50.15	53.67	55.55	**53.12 CD**
BX 2359AXTP	54.32	55.43	57.15	**55.63 B**
BX 2362AXTP	56.72	56.98	57.23	**56.97 A**
BX 2423AXTP	54.10	56.00	57.17	**55.75 AB**
BX 2451AXTP	55.17	55.85	56.03	**55.68 AB**
BX 2453AXTP	54.57	56.05	57.65	**56.08 AB**
FM 1621GL	50.07	52.93	54.05	**52.35 CD**
FM 1730GLTP	54.70	56.98	57.07	**56.25 AB**
FM 2398GLTP	50.52	54.35	55.08	**53.31 CD**
FM 2498GLT	50.77	52.68	52.53	**51.99 D**
ST 4990B3XF	55.97	56.77	56.82	**56.51 AB**
ST 4993B3XF	51.53	54.03	54.28	**53.28 CD**
Average	**53.21 C**	**55.14 B**	**55.88 A**	**--**
		----------$/A----------		
BX 2330AXTP	389	527	620	**512 AB**
BX 2359AXTP	345	555	635	**511 AB**
BX 2362AXTP	466	596	661	**574 A**
BX 2423AXTP	391	581	544	**505 AB**
BX 2451AXTP	363	553	614	**510 AB**
BX 2453AXTP	376	512	604	**497 B**
FM 1621GL	347	507	602	**485 B**
FM 1730GLTP	387	593	575	**518 AB**
FM 2398GLTP	331	525	638	**497 B**
FM 2498GLT	411	481	500	**463 B**
ST 4990B3XF	411	508	573	**497 B**
ST 4993B3XF	380	518	600	**499 B**
Average	**383 B**	**538 A**	**597 A**	**--**

TITLE:

Performance of Deltapine varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 32 feet, 4 replications

Planting Date: June 6

Varieties:

22R138B3XF	22R141B3XF
22R2222B3TXF	23R9822B3TXF
23R9837B3TXF	23R9929B3TXF
23R9943B3TXF	DP 2123B3XF
DP 2239B3XF	DP 2317B3TXF
DP 2335B3XF	DP 2436NRB3TXF

Herbicides:

Roundup 40oz/A+XtendiMax 16oz/A+Valor 2oz/A	4/21/23
Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
XtendiMax 16 oz/A + Roundup 32 oz/A	6/15/23
Liberty 32 oz/A + Roundup 32 oz/A + Warrant 48 oz/A	7/20/23

Fertilizer: 92-0-0

Irrigation:

	Low	Base	High
Preplant/Emergence	4.3”	4.2”	4.9”
In-season	7.7”	10.7”	13.5”
Total	12.0”	14.8”	18.3”

Harvest Date: November 2

RESULTS AND DISCUSSION:

Twelve varieties including Deltapine commercial and experimentals were evaluated under three levels of subsurface drip irrigation. In-season irrigation levels ranged from 7.7” to 13.5” applied per acre. As irrigation level increased, yields ranged from 744 to 1221 lbs lint/A compared to 297 lbs/A for dryland (Table 1). When averaged across irrigation levels, yields among varieties ranged from 738 to 872 lbs lint/A. Highest yields were produced with three experimentals and four commercial varieties including DP 2436NRB3TXF (a new variety for 2024). When averaged across varieties, loan values were similar for dryland and the low irrigation level and higher with the base and high irrigation level. When averaged across irrigation levels, highest loan value was achieved with DP 2436NRB3TXF. Gross revenues (yield x loan value) ranged from 390 to 470 $/A.

Table 1. Effects of variety and irrigation level on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A).

