2019 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 20-2

Texas A&M AgriLife and Research and Extension Center of Lubbock
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Texas A&M AgriLife scientists and Lamesa Cotton Growers want to express their appreciation to Dr. Danny Carmichael for his more than 23 years of service at AG-CARES. He has announced his retirement effective February 29, 2020. Danny has been a dedicated and loyal employee during his time of service. His assistance to a number of our programs including cotton variety testing and breeding, disease/nematodes, soil fertility/health, cropping systems, weed science, and irrigation and water use efficiency helped provide valuable information for producers in the Lamesa region. We wish Danny and his family well as he begins this new experience.

2019 proved to be an extremely challenging year for our Southern High Plains producers. Rainfall hampered planting keeping fields too wet until near or beyond the cut off date for most producers. Then rainfall was very limited during the growing season which reduced both yield and quality of the crop. An earlier than usual frost/freeze terminated the crop for many growers which was followed by a rainfall during harvest. Unfortunately, it was a very frustrating year from start to finish in 2019.

Our work at AG-CARES will continue to focus on:

- Root-knot nematode management and variety testing and development
- Soil fertility – improving nitrogen and potassium use and efficiency
- New cotton variety evaluations
- Cover crop evaluation
- Non-GMO variety development
- Irrigation and water management
- Weed control
- Soil health

All the above areas are important as we continue to demonstrate the sustainability of cotton production in the Southern High Plains of Texas.

We wish to thank Dr. Wayne Keeling for his continued leadership of our activities at AG-CARES.

Special thanks to Lamesa Cotton Growers for their continued support over the past 30 years and their current officers: David Zant, President; Kirk Tidwell, Vice-President; and Glen Phipps, Secretary.

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Corteva
Dawson County Commissioners Court
PhytoGen Cotton Seed
Syngenta Crop Protection

TITLE:

Cotton variety performance (continuous cotton terminated rye cover) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice DeLong – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications
Planting Date:	May 18
Varieties:	DP 1845 B3XF FM 2498 GLT NG 4777 B2XF PHY 350 W3FE ST 4946 GLB2
Herbicides:	Prowl H_2O 3 pt/A Roundup 32 oz/A-POST Roundup 32 oz/A-POST
Fertilizer in-season:	120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	3.1”	3.1”	3.1”
In Season	5.1”	7.7”	10.2”
Total	8.2”	10.8”	13.3”

Harvest Date: November 4

RESULTS AND DISCUSSION:

Five varieties were compared under three levels of center-pivot irrigation in a terminated rye cover crop system. This area has included a cover crop for the last nine years. When cotton lint yields were averaged across varieties, yields ranged from 496 to 797 lbs./A (Table 1). When averaged across irrigation levels, highest yields were produced with ST 4946 GLB2. Overall yields were much below average due to lack of in-season rainfall and above-average temperatures, which was typical for most of the region. Loan values increased with increased irrigation due to improved staple length. When averaged across irrigation levels, highest loan value was achieved with DP 1845 B3XF. Gross revenues ($/A) were highest with ST 4946 GLB2.

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

	Irrigation Levels (inches)			
Cultivar	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------			
DP 1845 B3XF	471	616	722	**603 BC**
FM 2498 GLT	455	592	862	**636 B**
NG 4777 B2XF	371	501	681	**518 BC**
PHY 350 W3FE	497	546	835	**626 B**
ST 4946 GLB2	687	758	885	**777 A**
Average	**496 B**	**602 B**	**797 A**	**--**
	----------¢/lb----------			
DP 1845 B3XF	54.13	54.52	55.85	**54.83 A**
FM 2498 GLT	48.25	51.23	52.88	**50.79 B**
NG 4777 B2XF	46.32	47.83	50.48	**48.21 BC**
PHY 350 W3FE	48.38	51.73	52.25	**50.79 B**
ST 4946 GLB2	49.00	50.60	50.70	**50.10 BC**
Average	**49.22 B**	**51.18 A**	**52.43 A**	**--**
	----------$/A----------			
DP 1845 B3XF	256	338	403	**332 B**
FM 2498 GLT	221	304	457	**327 B**
NG 4777 B2XF	177	239	344	**253 C**
PHY 350 W3FE	242	281	436	**320 B**
ST 4946 GLB2	337	384	450	**390 A**
Average	**246 B**	**309 B**	**418 A**	**--**

TITLE:

Cropping systems and cotton variety performance (conventional tillage, terminated rye cover crop, and wheat-cotton rotational systems) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice DeLong – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications
Planting Date:	May 18
Varieties:	DP 1845 B3XF ST 4946 GLB2
Herbicides:	**Conventional:** Trifluralin 24 oz/A-PPI Springtooth Roundup 32 oz/A-POST Roundup 32 oz/A-POST **Continuous Cotton, Rye Cover and Wheat-Cotton Rotation**: Prowl H_2O 3 pt/A Roundup 32 oz/A-POST Roundup 32 oz/A-POST
Fertilizer in-season:	120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	3.1”	3.1”	3.1”
In Season	5.1”	7.7”	10.2”
Total	8.2”	10.8”	13.3”

Harvest Date: November 4

RESULTS AND DISCUSSION:

A multi-year study has compared conventional tillage, terminated rye cover crop, and wheat-cotton rotational systems with multiple varieties and three irrigation levels. In 2019, yields in the conventional tillage system increased from 488 to 878 lbs. lint/A as irrigation level increased (Table 1). Similar yields were produced with DP 1845 B3XF and ST 4946 GLB2 when averaged across irrigation levels. Higher loan values were achieved with DP 1845 B3XF. In the terminated rye cover system, higher yields were achieved with ST 4946 GLB2 and higher loan values with DP 1845 B3XF (Table 2). This resulted in similar gross revenues ($/A) for the two varieties. (Table 3). In the wheat-cotton rotation system higher yields were achieved with ST 4946 GLB2 and similar loan values and gross revenues for both varieties.

When comparing the three systems, yields were 6% higher for the terminated cover crop system and 22% higher for the wheat-cotton rotation compared to conventional tillage. Little effect on loan value was observed (Table 4).

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

	Irrigation Levels (inches)			
Cultivar	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------			
DP 1845 B3XF	470	572	783	**608 A**
ST 4946 GLB2	506	623	972	**700 A**
Average	**488 B**	**597 B**	**878 A**	**--**
	----------¢/lb.----------			
DP 1845 B3XF	53.05	52.36	54.90	**53.44 A**
ST 4946 GLB2	49.05	50.38	52.65	**50.69 B**
Average	**51.05 B**	**51.37 B**	**53.78 A**	**--**
	----------$/A----------			
DP 1845 B3XF	250	299	431	**327 A**
ST 4946 GLB2	249	314	512	**358 A**
Average	**250 B**	**307 B**	**472 A**	**--**

Table 2. Effect of varieties and irrigation level on cotton lint yield (lbs./A), loan value (¢/lb.), and gross revenue ($/A) in a continuous cotton system with a terminated rye cover.

	Irrigation Levels (inches)			
Cultivar	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------			
DP 1845 B3XF	471	616	722	**603 B**
ST 4946 GLB2	687	758	885	**777 A**
Average	**579 A**	**687 A**	**803 A**	**--**
	----------¢/lb.----------			
DP 1845 B3XF	54.13	54.52	55.85	**54.83 A**
ST 4946 GLB2	49.00	50.60	50.70	**50.10 B**
Average	**51.57 A**	**52.56 A**	**53.28 A**	**--**
	----------$/A----------			
DP 1845 B3XF	256	338	403	**332 A**
ST 4946 GLB2	337	384	450	**390 A**
Average	**296 A**	**361 A**	**426 A**	**--**

Table 3. Effect of varieties and irrigation level on cotton lint yield (lbs./A), loan value (¢/lb.), and gross revenue ($/A) in a wheat cotton rotation.

	Irrigation Levels (inches)			
Cultivar	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------			
DP 1845 B3XF	604	756	849	**736 B**
ST 4946 GLB2	634	845	1102	**860 A**
Average	**619 B**	**800 AB**	**975 A**	**--**
	----------¢/lb.----------			
DP 1845 B3XF	52.53	54.27	55.42	**54.07 A**
ST 4946 GLB2	53.42	51.92	54.07	**53.13 A**
Average	**52.98 A**	**53.09 A**	**54.74 A**	**--**
	----------$/A----------			
DP 1845 B3XF	319	410	471	**400 A**
ST 4946 GLB2	341	444	599	**461 A**
Average	**330 B**	**427 AB**	**535 A**	**--**

Table 4. Lint Yield, Loan Value, and Return – (Average of 2 varieties)

	Irrigation Levels (inches)			
System	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------			
Conventional	**488**	**597**	**878**	**654**
Termination Rye	**579**	**687**	**803**	**690 (+6%)**
Wheat-Cotton	**619**	**800**	**975**	**798 (+22%)**
Average	**562**	**695**	**885**	**--**
	---------- ¢/lb.----------			
Conventional	**51.05**	**51.37**	**53.78**	**52.58**
Termination Rye	**51.57**	**52.56**	**53.28**	**52.47 (-0.2%)**
Wheat-Cotton	**52.98**	**53.09**	**54.74**	**53.60 (+2%)**
Average	**52.28**	**52.34**	**53.93**	**--**
	---------- $/A----------			
Conventional	**250**	**307**	**472**	**343**
Termination Rye	**296**	**361**	**426**	**361 (+5%)**
Wheat-Cotton	**330**	**427**	**535**	**431 (+26%)**
Average	**292**	**365**	**478**	**--**

TITLE:

Root-knot nematode density under different cropping systems, irrigation rates, and varieties.

AUTHORS:

Terry Wheeler (Professor)
Cecil Haralson, Zach Hilliard, and Robert Ballesteros

MATERIALS AND METHODS:

Large plot variety trials were conducted by Wayne Keeling in a continuous cotton wedge with no cover crop; a continuous cotton wedge with a rye cover crop; and in two wedges that were rotated with cotton followed by winter wheat and summer fallow. There were three irrigation rates, that were replicated three times in the trial (medium = 1.0B and low and high were 33% below or above this rate). Several different varieties were used in the trial, depending on the year including root-knot nematode susceptible DP 1646B2XF, PHY 490W3FE, NG 4545B2XF, and DP 1845B3XF. The variety ST 4946GLB2, which has partial resistance to root-knot nematode was in the trial all three years (2017 – 2019). The plots were sampled each fall and assayed for root-knot nematodes. A comparison was made across the three years (2017 to 2019) on the effects of the cropping system wedge, variety type (root-knot susceptible versus resistant), and irrigation rate on root-knot nematode density taken each in each plot of the test.

RESULTS:

The continuous cotton areas had higher root-knot nematode densities than the wheat/cotton rotation (Table 1). The partially resistant ST 4946GLB2 had lower root-knot nematode densities than the susceptible cotton varieties. These differences were particularly large in the two continuous cotton systems. The 1.33B irrigation rate had higher root-knot nematode densities (7,691 root-knot/500 cm^3 soil) than the 1.0B (5,478 root-knot/500 cm^3 soil) or the 0.67B irrigation rate (4,222 root-knot/500 cm^3 soil). Crop rotation with the wheat/summer fallow system had the largest impact on root-knot nematode densities, followed by the partial root-knot nematode resistance. The high irrigation rate did allow for more nematode buildup than the lower rates, though all three irrigation rates did allow for damaging densities of the nematode. Only crop rotation reduced root-knot nematode density low enough so that it would not be damaging to the subsequent cotton crop.

Table 1. Root-knot nematode densities (per 500 cm^3 soil) averaged over cropping system and variety type from 2017 to 2019.

	Variety type	
Cropping System	Susceptible	Partial Resistance
Continuous cotton/no cover	9,238	3,309
Continuous cotton/with cover	15,471	5,590
Cotton rotated with winter wheat/summer fallow	852	321

TITLE**:**

Cotton yield response to simulated cotton fleahopper and western tarnished plant bug infestations as influenced by irrigation level and cultivar treatments, Lamesa, TX, 2019.

AUTHORS:

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Abdul Hakeem – Assistant Research Scientist
Dol Dhakal - Research Associate
Wayne Keeling - Professor

MATERIALS AND METHODS:

Plot Size:	4 rows by 300 feet, 3 replications
Planting date:	May 18
Fertilizer in-season:	120-0-0
Cultivars:	PHY 350 W3FE and ST 4946 GLB2

Irrigation:

	Low	High
Preplant	3.1”	3.1”
In Season	5.1”	10.2”
Total	8.2”	13.3”

Herbicides:	Prowl H_2O 3 pt/A – pre-planting Roundup PowerMax 1 qt/A – post planting Roundup PowerMax 1qt/A – post planting
Treatments:	Three treatments included c*ontrol, manual removal of 100% squares three weeks into squaring (July 16) to time cotton fleahopper susceptible stage, and removal of 20% bolls from the top of the plant to simulate Lygus infestation (August 15).*
Boll collection date:	September 11, 2019 to estimate boll penetration pressure
Harvest date:	October 21, 2019 (hand-harvested)

Effect of manual removal of early stage fruits versus control was evaluated on two cotton cultivars, PHY 350 W3FE and ST 4946 GLB2, as influenced by irrigation water level. Experimental design consisted of two square abscission treatments (manual removal of 100% squares to mimic severe cotton fleahopper infestation versus control), two water levels (high versus low) and two cultivars (PHY 350 W3FE versus ST 4946 GLB2), replicated three times and deployed in a randomized complete block design (total 24 plots). In order to mimic a natural early season acute infestation of cotton fleahoppers, a 10-ft section was flagged in each plot and treatments were applied. Square abscission treatments, 1) control (zero square removal) and 2) manual removal off 100% squares, were deployed when cotton was highly vulnerable to fleahopper injury (2-3 weeks into cotton squaring). The test plots were monitored for the occurrence of any other insects, but no such occurrences were observed throughout the growing season. In another study within the same treatment combinations, two 10-ft sections were marked per plot and 20% bolls from the top of cotton plants were removed from *Lygus* injury simulated plots versus no bolls removed from control plots (24 plots).

RESULTS AND DISCUSSION:

***Simulation of early-season pest infestations*.** Combined over two cultivars, significantly higher lint yield was recorded from 'High' water regime (730 lb/acre) compared to that in 'Low' water regime (490 lb/acre) (Fig. 1). No significant difference in lint yield was recorded between fleahopper simulated treatments and control plots regardless of the water regime (Fig. 1). Square removal did not result in significant differences in lint yield between cotton variety PHY 350 W3FE (471 and 683 lb/A) and ST 4946 GLB2 (509 and 779 lb/A) in low and high water, respectively.

***Simulation of late-season Lygus-induced boll abortion*.** Lint yield did not significantly vary between 20% late-season fruit loss via manual pruning and control plots, but the yield penalty of 20% late fruit loss was more prominent in low water treatment than in high water regime (Fig. 2). Also, PHY 350 WFE was more susceptible to late-season fruit loss than ST 4946 GLB2 (Fig. 2). Both in 'low' and 'high' water regimes, significantly higher micronaire was recorded between fleahopper simulated treatments and control plots (Fig. 7), however, no significant differences in micronaire were detected between *Lygus* simulated treatments and control plots both in 'low' and 'high' water regimes (Fig. 8).

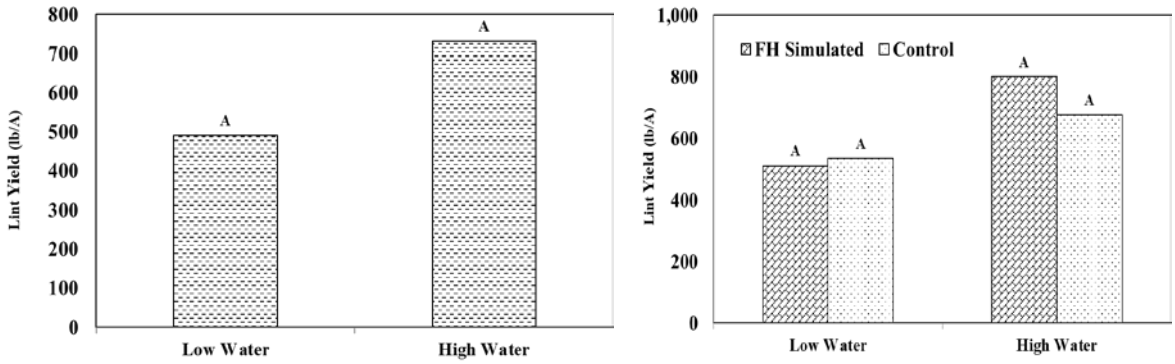


Figure 1. Average lint yield under high and low irrigation regimes (left) and the yield following manual removal of 100% squares prior to first flower versus control plots, Lamesa, Texas, 2019.

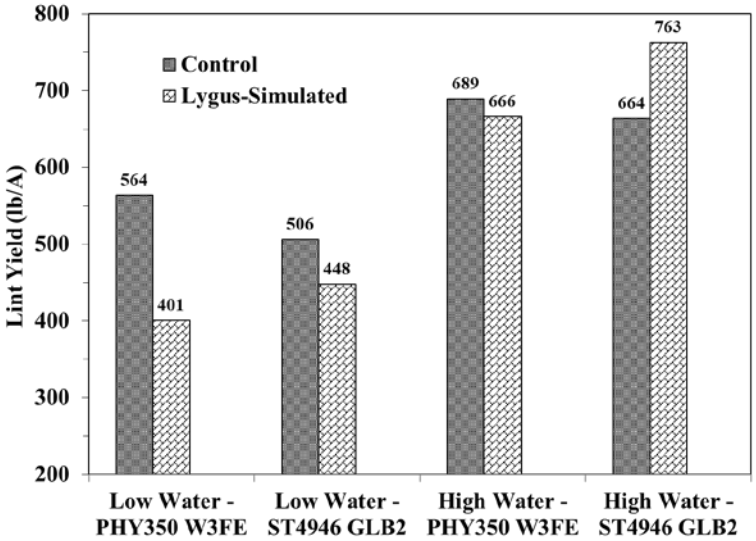


Figure 2. Average lint yield influenced by simulated *Lygus*-induced fruit removal in late season in two cotton varieties under high and low irrigation regimes, Lamesa, Texas, 2019. Average values were not statistically significant due to high variation in data.

Averaged over two cotton cultivars, early-season square removal resulted in increased micronaire values at both irrigation regimes, reaching to the discount range under high water regime (Fig. 3). The effect of late-season simulated *Lygus*-induced fruit removal did not significantly influence the lint micronaire. The increased irrigation water level (high water regime) increased micronaire values in both cotton cultivars, but PHY 350 W3FE had micronaire in the premium range at both irrigation levels while the micronaire values in ST 4946 GLB2 increased to move away from the premium range to the base range (Fig. 4).

