2016 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 17-2

Texas A&M AgriLife and Research and Extension Center of Lubbock
1102 E. FM 1294
Lubbock, TX 79403-6603

The outlook for farm economics was not promising according to speeches at the recent 2017 Ag Issues Summit. A panelist at the Summit, Dr. Joe Outlaw of the Agriculture and Food Policy Center at Texas A&M University said, "Right now, the only thing producers can hope for is a blip in the market and a home run crop." Our producers in the Southern High Plains are going to need to utilize the best available information and practices as they begin to prepare for the 2017 growing season.

We hope these 2016 results from AG-CARES will benefit your planning efforts. There are reports on newer varieties and their performance which include new herbicide technologies in Bollgard II XtendFlex and Enlist systems. Root-knot nematode management and maximizing use of rainfall and limited irrigation continue to be research priorities.

We wish to thank Lamesa Cotton Growers for their continued support and especially the current officers:

Johnny R. Todd, President
David Zant, Vice-President
Kirk Tidwell, Secretary
Kevin Pepper, Past President
Shawn Holladay, Past President

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

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

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

Americot Cotton Seed
Bayer CropScience
Cotton, Inc. – State Support Program
Dawson County Commissioners Court
DuPont Crop Protection
PhytoGen Cotton Seed
National Cotton Council
Syngenta Crop Protection
Sam Stevens, Inc.
Monsanto/Deltapine

TITLE:

Cotton variety performance (continuous cotton, terminated cover crop) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

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

Planting Date: May 24

Varieties:
DP 1454NR B2RF
FM 2011 GT
NG 1511 B2RF
PHY 417 WRF
ST 4946 GLB2

Herbicides:
2,4-D 1 qt/A – March 14
Roundup PowerMax 1 qt/A – March 14
Prowl 3 pt/A – April 27
Roundup PowerMax 1 qt/A – June 22
Roundup PowerMax 1qt/A – July 28
Warrant 3 pt/A – July 28

Fertilizer: 130-34-0

Irrigation in-season:

	Low	Base	High
Preplant	3.5”	3.5”	3.5”
In Season	3.1”	4.6”	6.2”
Total	6.6”	8.1”	9.7”

Harvest Date: November 18

RESULTS AND DISCUSSION:

This three-year study has compared five varieties planted into terminated rye cover under three irrigation levels. In-season irrigation totaled 3.1”, 4.6”, and 6.2” for the low, base, and high levels, respectively. When yields were averaged across irrigation levels, varieties ranged from 761-839 lbs lint/A. ST 4946 GLB2, PHY 417 WRF, and FM 2011 GT produced the highest yields (Table 1). When averaged across varieties, yields increased with base and high levels compared to the low irrigation. Loan values varied between varieties, and increased with base irrigation compared to the low level. Gross revenue ($/A) was highest with ST 4946 GLB2 and FM 2011 GT. Cotton lint yields, loan values, and gross revenues are summarized in Table 1.

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

	Irrigation Levels			
Cultivar	**Low (3.1)**	**Base (4.6)**	**High (6.2)**	**Average**
	---------- lbs/A----------			
DP 1454NR B2RF	629	814	771	**738 B**
FM 2011 GT	566	846	946	**786 AB**
NG 1511 B2RF	645	863	774	**761 B**
PHY 417 WRF	705	796	919	**807 AB**
ST 4946 GLB2	665	916	937	**839 A**
Average	**642 B**	**847 A**	**869 A**	**--**
	----------cents/lb----------			
DP 1454NR B2RF	0.547	0.545	0.538	**0.543 A**
FM 2011 GT	0.525	0.543	0.544	**0.537 AB**
NG 1511 B2RF	0.500	0.501	0.525	**0.509 C**
PHY 417 WRF	0.525	0.538	0.527	**0.530 B**
ST 4946 GLB2	0.522	0.544	0.542	**0.536 AB**
Average	**0.524 B**	**0.534 A**	**0.535 A**	**--**
	----------$/A----------			
DP 1454NR B2RF	344	444	415	**401 B**
FM 2011 GT	298	460	514	**424 AB**
NG 1511 B2RF	323	433	406	**387 B**
PHY 417 WRF	370	429	484	**428 AB**
ST 4946 GLB2	348	498	508	**452 A**
Average	**336 B**	**453 A**	**466 A**	**--**

TITLE:

Cotton variety performance (wheat-cotton rotation) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications
Planting Date:	May 24
Varieties:	DP 1454NR B2RF FM 2011 GT NG 1511 B2RF PHY 417 WRF ST 4946 GLB2
Herbicides:	2,4-D 1 qt/A – March 30 Roundup PowerMax 1 qt/A – March 30 Prowl 3 pt/A – April 28 Roundup PowerMax 1 qt/A – June 17 Roundup PowerMax 1qt/A – July 27 Warrant 3 pt/A – July 27
Fertilizer:	130-34-0

Irrigation in-season:

	Low	Base	High
Preplant	2.5”	2.5”	2.5”
In Season	3.1”	4.6”	6.2”
Total	5.6”	7.1”	8.7”

Harvest Date: November 18

RESULTS AND DISCUSSION:

This three-year study (2014-2016) has compared five varieties planted into wheat stubble that was maintained with no-tillage following harvest in June 2015. When averaged across varieties, yields for the five varieties increased for 1035 to 1279 lbs lint/A, with similar yields with the base and high irrigation treatment, FM 2011 GT and ST 4946 GLB2 produced the highest yields. Loan value varied among varieties but was not affected by irrigation level. Similar gross revenues were produced with FM 2011 GT, NG 1511 B2RF, and ST 4946 GLB2. Cotton lint yields, loan values, and gross revenues are summarized in Table 1.

When compared with the continuous cotton (terminated rye cover) to the wheat-cotton rotation, significant yield increases were found across all irrigation levels (Table 2). Yields increased 61, 43, and 47% across irrigation levels with the wheat-cotton rotation compared to the cover-crop system.

Table 1. Effect of cultivar and irrigation level on cotton lint yield (lbs/A), loan value (cents/lb), and gross revenue ($/A) under wheat-cotton rotation.

	Irrigation Levels			
Cultivar	**Low (3.1)**	**Base (4.6)**	**High (6.2)**	**Average**
	---------- lbs/A----------			
DP 1454NR B2RF	937	1161	1161	**1087 B**
FM 2011 GT	1027	1187	1507	**1240 A**
NG 1511 B2RF	1140	1323	1383	**1282 A**
PHY 417 WRF	966	1145	1012	**1041 B**
ST 4946 GLB2	1105	1231	1334	**1223 A**
Average	**1035 B**	**1209 A**	**1279 A**	**--**
	----------cents/lb----------			
DP 1454NR B2RF	0.536	0.542	0.545	**0.541 A**
FM 2011 GT	0.521	0.529	0.545	**0.531 AB**
NG 1511 B2RF	0.533	0.538	0.538	**0.536 AB**
PHY 417 WRF	0.538	0.533	0.519	**0.530 B**
ST 4946 GLB2	0.533	0.533	0.544	**0.536 AB**
Average	**0.532 A**	**0.535 A**	**0.538 A**	**--**
	----------$/A----------			
DP 1454NR B2RF	502	629	635	**589 B**
FM 2011 GT	536	629	821	**662 A**
NG 1511 B2RF	607	712	744	**688 A**
PHY 417 WRF	519	613	526	**553 B**
ST 4946 GLB2	588	656	725	**656 A**
Average	**551 B**	**647 A**	**690 A**	**--**

Table 2. Comparing the effect of rotation and irrigation level on cotton lint yield (lbs/A), loan value (cents/lb) and revenue ($/A). Values were averaged across cultivar.

	Irrigation Levels		
Cultivar	**Low (3.1)**	**Base (4.6)**	**High (6.2)**
	---------- lbs/A----------		
Continuous Cotton (Wheat)	642	847	869
Wheat – Cotton Rotation	1035	1209	1279
Change (%) with Rotation	**+61**	**+43**	**+47**
	----------cents/lb----------		
Continuous Cotton (Wheat)	0.524	0.534	0.535
Wheat – Cotton Rotation	0.532	0.535	0.538
Change (%) with Rotation	**+1.53**	**+0.19**	**+0.56**
	----------$/A----------		
Continuous Cotton (Wheat)	336	453	466
Wheat – Cotton Rotation	551	647	690
Change (%) with Rotation	**+64**	**+43**	**+48**

TITLE:

Influence of crop rotation, irrigation rate, and variety on Root-knot nematode at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

Terry Wheeler, Jimmy Grant, Cecil Haralson; Texas A&M AgriLife Research

MATERIALS AND METHODS:

The cotton-wheat rotation/variety trial conducted by Wayne Keeling from 2014 to 2016 had a dramatic effect on root-knot nematodes. There were five varieties in the trial, but for this analysis, the susceptible + partially resistant (PR) varieties (NG 1511B2RF, FM 2011GT, and ST 4946GLB2) will be combined and compared against the most root-knot nematode resistant variety, PHY 417WRF. A continuous cotton system was compared to a wheat/cotton system where wheat was planted in the winter, harvested, and the ground was left fallow the next summer, and then was planted into cotton the following year. There were also three irrigation rates in the experiment, but since they had no consistent effect on root-knot nematodes, they are not presented. Measurements included galls from 20 root systems/plot at 45 days after planting, and root-knot nematode density in the soil in late August or September

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RESULTS AND DISCUSSION:

Root galling was highest in all three years for the continuous cotton/susceptible + PR varieties and lowest for the wheat:cotton/resistant variety (Fig. 1A). The number of galls/root system were significantly lower for the wheat/cotton rotations, or any rotation with the resistant variety, compared to continuous cotton with a susceptible+PR variety. Root-knot nematode densities increased each year with the continuous cotton/susceptible+PR varieties (Fig. 1B). The wheat/cotton rotation reduced root-knot nematode density after 2014, and the resistant varieties reduced root-knot nematode densities in each of the three years.

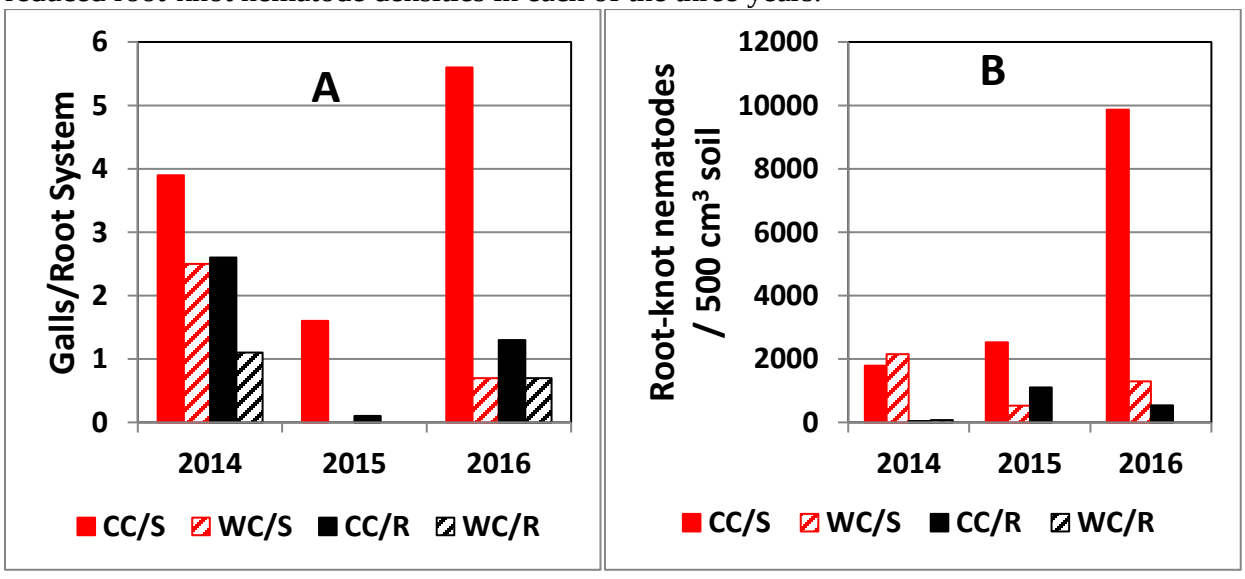

Figure 1. The effect on root-knot nematode galls on cotton roots (A) or nematode buildup (B) as a result of growing continuous cotton (CC) or wheat/cotton (W/C) rotation; and using a variety that was susceptible or partially resistant to root-knot nematodes (S) or highly resistant to root-knot nematodes (R).

TITLE:

Performance of Bollgard II XtendFlex cotton varieties at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size:	4 rows by 380-420 feet, 4 replications
Planting Date:	May 23
Varieties:	NG 3406 B2XF NG 3500 XF DP 1646 B2XF DP 1522 B2XF
Herbicides:	2,4-D 1 qt/A – March 30 Roundup PowerMax 1 qt/A – March 30 Prowl 3 pt/A – April 28 Roundup PowerMax 1 qt/A – June 17 Roundup PowerMax 1qt/A – July 27 Warrant 3 pt/A – July 27
Fertilizer:	130-34-0
Irrigation in-season:	

Preplant	2.5”
In Season	4.6”
Total	7.1”

Harvest Date:	November 21

RESULTS AND DISCUSSION:

Four Bollgard II XtendFlex cotton varieties were compared under the base irrigation level in 2016. Lint yields ranged from 1117 to 1225 lbs/A, with similar yields produced with DP 1522 BX2F, DP 1646 B2XF, and NG 3406 32XF. Loan values ranged from 53.84 to 55.26 ¢/lb. Gross revenues ($/A) averaged $638/A and were similar for all four varieties (Table 1).