	In-season Irrigation Levels (inches)				
Variety	**Dryland**	**Low (7.7)**	**Base (10.7)**	**High (13.7)**	**Average**
		---------- lbs/A----------			
22R138B3XF	246	685	872	1150	**738 C**
22R141B3XF	301	773	872	1344	**822 ABC**
22R2222B3TXF	283	691	986	1337	**824 ABC**
23R9822B3TXF	307	645	1015	1156	**780 BC**
23R9837B3TXF	332	747	922	1059	**765 BC**
23R9929B3TXF	251	689	913	1140	**748 C**
23R9943B3TXF	332	828	950	1372	**870 A**
DP2123B3XF	274	712	862	1147	**748 C**
DP2239B3XF	286	766	1026	1307	**846 AB**
DP2317B3TXF	278	717	973	1184	**788 ABC**
DP2335B3XF	353	868	1010	1260	**872 A**
DP2436NRB3TXF	326	806	929	1192	**813 ABC**
Average	**297 D**	**744 C**	**944 B**	**1221 A**	**--**
		----------¢/lb----------			
22R138B3XF	53.00	54.50	56.00	56.25	**54.93 C**
22R141B3XF	52.50	53.25	54.00	54.25	**53.50 EF**
22R2222B3TXF	53.00	53.00	55.00	55.25	**54.06 DEF**
23R9822B3TXF	51.75	51.75	53.25	53.75	**52.62 GH**
23R9837B3TXF	54.25	54.25	54.75	56.00	**54.81 CD**
23R9929B3TXF	55.25	55.50	56.50	56.25	**55.87 B**
23R9943B3TXF	51.75	51.75	54.25	55.50	**53.31 FG**
DP2123B3XF	51.75	52.50	52.25	52.25	**52.18 H**
DP2239B3XF	54.00	52.50	56.00	55.75	**54.56 CD**
DP2317B3TXF	52.25	53.75	55.00	55.50	**54.12 DE**
DP2335B3XF	53.50	53.25	55.50	55.50	**54.43 CD**
DP2436NRB3TXF	57.00	56.50	56.50	56.75	**56.68 A**
Average	**53.33 B**	**53.54 B**	**54.92 A**	**55.25 A**	**--**
		----------$/A----------			
22R138B3XF	129	372	488	648	**409 DE**
22R141B3XF	159	412	472	728	**442 A-D**
22R2222B3TXF	150	365	543	735	**448 A-D**
23R9822B3TXF	159	334	542	623	**414 CDE**
23R9837B3TXF	180	407	510	593	**422 B-E**
23R9929B3TXF	139	382	515	643	**419 B-E**
23R9943B3TXF	173	431	518	762	**470 AB**
DP2123B3XF	141	374	446	600	**390 E**
DP2239B3XF	155	402	578	729	**466 AB**
DP2317B3TXF	146	388	536	658	**431 A-E**
DP2335B3XF	190	464	563	702	**479 A**
DP2436NRB3TXF	186	458	526	677	**461 ABC**
Average	**159 D**	**399 C**	**520 B**	**675 A**	**--**

TITLE:

Performance of PhytoGen varieties as affected by irrigation levels at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 32 feet, 4 replications

Planting Date: May 17

Varieties:

PHY136W3E1	PHY205W3FE
PHY332W3FE	PHY390W3FE
PHY400W3FE	PHY411W3FE
PHY415W3FE	PHY480W3FE
PHY545W3FE	PX1122A214-04W3FE
PX1124B236-04W3FE	PX1124D252-03W3E1
PX1125B234-04W3FE	PX1125D251-03W3E1
PX1127D245-04W3FE	PX1130A317-03W3E1
PX1130D303-04W3FE	PX1140D326-03W3E1
PX1140D328-04W3FE	PX1150B437-04W3FE
PX1150D445-03W3E1	PX1150D446-03W3E1
PX1150D490-04W3FE	DP2044B3XF
FM2498GLT	NG3930B3XF

Herbicides:

Roundup 40oz/A+XtendiMax 16oz/A+Valor 2oz/A	4/21/23
Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
Liberty 32 oz/A + Roundup 32 oz/A	6/15/23
Liberty 32 oz/A + Roundup 32 oz/A + Warrant 48 oz/A	7/20/23

Fertilizer: 92-0-0

Irrigation:

	Low	Base	High
Preplant/Emergence	4.5”	4.9”	4.6”
In-season	6.8”	10.6”	13.9”
Total	11.3”	15.6”	18.4”

Harvest Date: October 20

RESULTS AND DISCUSSION:

Twenty-three commercial and experimental Phytogen varieties and three competitive varieties were evaluated under dryland and three levels of subsurface irrigation. The trial area had a rye cover crop terminated four weeks before planting. In-season irrigation levels ranged from 6.8” to 13.9” applied across the three irrigation levels. No preplant or in-season irrigation was applied to dryland plots. Average cotton lint yields ranged from 303 lbs lint/A (dryland) up

to 1206 lbs lint/A at the highest irrigation level (Table 1). When averaged across irrigation levels, yields ranged from 688 to 984 lbs lint/A among varieties. Loan values increased with increasing irrigation levels and varied from 48 to 55 cents/lb among varieties (Table 2). Gross revenues (yield x loan value) increased with increasing irrigation level and ranged from 362 to 536 $/A.

Table 1. Effect of variety and irrigation level on cotton lint yield (lbs./A).