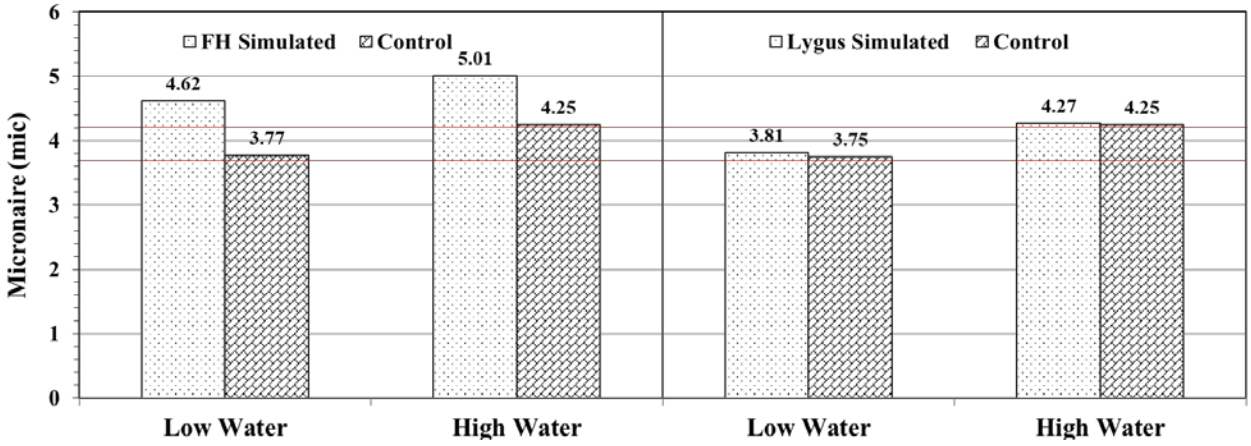


Figure 3. Average micronaire values influenced by early-season simulated cotton fleahopper damage (left) and simulated *Lygus*-induced fruit removal in late season averaged over two cotton cultivars under high and low irrigation regimes, Lamesa, Texas, 2019. The area enclosed by two red lines (3.7-4.2) indicates the microaire values for premium quality cotton lint.

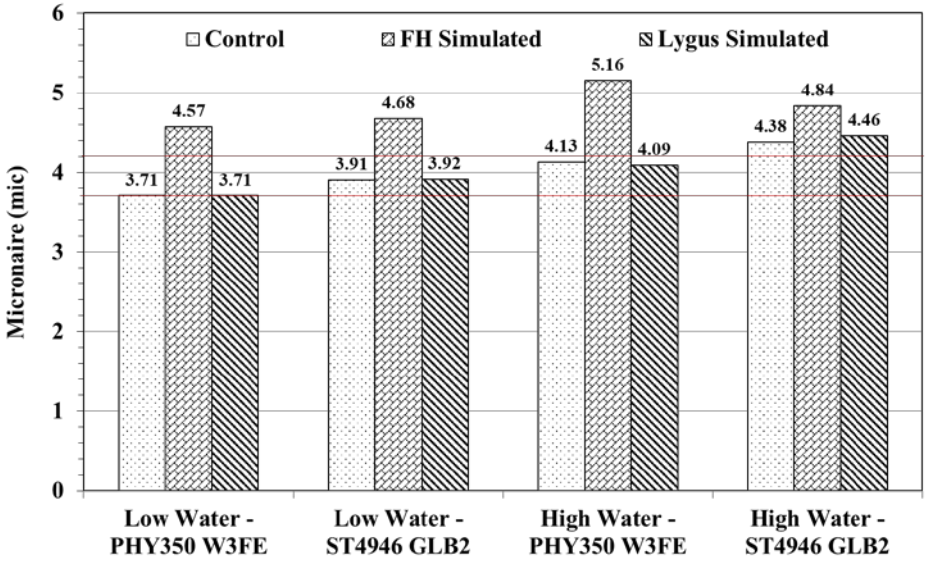


Figure 4. Average micronaire values influenced by early-season simulated cotton fleahopper damage and simulated *Lygus*-induced fruit removal in late season in two cotton cultivars under high and low irrigation regimes, Lamesa, Texas, 2019. The area enclosed by two red lines (3.7-4.2) indicates the micronaire values for premium quality cotton lint.

TITLE:

Performance of Americot varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice DeLong – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 35 feet, 4 replications

Planting Date: May 15

Varieties:
DP 1646 B2XF
NG 2982 B3XF
NG 3930 B3XF
NG 3956 B3XF
NG 4098 B3XF
NG 4777 B3XF
NG 4936 B3XF
NG 5711 B3XF

Herbicides:
Trifluralin 20 oz/A-PPI Springtooth
Roundup 32 oz/A-POST
Roundup 32 oz/A-POST

Fertilizer: 137-0-0

Irrigation in-season:

	Low	Base	High
Preplant	4.0”	4.0”	4.0”
In Season	7.0”	11.3”	14.6”
Total	11.0”	15.3”	18.6”

Harvest Date: November 5

RESULTS AND DISCUSSION:

Seven NexGen Bollgard 3 XtendFlex varieties and a competitive check were compared under three levels of subsurface drip irrigation. Adequate moisture at planting resulted in uniform stand establishment and good early-season growth. Lack of rainfall and consistent above-average temperatures during the growing season increased irrigation demand with 7.0, 11.3, and 14.6” of irrigation applied during the growing season for the three irrigation levels. When averaged across varieties, yields increased as irrigation level increased. When averaged across irrigation levels, highest yields were produced with NG 2982 B3XF, NG 4098 B3XF, and DP 1646 B2XF (Table1). Loan values were highest at the highest irrigation level, averaging 55.80 ¢/lb. When averaged across irrigation levels, loan values were similar for all varieties. Gross revenues ($/A) were related to yield, with DP 1646 B2XF, NG 2982 B3XF, NG 3930 B3XF, NG 3956 B3XF, and NG 4098 B3XF producing similar revenues.

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

Variety	In-season Irrigation Levels (inches) Low (7.0)	Base (11.3)	High (14.6)	Average
	---------- lbs./A----------			
DP 1646 B2XF	853	1128	1486	**1155 AB**
NG 2982 B3XF	885	1326	1519	**1243 A**
NG 3930 B3XF	907	1192	1500	**1199 AB**
NG 3956 B3XF	860	1150	1346	**1119 BC**
NG 4098 B3XF	862	1219	1425	**1168 AB**
NG 4777 B3XF	642	880	1146	**889 D**
NG 4936 B3XF	676	1071	1352	**1033 C**
NG 5711 B3XF	829	1195	1288	**1104 BC**
Average	**820 C**	**1153 B**	**1388 A**	
	---------- ¢/lb.----------			
DP 1646 B2XF	53.80	52.48	56.08	**54.12 A**
NG 2982 B3XF	52.78	52.35	55.35	**53.49 A**
NG 3930 B3XF	53.83	52.10	56.13	**54.02 A**
NG 3956 B3XF	52.95	50.83	54.85	**52.88 A**
NG 4098 B3XF	52.94	52.15	56.24	**53.78 A**
NG 4777 B3XF	51.05	52.43	54.95	**52.81 A**
NG 4936 B3XF	53.30	52.15	56.18	**53.88 A**
NG 5711 B3XF	52.55	51.33	56.18	**53.35 A**
Average	**52.90 B**	**51.99 B**	**55.80 A**	
	---------- $/A----------			
DP 1646 B2XF	498	653	855	**669 A**
NG 2982 B3XF	377	710	928	**671 A**
NG 3930 B3XF	465	613	885	**654 AB**
NG 3956 B3XF	462	611	765	**612 ABC**
NG 4098 B3XF	464	646	801	**637 ABC**
NG 4777 B3XF	326	405	698	**476 D**
NG 4936 B3XF	361	568	776	**568 C**
NG 5711 B3XF	436	589	724	**582 BC**
Average	**428 C**	**605 B**	**804 A**	

TITLE:

Performance of Deltapine varieties as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice DeLong - Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 35 feet, 4 replications

Planting Date: May 16

Varieties:

18R 628NR B3XF	DP 1909 XF
DP 1646 B2XF	DP 1948 B3XF
DP 1820 B3XF	DP 2012 B3XF
DP 1822 XF	DP 2020 B3XF
DP 1845 B3XF	DP 2022 B3XF
DP 1908 B3XF	DP 2044 B3XF

Herbicides: Prowl H_2O 3 pt/A
Roundup 32 oz/A-POST
Roundup 32 oz/A-POST

Fertilizer: 120-0-0

Irrigation in-season:

	Dry	Low	Base	High
Preplant	3.1”	3.1”	3.1”	3.1”
In Season	0.0”	5.1”	7.7”	10.2”
Total	3.1”	8.2”	10.8”	13.3”

Harvest Date: November 4

RESULTS AND DISCUSSION:

Twelve Deltapine varieties were evaluated under three levels of center-pivot irrigation in 2019. The trial area is a wheat-cotton rotation with wheat harvested in 2018 and residue maintained for planting in 2019 with no-tillage. When averaged across varieties yields increased from 708 to 1254 lbs lint/A as irrigation level increased. When averaged across irrigation levels, the highest yielding group included DP 1646 B2XF, DP 1822 XF, DP 1845 B3XF, DP 1948 B3XF, DP 2012 B3XF, and DP 2044 B3XF. Dryland varieties averaged 278 lbs/A with similar yields with all entries. There was a trend towards higher loan values with increased irrigation. When averaged across irrigation levels, highest loan values were achieved with DP 1646 B2XF, DP 1822 XF, DP 1845 B3XF, DP 1948 B3XF, and DP 2044 B3XF. Gross returns ($/A) increased with increasing irrigations and were highest with DP 1646 B2XF, DP 1822 XF, DP 1845 B3XF, DP 1948 B3XF and DP 2044 B3XF. Yields, loan values, and gross revenues for this trial are summarized in Table 1.

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

		Irrigation Levels (inches)			
Variety	**Dry (0.0)**	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
		---------- lbs/A----------			
18 R628NRB3XF	261 a	694	874	1286	**951 ABCD**
DP 1646 B2XF	295 a	877	1109	1334	**1107 A**
DP 1820 B3XF	257 a	587	993	1152	**911 CD**
DP 1822 XF	288 a	583	961	1397	**980 ABCD**
DP 1845 B3XF	299 a	763	951	1434	**1049 ABC**
DP 1908 B3XF	247 a	534	721	923	**726 E**
DP 1909 XF	281 a	639	818	1195	**884 DE**
DP 1948 B3XF	310 a	810	1206	1294	**1103 A**
DP 2012 B3XF	272 a	782	950	1299	**1010 ABCD**
DP 2020 B3XF	283 a	570	892	1171	**878 DE**
DP 2022 B3XF	275 a	660	797	1285	**914 BCD**
DP 2044 B3XF	268 a	1002	951	1276	**1076 AB**
Average	**278 a**	**708 C**	**935 B**	**1254 A**	**--**
		----------¢/lb----------			
18 R628NRB3XF	47.58 bc	49.05	52.73	54.05	**51.94 D**
DP 1646 B2XF	47.55 bc	54.05	52.78	54.03	**53.62 AB**
DP 1820 B3XF	50.45 ab	52.23	51.85	51.78	**51.95 D**
DP 1822 XF	50.45 ab	52.93	53.48	54.25	**53.55 ABC**
DP 1845 B3XF	50.25 ab	54.10	54.08	54.20	**54.13 A**
DP 1908 B3XF	44.28 cd	52.95	53.20	53.73	**53.29 BC**
DP 1909 XF	47.28 bc	52.58	53.15	53.95	**53.23 BC**
DP 1948 B3XF	52.68 a	54.15	54.25	54.15	**54.18 A**
DP 2012 B3XF	42.30 d	52.75	52.63	54.03	**53.13 BC**
DP 2020 B3XF	47.08 bcd	51.90	53.85	53.75	**53.17 BC**
DP 2022 B3XF	45.05 cd	52.30	52.98	53.15	**52.81 C**
DP 2044 B3XF	43.55 cd	53.48	53.60	54.15	**53.74 AB**
Average	**47.37 a**	**52.70 B**	**53.21 AB**	**53.77 A**	**--**
		----------$/A----------			
18 R628NRB3XF	124 a	340	461	695	**499 BCD**
DP 1646 B2XF	140 a	474	586	721	**593 A**
DP 1820 B3XF	130 a	307	515	596	**473 DE**
DP 1822 XF	145 a	308	514	758	**526 ABCD**
DP 1845 B3XF	150 a	413	514	777	**568 ABC**
DP 1908 B3XF	109 a	282	382	495	**387 E**
DP 1909 XF	133 a	337	435	645	**472 DE**
DP 1948 B3XF	163 a	439	654	701	**598 A**
DP 2012 B3XF	116 a	412	500	702	**538 ABCD**
DP 2020 B3XF	134 a	296	480	629	**469 DE**
DP 2022 B3XF	124 a	345	422	683	**483 CD**
DP 2044 B3XF	117 a	536	510	691	**579 AB**
Average	**132 a**	**374 C**	**498 B**	**674 A**	**--**

TITLE:

Performance of FiberMax and Stoneville varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice DeLong - Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 35 feet, 3 replications

Planting Date: May 15

Varieties:

BX 2002 GL	FM 1911 GLT
BX 2005 GLT	FM 2398 GLT
BX 2037 GLT	FM 2498 GLT
FM 1621 GL	FM 2574 GLT
FM 1830 GLT	ST 5600 B2XF
FM 1888 GL	ST 5707 B2XF

Herbicides: Trifluralin 20 oz/A-PPI Springtooth
Roundup 32 oz/A-POST
Roundup 32 oz/A-POST

Fertilizer: 137-0-0

Irrigation in-season:

	Low	Base	High
Preplant	4.0”	4.0”	4.0”
In Season	7.0”	11.3”	14.6”
Total	11.0”	15.3”	18.6”

Harvest Date: November 5

RESULTS AND DISCUSSION:

Twelve FiberMax and Stoneville varieties, including three experimentals, were compared under dryland and three levels of subsurface drip irrigation. Dryland yields averaged 283 lbs. lint/A with similar yields with all varieties. When averaged across varieties, yields increased from 1046-1703 lbs. lint/A as irrigation level increased. When averaged across irrigation levels, highest yields were produced with FM 1621 GL and ST 5600 B2XF. Loan values averaged 44.88 ¢/lb. for dryland and were highest for the base and high irrigation levels. When averaged across irrigation levels, loan values ranged from 50.57 to 52.79 ¢/lb. Seven varieties, including BX 2002 GL, BX 2005 GLT, BX 2037 GLT, FM 1830 GLT, FM 1888 GL, FM 1911 GLT, and FM 2574 GLT produced highest loan values. Gross revenues increased with increasing irrigation. When averaged irrigation levels, gross revenues were similar for all varieties. Lint yields, loan values, and gross revenues are summarized in Table 1.

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

		Irrigation Levels (inches)			
Cultivar	**Dry (0.0)**	**Low (7.0)**	**Base (11.3)**	**High (14.6)**	**Average**
		---------- lbs./A----------			
BX 2002 GL	321 a	1047	1506	1522	**1358 C**
BX 2005 GLT	257 a	978	1496	1584	**1353 C**
BX 2037 GLT	281 a	1042	1315	1514	**1290 C**
FM 1621 GL	285 a	1220	1839	2004	**1688 A**
FM 1830 GLT	296 a	979	1504	1515	**1333 C**
FM 1888 GL	308 a	976	1397	1526	**1300 C**
FM 1911 GLT	267 a	1005	1553	1814	**1457 BC**
FM 2398 GLT	269 a	989	1487	1768	**1415 BC**
FM 2498 GLT	268 a	1108	1337	1819	**1421 BC**
FM 2574 GLT	274 a	891	1263	1831	**1328 C**
ST 5600 B2XF	304 a	1234	1697	1910	**1614 AB**
ST 5707 B2XF	271 a	1088	1319	1630	**1345 C**
Average	**283 a**	**1046 C**	**1476 B**	**1703 A**	**--**
		----------¢/lb.----------			
BX 2002 GL	46.32 abc	50.82	53.95	53.60	**52.79 A**
BX 2005 GLT	46.68 abc	49.58	52.45	53.38	**51.81 AB**
BX 2037 GLT	46.23 abc	50.77	54.05	54.07	**52.96 A**
FM 1621 GL	44.08 bcd	47.58	51.82	52.98	**50.79 BC**
FM 1830 GLT	44.30 bc	49.42	54.08	53.32	**52.27 A**
FM 1888 GL	39.87 e	50.92	52.98	53.68	**52.53 A**
FM 1911 GLT	40.05 de	52.27	53.55	52.93	**52.92 A**
FM 2398 GLT	43.12 cde	49.38	50.77	52.20	**50.78 BC**
FM 2498 GLT	45.97 abc	49.73	49.83	50.90	**50.16 C**
FM 2574 GLT	45.63 abc	50.18	52.40	54.17	**52.25 A**
ST 5600 B2XF	48.72 a	50.58	50.23	50.88	**50.57 C**
ST 5707 B2XF	47.57 ab	49.07	50.48	50.83	**50.13 C**
Average	**44.88 a**	**50.03 B**	**52.22 A**	**52.75 A**	**--**
		----------$/A----------			
BX 2002 GL	149 a	531	813	816	**720 A**
BX 2005 GLT	121 a	484	784	844	**704 A**
BX 2037 GLT	130 a	529	711	818	**686 A**
FM 1621 GL	125 a	580	957	1063	**867 A**
FM 1830 GLT	131 a	483	814	810	**702 A**
FM 1888 GL	123 a	497	741	819	**686 A**
FM 1911 GLT	107 a	525	832	959	**772 A**
FM 2398 GLT	116 a	488	755	928	**724 A**
FM 2498 GLT	123 a	552	668	926	**716 A**
FM 2574 GLT	126 a	449	662	992	**701 A**
ST 5600 B2XF	150 a	623	853	970	**815 A**
ST 5707 B2XF	129 a	534	667	830	**677 A**
Average	**128 a**	**523 C**	**771 B**	**898 A**	**--**

TITLE:

Performance of PhytoGen varieties as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley and Ray White – Research Assistants
Brice Delong – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size: 4 rows by 32 feet, 4 replications

Planting Date: May 15

Varieties:

DP 1646 B2XF	PHY 500 W3FE
FM 1911 GLT	PHY 580 W3FE
NG 4777 B2XF	PX 2B14 W3FE
PHY 210 W3FE	PX 2C14 W3FE
PHY 250 W3FE	PX 3C06 W3FE
PHY 300 W3FE	PX 3D32 W3FE
PHY 320 W3FE	PX 3D43 W3FE
PHY 340 W3FE	PX 5C045 W3FE
PHY 350 W3FE	PX 5C05 W3FE
PHY 400 W3FE	PX 5E28 W3FE
PHY 480 W3FE	PX 5E34 W3FE

Herbicides: Prowl H_2O 3 pt/A
Roundup 32 oz/A - POST
Roundup 32 oz/A - POST

Fertilizer: 120-0-0

Irrigation in-season: LEPA

	Dry	Low	Base	High
Preplant	3.1”	3.1”	3.1”	3.1”
In Season	0.0”	5.1”	7.7”	10.2”
Total	3.1”	8.2”	10.8”	13.3”

Harvest Date: October 28

RESULTS AND DISCUSSION:

Twenty-two varieties, including PhytoGen commercial and experimental varieties and competitive checks were compared under dryland conditions and three levels of center-pivot irrigation. The trial area was in a wheat-cotton rotation and was fallow during the 2018 summer growing season and weeds were controlled with herbicides and no tillage operations were performed after wheat harvest until cotton planting. Dryland yields averaged only 207 lbs. lint/A due to lack of rainfall and extreme temperatures during the growing season. When averaged across varieties, yields ranged from 708 to 1013 lbs./A as irrigation levels increased. When

averaged across irrigation levels, yields ranged from 644 to 1010 lbs. lint/A. The highest yielding varieties included PHY 300 W3FE, PHY 350 W3FE, PHY 480 W3FE, and PHY 580 W3FE (Table 1). Loan values averaged 40.89 ¢/lb. for dryland, and up to 52.26 ¢/lb. with the highest irrigation level (Table 2). Gross revenue ($/A) were highest at the highest irrigation as would be expected ($546/A) (Table 3).

