2015 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 16-2

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

The Lamesa Press Reporter headline story on September 13, 2015 was “Providing 25 Years of Research” “Local AG-CARES Facility has Impacted Agriculture Worldwide”. September 12, 2015 marked the 25th anniversary of AG-CARES and the continuing partnership between Lamesa Cotton Growers and Texas A&M AgriLife Research and Extension.

It was fitting that our cropping systems group from the Lubbock Center received the 2015 Texas A&M AgriLife vice Chancellor’s Award in Excellence for Team Collaboration. Members of the team included Wayne Keeling, Jane Dever, Terry Wheeler, Megha Parajulee, Jim Bordovsky and Jason Woodward. The continued support from Lamesa Cotton Growers provided this team with the opportunity to design, conduct, and deliver research results at AG-CARES. The impacts of their research on producers bottom line was a major justification for the award.

We appreciate this past 25 years of cooperation and the current leadership provided by the officers of Lamesa Cotton Growers:

Johnny R. Todd, President
David Zant, Vice-President
Kirk Tidwell, Secretary

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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Participating Staff
Texas A&M AgriLife Research
Texas A&M AgriLife Extension

Jaroy Moore	Agriculture Administration
Wayne Keeling	Cropping Systems Agronomy/Weed Science
Jim Bordovsky	Irrigation
Danny Carmichael	Farm Manager
Stan Carroll	Cotton Entomology
Paul DeLaune	Environmental Soil Science
Jane Dever	Plant Breeding/Cotton
Tommy Doederlein	Entomology (IPM)
Abdul Hakeem	Cotton Entomology
Dustin Kelley	Soil Fertility and Chemistry
Carol Kelly	Plant Breeding/Cotton
Katie Lewis	Soil Fertility and Chemistry
Victor Mendoza	Plant Breeding/Cotton
Valerie Morgan	Plant Breeding/Cotton
Megha Parajulee	Cotton Entomology
Gary Roschetzky	CEA—Agriculture
Nick Ryan	Plant Pathology
Jackie Smith	Agricultural Economics
Justin Spradley	Cropping Systems Agronomy/Weed Science
Calvin Trostle	Agronomy
Joel Webb	Cropping Systems Agronomy/Weed Science
Terry Wheeler	Plant Pathology
Jason Woodward	Plant Pathology
Martha Zwonitzer	Cropping Systems Agronomy/Weed Science

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2015

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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/FiberMax
Cotton, Inc. – State Support Program
Dawson County Commissioners Court
DuPont Crop Protection
FMC Coorporation
Monsanto/Delta & Pine Land Seed Co.
PhytoGen Cotton Seed
Sam Stevens, Inc.
Syngenta Crop Protection

TITLE:

Cotton variety performance (continuous cotton) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley, Joel Webb, Martha Zwonitzer – Research Associates

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications
Planting Date:	May 16
Varieties:	PhytoGen 417 WRF Deltapine 1454NR B2RF FiberMax 2011 GT Stoneville 4946 GLB2
Herbicides:	2,4-D 1 qt/A – March 23 Roundup PowerMax 1 qt/A – April 6 Prowl 3 pt/A – April 22 Roundup PowerMax 1 qt/A – June 18 Roundup PowerMax 1qt/A – July 13
Fertilizer:	120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	1.8”	1.8”	1.8”
In Season	3.3”	4.9”	6.5”
Total	5.1”	6.7”	8.3”

Harvest Date: October 28

RESULTS AND DISCUSSION:

Four cultivars were planted into terminated rye cover under three irrigation levels in 2015 in a continuous wedge. When averaged across irrigation levels, cotton lint yields ranged from 583 to 721 lbs/A, with highest yields produced with ST 4946 GLB2. When averaged across varieties, lint yields ranged from 561 to 738 lbs/A with increasing irrigation levels. Lint quality, as measured by loan value increased with increased irrigation. Gross revenue ($/A) were highest with the highest irrigation level. Cotton lint yields, loan values, and gross revenues per acre are summarized in Table 1.

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

	Irrigation Levels			
Cultivar	**Low (3.3)**	**Base (4.9)**	**High (6.5)**	**Average**
	---------- lbs/A----------			
DP 1454NR B2RF	503	623	694	**606 BC**
FM 2011 GT	523	569	657	**583 C**
PHY 417 WRF	576	627	762	**655 B**
ST4946 GLB2	642	679	841	**721 A**
Average	**561 B**	**624 B**	**738 A**	**--**
	----------cents/lb----------			
DP 1454NR B2RF	49.20	48.67	50.97	**49.61 A**
FM 2011 GT	47.38	46.30	49.48	**47.72 B**
PHY 417 WRF	47.20	48.20	51.00	**48.80 AB**
ST4946 GLB2	48.10	49.27	48.18	**48.52 AB**
Average	**47.94 B**	**48.11 AB**	**49.91 A**	**--**
	----------$/A----------			
DP 1454NR B2RF	248	303	353	**301 B**
FM 2011 GT	272	263	325	**287 B**
PHY 417 WRF	272	302	388	**321 B**
ST4946 GLB2	333	334	406	**357 A**
Average	**281 B**	**300 B**	**368 A**	**--**

TITLE:

Cotton variety performance (wheat-cotton rotation) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Justin Spradley, Joel Webb, Martha Zwonitzer – Research Associates

MATERIALS AND METHODS:

Plot Size:	4 rows by 300-700 feet, 3 replications
Planting Date:	May 16
Varieties:	PhytoGen 417 WRF Deltapine 1454NR B2RF FiberMax 2011 GT Stoneville 4946 GLB2
Herbicides:	Roundup PowerMax 1qt/A – January 28 Roundup PowerMax 1 qt/A + 2,4-D 1 qt/A – April 9 Prowl 3 pt/A – April 21 Roundup PowerMax 1 qt/A – June 11 Roundup PowerMax 1 qt/A + Dual Magnum 1 pt/A – July 13
Fertilizer:	120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	0.8”	0.8”	0.8”
In Season	3.6”	5.3”	7.1”
Total	4.4”	6.1”	7.9”

Harvest Date: October 29

RESULTS AND DISCUSSION:

Four commercial varieties under three irrigation levels were planted in wheat stubble that was maintained with no-tillage following harvest in June 2014. Yields for the four varieties ranged from 812 to 1,030 lbs lint/A as irrigation level increased. When averaged across irrigation levels, yields ranged from 772 to 984 lbs lint/A, with highest yields produced with ST4946 GLB2. Loan values declined as irrigation level increased, and DP 1454NR B2RF, FM 2011 GT, and PHY 417 WRF produced higher loan values compared to ST 4946 GLB2. Gross revenues were highest at the highest irrigation level, and were similar for three of the four varieties. Cotton lint yields, loan values, and gross revenues per acre are summarized in Table 1.

Higher yields were produced across irrigation levels in the wheat-cotton rotation compared to continuous cotton with a terminated rye cover. Yield increases with the wheat-cotton rotation ranged from 26-44% across the three irrigation levels (Table 2). Loan values were similar between the two systems, but gross revenue was higher with the rotation due to higher yields.

Benefits of the wheat-cotton rotation include increased soil-moisture storage during the

fallow period and reduced nematode damage to cotton. Root-knot nematode galls/plant ranged from 1-1.5 in continuous cotton but were near zero in the rotation (Figure 1).

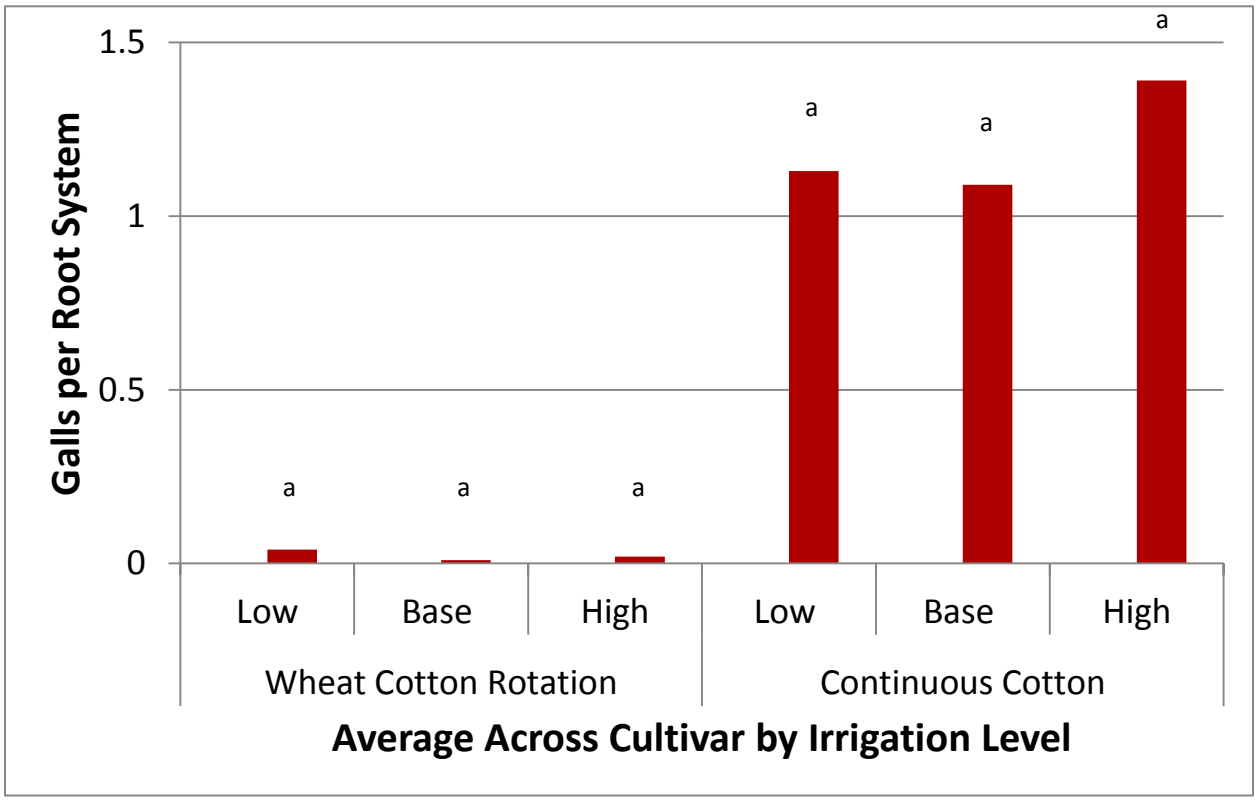
Table 1. Effect of cultivar and irrigation level on cotton lint yield (lbs/A), loan value (cents/lb), and revenue ($/A) under wheat-cotton rotation.

	Irrigation Levels			
Cultivar	**Low (3.6)**	**Base (5.3)**	**High (7.1)**	**Average**
	---------- lbs/A----------			
DP 1454NR B2RF	792	726	1072	**863 B**
FM 2011 GT	812	815	1035	**887 B**
PHY 417 WRF	707	698	912	**772 C**
ST4946 GLB2	938	913	1102	**984 A**
Average	**812 B**	**788 B**	**1030 A**	**--**
	----------cents/lb----------			
DP 1454NR B2RF	51.73	50.68	47.93	**50.12 A**
FM 2011 GT	51.82	47.40	48.53	**49.25 A**
PHY 417 WRF	48.13	50.90	50.92	**49.98 A**
ST4946 GLB2	48.98	48.65	46.23	**47.96 B**
Average	**50.17 A**	**49.41 A**	**48.40 B**	**--**
	----------$/A----------			
DP 1454NR B2RF	409	367	517	**431 A**
FM 2011 GT	421	386	502	**436 A**
PHY 417 WRF	341	355	465	**387 B**
ST4946 GLB2	458	444	509	**470 A**
Average	**407 B**	**388 B**	**498 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 (3.6)**	**Base (5.3)**	**High (7.1)**
	---------- lbs/A----------		
Continuous Cotton (Wheat)	561	624	738
Wheat – Cotton Rotation	812	788	1030
Change (%) with Rotation	**+44**	**+26**	**+39**
	----------cents/lb----------		
Continuous Cotton (Wheat)	47.94	48.11	49.91
Wheat – Cotton Rotation	50.17	49.41	48.40
Change (%) with Rotation	**+4**	**+3**	**+3**
	----------$/A----------		
Continuous Cotton (Wheat)	281	300	368
Wheat – Cotton Rotation	407	388	498
Change (%) with Rotation	**+45**	**+29**	**+35**

Figure 1. Effect of rotation on root-knot nematode galls in cotton in 2015.



TITLE:

Performance of PhytoGen cotton varieties as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Joel Webb, Justin Spradley, Martha Zwonitzer – Research Associates

MATERIALS AND METHODS:

Plot Size: 4 rows by 30 feet, 4 replications

Planting Date: May 11

Varieties:

PHY 222 WRF	PHY 308 WRF (PX 2048-04)
PHY 312 WRF	PHY 243 WRF (PX 2037-18)
PHY 333 WRF	PHY 223 WRF (PX 2045-11)
PHY 339 WRF	PX 3003-04 WRF
PHY 417 WRF	FM 2484 B2F
PHY 444 WRF	FM 2011 GT

Herbicides:
Roundup PowerMax – 1qt/A – April 6
Prowl – 3 pt/A – April 23
Roundup PowerMax – 1qt/A – June 11
Roundup PowerMax – 1 qt/A – August 5

Fertilizer: 120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	1.8”	1.8”	1.8”
In Season	3.5”	5.3”	7.1”
Total	5.3”	7.1”	8.9”

Harvest Date: October 27

RESULTS AND DISCUSSION:

Six PhytoGen commercial varieties, four experimentals, and two other commercial varieties were compared under dryland conditions and three levels of irrigation under LEPA irrigation in 2015. In-season irrigation totals were 3.5”, 5.3”, and 7.1” for the low, base, and high levels, respectively. When averaged across varieties, yields ranged from 492 lbs/A for dryland up to 915 lbs/A with the highest irrigation level, with differences between varieties (Table 1). When averaged across dryland and irrigation levels, yields ranged from 654 to 824 lbs lint/A. Loan values varied between varieties and was highest for dryland due to better leaf grades. Total revenue ($/A) was higher for irrigated cotton compared to dryland, but was similar for base and high irrigation levels. Cotton lint yield, loan value, and total revenue ($/A) are summarized in Table 1.