	In-season Irrigation Levels (inches)				
Variety	**Dry (0.0)**	**Low (6.8)**	**Base (10.6)**	**High (13.9)**	**Average**
	---------- lbs/A----------				
PHY136W3E1	290	1019	1213	1418	**984 A**
PHY205W3FE	265	743	890	1176	**768 HIJ**
PHY332W3FE	268	826	1095	1237	**856 C-G**
PHY390W3FE	317	742	1043	1303	**851 C-G**
PHY400W3FE	346	806	1091	1295	**884 CDE**
PHY411W3FE	302	902	1096	1274	**893 BCD**
PHY415W3FE	330	739	1022	905	**748 JK**
PHY480W3FE	287	779	1189	1340	**898 BCD**
PHY545W3FE	274	903	1142	1278	**899 BCD**
PX1122A214-04W3FE	253	896	952	1264	**841 C-G**
PX1124B236-04W3FE	368	893	1271	1291	**955 AB**
PX1124D252-03W3E1	358	696	1001	1147	**800 G-J**
PX1125B234-04W3FE	292	873	1075	1195	**858 C-G**
PX1125D251-03W3E1	314	729	1063	1101	**801 G-J**
PX1127D245-04W3FE	336	690	1092	1177	**823 E-H**
PX1130A317-03W3E1	291	983	1150	1186	**902 BC**
PX1130D303-04W3FE	277	742	965	1034	**754 IJ**
PX1140D326-03W3E1	261	819	1016	1248	**836 D-G**
PX1140D328-04W3FE	301	818	1032	1104	**813 F-I**
PX1150B437-04W3FE	300	726	1110	1095	**807 F-J**
PX1150D445-03W3E1	347	933	1155	1389	**955 AB**
PX1150D446-03W3E1	258	854	1239	1198	**887 CDE**
PX1150D490-04W3FE	292	1096	1104	1411	**975 A**
DP2044B3XF	259	696	964	1166	**771 HIJ**
FM2498GLT	364	829	1078	1202	**868 C-F**
NG3930B3XF	319	631	890	914	**688 K**
Average	**303 C**	**822 B**	**1074 A**	**1206 A**	**--**

Table 2. Effect of variety and irrigation level on loan value (¢/lb).

	In-season Irrigation Levels (inches)				
Variety	**Dry (0.0)**	**Low (6.8)**	**Base (10.6)**	**High (13.9)**	**Average**
	----------¢/lb----------				
PHY136W3E1	53.18	51.83	54.50	56.68	**54.04 ABC**
PHY205W3FE	46.70	48.35	48.48	49.45	**48.24 L**
PHY332W3FE	49.63	49.88	52.15	54.45	**51.52 F-K**
PHY390W3FE	50.60	51.25	52.48	55.03	**52.33 C-F**
PHY400W3FE	48.65	51.10	53.63	56.58	**52.48 B-F**
PHY411W3FE	48.90	48.13	50.60	50.58	**49.55 KL**
PHY415W3FE	48.65	49.60	54.58	54.55	**51.84 E-H**
PHY480W3FE	46.98	49.68	57.08	54.98	**52.17 C-G**
PHY545W3FE	47.23	47.30	52.50	54.35	**50.34 G-K**
PX1122A214-04W3FE	50.23	48.38	53.73	54.85	**51.79 E-J**
PX1124B236-04W3FE	49.93	51.95	52.75	53.00	**51.9 E-I**
PX1124D252-03W3E1	49.45	52.05	54.00	54.98	**52.61 B-F**
PX1125B234-04W3FE	48.28	50.18	49.80	52.43	**50.16 H-L**
PX1125D251-03W3E1	51.50	50.03	55.68	54.28	**52.86 B-F**
PX1127D245-04W3FE	50.93	55.35	54.38	53.88	**53.63 A-E**
PX1130A317-03W3E1	48.63	51.33	55.23	54.10	**52.31 C-G**
PX1130D303-04W3FE	48.80	49.85	50.15	51.25	**50.01 I-L**
PX1140D326-03W3E1	53.53	50.93	51.43	52.83	**52.17 C-G**
PX1140D328-04W3FE	50.30	51.25	51.98	53.60	**51.78 E-J**
PX1150B437-04W3FE	49.28	46.60	51.20	52.20	**49.81 JKL**
PX1150D445-03W3E1	52.93	54.45	56.33	57.73	**55.35 A**
PX1150D446-03W3E1	55.25	51.20	54.85	56.05	**54.33 AB**
PX1150D490-04W3FE	51.20	52.65	52.48	50.03	**51.58 F-J**
DP2044B3XF	50.95	53.48	55.95	55.48	**53.96 A-D**
FM2498GLT	50.58	52.10	52.30	51.90	**51.71 E-J**
NG3930B3XF	50.98	48.58	53.28	55.38	**52.05 D-H**
Average	**50.12 C**	**50.67 BC**	**53.13 AB**	**53.87 A**	**--**

Table 3. Effect of variety and irrigation level on gross revenue ($/A).