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

	In-season Irrigation Levels (inches)				
Variety	**Dry (0.0)**	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
	---------- lbs./A----------				
DP 1646 B2XF	260 a	728	761	1122	**870 BCDEF**
FM 1911 GLT	200 abcdef	626	785	772	**728 HI**
NG 4777 B2XF	189 cdef	467	700	767	**644 I**
PHY 210 W3FE	251 ab	658	699	942	**766 FGH**
PHY 250 W3FE	229 abcde	651	664	832	**715 HI**
PHY 300 W3FE	173 ef	794	1035	1043	**957 ABC**
PHY 320 W3FE	200 bcdef	753	715	908	**792 FGH**
PHY 340 W3FE	219 abcde	709	793	883	**795 FGH**
PHY 350 W3FE	251 ab	818	839	1143	**934 ABCDE**
PHY 400 W3FE	223 abcde	700	789	1043	**844 DEFG**
PHY 480 W3FE	159 f	785	827	1267	**960 AB**
PHY 500 W3FE	175 ef	624	646	949	**740 GHI**
PHY 580 W3FE	237 abcd	669	910	1193	**924 ABCDE**
PX 2B14 W3FE	185 def	674	716	1018	**802 FGJ**
PX 2C14 W3FE	204 abcdef	632	928	1001	**854 CDEF**
PX 3C06 W3FE	247 abc	663	733	1047	**815 FGH**
PX 3D32 W3FE	186 def	698	692	1033	**808 FGH**
PX 3D43 W3FE	202 abcdef	786	811	944	**847 DEF**
PX 5C045 W3FE	195 bcdef	947	993	1089	**1010 A**
PX 5C05 W3FE	188 cdef	835	902	1107	**948 ABCDE**
PX 5E28 W3FE	196 bcdef	703	715	1106	**841 EFG**
PX 5E34 W3FE	175 ef	649	690	1071	**803 FGH**
Average	**207 a**	**708 C**	**788 B**	**1013 A**	**--**

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

	In-season Irrigation Levels (inches)				
Variety	**Dry (0.0)**	**Low (5.1)**	**Base (7.7)**	**High (10.2)**	**Average**
		----------¢/lb.----------			
DP 1646 B2XF	43.92 a	56.28	53.98	55.23	**55.16 A**
FM 1911 GLT	34.65 a	53.48	52.45	53.35	**53.09 B**
NG 4777 B2XF	33.55 a	54.40	45.30	48.08	**49.26 F**
PHY 210 W3FE	44.52 a	52.88	51.83	52.95	**52.55 BC**
PHY 250 W3FE	43.35 a	52.80	49.93	51.43	**51.38 BCDE**
PHY 300 W3FE	34.97 a	51.05	48.08	49.98	**49.7 EF**
PHY 320 W3FE	38.27 a	53.70	49.33	52.20	**51.74 BCD**
PHY 340 W3FE	38.57 a	52.83	48.58	51.83	**51.08 CDEF**
PHY 350 W3FE	41.07 a	53.60	51.65	52.93	**52.73 BC**
PHY 400 W3FE	39.45 a	53.30	49.73	51.38	**51.47 BCDE**
PHY 480 W3FE	42.47 a	52.30	48.68	55.10	**52.03 BCD**
PHY 500 W3FE	43.15 a	52.90	49.80	52.98	**51.89 BCD**
PHY 580 W3FE	43.25 a	50.63	48.90	49.85	**49.79 EF**
PX2 B14 W3FE	45.85 a	51.88	51.85	54.50	**52.74 BC**
PX 2C14 W3FE	37.77 a	51.45	49.10	51.03	**50.53 DEF**
PX 3C06 W3FE	42.00 a	47.95	49.75	51.55	**49.75 EF**
PX 3D32 W3FE	39.57 a	53.13	51.13	53.03	**52.43 BCD**
PX 3D43 W3FE	44.70 a	51.70	49.40	52.15	**51.08 CDEF**
PX 5C045 W3FE	43.00 a	51.55	47.83	48.38	**49.25 F**
PX 5C05 W3FE	43.20 a	49.28	49.70	50.40	**49.79 EF**
PX 5E28 W3FE	39.35 a	55.58	54.33	56.10	**55.33 A**
PX 5E34 W3FE	42.80 a	56.73	54.85	55.45	**55.68 A**
Average	**40.89 a**	**52.70 A**	**50.28 B**	**52.26 A**	**--**

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

Variety	In-season Irrigation Levels (inches) Dry (0.0)	Low (5.1)	Base (7.7)	High (10.2)	Average
		----------$/A----------			
DP 1646 B2XF	111 a	427	478	539	**481 ABCD**
FM 1911GLT	70 a	310	416	430	**385 EF**
NG 4777 B2XF	68 a	270	315	382	**322 F**
PHY 210 W3FE	126 a	331	348	546	**408 CDE**
PHY 250 W3FE	117 a	386	353	429	**389 EF**
PHY 300 W3FE	42 a	426	461	538	**475 ABCD**
PHY 320 W3FE	81 a	397	367	445	**403 DE**
PHY 340 W3FE	90 a	374	385	490	**417 CDE**
PHY 350 W3FE	112 a	468	462	635	**521 A**
PHY 400 W3FE	101 a	410	440	561	**470 ABCD**
PHY 480 W3FE	69 a	393	407	756	**519 A**
PHY 500 W3FE	80 a	342	296	577	**405 CDE**
PHY 580 W3FE	106 a	351	408	589	**449 ABCDE**
PX 2B14 W3FE	90 a	355	377	575	**436 BCDE**
PX 2C14 W3FE	75 a	413	423	498	**444 ABCDE**
PX 3C06 W3FE	117 a	301	377	584	**421 BCDE**
PX 3D32 W3FE	63 a	356	363	578	**432 BCDE**
PX 3D43 W3FE	85 a	355	376	530	**420 BCDE**
PX 5C045 W3FE	78 a	490	461	547	**500 AB**
PX 5C05 W3FE	86 a	448	404	530	**460 ABCDE**
PX 5E28 W3FE	74 a	373	431	652	**486 ABC**
PX 5E34 W3FE	76 a	382	399	591	**457 ABCDE**
Average	**87 a**	**380 B**	**398 B**	**546 A**	**--**

TITLE:

Results of the irrigated, base level, cotton variety performance test at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Jane K. Dever, Carol M. Kelly, and Valerie M. Morgan; Professor, Research Scientist, and Research Specialist

MATERIALS AND METHODS:

Test:	Cotton variety, pivot irrigated – base level
Planting Date:	May 16th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 24ft, 40 in centers
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant
Fertilizer:	11.6 lbs/A nitrogen, and 19.2 lbs/A nitrogen (fertigation) pre-plant 24 lbs/A nitrogen (fertigation) applied in season
Irrigations:	Pre-Plant: 3.10 acre-in In Season: 7.70 acre-in (May-September) Total: 10.80 acre-in
Harvest Aid:	ET®X + Prep™ – two applications, and Paraquat – one application
Harvest Date:	November 1st

RESULTS AND DISCUSSION:

Texas A&M AgriLife Research conducts a fee-based testing system that evaluates a relatively large number of commercial and pre-commercial cotton varieties in small-plot replicated performance tests. This service allows varieties from different companies and seed developers to be tested together by an independent source. Small plot replicated tests evaluate relative genetic performance independent of biotechnology traits. Tests are managed as conventional varieties as opposed to herbicide or insecticide systems. Every effort is made to minimize the effects of insect and weed pressure. The same varieties are tested in five locations across the Southern High Plains, including the irrigated, base level, site at AG-CARES in Lamesa.

Lint yield is calculated from the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600 g sample grabbed from the harvested plot material. Boll size and pulled and picked lint percent are determined from 50 bolls picked randomly from two replications of each entry. 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) visual rating.

Forty-eight cotton varieties from seven different seed companies and one university were submitted for variety testing at five locations, including the base level irrigated location at AG-CARES in Lamesa. International Seed Technology (IST), is a company testing conventional cotton varieties developed in Brazil and BSD varieties are conventional varieties from Brownfield Seed and Delinting. Average yield was 758 pounds of lint per acre with a 19.5% test coefficient of variation and 173 pound least significant difference. The highest yielding variety was DP 1612 B2XF with a yield of 1002 pounds of lint per acre. DP 1612 B2XF had an 8.1 seed index, 4.5 micronaire, 1.03 in upper half mean length (UHML)., and a strength of 29.3 g/tex. The next 15 varieties in the test were not significantly different than the highest yielding variety (Table 1). Seed index for these varieties ranged from 7.4 to 10.2, and they had an average mic of 4.4, an average UHML of 1.02 in., and average strength of 27.8 g/tex. Deltapine brand was joined in the top tier by PhytoGen, NexGen, FiberMax, and Stoneville. Yields for the test ranged from 1002 to 497 pounds of lint per acre. Plant height ranged from 25-34 in with a test average of 31 in. Relative maturity of the varieties as indicated by percent open bolls on September 12 averaged 63%, with a range from 35-79%. Storm resistance ratings ranged from 3-7 with a test average of 5. Staple length indicated drought and/or heat stress during critical fiber elongation phase. Fiber quality showed high variation among varieties in the test with mic ranging from 3.5 to 5.2, UHML from 0.95 to 1.12 in., and strength from 24.8 to 31.7 g/tex (Table 2).

Table 1. Yield and agronomic property data from the irrigated uniform cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Boll	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height
Deltapine DP 1612 B2XF	1002	26.5	35.6	37.3	29.6	4.0	8.1	5.4	27.9	74	4	30
PhytoGen PX2B14W3FE	935	25.9	34.8	39.3	30.2	3.6	8.9	6.3	22.8	60	6	28
PhytoGen PHY 300 W3FE	913	27.0	35.5	39.4	30.3	4.5	7.4	5.3	33.3	64	5	31
PhytoGen PHY 480 W3FE	902	28.1	35.4	39.5	31.2	4.6	8.0	5.7	32.4	64	6	32
Deltapine DP 1822 XF	891	28.0	38.9	36.0	28.5	4.0	8.9	5.4	27.1	78	5	31
PhytoGen PX2C14W3FE	886	27.9	36.7	37.9	28.9	4.1	7.7	5.1	30.4	78	7	31
NexGen NG 3640XF	881	27.9	40.4	38.3	30.2	4.2	8.3	5.5	29.8	65	5	33
FiberMax FM 2398GLTP	872	29.8	35.8	39.0	31.0	4.8	8.5	5.9	31.6	66	5	29
PhytoGen PHY 580 W3FE	854	28.0	33.9	41.3	31.3	3.6	8.2	6.5	23.2	63	5	31
PhytoGen PHY 499 WRF	852	27.7	38.5	38.7	30.8	3.7	7.9	5.5	26.0	65	5	33
Deltapine DP 1845 B3XF	846	28.0	35.2	37.1	30.2	4.2	7.5	5.0	31.3	60	5	32
FiberMax FM 1621GT	843	28.8	35.3	39.6	31.5	4.5	8.4	6.1	29.5	71	6	30
Stoneville ST 5707B2XF	838	26.7	38.3	37.8	31.1	5.3	10.2	6.6	30.3	51	4	34
Deltapine DP 1646 B2XF	835	29.2	34.9	41.3	33.3	3.9	7.6	6.0	26.9	55	5	32
FiberMax FM 2498GLT	832	28.2	37.5	38.0	30.4	5.1	9.3	6.1	31.3	65	5	31
PhytoGen PHY 320 W3FE	829	25.2	34.1	37.8	30.0	4.2	7.8	5.2	30.4	71	5	30
NexGen NG 3930B3XF	828	26.2	38.0	36.3	28.4	4.2	7.5	4.7	32.6	65	5	31
Seed Source Genetics SSG UA 222	813	27.6	40.7	37.6	30.5	4.3	9.3	6.0	27.4	50	4	29
NexGen NG 4792XF	811	27.7	37.5	38.9	30.5	4.3	7.8	5.3	31.3	55	5	33
NexGen NG 4689B2XF	804	27.7	39.2	35.7	28.3	4.4	8.3	5.0	31.5	56	5	33
Deltapine DP 1549 B3XF	799	27.5	37.1	37.6	30.1	3.8	7.6	5.0	28.8	48	4	34
PhytoGen PX3B07W3FE	790	26.3	34.7	40.3	30.9	4.0	7.6	5.5	29.4	73	5	25
PhytoGen PHY 350 W3FE	788	27.0	35.9	39.5	30.8	4.2	8.6	6.0	27.5	64	5	28
PhytoGen PHY 250 W3FE	780	27.0	35.7	36.7	27.9	3.9	7.9	5.0	28.8	78	6	26
International Seed Technology BRS 286	779	26.8	38.5	36.6	28.6	4.1	9.0	5.5	27.3	53	3	32
NexGen NG 4545B2XF	774	26.9	39.6	37.5	29.6	4.7	8.4	5.5	32.3	64	5	34
NexGen NG 4777B2XF	774	25.8	38.8	32.9	26.6	4.1	8.9	4.7	28.5	55	4	34
PhytoGen PHY 340 W3FE	774	26.2	34.2	38.9	30.0	3.8	7.7	5.5	27.0	70	5	31
NexGen NG 3780B2XF	771	25.8	37.8	36.5	29.1	4.1	8.2	5.1	29.5	65	4	33
FiberMax FM 2574GLT	735	28.4	35.1	40.0	30.7	4.1	7.7	5.8	28.1	79	5	31

Table 1 (continued). Yield and agronomic property data from the irrigated uniform cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Boll	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height
Stoneville ST 5600B2XF	730	29.0	38.7	39.8	32.2	4.8	8.7	6.2	30.8	35	4	34
Deltapine DP 1948 B3XF	727	29.4	37.5	38.1	30.8	4.4	7.7	5.3	32.3	51	5	31
PhytoGen PHY 764 WRF	720	25.1	35.5	37.9	28.7	3.5	9.0	5.7	23.3	49	4	33
PhytoGen PHY 210 W3FE	699	27.6	36.1	37.4	28.2	3.9	8.2	5.3	27.4	78	7	26
NexGen NG 3956B3XF	690	25.8	39.5	34.9	28.1	4.7	8.7	5.1	32.3	59	5	32
Tamcot 73	664	25.3	39.4	35.2	28.1	4.3	8.5	5.0	29.9	68	5	26
FiberMax FM 1911GLT	660	26.9	38.6	38.8	30.3	5.0	9.5	6.4	30.3	73	6	28
Brownfield Seed and Delinting BSD 9X	645	25.8	39.3	36.4	28.8	4.7	10.2	6.2	28.1	64	5	27
Deltapine DP 1820 B3XF	622	27.6	36.1	39.3	31.0	3.5	8.2	5.8	23.6	75	6	33
NexGen NG 2982B3XF	622	23.4	37.7	31.5	25.0	4.2	8.7	4.3	30.2	75	5	29
International Seed Technology BRS 335	616	25.7	40.7	37.3	30.2	4.0	8.4	5.4	27.8	51	4	31
International Seed Technology BRS 416	606	23.8	40.3	33.2	26.4	4.3	9.5	5.0	28.2	51	4	32
Brownfield Seed and Delinting BSD 598	596	26.0	40.0	35.7	28.3	4.5	8.7	5.2	31.0	66	5	30
Seed Source Genetics SSG UA 114	596	26.1	39.0	36.9	29.7	4.7	9.3	5.7	30.6	63	5	32
International Seed Technology BRS 293	588	25.4	40.6	36.6	28.7	3.8	8.6	5.4	26.1	50	4	30
Brownfield Seed and Delinting BSD Ton Buster Elite	553	24.3	40.0	36.3	28.7	4.2	9.8	6.0	25.7	58	5	30
Brownfield Seed and Delinting BSD 224	531	26.0	40.0	34.4	26.3	4.0	9.4	5.4	25.9	60	5	28
Tamcot G11	497	26.3	38.5	35.6	28.1	4.5	8.9	5.4	29.3	56	5	29
Mean	758	26.9	37.5	37.5	29.5	4.2	8.5	5.5	28.9	63	5	31
c.v.%	19.5	5.5	5.2	2.0	2.7	9.7	5.7	6.9	10.1	16.9	14.5	9.0
LSD 0.05	173	1.7	2.3	1.0	1.1	0.6	0.7	0.5	4.0	12	1	3

Table 2. Fiber quality data from the irrigated regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
Deltapine DP 1612 B2XF	4.5	1.03	80.3	29.3	6.7	70.6	9.1	5	42-1,52-1
PhytoGen PX2B14W3FE	4.4	1.05	78.0	26.5	5.7	75.5	8.7	4	31-2,31-3,41-1
PhytoGen PHY 300 W3FE	3.9	0.98	78.2	25.3	5.8	73.2	10.1	4	32-1,32-2,33-1
PhytoGen PHY 480 W3FE	4.6	1.00	79.5	27.8	6.9	75.2	9.3	4	31-3,32-1
Deltapine DP 1822 XF	3.9	1.05	78.2	28.3	5.7	76.9	9.0	3	22-1,31-1,31-2
PhytoGen PX2C14W3FE	4.2	0.99	79.3	27.4	6.3	77.0	8.6	3	31-1,31-2
NexGen NG 3640XF	4.5	1.01	80.7	29.2	6.4	73.9	10.0	3	22-2,32-1,32-2
FiberMax FM 2398GLTP	4.5	1.00	79.3	26.4	5.6	76.4	9.1	3	21-2,31-1,32-1
PhytoGen PHY 580 W3FE	4.9	1.00	80.2	29.4	6.5	75.1	8.7	4	31-2,31-3,41-3
PhytoGen PHY 499 WRF	4.5	1.01	80.7	30.6	6.7	74.6	8.8	3	31-4,41-4
Deltapine DP 1845 B3XF	4.1	1.12	79.5	30.7	6.6	75.3	8.1	5	31-2,31-4,41-1
FiberMax FM 1621GT	4.1	1.00	78.5	26.4	5.4	74.4	8.8	5	31-2,32-1,41-1
Stoneville ST 5707B2XF	5.1	1.07	81.5	31.7	6.1	73.8	9.1	3	32-1,41-3,42-1
Deltapine DP 1646 B2XF	4.7	1.05	78.0	25.8	6.6	76.6	8.5	4	31-1,31-2
FiberMax FM 2498GLT	4.4	1.01	78.4	25.5	5.6	77.0	9.1	3	22-1,31-1,31-3
PhytoGen PHY 320 W3FE	3.9	1.01	79.6	26.3	5.9	74.9	9.1	4	22-2,31-4,41-3
NexGen NG 3930B3XF	4.1	1.02	79.1	25.0	6.0	74.5	9.4	4	31-4,32-1,42-1
Seed Source Genetics SSG UA 222	5.0	1.05	80.1	29.5	6.4	76.5	8.8	4	21-2,31-3,41-1
NexGen NG 4792XF	4.7	0.99	79.3	29.0	6.3	74.7	9.9	3	31-3,32-1
NexGen NG 4689B2XF	4.3	1.02	79.0	26.1	5.3	74.6	9.0	5	31-4,32-1,41-3
Deltapine DP 1549 B3XF	4.5	0.99	77.5	26.2	5.6	76.3	8.8	3	31-1,31-2,31-3
PhytoGen PX3B07W3FE	4.3	1.01	78.3	27.4	5.9	74.0	9.2	4	31-3,32-2,42-1
PhytoGen PHY 350 W3FE	4.4	1.03	79.2	26.5	6.1	75.3	9.2	3	31-3,32-2
PhytoGen PHY 250 W3FE	4.3	1.01	78.9	26.1	5.7	76.1	9.1	3	31-1,31-3
International Seed Technology BRS 286	4.7	0.98	78.8	28.0	5.7	76.0	8.4	3	31-1,31-2,41-1
NexGen NG 4545B2XF	4.5	1.00	79.5	25.6	5.3	73.9	9.1	4	32-1,41-3
NexGen NG 4777B2XF	3.9	1.01	78.5	25.0	5.3	74.6	9.0	4	31-4,32-2
PhytoGen PHY 340 W3FE	4.2	0.99	78.5	24.8	5.7	72.8	9.6	4	32-1,32-2,42-1
NexGen NG 3780B2XF	4.1	1.01	77.7	26.3	6.0	74.2	9.4	4	31-4,32-1,32-2
FiberMax FM 2574GLT	4.5	1.04	78.2	26.7	5.5	75.5	8.3	4	31-1,31-2,41-4