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

Cultivar	Irrigation Levels: Dry (0.0)	Low (3.5)	Base (5.3)	High (7.1)	Average
	---------- lbs/A----------				
PHY 222 WRF	517	648	816	806	**697 CDE**
PHY 312 WRF	543	696	905	866	**752 ABC**
PHY 333 WRF	529	708	1067	991	**824 A**
PHY 339 WRF	462	657	975	966	**765 ABC**
PHY 417 WRF	451	702	980	846	**744 BCD**
PHY 444 WRF	582	726	900	820	**757 ABC**
PHY 308 WRF (PX 2048-04)	512	625	910	1092	**785 AB**
PHY 243 WRF (PX 2037-18)	459	774	864	925	**757 ABC**
PHY 223 WRF (PX 2045-11)	486	634	782	802	**673 DE**
PX 3003-04 WRF	449	726	908	966	**762 ABC**
FM 2484 B2F	458	597	800	762	**654 E**
FM 2011 GT	459	709	978	1143	**822 A**
Average	**492 C**	**683 B**	**907 A**	**915 A**	
	----------cents/lb----------				
PHY 222 WRF	53.16	50.11	50.56	50.26	**51.02 CDE**
PHY 312 WRF	57.19	50.71	50.18	49.68	**51.94 BCD**
PHY 333 WRF	55.2	50.36	46.70	50.29	**50.64 DE**
PHY 339 WRF	55.08	52.78	52.61	54.63	**53.77 A**
PHY 417 WRF	51.93	49.24	50.08	51.23	**50.62 E**
PHY 444 WRF	56.86	51.86	53.00	53.66	**53.85 A**
PHY 308 WRF (PX 2048-04)	53.04	47.65	45.41	45.64	**47.93 F**
PHY 243 WRF (PX 2037-18)	54.66	49.36	48.21	49.39	**50.41 E**
PHY 223 WRF (PX 2045-11)	55.3	52.34	49.40	51.09	**52.03 BC**
PX 3003-04 WRF	51.39	50.84	52.44	54.45	**52.28 BC**
FM 2484 B2F	55.73	52.78	53.30	54.21	**54.00 A**
FM 2011 GT	53.84	51.97	51.31	52.29	**52.35 B**
Average	**54.45 A**	**50.83 BC**	**50.27 C**	**51.40 B**	
	----------$/A----------				
PHY 222 WRF	275	325	412	404	**354 D**
PHY 312 WRF	311	353	454	430	**387 BCD**
PHY 333 WRF	291	356	497	500	**411 AB**
PHY 339 WRF	255	348	514	527	**411 AB**
PHY 417 WRF	234	346	490	436	**377 BCD**
PHY 444 WRF	331	375	477	440	**405 ABC**
PHY 308 WRF (PX 2048-04)	272	298	413	498	**370 CD**
PHY 243 WRF (PX 2037-18)	251	382	415	456	**377 BCD**
PHY 223 WRF (PX 2045-11)	269	332	384	410	**347 D**
PX 3003-04 WRF	230	369	475	527	**400 ABC**
FM 2484 B2F	255	314	424	411	**351 D**
FM 2011 GT	246	369	501	597	**428 A**
Average	**268 C**	**347 B**	**454 A**	**470 A**	

TITLE:

Performance of Deltapine varieties as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Martha Zwonitzer, Justin Spradley, Joel Webb – Research Associates

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 3 replications

Planting Date: May 15

Varieties:

DP 1522 B2XF	15R 519 B2XF
15R 556 B2XF	15R 513 B2XF
ST 4946 GLB2	DP 1549 B2XF
DP 1646 B2XF	15R 525 B2XF
DP 1612 B2XF	DP 1410 B2RF
DP 1614 B2XF	15R 511 B2XF

Herbicides: Roundup PowerMax – 1qt/A – April 6
Prowl – 3 pt/A – April 23
Roundup PowerMax – 1qt/A – June 11
Roundup PowerMax – 1 qt/A – August 5

Fertilizer: 120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	1.8”	1.8”	1.8”
In Season	3.5”	5.3”	7.1”
Total	5.3”	7.1”	8.9”

Harvest Date: October 26

RESULTS AND DISCUSSION:

Ten Bollgard II XtendFlex commercial and experimental varieties and two commercial varieties were compared under dryland and three levels of LEPA irrigation in 2015. When averaged across varieties, yields ranged from 857 lbs/A for dryland to 1039 lbs/A at the high irrigation level. When averaged across irrigation levels, yields ranged from 832 to 1148 lbs lint/A. Highest yields were produced with DP 1522 B2XF, 15R 556 B2XF, ST 4946 GLB2, and DP 1646 B2XF. Loan values were not affected by irrigation level but there were differences between varieties. Total revenue ($/A) was highest for the four highest yielding varieties. Cotton lint yields, loan values, and total revenues per acre are summarized in Table 1.

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

	Irrigation Levels				
Cultivar	**Dry (0.0)**	**Low (5.3)**	**Base (7.1)**	**High (8.9)**	**Average**
	---------- lbs/A----------				
DP 1522 B2XF	1029	1163	1223	1179	**1148 A**
15R 556 B2XF	822	1184	1378	1075	**1114 AB**
ST 4946 GLB2	784	1052	1504	1061	**1100 AB**
DP 1646 B2XF	782	1080	1188	1309	**1090 ABC**
DP 1612 B2XF	978	981	1187	1042	**1047 BCD**
DP 1614 B2XF	888	961	1225	1073	**1037 BCD**
15R 519 B2XF	910	992	1081	1045	**1007 CD**
15R 513 B2XF	845	1082	1126	933	**996 D**
DP 1549 B2XF	820	1021	1136	990	**992 D**
15R 525 B2XF	845	910	1223	971	**987 D**
DP 1410 B2RF	842	1047	1072	906	**967 D**
15R 511 B2XF	735	796	916	880	**832 E**
Average	**857 C**	**1022 B**	**1188 A**	**1039 B**	
	----------cents/lb----------				
DP 1522 B2XF	55.06	54.96	55.11	55.90	**55.26 BC**
15R 556 B2XF	56.68	55.38	55.78	55.90	**55.93 A**
ST 4946 GLB2	56.08	54.05	54.90	55.18	**55.05 C**
DP 1646 B2XF	56.56	55.70	55.90	56.00	**56.04 A**
DP 1612 B2XF	56.03	54.96	55.78	55.85	**55.65 ABC**
DP 1614 B2XF	54.25	54.96	55.76	56.00	**55.24 C**
15R 519 B2XF	49.18	51.86	53.25	55.06	**52.34 D**
15R 513 B2XF	54.96	55.33	54.76	55.90	**55.24 C**
DP 1549 B2XF	55.68	55.06	55.70	55.75	**55.55 ABC**
15R 525 B2XF	54.95	55.66	55.70	55.85	**55.54 ABC**
DP 1410 B2RF	56.53	55.76	55.85	55.38	**55.88 AB**
15R 511 B2XF	56.48	55.70	55.18	54.61	**55.49 ABC**
Average	**55.20 A**	**54.95 A**	**55.30 A**	**55.61 A**	
	----------$/A----------				
DP 1522 B2XF	568	640	673	659	**635 A**
15R 556 B2XF	466	655	769	601	**623 AB**
ST 4946 GLB2	440	569	825	585	**605 ABC**
DP 1646 B2XF	442	601	664	733	**610 ABC**
DP 1612 B2XF	547	539	662	582	**582 BCD**
DP 1614 B2XF	482	528	683	601	**573 CDE**
15R 519 B2XF	448	513	576	575	**528 E**
15R 513 B2XF	465	598	616	521	**550 DE**
DP 1549 B2XF	465	562	633	552	**550 DE**
15R 525 B2XF	465	506	681	542	**548 DE**
DP 1410 B2RF	476	584	598	501	**540 DE**
15R 511 B2XF	415	443	505	481	**461 F**
Average	**472 C**	**561 B**	**657 A**	**577 B**	

TITLE:

Performance of Deltapine varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Martha Zwonitzer, Justin Spradley, Joel Webb – Research Associates

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 3 replications

Planting Date: May 15

Varieties:

DP 1522 B2XF	15R 519 B2XF
15R 556 B2XF	15R 513 B2XF
ST 4946 GLB2	DP 1549 B2XF
DP 1646 B2XF	15R 525 B2XF
DP 1612 B2XF	DP 1410 B2RF
DP 1614 B2XF	15R 511 B2XF

Herbicides: Trifluralin 1.5 pt/A – April 6
Roundup PowerMax – 1qt/A – June 18

Fertilizer: 120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	0”	0”	0”
In Season	4.1”	7.4”	9.9”
Total	4.1”	7.4”	9.9”

Harvest Date: November 6

RESULTS AND DISCUSSION:

Ten Deltapine commercial and experimental Bollgard II XtendFlex cotton varieties and two commercial varieties were compared under dryland and three levels of subsurface drip irrigation. The low, base, and high irrigation treatments received 4.1”, 7.4”, and 9.9” in/A, during the growing season, respectively. When averaged across varieties, yields ranged from 838 to 1823 lbs lint/A, with increased yields with each additional irrigation amount (Table 1). When averaged across irrigation levels, yields ranged from 1107 to 1349 lbs lint/A. Similar yields to the highest yielding variety were produced with DP 1614 B2XF, DP 1646 B2XF, 15R 556 B2XF, 15R 519 B2XF, DP 1410 B2RF, and ST 4946 GLB2. Loan value was influenced by variety but no consistent effect was observed with irrigation level. Gross revenues ($/A) increased with increased irrigation, and varied between varieties. Effects of variety and irrigation level on lint yield, loan value, and total revenues are summarized in Table1.

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

	Irrigation Levels				
Cultivar	**Dry (0.0)**	**Low (4.1)**	**Base (7.4)**	**High (9.9)**	**Average**
	---------- lbs/A----------				
DP 1522 B2XF	795	988	1369	1744	**1224 C**
15R 556 B2XF	896	1072	1452	1941	**1340 A**
ST 4946 GLB2	816	1064	1428	1902	**1302 ABC**
DP 1646 B2XF	938	1031	1508	1882	**1340 A**
DP 1612 B2XF	895	1046	1334	1883	**1289 ABC**
DP 1614 B2XF	858	1056	1481	2002	**1349 A**
15R 519 B2XF	934	1089	1419	1805	**1312 AB**
15R 513 B2XF	832	1045	1368	1739	**1246 BC**
DP 1549 B2XF	770	984	1463	1755	**1243 BC**
15R 525 B2XF	770	1003	1392	1804	**1242 BC**
DP 1410 B2RF	814	987	1438	1845	**1271 ABC**
15R 511 B2XF	746	946	1165	1573	**1107 D**
Average	**838 D**	**1026 C**	**1401 B**	**1823 A**	
	----------cents/lb----------				
DP 1522 B2XF	55.95	53.78	56.15	56.03	**55.47 BCD**
15R 556 B2XF	56.36	55.91	56.48	56.38	**56.28 ABC**
ST 4946 GLB2	56.48	51.61	55.58	56.01	**54.92 D**
DP 1646 B2XF	56.41	56.28	56.48	56.55	**56.43 A**
DP 1612 B2XF	56.45	52.78	56.61	55.68	**55.38 CD**
DP 1614 B2XF	53.73	51.80	54.51	54.58	**53.65 E**
15R 519 B2XF	49.36	46.05	49.85	52.33	**49.40 F**
15R 513 B2XF	54.86	55.55	56.28	55.91	**55.65 ABCD**
DP 1549 B2XF	55.18	54.45	53.98	56.30	**54.97 D**
15R 525 B2XF	54.76	55.95	56.90	56.50	**56.02 ABC**
DP 1410 B2RF	56.35	55.81	56.73	56.81	**56.42 AB**
15R 511 B2XF	55.83	54.58	55.70	56.28	**55.60 ABCD**
Average	**55.14 B**	**53.71 C**	**55.44 AB**	**55.78 A**	
	----------$/A----------				
DP 1522 B2XF	445	531	769	977	**680 BC**
15R 556 B2XF	504	599	819	1094	**754 A**
ST 4946 GLB2	461	549	794	1066	**717 AB**
DP 1646 B2XF	529	580	852	1064	**756 A**
DP 1612 B2XF	505	553	755	1048	**715 AB**
DP 1614 B2XF	461	545	807	1092	**726 AB**
15R 519 B2XF	460	502	707	946	**653 CD**
15R 513 B2XF	455	580	770	972	**694 BC**
DP 1549 B2XF	425	535	788	988	**684 BC**
15R 525 B2XF	421	561	792	1019	**698 BC**
DP 1410 B2RF	459	551	816	1048	**718 AB**
15R 511 B2XF	416	516	648	885	**616 B**
Average	**462 D**	**550 C**	**776 B**	**1016 A**	

TITLE:

Performance of FiberMax and Stoneville varieties as affected by subsurface drip irrigation levels at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Wayne Keeling – Professor
Joel Webb, Justin Spradley, Martha Zwonitzer – Research Associates

MATERIALS AND METHODS:

Plot Size: 4 rows by 40 feet, 4 replications

Planting Date: June 2

Varieties:

ST 4747 GLB2	FM 1911 GLT (BX 1635)
FM 2007 GLT	FM 2334 GLT
FM 1830 GLT	FM 2322 GL
FM 1900 GLT	FM 2484 B2F
BX 1637 GLT	ST 4946 GLB2
BX 1636 GLT	FM 2011 GT

Herbicides: Trifluralin 1.5 pt/A – April 6
Roundup PowerMax – 1qt/A – June 18

Fertilizer: 120-0-0

Irrigation in-season:

	Low	Base	High
Preplant	0”	0”	0”
In Season	4.1”	7.4”	9.9”
Total	4.1”	7.4”	9.9”

Harvest Date: November 9

RESULTS AND DISCUSSION:

Twelve entries, including FiberMax and Stoneville commercial varieties, and three experimentals were evaluated under dryland and three levels of subsurface drip irrigation. In-season irrigation amounts were 4.1”, 7.4”, and 9.9”/A for the low, base, and high irrigation levels, respectively. When averaged across varieties, yields ranged from 657 lbs/A for dryland up to 1497 lbs/A with the high irrigation treatment (Table 1). When averaged across irrigation levels, yields ranged from 1059 to 1171 lbs lint/A, with differences observed among varieties. Loan values ranged from 55.27 to 56.74 c/lb across irrigation levels, with slightly higher loan values for dryland and low irrigation. Total revenue ($/A) increased with irrigation level and varied between varieties. Although the trial was re-planted June 1 after the original planting was damaged by hail, excellent late summer and fall growing conditions with above average heat unit accumulation into October resulted in excellent yields and fiber quality.

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

Cultivar	Irrigation Levels				
	Dry (0.0)	Low (4.1)	Base (7.4)	High (9.9)	Average
	---------- lbs/A----------				
ST 4747 GLB2	711	1107	1165	1444	**1107 BC**
FM 2007 GLT	689	1082	1092	1389	**1063 C**
FM 1830 GLT	652	1130	1285	1570	**1159 AB**
FM 1900 GLT	711	1054	1155	1364	**1071 C**
FM 1911 GLT (BX 1635)	606	1047	1297	1613	**1140 AB**
BX 1636 GLT	657	1037	1293	1562	**1137 AB**
BX 1637 GLT	658	1078	1321	1473	**1133 AB**
FM 2334 GLT	633	1142	1256	1503	**1134 AB**
FM 2322 GL	677	1086	1367	1546	**1169 A**
FM 2484 B2F	567	1074	1235	1360	**1059 C**
ST 4946 GLB2	708	1070	1273	1504	**1139 AB**
FM 2011 GT	614	1118	1317	1635	**1171 A**
Average	**657 D**	**1085 C**	**1255 B**	**1497 A**	
	----------cents/lb----------				
ST 4747 GLB2	56.62	56.55	56.15	55.07	**56.10 BCD**
FM 2007 GLT	56.75	56.72	54.85	53.10	**55.35 E**
FM 1830 GLT	56.82	56.77	57.02	56.77	**56.85 A**
FM 1900 GLT	56.65	56.77	56.40	55.85	**56.41 ABC**
FM 1911 GLT (BX 1635)	56.77	56.87	56.90	55.87	**56.60 AB**
BX 1636 GLT	56.52	56.35	56.25	53.95	**55.76 CDE**
BX 1637 GLT	56.80	56.27	56.12	54.42	**55.90 CDE**
FM 2334 GLT	56.77	56.95	56.15	55.82	**56.42 ABC**
FM 2322 GL	56.75	56.65	56.62	56.77	**56.70 AB**
FM 2484 B2F	56.92	56.35	55.50	54.00	**55.69 DE**
ST 4946 GLB2	56.75	56.85	55.07	54.80	**5586 CDE**
FM 2011 GT	56.75	56.80	56.67	56.85	**56.76 AB**
Average	**56.74 A**	**56.66 A**	**56.14 B**	**55.27 C**	
	----------$/A----------				
ST 4747 GLB2	402	625	653	796	**619 BCD**
FM 2007 GLT	391	613	599	737	**585 D**
FM 1830 GLT	370	641	733	891	**659 A**
FM 1900 GLT	402	598	651	763	**603 CD**
FM 1911 GLT (BX 1635)	343	595	737	900	**644 AB**
BX 1636 GLT	371	584	727	842	**631 ABC**
BX 1637 GLT	374	606	742	802	**631 ABC**
FM 2334 GLT	359	650	705	839	**638 ABC**
FM 2322 GL	384	615	774	877	**662 A**
FM 2484 B2F	322	605	686	736	**587 D**
ST 4946 GLB2	402	608	701	825	**634 ABC**
FM 2011 GT	348	634	746	929	**644 A**
Average	**372 D**	**614 C**	**704 B**	**828 A**	

TITLE:

Results of the pivot-irrigated cotton variety performance test, and intermediate strains test at AG-CARES, Lamesa, TX, 2015.