Variety	In-season Irrigation Levels (inches) Dry (0.0)	Low (6.8)	Base (10.6)	High (13.9)	Average
	----------$/A----------				
PHY136W3E1	154	528	661	804	**536 A**
PHY205W3FE	124	359	431	582	**374 JK**
PHY332W3FE	133	412	571	673	**447 D-G**
PHY390W3FE	160	381	547	717	**451 C-G**
PHY400W3FE	168	412	585	733	**474 B-E**
PHY411W3FE	147	434	554	644	**445 EFG**
PHY415W3FE	160	367	558	494	**394 IJK**
PHY480W3FE	135	387	678	737	**484 BC**
PHY545W3FE	129	427	600	694	**462 C-F**
PX1122A214-04W3FE	127	433	511	693	**441 EFG**
PX1124B236-04W3FE	184	464	671	684	**500 B**
PX1124D252-03W3E1	177	362	540	631	**427 GHI**
PX1125B234-04W3FE	141	438	535	626	**435 FGH**
PX1125D251-03W3E1	162	365	592	598	**428 FGH**
PX1127D245-04W3FE	171	382	594	634	**445 EFG**
PX1130A317-03W3E1	142	504	635	641	**480 BCD**
PX1130D303-04W3FE	135	370	484	530	**379 JK**
PX1140D326-03W3E1	140	417	523	659	**434 FGH**
PX1140D328-04W3FE	151	419	536	592	**424 GHI**
PX1150B437-04W3FE	148	338	568	571	**406 HIJ**
PX1150D445-03W3E1	184	508	650	802	**535 A**
PX1150D446-03W3E1	142	437	680	672	**482 BC**
PX1150D490-04W3FE	149	577	579	706	**502 AB**
DP2044B3XF	132	372	539	647	**422 GHI**
FM2498GLT	184	432	564	624	**450 C-G**
NG3930B3XF	162	306	474	506	**362 K**
Average	**152 D**	**417 C**	**572 B**	**650 A**	**--**

TITLE:

Effect of planting date on yield and fiber quality of Deltapine varieties at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 200 feet		
Planting Date:	May 4, May 16, June 5, June 14		
Varieties:	DP 2123B3XF	DP 2127B3XF	
	DP 2211B3TXF	DP 2239B3XF	
	DP 2317B3TXF	DP 2335B3XF	
Herbicides:	Roundup 32 oz/A + Valor 2 oz/A		4/6/23
	Caparol 24 oz/A + Gramoxone 22 oz/A		5/17/23
	XtendiMax 16 oz/A + Roundup 32 oz/A		6/15/23
	Roundup 32 oz/A + Liberty 32 oz/A + Warrant 48 oz/A		7/20/23
Fertilizer:	90-34-0		

Irrigation:

	Base
Preplant/Emergence	3.3”
In-season	7.0”
Total	10.3”

Harvest Date: Planting dates 1-3 harvested October 16
Fourth planting date harvested October 19

RESULTS AND DISCUSSION:

Six Deltapine varieties were planted on four dates (May 4, May 16, June 5, and June 14). Irrigation was applied similarly across all four dates during the growing season. Wheat was grown in the plot area in 2022 with stubble maintained with no-tillage. Highest overall yields were produced with the June 5 and June 14 planting dates (Table 1). When varieties were averaged across planting dates, highest yields were produced with DP 2127 B3XF. Loan values were higher with the two June planting dates. When averaged across planting dates, highest loan values were achieved with DP 2123 B3XF and DP 2239 B3XF varieties. Gross revenues (yield x loan value) were highest with the June planting dates and varied between varieties. These results are similar to the 2022 tests, with higher yields produced with the June planting dates.

Table 1. Effects of planting date and Deltapine varieties on cotton lint yield (lbs/A), loan value (¢/lb), and gross revenue ($/A) in a wheat cotton rotation in 2023.

	Planting Date				
Variety	**May 4**	**May 16**	**June 5**	**June 14**	**Average**
		---------- lbs/A----------			
DP2123B3XF	703	584	693	885	**716 B**
DP2127B3XF	742	734	865	940	**820 A**
DP2211B3TXF	597	620	701	761	**670 BC**
DP2239B3XF	702	704	727	754	**722 B**
DP2317B3TXF	536	531	773	762	**650 C**
DP2335B3XF	565	584	641	726	**629 C**
Average	**641 B**	**626 B**	**733 AB**	**805 A**	**--**
		---------- ¢/lb----------			
DP2123B3XF	0.51	0.54	0.55	0.55	**0.54 A**
DP2127B3XF	0.43	0.42	0.49	0.52	**0.46 C**
DP2211B3TXF	0.46	0.45	0.55	0.56	**0.50 B**
DP2239B3XF	0.52	0.48	0.56	0.55	**0.53 A**
DP2317B3TXF	0.46	0.47	0.55	0.55	**0.51 B**
DP2335B3XF	0.45	0.45	0.55	0.57	**0.50 B**
Average	**0.47 B**	**0.47 B**	**0.54 A**	**0.55 A**	**--**
		---------- $/A----------			
DP2123B3XF	355	315	378	487	**384 A**
DP2127B3XF	319	305	424	484	**383 A**
DP2211B3TXF	275	279	386	422	**340 B**
DP2239B3XF	365	334	404	415	**379 A**
DP2317B3TXF	244	250	421	419	**333 B**
DP2335B3XF	254	263	349	414	**320 B**
Average	**302 B**	**291 B**	**394 A**	**440 A**	**--**