Table 2 (continued). Fiber quality data from the irrigated regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
Stoneville ST 5600B2XF	5.2	1.04	80.6	29.7	6.4	74.6	9.4	3	31-4,32-1,32-2
Deltapine DP 1948 B3XF	4.7	1.10	80.6	31.2	6.7	75.7	8.2	4	31-1,41-1
PhytoGen PHY 764 WRF	3.8	1.01	79.4	29.8	6.0	74.9	9.0	4	31-2,32-1,41-3
PhytoGen PHY 210 W3FE	3.9	1.01	79.4	27.0	5.5	76.6	9.1	4	31-1,31-3
NexGen NG 3956B3XF	4.2	1.00	79.1	26.2	6.2	74.2	9.9	4	32-1
Tamcot 73	4.4	1.03	80.0	31.2	5.9	75.3	8.7	3	31-1,31-2,41-3
FiberMax FM 1911GLT	4.0	1.04	79.4	27.8	5.5	76.9	8.7	3	21-2,31-1,41-1
Brownfield Seed and Delinting BSD 9X	4.4	0.99	78.3	26.3	5.4	77.6	9.0	2	21-1,31-1,31-3
Deltapine DP 1820 B3XF	4.5	1.07	79.1	28.0	5.4	75.5	8.8	4	31-1,31-3,31-4
NexGen NG 2982B3XF	3.5	0.99	79.2	27.8	5.6	70.9	8.1	7	41-2,41-4,51-3
International Seed Technology BRS 335	4.2	1.01	78.5	25.7	5.8	76.6	8.3	3	31-2
International Seed Technology BRS 416	4.3	1.10	79.3	29.2	5.3	76.6	8.5	2	31-1,31-2,31-3
Brownfield Seed and Delinting BSD 598	4.4	1.00	78.7	26.8	5.4	76.5	8.6	3	31-1,31-2,31-3
Seed Source Genetics SSG UA 114	4.7	1.03	80.5	28.1	6.4	74.2	9.0	4	31-4,32-1,41-3
International Seed Technology BRS 293	4.7	0.95	78.4	27.6	6.0	75.2	9.4	1	31-3,32-1
Brownfield Seed and Delinting BSD Ton Buster Elite	4.3	1.00	79.2	26.0	6.0	75.0	9.1	3	31-1,32-1,41-3
Brownfield Seed and Delinting BSD 224	4.2	1.00	78.5	27.8	5.4	77.3	9.0	3	22-1,31-1
Tamcot G11	4.0	1.03	76.3	25.3	5.7	75.7	9.6	3	21-4,22-2,31-3
Mean	4.4	1.02	79.1	27.5	5.9	75.2	9.0	4	
c.v.%	6.9	2.1	1.2	4.4	2.3	1.5	3.6	23.1	
LSD 0.05	0.4	0.03	1.3	1.6	0.2	1.5	0.4	1	

Title:

Results of the limited irrigation cotton variety performance test at AG-CARES, Lamesa, TX,2019.

Authors:

Jane K. Dever, Carol M. Kelly, and Valerie M. Morgan; Professor, Research Scientist, and Research Specialist

Materials and Methods:

Test:	Cotton variety, pivot irrigated – low level
Planting Date:	May 16th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 24-ft long, 40-in centers
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant
Fertilizer:	11.6 lbs/A nitrogen, and 19.2 lbs/A nitrogen (fertigation) pre-plant 24 lbs/A nitrogen (fertigation) applied in season
Irrigations:	Pre-Plant: 3.10 acre-in In Season: 5.08 acre-in (May – September) Total: 8.18 acre-in
Harvest Aid:	ET®X + Prep™ – two applications, and Paraquat – one application
Harvest Date:	November 1st

Results and Discussion:

Texas A&M AgriLife Research conducts a fee-based testing system that evaluates a relatively large number of commercial and pre-commercial cotton varieties in small-plot replicated performance tests. This service allows varieties from different companies and seed developers to be tested together by an independent source. Small plot replicated tests evaluate relative genetic performance independent of biotechnology traits. Tests are managed as conventional varieties as opposed to herbicide or insecticide systems. Every effort is made to minimize the effects of insect and weed pressure. The same varieties are tested in five locations across the Southern High Plains, including the irrigated, low level, site at AG-CARES in Lamesa.

Lint yield is calculated from the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600 g sample grabbed from the harvested plot material. Boll size and pulled and picked lint percent are determined from 50 bolls picked randomly from two replications of each entry. 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) visual rating.

Forty-eight cotton varieties from seven different seed companies and one university were submitted for variety testing at five locations, including the irrigated, low level, location at AG-CARES in Lamesa. International Seed Technology (IST), is a company testing conventional cotton varieties developed in Brazil and BSD varieties are conventional varieties from Brownfield Seed and Delinting. Average yield was 472 pounds of lint per acre with a 22.8% test coefficient of variation and 126 pound least significant difference. The highest yielding variety was PHY 300 W3FE with a yield of 662 pounds of lint per acre. PHY 300 W3FE had an 9.0 seed index, 4.2 micronaire, 0,97 in upper half mean length (UHML)., and a strength of 24.6 g/tex. The next 14 varieties in the test were not significantly different than the highest yielding variety (Table 1). Seed index for these varieties ranged from 7.3 to 9.5, with an average mic of 4.4, an average UHML of 1.01 in., and average strength of 27.8 g/tex. PhytoGen brand was joined in the top tier by Deltapine, FiberMax, Stoneville, and NexGen. Yields for the test ranged from 662 to 261 pounds of lint per acre. Plant height ranged from 23-31 inches with a test average of 27 inches. Relative maturity of the varieties as indicated by percent open bolls on September 12 averaged 67%, with a range from 38-80%. Storm resistance ratings ranged from 2-7 with a test average of 5. Staple length indicated heat and/or drought stress during critical fiber elongation phase, though fiber quality varied widely throughout the test with mic ranging from 3.2 to 5.2, UHML from .96 to 1.10 in., and strength from 23.1 to 31.5 g/tex (Table 2).

Table 1. Yield and agronomic property data from the limited irrigation regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height
PhytoGen PHY 300 W3FE	662	24.1	29.7	37.9	29.9	3.9	9.0	6.1	25.0	76	5	29
PhytoGen PHY 499 WRF	612	27.2	34.9	38.3	30.6	3.6	9.0	6.2	22.2	71	5	30
Deltapine DP 1549 B3XF	607	26.7	35.8	37.0	29.8	4.1	7.4	4.9	30.7	54	4	31
FiberMax FM 1621GT	603	25.1	31.3	36.8	29.7	4.5	8.4	5.6	29.8	66	5	28
Deltapine DP 1612 B2XF	597	24.2	31.4	36.2	28.7	4.1	8.2	5.1	28.8	78	4	25
PhytoGen PHY 580 W3FE	592	26.3	30.2	38.5	29.6	3.8	8.0	5.7	25.4	61	5	27
Stoneville ST 5707B2XF	587	25.3	36.6	34.7	28.5	4.8	9.5	5.5	29.8	63	5	31
PhytoGen PHY 480 W3FE	586	26.8	30.0	39.3	31.0	4.2	7.4	5.4	30.3	76	5	28
PhytoGen PHY 350 W3FE	575	26.3	30.6	39.4	31.2	4.2	7.3	5.6	29.3	70	5	24
PhytoGen PHY 320 W3FE	558	22.5	30.7	37.6	28.7	3.9	7.9	5.2	28.1	75	5	27
PhytoGen PHY 340 W3FE	552	24.9	30.8	33.4	25.8	3.7	7.3	4.4	28.4	68	4	29
Deltapine DP 1845 B3XF	550	25.9	33.4	36.5	29.6	4.6	7.5	4.8	35.2	55	4	27
PhytoGen PX3B07W3FE	546	24.8	33.3	35.5	28.1	3.8	7.8	4.8	27.5	78	6	24
NexGen NG 4792XF	538	23.3	32.9	37.4	30.1	4.1	8.7	5.6	27.9	64	4	29
NexGen NG 4545B2XF	537	24.5	35.0	36.4	29.3	4.1	7.9	4.8	30.9	64	5	30
PhytoGen PX2C14W3FE	526	23.6	33.3	35.2	27.6	4.3	7.3	4.3	34.8	65	6	28
Deltapine DP 1646 B2XF	515	26.9	32.3	40.2	32.6	3.8	7.1	5.3	29.1	65	4	29
Deltapine DP 1820 B3XF	499	25.3	32.2	37.1	28.5	3.4	7.9	5.1	25.0	74	5	29
PhytoGen PHY 210 W3FE	498	23.5	32.1	39.5	30.3	4.1	7.8	5.4	30.0	75	7	24
NexGen NG 3640XF	490	24.0	34.1	33.6	27.3	3.9	7.6	4.4	29.3	58	4	29
FiberMax FM 2398GLTP	486	26.4	34.1	35.1	27.5	4.4	8.0	4.9	31.5	71	5	27
FiberMax FM 2498GLT	484	26.1	34.0	38.6	30.2	4.3	8.4	5.5	30.1	70	6	27
NexGen NG 3930B3XF	477	22.8	33.2	34.0	26.8	3.7	7.5	4.3	29.4	75	5	26
PhytoGen PX2B14W3FE	474	24.0	31.7	36.0	28.3	4.0	7.7	5.0	28.4	74	6	26
Seed Source Genetics SSG UA 222	469	24.2	36.0	34.8	28.9	4.6	9.2	5.3	29.5	61	4	26
Stoneville ST 5600B2XF	461	26.3	32.6	34.9	29.4	4.7	7.9	5.0	32.8	45	4	29
NexGen NG 3780B2XF	453	22.0	34.0	32.9	26.2	4.0	8.2	4.5	29.3	70	4	29
Deltapine DP 1822 XF	450	23.3	36.3	34.8	27.4	3.7	8.8	5.1	25.4	80	5	28
FiberMax FM 1911GLT	438	24.8	35.4	36.2	28.6	4.4	9.9	6.1	26.8	74	7	27
FiberMax FM 2574GLT	429	25.1	28.8	39.9	30.8	3.5	7.4	5.6	24.8	73	5	29

Table 1 (continued). Yield and agronomic property data from the limited irrigation regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height
International Seed Technology BRS 335	428	23.1	36.9	35.1	28.9	4.1	8.4	5.0	29.4	65	5	28
Brownfield Seed and Delinting BSD 9X	425	22.8	34.4	35.2	27.8	4.2	8.9	5.1	28.7	69	5	25
PhytoGen PHY 250 W3FE	424	23.1	32.1	35.4	27.4	3.9	7.8	4.7	29.1	80	6	25
NexGen NG 4689B2XF	420	23.7	36.1	34.1	26.8	4.0	8.0	4.5	30.6	63	5	30
NexGen NG 3956B3XF	418	24.2	39.2	34.7	27.4	4.2	8.2	4.7	31.6	75	6	28
NexGen NG 2982B3XF	404	20.8	35.6	32.7	25.6	4.1	8.4	4.3	30.6	75	5	26
PhytoGen PHY 764 WRF	396	21.9	30.5	35.9	27.2	3.2	8.7	5.2	21.4	38	2	29
Tamcot 73	385	23.2	36.8	34.7	28.2	4.5	8.1	4.6	34.2	68	5	23
International Seed Technology BRS 416	381	22.8	40.2	32.0	25.4	4.0	9.3	4.7	27.2	54	4	26
Brownfield Seed and Delinting BSD 598	380	21.6	33.8	36.7	28.8	4.0	8.8	5.4	27.6	76	6	26
Brownfield Seed and Delinting BSD 224	379	22.0	34.1	35.5	27.8	4.0	8.4	5.0	28.3	75	4	24
Seed Source Genetics SSG UA 114	378	23.1	35.7	35.9	28.8	4.4	8.4	5.0	31.9	69	4	28
International Seed Technology BRS 286	364	23.6	35.8	34.2	26.7	4.0	8.3	4.7	29.0	64	3	27
International Seed Technology BRS 293	348	24.5	35.6	32.8	26.1	4.1	8.2	4.4	30.7	45	4	26
NexGen NG 4777B2XF	341	21.2	37.4	33.2	26.0	4.1	8.1	4.3	31.4	60	5	30
Deltapine DP 1948 B3XF	336	24.5	32.8	36.6	29.5	4.1	7.7	5.0	29.9	51	4	28
Brownfield Seed and Delinting BSD Ton Buster Elite	322	21.0	36.4	32.7	25.2	3.4	8.5	4.6	24.7	70	4	25
Tamcot G11	261	23.2	36.4	34.4	27.3	4.2	8.4	4.8	30.4	64	5	25
Mean	472	24.1	33.9	35.8	28.4	4.0	8.1	5.0	29.0	67	5	27
c.v.%	22.8	4.9	4.9	2.1	3.0	6.5	6.1	7.4	7.3	15.3	18.4	9.2
LSD 0.05	126	1.4	1.9	1.2	1.4	0.4	0.8	0.6	3.5	12	1	3

Table 2. Fiber quality data from the limited irrigation regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
PhytoGen PHY 300 W3FE	4.2	0.97	77.6	24.6	5.8	73.6	10.1	3	32-2,33-1
PhytoGen PHY 499 WRF	4.8	1.00	80.4	29.6	6.8	74.9	9.2	3	31-3,32-2
Deltapine DP 1549 B3XF	4.6	0.99	78.5	26.9	5.8	78.6	8.8	2	21-1,31-1
FiberMax FM 1621GT	4.3	1.01	78.4	27.2	5.4	74.7	9.0	3	31-4
Deltapine DP 1612 B2XF	4.2	1.02	79.6	28.4	6.6	71.5	9.6	5	42-1
PhytoGen PHY 580 W3FE	4.5	0.99	79.2	28.2	6.4	75.7	9.2	3	31-1,32-1
Stoneville ST 5707B2XF	5.2	1.05	80.0	31.3	6.0	73.4	9.0	3	41-3,42-1
PhytoGen PHY 480 W3FE	4.5	1.00	80.3	28.0	6.7	74.6	9.7	4	32-1
PhytoGen PHY 350 W3FE	4.7	0.99	79.2	28.1	7.0	75.0	9.3	4	31-3
PhytoGen PHY 320 W3FE	4.0	1.01	79.1	25.9	6.0	75.6	9.4	4	31-3,32-1
PhytoGen PHY 340 W3FE	4.1	0.99	78.1	25.1	5.7	72.6	10.2	3	32-1,32-2
Deltapine DP 1845 B3XF	4.3	1.09	79.0	29.0	6.5	74.9	8.4	4	31-4,41-1
PhytoGen PX3B07W3FE	4.1	1.02	78.0	27.9	5.9	74.0	9.2	4	31-3,42-1
NexGen NG 4792B2XF	4.4	0.98	79.5	28.2	6.2	73.9	10.6	3	22-2,321
NexGen NG 4545B2XF	4.5	0.99	78.1	25.6	5.3	74.8	9.1	3	31-3,32-2
PhytoGen PX2C14W3FE	3.6	0.98	77.8	26.5	6.1	76.4	9.4	3	31-3,32-1
Deltapine DP 1646 B2XF	4.6	1.05	76.6	26.9	6.5	77.9	8.6	3	31-1
Deltapine DP 1820 B3XF	4.5	1.04	77.0	27.7	5.5	75.6	9.1	3	31-3
PhytoGen PHY 210 W3FE	4.0	1.00	78.4	27.9	5.5	77.0	9.1	4	21-4,31-3
NexGen NG 3640XF	4.3	0.98	79.4	27.9	6.3	73.4	10.3	4	32-1
FiberMax FM 2398GLTP	4.4	1.01	78.4	24.7	5.7	76.3	9.5	2	21-4,32-1
FiberMax FM 2498GLT	4.2	1.01	76.6	25.2	5.5	77.6	9.6	3	21-3,31-3
NexGen NG 3930B3XF	3.8	1.02	77.7	25.1	5.9	74.1	9.6	4	32-1,32-2
PhytoGen PX2B14W3FE	4.1	1.02	77.1	27.1	5.7	76.2	9.1	5	31-3,31-4
Seed Source Genetics SSG UA 222	4.6	1.04	78.7	28.5	6.4	75.7	9.3	4	31-3
Stoneville ST 5600B2XF	4.8	0.98	78.2	26.5	6.4	74.0	10.0	2	32-1
NexGen NG 3780B2XF	4.1	0.98	76.5	24.5	6.0	74.0	9.5	5	31-4,32-1
Deltapine DP 1822 XF	3.8	1.02	78.0	26.9	5.6	76.2	9.3	3	31-3
FiberMax FM 1911GLT	3.6	1.03	78.0	27.0	5.7	78.1	9.5	3	21-1,21-4
FiberMax FM 2574GLT	4.2	1.02	76.8	25.0	5.4	77.9	8.7	3	21-2,311

Table 2 (continued). Fiber quality data from the irrigated, low level, regional cotton performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
International Seed Technology BRS 335	4.2	1.00	77.4	25.0	5.8	76.5	8.5	4	31-1,31-2
Brownfield Seed and Delinting BSD 9X	4.1	1.01	78.4	28.2	5.3	77.1	9.4	2	21-4
PhytoGen PHY 250 W3FE	4.2	0.99	77.8	26.3	5.6	76.3	9.3	4	21-2,32-1
NexGen NG 4689B2XF	3.9	0.97	76.5	25.0	5.4	75.1	9.6	4	31-3,32-1
NexGen NG 3956B3XF	4.1	0.98	77.8	26.2	6.0	73.5	10.7	3	22-2,32-1
NexGen NG 2982B3XF	3.2	1.01	78.3	28.4	5.6	69.2	8.2	8	51-3,52-1
PhytoGen PHY 764 WRF	3.8	1.02	78.0	31.5	6.0	75.7	9.3	3	21-4,31-3
Tamcot 73	4.4	1.02	78.5	30.3	5.8	73.6	8.6	5	41-3
International Seed Technology BRS 416	4.5	1.10	78.5	30.8	5.3	77.7	8.6	2	31-1
Brownfield Seed and Delinting BSD 598	4.3	0.98	77.1	27.1	5.4	75.7	9.1	3	21-4,31-4
Brownfield Seed and Delinting BSD 224	4.2	0.99	78.7	26.6	5.5	76.2	9.1	2	21-4,31-4
Seed Source Genetics SSG UA 114	4.7	1.03	80.2	28.2	6.4	74.1	9.3	3	31-3,32-2
International Seed Technology BRS 286	4.7	0.97	77.8	26.7	5.6	76.3	9.0	3	31-3
International Seed Technology BRS 293	4.4	0.96	76.8	27.2	6.0	75.9	9.6	3	21-4,32-1
NexGen NG 4777B2XF	3.5	0.98	77.2	23.1	5.2	73.5	9.6	3	32-1,32-2
Deltapine DP 1948 B3XF	4.7	1.02	77.3	29.1	6.7	76.0	9.1	3	31-1,32-1
Brownfield Seed and Delinting BSD Ton Buster Elite	4.1	0.99	77.6	24.9	6.1	75.9	9.4	3	31-1,32-1
Tamcot G11	3.5	1.05	74.9	25.1	5.7	75.9	9.6	5	21-4,32-1
Mean	4.2	1.00	78.1	27.1	5.7	75.2	9.3	3	
c.v.%	5.7	2.60	1.5	6.0	1.9	1.5	3.4	27.5	
LSD 0.05	0.4	0.04	2.0	2.7	0.2	1.9	0.5	1	

Title:

Results of the Root-Knot Nematode (RKN) cotton variety performance test at AG-CARES, Lamesa, TX, 2019.