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 16th
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:	5.4 acre-in applied May-September
Harvest Aid:	Bollbuster @1 qt/A+Display @ 1.5pt/A Oct. 5th
	ETX @ 1oz/A applied Oct. 19
Harvest Date:	November 29th

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 tests. 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-eight cotton varieties from 7 different seed companies were submitted for variety testing at 5 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 795 pounds of lint per acre with a test coefficient of variation of 16.6 and 155 pound least significant difference. The highest yielding variety was FM 2011GT with a yield of 1183 pounds of lint per acre; also a top performer in the dryland trial. The next 3 varieties in the test were not significantly different than the highest yielding variety (Table 1). Stoneville, PhytoGen, Americot, and FiberMax brands were all represented in this top tier. Yields for the test ranged from 1,183 pounds of lint per acre to 396 pounds of lint per acre in 2015. Plant height ranged from 13-30 inches with a test average of 26 inches. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 55%, with a range from 24-74%. Storm resistance ratings ranged from 2-6 with the test average at 5.

Average fiber length of the varieties tested was 1.10in with a range of 1.16-1.02. Average strength was 31.3g/tex with a range of 35.0-25.8. Micronaire averaged 4.3 with a range of 5.1-3.7 (Table 2).

Intermediate Strains

Twenty-six experimental breeding strains and 2 commercial check varieties were evaluated in intermediate strains testing at 2 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 729 pounds of lint per acre with a test coefficient of variation of 14.8 and 127 pound least significant difference. 12-18-314V was the top yielder with 954 pounds of lint per acre; 3 other strains and FM 989 were not significantly different from the highest yielding strain (Table 3). Yields in the strains test ranged from 954 pounds of lint yield per acre to 576 pounds of lint yield per acre in 2015. Plant height ranged from 21-30 inches with a test average of 26 inches. Relative maturity of the strains as indicated by percent open boll on a given date averaged 54%, with a range of 42-68%. Storm resistance ratings were all 5 or 6, indicating little wind damage and improvement in storm resistance in newly developed strains. Average fiber length was 1.13in with a range of 1.22-1.08. Average strength was 33.3g/tex with a range of 35.0-31.0. Micronaire averaged 3.9 with a range of 4.1-3.5 (Table 4). Average fiber quality of the new strains (Table 4) compared to commercial varieties (Table 2) indicates higher length and strength, and lower micronaire, among new material developed in the breeding program at Texas A&M AgriLife Research.

Table 1. Yield and agronomic property results from the irrigated regional cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	30-Sep	Resistance	Height
FiberMax FM 2011GT	1183	29.3	45.2	39.4	29.8	5.9	11.4	8.1	28.8	73	6	27
PhytoGen PHY 417 WRF	1124	30.8	46.9	41.2	32.3	5.0	8.8	6.5	31.4	69	5	30
Stoneville ST 4946GLB2	1093	28.6	46.8	39.8	30.3	4.9	10.7	7.3	26.4	53	6	27
Americot AMDG-5964-B2XF	1035	27.9	46.5	37.0	27.3	4.7	9.8	6.3	27.8	50	6	27
Americot AMDG-3X2XF	1017	31.0	45.5	38.7	29.0	4.4	9.7	6.6	25.5	59	5	26
Americot AMDG-3-6951XF	977	30.5	45.2	39.5	29.8	4.7	9.9	7.0	26.4	54	4	26
NexGen NG 4545 B2XF	975	29.0	47.0	39.3	29.1	5.1	9.3	6.4	30.8	59	5	28
PhytoGen PHY 312 WRF	971	29.0	45.1	40.2	29.6	4.7	9.9	7.2	26.2	41	5	28
NexGen NG 3500 XF	965	29.6	46.0	39.9	29.5	4.7	9.7	6.8	27.7	48	6	27
Americot AMDG-2-6489B2XF	954	29.4	44.8	39.3	28.2	5.0	9.5	6.5	29.8	56	5	28
Deltapine DP 1044 B2F	953	28.9	46.6	37.2	27.6	4.1	9.3	5.9	25.8	61	5	29
Americot AMDG-3-7040XF	950	29.0	46.5	38.7	28.9	4.8	10.0	6.8	27.5	46	5	25
Stoneville ST 4747GLB2	939	28.0	46.0	38.9	27.8	4.6	10.6	7.5	24.0	63	6	25
Deltapine DP 0912 B2RF	931	29.0	44.8	38.3	30.3	5.2	9.8	6.5	30.4	60	4	28
Deltapine DP 1219 B2RF	917	28.3	44.8	37.6	27.8	4.3	9.1	6.2	26.4	51	5	28
NexGen NG 3517 B2XF	911	27.6	46.2	36.7	27.2	4.4	9.8	6.1	26.6	68	5	27
NexGen NG 1511B2F	889	30.5	44.3	40.2	30.8	4.9	9.9	7.2	27.6	60	6	29
Americot AMDG-1-5999B2XF	882	28.0	46.8	35.0	25.9	4.4	9.9	5.8	26.2	55	5	26
PhytoGen PHY 339 WRF	875	29.2	45.9	38.0	27.7	4.1	9.2	6.3	24.5	73	5	26
Dyna-Gro DG2615B2RF	865	28.1	46.1	39.1	29.6	5.4	11.2	7.6	27.8	35	6	30

PhytoGen PHY 333 WRF	836	28.3	43.4	40.6	29.4	5.2	10.1	7.3	28.9	56	6	29
Deltapine DP 1522 B2XF	825	29.8	46.0	38.4	29.7	4.7	9.4	6.5	28.1	54	6	29
All-Tex Nitro 44B2RF	823	25.9	45.8	35.2	23.8	4.5	11.5	6.6	23.4	39	5	24
FiberMax FM 2322GL	814	31.2	42.5	42.2	31.2	5.4	10.0	7.9	28.5	66	5	25
All-Tex CT 15445 B2RF	782	28.7	45.7	38.8	30.5	4.6	10.0	6.8	26.3	56	5	24
BRS 335	762	27.6	47.6	36.9	27.4	4.9	10.8	6.7	27.4	31	6	30
FiberMax FM 2484B2F	753	27.9	46.1	37.6	28.9	4.8	10.1	6.6	27.3	50	5	25
Americot AMDG-7824	750	31.2	44.1	38.9	28.4	4.6	9.9	7.1	25.5	65	5	26
NexGen NG 3406B2XF	748	28.0	45.1	42.5	32.0	4.8	9.4	7.2	27.7	59	5	24
FiberMax FM 2334GLT	740	29.1	43.6	43.4	32.0	4.7	9.1	7.2	27.7	71	5	23
Deltapine DP 1518 B2XF	739	27.8	46.0	38.8	29.1	4.6	9.2	6.3	28.0	64	5	26
Deltapine DP 1212 B2RF	719	28.1	45.5	36.8	28.6	5.2	9.7	6.3	30.4	59	4	25
NexGen NG 3405B2XF	690	27.8	45.4	38.0	27.6	4.7	9.7	6.5	27.3	55	5	23
Seed Source Genetics SSG UA 222	679	26.3	46.1	36.8	27.6	5.3	11.1	7.0	28.3	48	5	26
PhytoGen PHY 499 WRF	677	29.2	44.4	38.3	26.9	4.1	9.5	6.5	23.9	33	6	27
FiberMax FM 2007GLT	674	27.0	46.7	36.8	27.7	4.9	10.5	6.5	27.5	68	6	23
PhytoGen PHY 444 WRF	670	29.8	44.9	40.5	30.2	4.9	10.3	7.4	26.5	36	5	25
PhytoGen PHY 222 WRF	657	26.5	43.7	40.2	28.6	4.4	9.6	7.1	24.8	74	5	23
Deltapine DP 1410 B2RF	633	27.7	45.1	39.5	30.6	5.3	10.1	7.0	29.9	69	6	24
BRS 293	613	28.0	46.8	36.6	28.2	5.3	10.4	6.4	30.2	31	5	27
BRS 269	607	27.6	47.0	36.0	25.5	4.6	10.7	6.4	25.8	25	4	23
FiberMax FM 1830GLT	590	28.8	45.5	40.9	30.8	5.1	9.4	7.1	29.4	74	5	23
BRS 286	572	27.8	46.0	35.9	26.8	5.1	11.1	6.6	27.8	24	2	13
PhytoGen PHY 725 RF	540	25.1	46.8	35.2	26.9	5.2	10.3	6.1	29.4	65	4	28
Dyna-Gro DG3544B2XF	513	28.3	45.0	37.6	26.4	5.6	12.0	7.7	27.3	55	6	22
Seed Source Genetics SSG HQ 210 CT	501	26.0	47.7	34.8	26.2	4.6	9.2	5.2	30.5	44	5	23
All-Tex Concho B2XF	475	25.1	45.6	39.8	27.9	5.3	11.1	7.6	28.0	63	5	25
FiberMax FM 1900GLT	396	27.3	43.9	39.3	28.9	5.1	10.1	7.2	27.7	59	4	18
Mean	795	28.4	45.6	38.5	28.6	4.8	10.0	6.8	27.5	55	5	26
c.v.%	16.6	4.2	2.6	3.1	5.4	8.5	3.1	4.7	8.1	25.2	19.5	16.8
LSD 0.05	155	1.4	1.4	2.0	2.6	0.7	0.5	0.5	4.0	16	1	5

Table 2. Fiber quality results from the irrigated regional cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
FiberMax FM 2011GT	4.3	1.10	81.3	30.7	6.7	4	73.9	8.5	41-3
PhytoGen PHY 417 WRF	4.1	1.08	81.0	30.7	9.2	3	73.5	9.2	32-2,41-3
Stoneville ST 4946GLB2	4.2	1.10	82.1	33.1	8.6	3	72.0	9.6	32-2,42-1
Americot AMDG-5964-B2XF	4.6	1.12	80.7	30.8	6.8	3	72.6	9.4	32-2,41-3
Americot AMDG-3X2XF	4.9	1.08	82.1	32.7	8.5	2	72.3	9.8	32-2,42-1
Americot AMDG-3-6951XF	5.1	1.05	81.9	31.6	7.6	2	73.0	9.8	32-1,32-2
NexGen NG 4545 B2XF	4.8	1.08	81.3	31.2	6.0	2	72.4	9.8	32-1,42-1
PhytoGen PHY 312 WRF	4.3	1.12	82.2	31.9	7.6	6	71.8	9.1	32-2,42-2
NexGen NG 3500 XF	4.9	1.07	82.8	33.1	7.9	2	73.7	10.0	32-1,32-2
Americot AMDG-2-6489B2XF	4.8	1.06	81.2	30.0	5.9	3	72.4	9.6	32-2,42-1
Deltapine DP 1044 B2F	4.1	1.09	80.1	30.4	10.3	3	73.1	9.8	32-1,32-2
Americot AMDG-3-7040XF	4.9	1.08	82.5	33.8	8.9	2	72.2	10.0	32-1,42-1
Stoneville ST 4747GLB2	4.3	1.11	80.3	27.5	6.8	5	71.0	8.1	41-4,51-1
Deltapine DP 0912 B2RF	4.6	1.04	81.1	29.6	8.5	3	71.3	9.6	32-2,42-1
Deltapine DP 1219 B2RF	4.3	1.10	80.4	31.6	7.3	2	74.6	9.4	31-3,32-2
NexGen NG 3517 B2XF	4.7	1.09	81.5	30.1	8.3	3	73.0	9.6	32-2,42-1
NexGen NG 1511B2F	4.4	1.08	81.7	32.3	8.6	2	72.3	9.5	32-2,42-1
Americot AMDG-1-5999B2XF	4.4	1.11	80.2	29.2	6.6	3	71.7	9.8	32-2,42-1
PhytoGen PHY 339 WRF	4.2	1.09	81.4	32.3	8.2	3	73.9	8.5	41-1,41-3
Dyna-Gro DG2615B2RF	4.6	1.09	81.2	30.2	8.1	3	74.2	9.4	32-1,32-2
PhytoGen PHY 333 WRF	4.3	1.11	82.3	30.8	7.0	4	72.6	9.8	32-1,42-1
Deltapine DP 1522 B2XF	4.5	1.09	82.0	31.2	9.5	3	71.5	9.4	42-1
All-Tex Nitro 44B2RF	3.7	1.16	82.6	35.0	7.9	4	73.5	9.3	32-2,42-1
FiberMax FM 2322GL	4.6	1.12	82.1	33.1	5.9	3	72.5	9.2	41-3,42-1
All-Tex CT 15445 B2RF	4.4	1.11	82.8	34.1	8.5	3	74.1	9.2	31-3,32-2
BRS 335	3.7	1.12	80.6	30.9	8.0	4	75.1	9.1	31-4
FiberMax FM 2484B2F	3.8	1.15	81.9	32.0	6.7	3	75.2	8.8	31-4,41-1
Americot AMDG-7824	4.8	1.01	80.6	26.4	7.0	2	73.1	9.8	32-1,32-2
NexGen NG 3406B2XF	4.3	1.10	82.4	30.8	9.5	3	74.0	9.8	32-1,32-2
FiberMax FM 2334GLT	4.5	1.13	82.0	32.6	6.2	3	74.3	9.0	31-3,41-3
Deltapine DP 1518 B2XF	4.5	1.09	81.0	28.7	7.6	3	73.9	9.4	32-1,42-1
Deltapine DP 1212 B2RF	4.5	1.10	81.1	31.7	7.8	3	71.1	9.5	42-1
NexGen NG 3405B2XF	4.4	1.03	79.7	25.8	7.4	3	72.3	9.8	32-2
Seed Source Genetics SSG UA 222	4.1	1.15	82.1	32.3	8.9	5	71.6	9.3	42-1
PhytoGen PHY 499 WRF	4.1	1.07	81.3	32.1	9.0	3	75.4	9.7	22-2,32-1

FiberMax FM 2007GLT	3.7	1.12	80.1	31.7	7.9	4	74.5	8.8	32-2,41-1
PhytoGen PHY 444 WRF	4.1	1.11	80.5	29.4	8.5	2	75.1	9.7	22-2,32-2
PhytoGen PHY 222 WRF	4.7	1.08	82.0	29.9	9.0	4	72.0	9.3	42-1
Deltapine DP 1410 B2RF	3.9	1.12	80.1	31.4	6.8	4	72.3	8.7	41-3
BRS 293	4.3	1.02	79.8	31.4	8.1	1	72.3	10.5	32-2,33-1
BRS 269	4.3	1.08	80.2	30.3	6.1	3	74.2	9.3	31-3,42-1
FiberMax FM 1830GLT	4.4	1.12	81.5	32.3	6.1	1	75.1	8.7	31-4
BRS 286	4.0	1.13	82.0	33.7	8.0	3	73.4	9.0	31-4,41-3
PhytoGen PHY 725 RF	4.3	1.16	81.8	35.4	8.1	2	72.6	9.5	32-2,42-1
Dyna-Gro DG3544B2XF	4.7	1.12	82.1	32.1	7.4	2	75.3	8.4	31-4,41-1
Seed Source Genetics SSG HQ 210 CT	4.0	1.05	79.9	31.1	7.8	2	74.3	9.4	31-3,32-2
All-Tex Concho B2XF	4.4	1.16	82.8	33.7	6.3	2	76.2	8.5	31-1,31-2
FiberMax FM 1900GLT	4.1	1.12	80.8	30.9	6.1	3	71.5	9.4	42-1
Mean	4.3	1.10	81.3	31.3	7.7	3	73.2	9.3	
c.v.%	5.7	1.8	1.0	4.0	8.2	35.0	1.5	3.3	
LSD 0.05	0.4	0.03	1.4	2.1	1.1	2	1.7	0.5	

Table 3. Yield and agronomic property results from the irrigated intermediate experimental strains test conducted at AG-CARES, Lamesa, TX, 2015