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

Cultivar	Lint Yield (lbs/A)	Loan Value (¢/lb)	Gross Revenue ($/A)
NG 3406 B2XF	1162 AB	53.84 B	626 A
NG 3500 XF	1117 B	54.45 AB	608 A
DP 1646 B2XF	1205 AB	55.26 A	667 A
DP 1522 B2XF	1225 A	54.15 B	650 A
Average	**1177**	**54.43**	**638**

TITLE:

Results of the pivot irrigated cotton variety performance test, and intermediate strains at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Test:	Cotton variety, pivot irrigated
Planting Date:	May 26th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 33ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant
Fertilizer:	27 lbs/A nitrogen applied through fertigation
Irrigations:	6.6 acre-in applied May-September
Harvest Aid:	Bollbuster @1 qt/A+ETX @ 1.3oz/A Oct. 10th
	Sharpen @ 1oz/A applied Oct. 21st
	Paraquat @ 32oz/A applied Nov 4th
Harvest Date:	November 16th

RESULTS AND DISCUSSION:

Cotton variety test

Texas A&M AgriLife Research, in conjunction with the AG-CARES location in Lamesa, provide an important service to seed companies and producers through a fee-based testing system that can evaluate a relatively large number of commercial and pre-commercial cotton varieties in small-plot replicated performance trials. This service allows varieties from different companies and seed developers to be tested together by an independent source. The small-plot replicated trials are intended to evaluate the genetic performance of lines independent of biotechnology traits, so the 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 5 locations across the Southern High Plains, including the irrigated site at AG-CARES.

Lint yield is determined by the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600g grab sample collected randomly from the harvested plot material. Boll size, and pulled and picked lint percent are determined from a 50 boll sample obtained from 2 replications of each entry. Maturity and storm resistance ratings are a visual assessment of percent open bolls and a 1(very loose, considerable storm loss) to 9(very tight boll, no storm loss) storm resistance rating.

Forty-three cotton varieties from seven different seed companies were submitted for variety testing at 5 locations, including the irrigated location at AG-CARES in Lamesa. IST, International Seed Technology, is a company testing conventional cotton varieties developed in Brazil. Average yield was 1457 pounds of lint per acre with a test coefficient of variation of 14.9 and 254 pound least significant difference. The highest yielding variety was NG 3406B2XF with a yield of 1805 pounds of lint per acre. The next 15 varieties in the test were not significantly different than the highest yielding variety (Table 1). NexGen was joined in the top tier by; Deltapine, FiberMax, PhytoGen, All-Tex, Stoneville, and IST brands. Yields for the test ranged from 1805 pounds of lint per acre to 918 pounds of lint per acre in 2016. Plant height ranged from 27-35 inches with a test average of 31 inches. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 73%, with a range from 61-81%. Storm resistance ratings ranged from 4-6 with the test average of 4.

Fiber quality results can be found in Table 1A. Average fiber length was 1.19in with a range of 1.11-1.29. Eight varieties in the top yield tier had a length of 1.20 or longer, some being paired with a strength over 30g/tex. Only four varieties had a length uniformity below 81% and only one of those four was less than the Lamesa classing office average of 80.6% (USDA report as of January 27, 2017). Average strength was 31.3g/tex with a range of 27.8-34.6. Micronaire averaged 3.9 with a range of 3.2-4.6.

Intermediate Strains

Thirteen strains, 1 internal check, and 2 commercial check varieties were entered for intermediate strains testing at 2 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 1265 pounds of lint per acre with a test coefficient of variation of 7.9 and 119 pound least significant difference. FM 958 was the top yielder with 1437 pounds of lint per acre, four strains were not significantly different from the highest yielding strain (Table 2). Yields in the trial ranged from 1437 pounds of lint yield per acre to 1108 pounds of lint yield per acre in 2016. Plant height ranged from 30-35 inches with a test average of 33 inches. Relative maturity of the strains as indicated by percent open boll on a given date averaged 53%, with a range of 43-63%. Storm resistance ratings ranged from 5-7 with an average of 6.

Table 1. Yield and agronomic property results from the irrigated uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	4-Oct	Resistance	Height
NexGen NG 3406B2XF	1805	28.8	46.8	41.1	31.4	5.5	10.1	7.5	30.2	78	4	31
IST BRS 335	1768	26.6	47.6	39.3	32.9	5.8	10.7	7.2	31.9	73	5	31
Deltapine DP 1612 B2XF	1737	27.8	45.8	41.0	30.2	5.3	9.7	7.1	30.2	78	4	30
FiberMax FM 2484B2F	1727	27.7	45.7	40.1	30.6	4.9	11.0	7.7	25.7	68	6	29
Stoneville ST 4747GLB2	1714	27.9	46.3	40.1	31.1	5.3	11.2	8.0	26.4	75	5	32
PhytoGen PHY 444 WRF	1714	28.9	44.9	42.1	32.2	5.4	10.9	8.4	27.1	65	5	30
NexGen NG 3500XF	1673	27.3	44.9	39.4	31.2	5.7	10.7	7.3	30.8	78	5	33
Deltapine DP 1549 B2XF	1653	26.1	43.2	41.3	31.2	4.9	9.0	6.6	30.7	60	5	31
FiberMax FM 2322GL	1638	30.6	40.8	44.2	32.3	5.4	11.2	9.3	25.3	76	5	34
PhytoGen PHY 333 WRF	1633	27.6	46.2	40.7	30.2	5.8	10.4	7.7	30.4	70	5	32
FiberMax FM 1911GLT	1600	28.4	45.7	42.1	31.8	6.6	13.1	10.0	27.7	75	6	30
All-Tex Nitro 44B2RF	1594	26.0	47.8	38.0	26.8	5.0	11.3	7.3	26.1	74	5	32
FiberMax FM 1900GLT	1591	27.7	43.2	39.6	29.8	5.9	11.6	8.1	28.7	75	5	30
Deltapine DP 1646 B2XF	1566	32.1	43.6	43.5	33.4	4.6	8.1	6.8	29.4	73	5	30
NexGen NG 3517B2XF	1562	26.6	45.6	39.6	30.2	5.6	11.2	7.6	29.2	74	5	35
Deltapine DP 1522 B2XF	1558	27.6	44.7	41.8	34.3	5.2	9.8	7.4	29.5	78	4	31
PhytoGen PHY 243 WRF	1539	26.4	45.9	37.0	27.6	5.4	11.5	7.4	27.0	76	5	32
PhytoGen PHY 308 WRF	1539	25.3	45.9	38.2	30.3	5.3	11.9	7.8	25.9	74	5	31
PhytoGen PHY 312 WRF	1530	26.2	44.8	39.9	30.7	6.3	11.9	8.4	30.0	74	6	32
NexGen NG 1511B2RF	1522	28.3	43.7	42.7	32.4	5.1	10.3	8.1	27.1	79	4	31
Deltapine DP 1614 B2XF	1517	28.9	43.5	42.6	33.8	4.9	8.3	6.8	30.5	78	4	29
FiberMax FM 2011GT	1504	28.9	47.6	41.7	31.3	6.0	12.2	9.3	27.0	78	5	31
Deltapine DP 1044 B2RF	1473	26.3	48.0	38.9	30.6	4.7	9.5	6.5	28.0	66	5	29
Deltapine DP 0912 B2RF	1468	27.8	45.9	39.5	31.0	5.5	10.4	7.2	30.2	79	4	30
PhytoGen PHY 417 WRF	1457	28.4	45.5	42.1	32.0	5.2	9.0	6.9	31.3	70	5	30
Deltapine DP 1518 B2XF	1424	26.2	45.3	38.9	27.8	4.9	10.2	7.1	26.9	74	4	32
Stoneville ST 4946GLB2	1411	27.9	47.6	39.9	29.9	6.1	12.2	8.3	29.0	78	5	31
PhytoGen PHY 499 WRF	1381	26.4	44.4	40.0	31.7	5.4	10.4	7.5	28.8	79	5	30
FiberMax FM 1830GLT	1371	27.9	42.8	44.8	36.2	5.2	9.5	8.1	29.0	78	5	29
FiberMax FM 2334GLT	1343	27.6	41.9	40.9	30.3	5.0	9.5	7.0	29.4	79	5	31

Table 1. Yield and agronomic property results from the irrigated uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	4-Oct	Resistance	Height
Seed Source Genetics SSG HQ 210CT	1292	27.2	47.8	38.0	29.9	5.0	9.9	6.3	30.0	74	4	27
PhytoGen PHY 223 WRF	1290	23.4	47.8	36.9	28.0	5.5	11.6	7.2	28.2	80	5	31
IST BRS 286	1287	25.8	47.4	37.8	29.0	5.2	10.8	6.9	28.3	63	4	32
Seed Source Genetics SSG UA 222	1277	25.7	45.8	39.1	29.6	5.9	11.7	8.1	28.9	61	5	28
13-9-218S	1272	24.7	48.6	34.6	25.5	5.1	12.4	7.0	25.1	69	5	32
NexGen NG 5007B2XF	1261	28.4	43.3	41.9	32.9	5.1	8.3	6.5	33.0	78	4	32
NexGen NG 4545B2XF	1254	26.7	45.5	39.6	29.2	5.3	10.7	7.3	28.8	74	5	34
IST BRS 293	1233	26.5	45.9	37.6	29.6	5.8	10.9	6.9	31.8	61	5	31
PhytoGen PHY 725 RF	1176	25.6	48.4	36.7	28.3	5.6	11.5	7.1	28.9	79	4	32
IST BRS 269	1155	24.4	43.8	37.5	27.8	5.8	12.1	7.5	29.1	56	4	34
PhytoGen PHY 222 WRF	1130	27.0	45.6	40.9	30.6	5.3	11.2	8.2	26.6	81	4	32
UA 48	1095	24.0	47.4	35.8	26.7	5.6	11.6	6.8	29.6	79	4	29
Seed Source Genetics SSG UA 103	918	24.8	45.8	38.4	27.9	5.8	11.3	7.5	29.7	74	5	27
Mean	1457	27.1	45.5	39.9	30.4	5.4	10.7	7.5	28.7	73	4	31
c.v.%	14.9	4.1	3.5	2.8	6.2	6.4	3.6	4.2	7.4	8.6	14.9	6.5
LSD 0.05	254	1.3	1.9	1.9	3.2	0.6	0.7	0.5	3.6	7	1	2

Table 1A. Fiber quality results from the irrigated uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
NexGen NG 3406B2XF	4.0	1.15	82.3	30.7	8.2	4	72.0	8.5	41-3,41-4
IST BRS 335	3.5	1.20	82.1	30.7	7.1	4	71.4	8.0	41-2,41-4
Deltapine DP 1612 B2XF	4.2	1.16	82.4	30.9	8.1	6	69.4	8.4	42-2,51-3
FiberMax FM 2484B2F	3.6	1.24	81.9	32.5	6.5	4	71.1	8.3	41-2,42-2
Stoneville ST 4747GLB2	4.0	1.22	82.1	29.8	6.1	5	71.0	7.3	51-1
PhytoGen PHY 444 WRF	3.2	1.19	79.4	32.3	6.7	4	71.7	8.7	41-4,42-1
NexGen NG 3500XF	4.5	1.16	82.7	32.6	7.6	3	70.6	9.1	42-1,42-2
Deltapine DP 1549 B2XF	3.4	1.19	80.8	31.8	6.9	3	69.5	8.9	42-2,51-3
FiberMax FM 2322GL	4.2	1.22	81.6	33.6	6.0	5	70.9	8.2	41-4,51-3
PhytoGen PHY 333 WRF	3.9	1.19	83.5	29.9	8.0	4	70.6	8.6	41-4,42-2
FiberMax FM 1911GLT	3.8	1.21	83.2	32.1	6.7	4	72.8	8.1	41-2,41-3
All-Tex Nitro 44B2RF	3.5	1.23	82.6	33.5	7.9	6	69.2	8.3	42-2,51-1
FiberMax FM 1900GLT	3.9	1.20	80.8	31.7	5.8	4	70.7	8.6	41-4,42-1
Deltapine DP 1646 B2XF	3.9	1.28	83.1	29.5	8.8	3	73.2	8.2	41-1
NexGen NG 3517B2XF	4.4	1.15	81.0	30.3	8.4	4	70.7	8.6	41-4,42-2
Deltapine DP 1522 B2XF	4.4	1.17	82.9	29.8	9.2	5	70.3	8.2	41-4,51-3
PhytoGen PHY 243 WRF	3.6	1.21	80.7	29.3	7.6	5	70.5	8.1	41-4,51-3
PhytoGen PHY 308 WRF	4.0	1.16	82.6	31.4	7.4	5	68.8	8.4	51-3,52-1
PhytoGen PHY 312 WRF	4.1	1.18	82.8	30.3	7.2	4	70.4	8.3	41-4
NexGen NG 1511B2RF	4.1	1.14	81.5	30.7	9.0	4	70.4	8.6	41-4,42-2
Deltapine DP 1614 B2XF	4.3	1.19	82.0	30.2	7.5	4	69.1	8.9	42-2,52-1
FiberMax FM 2011GT	3.9	1.18	83.7	32.3	6.4	5	73.0	7.9	41-2
Deltapine DP 1044 B2RF	3.6	1.15	81.1	28.9	9.0	4	69.3	8.3	41-4,52-1
Deltapine DP 0912 B2RF	4.4	1.11	82.8	29.4	7.5	5	70.1	8.4	41-4,52-1
PhytoGen PHY 417 WRF	3.4	1.12	82.1	30.7	9.2	4	70.1	8.9	42-1,51-3
Deltapine DP 1518 B2XF	3.9	1.19	82.9	30.6	8.1	5	68.1	8.7	41-2,52-1
Stoneville ST 4946GLB2	4.1	1.19	82.7	31.2	7.6	5	71.1	8.4	41-4,42-2
PhytoGen PHY 499 WRF	3.5	1.14	82.0	31.6	8.1	4	69.8	8.5	42-1,51-3
FiberMax FM 1830GLT	3.9	1.23	82.0	31.9	6.5	4	71.2	8.1	41-2,41-4
FiberMax FM 2334GLT	4.1	1.23	82.5	30.4	6.0	4	72.2	7.5	41-2,51-1