Authors:

Jane K. Dever, Terry A. Wheeler, Carol M. Kelly, and Valerie M. Morgan; Cotton Breeder, Plant Pathologist, Research Scientist, and Research Specialist

Materials and Methods:

Test:	Root-Knot Nematode Variety
Planting Date:	May 16th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 24ft, 40-in centers
Planting Pattern:	Solid
Herbicide:	Prowl® @3.0 pt/A + Roundup® @ 1qt/A applied pre-plant
Fertilizer:	11.6 lbs/A nitrogen, and 19.2 lbs/A nitrogen (fertigation) pre-plant 24 lbs/A nitrogen (fertigation) applied in season
Irrigations:	Pre-Plant: 3.10 acre-in In Season: 10.24 acre-in (May - September) Total: 13.34 acre-in
Harvest Aid:	ET®X + Prep™ – two applications, and Paraquat – one application
Harvest Date:	October 28th

Results and Discussion:

Some locations at the AG-CARES facility provide an excellent opportunity to evaluate commercial, pre-commercial; and breeding strains from multiple companies and seed developers in small-plot replicated trials under root-knot nematode (RKN) pressure. Texas A&M AgriLife Research provides a fee-based testing service to evaluate varieties from different sources in the same test and allow producers access to independently generated performance data in production situations that may resemble their own.

Lint yield is calculated from the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600g sample grabbed from the harvested plot material. Boll size and pulled and picked lint percent are determined from 50 bolls picked randomly from two replications of each entry. 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) visual rating.

Thirty-six cotton varieties and experimental strains from six seed companies were submitted for variety testing in a field where root-knot nematodes are known to be present. Average yield was 747 pounds of lint per acre with a 15.4% test coefficient of variation and 135 pound least significant difference. Yields for the test ranged from 990 to 590 pounds of lint per acre (Table 1). PhytoGen PX5C45W3FE, an experimental strain, was the top yielding entry with a storm resistance of 5 and a seed index of 8.4. This top yield came with a 4.5 micronaire, 1.01 in upper half mean length (UHML)., and a strength of 28.6 g/tex (Table 2). It was followed by four varieties and experimental strains that were not significantly different in terms of yield represented by Deltapine, PhytoGen, and FiberMax brands. This group of varieties had an average micronaire of 4.7, UHML of 1.03 in., and strength of 29.0 g/tex (Table 2). Phytogen PX2C14W3FE allowed the lowest level of nematode reproduction with an RKN count of zero in 2019 while obtaining a yield of 767 pounds of lint per acre.

PHY 580W3FE had the second lowest level of nematode reproduction (LRK 0.50) and was in the highest yielding group at 858 pounds of lint per acre. PHY 320 W3FE had the same low level of nematode reproduction (LRK, 0.50) with a yield of 815 pounds of lint per acre, followed by PX5D28W3FE (LRK, 0.52) with a yield of 770 pounds (Table 1). Fiber quality for this test overall was poor, with an average micronaire of 4.4, UHML of 1.04 in., and a strength of 28.9 g/tex. However, there was variation among the thirty-six entries with micronaire ranging from 3.8 to 5.1, UHML from 0.99 to 1.09 in., and strength from 26.5 to 32.3 g/tex (Table 2).

Table 1. Yield and agronomic property data from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

		Agronomic Properties												
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm		Nematode Ratings	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height	Rk	LRk
PhytoGen PX5C45W3FE	990	28.0	32.0	40.2	30.9	3.7	8.4	6.6	22.6	63	5	30	460	1.95
Deltapine DP 1747 B2XF	918	29.5	33.1	41.7	33.8	4.8	8.3	6.5	31.0	44	4	30	3105	3.39
PhytoGen PX5C05W3FE	886	27.4	29.6	40.5	31.2	4.1	8.2	6.5	25.6	70	5	30	205	1.78
PhytoGen PHY 580W3FE	858	28.1	31.5	42.0	32.7	4.2	8.2	6.5	27.3	56	5	29	25	0.50
FiberMax FM 1621GL	854	27.5	33.7	38.2	30.3	5.1	9.1	6.3	31.0	74	6	29	4185	3.52
PhytoGen PX3B07W3FE	848	26.8	33.3	35.5	27.2	3.6	8.4	5.2	24.2	71	7	24	1985	2.54
Stoneville ST 4946B2GL	820	26.9	38.2	36.3	29.4	5.3	9.3	5.8	33.2	65	5	29	2510	3.27
PhytoGen PHY 320W3FE	815	25.1	33.2	37.3	29.9	4.3	8.1	5.5	28.8	73	6	28	25	0.50
NexGen NG 4792 XF	811	26.1	35.3	37.3	29.6	4.4	8.2	5.3	30.8	53	4	32	11410	3.83
PhytoGen PX5D28W3FE	770	24.5	30.3	39.3	29.2	3.4	7.7	5.8	23.2	64	4	31	30	0.52
NexGen NG 3956 B3XF	767	24.9	39.7	37.4	30.0	4.7	9.5	5.9	29.8	58	6	33	2525	2.96
PhytoGen PX2C14W3FE	767	24.6	34.3	35.8	27.2	4.2	7.8	4.9	30.5	71	7	27	0	0.00
PhytoGen PX3D43W3FE	763	27.1	34.1	36.3	27.8	4.6	9.1	5.9	28.3	76	5	30	80	0.63
PhytoGen PHY 350W3FE	760	26.1	35.4	37.9	29.8	4.2	9.0	6.0	26.4	71	5	30	2780	3.38
DynaGro DGX 052 B3XF	759	26.7	36.9	36.7	28.3	4.3	8.6	5.4	29.3	61	6	29	3630	3.37
PhytoGen PX5E34W3FE	751	23.9	36.5	35.8	28.4	3.7	8.2	5.0	26.7	64	4	32	855	1.97
PhytoGen PHY 480W3FE	744	26.9	33.5	36.8	28.8	4.5	7.9	5.4	30.2	71	6	28	235	1.74
Stoneville ST 5707B2XF	742	25.4	38.5	35.1	28.3	4.9	10.0	6.0	28.4	54	4	32	6455	3.74
PhytoGen PX3D32W3FE	738	24.5	33.0	35.4	27.4	4.4	8.5	5.2	29.8	61	5	30	60	1.04
PhytoGen PX2B14W3FE	734	24.2	32.4	37.3	28.7	4.6	9.1	5.9	29.1	71	7	25	145	0.69
NexGen NG 3930 B3XF	730	25.1	36.2	35.1	27.8	4.0	8.1	5.0	28.0	76	6	31	3825	3.24
FiberMax FM 2498GLT	728	28.1	37.2	37.7	30.0	5.0	9.3	6.1	30.8	58	5	29	5950	3.66
NexGen NG 2982 B3XF	723	22.3	36.9	32.9	26.4	4.3	9.0	4.8	29.0	73	5	28	5475	3.59
FiberMax FM 2398GLTP	706	29.3	36.0	39.2	29.9	4.4	8.5	6.0	28.7	68	5	28	10155	3.87
BASF BX 2002GL	704	27.6	31.5	40.9	32.3	4.8	8.2	6.5	30.3	66	4	29	4940	2.80
Bayer CropScience 18R628NRB3XF	700	26.2	29.4	38.2	29.9	3.8	6.8	5.0	28.4	64	4	30	2540	3.19
DynaGro DG 3651NR B2XF	693	27.5	34.8	40.4	31.6	4.8	8.4	6.3	30.9	41	4	31	2180	2.92
FiberMax FM 2574GLT	687	26.4	32.0	39.8	30.9	4.2	8.1	6.0	27.9	66	5	29	14355	4.12
BASF BX 2076GLTP	682	27.4	37.3	37.5	29.7	5.0	9.3	6.1	31.0	60	4	29	16400	4.16
PhytoGen PX5E28W3FE	677	24.4	36.3	34.2	27.0	4.0	7.9	4.6	29.3	46	3	35	625	2.52

Table 1 (continued). Yield and agronomic property data from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

		Agronomic Properties								% Open				
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm		Nematode Ratings	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	12-Sep	Resistance	Height	Rk	LRk
Stoneville ST 5600B2XF	653	26.5	34.4	39.5	31.9	5.3	8.7	6.2	33.7	46	4	30	1925	3.26
FiberMax FM 1911B2XF	650	25.8	36.9	36.1	28.5	4.8	8.0	4.9	35.2	63	6	26	4195	3.58
DynaGro DGX 014 B3XF	646	25.3	38.8	34.7	27.7	4.4	8.4	4.9	30.7	63	7	30	4400	3.52
Seed Source Genetics SSG UA 222	636	25.2	38.6	35.7	28.9	4.4	10.2	6.2	25.7	50	6	27	5890	3.63
BASF BX 2037GLT	603	28.0	32.7	40.7	31.8	4.3	8.8	6.7	26.1	56	5	27	3975	3.45
NexGen NG 4777 B2XF	590	24.0	38.3	33.6	26.9	4.6	8.4	4.6	33.7	46	5	31	18460	3.79
Mean	747	26.2	34.8	37.5	29.4	4.4	8.5	5.0	29.0	62	5	29	4055	2.68
c.v.%	15.4	2.8	3.2	1.5	1.9	6.9	4.2	4.7	6.5	18.1	18.6	7.6		
LSD 0.05	135	0.9	1.3	1.0	0.9	0.5	0.6	0.5	3.2	13	1	3		
												MSD(0.05)	9228	1.11

Table 2. Fiber quality data from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
PhytoGen PX5C45W3FE	4.5	1.01	79.4	28.6	6.6	75.0	8.7	5	31-3,41-1
Deltapine DP 1747 B2XF	5.0	1.04	80.4	30.2	6.1	75.2	9.0	5	31-3,41-3
PhytoGen PX5C05W3FE	4.9	0.99	81.4	28.2	6.8	74.7	9.0	5	31-3,41-3
PhytoGen PHY 580W3FE	4.7	1.04	79.8	29.8	6.4	75.1	8.5	5	31-3,41-1
FiberMax FM 1621GL	4.3	1.03	79.5	27.9	5.4	73.5	8.5	5	41-3
PhytoGen PX3B07W3FE	4.2	1.02	79.7	27.6	6.1	73.4	9.0	5	31-3,41-3
Stoneville ST 4946B2GL	4.4	1.03	79.8	28.9	6.5	74.9	9.4	4	31-4,32-1
PhytoGen PHY 320W3FE	4.2	1.04	81.5	28.2	6.1	73.1	8.6	6	41-3
NexGen NG 4792 XF	4.7	1.03	81.4	30.5	6.3	73.7	9.5	5	32-1,32-2
PhytoGen PX5D28W3FE	4.2	1.02	80.5	28.2	5.7	74.9	8.8	5	31-4,41-1
NexGen NG 3956 B3XF	4.4	1.02	79.6	27.7	6.3	74.0	10.1	4	32-1
PhytoGen PX2C14W3FE	3.9	1.00	79.1	27.2	6.3	76.2	9.2	4	31-3
PhytoGen PX3D43W3FE	4.5	1.08	81.9	32.1	6.2	75.5	9.0	5	31-3,31-4
PhytoGen PHY 350W3FE	4.5	1.06	81.4	28.7	6.1	75.3	8.7	4	31-4,41-1
DynaGro DGX 052 B3XF	4.3	1.03	79.2	27.5	5.9	78.0	9.3	2	21-1,21-4
PhytoGen PX5E34W3FE	4.1	1.07	81.2	30.5	6.2	75.5	8.5	5	31-2,41-1
PhytoGen PHY 480W3FE	4.4	1.05	80.9	29.0	6.9	74.3	9.1	5	31-36,41-3
Stoneville ST 5707B2XF	4.9	1.08	81.5	31.7	6.2	74.8	9.2	4	31-3
PhytoGen PX3D32W3FE	4.4	1.06	79.5	27.5	6.4	73.8	9.5	5	31-3,42-1
PhytoGen PX2B14W3FE	3.9	1.06	78.1	26.7	5.6	75.7	8.8	4	31-3,31-4
NexGen NG 3930 B3XF	4.0	1.08	80.3	27.4	6.1	74.3	9.2	5	31-1,42-1
FiberMax FM 2498GLT	4.4	1.07	80.9	28.5	5.5	76.7	8.5	4	31-1,31-2
NexGen NG 2982 B3XF	3.8	1.04	81.5	30.8	5.6	68.8	8.0	8	51-3
FiberMax FM 2398GLTP	4.5	1.05	79.7	26.7	5.7	75.4	8.8	4	31-3,31-4
BASF BX 2002GL	4.5	1.07	81.8	32.3	6.1	75.1	9.0	3	21-4,41-3
Bayer CropScience 18R628NRB3XF	4.4	1.04	81.0	31.2	6.2	73.2	8.6	5	41-3,41-4
DynaGro DG 3651NR B2XF	4.8	1.04	79.0	28.1	6.3	75.6	9.2	4	31-3,32-2
FiberMax FM 2574GLT	4.6	1.07	80.0	28.1	5.3	77.6	8.2	4	31-1,31-2
BASF BX 2076GLTP	4.6	1.07	80.7	29.3	5.5	77.9	8.7	4	21-2,31-1
PhytoGen PX5E28W3FE	4.1	1.05	80.4	29.4	6.3	75.6	8.5	4	31-1,41-3

Table 2 (continued). Fiber quality data from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm, Lamesa, 2019.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color Grade
Stoneville ST 5600B2XF	5.1	1.06	81.4	31.4	6.4	74.1	9.4	4	31-3,32-2
FiberMax FM 1911B2XF	3.9	1.06	79.6	28.0	5.7	78.0	8.6	4	21-2,31-2
DynaGro DGX 014 B3XF	4.2	1.04	79.9	27.1	5.9	74.3	9.6	4	31-1,32-1
Seed Source Genetics SSG UA 222	4.5	1.07	79.5	29.0	6.4	74.4	8.8	6	31-4,41-3
BASF BX 2037GLT	4.2	1.09	80.3	30.2	5.4	78.3	8.1	4	31-1,31-2
NexGen NG 4777 B2XF	4.1	1.03	78.7	26.5	5.3	74.4	8.9	5	41-3,31-4
Mean	4.4	1.04	80.3	28.9	6.0	75.0	8.9	4	
c.v.%	4.2	2.2	1.0	4.6	2.0	1.9	3.7	25.6	
LSD 0.05	0.3	0.04	1.4	2.2	0.2	2.4	0.6	2	

TITLE:

Variety performance in the presence of Root-knot Nematode at AG-CARES, Lamesa, TX, 2019.

AUTHORS:

Terry Wheeler – Professor
Zach Hilliard, Cecil Haralson, Robert Ballesteros, and Daniel Campos - Technicians

MATERIALS AND METHODS:

Plot size: 2-rows wide, 36 feet long with four replications and 32 entries

Planting Date: 18 May

Sampling Date: 5 August

Harvest Date: 1 November

RESULTS AND DISCUSSION

The highest yields were associated with three Phytogen breeding lines and several Phytogen varieties (PHY 480W3FE, PHY 580W3FE, and PHY 500W3FE, Table 1). These entries also had low densities of root-knot nematode. DP 1747NRB2XF was the highest yielding variety with dicamba tolerance. This variety has root-knot nematode resistant genes. The new DP 1823NRB2XF, which also has root-knot nematode resistance yielded 180 lbs/acre less than did DP 1747NRB2XF.

Table 1.Small plot variety trial at AGCARES.

Variety[1]	Lint yield (lbs/a)	Yield x Loan ($/a)	Turn out	Loan	RK[3]/500 cc soil	LOG10 (RK+1)	Plants /ft
PX5C45W3FE	1,181	581.53	0.321	49.23	30	0.52	3.06
PHY 480W3FE	1,178	600.06	0.312	50.95	390	1.31	3.00
PHY 580W3FE	1,130	565.88	0.304	50.10	400	2.01	2.99
PX5C05W3FE	1,095	512.24	0.321	46.78	30	0.52	3.02
PX3D43W3FE	1,066	537.01	0.300	50.40	80	1.52	3.29
PHY 500W3FE	1,055	559.28	0.299	53.00	290	1.38	3.17
DP 1747NRB2XF	1,053	515.97	0.322	49.00	780	2.83	2.63
ST 4946GLB2	1,020	519.87	0.295	50.98	3,085	3.35	3.09
PX2B14W3FE	1,014	553.68	0.281	54.63	240	2.31	3.25
NG 4098B3XF	987	532.49	0.280	53.95	12,155	4.04	2.69
DP 1646B2XF	976	543.01	0.329	55.65	9,035	3.95	2.47
PX5E34W3FE	972	532.17	0.311	54.75	80	1.10	2.74
PHY 320W3FE	966	510.05	0.278	52.80	175	1.20	3.33
PX5E28W3FE	952	516.33	0.284	54.25	350	2.40	2.59
DP 1851B3XF	940	475.30	0.325	50.55	6,400	2.91	2.78
FM 1911GLT	920	493.26	0.304	53.63	2,790	3.14	3.21
ST 5707B2XF	913	460.76	0.312	50.48	7,135	3.52	3.03
PHY 490W3FE	905	482.64	0.276	53.33	6,335	3.65	2.70
FM 2574GLT	890	481.45	0.323	54.08	14,850	4.01	2.76
DP 1522B2XF	889	443.80	0.310	49.95	7,400	3.77	2.74
MX19A005B3XF	879	488.01	0.311	55.55	8,235	3.91	2.29
DP 1823NRB2XF	873	484.24	0.304	55.50	1,295	3.05	2.01
CP 9608B3XF	856	425.61	0.337	49.75	7,745	3.76	2.90
BX2076GLTP	845	419.72	0.313	49.70	13,250	3.84	2.86
DP 1820B3XF	840	452.88	0.304	53.93	14,040	3.96	2.31
CP 9178B3XF	839	425.46	0.322	50.73	4,355	3.33	2.17
NG 3994B3XF	835	424.59	0.313	50.88	6,255	2.81	2.16
NG 4689B2XF	823	404.67	0.294	49.20	11,625	4.05	2.87
NG 3956B3XF	811	409.43	0.286	50.50	4,025	3.54	2.76
BX2037GLT	789	438.00	0.332	55.53	23,400	4.36	1.60
NG 3640XF	776	392.40	0.282	50.55	16,400	4.12	2.66
FM 2398GLTP	773	402.86	0.311	52.15	14,170	4.10	2.94
MSD (0.05)[2]	120	63	0.028	1.94	7523	1.14	0.49

[1]BX=experimental line for BASF, CP=Croplan, DP=Deltapine, FM=Fibermax, MX=experimental line for Americot, NG=NexGen, PHY=Phytogen, PX=experimental line for Phytogen, and ST=Stoneville.