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	30-Sep	Resistance	Height
12-18-314V	954	25.4	47.2	34.6	26.7	6.0	12.0	6.7	30.9	53	5	27
13-11-109BB	894	27.1	46.8	35.0	27.1	6.0	11.9	6.8	31.2	46	5	30
13-9-218S	867	26.5	48.5	34.6	26.9	5.1	11.4	6.3	27.7	43	6	29
FiberMax FM 989	841	26.4	47.9	35.1	27.0	5.5	11.3	6.3	30.5	49	5	29
12-20-407V	828	24.6	45.2	34.2	25.2	5.5	11.8	6.5	29.0	46	5	27
11-18-128N	816	25.3	46.8	34.0	24.6	5.5	11.8	6.4	29.2	59	5	25
13-29-201N	795	27.6	46.6	36.3	28.3	5.2	9.8	6.0	31.9	46	6	26
12-1-820FQ	779	26.2	46.4	35.2	26.3	5.8	11.2	6.4	31.6	51	5	27
13-2-1009FQ	779	26.3	45.3	36.2	27.2	5.1	10.3	6.1	30.5	59	5	28
13-2-1004FQ	778	27.5	46.4	35.6	27.7	4.7	9.3	5.5	30.1	65	6	25
12-20-707N	752	23.0	48.8	29.8	22.3	6.0	12.6	5.8	30.9	60	5	27
12-20-402N	751	26.1	46.8	33.9	25.2	5.5	11.3	6.1	30.5	55	5	28
Deltapine DP 491	741	26.9	46.4	35.4	27.3	5.8	10.3	6.0	34.0	46	6	28
12-20-1206N	718	24.0	49.6	31.0	24.1	5.8	10.7	5.1	35.7	60	6	27
13-9-1001S	716	27.9	46.1	36.0	27.4	4.6	9.3	5.5	30.5	58	5	26
11-14-507V	715	26.5	47.2	34.1	26.4	4.9	11.3	6.2	27.2	51	5	27
13-2-913FQ	715	24.7	44.8	33.2	24.2	6.0	11.9	6.4	31.1	51	6	27
13-2-1111FQ	672	26.7	49.5	33.9	26.2	4.5	10.1	5.5	27.4	68	6	23
13-3-714DS	654	28.2	45.1	36.8	28.0	4.8	9.3	5.8	30.4	60	6	26
11-11-505BB	652	23.8	47.8	32.5	24.9	5.3	10.9	5.5	31.6	65	6	25
13-18-203D	646	24.5	49.6	32.3	25.0	5.0	10.0	5.1	31.9	68	5	28
11-14-807V	644	23.6	46.5	31.7	23.8	5.2	11.9	5.9	28.3	60	5	28
11-11-307BB	642	26.0	48.4	34.9	27.1	5.8	12.4	6.9	28.9	48	5	21
12-1-1104FQ	639	25.6	47.7	34.3	26.1	5.3	11.4	6.3	28.8	49	5	25
13-2-501FQ	637	28.0	48.5	32.6	25.0	4.8	10.6	5.5	29.0	42	6	26
13-11-702BB	619	25.6	48.5	32.8	25.3	5.3	10.9	5.6	30.6	55	6	27
11-11-607BB	594	26.3	47.2	34.5	25.6	5.0	10.9	6.1	28.4	54	5	28
13-2-1005FQ	576	26.9	48.0	34.8	26.6	5.1	10.9	6.1	29.1	51	6	24
Mean	729	26.0	47.3	34.1	26.0	5.3	11.0	6.0	30.2	54	5	26
c.v.%	14.8	3.6	2.8	2.3	3.2	8.1	3.9	4.0	8.9	19.8	11.8	8.8
LSD 0.05	127	1.1	1.5	1.3	1.4	0.7	0.7	0.4	4.6	13	1	3

Table 4. Fiber quality results from the irrigated regional cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf	Color grade
12-18-314V	4.1	1.11	81.8	33.4	7.6	73.3	9.1	5	31-3,42-1
13-11-109BB	4.1	1.14	82.3	32.3	8.0	73.5	9.6	4	32-1,42-1
13-9-218S	4.2	1.14	81.7	34.0	6.6	74.4	9.2	4	31-3,32-2
FiberMax FM 989	3.9	1.12	81.9	34.0	6.5	74.7	9.2	4	31-4,32-1
12-20-407V	3.8	1.14	83.2	35.1	7.3	74.7	9.2	5	31-3,31-4
11-18-128N	3.9	1.15	82.2	35.9	7.6	74.9	9.0	3	31-3,41-3
13-29-201N	4.1	1.10	81.3	31.6	7.5	74.6	9.3	2	31-3,32-2
12-1-820FQ	3.8	1.09	81.3	31.0	8.1	72.8	9.1	3	32-2,42-2
13-2-1009FQ	3.7	1.18	79.9	32.8	5.9	76.6	8.6	4	31-1,31-2
13-2-1004FQ	3.9	1.10	80.7	33.1	8.7	74.7	8.9	5	31-2,32-2
12-20-707N	3.6	1.22	81.7	32.1	7.1	73.4	8.7	4	31-4,41-3
12-20-402N	4.1	1.14	81.9	34.3	8.6	73.8	9.3	5	32-2
Deltapine DP 491	4.1	1.14	81.1	33.8	7.2	73.1	9.4	3	32-2,42-1
12-20-1206N	4.0	1.12	82.6	34.0	8.3	72.1	8.6	5	41-3,41-4
13-9-1001S	3.5	1.15	81.2	33.3	7.4	74.3	9.5	4	32-1,32-2
11-14-507V	4.2	1.10	81.8	34.1	6.6	73.7	9.4	4	32-2
13-2-913FQ	3.8	1.11	79.5	31.0	8.0	74.5	9.1	4	31-3,41-3
13-2-1111FQ	3.8	1.15	81.4	34.9	8.0	71.7	9.5	3	42-1
13-3-714DS	3.8	1.08	80.4	31.4	7.1	72.9	9.6	2	32-2,42-1
11-11-505BB	3.6	1.18	81.8	33.6	7.2	73.4	8.9	4	32-2,41-3
13-18-203D	4.0	1.17	83.6	36.0	6.3	74.2	8.9	4	31-3,41-3
11-14-807V	4.0	1.13	82.5	35.7	6.8	73.7	8.8	4	31-4,41-3
11-11-307BB	4.4	1.14	81.6	32.9	5.8	74.3	9.3	3	31-4,32-2
12-1-1104FQ	3.5	1.10	79.9	32.9	7.9	71.1	9.6	5	22-2,52-1
13-2-501FQ	4.1	1.12	81.4	32.8	7.2	72.2	9.3	3	32-2,42-1
13-11-702BB	3.7	1.17	82.4	32.6	6.6	73.6	8.8	4	41-3
11-11-607BB	4.1	1.13	82.4	32.6	7.0	72.2	8.4	5	41-1
13-2-1005FQ	3.8	1.18	81.4	31.2	6.1	74.4	8.4	4	41-1,41-3
Mean	3.9	1.13	81.6	33.3	7.2	73.6	9.1	4	
c.v.%	6.1	2.1	1.0	3.8	6.6	2.2	3.7	38.8	
LSD 0.05	0.4	0.04	1.3	2.1	0.8	2.7	0.6	2	

TITLE:

Results of the dryland cotton variety performance test at AG-CARES, Lamesa, TX, 2015.

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 15
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:	23.5 inches in season
Harvest Aid:	Bollbuster @1.5 pt/A+Display@ 1oz/A Oct. 5th
	ETX @ 1oz/A applied Oct. 19
Harvest Date:	October 28

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 test 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 comprehensive information to supplement 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-eight 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 640 pounds of lint per acre with a test coefficient of variation of 17.4 and 130 pound least significant difference. The highest yielding variety was ST 4946GLB2 with a yield of 853. The next 9 varieties in the test were not significantly different than the highest yielding variety.

(Table 1). Stoneville, PhytoGen, FiberMax, Dyna-Gro, NexGen, and All-Tex brands were all represented in this top tier. Yields for the test ranged from 853 pounds of lint per acre to 347 pounds of lint per acre in 2015. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 68%, with a range from 53-83%. All of the varieties tested had storm resistance ratings from 3-6 with a test average of 5. Plant height averaged 30 inches and ranged from 24-32 inches across all varieties. Average fiber length was 1.06in with a range of 1.11-1.02 in. Average strength was 29.6g/tex with a range of 33.1-25.4g/tex. Micronaire averaged 4.6 with a range of 5.1-3.9 (Table 2).

Table 1. Yield and agronomic property results from the dryland regional cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

		Agronomic Properties										
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	22-Sep	Resistance	Height
Stoneville ST 4946GLB2	853	29.6	46.1	40.2	32.7	6.0	9.8	7.0	33.9	63	5	32
FiberMax FM 2011GT	793	30.0	45.0	39.3	28.2	5.1	9.9	7.1	28.1	79	5	29
PhytoGen PHY 339 WRF	782	30.1	45.4	38.6	28.5	3.9	8.3	6.3	23.6	70	4	33
Dyna-Gro DG2615B2RF	767	30.1	46.5	40.3	32.3	5.4	9.6	6.9	31.5	58	6	31
NexGen NG 1511B2F	765	30.8	43.0	42.7	31.7	4.5	8.2	6.6	29.2	63	4	32
Americot AMDG-3X2XF	763	30.4	45.9	40.3	29.7	4.8	8.8	6.5	29.7	65	6	31
Americot AMDG-7824	743	30.3	44.6	44.5	36.2	5.7	8.6	7.4	34.1	81	5	29
All-Tex CT 15445 B2RF	741	29.9	47.6	39.5	31.2	4.6	8.5	6.5	27.7	83	6	29
Stoneville ST 4747GLB2	741	28.1	44.7	38.9	28.3	4.7	9.0	6.4	28.3	75	5	32
NexGen NG 3406B2XF	723	29.7	45.9	41.9	32.5	4.9	8.6	6.8	30.3	65	4	31
Deltapine DP 1212 B2RF	706	29.3	45.3	38.9	28.5	4.8	8.8	6.6	27.9	70	5	29
FiberMax FM 2322GL	698	31.0	41.7	43.3	31.4	5.0	8.3	7.6	28.7	68	5	30
All-Tex Nitro 44B2RF	690	26.3	47.2	36.4	27.7	4.7	9.9	6.1	28.2	70	5	29
Americot AMDG-3-7040XF	687	29.2	46.2	41.8	31.5	4.7	8.6	6.5	29.9	71	6	29
FiberMax FM 2334GLT	685	29.4	42.3	42.3	29.4	4.8	8.3	6.7	30.1	80	4	30
NexGen NG 3405B2XF	683	29.5	43.7	41.5	32.3	5.0	8.4	6.5	32.0	75	4	30
Deltapine DP 1410 B2RF	676	28.9	44.8	40.1	32.1	5.5	8.9	6.7	33.3	78	6	28
Americot AMDG-3-6951XF	673	28.5	43.3	41.6	29.4	4.2	8.3	6.3	27.1	65	5	30
Deltapine DP 0912 B2RF	667	28.9	46.8	38.6	28.2	4.6	9.0	6.3	28.1	70	4	31
PhytoGen PHY 499 WRF	657	30.0	45.0	40.5	31.4	4.3	8.5	6.4	27.4	70	5	31
PhytoGen PHY 333 WRF	657	29.6	43.6	41.5	31.0	5.1	8.7	7.0	30.3	68	4	32
FiberMax FM 2484B2F	655	28.0	46.7	39.3	29.6	4.3	8.9	6.1	27.7	75	5	31
PhytoGen PHY 312 WRF	655	29.6	46.1	41.6	31.2	4.2	9.0	7.2	24.4	65	4	32
BRS 335	649	29.9	48.9	39.0	29.8	5.4	9.5	6.6	31.9	53	5	29
FiberMax FM 2007GLT	643	28.8	47.2	38.8	28.0	4.7	8.7	6.1	29.9	75	6	28
PhytoGen PHY 444 WRF	640	30.8	44.5	40.8	28.9	4.5	9.1	6.9	26.4	58	6	29
PhytoGen PHY 417 WRF	635	31.1	43.9	41.3	30.8	4.8	7.6	6.1	32.4	68	6	31
NexGen NG 3500 XF	634	28.8	45.0	41.2	29.8	4.3	8.5	6.4	27.3	70	5	31

NexGen NG 4545 B2XF	633	29.3	47.4	39.7	31.0	4.9	8.9	6.4	30.9	71	5	32
Deltapine DP 1044 B2F	630	28.1	45.8	38.9	29.0	3.9	8.3	5.8	26.3	64	4	31
FiberMax FM 1900GLT	629	29.3	45.4	38.1	27.5	5.1	9.4	6.7	28.8	70	6	29
Deltapine DP 1518 B2XF	623	29.2	45.6	41.6	32.4	4.4	8.5	6.8	27.2	70	5	32
NexGen NG 3517 B2XF	620	27.5	46.4	39.6	31.6	5.0	8.5	6.0	33.0	73	5	30
Deltapine DP 1522 B2XF	618	29.0	43.9	40.7	28.9	4.2	8.3	6.4	27.2	68	5	31
Americot AMDG-5964-B2XF	607	28.7	47.1	38.0	26.8	4.3	8.0	5.6	28.8	70	6	31
FiberMax FM 1830GLT	602	30.0	43.5	42.1	33.5	5.2	8.3	6.7	32.2	78	5	28
Americot AMDG-2-6489B2XF	587	28.7	44.6	42.4	29.9	4.8	8.1	6.4	32.0	63	6	30
Americot AMDG-1-5999B2XF	547	27.3	47.0	39.3	31.0	4.8	8.9	6.1	30.7	78	6	29
Deltapine DP 1219 B2RF	534	28.7	45.6	40.5	30.5	4.4	8.2	6.0	29.4	60	5	29
Dyna-Gro DG3544B2XF	532	28.3	45.1	39.1	28.0	5.0	10.4	7.3	26.7	70	5	29
PhytoGen PHY 725 RF	525	24.6	43.7	37.9	29.3	4.8	9.1	5.9	31.1	65	3	30
BRS 286	519	27.8	47.2	38.1	29.6	4.7	9.3	6.2	28.9	63	5	28
All-Tex Concho B2XF	518	26.4	45.4	37.1	26.3	5.2	10.1	6.7	28.8	73	6	30
PhytoGen PHY 222 WRF	508	26.9	42.7	41.7	28.7	4.0	8.5	6.7	24.6	83	5	29
Seed Source Genetics SSG UA 222	491	28.1	46.4	37.2	29.5	5.4	9.9	6.5	30.8	50	5	27
BRS 293	489	29.6	46.3	37.7	28.5	5.5	9.2	6.2	33.4	50	5	28
Seed Source Genetics SSG HQ 210 CT	484	28.2	47.7	38.7	30.5	4.7	7.9	5.5	32.9	63	5	24
BRS 269	347	28.6	46.4	36.7	27.5	4.5	9.8	6.3	26.0	45	5	27
Mean	640	29.0	45.4	40.0	30.0	4.8	8.8	6.5	29.3	6.8	5	30
c.v.%	17.4	4.3	3.0	3.6	6.3	10.0	3.5	5.7	10.0	13.5	14.0	6.9
LSD 0.05	130	1.4	1.6	2.4	3.2	0.8	0.5	0.6	4.9	11	1	2

Table 2. Fiber quality results from the dryland regional cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
Stoneville ST 4946GLB2	4.8	1.06	81.2	30.9	7.2	2	70.1	9.6	42-1,42-2
FiberMax FM 2011GT	4.1	1.08	81.7	29.7	6.7	5	71.6	8.8	41-3,42-2
PhytoGen PHY 339 WRF	4.4	1.05	80.3	30.6	7.2	4	71.1	8.5	42-1,51-3
Dyna-Gro DG2615B2RF	4.6	1.08	81.6	32.1	7.7	2	73.7	9.2	32-2
NexGen NG 1511B2F	4.7	1.04	80.3	30.2	8.6	3	69.6	9.3	42-1,42-2
Americot AMDG-3X2XF	5.0	1.07	81.1	30.8	8.0	2	72.5	9.5	32-2,42-1
Americot AMDG-7824	4.8	1.00	79.5	25.4	7.2	2	69.2	9.5	42-1,42-2
All-Tex CT 15445 B2RF	4.4	1.05	81.5	32.6	8.4	4	71.2	8.8	42-2
Stoneville ST 4747GLB2	4.4	1.06	79.2	26.3	5.0	3	68.1	8.7	52-1

