2014 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 15-2

Foreword:

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

Our AG-CARES site was the first stop for Congressman Mike Conaway's visit to Lamesa for "Cotton Day" on October 31, 2014. Jaroy Moore gave a brief history of the partnership between Lamesa cotton Growers and Texas A&M AgriLife over the past 24 years of AG-CARES. This was followed by Research and Extension updates by Wayne Keeling, Jane Dever, Terry Wheeler, and Jackie Smith. Dr. Doug Steele, Director of Texas A&M AgriLife Extension Service, and Dr. Ron Lacewell, Vice Chancellor for Federal Relations, provided greetings from the Texas A&M System. Danny Carmichael, site manager, assisted Congressman Conaway as he operated a cotton stripper and module builder on site. Later in the day, visits were made to King Mesa Gin and the USDA Cotton Classing Office to give Chairman Conaway hands-on experience with cotton production in West Texas.

AG-CARES continues to provide our Texas A&M AgriLife Research and Extension scientists an ideal location to conduct large scale research and demonstration studies in the sandy land soils under limited irrigation. Major issues addressed in 2014 were:

- Management strategies for root-knot nematodes
- Variety selection for efficient use of declining water tables
- Performance of Bollgard II XtendFlex varieties (Deltapine and Americot)

As always, we are especially grateful to Lamesa Cotton Growers for providing their support and the leadership provided by their officers:

Johnny Ray Todd, President
Quinton Kearney, Vice-President
David Zant, Secretary
Shawn Holladay, Past President
Kevin Pepper – Past President

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

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

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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
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Lamesa Cotton Growers, Inc.
2014

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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
PhytoGen Cotton Seed
Syngenta Crop Protection
Sam Stevens, Inc.
Monsanto/Delta & Pine Land Seed Co.

TITLE:

Cotton variety performance (continuous cotton) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

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

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 NexGen 1511 B2RF
Herbicides:	Prowl – 3 pt/A – April 14 Roundup PowerMax – 1qt/A + Dual 1pt/A June – 13 Roundup PowerMax – 1 qt/A – July 8
Fertilizer:	120-40-0

Irrigation in-season:

	Low	Base	High
Preplant	5.05”	5.05”	5.05”
In Season	3.0”	4.4”	6.0”
Total	8.05”	9.45”	11.05”

Harvest Date: November 12

RESULTS AND DISCUSSION:

Five cultivars were planted including PHY 417 WRF, DP 1454NR B2RF, FM 2011 GT, Stoneville 4946 GLB2, and NG 1511 B2RF under three irrigation levels in continuous cotton with a terminated rye cover crop. Lint yields—when averaged across irrigation—were 579 lbs/A (low irrigation), 705 lbs/A (base irrigation), and 861 lbs/A (high irrigation; Table 1). When averaged across irrigation levels, highest yields were produced with FM 2011 GT. Lint value was not affected by irrigation level or cultivar. Gross revenues ($/A) increased with irrigation level, but were similar between cultivars.

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

Cultivar	Irrigation Levels			Average
	Low (3.0)	Base (4.4)	High (6.0)	
		lbs/A		
DP 1454NR B2RF	632	656	819	702 A
FM 2011 GT	577	738	915	743 A
NG 1511 B2RF	584	662	788	681 A
PHY 417 WRF	521	672	924	706 A
ST 4946 GLB2	580	794	861	742 A
Average	**579 B**	**705 B**	**861 A**	--
		cents/lb		
DP 1454NR B2RF	48.55	47.40	47.70	47.88 A
FM 2011 GT	46.82	47.70	45.03	46.52 A
NG 1511 B2RF	47.01	46.20	47.00	47.00 A
PHY 417 WRF	48.40	47.36	46.27	47.27 A
ST 4946 GLB2	45.90	51.78	48.12	48.30 A
Average	**47.29 A**	**48.06 A**	**46.82 A**	--
		$/A		
DP 1454NR B2RF	307	311	388	335 A
FM 2011 GT	270	353	411	344 A
NG 1511 B2RF	274	306	371	323 A
PHY 417 WRF	252	318	432	333 A
ST 4946 GLB2	266	411	413	359 A
Average	**274 C**	**340 B**	**403 A**	--

TITLE:

Cotton variety performance (wheat-cotton rotation) as affected by low-energy precision application (LEPA) irrigation levels at AG-CARES, Lamesa, TX, 2014

AUTHORS:

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

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
NexGen 1511 B2RF

Herbicides: Prowl – 3 pt/A – April 14
Roundup PowerMax – 1qt/A + Dual 1pt/A June – 13
Roundup PowerMax – 1 qt/A – July 8

Fertilizer:

Timing	Irrigation Level		
	Low	Base	High
Pre-plant (lbs)	42-34-0	42-34-0	42-34-0
In-season (lbs)	60-0-0	90-0-0	120-0-0

Irrigation:

	Low	Base	High
Preplant	5.05”	5.05”	5.05”
In Season	3.0”	4.4”	6.0”
Total	8.05”	9.45”	11.05”

Harvest Date: October 28

RESULTS AND DISCUSSION:

Five cultivars were planted including PHY 417 WRF, DP 1454NR B2RF, FM 2011 GT, Stoneville 4946 GLB2, and NG 1511 B2RF under three irrigation levels in wheat residue that was maintained with no-tillage following harvest in October 2014. When averaged across cultivars lint yield averaged 775 lbs/A (low irrigation), 979 lbs/A (base irrigation) and 1100 lbs/A (high irrigation). When cultivars were averaged across irrigation levels, average yields ranged from 903-1022 lbs/A (Table 1). Yields increased with higher irrigation levels, but no differences in cultivars resulted. Cotton loan values tended to be high with higher irrigation, but

all cultivars produced similar loan values when averaged across irritation levels. Gross revenues ($/A) were similar at the base and high irrigation levels, and no difference between cultivar in gross revenue was reported when averaged across irrigation levels. The wheat-cotton rotation increased yields 28-29% compared to continuous cotton, but had little effect on loan value (Table 2). Gross revenues increased 20-40% across irrigation levels with the wheat-cotton rotation compared to continuous cotton.