[2]MSD=minimum significant difference at *P*=0.05.

[3]RK=Root-knot nematode (eggs + second-stage juveniles).

Table 2. Fiber properties for variety/root-knot nematode trial.

Variety	Micro-naire	Length	Unif-ormity	Strength	Elon-gation	Rd	+b	Leaf
BX2037GLT	4.73	1.12	80.95	31.45	5.45	80.95	7.7	3.0
BX2076GLTP	5.27	1.07	81.85	30.60	5.40	79.90	8.3	2.5
CP 9178B3XF	4.92	1.02	80.30	27.40	5.90	78.50	9.1	1.0
CP 9608B3XF	4.89	1.03	79.95	25.90	5.90	77.10	9.1	3.5
DP 1522B2XF	5.06	1.05	81.75	30.05	7.15	76.30	8.6	4.5
DP 1646B2XF	4.86	1.11	80.50	29.90	6.55	80.30	8.3	3.0
DP 1747NRB2XF	5.26	1.04	81.00	30.70	5.95	77.45	9.2	3.5
DP 1820B3XF	5.00	1.12	80.70	31.25	5.40	78.80	8.3	2.5
DP 1823NRB2XF	4.80	1.11	83.20	32.70	6.50	76.40	8.5	5.0
DP 1851B3XF	5.16	1.05	82.10	31.15	7.00	79.15	8.9	3.0
DP 1909XF	4.71	1.09	80.65	28.85	5.45	80.15	7.5	4.0
FM 1911GLT	4.59	1.08	81.50	29.55	5.55	76.45	8.0	6.0
FM 2398GLTP	5.04	1.06	81.20	28.55	5.60	78.70	8.9	3.5
FM 2574GLT	5.16	1.13	82.15	31.90	5.45	80.25	8.0	3.5
MX19A005B3XF	4.74	1.11	81.65	29.20	5.95	80.85	8.4	3.0
NG 3640XF	5.03	1.04	82.35	32.30	6.45	75.50	9.8	3.0
NG 3956B3XF	4.88	1.04	80.95	28.45	6.25	75.95	9.7	4.5
NG 3994B3XF	4.97	1.07	80.55	28.45	6.00	75.85	9.0	5.5
NG 4098B3XF	4.78	1.11	82.70	34.00	6.30	76.15	8.3	6.0
NG 4689B2XF	5.14	1.04	81.45	29.45	5.20	76.85	9.0	4.0
NG 4777B2XF	4.61	1.06	80.45	28.85	5.05	76.50	9.4	3.5
NG 4936B3XF	4.82	1.10	82.65	27.75	6.15	80.00	7.9	3.5
PHY 320W3FE	4.60	1.06	81.80	29.10	6.25	76.90	8.9	4.5
PHY 480W3FE	4.94	1.04	82.00	29.75	7.10	76.60	8.8	4.5
PHY 490W3FE	4.72	1.07	82.90	33.50	6.70	77.35	8.5	3.5
PHY 500W3FE	4.59	1.05	81.25	30.65	5.70	77.45	8.4	4.5
PHY 580W3FE	5.15	1.05	81.70	31.50	6.50	77.90	8.5	4.0
PX2B14W3FE	4.33	1.11	79.85	29.35	5.55	77.70	8.7	5.5
PX3D43W3FE	5.14	1.06	82.20	32.00	6.25	77.60	9.2	3.0
PX5C05W3FE	5.26	1.01	82.15	31.05	6.80	77.70	8.8	4.0
PX5C45W3FE	5.08	1.03	81.65	31.45	6.70	77.60	8.7	3.0
PX5E28W3FE	4.58	1.09	82.05	32.45	6.50	79.55	8.3	3.0
MSD (0.05)[2]	0.19	0.04	1.33	2.03	0.38	1.6	0.4	1.8

[1]BX=experimental line for BASF, CP=Croplan, DP=Deltapine, FM=Fibermax, MX=experimental line for Americot, NG=NexGen, PHY=Phytogen, PX=experimental line for Phytogen, and ST=Stoneville.

[2]MSD=minimum significant difference at P=0.05.

TITLE:

The effect of nematicide seed treatments and infurrow nematicides on cotton yield.

AUTHORS:

Terry Wheeler (Professor)
Zach Hilliard, Cecil Haralson, Robert Ballesteros, and Daniel Campos (Technicians).

MATERIALS AND METHODS:

Plot size: 4-rows wide, 36 feet long, with four replications/treatment
Seed treatments: CoPeo, Nemastrike, BioST nematicide
Variety: DP 1646B2XF
Infurrow nematicides: Velum Total at 14 oz/acre and Propulse at 13.6 oz/acre

Planting date: 18 May

Harvest Date: 1 November

RESULTS AND DISCUSSIONS:

The chemical treatments did not differ significantly from each other with regards to the measurements (galls/root system, root-knot nematode/500 cm^3 soil, stand and yield). None of the products appeared to be effective at managing root-knot nematode galling or reducing the soil density of the nematode.

Table 1. The effects of nematicide treatments on cotton yield and root-knot nematode galling and density.

Treatment	Lint Yield (lbs/acre	Plants /foot	Galls	Root-knot/ 500 cm^3 soil
None	1,237	2.81	10.0	1,911
Copeo	1,345	2.80	8.3	2,594
Copeo+Velum Total	1,252	2.77	11.9	2,850
Velum Total	1,352	3.17	11.0	3,056
Copeo+Propulse	1,314	2.53	8.3	1,814
Propulse	1,345	2.63	12.3	1,061
BioST Nematicide	1,212	2.80	7.8	2,840
Nemastrike	1,296	2.92	10.9	2,133

TITLE:

Cover crop management with wheat and rye at AG-CARES, Lamesa, TX, 2017-2019.

AUTHORS:

Ray White – Research Assistant
Wayne Keeling – Professor
Katie Lewis – Assistant Professor
Justin Spradley – Research Assistant
Brice DeLong – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size:	8 rows by 50-60 feet, 3 replications
Cover Crop Seeding Date:	December 12, 2016 November 17, 2017 December 18, 2018
Cover Crop Terminations:	March 27 & April 10, 2017 March 27 & April 10, 2018 April 9 & 23, 2019
Cotton Planting Date:	May 24, 2017 May 16, 2018 May 19, 2019
Variety	NexGen 4545 B2XF Deltapine 1646 B2XF Deltapine 1646 B2XF
Herbicides:	2,4-D 1 qt/A Prowl 3 pt/A Roundup PowerMax 1 qt/A Roundup PowerMax 1qt/A
Fertilizer:	2017 - 138-40-0 2018 - 115-35-0 2019 - 120-0-0

Irrigation:

	2017	2018	2019
Preplant	0.0”	0.5”	1.8”
In Season	9.1”	11.1”	9.0”
Total	9.1”	11.6”	10.8”

Harvest Date:	October 20, 2017 November 14, 2018 October 28, 2019

RESULTS AND DISCUSSION:

In 2017, biomass ranged from 3000-4000 lbs/A at the optimum termination and doubled to 6000-7000 lbs/A at the late termination. At the late termination timing, there was no difference between seeding rate or species in biomass accumulated. At the optimum termination, there was

no difference within species at either seeding rate. In 2018, less biomass was accumulated when compared to 2017 with only 2000-4000 lbs/A from the optimum to late termination. At the late termination timing, rye at 30 lbs/A produced more biomass than wheat at either seeding rate. At the optimum termination time, there was no difference between species, but wheat at 60 lbs/A produced more than 30 lbs/A. In 2019, biomass accumulated was even less than previous years, producing between 1000-2000 lbs/A. The late terminated wheat at both seeding rates and rye at 60 lbs/A produced more biomass than any combination in the optimum. At the optimum termination, there were no differences across treatments. (Fig. 1)

In both 2017 and 2019, cotton populations were at an acceptable range for optimum production. In 2018, due to poor early season conditions, low stands were recorded with both the rye and wheat at the late termination and 30 lbs/A seeding rate being significantly lower. However, the late, lower seeding rate wheat was the only treatment that was below an acceptable stand. (Fig. 2)

Cotton lint yields ranged from 1000-1400 lbs lint/A in 2017. When compared to the conventional tillage system, the only significantly lower treatment was the rye at the late termination timing. All other treatments were similar to the conventional. The conventional and the lower seeding rate and optimum termination in both species trended towards the highest yields. In 2018, yields ranged from 550-900 lbs lint/A. Highest yields were attained by the wheat at the low seeding rate and optimum termination as well as the conventional tillage. The conventional system was also similar to the rye at the low seeding rate and early termination timing. All other treatments were lower when compared to the conventional. Yields had less variation in 2019, ranging from 750-850 lbs lint/A. No treatments varied when compared to the conventional. (Fig. 3)

Figure 1. Effect of cover crop species, planting rate, and termination date on aboveground biomass production at three collection dates.

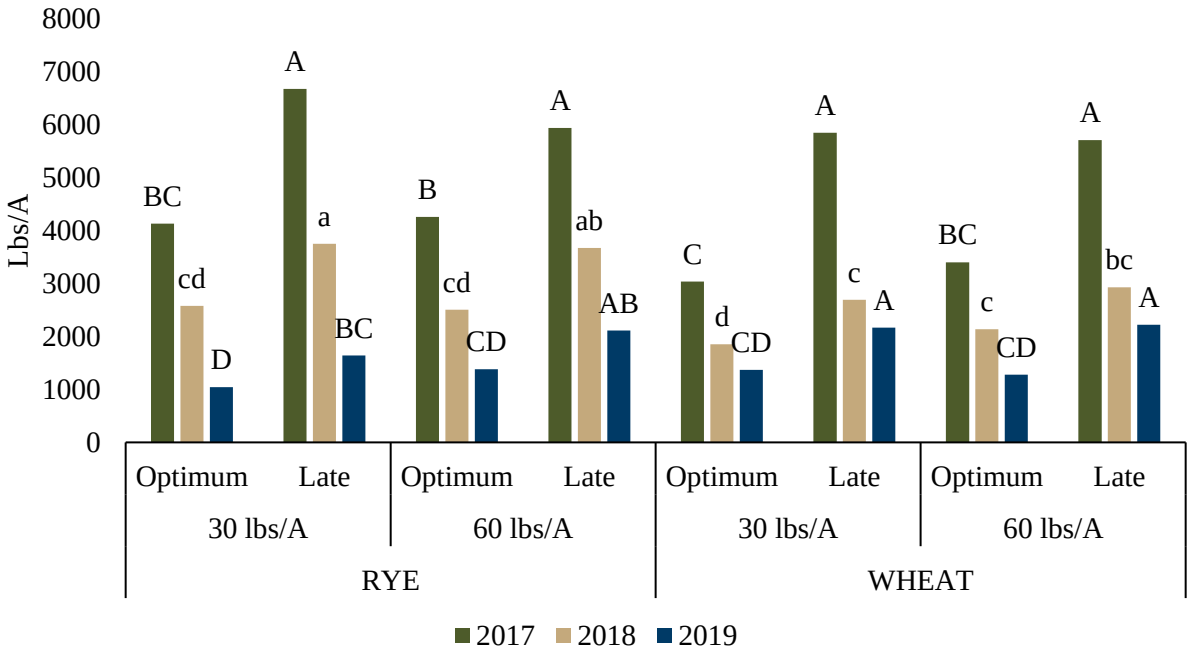


Figure 2. Effect of cover crop species, planting rate, and termination date on cotton plant populations.

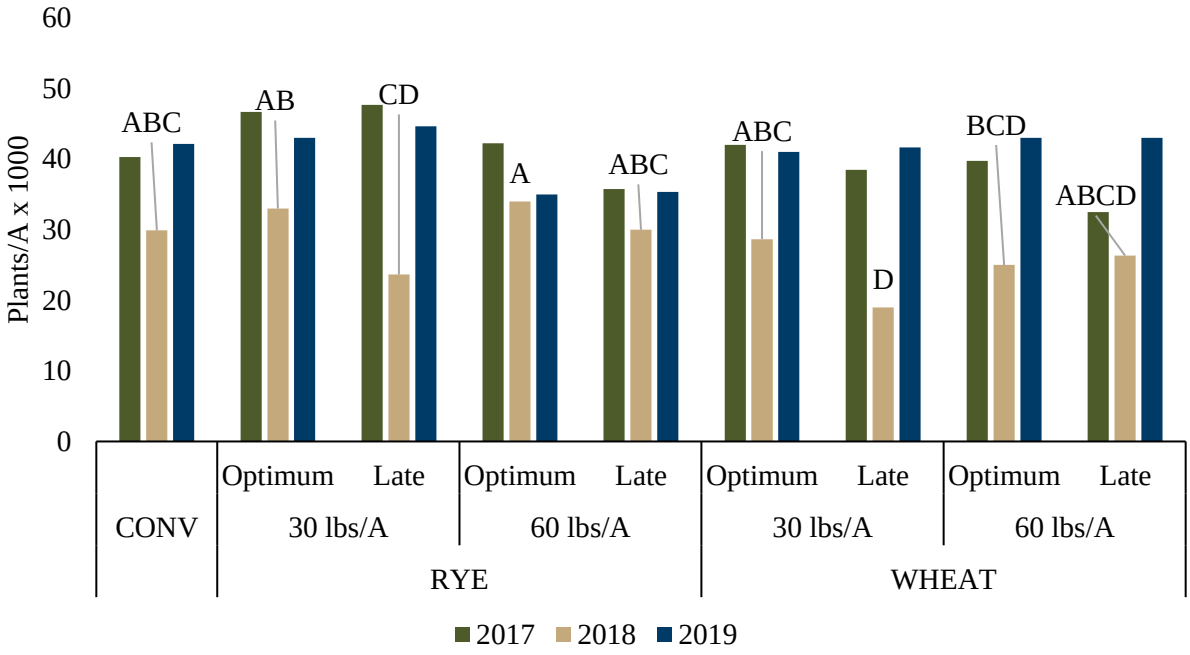


Figure 3. Effect of cover crop termination timing on cotton lint yield.

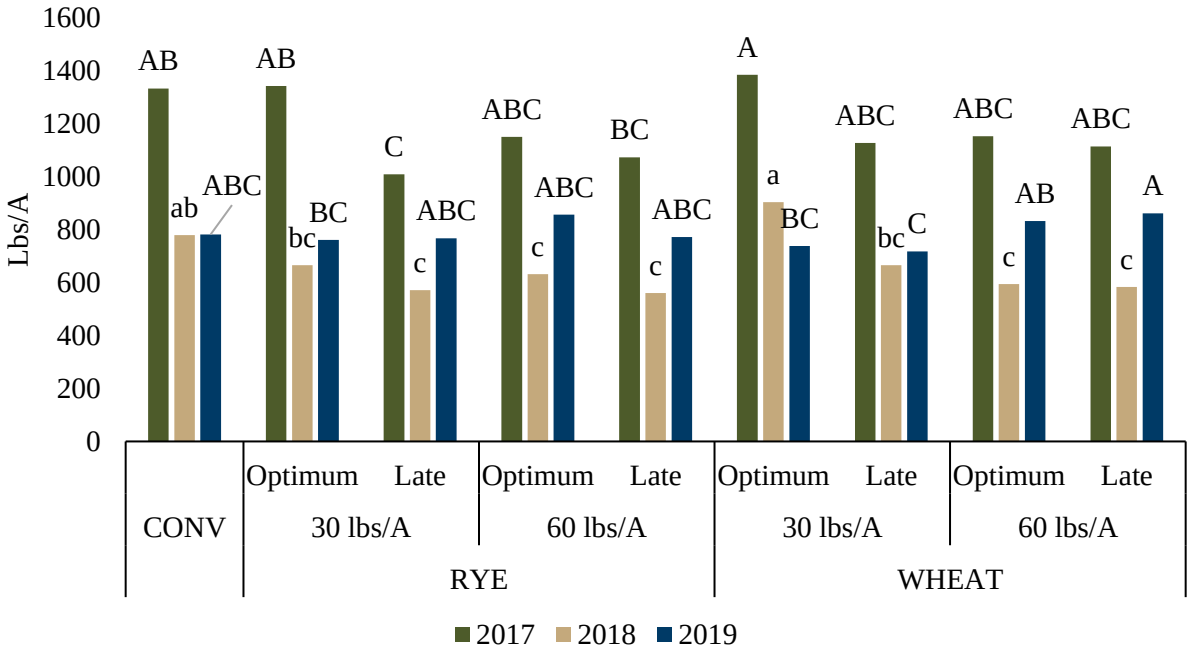
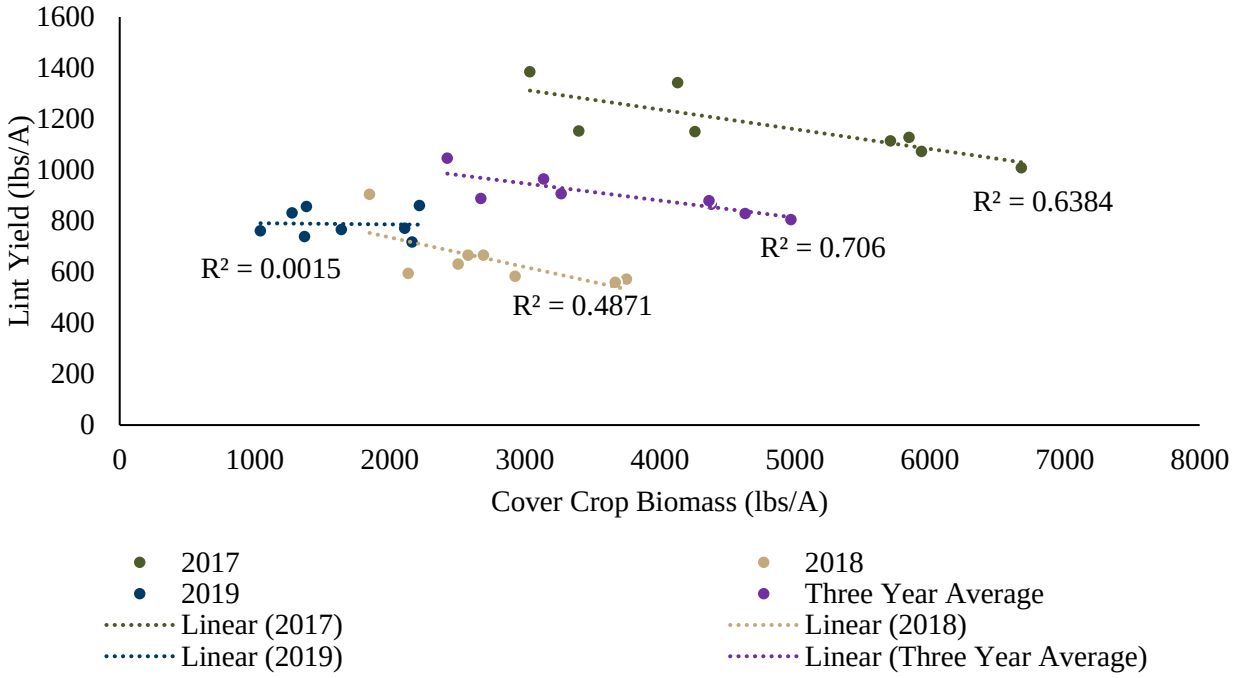


Figure 4. Relationship between cover crop biomass and cotton lint yield, 2017-2019 and three-year average.