NexGen NG 3406B2XF	4.6	1.03	80.6	28.2	9.0	3	71.3	9.4	42-1
Deltapine DP 1212 B2RF	5.0	1.07	81.1	30.3	9.8	3	69.2	9.1	42-2,52-1
FiberMax FM 2322GL	4.6	1.06	79.5	30.0	6.9	3	71.2	9.2	42-1
All-Tex Nitro 44B2RF	4.0	1.12	81.6	33.1	8.4	7	67.1	8.4	52-1,52-2
Americot AMDG-3-7040XF	5.1	1.06	81.8	31.8	7.9	2	70.7	10.0	42-1
FiberMax FM 2334GLT	4.8	1.11	81.6	30.9	5.7	2	73.2	8.4	41-3
NexGen NG 3405B2XF	4.7	1.02	78.5	25.4	7.1	3	69.8	9.7	42-1,42-2
Deltapine DP 1410 B2RF	4.4	1.08	80.0	29.8	6.9	3	71.0	8.9	42-1,42-2
Americot AMDG-3-6951XF	5.1	1.01	80.4	30.3	7.8	3	70.0	9.7	42-1
Deltapine DP 0912 B2RF	5.0	1.03	80.1	29.2	8.0	3	71.3	9.2	42-1
PhytoGen PHY 499 WRF	4.8	1.06	82.1	30.3	9.4	4	71.9	9.4	42-1
PhytoGen PHY 333 WRF	4.5	1.09	81.1	29.2	6.8	4	68.3	9.5	42-2
FiberMax FM 2484B2F	4.0	1.11	80.7	32.5	5.5	4	71.6	8.0	41-2,41-4
PhytoGen PHY 312 WRF	4.6	1.08	81.0	28.3	7.1	3	69.8	9.2	42-1,42-2
BRS 335	4.6	1.08	80.1	29.9	7.2	3	72.3	8.9	41-3,42-1
FiberMax FM 2007GLT	4.3	1.08	79.8	30.8	5.5	4	71.4	8.7	41-4,42-2
PhytoGen PHY 444 WRF	3.9	1.10	80.2	29.3	7.2	2	72.8	9.7	32-1,42-1
PhytoGen PHY 417 WRF	4.4	1.02	80.1	27.7	8.0	3	71.4	9.5	42-1
NexGen NG 3500 XF	4.7	1.03	80.5	28.6	7.4	2	70.4	9.5	42-1
NexGen NG 4545 B2XF	4.9	1.04	80.4	27.6	6.5	2	72.4	9.6	32-2,42-1
Deltapine DP 1044 B2F	4.6	1.06	79.7	29.5	8.3	3	71.9	8.8	41-3,42-1
FiberMax FM 1900GLT	4.2	1.07	79.8	28.5	6.6	3	71.5	8.9	41-3,42-1
Deltapine DP 1518 B2XF	4.7	1.05	80.4	28.4	7.3	4	70.6	9.1	42-1,42-2
NexGen NG 3517 B2XF	4.6	1.05	79.9	29.1	7.2	4	70.2	9.3	42-1,42-2
Deltapine DP 1522 B2XF	4.8	1.03	80.0	29.2	9.8	3	71.1	9.1	41-3,42-2
Americot AMDG-5964-B2XF	4.7	1.04	79.0	27.6	6.1	4	70.2	9.5	42-1
FiberMax FM 1830GLT	4.4	1.09	80.6	30.2	5.8	3	72.9	8.4	41-1,41-4
Americot AMDG-2-6489B2XF	4.9	1.01	80.0	26.9	7.0	3	70.9	9.6	42-1,42-2
Americot AMDG-1-5999B2XF	4.5	1.10	80.0	29.3	6.8	3	70.5	9.8	32-2,42-2
Deltapine DP 1219 B2RF	4.3	1.07	79.8	30.1	6.9	2	71.9	9.3	32-2,42-1
Dyna-Gro DG3544B2XF	4.9	1.08	81.9	31.7	6.5	2	73.2	8.7	41-3
PhytoGen PHY 725 RF	4.5	1.06	80.4	29.2	8.1	3	69.7	9.2	42-1,42-2
BRS 286	4.4	1.03	80.1	30.0	7.7	2	73.3	9.1	32-2,41-3
All-Tex Concho B2XF	4.5	1.12	80.3	31.3	6.9	3	72.6	8.5	41-1,42-1
PhytoGen PHY 222 WRF	4.6	1.04	80.6	28.3	8.1	4	68.5	9.4	42-2,52-1

Seed Source Genetics SSG UA 222	4.5	1.10	80.8	31.6	8.3	5	71.0	9.5	32-2,42-2
BRS 293	4.6	1.02	79.2	29.2	7.6	2	72.7	9.8	32-2
Seed Source Genetics SSG HQ 210 CT	4.6	1.03	79.5	30.6	7.6	2	72.4	9.3	32-1,42-2
BRS 269	4.6	1.07	80.6	28.9	6.4	2	73.4	9.5	32-2
Mean	4.6	1.06	80.4	29.6	7.3	3	71.1	9.2	
c.v.%	4.8	2.3	1.2	4.6	9.2	40.7	1.9	3.1	
LSD 0.05	0.4	0.04	1.6	2.3	1.1	2	2.2	0.5	

TITLE:

Demonstrating soil health promoting practices to increase water holding capacity and yield in deficit-irrigation agriculture, at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Paul DeLaune – Associate Professor; Jamie Foster – Associate Professor;
Wayne Keeling – Professor; and Katie Lewis – Assistant Professor
Dustin Kelley – 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:	2 December 2014	(cover crop)
	13 May 2015	(cotton)
	4 November 2015	(cover crop)
Termination:	10 April 2015 (cover crop)	
Harvest:	20 March 2015	(broadleaf portion of cover)
	26 March 2015	(grass portion of cover)
	28 October 2015	(cotton)
Variety:	Deltapine 1321 planted at 53k seed per acre	
Fertility:	130-40-0	
Rainfall:	12.4” in season	
Irrigation:	Pre-plant/Emergence:	1.8”
	In-season:	5.3”

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. Cover crops were planted using a no-till drill on 2 December 2014 and were chemically terminated 10 April 2015 using Roundup PowerMAX (32 oz/acre). Prior to termination, cover crops were harvested from a 1 m^2 area to calculate biomass, nitrogen uptake, and C:N ratios. The broadleaf portion of the no-till cover plots were harvested six days prior to the grass portion due to an expected application of 2-4D on the 23 March 2015. Soil core samples were collected 9 May 2015 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 (DeltaPine 1321) was planted in all plots on 14 May 2015 at a seeding rate 53,000 seed/acre. Cotton was harvested on 28 October 2015. One week after cotton harvest the no-till plots were drilled with cover on 4 November 2015.

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 .

RESULTS AND DISCUSSION:

Soil Characteristics

Soil organic C (SOC) and total N were greatest in reduced tillage, rye cover plots at the 0-15 cm depth followed by reduced tillage, mixed cover plots and then conventional plots (Figs. 1 and 2). Compared to conventional plots, SOC increased by 92% and 48% under reduced tillage-rye cover and reduced tillage-mixed cover, respectively (Fig. 1). Similar trends were demonstrated at the 30-60 cm depth; however, at 15-30 cm, SOC was greatest under conventional practices followed by reduced tillage-mixed cover and then reduced tillage-rye cover. At a depth of 0-15 cm, total N increased 70% and 30% under reduced tillage-rye cover and reduced tillage-mixed cover, respectively, compared to conventional practices (Fig. 2). Differences in total N between management practices at deeper depths were much less than at 0-15 cm.

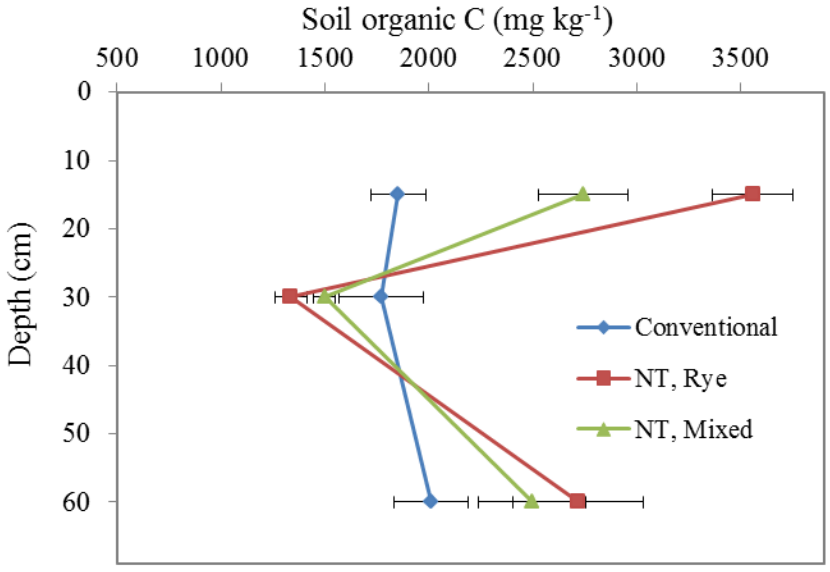


Figure 1. Soil organic C content under conventional, reduced tillage-rye cover (NT, Rye), and reduced tillage-mixed cover (NT, Mixed) management practices at Lamesa, TX. Bars represent standard deviation of the sample mean.

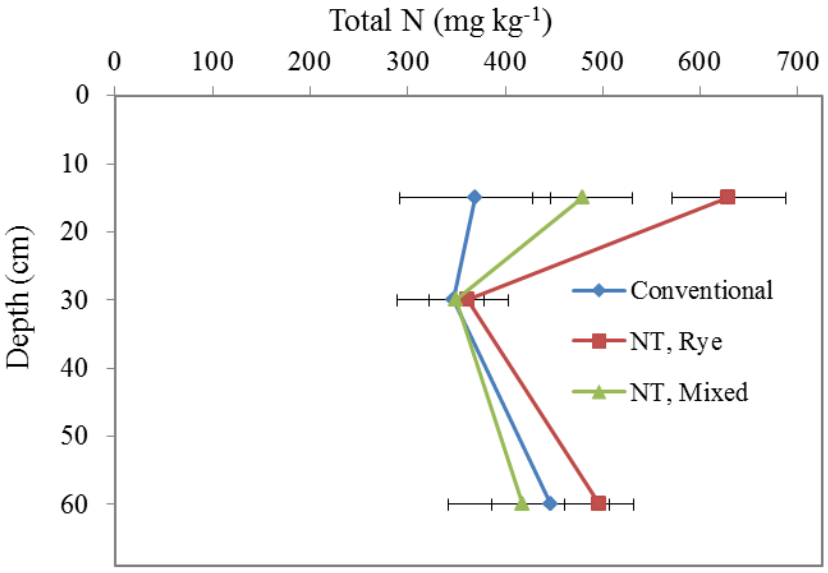


Figure 2. Total N content under conventional, reduced tillage-rye cover (NT, Rye), and reduced tillage-mixed cover (NT, Mixed) management practices at Lamesa, TX. Bars represent standard deviation of the sample mean.

At a depth of 0-15 cm, conductivity was greater in reduced tillage plots compared to conventional plots; however, the trend was reversed at 30-60 cm depth (Table 1). Other than nitrate-N, magnesium and sodium, nutrient concentrations were greater under reduced tillage compared to conventional tillage at 0-15 cm depth. Phosphorus concentrations were also greater at 15-30 cm with reduced tillage. At each depth, sodium concentrations were greatest under conventional practices. Regardless of tillage practice, soil pH and magnesium and sodium concentrations increase with depth and P and K concentrations decrease.

Table 1. Soil pH and electrical conductivity (EC) and extractable nutrient and sodium concentrations under conventional, reduced tillage-rye cover (NT, Rye), and reduced tillage-mixed cover (NT, Mixed) management practices at Lamesa, TX.

Management	Depth	pH	EC	Nitrate-N	P	K	Ca	Mg	S	Na
Practice	cm	-----	µmhos cm^{-1}	mg kg^{-1}						
Conv.	0-15	7.7	131	9.8	40	265	591	619	2.7	26
	15-30	7.8	140	10.0	28	261	649	667	5.4	45
	30-60	8.1	174	10.2	7	223	903	789	6.6	98
NT, Rye	0-15	7.6	154	10.0	52	350	630	611	3.8	17
	15-30	7.9	138	9.5	37	270	550	626	3.6	26
	30-60	8.0	160	9.6	14	236	745	764	4.7	63
NT, Mixed	0-15	7.6	148	10.0	49	334	653	643	3.6	18
	15-30	7.9	148	9.5	40	282	573	665	3.5	22
	30-60	8.0	165	9.6	9	227	737	832	4.6	62

Soil Moisture

Stored soil moisture was greatest in conventional plots until cover crops were terminated (Fig. 3). Reduced tillage and cover cropping enabled this sandy clay loam soil to store greater moisture following a rainfall event compared to conventional practices (Figs. 3 and 4). After cotton was planted, there was little to no difference in stored moisture between plots. With little rainfall in August, soil moisture decreased in all plots; however, the decrease was much more rapid under conventional tillage compared to reduced tillage. Differences in stored soil moisture between management practices, especially in a sandy soil appear to be much more dramatic at moisture extremes. In other words, in wet conditions reduced tillage and cover cropping enables the soil to retain greater moisture when there is a tendency for greater percolation. Reduced tillage and cover cropping through added organic matter and less soil disturbance will likely improve soil structure and pore space in sandy soil; thus, in wet and dry conditions, conservation practices improve the soils ability to store moisture.

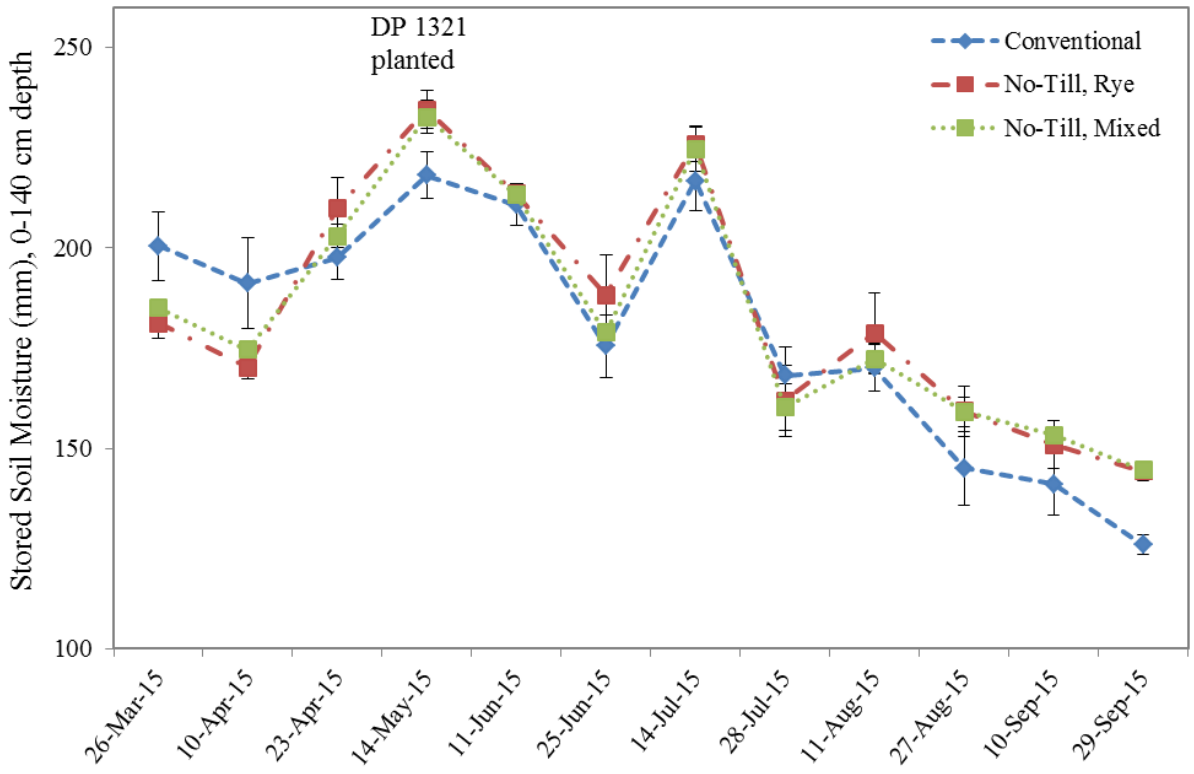


Figure 3. Stored soil moisture to a soil depth of 140 cm under conventional tillage, reduced tillage-rye cover (No-Till, Rye), and reduced tillage-mixed cover (No-Till, Mixed).