TITLE:

Cotton yield response to simulated cotton fleahopper and western tarnished plant bug infestations as influenced by irrigation level and cultivar treatments at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Megha Parajulee – Professor, Faculty Fellow, and Regents Fellow
Dol Dhakal - Research Specialist II
Raju Sapkota – Research Associate
Wayne Keeling - Professor

MATERIALS AND METHODS:

Plot Size: 4 rows by 300-700 feet, 3 replications

Planting Date: May 16, Rye cover planted

Varieties: DP 2143NR B3XF
FM 2498 GLT

Herbicides:

Roundup 32 oz/A	4/6/23
Caparol 24 oz/A + Gramoxone 22 oz/A	5/17/23
Roundup 32 oz/A + Liberty 22 oz/A	6/14/23
Roundup 32 oz/A + Liberty 32 oz/A + Warrant 48 oz/A	7/20/23

Fertilizer: 90-34-0

Irrigation:

	Low	Base	High
Preplant/Emergence	4.25”	4.25”	4.25”
In-season	4.9”	7.0”	9.10”
Total	7.25”	14.2”	16.5”

Treatments: Three treatments included c*ontrol, manual removal of 100% squares three weeks into squaring (July 14) to time cotton fleahopper susceptible stage, and removal of 20% bolls from the top of the plant to simulate Lygus infestation (August 17).*

Harvest date: October 20 (hand-harvested)

Effect of manual removal of early-stage versus late-stage fruits was evaluated on two cotton cultivars, FM 2498 GLT and DP 2143NR B3XF, as influenced by two irrigation (low and high) water levels. The experiment comprised of two water levels, two cultivars, and three simulated fruit loss events [control, pre-flower 100% square loss mimicking the cotton fleahopper injury-induced loss, and 20% small bolls (<3 cm diameter) loss mimicking the Lygus boll injury-induced small fruit abortion at cut-out], replicated three times, totaling 36 plots. The test plots were monitored for the occurrence of any other insects, but no such occurrences were observed during the growing season.

RESULTS AND DISCUSSION:

Combined over two cultivars and three insect simulation treatments, significantly higher lint yield was recorded from 'high' water regime (629 lb/acre) compared to that in 'low' water regime (389 lb/acre). Lint yield was abnormally low in 2023 due to prolonged drought during the growing season. Nevertheless, the insect simulation treatments showed characteristic treatment differences. That is, the late season fruit removal mimicking Lygus injury did not significantly reduce the lint yield regardless of the irrigation water treatment (Low water: uninfested control – 419 lb/acre, Lygus-simulated -383 lb/acre; High water: uninfested control – 687 lb/acre, Lygus-simulated – 724 lb/acre), whereas an early season fruit (square) removal mimicking cotton fleahopper injuiry reduced lint yield (Low water: uninfested control – 419 lb/acre, cotton fleahopper-simulated -363 lb/acre; High water: uninfested control – 687 lb/acre, cotton fleahopper-simulated – 476 lb/acre) under high water regime. The effect of simulated cotton fleahopper was much more pronounced under high irrigation production regime (Fig. 1), indicating a greater pest risk at high irrigation production regime for pre-flower cotton. The effect of insect injury simulation was similar in both cultivars; however, DP 2143NRB3XF appeared to be slightly more vulnerable to late season Lygus infestation than FM 2498GLT and the effect was more pronounced under deficit irrigation production condition (Fig. 2).

All treatment combinations (2 Water x 2 Cultivar x 3 Insect Infestation treatments), except for DP 2143NRB3XF in Low water treatment, resulted in micronaire values >4.2 (4.3 in DP 2143NRB3XF Low water-Control to 5.48 in FM 2498 GLT-High Water-Lygus Simulation), rendering most of the test crop to a discount range. Irrigation water treatment significantly impacted the Short Fiber Index (SFI), with SFI values of 10.76 in 'high' water and 12.96 in 'low' water treatments. Similarly, late-season boll removal improved SFI (10.3) compared to control (12.65) and early-season square removal (12.65), suggesting a significant fiber quality impact by early-season cotton fleahopper infestation that with high severity. Similarly, late-season boll removal as simulated Lygus damage enhanced fiber strength (30.47 gram/tex) compared to fleahopper-simulated square removal (27.47 gram/tex) or uninfested control (27.14 gram/tex) (Fig. 3). Overall, 'high' water plots produced stronger fiber (29.7 gram/tex) than 'low' water plots (27.02 gram/tex). A significant interaction of water x cultivar x insect simulation influenced fiber strength. Five of the 12 treatment combinations resulted in strong or very strong fiber, five produced average fiber, and two weak fiber (Fig. 3).