Table 1A. Fiber quality results from the irrigated uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
Seed Source Genetics SSG HQ 210CT	4.1	1.16	81.0	31.9	7.4	3	72.0	8.2	41-2,41-4
PhytoGen PHY 223 WRF	3.8	1.25	83.7	30.8	6.8	5	71.4	8.0	41-2,41-4
IST BRS 286	3.5	1.12	81.2	32.3	6.3	4	67.9	8.9	42-2,52-1
Seed Source Genetics SSG UA 222	3.7	1.22	81.8	31.1	8.6	5	71.2	8.6	41-3,41-4
13-9-218S	3.6	1.21	82.0	32.5	6.4	4	71.2	8.3	41-4,51-3
NexGen NG 5007B2XF	4.0	1.15	81.0	27.8	8.2	4	72.0	8.9	41-3,42-1
NexGen NG 4545B2XF	4.3	1.16	82.0	32.2	5.4	3	70.6	9.2	42-1,42-2
IST BRS 293	3.3	1.13	80.1	32.9	7.5	5	68.3	8.7	51-3,52-1
PhytoGen PHY 725 RF	3.9	1.27	84.1	33.3	7.3	4	71.0	8.3	41-4
IST BRS 269	3.4	1.21	82.0	33.7	5.6	5	70.5	8.5	42-2,51-3
PhytoGen PHY 222 WRF	4.6	1.13	82.6	30.2	9.4	4	71.7	8.2	41-2,41-4
UA 48	4.3	1.29	83.6	34.6	6.7	4	69.7	8.1	51-3
Seed Source Genetics SSG UA 103	4.3	1.18	82.5	31.6	7.3	3	73.6	8.3	41-1,41-3
Mean	3.9	1.19	82.1	31.3	7.4	4	70.7	8.4	
c.v.%	7.5	2.0	1.3	3.5	7.9	26.3	2.0	5.4	
LSD 0.05	0.5	0.04	1.8	1.8	1.0	2	2.4	0.8	

Table 2. Yield and agronomic property results from the irrigated intermediate strains performance test at the AG-CARES farm in Lamesa, 2016.

				Agronomic Properties									
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm		
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	17-Oct	Resistance	Height	Visual
FiberMax FM 958	1437	25.1	45.9	38.2	27.4	5.1	11.2	7.4	26.2	59	6	30	6
13-9-1107S	1370	26.3	47.6	35.2	26.6	5.4	12.1	7.0	27.5	53	6	33	6
13-11-702BB	1355	26.0	46.8	35.5	27.5	5.4	11.4	6.7	28.9	51	6	32	5
13-9-1001S	1350	26.7	45.0	36.6	27.1	5.2	9.7	5.8	32.5	55	5	33	5
Internal check	1322	25.7	47.3	37.3	29.1	5.9	11.5	7.3	30.3	61	7	35	5
11-11-607BB	1318	25.8	45.6	36.0	25.6	5.3	11.5	6.7	28.1	63	6	31	6
13-11-109BB	1286	25.4	47.4	34.5	27.4	6.0	12.7	7.1	29.3	50	5	34	5
13-29-201N	1235	26.1	46.2	34.9	27.0	5.2	11.2	6.4	28.6	59	6	34	5
13-2-1009FQ	1231	24.3	45.2	35.7	26.0	5.2	12.0	7.1	25.8	46	6	32	5
Deltapine DP 491	1230	25.4	45.7	37.5	28.6	5.1	10.2	6.6	29	50	5	33	5
11-11-307BB	1226	27.0	48.9	35.0	27.2	6.2	12.8	7.2	30.3	43	6	32	5
11-11-505BB	1223	25.7	47.3	35.2	28.4	4.7	10.5	6.3	26.3	53	6	31	6
11-18-128N	1210	24.5	45.1	35.8	26.1	5.1	11.4	7.4	24.7	53	6	31	6
13-18-203D	1189	24.9	46.4	32.3	24.0	4.7	10.9	5.6	27.1	58	7	34	6
13-9-218S	1154	25.2	47.2	35.0	25.4	4.8	11.6	6.5	25.9	45	6	35	5
13-2-913FQ	1108	24.5	46.7	35.4	26.2	6.3	13.1	7.4	30.1	50	6	34	5
Mean	1265	25.5	46.5	35.6	26.8	5.3	11.5	6.7	28.1	53	6	33	5
c.v.%	7.9	3.7	3.9	2.9	5.4	8.3	4.3	6.4	9.7	20.6	9.8	11.8	18.7
LSD 0.05	119	1.1	2.1	1.8	2.5	0.8	0.9	0.8	4.8	13	1	5	1

TITLE:

Results of the dryland cotton variety performance test, and the dryland advanced strains test at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Test:	Cotton variety, dryland
Planting Date:	May 26th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 33ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant
Fertilizer:	32 lbs/A nitrogen applied through fertigation
Rainfall:	17.1 inches in season
Harvest Aid:	ETX@ 1oz/A +Bollbuster @ 2 pt/A applied Nov. 19th Sharpen @ 1oz/A applied Nov. 21st
Harvest Date:	November 19th

RESULTS AND DISCUSSION:

Cotton variety

The AG-CARES facility provides an excellent opportunity to evaluate varieties in small-plot replicated trials under both irrigated and dryland conditions in the Southern High Plains. Testing varieties in dryland conditions presents some of the same challenges of dryland cotton production, such as waiting for a planting rain which may favor early maturing varieties if the rain comes late, and trying to plant after rain before the soil dries. The dryland location at Lamesa AG-CARES is one of the official locations included in the National Cotton Variety Testing Program (NCVT), so data are reported even under difficult conditions. Since the location is important to the NCVT, the trial is planted under the pivot so minimum planting moisture can be applied if necessary. Some un-adapted varieties are included in these tests because they are national standards for the NCVT program. There has been a NCVT location in the Southern High Plains region since the inception of the program in 1950.

The dryland location also allows growers to evaluate variety relative yields in unpredictable situations, but other parameters, such as maturity, storm resistance, and plant height are also important in assessing overall performance when yield may be influenced as much by field conditions as variety genetic response. Data presented here are intended to provide pertinent information for variety selection decisions.

Lint yield is determined by the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600g grab sample collected randomly from the harvested plot material. Boll size, and pulled and picked lint percent are determined from a 50 boll sample obtained from 2 replications of each entry. Maturity and storm resistance ratings are a visual assessment of percent open bolls and a 1(very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating.

Forty-three cotton varieties from 7 different seed companies were submitted for variety testing at 5 locations, including the dryland location at AG-CARES in Lamesa. Average yield was 585 pounds of lint per acre with a test coefficient of variation of 18.6 and 128 pound least significant difference. The highest yielding variety was FM 2011 GT with a yield of 778. The next 13 varieties in the test were not significantly different than the highest yielding variety (Table 3). Deltapine, PhytoGen, Stoneville, and NexGen brands were all represented in this top tier. Yields for the test ranged from 778 pounds of lint per acre to 354 pounds of lint per acre in 2016. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 55%, with a range from 28-75%. All of the varieties tested had storm resistance ratings from 3-6 with the test average of 4. Plant height averaged 23 inches and ranged from 17-26 inches across all varieties.

Average fiber length was 1.15in with a range of 1.10-1.23in. Two of the varieties in the top yield tier retained lengths above 1.20in even under these dryland conditions. Average strength was 31.3g/tex with a range of 28.5-34.7g/tex. Micronaire averaged 4.3 with a range of 3.3-4.9 will all varieties in the top yielding tier having a micronaire of 3.5 or above (Table 3A).

Table 3. Yield and agronomic property results from the dryland uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	23-Sep	Resistance	Height
FiberMax FM 2011GT	778	28.4	43.9	38.6	30.9	6.0	11.8	7.9	29.3	73	6	24
Deltapine DP 1646 B2XF	774	28.2	43.6	38.8	32.1	4.9	8.3	6.1	31.3	56	5	23
PhytoGen PHY 499 WRF	766	27.5	45.0	37.9	30.5	5.0	10.2	6.7	28.1	60	4	25
Stoneville ST 4946GLB2	765	27.0	46.5	38.4	31.8	6.1	11.8	7.6	31.1	40	4	25
Deltapine DP 0912 B2RF	756	26.1	44.4	37.8	30.5	4.8	10.0	6.5	28.0	65	4	23
Deltapine DP 1612 B2XF	745	23.9	40.7	35.1	29.6	5.6	10.0	6.2	31.7	65	4	24
FiberMax FM 2484B2F	737	25.9	45.9	37.8	31.4	5.0	11.0	7.0	27.2	39	6	21
FiberMax FM 1900GLT	710	28.4	45.2	36.9	31.0	6.3	11.0	7.4	31.3	63	5	25
NexGen NG 3517B2XF	694	25.4	45.7	35.9	28.4	5.3	10.8	6.4	29.5	66	5	26
PhytoGen PHY 308 WRF	684	24.8	43.2	36.3	29.4	5.4	10.7	6.8	29.1	59	4	23
PhytoGen PHY 333 WRF	674	25.9	44.1	38.0	30.5	5.5	10.0	6.7	30.9	55	5	24
PhytoGen PHY 243 WRF	666	25.2	46.2	35.6	29.5	5.5	10.9	6.8	28.9	69	5	24
PhytoGen PHY 417 WRF	654	31.4	45.3	39.0	31.9	5.3	9.1	6.2	33.5	46	4	22
NexGen NG 3406B2XF	651	27.0	42.8	37.5	30.2	5.4	9.9	6.4	31.0	65	5	26
FiberMax FM 1911GLT	647	28.3	44.8	41.5	32.7	6.2	13.0	9.4	27.2	56	6	24
Deltapine DP 1522 B2XF	644	26.1	44.2	39.2	32.4	5.0	9.6	6.6	29.8	51	5	24
PhytoGen PHY 312 WRF	643	25.3	44.0	37.5	29.8	5.3	11.0	7.1	28.3	51	4	26
Deltapine DP 1044 B2RF	637	25.6	45.4	37.0	29.9	4.4	9.6	6.0	26.8	46	4	20
NexGen NG 4545B2XF	623	27.4	44.4	37.1	30.0	6.0	10.2	6.3	34.8	66	5	25
Deltapine DP 1549 B2XF	617	26.9	44.9	37.8	30.4	5.2	9.0	6.0	32.6	28	4	24
NexGen NG 3500XF	610	24.1	42.0	36.0	29.4	5.4	10.6	6.4	30.5	58	5	26
FiberMax FM 2334GLT	609	27.1	43.3	40.1	31.4	5.4	9.5	6.8	32.2	58	5	21
PhytoGen PHY 444 WRF	604	29.5	45.7	39.6	31.1	5.4	10.6	7.3	29.1	34	6	23
NexGen NG 1511B2RF	575	26.6	40.7	39.3	31.2	5.3	10.4	7.2	28.9	71	4	26
All-Tex Nitro 44B2RF	571	24.8	45.0	34.9	27.9	5.1	11.6	6.7	26.3	63	4	25
FiberMax FM 1830GLT	560	29.7	42.7	39.9	32.8	5.8	10.1	7.3	32.1	70	5	24
Stoneville ST 4747GLB2	556	25.7	42.8	34.3	28.4	5.8	10.9	6.6	30.5	73	6	24
PhytoGen PHY 223 WRF	538	25.2	44.2	37.6	29.8	5.8	11.1	7.0	30.7	61	6	26
IST BRS 286	528	27.3	46.1	36.6	29.1	4.8	10.7	6.5	27.0	39	4	22
FiberMax FM 2322GL	526	27.5	40.2	40.0	30.6	5.5	10.5	7.7	28.7	66	4	24

Table 3. Yield and agronomic property results from the dryland uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	23-Sep	Resistance	Height
Seed Source Genetics SSG UA 222	522	25.2	44.9	35.6	28.9	5.8	12.0	7.1	28.9	28	4	20
IST BRS 335	520	24.1	46.4	36.1	29.2	5.0	10.9	6.4	28.3	33	5	22
Deltapine DP 1614 B2XF	498	25.2	39.9	40.2	31.9	4.9	8.7	6.4	30.9	55	4	22
IST BRS 293	491	25.9	47.3	35.0	28.5	5.5	10.6	6.4	30.1	36	4	22
PhytoGen PHY 222 WRF	449	28.8	45.9	36.8	29.1	5.4	10.8	6.9	28.6	75	4	24
Seed Source Genetics SSG HQ 210CT	417	25.8	47.8	34.6	28.1	4.8	9.5	5.4	30.8	48	5	17
UA 48	417	23.7	46.7	33.6	26.9	5.7	11.4	6.2	30.9	66	3	19
Deltapine DP 1518 B2XF	414	25.8	43.6	37.9	30.2	5.1	9.8	6.6	29.2	61	4	22
NexGen NG 5007B2XF	412	27.2	42.7	40.1	31.7	4.7	8.2	5.9	32.1	68	4	23
13-9-218S	383	24.2	47.9	33.8	27.1	5.8	11.6	6.5	30.4	43	4	23
Seed Source Genetics SSG UA 103	381	25.1	45.0	35.7	27.4	5.8	11.8	6.8	30.2	46	3	21
PhytoGen PHY 725 RF	369	21.5	43.5	33.2	26.7	5.6	11.0	5.9	31.2	70	3	26
IST BRS 269	354	22.9	46.9	34.7	27.9	5.5	11.1	6.6	29.0	38	4	22
Mean	585	26.2	44.4	37.2	29.9	5.4	10.4	6.7	30.0	55	4	23
c.v.%	18.6	3.4	3.2	3.0	3.5	5.5	3.8	4.7	5.4	24.6	17.5	8.1
LSD 0.05	128	1.1	1.6	1.9	1.7	0.5	0.7	0.5	2.7	16	1	2