TITLE: Impact of Cotton Cropping Systems on Cotton Lint Yield and the Productive Capacity of Soil, AG-CARES, Lamesa, TX 2019.

AUTHORS:
Katie Lewis – Assistant Professor
Joseph Burke – Graduate Research Assistant
Wayne Keeling – Professor
Dustin Kelley – Research Associate
Amee Bumguardner – Research Associate

MATERIALS AND METHODS:

Location:	AG-CARES, Lamesa, TX
Plot Size:	8 rows by 250 ft, 3 replications
Design:	Randomized complete block
Row Spacing:	40”
Cover Crop	
Seeding Dates:	2 December 2014; 4 November 2015; 12 December 2016; 17 November 2017; 4 December 2018; and 21 November 2019
Termination:	10 April 2015; 11 March 2016; 3 April 2017; 27 March 2018; and 9 April 2019
Cotton	
Planting Dates:	13 May 2015; 24 May 2016; 5 May 2017; 15 May 2018; and 19 May 2019
Cotton Harvest:	28 October 2015; 22 November 2016; 7 November 2017; 19 November 2018; and 28 October 2019
Variety:	DP 1321 B2RF planted at 53,000 seed/acre; 2018 DP 1646 B2XF planted at 53,000 seed/acre; 2019 DP 1747 NR B2XF and DP 1646 B2XF planted at 53,000 seed/acre
Fertility:	120 lb N/A as 32-0-0 and 113 lb/A 10-34-0
Rainfall:	12.4” (2015); 13” (2016); 10.5” (2017); 6” (2018); and 10.9” (2019)
Irrigation:	7.1” (2015); 5.1” (2016); 8.0” (2017); 11.6” (2018); and 10.8” (2019)

This research was aimed at evaluating the effects of incorporating single and mixed species cover crops into long-term reduced tillage continuous cotton. More specifically it determined the impact of cover crops and tillage on soil health parameters [soil organic C (SOC), soil pH, and nutrient availability] and cotton yield. Management practices being demonstrated include: 1) conventional, winter fallow; 2) reduced tillage (no-till) - rye (*Secale cereal* L.) cover crop; and, 3) reduced tillage (no-till) – mixed species cover crop. Mixed cover crop species included hairy vetch (*Vicia villosa* Roth), radish (*Raphanus sativus* L.), winter pea (*Pisum sativum* L.), and rye. Conventional tillage and reduced tillage with rye cover crop treatments were established in 1998 and the mixed species cover was seed in 2014 in 8 of 16 rows of the rye cover crop plots. In 2019, each plot was split into 8-row plots to include a nematode resistant cotton variety (DP 1747 NR B2XF). Cover crops were planted using a no-till drill on 2 December 2014, 4 November 2015, 12 December 2016, 17 November 2017, 4 December 2018,

and 21 November 2019 and were chemically terminated 10 April 2015, 11 March 2016, 3 April 2017, 27 March 2018, and 9 April 2019 using Roundup PowerMAX (32 oz/acre). Prior to termination, above ground biomass of cover crops were harvested from a 1 m^2 area to calculate herbage mass (dry weight basis), nitrogen (N) uptake, and C:N ratios. Soil core samples were collected following cover crop termination each year to a depth of 24 inches from each plot and analyzed for total C and N, organic C, nitrate-N, Mehlich III extractable macronutrients, and sodium (Na), and pH and electrical conductivity (EC). Additional samples were collected at this time to a 6-inch depth and analyzed using the Soil Health Test. After soil sampling, cotton (DP 1321 B2RF) was planted 13 May 2015, 24 May 2016, 5 May 2017, (DP 1646 B2XF) 15 May 2018, and 19 May 2019 (DP 1747 NR B2XF and DP 1646 B2XF) at a seeding rate 53,000 seed/acre. Cotton was harvested on 28 October 2015, 22 November 2016, 7 November 2017, 19 November 2018, and 28 October 2019. After cotton harvest the no-till plots were drilled with cover.

Soil moisture measurements were collected via neutron attenuation with access tubes installed within each plot to a depth of approximately 60 inches. Readings were taken at 7.9-inch increments and every two weeks throughout the year unless rainfall inhibited our ability to get into the field.

Additional locations where soil quality is being monitored include: 1) AG-CARES, Lamesa, TX (conventional tillage/continuous cotton; reduced tillage, wheat/fallow/cotton rotation; and, reduced tillage, continuous cotton with rye cover); and, 2) Helms Farm near Halfway, TX (cotton/grain sorghum rotation, cotton/wheat rotation, and cotton following wheat cover all under conventional and reduced tillage). Soil samples are collected to a 24-inch depth (0-6”, 6-12”, and 12-24” increments) once per year and analyzed for organic C. Aggregate stability is determined using a dry sieving technique and reported as mean weight diameter.

RESULTS AN DISCUSSION:

Soil Characteristics

Soil organic C (SOC) was greater with the no-till, mixed cover crop treatment at the 0-6” depth followed by the no-till, rye cover crop and conventional tillage treatments prior to planting cotton in May 2016, 2017, 2018, and 2019 (Fig. 1). However, in 2015, the no-till with rye cover crop treatment resulted in greater SOC compared to the conventional tillage treatment. From 2015 to 2019, a greater increase in SOC has been determined for the no-till, mixed cover treatment compared to the no-till, rye cover treatment. This may be the result of greater microbial biomass and activity with a mixed cover crop compared to a single species cover crop. In 2018, there was a decrease of soil organic C in all treatments. This decrease most likely resulted from decreased cover crop biomass production in 2018, and the dry winter of 2017 and 2018 (Fig. 2). An increase in SOC for 2019 most likely resulted from increased biomass production and adequate rainfall in winter 2019.

Total N was significantly greater and nitrate-N was generally greater under no-till compared to conventional tillage at the 0-6” depth (Table 1). At the 0-6” depth, pH was significantly decreased with conservation management practices compared to the conventional system. Electrical conductivity was greater in the no-till treatments compared to the control at the 0-6 and 6-12” depth. Phosphorus levels were greatest under no-till at the 0-6” depth.

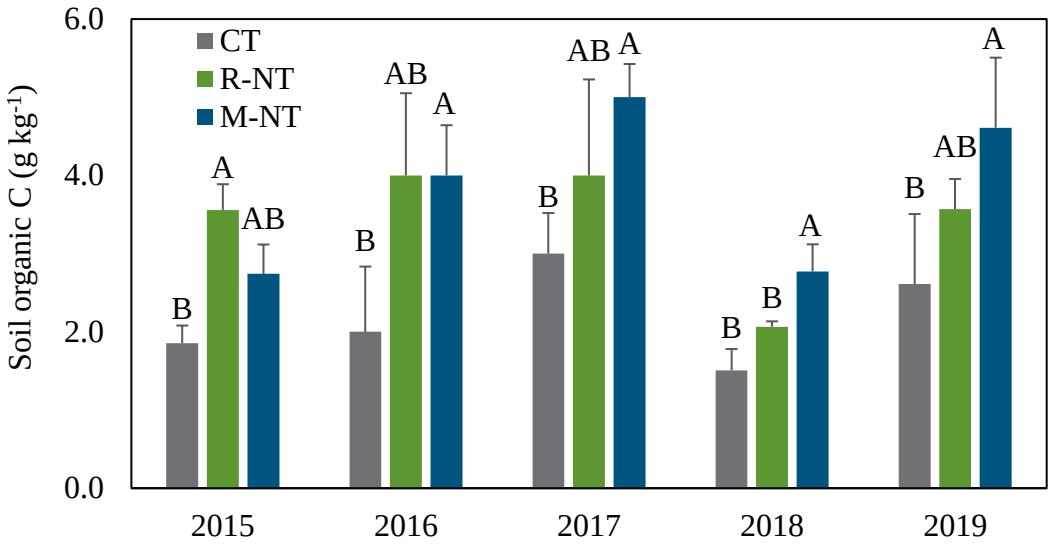


Figure 1. Soil organic C levels under conventional tillage, no-till with rye cover, and no-till with mixed cover management practices at Lamesa, TX. Bars represent standard deviation of the sample mean. Mean values with the same letter within year are not significantly different at $P < 0.05$.

Table 1. Soil pH and electrical conductivity (EC) and extractable macronutrient under conventional tillage (winter fallow), no-till with rye cover, and no-till with mixed cover at depths of 0-6", 6-12", and 6-24". Samples were collected prior to planting cotton in 2018. Means within soil parameter and depth followed by the same letter are not significantly different at $P < 0.05$.

Management	pH	EC	TN	NO_3-N	P	K	Ca	Mg	S
Practice	----	µmhos cm^{-1}			mg kg^{-1}				
					Depth 0 - 6"				
CT	7.6 a	94	490 b	6.1	42 c	280	585	595	7
R-NT	6.6 b	112	1495 a	16.0	60 b	360	580	548	7
M-NT	6.9 b	133	1182 a	19.2	82 a	357	633	597	7
					Depth 6 - 12"				
CT	7.5	64	568	3.3	47	268	555	626	7
R-NT	7.4	87	484	1.4	34	281	505	564	4
M-NT	7.5	81	514	1.8	35	276	548	595	5
					Depth 12 - 24"				
CT	7.9	126	517	3.4	11	229	967	791	15
R-NT	7.7	91	862	2.5	11	232	684	823	18
M-NT	8.0	185	808	2.8	9	233	1678	812	18

Cover Crop Herbage Mass

Herbage mass was not significantly different between no-till with rye cover and no-till with mixed cover crop treatments in 2016 and 2018 but differences were determined in 2015, 2017, and 2019 with the rye cover crop treatment producing greater above ground biomass compared to the mixed cover crop treatment in 2015 and 2017, while in 2019 the mixed species cover produced significantly greater biomass compared to the rye (Fig. 2). . In 2015, 2016, and 2018 the rye cover crop tended to produce more herbage mass than the mixed cover crop treatment. Cover crops harvested in 2016 were seeded about a month earlier than cover crops harvested in 2015 and 2017, which provided adequate time for crop establishment prior to colder temperatures. Cover crops harvested in 2018 had the longest growing season of the five years but due to limited rainfall during the growing season it produced reduced biomass. In 2019, the mixed species cover produced greater herbage mass compared to rye for the first time in the study. This is most likely due to poor rye seeding rates planted in winter 2018.

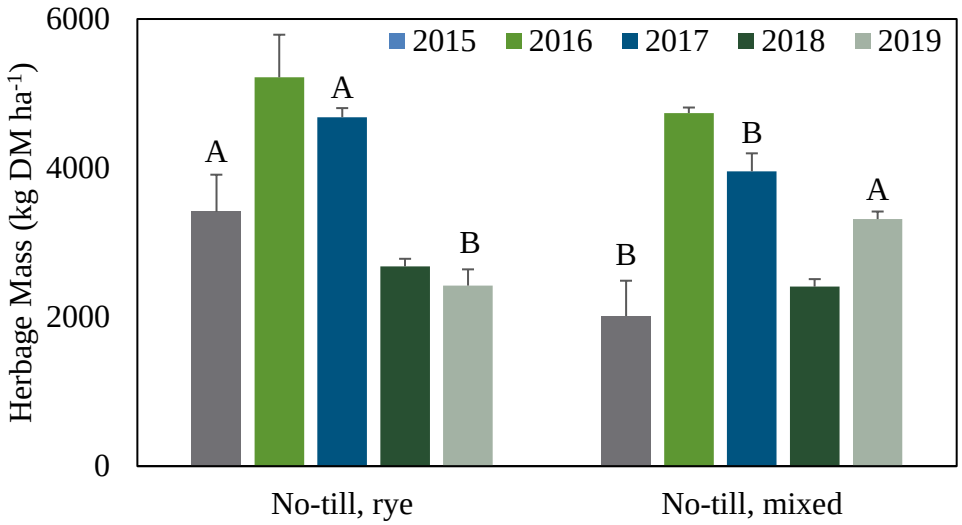


Figure 2. Herbage mass of rye and mixed cover crops harvested in 2015, 2016, 2017, 2018, and 2019 with the no-till treatments at Lamesa, TX. Bars represent standard error of the sample mean. Mean values with the same letter within year are not significantly different at $P < 0.05$.

Cotton Lint Yield

Lint yields were greater in the conventional tillage treatment followed by no-till, mixed cover and no-till, rye cover treatments in 2016 and 2017 (Fig. 3). Lint yields were not different between the conventional tillage and no-till with mixed cover crop treatments in any year but were significantly reduced when cotton was planted in terminated rye cover compared to the conventional tillage treatment in 2016 and 2017. In 2019, plots were split from 16 to 8 rows to determine the impact of nematode pressure of cotton lint yield under conservation management practices. The first year of results suggest there is no yield benefit to nematode resistant varieties in conservation management systems.

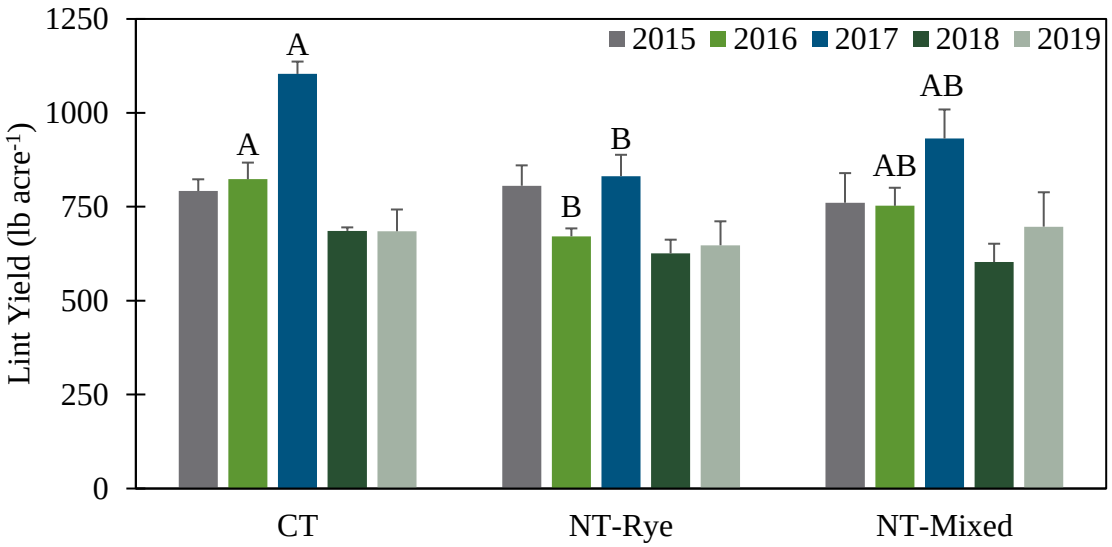


Figure 3. Lint yield with conventional tillage (CT), no-till with rye cover (NT-Rye), and no-till with mixed cover (NT-Mixed) treatments in Lamesa, TX for 2015, 2016, 2017, 2018, and 2019. Bars represent standard deviation of the sample mean. Mean values within year with the same letter are not significantly different at $P < 0.1$.

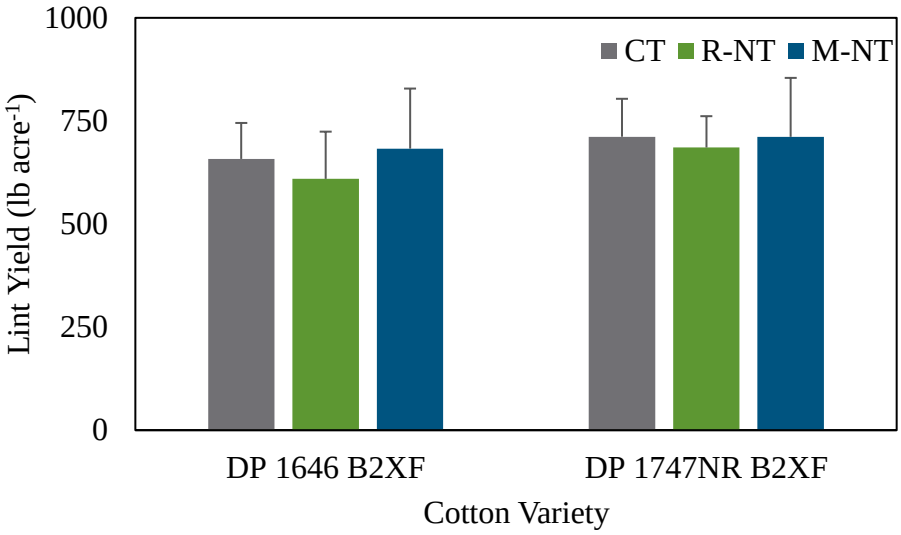


Figure 4. Lint yield between DP 1646 B2XF and DP 1747NR B2XF for with conventional tillage (CT), no-till with rye cover (NT-Rye), and no-till with mixed cover (NT-Mixed) treatments in Lamesa, TX in 2019. Bars represent standard deviation of the sample mean. There were no differences between variety or treatments within variety.

Soil Moisture

Stored soil moisture was greatest in the conventional tillage treatment (CT) prior to cover crop termination in 2015, 2016, and 2017 compared to the no-till treatments (Fig. 4). However, in 2018 and 2019 stored soil moisture was greatest in the no-till treatments compared to the conventional tillage prior to cover crop termination. During the cropping season, soil moisture was greatest in the no-till treatments (NT-Mixed and NT-Rye) where greater soil cover provided by cover crop residue likely increased water capture and reduced evaporation losses. Organic matter and reduced tillage can improve soil structure increasing infiltration and percolation while decreasing evaporation from the soil surface. The no-till treatments were better able to respond to precipitation events possibly through increased infiltration and moisture storage. Water infiltration and soil water holding capacity have likely increased over the 19-year period, which enables greater water capture and retention with cover crops.