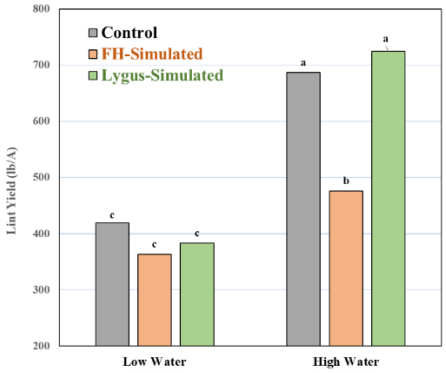

Figure 1. Average lint yield under low and high irrigation regimes following cotton fleahopper and Lygus infestation simulation versus control, Lamesa, Texas, 2023.

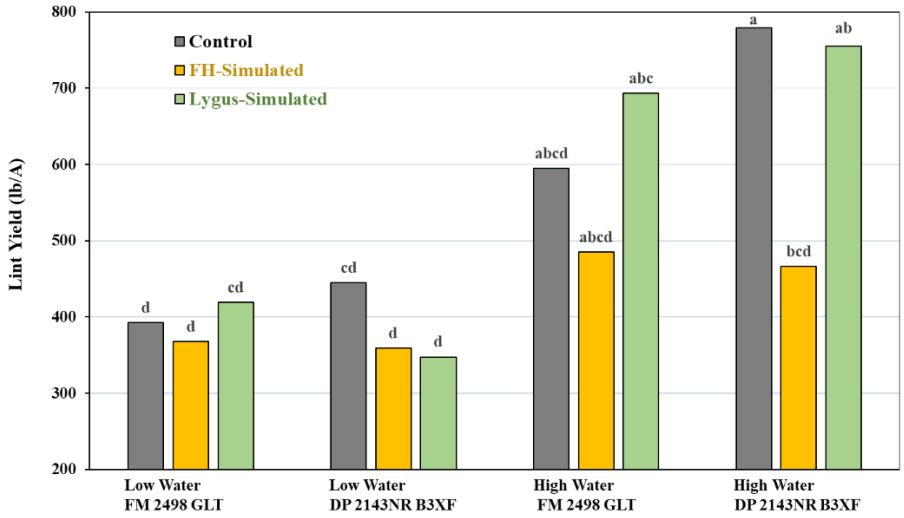

Figure 2. Average lint yield influenced by simulated cotton fleahopper versus *Lygus*-induced fruit removal in two cotton cultivars under low and high irrigation regimes, Lamesa, Texas, 2023

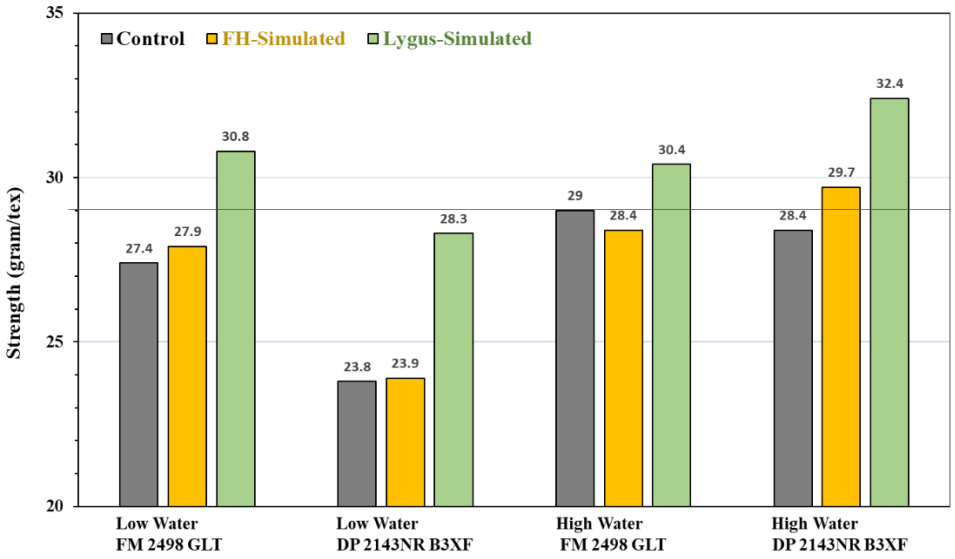

Figure 3. Average fiber strength values (grams/tex) influenced by early-season simulated cotton fleahopper damage and simulated *Lygus*-induced fruit removal in late season in two cotton cultivars under low and high irrigation regimes, Lamesa, Texas, 2023. Interpretation of fiber strength: Very strong ≥31, Strong 29-30, Average 26-28, Intermediate 24-25, and Weak ≤23.

TITLE:

Effect of preemergence herbicides on cotton in sandy soils at AG-CARES, Lamesa, TX, 2023.