Table 3A. Fiber quality results from the dryland uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
FiberMax FM 2011GT	4.5	1.12	81.7	31.0	7.1	3	72.5	8.3	41-3,41-4
Deltapine DP 1646 B2XF	4.1	1.23	81.7	29.5	7.8	3	72.8	8.9	41-3
PhytoGen PHY 499 WRF	4.2	1.12	81.4	31.0	9.4	5	68.7	8.9	42-2,52-1
Stoneville ST 4946GLB2	4.1	1.12	80.9	30.8	8.6	4	69.2	9.4	42-2
Deltapine DP 0912 B2RF	4.8	1.11	80.0	31.1	8.0	4	69.1	8.6	51-3,52-1
Deltapine DP 1612 B2XF	4.8	1.11	80.6	31.5	10.1	6	67.9	8.6	52-1
FiberMax FM 2484B2F	4.2	1.22	81.6	32.2	6.6	4	68.9	8.7	42-2,51-3
FiberMax FM 1900GLT	4.8	1.15	80.6	32.0	5.4	4	69.6	8.3	42-2,52-1
NexGen NG 3517B2XF	4.4	1.18	81.8	33.4	7.9	4	70.7	8.7	41-4,42-2
PhytoGen PHY 308 WRF	4.8	1.14	81.0	32.4	8.3	5	68.5	8.8	42-2,52-1
PhytoGen PHY 333 WRF	3.5	1.14	82.0	30.0	7.2	4	70.8	9.1	42-2
PhytoGen PHY 243 WRF	4.2	1.17	80.7	31.2	8.1	5	70.9	8.1	41-2,51-3
PhytoGen PHY 417 WRF	4.0	1.10	80.2	30.1	9.5	3	69.9	9.5	42-1,42-2
NexGen NG 3406B2XF	4.8	1.10	80.4	29.6	9.2	4	72.1	8.8	41-3,41-4
FiberMax FM 1911GLT	4.5	1.17	82.7	32.9	6.7	3	74.8	7.7	41-1
Deltapine DP 1522 B2XF	4.5	1.17	81.4	30.7	10.4	4	69.7	8.6	41-4,42-2
PhytoGen PHY 312 WRF	4.6	1.12	81.3	29.2	8.1	2	70.4	9.6	42-1,43-1
Deltapine DP 1044 B2RF	4.4	1.11	81.1	29.4	9.8	2	69.0	9.7	42-2,42-2
NexGen NG 4545B2XF	4.4	1.16	81.3	34.4	5.4	3	70.8	8.6	41-4,42-1
Deltapine DP 1549 B2XF	3.7	1.13	79.7	32.0	7.2	2	71.1	9.0	41-4,42-1
NexGen NG 3500XF	4.7	1.12	80.0	31.7	7.7	3	68.8	9.1	42-2,52-1
FiberMax FM 2334GLT	4.5	1.19	81.6	31.8	6.9	4	73.1	8.2	41-1
PhytoGen PHY 444 WRF	3.9	1.20	81.7	30.6	6.8	3	70.4	9.1	42-1,42-2
NexGen NG 1511B2RF	4.7	1.13	80.0	31.2	8.6	4	70.4	8.8	42-2
All-Tex Nitro 44B2RF	3.9	1.20	82.1	34.2	7.7	6	67.9	8.1	51-3,52-1
FiberMax FM 1830GLT	4.3	1.19	82.8	31.9	6.3	3	72.6	8.5	41-3,41-4
Stoneville ST 4747GLB2	4.9	1.17	80.1	28.5	5.3	6	68.9	7.1	51-1
PhytoGen PHY 223 WRF	4.8	1.17	82.2	31.4	7.8	5	68.8	8.1	42-2,51-2
IST BRS 286	3.5	1.12	79.8	31.2	7.7	3	71.5	9.1	41-3,42-1
FiberMax FM 2322GL	4.2	1.20	81.3	34.7	5.2	3	70.2	8.2	41-4,51-3

Table 3A. Fiber quality results from the dryland uniform cotton performance test at the AG-CARES farm in Lamesa, 2016.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
Seed Source Genetics SSG UA 222	3.3	1.18	80.9	30.9	8.4	4	69.7	9.5	42-1,42-2
IST BRS 335	3.5	1.16	80.9	30.7	6.6	4	71.1	8.3	41-4
Deltapine DP 1614 B2XF	4.7	1.18	79.9	29.9	9.3	5	68.6	8.7	52-1
IST BRS 293	3.8	1.12	80.7	31.8	7.7	3	69.7	9.2	42-2
PhytoGen PHY 222 WRF	5.2	1.08	81.3	30.3	8.5	3	71.5	8.2	41-2,41-4
Seed Source Genetics SSG HQ 210CT	4.5	1.11	79.1	31.0	7.9	3	70.1	9.4	41-4,43-1
UA 48	5.0	1.21	81.7	33.8	6.2	3	71.1	8.5	41-2,42-1
Deltapine DP 1518 B2XF	4.1	1.15	80.4	30.0	7.7	4	70.3	8.2	41-4,51-3
NexGen NG 5007B2XF	4.6	1.16	80.2	28.0	9.1	2	72.0	8.5	41-4
13-9-218S	4.1	1.16	82.9	33.4	5.6	3	72.1	8.2	41-4
Seed Source Genetics SSG UA 103	3.8	1.17	80.6	32.8	7.6	2	71.0	9.3	42-1,42-2
PhytoGen PHY 725 RF	4.2	1.15	80.8	33.0	7.9	4	68.3	8.8	52-1
IST BRS 269	3.6	1.14	79.8	32.9	7.0	2	71.3	8.7	41-4,42-1
Mean	4.3	1.15	81.0	31.3	7.7	3	70.4	8.7	
c.v.%	8.2	2.2	1.0	2.9	8.4	29.7	1.5	5.4	
LSD 0.05	0.6	0.04	1.4	1.5	1.1	2	1.8	0.8	

TITLE:

Results of the Root-knot nematode cotton variety performance test at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

Jane K. Dever, Terry A. Wheeler, Carol M. Kelly, and Valerie M. Morgan; Professor, Professor, Associate Research Scientist, and Research Associate

MATERIALS AND METHODS:

Test:	Root-Knot Nematode Variety
Planting Date:	May 26th
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 33ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant
Fertilizer:	32 lbs/A nitrogen applied through fertigation
Irrigations:	6.7 acre-in applied May-September
Harvest Aid:	ETX @1oz/A +Bollbuster @ 2pt/A applied Oct. 10th
	Sharpen @ 1oz/A applied Oct. 21
	Paraquat @ 32oz/A applied Nov. 4th
Harvest Date:	November 17th

RESULTS AND DISCUSSION:

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

Lint yield is determined by the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600g grab sample collected randomly from the harvested plot material. Boll size, and pulled and picked lint percent are determined from a 50 boll sample obtained from 2 replications of each entry. Maturity and storm resistance ratings are a visual assessment of percent open bolls and a 1(very loose, considerable storm loss) to 9 (very tight boll, no storm loss) storm resistance rating.

Twenty-two cotton varieties and experimental strains from 4 different seed companies were submitted for variety testing in a field where root-knot nematodes were known to have been present. Average yield was 1186 pounds of lint per acre with a test coefficient of variation of 16.4 and 230 pound least significant difference. Yields for the test ranged from 1580 pounds of

lint per acre to 873 pounds of lint per acre. PHY 417 WRF allowed the lowest level of nematode reproduction in 2016 while obtaining a yield of 1128 pounds of lint per acre (Table 4).

Average fiber length was 1.17in with a range of 1.23-1.11in. Two of the top ten yielders were longer than 1.20in with strengths slightly above 32g/tex. Average strength was 30.6g/tex with a range of 32.8-28.3g/tex. Micronaire averaged 3.1 with a range of 3.8-2.6 (Table 4A).

Table 4. Yield and agronomic property results from the irrigated root-knot nematode cotton performance test at the AG-CARES farm in Lamesa, 2016.

		Agronomic Properties													
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm			RK/500cc	LOG10
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	4-Oct	Resistance	Height		soil	(RK)
FiberMax FM 2011GT	1580	28.9	46.4	41.2	30.8	6.3	12.1	9.0	29.0	73	6	28		2970	3.41
FiberMax FM 1911GLT	1403	27.8	45.8	42.1	31.9	6.1	12.9	9.8	26.4	71	6	26		6210	3.74
NexGen NG 3500XF	1384	26.0	46.3	39.1	31.3	5.4	10.6	7.1	30.3	60	5	28		18025	4.04
PhytoGen PHY 308 WRF	1378	24.8	46.1	38.3	26.6	5.3	10.9	7.2	28.2	68	5	27		3060	3.41
Stoneville ST 4946GLB2	1333	26.0	44.9	39.1	29.4	5.4	11.4	7.8	27.1	66	5	26		2640	3.40
Deltapine DP 1747NR B2XF	1266	27.9	43.1	42.8	33.0	5.8	10.4	8.3	29.9	30	4	29		1020	2.91
Bayer CropScience BX 1739GLT	1230	26.2	44.7	41.3	31.3	4.4	10.9	8.1	22.7	56	5	28		10710	3.91
PhytoGen PHY 499 WRF [s]	1216	25.1	46.1	39.6	27.8	4.6	10.4	7.2	25.7	58	4	30		10200	3.87
FiberMax FM 1888GL	1213	25.4	43.2	40.8	30.7	6.1	10.6	7.6	33.7	70	5	27		23850	4.26
PhytoGen PHY 333 WRF [s]	1207	25.3	45.7	40.3	30.3	5.4	10.2	7.2	30.2	65	5	26		5700	3.69
Monsanto 16R251NR B2XF	1178	25.2	42.1	40.7	31.5	5.8	10.3	7.5	31.4	20	4	33		745	2.58
Deltapine DP 1558NR B2RF	1177	25.9	44.1	40.4	30.5	5.9	10.5	7.5	31.7	29	5	32		2580	3.13
Bayer CropScience BX 1733GLT	1172	26.0	44.8	39.8	31.7	5.5	11.1	7.7	28.6	48	5	29		12750	3.97
Stoneville ST 5020GLT	1172	25.2	45.8	39.6	29.6	5.5	11.1	7.7	28.4	66	4	25		13050	4.10
Bayer CropScience BX 1774GLTP	1167	25.4	47.1	37.6	33.3	5.7	10.4	6.7	32.0	66	5	26		14040	4.09
PhytoGen PHY 417WRF	1128	26.7	46.4	40.7	31.3	4.6	11.1	8.1	23.4	73	5	26		585	2.54
Monsanto 16R252NR B2XF	1109	26.0	42.3	42.0	33.7	5.6	9.5	7.3	32.4	28	5	31		1435	2.88
Bayer CropScience BX 1737GLT	1054	24.6	46.2	38.7	28.8	5.1	10.2	6.8	29.2	76	5	24		7740	3.77
Bayer CropScience BX 1775GLTP	1008	23.6	45.7	37.4	28.3	4.5	9.1	5.8	28.6	84	5	24		14880	4.13
FiberMax FM 1953GLTP	963	25.8	47.4	36.9	29.9	5.3	10.4	6.6	29.9	69	5	26		28200	4.24
Bayer CropScience BX 1776GLTP	876	23.4	43.8	38.2	27.2	4.5	10.5	7.0	24.6	80	5	23		5550	3.53
Bayer CropScience BX 1736GLT	873	26.4	44.9	40.3	31.9	5.7	10.5	7.8	29.5	66	6	25		3090	3.29
Mean	1186	25.8	45.1	39.8	30.5	5.4	10.7	7.5	25.7	60	5	27	MSD 0.05	14,147	0.58
c.v.%	16.4	4.8	3.0	1.9	3.6	4.4	7.3	7.1	5.9	18.9	14.7	9.7			
LSD 0.05	230	1.5	1.6	1.3	1.9	0.4	1.3	0.9	2.9	13	1	3			