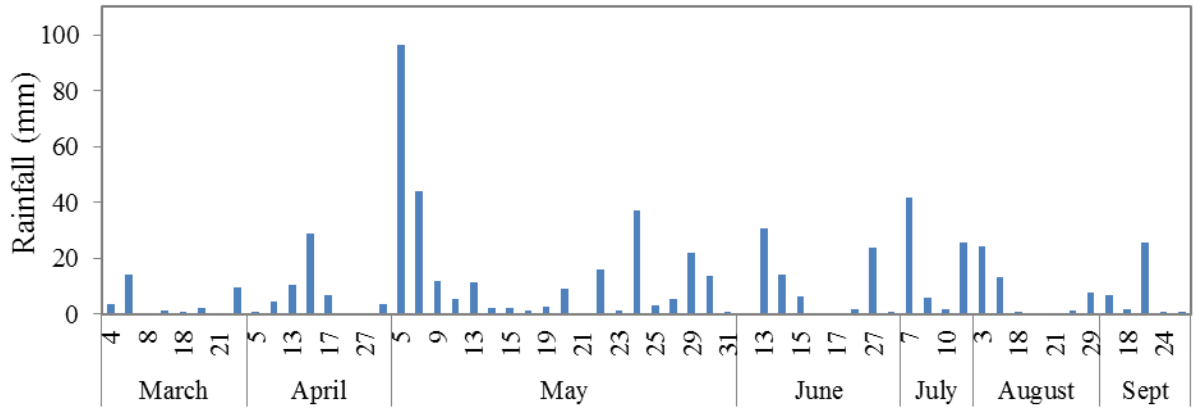


Figure 4. Rainfall events from March to September 2015.

Cover Crop Biomass and Nitrogen Uptake

Biomass produced under rye cover (3,413 kg DM ha^{-1}) was much greater than under mixed cover (2,015 kg DM ha^{-1}) (Table 2). As a result, N uptake was greater with rye cover (118 kg N ha^{-1}) compared to mixed cover (82 kg N ha^{-1}).

Table 2. Biomass (dry matter, DM) and N uptake with rye and mixed cover crops.

	Biomass (DM)	N Uptake
Cover Crop	kg ha^{-1}	
Rye	3,413	118
Mixed	2,015	82

Cotton Yield

Cotton lint was not significantly different between conventional and no-till cover crop systems. Lint yield averaged 887 kg ha^{-1} for conventional tillage, 903 kg ha^{-1} and 852 kg ha^{-1} for the rye and mixed no-tillage systems respectively. Lint turnouts averaged 37%.

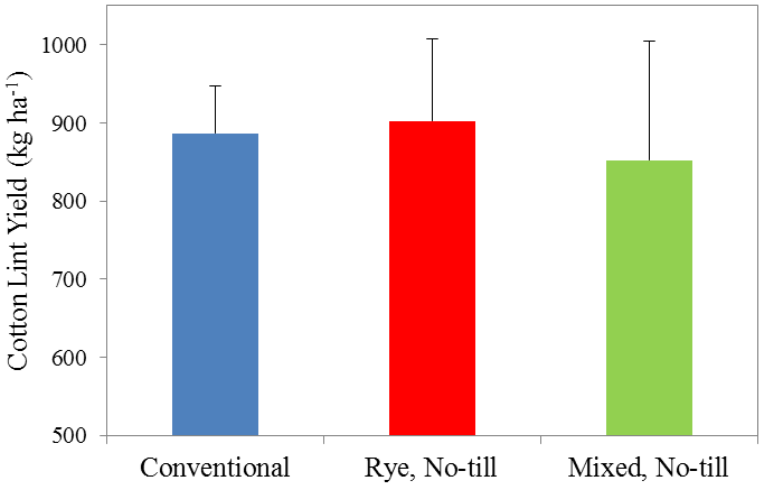


Figure 5. Cotton lint yield (kg ha^{-1})

Soil Health Test Assessment

Other than available phosphorus and nitrogen, all other parameters were greater in the no-till cover crop systems than the conventional tillage system (Table 3).

Table 3. Soil Health Test parameters measured in surface soil (0-15 cm) following cover crop termination in May 2015.

Management Practice	Org C[1]	Org N	Plant Available Nutrients				Nutrient Value[3]	Soil Health[4]
			NO_3^--N	N[2]	P_2O_5	K_2O		
	mg kg^{-1}		kg ha^{-1}				$ ha^{-1}	
Conventional	109 b	12.2 b	1.1 b	9.5 b	67	115 c	102.48 b	3.15 b
Rye Cover	161 a	18.4 a	1.6 b	15.0 ab	94	187 a	154.39 a	4.75 a
Mixed Cover	159 a	18.5 a	2.5 a	21.0 a	88	160 b	142.56 a	5.21 a
P-value	0.007	0.001	0.01	0.017	0.098	0.0003	0.006	0.001

[1] Organic C and N: water extractable organic C and N.

[2] N: calculated as NH_4^+-N + 70% of NO_3^--N + (microbially active C*organic N*4).

[3] Nutrient Value: value in dollars per acre of nutrients currently in the soil.

[4] Soil Health: calculated to include a weighted contribution of microbial activity and water extractable organic C and N.

[5] Within columns, means with the same letters are not significantly different at α=0.05.

TITLE:

Evaluation of cotton yield, quality, and plant growth response to soil-applied potassium at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Katie Lewis – Assistant Professor; Gaylon Morgan – State Cotton Specialist
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:	11 May 2015
	2 June 2015 (replanted due to hail damage)
Harvest:	4 November 2015
Variety:	Deltapine 1321 planted at 53k seed per acre
Rainfall:	12.4” in season
Irrigation:	10.36” High 8.65” Medium 4.28” Low

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 potassium on cotton yield, quality, and return on investment.

Soil cores were collected by plot to determine existing potassium levels before season. Potassium was applied to the study in two forms with two different application methods at five different rates. All potassium fertilizer was applied pre plant on 25 April 2015. The treatments were 0, 40, 80, 120, and 160 lb/acre of K using both broadcast and knife injected application 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 2-4” off the top center of the bed and placed to run 6” beneath the surface. The second form of potassium was granular muriate of potash (0-0-60). After application a rolling cultivator was used across all plots to incorporate the granular fertilizer and close any trenches left open by injection knives. Cotton was planted 11 May 2015, but due to hail damage had to be replanted (2 June 2015). Treatments were replicated three times within three irrigation levels (high, medium, and low). Data collected included soil macronutrient concentrations, in-season plant measurements (stand counts, total nodes, boll distribution, and vigor ratings), K content of leaf tissue, and lint yield and quality. Plots were harvested 4 November 2015 using a JD 7445 with an onboard weigh system.

RESULTS AND DISCUSSION:

Soil Nutrient Characterization

Soil at the AG-CARES farm is classified as an Amarillo fine sandy loam with an alkaline pH (7.8 – 8.0). Regardless of soil depth, K concentrations are above the critical range of K (150 mg/kg) and considered sufficient for cotton production.

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

Soil Depth (inches)	pH	EC (µS/cm)	NO_3^--N	P	K	Ca	Mg	S	Na
			----------(mg/kg)----------						
0-6	7.8	163	8.4	33	392	1311	280	5.1	8
6-12	7.8	148	8.5	15	294	1287	291	5.0	10
12-24	8.0	194	9.1	9	252	2198	413	8.5	38

Leaf Tissue K

Under high irrigation, leaf tissue K was greater when K was applied at the greatest rate 160 lb/acre (Fig. 1). However, differences between rates only existed for knife injected K. Leaf tissue K was greater with 160 lb/acre injected K (1.81% K) compared to the control (1.67% K) and the 40 lb/acre (1.69% K) and120 lb/acre (1.70% K) injected K treatments. Trends did not exist under low irrigation.

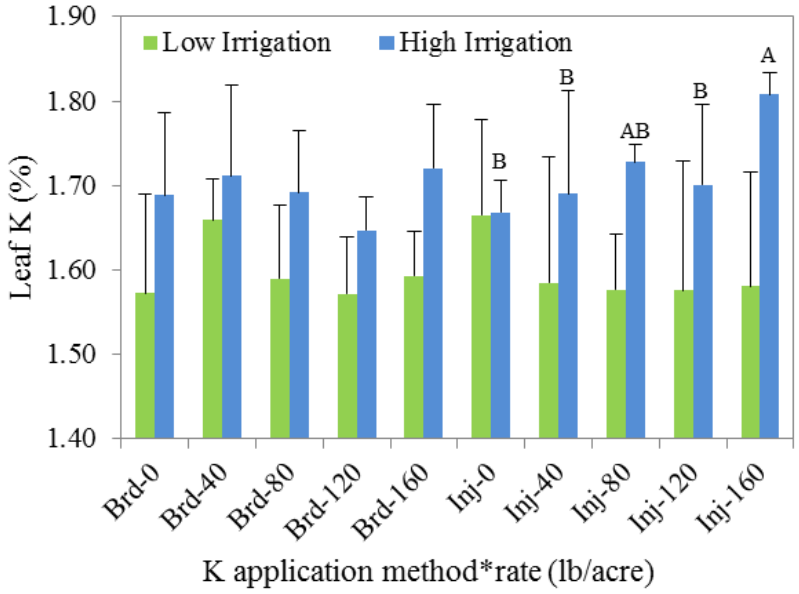


Figure 1. Leaf K content as affected by irrigation and K application rate. Bars represent standard deviation of the sample mean. Mean values followed by the same letter within application method and irrigation level are not significantly different at $P < 0.05$.

Cotton Lint Yield

Lint yield was different among irrigation levels particularly between the low level which received 4.28” of irrigation and the medium and high levels at 8.65” and 10.36”, respectively (Fig. 2). Lint yield averaged 1072 lb/acre under the low irrigation level with treatment yields ranging from 977 lb/acre at the low K application rate (40 lb/A broadcast) to 1145 lb/acre at the high K application rate (160 lb/acre injected). Under high irrigation, lint yield averaged 1733 lb/acre with treatment yields ranging from 1640 lb at the low K application rate (40 lb/acre broadcast) to 1868 lb/acre at the high K application rate (160 lb/acre injected).

Differences between application rates of K within irrigation level only existed when K fertilizer was knife injected under the high and medium irrigation levels but not the low irrigation level (Fig. 2). Under high irrigation lint yield was greater for the high rate of knife injected K compared to the control (0 lb/acre) and 40 lb/acre application rate. Lint yield was increased by nearly 200 lb when 160 lb/acre K was knife injected compared to the control. Under medium irrigation the highest rate of injected K (160 lb/acre) resulted in greater lint yield than the 0 lb/acre, 40 lb/acre, and 80 lb/acre injected K treatments.

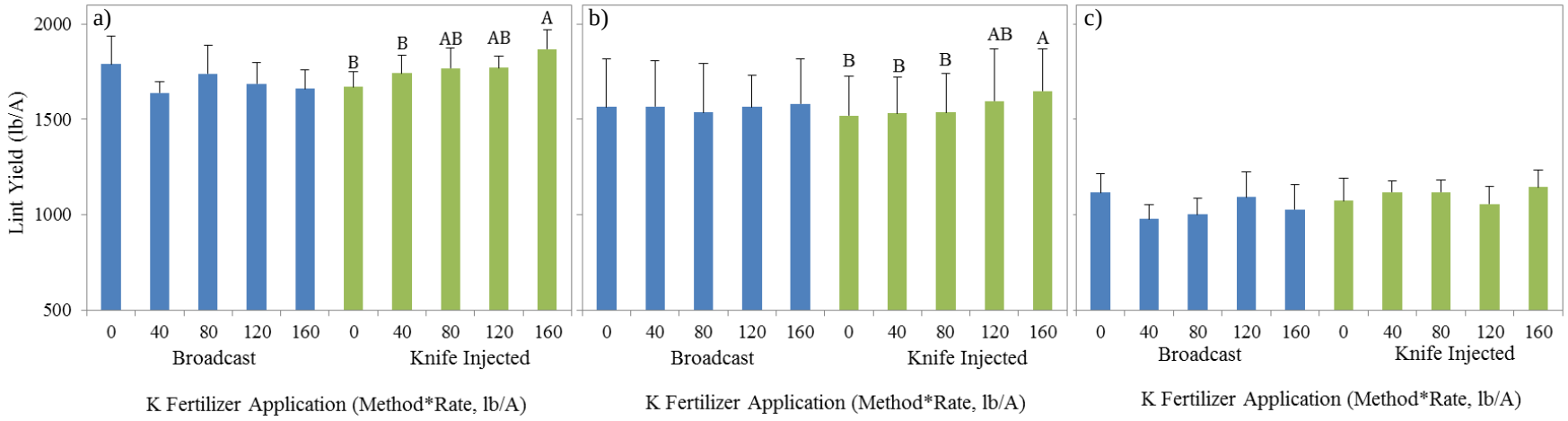


Figure 2. Lint yield (lb/A) between application method, rate, and irrigation level [a) high irrigation; b) medium irrigation; c) low irrigation]. Bars represent standard deviation of the sample mean. Mean values followed by the same letter within application method and irrigation level are not significantly different at $P < 0.05$.

TITLE:

Results of the Root-Knot Nematode (RKN) Cotton Variety Performance Test and Nursery at AG-CARES, Lamesa, TX, 2015.

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 15th
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:	5.7 acre-in applied May-September
Harvest Aid:	Bollbuster @1.5 pt/A+Display @1oz/A applied Oct. 10th
	ETX @ 1oz/A applied Oct. 19
Harvest Date:	October 27th

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. The Texas A&M AgriLife Research cotton breeding program at Lubbock utilizes the same location to select progeny from RKN resistant breeding populations and advance promising lines for yield performance testing.

RKN Variety Test

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.

Thirty-two cotton varieties and experimental strains, from 4 different seed companies were submitted for variety testing in a field where root-knot nematodes are known to be present. Average yield was 1,206 pounds of lint per acre with a test coefficient of variation of 7.7 and 109 pound least significant difference. Yields for the test ranged from 1,510 pounds of lint per acre to 1,010 pounds of lint per acre. PHY 417 WRF allowed the lowest level of nematode reproduction in 2015 while obtaining a yield of 1,071 pounds of lint per acre (Table 1). Root-knot nematode counts indicate uniform, consistent pressure, allowing for excellent evaluation of varietal response.

Fiber quality from commercial RKN-tolerant varieties appears to be improving (Table 2). Average fiber length was 1.09in with a range of 1.14-1.03in. Average strength was 30.8g/tex with a range of 33.3-26.9g/tex. Micronaire averaged 4.3 with a range of 4.9-3.5. Leaf grades were higher than normal in 2015, averaging 4, and ranging from 3-6. Coefficient of variation was high for leaf grade, and no varietal factor appeared to be responsible.

Root-knot Nematode Nursery

One hundred sixteen individual plant selections harvested in 2014 and screened in the greenhouse during 2015 were planted in a nursery under pivot irrigation in Lamesa where RKN numbers were high. The nursery was planted in 1 row, 33ft, un-replicated plots on May 15th. One hundred twenty-three plant selections and boll samples were harvested in 2015, along with 10 whole rows. Selections were based on greenhouse screening from the previous generation plant selection, boll type, maturity, yield potential and fiber quality. All individual plant selections were screened in the greenhouse for gall production since RKN pressure can be variable in the nursery. Plant selections with good RKN response results with data that indicate improved fiber quality, boll type, and yield potential will be considered for advancement to the 2015 nursery. The 16 rows selected for 2016 yield testing were screened in the greenhouse for both gall production and egg reproduction. These lines will be planted in multi-location small-plot replicated trials, with different levels of RKN pressure, in 2016.

Table 1. Yield and agronomic property results from the irrigated root-knot nematode cotton variety test conducted at AG-CARES, Lamesa, TX, 2015.