AUTHORS:

Wayne Keeling – Professor
Ray White – Research Scientist
Justin Spradley – Research Assistant

MATERIALS AND METHODS:

Plot Size:	2 rows by 30 feet, 2 replications	
Planting Date:	May 19	
Application Dates:	PRE - May 19 POST (cotyledon) - May 30	
Variety:	BX 2330AXGLTP (Axant Flex)	
Herbicides:	Roundup 40oz/A+XtendiMax 16oz/A+Valor 2oz/A XtendiMax 16 oz/A + Roundup 32 oz/A Liberty 32 oz/A + Roundup 32 oz/A + Warrant 48 oz/A	4/21/23 6/15/23 7/20/23
Fertilizer:	92-0-0	

Irrigation:

	High
Preplant/Emergence	4.9”
In-season	13.5”
Total	18.3”

RESULTS AND DISCUSSION:

Axant Flex cotton varieties contain herbicide resistance to Alite 27, glyphosate, dicamba, and glufosinate. This study was designed to determine crop tolerance of Alite 27 alone or in combination with standard preemergence (PRE) herbicides and the same treatments over the top at cotton emergence. All treatments were applied at 1X and 2X rates. Approximately 3” of rainfall was received within 24 days after planting. At 1X rates, no crop injury was observed with Alite 27, Caparol, or Alite + Caparol. When applied after emergence, no injury was observed with Alite 27 at the 1X, but slight injury (7.5%) was observed at the 2X rate. Significant injury was observed with Caparol, Cotoran, Direx, or Reflex applied POST as expected. These results indicate that when applied at the 3 oz/A (1X) rate, Alite 27 has excellent crop safety on sandy soils applied to Axant Flex varieties.

Table 1. Effects of preemergence herbicides on cotton growth.

Treatment	Injury (%)[1] June 13	June 20	July 15
----------PRE----------			
Alite 27 (3 oz)	0 D	0 B	0 D
Alite 27 (6 oz)	0 D	2.5 B	0 D
Caparol (32 oz)	0 D	0 B	0 D
Caparol (64 oz)	7.5 D	4 B	0 D
Cotoran (32 oz)	17.5 D	30 A	20 C
Direx (32 oz)	5 D	0 B	0 D
Reflex (16 oz)	10 D	10 B	6.5 D
Warrant (48 oz)	5 D	0 B	0 D
Alite 27 (2 oz) + Caparol (16 oz)	0 D	0 B	0 D
Alite 27 (2 oz) + Direx (16 oz)	0 D	0 B	0 D
Alite 27 (2 oz) + Reflex (8 oz)	5 D	0 B	0 D
Alite 27 (2 oz) + Warrant (24 oz)	0 D	0 B	0 D
----------POST----------			
Alite 27 (3 oz)	0 D	0 B	0 D
Alite 27 (6 oz)	7.5 D	7.5 B	2.5 D
Caparol (32 oz)	45 BC	35 A	40 AB
Caparol (64 oz)	65 A	45 A	40 AB
Cotoran (32 oz)	35 C	40 A	45 A
Direx (32 oz)	35 C	30 A	30 B
Reflex (16 oz)	50 B	45 A	40 AB
Warrant (48 oz)	0 D	0 B	0 D

[1]0=no injury, 100=complete kill

	January			February		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	72	41	-	31	23	-
2	71	42	-	53	28	0.25
3	55	33	-	57	23	-
4	61	35	-	66	30	-
5	61	25	-	76	29	-
6	78	35	-	80	39	-
7	51	33	-	54	42	-
8	63	23	-	56	33	-
9	72	30	-	56	33	-
10	78	35	-	46	23	-
11	73	38	-	55	20	-
12	55	29	-	68	24	-
13	63	24	-	63	35	-
14	71	35	-	66	38	-
15	72	47	-	71	29	-
16	67	40	-	43	18	-
17	66	47	-	49	13	-
18	57	37	-	53	31	-
19	54	22	-	55	32	-
20	64	34	-	76	46	-
21	55	23	-	81	48	-
22	54	22	-	71	48	-
23	53	28	-	58	34	-
24	40	31	-	42	28	-
25	44	27	-	46	35	-
26	47	22	-	84	44	-
27	55	24	-	71	39	-
28	66	27	-	77	33	-
29	41	25	-			
30	26	19	-			
31	24	19	-			

	March			April		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	70	45	-	75	36	-
2	73	31	-	85	44	-
3	68	30	-	88	42	-
4	70	32	-	84	49	-
5	82	38	-	64	39	-
6	84	42	-	65	40	-
7	76	42	-	67	33	-
8	55	41	-	74	38	-
9	66	43	-	79	52	-
10	68	44	-	79	52	-
11	86	49	-	82	45	-
12	67	38	-	83	51	-
13	59	36	-	84	48	-
14	64	31	-	83	56	-
15	73	38	-	77	46	-
16	75	38	-	71	34	-
17	51	32	-	74	45	-
18	53	28	-	90	49	-
19	57	23	-	89	57	-
20	66	35	-	78	52	-
21	78	45	-	74	42	-
22	84	53	-	71	40	-
23	82	51	-	48	40	-
24	69	40	-	65	44	-
25	67	37	-	82	53	-
26	69	34	-	80	51	-
27	68	31	-	80	38	-
28	58	33	-	69	42	-
29	75	47	-	79	38	-
30	78	50	-	94	43	-
31	70	43	-			