Table 4A. Fiber quality results from the irrigated root-knot nematode cotton performance test at the AG-CARES farm in Lamesa, 2016.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
FiberMax FM 2011GT	3.7	1.15	81.0	31.5	7.3	4	75.0	8.0	41-1
FiberMax FM 1911GLT	3.8	1.19	81.7	32.3	6.7	3	74.0	7.5	41-1,41-2
NexGen NG 3500XF	3.7	1.13	82.3	30.3	8.0	3	70.8	9.4	42-1
PhytoGen PHY 308 WRF	3.1	1.16	82.3	32.8	8.3	7	70.6	8.5	41-4
Stoneville ST 4946GLB2	3.3	1.16	81.0	31.0	8.4	4	72.0	9.2	42-1
Deltapine DP 1747NR B2XF	2.9	1.11	78.2	29.1	7.5	3	70.0	10.6	33-2,43-1
Bayer CropScience BX 1739GLT	3.3	1.23	80.7	32.1	5.7	4	72.5	8.6	41-3,41-4
PhytoGen PHY 499 WRF [s]	3.0	1.14	81.0	30.4	8.5	4	71.6	9.3	42-1
FiberMax FM 1888GL	3.7	1.21	82.1	32.8	5.5	5	72.4	8.0	41-2,41-4
PhytoGen PHY 333 WRF [s]	3.2	1.17	81.1	29.9	7.6	4	72.5	9.2	42-1
Monsanto 16R251NR B2XF	2.9	1.19	80.4	30.0	7.5	3	70.1	10.1	42-1
Deltapine DP 1558NR B2RF	3.1	1.17	80.4	30.7	7.1	3	70.6	9.9	42-1
Bayer CropScience BX 1733GLT	3.0	1.20	80.0	31.1	7.1	3	72.6	8.8	41-3,42-1
Stoneville ST 5020GLT	3.5	1.16	79.7	32.0	9.0	3	71.5	7.9	41-4,51-1
Bayer CropScience BX 1774GLTP	3.2	1.19	81.0	29.2	7.2	4	74.4	7.8	41-1
PhytoGen PHY 417WRF	2.7	1.13	80.5	30.0	9.1	4	72.8	9.4	32-2,41-3
Monsanto 16R252NR B2XF	3.2	1.14	80.1	28.3	8.5	3	73.0	9.3	32-2,42-1
Bayer CropScience BX 1737GLT	3.1	1.19	81.0	29.5	7.4	3	73.0	8.3	41-2,41-3
Bayer CropScience BX 1775GLTP	2.7	1.18	79.7	28.8	8.9	4	73.5	8.1	41-1
FiberMax FM 1953GLTP	3.0	1.21	81.2	31.2	7.6	5	74.6	7.6	41-1,41-2
Bayer CropScience BX 1776GLTP	2.6	1.16	78.5	29.1	7.3	2	72.0	8.9	41-3,42-2
Bayer CropScience BX 1736GLT	2.8	1.20	81.0	30.5	8.0	4	72.1	9.5	32-2,42-1
Mean	3.1	1.17	80.7	30.6	7.6	3	72.3	8.8	
c.v.%	9.0	1.7	1.1	3.7	7.9	24.2	1.4	3.9	
LSD 0.05	0.5	0.03	1.6	1.9	1.0	1	1.7	0.6	

TITLE:

Performance of FiberMax and Stoneville cotton varieties as affected by irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 3 replications

Planting Date: May 23

Varieties:
FM 1830 GLT
FM 1888 GL
FM 1900 GLT
FM 1911 GLT
FM 2007 GLT
FM 2322 GL
FM 9250 GL
ST 4747 GLB2
ST 4946 GLB2

Herbicides:
Trifluralin 1.4 pt/A – April 26
Caparol 1.5 pt/A – May 27
Roundup PowerMax – 1qt/A – June 24
Roundup PowerMax – 1qt/A – July 26

Fertilizer: 130-34-0

Irrigation in-season:

	Low	Base	High
Preplant	4.7”	4.7”	4.7”
In Season	4.2”	4.9”	6.6”
Total	8.9”	9.6”	11.3”

Harvest Date: November 30

RESULTS AND DISCUSSION:

Seven FiberMax and two Stoneville varieties were evaluated for dryland and three levels of subsurface drip irrigation in 2016. The trial was planted May 23 and was making excellent progress prior to a hailstorm on July 5th which caused significant damage. Irrigation and fertility inputs were continued and the crop recovered sufficiently to produce 1369 lbs/A averaged across three irrigation levels.

When averaged across varieties, dryland yields average 569 lbs lint/A and 1098 to 1562 lbs/A with increasing irrigation levels (Table 1). Similar yields were produced with the base and high irrigation levels, which were higher than the low irrigation treatment. When averaged

across irrigation levels, the highest yielding varieties included ST 4946 GLB2, ST 4747 GLB2, and FM 1888 GL, which is a new variety for 2017.

Loan price was not affected by irrigation level, but did vary between varieties. Gross revenues ($/A) were related mainly to yield and varied between varieties. Highest gross revenues were produced with ST 4946 GLB2. Effects of variety and irrigation level on cotton lint yield, loan price, and gross revenues are summarized in Table 1.

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

	Irrigation Levels				
Variety	**Dry (0.0)**	**Low (4.2)**	**Base (4.9)**	**High (6.6)**	**Average**
	---------- lbs/A----------				
FM 1830 GLT	555	990	1441	1452	**1110 CD**
FM 1888 GL	628	1189	1380	1555	**1188 ABC**
FM 1900 GLT	512	1137	1454	1547	**1162 BCD**
FM 1911 GLT	525	1004	1466	1660	**1164 BCD**
FM 2007 GLT	623	1063	1467	1462	**1154 CD**
FM 2322 GL	536	856	1392	1597	**1095 D**
FM 9250 GL	524	1112	1379	1491	**1127 CD**
ST 4747 GLB2	598	1244	1500	1673	**1254 AB**
ST 4946 GLB2	620	1284	1555	1620	**1270 A**
Average	**569 C**	**1098 B**	**1448 A**	**1562 A**	**-**
	----------cents/lb----------				
FM 1830 GLT	53.9	54.4	55.0	54.9	**54.6 A**
FM 1888 GL	51.2	52.6	51.4	54.2	**52.3 D**
FM 1900 GLT	53.6	50.0	53.5	52.8	**52.5 D**
FM 1911 GLT	55.3	53.9	53.8	54.1	**54.3 AB**
FM 2007 GLT	52.1	53.7	50.8	55.0	**52.9 BCD**
FM 2322 GL	50.8	55.2	52.5	53.8	**53.1 BCD**
FM 9250 GL	51.2	52.4	52.7	54.3	**52.7 CD**
ST 4747 GLB2	48.9	51.9	51.0	48.3	**50.0 E**
ST 4946 GLB2	53.5	53.8	53.8	55.0	**54.0 ABC**
Average	**52.3 B**	**53.1 AB**	**52.7 AB**	**53.6 A**	**-**
	----------$/A----------				
FM 1830 GLT	299	539	793	798	**607 B**
FM 1888 GL	322	623	709	840	**623 B**
FM 1900 GLT	274	570	776	817	**609 B**
FM 1911 GLT	290	541	796	899	**631 B**
FM 2007 GLT	325	570	745	804	**611 B**
FM 2322 GL	273	473	730	859	**584 B**
FM 9250 GL	268	584	726	810	**597 B**
ST 4747 GLB2	292	643	765	808	**627 B**
ST 4946 GLB2	331	693	840	891	**689 A**
Average	**297 C**	**582 B**	**764 A**	**836 A**	**-**

TITLE:

Performance of PhytoGen cotton varieties as affected by irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 4 replications

Planting Date: May 23

Varieties:
PHY 470 W3FE
ST 4946 GLB2
PHY 499 WRF
PHY 340 W3FE
PHY 450 W3FE
PHY 460 W3FE
PHY 490 W3FE
PHY 333 WRF
PHY 330 W3FE
PHY 243 WRF
PHY 300 W3FE
PHY 380 W3FE
PHY 220 W3FE

Herbicides:
Prowl 3 pt/A – April 28
Roundup PowerMax 1qt/A – June 17
Roundup PowerMax 1qt/A + Warrant 3 pt/A – July 27

Fertilizer: 130-34-0

Irrigation in-season:

	Low	Base	High
Preplant	2.0”	2.0”	2.0”
In Season	3.1”	4.6”	6.2”
Total	5.1”	6.6”	8.2”

Harvest Date: November 23

RESULTS AND DISCUSSION:

Twelve PhytoGen varieties including nine Enlist (2,4-D tolerant) varieties were planted under dryland and three levels of irrigation in 2016. When combined across varieties, dryland yields averaged 513 lbs lint/A and irrigated yields increased from 884 to 1252 lbs/A with increased irrigation inputs. When combined across irrigation levels PhytoGen 470 W3FE and ST 4946 GLB2 produced the highest yields (>1400 lbs/A) under high irrigation. Cotton loan values trended higher with irrigation compared to dryland. Gross revenue ($A) increased with additional irrigation inputs. Cotton lint yields, loan values, and gross revenues are summarized in Table 1. Enlist Duo herbicide is now registered for use in Enlist cotton varieties.

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

Variety	Irrigation Levels				
	Dry (0.0)	Low (3.1)	Base (4.6)	High (6.2)	Average
	---------- lbs/A----------				
PHY 470 W3FE	600	1008	1304	1483	**1099**
ST 4946 GLB2	590	1036	1301	1425	**1088**
PHY 499 WRF	601	923	1264	1303	**1023**
PHY 340 W3FE	572	917	1254	1279	**1005**
PHY 450 W3FE	541	896	1233	1252	**981**
PHY 460 W3FE	507	904	1182	1240	**958**
PHY 490 W3FE	481	864	1194	1239	**945**
PHY 333 WRF	510	888	1171	1225	**949**
PHY 330 W3FE	519	860	1124	1200	**926**
PHY 243 WRF	478	828	1058	1198	**890**
PHY 300 W3FE	464	825	1039	1151	**870**
PHY 380 W3FE	416	806	1008	1127	**839**
PHY 220 W3FE	388	732	976	1151	**812**
Average	**513**	**884**	**1162**	**1252**	**-**
LSD (0.05)	**48**	**65**	**60**	**71**	**-**
	----------cents/lb----------				
PHY 470 W3FE	55.2	57.1	57.7	57.7	**56.9**
ST 4946 GLB2	55.8	53.9	57.6	57.6	**56.2**
PHY 499 WRF	54.5	56.4	57.6	57.0	**56.3**
PHY 340 W3FE	55.4	56.3	57.7	57.7	**56.7**
PHY 450 W3FE	54.1	56.5	57.8	57.7	**56.5**
PHY 460 W3FE	55.0	55.0	57.7	57.8	**56.4**
PHY 490 W3FE	55.0	56.9	56.8	57.7	**56.6**
PHY 333 WRF	52.1	54.6	56.0	57.8	**55.1**
PHY 330 W3FE	51.7	54.7	57.2	57.8	**55.3**
PHY 243 WRF	55.4	56.2	57.5	57.6	**56.7**
PHY 300 W3FE	56.3	55.3	57.6	57.4	**56.7**
PHY 380 W3FE	53.9	55.6	57.1	56.6	**55.8**
PHY 220 W3FE	50.3	50.4	53.6	55.5	**52.4**
Average	**54.2**	**55.3**	**57.1**	**57.4**	**-**
LSD (0.05)	**0.0119**	**0.0089**	**0.0031**	**0.0030**	**-**
	----------$/A----------				
PHY 470 W3FE	333	575	752	856	**629**
ST 4946 GLB2	330	561	749	820	**615**
PHY 499 WRF	329	520	728	742	**579**
PHY 340 W3FE	317	516	723	738	**573**
PHY 450 W3FE	293	505	712	722	**558**
PHY 460 W3FE	278	498	682	716	**544**
PHY 490 W3FE	266	492	679	715	**538**
PHY 333 WRF	265	486	657	708	**529**
PHY 330 W3FE	265	470	643	694	**518**
PHY 243 WRF	265	464	608	690	**507**
PHY 300 W3FE	262	457	599	661	**494**
PHY 380 W3FE	223	448	576	639	**471**
PHY 220 W3FE	196	372	524	638	**432**
Average	**278**	**490**	**664**	**718**	**-**
LSD (0.05)	**27**	**39**	**35**	**41**	**-**

TITLE:

Performance of Deltapine cotton varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 3 replications

Planting Date: May 23

Varieties:
DP 1522 B2XF
DP 1549 B2XF
DP 1612 B2XF
DP 1646 B2XF
DP 1747NR B2XF
ST 4946 GLB2

Herbicides:
Trifluralin 1.4 pt/A – April 26
Caparol 1.5 pt/A – May 27
Roundup PowerMax – 1qt/A – June 24
Roundup PowerMax – 1qt/A – July 26

Fertilizer: 160-0-0

Irrigation in-season:

	Low	Base	High
Preplant	4.7”	4.7”	4.7”
In Season	4.2”	4.9”	6.6”
Total	8.9”	9.6”	11.3”

Harvest Date: November 29

RESULTS AND DISCUSSION:

Five Bollgard II XtendFlex Deltapine varieties were compared under dryland production and three levels of subsurface drip irrigation in 2016. When averaged across irrigation levels, highest yields were produced with DP 1522 B2XF, DP 1612 B2XF, DP 1646 B2XF, and were similar to ST 4946 GLB2. When averaged across varieties, highest loan values were produced with the low irrigation treatment and trended lower as irrigation level increased. Gross revenue varied between varieties, and increased with increasing irrigation up to the base level. Yields and lint quality trended lower with the high irrigation treatment. Lint yields, loan values, and gross revenue are summarized in Table 1. Significant hail damage to the trial occurred in early July.