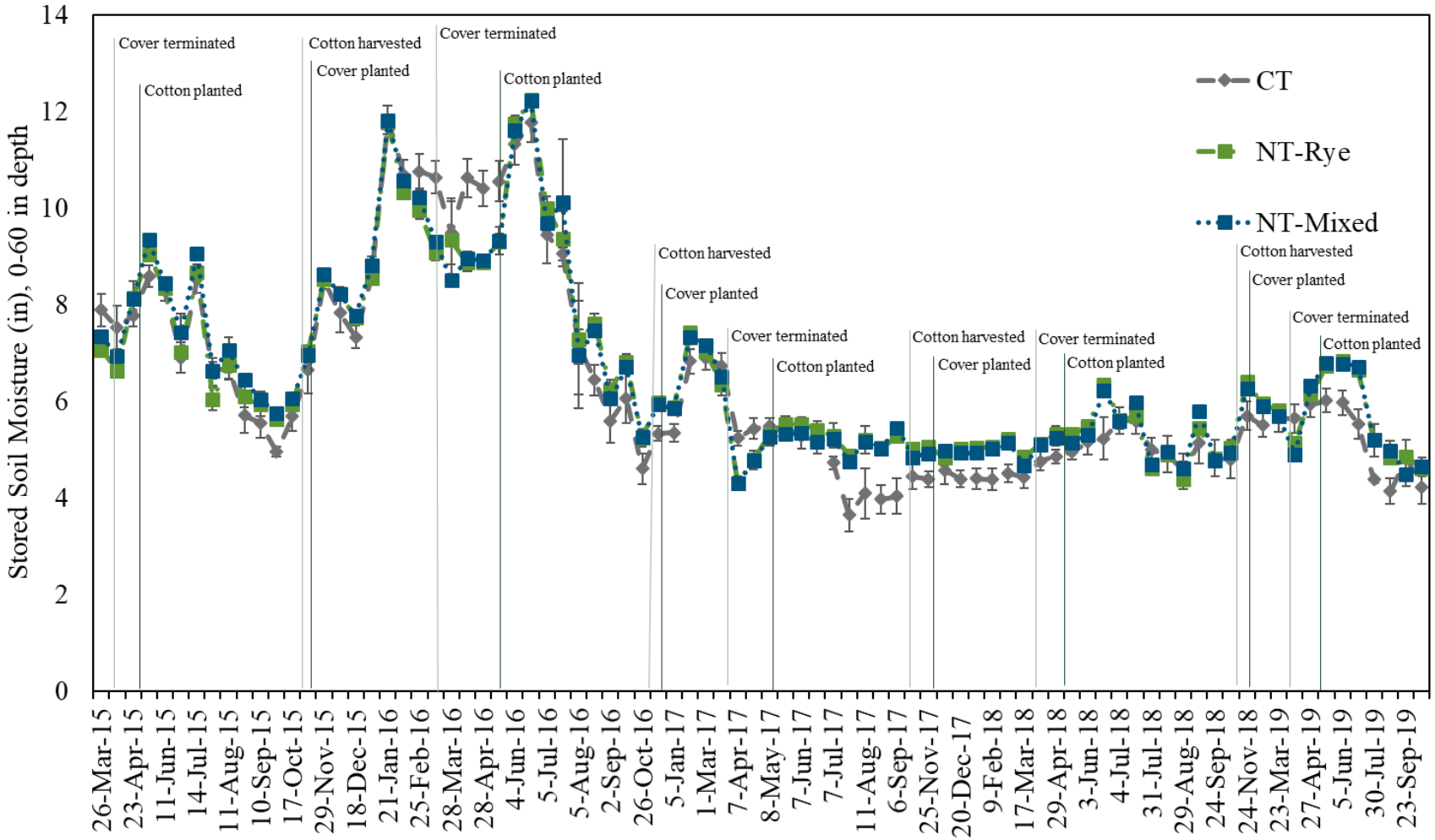


Figure 5. Stored soil moisture measured from March 2015 to October 2017 to a depth of 60 inches under conventional tillage (CT), no-till with mixed cover (NT-Mixed), and no-till with rye cover (NT-Rye) in Lamesa, TX. Bars represent standard deviation of the sample mean.

Cropping Systems and Soil Quality

Soil quality parameters are being compared between continuous cotton (conventional tillage/winter fallow), continuous cotton with a rye cover crop, and a wheat-fallow-cotton rotation under two different irrigation levels (high – base level +33%; low – base level -33%). Conservation practices were implemented in 2013, and the continuous cotton has been in place since 1998. Greater SOC was determined in the 6-12 and 12-24-inch depths under high irrigation with the continuous cotton with rye cover crop system compared to the continuous cotton with conventional tillage and the wheat-cotton rotation regardless of the stage of the rotation. This is likely the result of greater plant residue being produced on an annual basis with the rye cover crop compared to the wheat rotation. However, under low irrigation using a cover crop did not consistently result in greater SOC as it did under high irrigation. Even though it is expected that an increase in SOC would result in greater aggregate formation and stability, this is not what was determined. Under low irrigation, aggregate formation and stability was not significantly different between the conventional tillage system, continuous cotton system with a rye cover, and cotton-wheat rotation at any depth.

Table 2. Mean weight diameter of soil collected from the AG-CARES, Lamesa, TX, location from 0-48" depth in Spring 2019 from continuous cotton, a wheat/cotton rotation, and continuous cotton with a rye cover crop under low and high irrigation levels. Means within depth and irrigation followed by the same letter are not significantly different at $P < 0.05$.

	Soil depth (inch)			
	0-6	6-12	12-24	24-48
	MWD (mm)			
Low irrigation				
Cont. cotton	0.86	0.88	1.26	1.33
Rot. (W'18-C'19)	0.81	0.84	1.35	1.41
Rot. (C'18-W'19)	0.80	0.84	1.05	1.08
Cont. cotton (rye cov.)	0.72	0.82	1.11	1.23
High irrigation				
Cont. cotton	0.76	0.93	1.41	1.29
Rot. (W'18-C'19)	0.82	0.84	1.41	1.15
Rot. (C'18-W'19)	0.86	0.84	1.01	0.99
Cont. cotton (rye cov.)	0.82	0.93	1.22	1.36

TITLE: Impact of Cotton Cropping Systems and Nitrogen Management on Cotton Lint Yield, AG-CARES, Lamesa, TX 2019.

AUTHORS:
Katie Lewis – Assistant Professor
Joseph Burke – Graduate Research Assistant
Wayne Keeling – Professor
Dustin Kelley – Research Associate
Amee Bumguardner – Research Associate

MATERIALS AND METHODS:

Location:	AG-CARES, Lamesa, TX
Plot Size:	4 rows by 40 ft, 40” row spacing
Design:	Randomized complete block with 4 replications
Cotton	
Planting Dates:	16 May 2018; replanted on 7 June 2018; and 19 May 2019
Cotton Harvest:	26 November 2018 and 31 October 2019
Variety:	DP 1522 B2XF planted at 53,000 seed/acre
Fertility:	120 lb N/A as 32-0-0 and 113 lb/A 10-34-0 applied through the pivot in 4 applications of 30 lb N/A
Rainfall:	6” (2018) and 10.9” (2019)
Irrigation:	11.6” (2018) and 10.8” (2019)

A trial was initiated in 2018 to evaluate the effect of N fertilizer application time on lint yield of cotton (DP 1522 B2XF) following a rye cover crop, in rotation with wheat, and in a conventional tillage/winter fallow system. The N treatments were replicated within each cropping system, and included: 1) check, AG-CARES practice (described above); 2) additional 30 lb N/A applied at preplant; 3) additional 30 lb N/A applied three weeks after emergence; and, 4) additional 30 lb N/A applied at pinhead square plus 2 weeks. This research serves as preliminary data to help explain yield reductions following a rye cover crop. Cotton in this trial was harvested 17 November 2018 and 31 October 2019.

RESULTS AN DISCUSSION:

The significance of the cropping system and N treatment interaction was tested and determined to be significant for yield and nitrogen use efficiency (NUE) ($P = 0.052$ and $P = 0.0002$, respectively), and for this reason, N treatments were compared within cropping systems. Lint yield differences were determined within the continuous cotton (winter fallow) and continuous cotton with a rye cover crop (Table 1). In the continuous cotton system an additional 30 lb N/A applied during the growing season did not significantly increase lint yield compared to the farmer practice (check). For the continuous cotton with a rye cover crop system, applying an additional 30 lb N/A preplant resulted in greater yield compared to the check followed by 30 lb N/A applied 3 weeks after emergence. There was no yield difference between the check and the 30 lb N/A applied at 2 weeks after pinhead square. Similar trends were observed for NUE. Results from 2018 and 2019 indicate that the timing of N application can potentially influence N mineralization/immobilization processes following a cover crop.

Table 1. Lint yield and nitrogen use efficiency (NUE) from AG-CARES, Lamesa, TX, in 2019 from cropping systems of continuous cotton (CC), and continuous cotton with a rye cover. Means within system followed by the same letter are not significantly different at $P < 0.05$.

Nitrogen Management	**Cont. Cotton (CC)**	**CC, Rye Cover**
	----------Lint yield (lb/A)----------	
Farm Practice (120 lb N/A)	845	924 b
Preplant (+30 lb N/A)	872	1118 a
Emerg + 3 wks (+30	790	1001 ab
PHS + 2 wks (+30 lb N/A)	776	913 b
P -value	0.208	0.005
	-------NUE, over check (lb lint/lb N)------	
Farm Practice (120 lb N/A)	---	---
Preplant (+30 lb N/A)	0.90	6.47 a
Emerg + 3 wks (+30	-1.85	2.57 ab
PHS + 2 wks (+30 lb N/A)	-2.30	-0.38 b
P -value	0.121	0.021

TITLE:
Dryland Replicated Agronomic Cotton Evaluation (RACE) Trial at Ag-CARES, Lamesa, TX, 2019

AUTHORS:
Murilo Maeda – Cotton Specialist
Robert Wright – Extension Technician

MATERIALS AND METHODS:
Plot Size: 4 rows by 900 feet, 3 replications

Planting Date: May 23, 2019

Varieties:

Deltapine 1646 B2XF	NexGen 4777 B3XF
Deltapine 1948 B3XF	NexGen 4792 XF
Fibermax 2334 GLT	Stoneville 5600 B2XF
NexGen 3930 B3XF	Winfield United 19XB9 B3XF
NexGen 3956 B3XF	

Herbicides: Trifluralin 24 oz/A – Pre-plant
Caparol 26oz/A – Pre-Emergence
Liberty 32 oz/A + Roundup 32 oz/A + Dual 16 oz/A (FM Varieties only) – Late Flower
XTendFlex 22 oz/A + Roundup 32 oz/A + Dual 16 oz/A (XF Varieties only) – Late Flower

Fertilizer in-season: 40 lb/a (N) 32-0-0

Harvest: November 26, 2019

RESULTS AND DISCUSSION:

Nine varieties from 5 different brands (Deltapine, Fibermax, NexGen, Stoneville, and Winfield United) were tested under dryland conditions and conventional tillage system. The trial was planted with adequate soil moisture and good environmental conditions (14 mph winds, 79.5 °F air, 73.5% RH, and 78 °F soil). Plots were seeded at 38,000 seeds/a and the mean plant population for the test was 35,149 plants/a. Although not statistically different, when averaged across replications lint yields ranged from 176 to 270 lbs/a for DP1948 B3XF and NG4792 XF, respectively. Loan value varied significantly among varieties and the test average was $46.7 cents/lb. Loan values ranged from $43 to $52 cents/lb for NG4777 B2XF and DP1948 B3XF, respectively. Ultimately, lint value averaged across three replications ranged from as low as $85/a to as high as $127/a for NG4777 B3XF and NG4792 XF, respectively. The mean lint value for the test was $100/a.

Table 1. Lint Yield and fiber quality parameters of nine cultivars tested under dryland conditions in 2019 at AG-CARES in Lamesa, TX.

AGCARES

Variety	Lint Yield lb/a	Turnout %	MIC	Length in.	Uniformity %	Strength g/tex	Loan Value cents/lb	Lint Value $/a
NG4792XF	270	0.38	4.4	1.02	79.1	26.4	47.2	127
FM2334GLT	246	0.39	4.0	1.03	77.8	23.3	46.7	115
WFU19XB9B3XF	223	0.36	4.2	1.05	78.5	24.7	46.4	104
ST5707B2XF	218	0.37	4.6	1.03	80.4	26.2	47.9	104
NG3930B3XF	210	0.35	3.8	1.03	79.5	23.3	45.9	96
NG3956B3XF	207	0.34	4.1	1.01	79.1	25.1	43.4	90
NG4777B2XF	196	0.35	3.7	0.98	76.6	20.6	43.2	85
DP1646B2XF	186	0.40	4.1	1.03	77.7	23.6	47.9	90
DP1948B3XF	176	0.38	4.3	1.09	80.5	28.3	51.6	91
Mean	215	0.37	4.1	1.03	78.8	24.6	46.7	100
STDEV	49	0.02	0.3	0.03	1.3	2.2	2.8	24
CV, %	23	5.5	6.7	3.1	1.7	9.1	5.9	24
p-value	0.4120	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.4506
LSD	n.s.	0.01	0.09	0.02	0.5	0.8	1.6	n.s.

Loan value calculated using the Cotton Incorporated Upland Loan Calculatyor Program ($52.0 cents/lb base for 41 color, 4 leaf, 34 staple)
STDEV (standard deviation). CV (coefficient of variation). LSD (least significant difference, p <0.05).
https://www.cottoninc.com/cotton-production/ag-resources/cotton-farming-decision-aids/2019-upland-cotton-loan-calculator/

	January			February		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	23	32	-	31	66	-
2	24	31	-	46	70	-
3	24	51	-	43	75	-
4	26	67	-	37	75	-
5	26	68	-	53	73	-
6	34	68	-	51	76	-
7	38	68	-	27	55	-
8	38	55	-	17	35	-
9	37	54	-	26	38	-
10	42	63	0.10	35	55	-
11	40	63	0.08	39	64	0.03
12	31	53	-	26	58	-
13	28	44	-	24	66	-
14	31	45	-	42	82	-
15	39	57	-	41	81	-
16	32	72	-	29	75	-
17	37	71	-	25	56	-
18	42	70	-	27	36	-
19	32	56	-	21	40	-
20	28	65	-	16	57	-
21	37	74	-	40	65	-
22	27	54	-	33	65	-
23	19	53	-	29	60	-
24	26	54	-	18	60	-
25	16	56	-	32	69	-
26	18	60	-	33	75	-
27	23	61	-	33	71	-
28	30	55	-	22	63	-
29	20	43	-			
30	28	52	-			
31	26	72	-			

	March			April		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	34	79	0.01	36	62	-
2	33	47	-	35	78	-
3	24	33	0.01	47	82	-
4	16	31	-	43	82	-
5	11	47	-	51	83	0.25
6	23	60	-	54	79	0.04
7	30	72	-	47	83	-
8	46	77	-	46	85	-
9	41	72	-	48	93	-
10	39	52	-	58	92	-
11	39	47	0.23	41	67	-
12	47	64	0.75	40	71	0.03
13	44	63	0.04	38	47	2.56
14	35	57	-	34	71	-
15	29	54	-	50	84	-
16	34	57	-	52	79	-
17	34	64	-	54	78	-
18	36	65	-	21	74	-
19	42	67	-	42	74	-
20	42	65	-	44	87	-
21	35	68	-	58	89	-
22	49	67	-	59	73	0.05
23	46	74	-	54	67	0.10
24	41	81	-	51	68	-
25	43	72	-	47	86	-
26	43	74	-	53	78	-
27	54	78	-	60	94	-
28	54	83	-	55	90	-
29	50	87	-	61	78	-
30	41	57	-	59	86	0.03
31	28	53	-			

	May			June		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	53	88	-	61	90	-
2	49	65	-	61	83	0.86
3	56	74	0.05	61	84	0.02
4	57	72	-	64	84	-
5	57	84	-	61	84	0.07
6	60	85	-	57	83	-
7	61	80	0.04	60	88	-
8	51	82	-	64	92	-
9	45	61	-	60	76	-
10	43	47	0.99	59	76	-
11	45	68	-	58	88	-
12	47	76	-	61	82	-
13	57	80	0.81	57	88	-
14	51	82	-	66	95	-
15	55	86	-	68	97	-
16	63	86	-	64	87	-
17	66	93	-	61	89	0.03
18	53	84	-	59	91	0.23
19	47	81	-	63	94	-
20	62	88	0.11	67	101	-
21	50	80	-	75	101	-
22	59	92	-	71	96	-
23	58	88	-	66	92	-
24	60	78	0.07	63	89	-
25	63	81	-	63	94	-
26	64	78	-	69	92	-
27	65	92	-	71	92	-
28	60	86	-	72	95	-
29	56	78	-	68	95	-
30	55	80	-	66	100	-
31	57	82	0.01			

	July			August		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	67	95	-	70	99	-
2	73	91	0.03	74	101	-
3	69	96	-	72	97	-
4	68	99	-	68	95	-
5	73	97	-	68	96	-
6	66	94	-	74	97	-
7	67	86	0.24	79	101	-
8	66	94	-	80	99	-
9	72	102	-	76	100	-
10	65	103	-	75	99	-
11	72	91	-	73	100	-
12	69	94	-	71	103	-
13	68	93	-	69	94	-
14	64	91	-	68	96	-
15	69	97	-	70	99	-
16	74	97	-	69	103	0.20
17	76	96	-	73	104	-
18	75	100	-	75	105	-
19	77	101	-	74	102	-
20	75	100	-	77	99	-
21	76	98	-	73	97	-
22	71	89	-	67	94	-
23	63	87	-	66	92	0.01
24	60	88	-	65	92	-
25	61	90	-	72	104	-
26	64	92	-	71	109	-
27	67	93	-	70	83	-
28	68	95	-	66	83	0.12
29	71	95	-	68	95	-
30	65	97	-	67	96	-
31	70	99	-	66	95	-

	September			October		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	70	96	-	73	87	-
2	65	97	-	71	86	-
3	64	97	-	61	86	-
4	73	94	-	59	84	-
5	66	95	-	59	89	-
6	65	95	-	58	92	-
7	65	96	-	50	74	-
8	68	96	0.30	48	84	-
9	69	84	-	59	90	-
10	69	89	-	47	90	-
11	68	90	-	36	59	-
12	69	92	-	30	67	-
13	66	88	0.01	41	88	-
14	65	89	-	59	84	-
15	62	91	-	57	83	-
16	63	91	-	42	74	-
17	63	92	-	38	82	-
18	65	97	-	54	88	-
19	68	97	-	49	79	-
20	68	92	0.82	52	87	-
21	68	79	0.86	33	75	-
22	68	87	-	34	76	-
23	71	85	0.44	40	84	-
24	67	89	-	35	59	-
25	69	92	-	27	57	-
26	66	93	-	24	77	-
27	67	93	-	38	71	-
28	65	85	0.69	31	56	-
29	72	87	-	31	43	-
30	69	85	-	25	37	-
31				17	55	-

	November			December		
Day	Min Temp	Max Temp	Precipitation	Min Temp	Max Temp	Precipitation
1	28	75	-	28	54	-
2	27	59	-	26	62	-
3	29	79	-	33	69	-
4	36	83	-	33	63	-
5	38	70	-	41	74	-
6	48	65	-	39	61	-
7	36	57	-	35	65	-
8	35	53	-	39	71	-
9	35	71	-	40	57	-
10	45	78	-	32	50	-
11	29	57	-	30	45	-
12	21	38	-	29	65	-
13	29	57	-	35	72	-
14	34	55	-	32	72	-
15	26	62	-	35	78	-
16	40	69	-	28	49	-
17	37	64	-	20	47	-
18	32	77	-	17	55	0.50
19	36	79	-	17	54	-
20	57	74	-	22	56	-
21	43	64	-	19	62	-
22	39	56	-	21	68	-
23	34	64	-	24	69	-
24	31	71	-	33	68	-
25	39	70	-	36	67	-
26	40	69	-	38	62	-
27	29	42	-	48	63	-
28	34	39	-	36	59	-
29	38	55	-	26	47	-
30	40	57	-	21	51	-
31						