		Agronomic Properties													
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm		RK/500cc	Log10	LOG10) (mean sep.
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	29-Sep	Resistance	Height	soil	(RK)	P=0.05)
FiberMax FM 2011GT	1510	30.4	47.1	40.6	31.9	6.7	10.5	7.6	35.6	65	5	33	3210	3.500	fg
Stoneville ST 4946GLB2	1408	29.6	48.1	39.5	31.3	6.0	10.5	7.3	32.6	53	5	33	4320	3.618	c-g
Deltapine DP 1558NR B2RF	1367	31.4	45.2	41.6	32.2	6.0	9.9	7.3	34.1	38	5	35	1260	2.875	hi
Americot AMDG-7824	1335	30.8	45.1	41.5	31.9	5.3	9.5	7.1	30.6	59	5	34	24630	4.203	abc
Americot AMDG-3-6951 XF	1291	30.2	47.2	41.4	31.7	6.1	9.6	7.1	35.5	55	6	34	18150	4.094	a-e
FiberMax FM 1911GLT	1289	30.3	47.0	39.9	30.1	6.2	11.6	8.2	30.1	71	6	31	4740	3.588	d-g
Stoneville ST 6182GLT	1286	32.1	44.7	44.7	34.6	5.3	8.8	7.7	30.3	48	4	35	19830	4.187	abc
Deltapine DP 1454NR B2RF	1280	31.5	44.1	41.7	30.0	5.4	9.2	7.1	31.9	38	5	36	7230	3.695	b-g
NexGen NG 3500 XF	1278	30.1	46.8	38.9	29.2	5.1	9.5	6.5	30.4	64	5	33	14160	4.029	a-f
Bayer CropScience BX 1636GLT	1269	30.8	46.8	41.9	31.5	6.0	10.7	8.2	30.6	71	6	32	3300	3.264	gh
Americot AMDG-3X2 XF	1267	29.7	45.4	40.7	32.3	5.5	9.2	6.6	33.5	68	5	34	32640	4.418	a
NexGen NG 3517 B2XF	1241	28.1	47.0	38.5	29.9	5.1	9.4	6.2	31.5	63	5	34	36930	4.483	a
NexGen NG 3405 B2XF	1235	30.3	45.4	39.8	30.6	5.2	9.8	6.9	30.1	60	5	31	18000	4.150	a-d
PhytoGen PHY 308 WRF	1231	27.7	46.0	38.9	29.6	5.3	10.5	7.1	29.4	56	5	33	2970	3.273	gh
Bayer CropScience BX 1637GLT	1226	29.8	47.5	38.6	29.2	6.7	11.0	7.4	35.2	70	6	32	1980	3.140	ghi
FiberMax FM 2484B2F	1224	30.4	47.8	38.4	32.9	6.1	10.1	6.7	34.9	64	5	32	36180	4.468	a
NexGen NG 3406 B2XF	1222	30.1	45.9	40.4	31.1	5.5	9.5	7.0	31.7	68	5	31	19200	4.255	ab
Bayer CropScience BX 1532GLT	1220	32.7	42.7	43.8	33.9	5.3	9.0	7.7	30.4	64	5	33	3570	3.529	efg
PhytoGen PX 3003-04 WRF	1211	28.5	47.9	37.4	28.8	5.4	9.8	6.2	32.6	38	5	34	600	2.666	ij
Americot AMDG-1-5999 B2XF	1193	28.7	47.2	37.2	28.5	4.9	10.0	6.2	29.3	59	5	31	22650	4.245	ab
Americot AMDG-3-7040 XF	1168	30.3	47.0	38.4	28.3	5.0	9.4	6.3	30.4	61	5	33	43260	4.592	a

Americot AMDG-2-6489 B2XF	1154	30.4	46.9	40.3	30.4	5.7	9.7	6.9	33.2	61	5	33	30990	4.275	ab
Americot AMDG-5964-B2XF	1145	29.5	47.5	39.1	30.6	5.6	9.5	6.5	34.2	68	5	34	22680	4.263	ab
PhytoGen PHY 487 WRF	1140	28.3	46.8	39.4	28.6	4.7	8.9	6.2	30.2	46	5	36	1590	2.854	hi
Stoneville ST 5115GLT	1092	27.8	45.5	38.6	30.3	5.7	10.5	7.0	31.5	58	5	33	13530	4.005	a-f
PhytoGen PHY 417 WRF	1071	30.5	47.5	40.4	32.0	5.0	8.7	6.3	31.7	48	5	32	140	2.138	j
Stoneville ST 4949GLT	1063	30.0	44.0	42.1	31.5	5.2	9.4	7.2	30.5	49	5	34	15210	4.134	a-d
Stoneville ST 4848GLT	1058	29.8	45.2	41.3	33.1	5.5	9.4	7.1	31.9	68	5	31	30150	3.715	b-g
Bayer CropScience BX 1634GLT	1058	28.8	46.8	39.9	29.6	5.2	9.5	6.7	31.0	76	6	31	28530	4.367	a
PhytoGen 427 WRF	1048	28.6	47.2	40.3	29.0	4.4	9.3	6.5	26.9	58	5	34	1400	2.781	hi
Bayer CropScience BX 1638GLT	1013	29.2	45.5	37.2	28.5	5.2	9.7	6.1	31.3	40	5	33	12360	4.051	a-f
NexGen NG 4545 B2XF	1010	29.1	46.1	39.0	29.7	5.1	9.3	6.3	31.5	59	5	32	15810	4.169	a-d
Mean	1206	29.9	46.3	40.0	30.7	5.5	9.7	6.9	31.7	58	5	33			
c.v.%	7.7	3.3	2.9	2.0	3.3	6.2	2.4	2.7	6.0	15.7	12.2	6.3			
LSD 0.05	109	1.1	1.6	1.4	1.7	0.6	0.4	0.3	3.2	11	1	2			

Table 2. Fiber quality results from the irrigated root-knot nematode cotton variety test conducted at AG-CARES, Lamesa, TX, 2015

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
FiberMax FM 2011GT	4.2	1.09	81.8	31.1	7.3	5	72.7	8.1	41-1,51-3
Stoneville ST 4946GLB2	4.2	1.11	82.5	32.8	8.8	5	71.4	8.9	42-1,42-2
Deltapine DP 1558NR B2RF	4.6	1.11	81.9	33.3	8.4	5	73.1	9.6	32-2
Americot AMDG-7824	4.6	1.03	80.0	26.9	7.4	3	72.0	9.4	32-2,42-1
Americot AMDG-3-6951 XF	4.9	1.06	81.9	32.1	8.5	3	73.4	9.6	32-1,32-2
FiberMax FM 1911GLT	4.2	1.14	82.1	31.9	7.3	4	73.9	8.5	31-4,41-3
Stoneville ST 6182GLT	4.5	1.08	80.8	28.4	7.7	4	74.5	9.1	31-4
Deltapine DP 1454NR B2RF	4.5	1.06	80.5	29.9	8.9	4	71.6	9.3	42-1
NexGen NG 3500 XF	4.8	1.08	81.5	31.9	8.5	3	72.4	9.2	42-1
Bayer CropScience BX 1636GLT	3.9	1.16	81.1	30.6	6.4	5	72.3	8.6	41-3
Americot AMDG-3X2 XF	4.8	1.06	81.3	32.7	8.5	5	71.1	9.2	42-1
NexGen NG 3517 B2XF	4.6	1.10	80.9	31.0	8.1	3	71.3	9.1	42-1
NexGen NG 3405 B2XF	4.3	1.03	79.3	26.2	7.7	3	73.6	9.3	31-4,32-2
PhytoGen PHY 308 WRF	4.0	1.11	83.1	34.4	8.1	6	68.6	8.8	42-2,52-1
Bayer CropScience BX 1637GLT	3.5	1.14	80.9	31.7	6.5	5	73.3	8.6	41-3
FiberMax FM 2484B2F	3.6	1.14	81.2	32.4	7.1	5	73.3	7.9	41-2
NexGen NG 3406 B2XF	4.4	1.09	82.3	31.2	8.4	3	72.1	9.0	41-3,42-2
Bayer CropScience BX 1532GLT	4.6	1.07	80.5	28.5	8.3	4	73.6	8.9	32-2,41-3

PhytoGen PX 3003-04 WRF	4.3	1.09	80.5	30.6	7.7	3	73.9	8.7	31-4,41-3
Americot AMDG-1-5999 B2XF	4.2	1.10	80.0	29.7	7.6	3	70.5	9.1	42-1
Americot AMDG-3-7040 XF	4.9	1.06	81.7	33.0	8.4	3	71.6	9.6	42-1
Americot AMDG-2-6489 B2XF	4.8	1.06	81.7	30.1	6.7	4	71.0	9.3	42-1,42-2
Americot AMDG-5964-B2XF	4.6	1.09	80.4	29.5	6.0	4	71.9	9.2	42-1
PhytoGen PHY 487 WRF	4.0	1.05	79.6	29.4	8.4	4	71.6	8.8	41-4,42-1
Stoneville ST 5115GLT	4.1	1.06	79.3	30.7	8.0	3	74.6	8.5	41-1,41-3
PhytoGen PHY 417 WRF	3.5	1.08	81.4	30.4	9.2	5	71.2	8.8	41-3,42-2
Stoneville ST 4949GLT	4.2	1.10	82.3	31.5	7.2	3	71.6	9.0	42-1
Stoneville ST 4848GLT	4.3	1.10	81.2	30.1	7.3	5	71.6	9.1	42-1
Bayer CropScience BX 1634GLT	3.8	1.12	81.7	31.4	7.3	4	72.7	8.9	41-3
PhytoGen 427 WRF	3.8	1.10	81.2	31.7	8.2	4	71.9	8.9	32-2,41-4
Bayer CropScience BX 1638GLT	3.8	1.12	80.1	31.0	8.1	5	73.2	9.6	32-1,42-1
NexGen NG 4545 B2XF	4.5	1.08	81.2	30.4	6.6	3	72.3	9.2	42-1
Mean	4.3	1.09	81.1	30.8	7.7	4	72.3	9.0	
c.v.%	4.9	1.7	0.8	3.0	10.1	28.3	1.4	3.0	
LSD 0.05	0.4	0.03	1.1	1.6	1.3	2	1.7	0.5	

TITLE:

Impact of Varieties, Crop Rotation, and Irrigation on Root-knot Nematode Densities and Root Galls at AG-CARES, Lamesa, TX, 2105.

AUTHORS:

Terry Wheeler, Nick Ryan, James Grant, and Cecil Haralson

MATERIALS AND METHODS:

Varieties:	Deltapine (DP) 1454NRB2RF (2G), Fibermax (FM) 2011GT (1G), NexGen (NG) 1511B2RF (S), Phytogen (PHY) 417WRF (2G), and Stoneville (ST) 4946GLB2 (1G), where 2G indicates a 2-gene system of nematode resistance, 1G indicates partial (1G) system for nematode resistance, and S indicates susceptible to root-knot nematode.
Crop Rotation comparison:	Wheat/fallow/cotton versus continuous cotton.
Irrigation rates:	Base, and 30% above (High), and 30% below (Low) base rate.

Root samples were examined around 45 days after planting for root galls (20 plants/plot). Soil samples (20 cores/plot) were taken on 11-12 September in each plot. Soil samples were taken on the entire circle (spans 3 – 8; 9 wedges; on rows 12 and 36) on 12 December. All samples were assayed for root-knot nematode eggs, and for plant parasitic nematodes in general.

RESULTS AND DISCUSSION:

Root galls, which essentially represents the nematode pressure at-planting, were higher on the continuous cotton system (average of 1.4 galls/root)) than on cotton rotated with wheat/fallow (average of 0.2 galls/root). The susceptible variety, NG 1511B2RF had more galls (1.5, averaged over both cropping systems) than did the 1-gene (0.5 galls/plant) or 2-gene (0.3 galls/plant) systems of resistance to root-knot nematode.

Root-knot nematode density was higher in the continuous cotton system (2,351 root-knot nematodes/500 cm^3 soil) than in the cotton, rotated with wheat/fallow (367 root-knot nematodes/500 cm^3 soil). The high irrigation treatment had more nematodes (1,587 root-knot/500 cm^3 soil) than the base (1,212 root-knot/500 cm^3 soil) and low (1,279 root-knot nematodes/500 cm^3 soil) irrigation rates.

The wedges planted in cotton in 2015 averaged more root-knot nematodes (652/500 cm^3 soil) in December, than did the wedges planted in wheat in 2015 (382 root-knot nematodes/500 cm^3

soil). The wedges that were not irrigated (wheat and cotton) had fewer root-knot nematodes (139/500 cm^3 soil) than did all the irrigated wedges (which did not differ from each other and averaged 643 root-knot/500 cm^3 soil.

Crop rotation with wheat/fallow/cotton greatly reduced root-knot nematode density, compared with growing continuous cotton. Root-knot nematode ceased to be an issue on ground in this rotation scheme. Root-knot nematode resistant varieties also reduced the nematode populations, such that the following year there was less nematode pressure at the start of the growing season.

TITLE:

Economic Impact of Crop Rotation, Irrigation Rate, and Varieties that were Resistant or Susceptible to Root-knot Nematodes during 2012 to 2014 at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Terry Wheeler, Wayne Keeling, and Danny Carmichael

MATERIALS AND METHODS:

Cropping Systems:	Continuous Cotton (CCC), wheat/fallow/cotton (WFC), Dryland Cotton/Irrigated Continuous Cotton (DryC/C).
Irrigation rates:	Base (medium), Base+30% (high), Base-30% (low).
Variety:	Partially resistant (either Stoneville (ST) 5458B2F or ST 4946GLB2) versus susceptible (either Fibermax (FM) 2989GLB2, or NexGen (NG) 1511B2RF).

Information was applied into a spread sheet for calculating budgets (southplainsprofit.tamu.edu). Recommended prices supplied by the budget sheet for 2016 were utilized (wheat = $4.75/bushel, cotton close to $0.60/lb lint (adjusted slightly for HVI values or harvested variety).

RESULTS AND DISCUSSION:

The wheat/fallow/cotton system returned $128/acre more than the continuous cotton system and $95/acre more than continuous cotton irrigated rotated with dryland cotton (Table 1). The low irrigation rate returned $60 and $64/acre less than did the base and high irrigation rates, respectively. The variety that was partially resistant to root-knot nematode returned $29/acre more than did the nematode susceptible variety. All system combinations lost money when the price of cotton lint was approximately $0.60/lb lint. Cotton yields were 41% higher when cotton followed a wheat/fallow system than for continuous cotton. Cotton that received 30% more irrigation (equal water during the prewater and plant establishment, increased irrigation the rest of the season), had 11% higher yields than the base irrigation rate, and when irrigation was reduced by 30%, then cotton yield was reduced 24% compared to the base irrigation rate. The root-knot nematode resistant varieties yielded 11% more than the susceptible varieties.

Table 1. Returns above variable costs (RAVC in $/acre) for three cropping systems, three irrigation rates, and root-knot nematode partially resistant and susceptible varieties averaged over three years (2012 – 2014).

	Cropping System		Irrigation Rate			Variety Type		
Cropping System[1]	**RAVC ($/a)**	**Lbs lint /acre**	**Irr. rate**	**RAVC ($/a)**	**Lbs lint /acre**	**Var[2] type**	**RAVC ($/a)**	**Lbs lint /acre**
W/F/C	-80.09 a[3]	981 a	High	-131.96 a	844 a	Res	-140.03 a	766 a
CCC	-208.31 c	694 b	Base	-135.57 a	761 b	Susc	-168.73 b	691 b
DryC/C	-174.74 b	509 c	Low	-195.61 b	579 c			

[1]W/F/C is wheat/fallow/cotton rotation; CCC is continuous cotton; DryC/C is dryland cotton/irrigated cotton system.
[2]Variety type was Res=partially resistant to root-knot nematode, Susc = susceptible.
[3]Returns above variable costs followed by the same letter are not significantly different at P=0.05.

TITLE:

The Effect of Nematicides on Control of Root-knot Nematodes in Cotton at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

Terry Wheeler, Nick Ryan, James Grant, and Cecil Haralson

METHODS AND MATERIALS:

Nematicides to control root-knot nematodes include seed treatments (Avicta, Aeris, and CoPeo), and the liquid infurrow, Velum Total (applied at 14 oz/acre). Some of these products were tested at AGCARES in 2015, and compared back to control exhibited by Temik 15G. The test was conducted on two varieties, Stoneville (ST) 4747GLB2 (susceptible to root-knot nematodes), and ST 4946GLB2 (partially resistant to root-knot nematodes). Plot size was 36 feet long, 4 rows wide, with four replications/treatment. Since the results were consistent across both varieties, the overall averages will be presented.