	May			June		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	78	50	-	75	62	-
2	83	53	-	80	60	1.50
3	85	55	-	76	57	-
4	88	63	-	79	59	-
5	93	52	-	79	61	-
6	91	50	-	82	60	-
7	94	48	-	86	58	-
8	96	61	-	86	58	0.80
9	95	58	-	95	66	-
10	90	60	-	95	62	-
11	85	56	0.80	98	61	-
12	92	51	-	80	68	-
13	63	57	0.45	93	65	-
14	73	59	-	94	64	-
15	76	60	-	99	62	-
16	83	57	-	97	59	-
17	86	58	-	101	66	-
18	86	62	-	98	62	-
19	85	62	-	105	69	-
20	74	56	-	105	69	-
21	80	57	-	107	72	-
22	85	62	1.90	102	69	-
23	89	63	-	101	73	-
24	79	61	-	108	73	-
25	80	59	0.50	105	77	-
26	76	58	0.40	103	73	-
27	77	64	-	107	81	-
28	85	59	-	103	78	-
29	86	60	0.60	100	73	-
30	89	63	-	95	68	1.25
31	85	64	-			

	July			August		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	79	68	-	101	78	-
2	90	66	-	100	72	-
3	93	68	-	101	76	-
4	94	69	-	103	77	-
5	97	73	-	105	76	-
6	92	72	-	105	79	-
7	96	73	-	98	72	-
8	96	71	-	100	69	-
9	96	73	-	105	72	-
10	103	69	-	106	73	-
11	104	73	-	107	82	-
12	109	80	-	106	75	-
13	106	81	-	103	74	-
14	104	79	-	91	74	-
15	96	74	-	94	65	-
16	100	70	-	103	67	-
17	103	68	-	107	72	-
18	107	78	-	104	67	-
19	105	78	-	101	64	-
20	102	76	-	99	65	-
21	95	69	-	100	68	-
22	92	69	-	96	71	-
23	101	68	-	91	71	-
24	102	69	-	96	71	-
25	101	75	-	99	64	-
26	99	67	-	101	71	-
27	100	67	-	94	71	-
28	98	68	-	88	69	-
29	99	70	-	93	62	
30	97	66	-	93	65	
31	99	70	-	98	61	

	September			October		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	99	61	-	86	69	-
2	100	62	-	84	65	-
3	100	60	-	86	61	1.20
4	102	70	-	85	64	0.50
5	105	76	-	76	60	-
6	99	71	-	79	53	-
7	102	69	-	69	46	-
8	105	69	-	82	49	-
9	100	66	-	85	48	-
10	94	75	0.50	83	49	0.70
11	92	65	0.10	88	61	-
12	68	61	-	89	63	-
13	68	60	-	72	53	-
14	84	64	-	68	47	-
15	86	60	-	69	44	-
16	79	59	1.50	75	43	-
17	84	61	-	83	46	-
18	90	63	1.70	87	48	-
19	97	69	-	85	47	-
20	98	62	-	89	48	-
21	90	69	-	88	54	-
22	98	68	-	82	65	-
23	101	68	-	72	60	-
24	96	63	-	78	64	-
25	87	69	-	77	57	2.40
26	89	62	-	80	51	-
27	93	63	-	61	51	-
28	93	63	-	54	48	-
29	93	69	-	47	34	-
30	88	71	-	45	31	-
31				56	29	

	November			December		
Day	Max Temp	Min Temp	Precipitation	Max Temp	Min Temp	Precipitation
1	59	30	-	65	30	-
2	69	35	-	63	35	-
3	77	38	-	68	29	-
4	81	40	-	63	27	-
5	80	44	-	66	34	-
6	88	43	-	67	31	-
7	89	46	-	77	43	-
8	87	53	-	76	39	-
9	58	46	-	54	30	-
10	57	44	-	54	21	-
11	58	44	-	65	26	-
12	63	44	-	55	32	-
13	60	47	-	51	42	-
14	56	49	-	46	39	-
15	58	44	-	54	36	0.75
16	69	45	-	62	32	-
17	68	46	-	66	32	-
18	59	46	-	58	33	-
19	73	46	-	62	38	-
20	67	40	-	63	40	-
21	57	35	-	61	42	-
22	66	30	-	67	38	-
23	67	31	-	61	48	0.10
24	48	36	-	55	34	-
25	51	38	-	46	29	-
26	51	29	-	49	25	-
27	54	29	-	55	27	-
28	58	30	-	56	27	-
29	62	34	-	60	23	-
30	67	39	-	68	25	-
31				63	29	-

Total rainfall for 2023-17.9"