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

Variety	Irrigation Levels				
	Dry (0.0)	**Low (4.2)**	**Base (4.9)**	**High (6.6)**	**Average**
	---------- lbs/A----------				
DP 1522 B2XF	907	1718	1914	1840	**1595 A**
DP 1549 B2XF	922	1453	1441	1330	**1287 C**
DP 1612 B2XF	898	1592	2005	2050	**1636 A**
DP 1646 B2XF	891	1809	1960	1772	**1608 A**
DP 1747NR B2XF	980	1611	1818	1580	**1497 B**
ST 4946 GLB2	955	1837	1982	1857	**1658 A**
Average	**925 C**	**1670 B**	**1853 A**	**1738 AB**	**-**
	----------cents/lb----------				
DP 1522 B2XF	56.3	56.9	54.8	56.4	**56.1**
DP 1549 B2XF	53.6	54.7	56.5	54.7	**54.9**
DP 1612 B2XF	56.3	56.9	56.7	56.8	**56.7**
DP 1646 B2XF	55.4	56.8	56.4	54.7	**55.8**
DP 1747NR B2XF	56.6	56.6	56.5	55.7	**56.3**
ST 4946 GLB2	49.5	56.7	56.7	56.6	**54.9**
Average	**54.6 D**	**56.4 A**	**56.2 B**	**55.8 C**	**-**
	----------$/A----------				
DP 1522 B2XF	510	977	1048	1038	**893 A**
DP 1549 B2XF	494	795	813	728	**708 C**
DP 1612 B2XF	506	906	1137	1163	**928 A**
DP 1646 B2XF	494	1028	1105	969	**899 A**
DP 1747NR B2XF	555	912	1026	879	**843 B**
ST 4946 GLB2	473	1042	1123	1051	**922 A**
Average	**505 C**	**943 B**	**1042 A**	**971 AB**	**-**

TITLE:

Variety and nematicide treatments for management of Root-knot nematodes at AG-CARES, Lamesa, TX 2016.

AUTHORS:

Terry Wheeler, Cecil Haralson, Jimmy Grant; Texas A&M AgriLife Research, Lubbock.

MATERIALS AND METHODS:

Varieties tested: ST 4946GLB2 (partially resistant), ST 4747GLB2 (partially tolerant).

Nematicide Treatments: None; Gaucho Grande (G, seed treatment for thrips); Aeris (A, seed treatment for thrips and nematodes); Copeo (seed treatment for nematodes) + G; Velum Total at 14 oz/acre (nematicide and thrips materials applied as a liquid in the furrow at planting); Velum Total at 18 oz; A + Velum Total at 14 oz/acre.

The 7 chemical treatments and 2 varieties were randomized within each block, and there were four replications of each treatment/variety combination. The plots were four rows wide and 36 feet long. The outside two rows were used for sampling and the middle two rows for harvest.

Planting date: 27 May
Roots checked for galls: 8 July
Soil sampling for nematode assays: 25 July
Harvest: 18 November

RESULTS AND DISCUSSION:

The partially tolerant variety ST 4747GLB2 had more galls (12.7) than partially resistant ST 4946GLB2 (9.0). Root-knot nematode reproduction was similar on both varieties (3,338 versus 3,065/500 cm^3 soil for ST 4747GLB2 and ST 4946GLB2, respectively). Lint yield was higher for ST 4946GLB2 (1,502 lbs/acre) than for ST 4747GLB2 (1,357 lbs/acre). There was no beneficial effect of any of the nematicide treatments compared to the non-treated check for galls/root system, nematode reproduction, or yield (Table 1). Both varieties had similar chemical treatment responses so they are averaged across variety in Table 1.

Table 1. Effect of nematicide treatments on galls/root system, root-knot nematode reproduction, and cotton lint yields at AGCARES.

Treatment	Galls/ plant	Root-knot/ 500 cc soil	Lint yield (lbs/acre)
None	11.4	2,878	1,376
Gaucho (G)	12.5	4,478	1,473
Aeris (A)	9.0	1,335	1,416
Copeo + G	12.7	4,894	1,413
Velum Total (14 oz/a)	11.1	3,278	1,446
Velum Total (18 oz/a)	7.2	2,040	1,444
A + Velum Total (14 oz/a)	12.2	1,435	1,435

TITLE:

Demonstrating soil health promoting practices to increase water holding capacity and lint yield in deficit-irrigation agriculture, AG-CARES

AUTHORS:

Katie Lewis – Assistant Professor; Paul DeLaune – Associate Professor; Wayne Keeling – Professor; Dustin Kelley – Research Assistant; and Joseph Burke – Graduate Research Assistant

MATERIALS AND METHODS:

Plot Size:	16 rows by 250 ft, 3 replications	
Design:	Randomized complete block	
Row Spacing:	40”	
Irrigation:	Low Energy Precision Application (LEPA)	
Planting Date:	4 November 2015	(cover crop)
	24 May 2016	(cotton)
	12 December 2016	(cover crop)
Termination:	11 March 2016	(cover crop)
Harvest:	10 March 2016	(cover crop)
	22 November 2016	(cotton)
Variety:	DP 1321 B2RF planted at 53k seed per acre	
Fertility:	120 lbs 32-0-0	
Rainfall:	13”	
Irrigation:	Pre-plant/Emergence:	0.5”
	In-season:	4.6”

This research aims to evaluate the effects of incorporating single and mixed species cover crops into long-term, reduced tillage cotton systems. We are evaluating how soil health promoting practices can improve water use efficiencies under deficit irrigation without compromising crop yields and/or economic returns. 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 cover crop. Mixed cover crops included hairy vetch (Vicia villosa Roth), radish (Raphanus sativus L.), winter pea (Pisum sativum L.), and rye. Cover crops were planted using a no-till drill on 4 November 2015 and were chemically terminated 11 March 2016 using Roundup PowerMAX (32 oz/acre). Prior to termination, cover crops were harvested on 10 March 2016 from a 1 m^2 area to calculate biomass, nitrogen uptake, and C:N ratios. Soil core samples were collected 15 April 2016 to a depth of 60 cm from each

demonstration plot and analyzed for total C and N, organic C, nitrate-N, Mehlich III extractable macronutrients, and sodium, and pH and electrical conductivity. Additional samples were collected at this time to a 15 cm depth and analyzed using the Soil Health Test. After soil sampling, cotton (DP 1321 B2RF) was planted in all plots on 24 May 2016 at a seeding rate 53,000 seed/acre. Cotton was harvested on 22 November 2016. After cotton harvest the no-till plots were drilled with cover on 12 December 2016. Additional soil samples were collected monthly at the 0-15 cm depth beginning in July 2015 and analyzed for total and organic C.

Soil moisture measurements were collected via neutron attenuation with access tubes installed within each plot to a depth of 1.5 m. Readings were taken at 20 cm increments and every two weeks throughout the year unless rainfall inhibited our ability to get into the field.

RESULTS AND DISCUSSION:

Soil Characteristics

Soil organic C (SOC) was greatest in reduced tillage plots at the 0-15 cm depth followed by the conventional tillage plots prior to planting cotton (DP 1321) in May 2016 (Fig. 1). Compared to conventional plots, SOC increased from 0.21% OC to 0.42% OC and 0.36% OC under reduced tillage-mixed cover and reduced tillage-rye cover, respectively (Figure 1). There were no differences between SOC levels at the 15-60 cm depth between treatments (Figure 1). SOC level was nearly 2.5 times in July 2016 compared to April 2016; however, there were no significant differences in treatments from July to September (Fig. 2). Increases in SOC likely resulted from cotton rhizodeposition during the growing season. These rhizodeposits are rapidly mineralized by soil microbes and can enhance the decomposition rates of organic matter (Cheng et al. 2003).

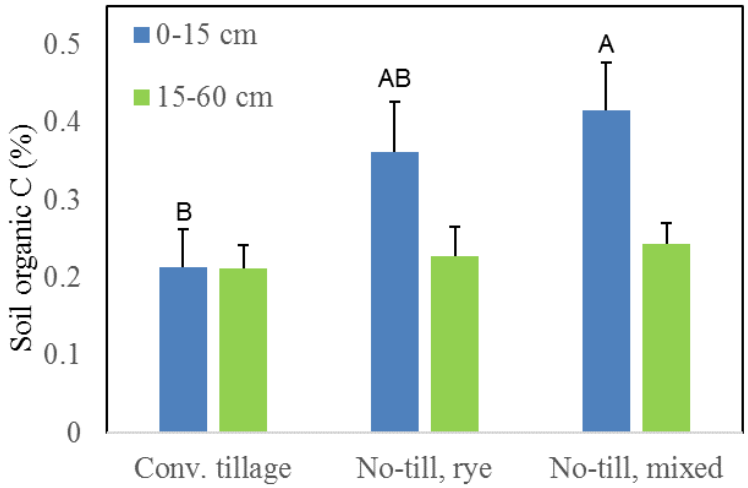

Figure 1. Soil organic C levels under conventional; reduced tillage, rye cover (NT, Rye), and reduced tillage, mixed cover (NT, Mixed) management practices at Lamesa, TX. Bars represent standard deviation of the sample mean. Mean values followed by the same letter within application method and irrigation level are not significantly different at $P < 0.05$.

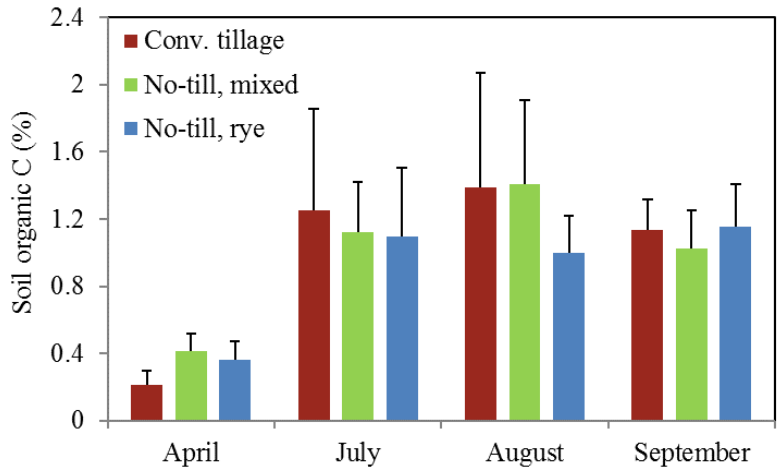

Figure 2. Temporal soil organic C levels at 0-6 inch depth under conventional tillage; reduced tillage, rye cover (NT, Rye); reduced tillage, mixed cover (NT, Mixed) management practices at Lamesa, TX. Bars represent standard deviation of the sample mean.

At a depth of 0-15 cm, conductivity was greater in reduced tillage plots compared to conventional plots; however, the trend is reversed at 12-24 inch depth (Table 1). Nitrate-N, phosphorus (P), and potassium (K) concentrations were greater under reduced tillage plots compared to conventional tillage at the 0-6 inch depths. Nitrate-N, P and K concentrations decreased with depth in all treatments. Soil pH, magnesium, sodium, and calcium concentrations increased with depth. Sodium concentrations were greater at both depths in conventional tillage plots.

Table 1. Soil pH and electrical conductivity (EC) and extractable nutrient and sodium concentrations under conventional tillage (winter fallow), no-tillage with rye cover, and no-tillage with mixed cover at depths of 0-6 inch and 6-12 inch. Samples were collected prior to planting cotton in 2016.

Management	Depth	pH	EC	TN	Nitrate-N	P	K	Ca	Mg	S	Na
Practice	inch	----	µmhos/cm	mg/kg							
Winter Fallow	0-6	7.6	154	338	2.54	35	257	591	636	10	47
(conv. tillage)	6-24	7.9	203	493	1.11	10	232	1149	848	14	96
Rye Cover	0-6	7.2	192	638	4.55	39	334	688	688	13	47
(no-tillage)	6-24	7.6	188	478	0.41	13	276	765	859	17	68
Mixed Cover	0-6	7.0	204	634	6.27	61	353	713	671	20	40
(no-tillage)	6-24	7.7	160	428	0.35	18	289	728	814	10	45

Herbage Mass

Herbage mass was not significantly different between reduce tillage-rye cover and reduced tillage-mixed cover although the rye cover generally produced more herbage mass than the mixed cover (Fig. 3). Cover crops harvested in 2016 were seeded nearly a month earlier, which provided adequate time for crop establishment prior to colder temperatures and greater biomass production compared to cover harvested in 2015.

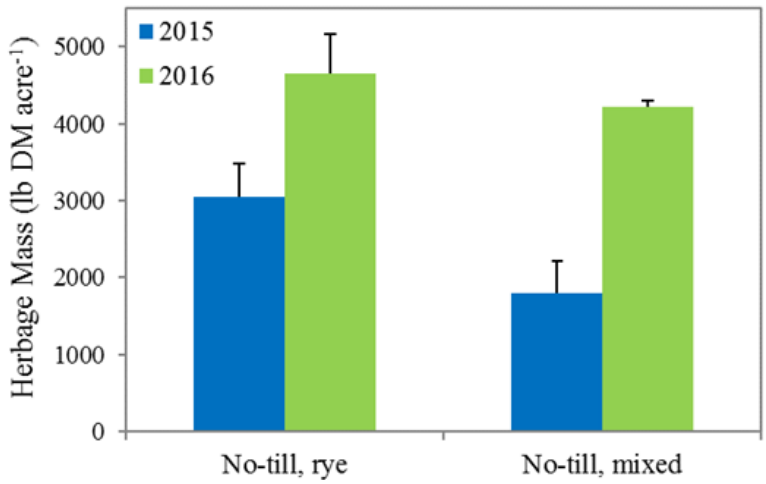

Figure 3. Herbage biomass harvested on 10 March 2016 from reduced tillage-rye cover and reduced tillage-mixed cover management practices at Lamesa, TX. Bars represent standard deviation of the sample mean.