RESULTS AND DISCUSSION:

Root galls are the best indication of whether a nematicide was effective at controlling the nematode. For this trial, the seed treatments Aeris and CoPeo (which will be new in either 2016 or 2017) did reduce the number galls/root system, compared with the susceptible check, which just had the insecticide Gaucho applied (Table 1). The combination of Velum Total plus Aeris seed treatment, and Temik 15G (5 lbs/acre) also significantly reduce galls caused by root-knot nematode. There was no significant reduction in eggs of root-knot nematodes on the roots at 45 days after planting, but certainly a trend towards lower egg numbers associated with Velum Total or Temik 15G. Yields were also not significantly improved with the addition of nematicides. The seed treatments averaged only 11 lbs more of lint/acre than the Gaucho only treatment (1% improvement), while Velum Total and Temik 15G averaged 42 lbs of lint (4% more) and 83 lbs of lint (8% more) than the Gaucho only treatment. That is consistent over the years with the yield relationship associated with seed treatment nematicides (Aeris or Avicta) relative to Temik 15G.

Table 1. Effect of seed treatment nematicides, Velum-Total and Temik on cotton infected with root-knot nematode at AGCARES.

Chemical*	Galls/ root	Root-knot Eggs/ gram root	Lbs of Lint/acre
Gaucho	9.1 a	1,367	998
Aeris (A)	7.8 b	1,334	1,012
CoPeo	5.1 bc	1,150	1,006
A+Velum Total	4.9 bc	750	1,040
Temik 15G	4.1 c	456	1,081

*Gaucho is an insecticide seed treatment; Aeris is a seed treatment containing both an insecticide and a nematicide; FLU-ST contained a nematicide seed treatment plus Gaucho Grande; Velum Total was applied as a liquid in-furrow at planting (14 oz/acre); Temik 15G was a granular nematicide applied at planting at 5 lbs/acre.

TITLE:

Cotton yield response to cotton fleahopper acute infestations as influenced by irrigation level treatments at AG-CARES, Lamesa, TX, 2015.

AUTHORS:

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

MATERIALS AND METHODS:

Plot Size:	4 rows by 300 feet, 3 replications
Planting date:	May 16, 2015
Fertilizer:	120-40-0
Treatments:	
Cultivar:	Deltapine 1454 B2RF FiberMax 2011 GT
Irrigation:	Low: Pre-plant = 0.8 inches; In-season = 3.6 inches High: Pre-plant = 0.8 inches; In-season = 7.1 inches
Cotton fleahopper:	2 insect stages (adults vs nymphs); 3 insect release treatments [control (zero cotton fleahopper), low fleahopper density (2 bugs per plant), high fleahopper density (5 bugs per plant),
Herbicides:	Roundup PowerMax® 1qt/A – January 28 Roundup PowerMax® 1 qt/A + 2,4-D 1 qt/A – April 9 Prowl® 3 pt/A – April 21 Roundup PowerMax® 1 qt/A – June 11 Roundup PowerMax® 1 qt/A + Dual Magnum® 1 pt/A – July 13
Insect release date:	July 2, 2015 (fleahopper susceptible stage)
Plant mapping date:	July 22, 2015 (in-season); October 14, 2015 (pre-harvest)
Harvest date:	October 26, 2015 (hand-harvested)

Cotton fleahopper feeding injury and resulting cotton lint yield were evaluated in two cotton cultivars, as affected by irrigation level, insect stages, and infestation densities. Two seasonal irrigation levels were evaluated, High (7.9") and Low (4.4"), under a center pivot irrigation system. Laboratory-reared and/or field collected cotton fleahoppers were released onto cotton terminals in 3-ft. (L) x 2-ft. (W) x 3 ft. (H) multi-plant cages (adults; Fig. 1) or in the 3-ft sections of cotton rows on open field (nymphs). Each section contained 7 plants.

Experimental design consisted of two insect stages (adults versus nymphs), three insect release treatments (high, low, and control), two water levels (high versus low), and two cotton cultivars (DP 1454 B2RF and FM 2011 GT), replicated three times and deployed in a randomized

complete block design (total 72 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 2, 2015 (Fig. 1), and then allowed to feed for one week in order to mimic a natural early-season acute infestation. A single release of cotton fleahoppers was timed to simulate the acute infestation of cotton fleahoppers while cotton was highly vulnerable to the fleahopper injury, which is approximately around 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 26. 2015.

There was no natural infestation of cotton fleahoppers at the experimental farm, so the control plots did not require any insecticidal intervention. Post-release data collection included plant mapping on July 22, a pre-harvest complete plant mapping on October 14, and harvesting on October 26, 2015.

RESULTS AND DISCUSSION:

Averaged across cultivars, irrigation levels, and insect stages, artificial augmentation of cotton fleahoppers caused 7.5 and 12.2% square loss following low and high levels of infestations, respectively, compared to 3.9% square loss in control plots (Fig. 2). This level of square loss in pre-flower cotton is considered a low to moderate level of insect-induced early fruit loss in Texas High Plains cotton. Overall, insect-induced square loss did not vary between the two cultivars, but cotton fleahopper nymphs caused significantly greater square loss compared to the adults. Interestingly, there was a significant cultivar x insect stage interaction in square loss phenomenon; with significantly greater damage by nymphs in DP 1454 B2RF than adults while nymphs and adults caused similar damage to FM 2011 GT (Fig. 2). Fleahopper crop damage, as measured by cotton square loss, did not significantly vary between the two water levels.

Although the crop was at a highly cotton fleahopper susceptible stage, the augmented cotton fleahopper densities of 2 and 5 per plant caused lower levels (7.5 and 12.2%) of fruit abscission than we had anticipated. Nevertheless, lint yield was significantly impacted by the fleahopper augmentation treatment, with significantly lower yields in fleahopper-augmented plots (Fig. 3). Lint yield values were 1415, 1233, and 1149 lb/acre in control, low, and high bug density treatments in high water plots and 1005, 890, 983 lb/acre in low water treatment plots, respectively (Fig. 4). The effect of fleahopper on lint yield was significant under high irrigation plots, but no significant effect of cotton fleahopper was observed in low irrigation plots, indicating plants' from low irrigation plots allowed for lowering of the fruit load via insect-induced fruit loss.

Figure 1. Multi-plant cages deployed in the field to examine the impact of cotton fleahopper densities on cotton yield, Lamesa, TX.

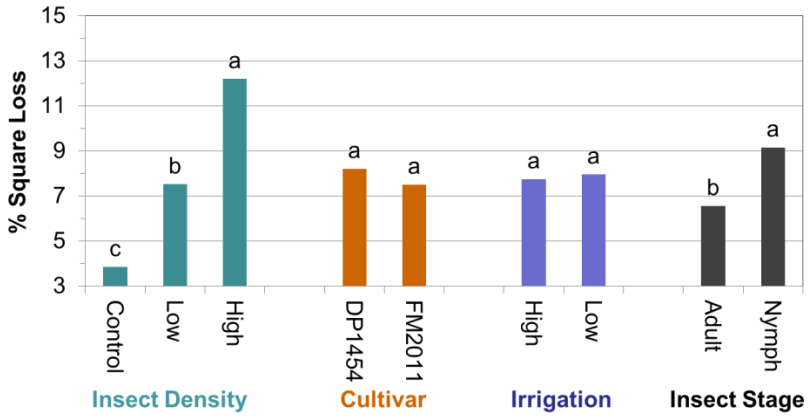


Figure 2. Average percentage square loss following a simulated acute infestation of cotton fleahoppers, achieved by augmenting 2 (low) and 5 (high) bugs per plant during the second week of squaring, under low and high irrigation regimes in two cotton cultivars, Lamesa, Texas, 2015.

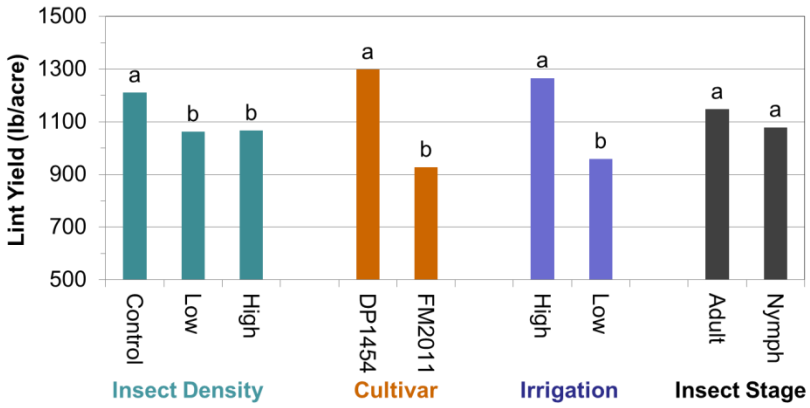


Figure 3. Average lint yield following a simulated infestation of cotton fleahoppers, achieved by augmenting 2 (low) and 5 (high) bugs per plant during the second week of squaring, under low and high irrigation regimes in two cotton cultivars, Lamesa, Texas, 2015.

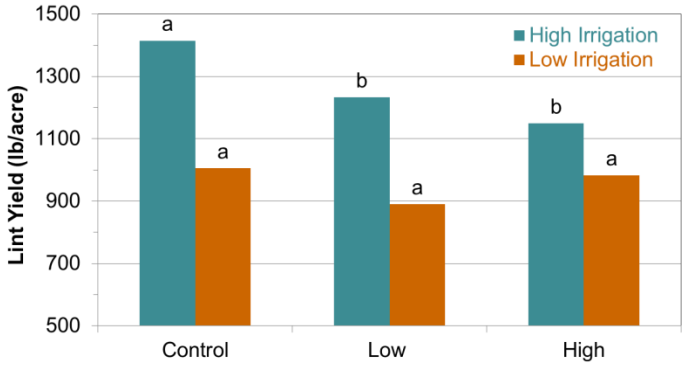


Figure 4. Average lint yield following a simulated acute infestation of cotton fleahoppers under high and low irrigation regimes, Lamesa, Texas, 2015.

	January			February		
Days	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	19	12	0	48	37	0
2	26	16	1.50	48	25	0
3	30	24	0	50	25	0
4	45	23	0	61	28	0
5	37	21	0	71	27	0
6	52	21	0	44	26	0
7	54	28	0	71	26	0
8	30	16	0	79	33	0
9	41	16	0	78	35	0
10	33	23	0	79	34	0
11	32	23	0	80	33	0
12	66	28	0	55	34	0
13	30	24	0	55	32	0
14	33	24	0	70	32	0
15	37	27	0	73	35	0
16	55	26	0	75	27	0
17	61	26	0	46	27	0
18	64	27	0	46	26	0
19	68	28	0	63	26	0
20	73	28	0	70	30	0
21	63	32	0	79	33	0
22	46	30	0	62	37	0
23	32	27	0.50	37	16	0
24	40	31	0	24	16	0
25	59	30	0	46	21	0
26	62	28	0	66	26	0
27	70	28	0	33	16	0
28	75	41	0	19	15	0
29	78	39	0			
30	59	37	0			
31	46	37	0.80			

	March			April		
Days	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	27	15	0	82	46	0
2	34	24	0	84	48	0
3	39	28	0	87	45	0
4	62	39	0	66	39	0
5	48	21	0	59	39	0
6	41	21	0	82	46	0
7	57	21	0	87	51	0
8	62	28	0	89	57	0
9	68	37	0	86	57	0
10	55	37	0	73	45	0
11	68	37	0	71	45	0
12	71	33	0	82	53	0.25
13	70	33	0	82	53	2.00
14	73	37	0	57	44	0
15	69	34	0	63	43	0
16	70	33	0	78	43	0
17	77	37	0	79	54	0
18	55	43	0	77	45	0
19	64	42	0	78	45	0
20	78	42	0	69	42	0
21	55	43	0.40	72	42	0
22	55	43	0	80	46	0
23	78	42	0	82	57	0
24	82	42	0	79	57	0
25	84	46	0	79	51	0
26	84	37	0	80	46	0
27	64	37	0	82	48	0
28	68	39	0	66	42	0
29	89	36	0	60	39	0
30	89	42	0	75	39	0
31	77	46	0			

	May			June		
Days	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	80	39	0	88	62	0
2	82	42	0	90	67	0
3	84	42	0	93	64	0
4	88	50	0	92	64	0
5	81	54	4.75	89	65	0
6	78	54	0	88	64	0
7	82	60	0	85	65	0
8	84	55	0	90	66	0
9	87	55	0	92	64	0
10	82	41	0	91	63	0
11	79	51	0	91	64	0
12	68	52	0.50	97	66	0.60
13	75	50	0.50	84	64	0.60
14	81	65	0	86	60	0.20
15	82	61	0	87	61	0
16	85	63	0	79	63	0
17	80	50	0	82	64	0
18	88	54	0.30	81	62	0
19	84	62	0	91	62	0
20	72	53	0.18	89	63	0
21	58	48	0	89	66	0
22	65	53	1.81	90	66	0
23	82	57	1.54	90	62	0
24	81	58	0	87	64	0
25	77	56	3.27	89	64	0
26	85	56	0	95	64	0
27	88	66	0	91	66	0
28	80	60	0.25	88	61	0
29	83	57	0	91	62	0
30	72	59	0.39	93	62	0
31	80	56	0			

	July			August		
Days	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	91	68	0	95	69	0
2	91	69	0	97	68	0.15
3	91	69	0	96	69	0.48
4	93	70	0	96	69	0.26
5	95	71	0	99	69	0
6	99	73	0.49	100	71	0
7	75	67	0.41	99	67	0
8	83	65	0	100	72	0
9	88	68	0	101	74	0
10	90	68	1.37	99	75	0
11	90	69	0.10	97	70	0
12	95	68	0	101	69	0
13	97	68	0	102	70	0
14	96	69	0	105	70	0
15	95	68	0	96	68	0
16	98	72	0	95	70	0
17	99	72	0	88	69	0
18	99	67	0	97	70	0
19	97	71	0	81	64	0
20	99	75	0	87	61	0
21	96	70	0	95	69	0.04
22	96	71	0	99	66	0
23	99	76	0	94	69	0
24	98	75	0	94	61	0
25	99	71	0	98	65	0
26	100	70	0	96	62	0
27	101	76	0	97	64	0
28	100	71	0	98	71	0
29	97	68	0	84	64	0.03
30	97	71	0	93	57	0
31	99	68	0	93	60	0

	September			October		
Days	Temp. Max	Temp. Min	Precipitation	Temp. Max.	Temp. Min.	Precipitation
1	94	65	0	94	62	0
2	94	62	0	83	60	0
3	94	61	0	74	57	0
4	95	64	0	66	53	0.04
5	96	67	0	73	55	0.06
6	97	71	0	84	47	0
7	96	72	0	83	60	0
8	98	69	0.17	73	59	1.45
9	85	67	0	75	60	0.13
10	92	65	0	75	57	0
11	90	64	0	90	60	0
12	88	63	0	85	57	0
13	96	65	0	85	48	0
14	95	67	0	90	51	0
15	94	58	0	91	63	0
16	93	63	0	72	58	0
17	97	69	0	80	50	0
18	98	72	0	79	56	0
19	85	64	0	79	56	0
20	79	67	0	81	54	0
21	91	59	0	71	60	0.50
22	91	72	0	71	56	1.48
23	83	63	0.24	75	58	0
24	78	59	0.01	62	47	0
25	89	63	0	68	40	0
26	91	57	0	72	35	0
27	88	57	0	79	43	0
28	90	57	0	70	45	0
29	90	56	0	78	43	0
30	90	55	0	73	59	0.15
31				71	46	0

	November			December		
Days	Temp. Max.	Temp. Min.	Precipitation	Temp. Max.	Temp. Min.	Precipitation
1	77	41	0	61	32	0
2	82	45	0	60	29	0
3	80	47	0	61	29	0
4	78	54	0	58	33	0
5	77	43	0	64	33	0
6	69	37	0	63	33	0
7	63	42	0	66	29	0
8	62	36	0	73	33	0
9	75	41	0	70	35	0
10	74	53	0	75	43	0
11	67	45	0	78	40	0
12	64	29	0	69	44	0.31
13	67	37	0	47	36	0
14	62	41	0	69	33	0
15	60	63	0.17	56	32	0
16	75	48	0.32	53	25	0
17	57	36	0	52	24	0
18	67	33	0	58	20	0
19	61	39	0	62	26	0
20	73	33	0	65	44	0
21	51	27	0	64	31	0
22	63	23	0	67	32	0
23	60	27	0	67	48	0
24	73	33	0	64	36	0
25	73	49	0	67	33	0
26	70	46	0	55	29	0.03
27	44	31	1.27	29	25	0
28	34	30	0.52	43	19	0.29
29	42	34	0.34	38	10	0.25
30	59	39	0.01	46	15	0.26
31				34	21	0