Soil Moisture

Stored soil moisture was greatest in the conventional tillage plots (CT) prior to cover crop termination in 2015 and 2016 (Fig. 4). During the cropping season, soil moisture was greatest in the no-tillage plots (NT-Mixed and NT-Rye) where increased residues enabled greater stored soil moisture. Throughout the cotton growing season difference in moisture is small between practices until rainfall events in September. At this point stored soil water increased in no-tillage plots likely due to greater infiltration and water storage and capture. Organic matter and reduced tillage can improve soil structure increasing infiltration and percolation, while decreasing evapotranspiration from the soil surface. Reduced tillage plots were better able to respond to precipitation events through increased infiltration and moisture storage.

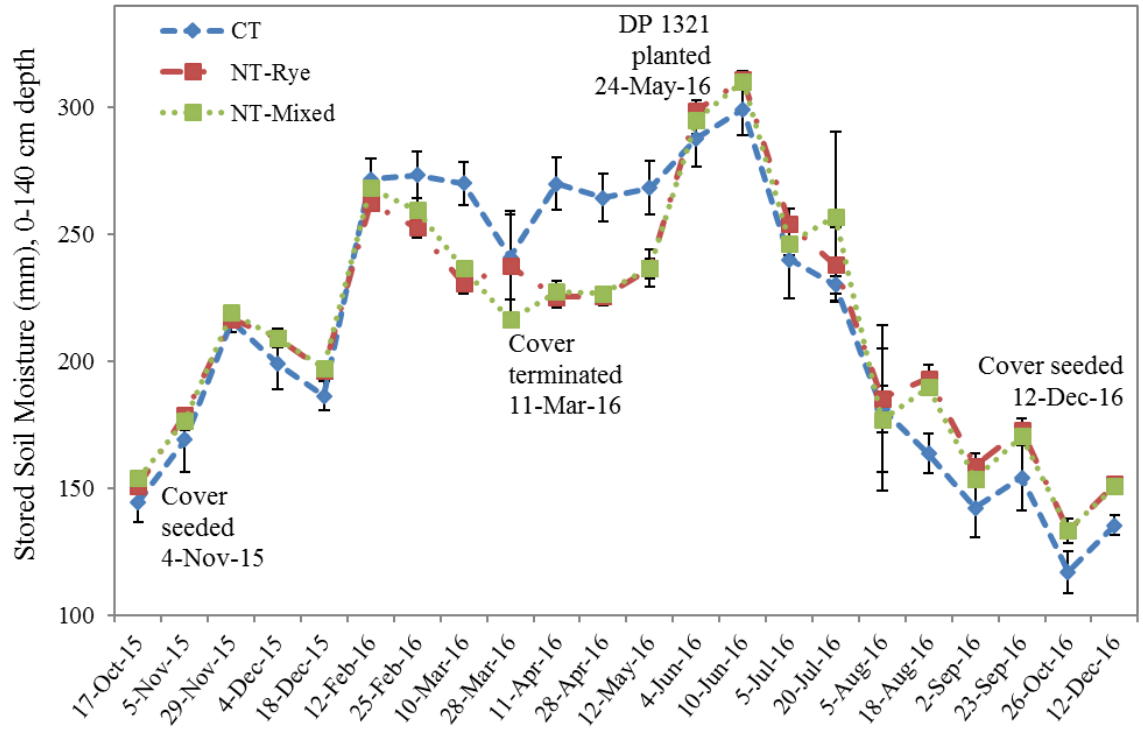

Figure 4. Stored soil moisture measured from October 2015 to December 2016 to a depth of 140 cm under conventional tillage (CT), reduced tillage-mixed cover (NT-Mixed), and reduced tillage-rye cover (NT-Rye) in Lamesa, TX. Bars represent standard deviation of the sample mean.

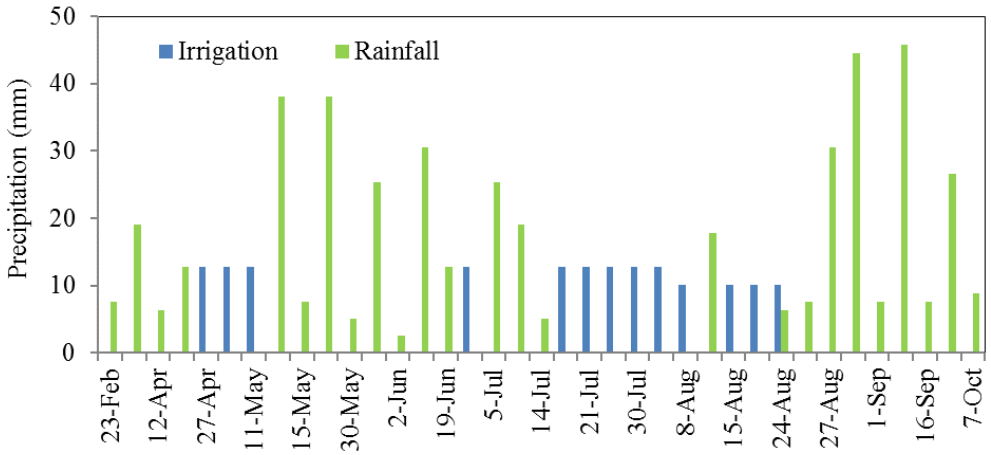

Figure 5. Precipitation events, either by irrigation or rainfall, from February to October 2016 in Lamesa, TX.

Lint Yield

Lint yields were generally greatest in the conventional tillage plots (Conv) followed by reduced tillage-mixed cover (Mixed NT) and reduced tillage-rye cover (Rye NT) in 2016 (Fig. 5). Lint yields were not different in Conv and Mixed NT in 2015 and 2016 but significantly reduced when cotton was planted in terminated rye cover (Rye NT) in 2016.

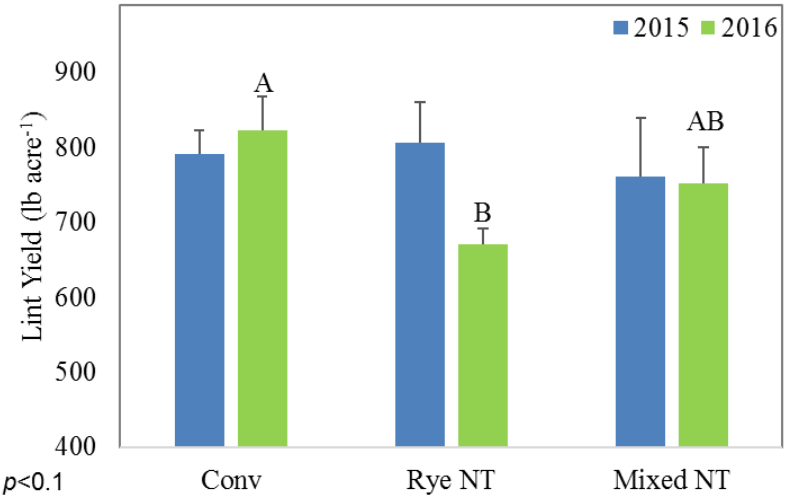

Figure 5. Lint yield from conventional tillage, (Conv), reduced tillage-rye cover (Rye NT), and reduced tillage-mixed cover (Mixed NT) in Lamesa, TX for 2015 and 2016. Bars represent standard deviation of the sample mean. Mean values followed by the same letter within application method and irrigation level are not significantly different at $P < 0.1$.

By implementing reduced tillage and cover crops, OC has increased from 0.2% to 0.4%. This increase has been a slow process taking nearly 18 years. While the benefits of conservation practices to soil have been observed, cotton lint yield has not been consistent from one year to the next. While cover crops do reduce stored soil water, timely rainfall has reduced water deficits at planting. Nitrogen and P immobilization may be reason for reduced lint yield for cotton planted into rye but not the mixed cover. Not only is timely termination important for soil water dynamics but also nutrient availability. Increasing the length of time between cover crop termination and planting cotton should have a positive effect on cotton growth and development.

REFERENCES

Cheng, W., Johnson, D.W. and Fu, S. (2003) Rhizosphere effects on decomposition: controls of plants species, phenology, and fertilization. Soil Science Society of America Journal 67: 1418-1427.

TITLE:

Evaluation of cotton yield, quality, and plant growth response to aoil-applied potassium, at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

Katie Lewis – Assistant Professor; Gaylon Morgan – Cotton Extension Specialist; and, Dustin Kelley – Research Assistant

MATERIALS AND METHODS:

Plot Size:	4 rows by 40 ft., 4 replications
Design:	Randomized complete block within irrigation zone
Row Spacing:	40”
Irrigation:	Subsurface drip
Planting Date:	24 May 2016
Harvest:	18 November 2016
Variety:	DP 1522 32XF planted at 53k seed/acre
Rainfall:	12.95” in season
Irrigation:	4.7” Pre plant 6.7” High in season 4.5” Low in season
Non trial fertility:	40 lbs. N pre 120 lbs. N post

This study aimed to re-evaluate soil potassium recommendations for optimized cotton yields throughout the cotton producing states. The sub-surface drip field at AG-CARES was one of 13 locations to carry out this study with Cotton Incorporated. The research was aimed at quantifying soil potassium (K) levels throughout the cotton belt and then to evaluate the impact of application method and rates of K fertilizer on cotton yield, quality, and return on investment. This is the second year of this research at AG-CARES.

Soil cores were collected by plot to determine soil K levels before fertilizer application on 15 April 2016. Potassium was applied to the study in two forms with two different application methods at five different rates. All K fertilizer was applied pre-plant on 2 May 2016. Fertilizer rates of 0, 40, 80, 120, and 160 lb/acre of K were applied using broadcast and knife injection methods. Liquid fertilizer in the form of 0-0-15 was applied with a four row sidedress applicator with four injection knives, one per row, mounted behind coulters. The knives were set 4” off the top center of the bed and placed to run 6” beneath the surface. The second form of K fertilizer was granular muriate of potash (MOP, 0-0-60). MOP was weighed out individually for each plot and then broadcast applied by hand. After fertilizer application, a rolling cultivator was used to

incorporate the granular fertilizer and close any trenches left open by injection knives. Cotton (DP 1522 B2XF) was planted 24 May 2016. The entire trial received 40 lb/acre N as urea ammonium nitrate (UAN, 32-0-0) pre-plant through the subsurface drip system and 120 lb/acre N was applied in season.

Treatments were replicated four times under high and low irrigation levels. Data collected included soil macronutrient concentrations, in-season plant measurements (stand counts, boll counts, and vigor ratings), K content of leaf tissue, and lint yield and quality. Plots were harvested 18 November 2016 with a IH 1400 deck stripper. Lint samples were collected and shipped to Cotton Incorporated for HVI analysis. Leaf tissue mineral concentrations and HVI data had not been received at time of publication.

RESULTS AND DISCUSSION:

Soil Nutrient Characterization

Soil at the AG-CARES farm is classified as an Amarillo fine sandy loam. Regardless of soil depth, K concentrations are above the critical range of K (150 mg/kg) and considered sufficient for cotton production. Potassium concentrations decrease with increasing depth. Soil pH averaged 6.87 across depths. Calcium, Mg, S, and Na concentrations increase with soil depth while both P and K decrease with depth.

Table 1. Soil pH and electrical conductivity (EC) and extractable nutrient and sodium concentrations at depths of 0-6, 6-12, and 12-24 inches.

Soil Depth	pH	EC	P	K	Ca	Mg	S	Na
		µmhos/cm			mg/kg			
0-6"	6.75	132	29	287	959	250	3	2
6-12"	6.84	153	25	270	1091	278	6	6
12-24"	7.01	164	8	240	1618	365	13	15

Cotton Lint Yield and Quality

Yield differences were not determined between treatments for either high (*P*=0.38) or low (*P*=0.14) irrigation. Under high irrigation there was a general trend of increasing lint yield in both the knife injected as well as the broadcast applications from 0 to 80 lb K/acre (Fig. 1). An application rate of 80 lb/acre K resulted in lint yields of 1902 lb/acre and 1813 lb/acre for broadcast and knife-injected K, respectively (Figure 1). Similar trends were observed last year in the study. In the low irrigation level, the check (0 lb K/acre) produced 1646 lb/acre lint while the 160 lb/acre K broadcast treatment produced 1543 lb/acre lint. Knife injected K at a rate of 160 lb/acre under low irrigation, generally resulted in greater lint yield (1800 lb/acre) than other treatments (1554 lb/acre average) and the check (1587 lb/acre lint). A large rain event that included significant hail early in the growing season (July 5, 2016) may have affected the results of this study.

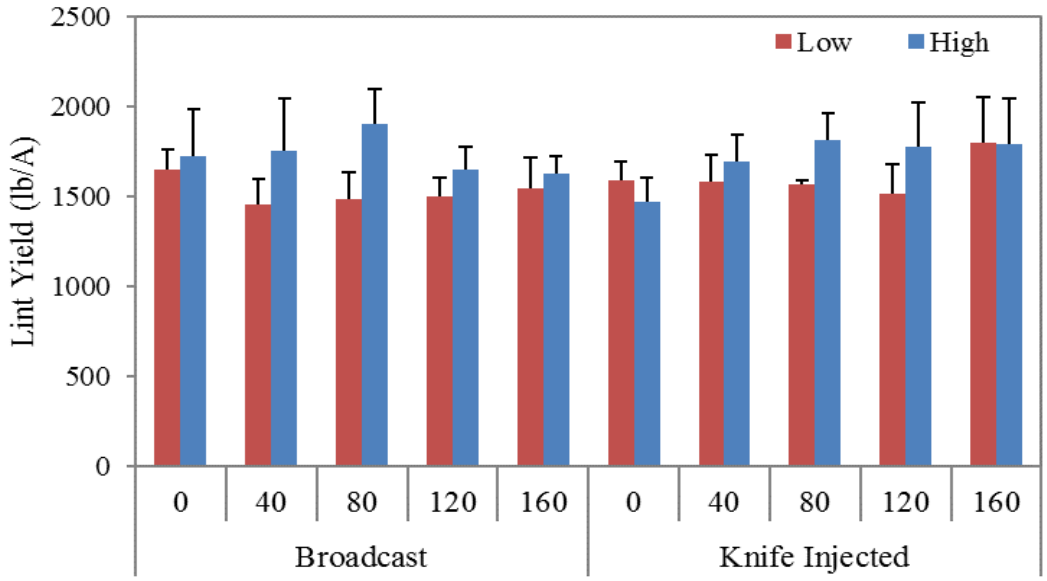

Figure 1. Lint yield in pounds per acre under high and low irrigation.

TITLE:

Small plot evaluation of cotton varieties and breeding lines with varying levels of resistance to root-knot nematodes under varying irrigation levels at AG-CARES, Lamesa, TX, 2016.

AUTHORS:

Jason Woodward, Extension Plant Pathologist, Richard Roper, Graduate Research Assistant, Ira Yates, Bobby Rodriguez and Debra Dobitz, Technicians

MATERIALS AND METHODS:

Plot size: 2-rows by 35 feet, four replications

Soil type: Amarillo fine sandy loam

Planting date: 23-May

Varieties: DP EXP1, DP EXP2, DP 1558 NR B2RF,
FM 1911 GLT, FM 2011 GT, FM EXP1,
FM EXP2, NG 1511 B2RF, PHY 417 WRF,
PHY 427 WRF, PHY 499 WRF and ST 4946GLB2

Herbicides: Prowl 3 pt/A – April 28
Roundup PowerMax 1qt/A – June 17
Roundup PowerMax 1qt/A + Warrant 3 pt/A – July 27

Fertilizer: 130-34-0

Irrigation in-season:

	Low	Base	High
Preplant	2.0”	2.0”	2.0”
In Season	3.1”	4.6”	6.2”
Total	5.1”	6.6”	8.2”

Harvest Date: 23-November

RESULTS AND DISCUSSION:

Differences in lint yield and revenue were observed between varieties for all three irrigation levels (Table 1). Yields were greatest for ST 4949GLB2 (1,394 lb ac^{-1}) and lowest for FM EXP1 (848 lb ac^{-1}) when averaged across all three irrigation levels. The use of nematode resistant varieties such as, DP 1558 NR B2RF, DP EXP 1, DP EXP 2, FM 2011 GT, FM 1911 GLT, PHY 417 WRF, PHY 427 WRF and ST 4946 GLB2 reduced root-knot reproduction compared to the susceptible varieties, PHY 499 WRF, NG 1511 B2RF, FM EXP 1 and FM EXP 2 (data not shown). Likewise, irrigation level had a pronounced effect on the level of nematode reproduction, where nematode populations increased with increased irrigation. Despite this relationship, nematode damage was more severe under drought conditions. Additional studies are needed to better understand the performance of these and other varieties in fields with a history of root-knot nematodes.

Table 1. Effect of variety and irrigation level on lint yield and revenue under moderate nematode pressure at AG-CARES, 2016

Variety	Low (5.1")		Base (6.6")		High (8.2")		Variety mean
	- (lb ac^{-1}) -						
ST 4946	1,151	a	1,453	a	1,579	a	**1,394**
FM 2011	1,079	ab	1,332	b	1,567	a	**1,326**
NG 1511	971	bcde	1,358	ab	1,384	abc	**1,238**
FM 1911	900	cdef	1,257	b	1,448	ab	**1,202**
DP EXP 2	1,019	abcd	1,297	b	1,243	bcd	**1,186**
DP 1558	1,038	abc	1,277	b	1,239	cd	**1,185**
DP EXP 1	1,033	abcd	1,116	c	1,179	cd	**1,109**
PHY 417	870	def	1,084	cd	1,207	cd	**1,054**
PHY 427	910	cde	1,126	c	1,098	d	**1,045**
PHY 499	905	cde	1,050	cde	1,086	d	**1,014**
FM EXP 2	740	f	991	de	1,108	d	**946**
FM EXP 1	809	ef	693	e	1,042	d	**848**
Trial mean	**934**		**1144**		**1236**		**--**
$LSD_{(0.05)}$	**163**		**114**		**206**		**--**
	- ($ ac^{-1}) -						
ST 4946	627	a	791	a	839	a	**752**
FM 2011	544	abc	693	b	815	a	**684**
DP EXP 2	540	abc	673	cb	651	bc	**621**
DP 1558	562	ab	667	bc	635	cd	**621**
NG 1511	429	cd	702	b	670	bc	**600**
DP EXP 1	552	ab	609	cde	621	cd	**594**
FM 1911	389	d	638	bcd	754	ab	**594**
PHY 427	489	bcd	585	de	569	cd	**548**
PHY 417	445	bcd	575	def	588	cd	**536**
PHY 499	454	bcd	548	efg	554	cd	**519**
FM EXP 1	433	cd	502	g	536	d	**490**
FM EXP 2	204	e	517	fg	577	cd	**433**
Trial mean	**472**		**625**		**651**		**--**
$LSD_{(0.05)}$	**116**		**65**		**110**		**--**

TITLE:

Cotton yield response to cotton fleahopper acute infestations as influenced by irrigation level treatments, Lamesa, TX, 2016.

AUTHORS:

Megha Parajulee – Professor, Faculty Fellow, and Regents Fellow
Abdul Hakeem – Postdoctoral Research Associate
Sean Coyle – Technician
Stanley Carroll – Research Scientist
Wayne Keeling - Professor

MATERIALS AND METHODS:

Plot Size:	4 rows by 300 feet, 3 replications
Planting date:	May 24, 2016
Fertilizer:	10-34-0
Treatments:	
Cultivar:	FM 2011 GT
Irrigation:	*Low*: Pre-plant = 3.5 inches; In-season = 3.1 inches *High*: Pre-plant = 3.5 inches; In-season = 6.2 inches
Cotton fleahopper:	Three insect release treatments [*Control* (zero cotton fleahoppers), *Low fleahopper density* (2 bugs per plant), *High fleahopper density* (5 bugs per plant),
Herbicides:	2,4-D 1 qt/A – March 14 Roundup PowerMax 1 qt/A – March 14 Prowl 3 pt/A – April 27 Roundup PowerMax 1 qt/A – June 22 Roundup PowerMax 1qt/A – July 28 Warrant 3 pt/A – July 28
Insect release date:	July 9, 2016 at fleahopper susceptible stage
Plant mapping date:	August 3, 2016 (in-season); October 25, 2016 (pre-harvest)
Harvest date:	October 25, 2016 (hand-harvested)

Cotton fleahopper feeding injury and resulting cotton lint yield were evaluated on cotton variety FM 2011 GT, as affected by irrigation level and infestation densities. Two seasonal irrigation levels, *High* (9.7 inches) and *Low* (6.6 inches) were evaluated under a center pivot irrigation system. Laboratory-reared and/or field collected cotton fleahopper adults were released onto cotton terminals in 3-ft. (L) x 2-ft. (W) x 3 ft. (H) multi-plant cages (Fig. 1). Each cage

contained seven plants. Experimental design consisted of three insect release treatments (*high*, *low*, and *control*) and two water levels (*high* versus *low*), replicated three times and deployed in a randomized complete block design (total 18 plots). Insect release treatments, 1) *control* (zero fleahopper augmentation), 2) two bugs per plant (*low* density), and 3) five bugs per plant (*high* density), were deployed on July 9, 2016 (Fig. 1), and then allowed to feed for one week in order to mimic a natural early-season acute infestation. No natural infestation of cotton fleahoppers were observed at the experimental farm, therefore, insecticides were not applied on the control plots. A single release of cotton fleahoppers was timed to simulate an acute infestation of cotton fleahoppers while cotton was highly vulnerable to fleahopper injury, which was approximately the second week of cotton squaring. Plant mapping was conducted before and after cotton fleahopper releases to monitor for altered fruiting patterns. Yield monitoring was achieved via hand-harvesting of each experimental plot on October 25. 2016.

Figure 1. Examination of cotton squares (left), and multi-plant cages (right) deployed in the field to release cotton fleahopper densities to examine damage potential on cotton yield, Lamesa, TX.

RESULTS AND DISCUSSION:

Percentage square loss tended to be higher on cotton fleahopper infested plots compared to that in control plots under the *high* irrigation level (Fig. 2). Fleahopper crop damage, as measured by cotton square loss, did not significantly vary between the two water levels. Artificial augmentation of cotton fleahoppers caused 36.13% and 37.98% square loss following *low* and *high* levels of infestations, respectively and such pre-flower cotton square loss is considered a moderate level of insect-induced early fruit loss for Texas High Plains cotton.

A significantly higher lint yield was recorded from *control* plots compared to that from *high* fleahopper density plots. In *low* irrigation plots, a significantly higher lint yield was recorded from *control* plots than both *low* and *high* fleahopper densities; however, significantly higher lint yield was recorded from *low* fleahopper densities compared to *high* fleahopper densities in *high* irrigation plots (Fig. 3). These data suggest that the deficit-irrigated cotton is more sensitive to fleahopper-induced square losses than the crop that receives sufficient irrigation even at low cotton fleahopper densities. At high cotton fleahopper densities, cotton fleahopper-induced square loss resulted in significantly lower lint yield regardless of the irrigation water level.

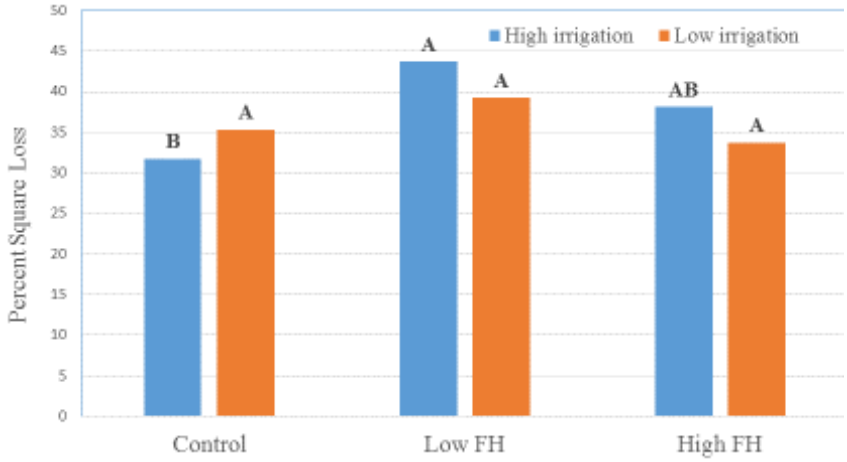

Figure 2. Average percentage square loss following a simulated acute infestation of cotton fleahoppers, achieved by augmenting 2 (low) and 5 (high) bugs per plant during the second week of squaring, under low and high irrigation regimes on cotton, Lamesa, Texas, 2016.

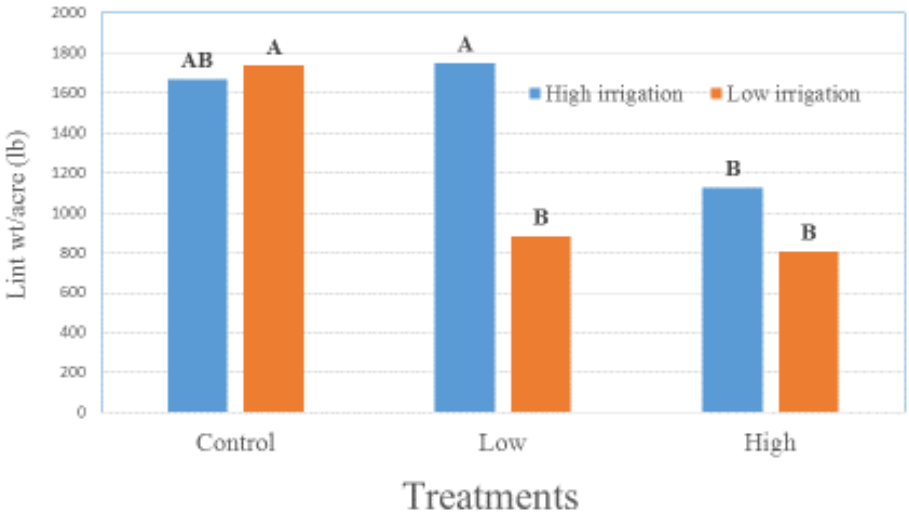

Figure 3. Average lint yield following a simulated acute infestation of cotton fleahoppers under high and low irrigation regimes, Lamesa, Texas, 2016.

Lamesa Rainfall 2016

January	
23	0.30
total	0.30
YTD	2.80

Feburary	
total	0.00
YTD	2.80

March	
21	0.40
total	0.40
YTD	3.20

April	
9	0.75
12	0.25
20	0.5
total	0.50
YTD	3.70

May	
13	1.50
15	0.30
19	1.50
30	0.20
31	1.00
total	4.50
YTD	8.20

June	
2	0.10
11	1.20
19	0.50
total	1.80
YTD	10.00

July	
1	1.00
5	0.75
8	0.20
total	1.95
YTD	11.95

August	
11	0.70
24	0.25
25	0.30
27	1.20
31	1.75
total	4.20
YTD	16.15

September	
1	0.30
7	0.25
10	0.50
16	1.00
17	0.50
25	1.00
total	3.55
YTD	19.70

October	
8	0.3
total	0.30
YTD	20.00

November	
2	1.3
4	1
6	0.7
total	3.00
YTD	23.00

December	
total	0.00
YTD	23.00