Soil samples were assessed for Root-knot nematodes early season root galls. Results indicated that there was no significant decrease in nematode population density when compared to the continuous cotton system (Figure 1). The overall density of root-knot nematode was low at the start of 2014 and an increase in nematode population density during the growing the season was affected by cultivar, but not by rotation (Figure 2). Low initial nematode pressure was insufficient to cause substantial yield losses, so the susceptible NG 1511 B2RF was able to yield similar to the cultivars with some nematode resistance. However, the root-knot nematode buildup in the susceptible cultivar should eventually result in a more damaging nematode density in the future.

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

Cultivar	Irrigation Levels			Average
	Low (3.0)	Base (4.4)	High (6.0)	
		lbs/A		
DP 1454NR B2RF	806	875	1027	903 A
FM 2011 GT	726	1032	1132	963 A
NG 1511 B2RF	794	969	1072	949 A
PHY 417 WRF	717	991	1044	919 A
ST 4946 GLB2	822	1022	1224	1022 A
Average	**775 C**	**979 B**	**1100 A**	**--**
		cents/lb		
DP 1454NR B2RF	47.62	50.08	47.83	48.51 A
FM 2011 GT	45.13	49.18	46.92	47.08 A
NG 1511 B2RF	44.73	49.35	46.75	47.02 A
PHY 417 WRF	47.25	47.69	45.65	46.81 A
ST 4946 GLB2	44.48	47.72	50.02	47.36 A
Average	**45.83 B**	**48.81 A**	**47.43 AB**	**--**
		$/A		
DP 1454NR B2RF	386	438	491	438 A
FM 2011 GT	328	507	531	455 A
NG 1511 B2RF	355	477	502	445 A
PHY 417 WRF	340	473	477	430 A
ST 4946 GLB2	365	482	609	485 A
Average	**355 B**	**475 A**	**522 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.

Cultivar	Irrigation Levels		
	Low (3.0)	Base (4.4)	High (6.0)
		lbs/A	
Wheat -- Cotton Rotation	773	978	1099
Continuous Cotton (Wheat)	579	705	861
Change (%) with Rotation	**+34**	**+39**	**+29**
		cents/lb	
Wheat -- Cotton Rotation	45.83	48.81	47.43
Continuous Cotton (Wheat)	47.29	48.06	46.82
Change (%) with Rotation	**+3**	**+2**	**+1**
		$/A	
Wheat -- Cotton Rotation	355	475	522
Continuous Cotton (Wheat)	274	340	403
Change (%) with Rotation	**+30**	**+40**	**+30**

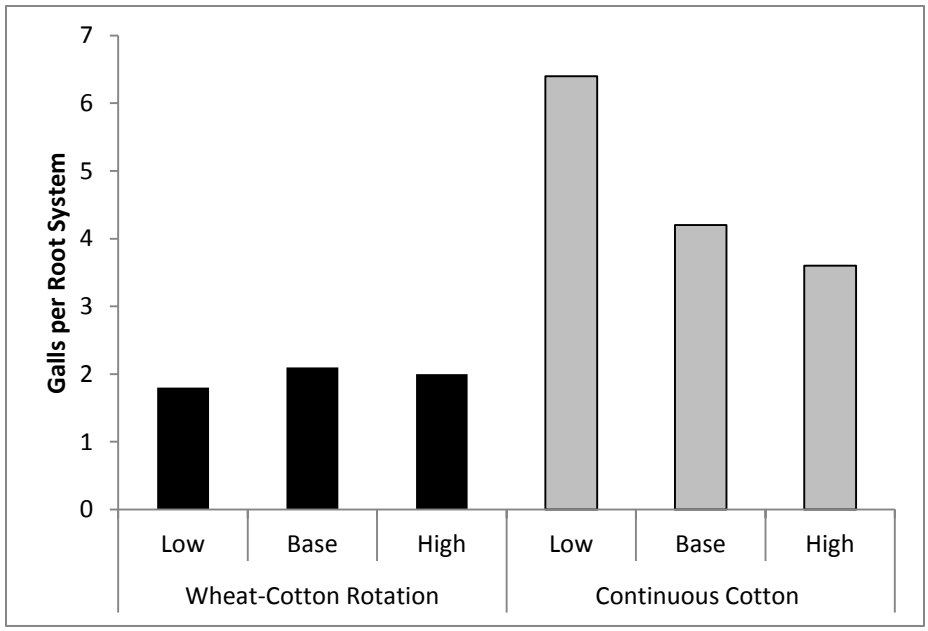

Figure 1. Effect of rotation on Root-knot nematode galls in cotton.

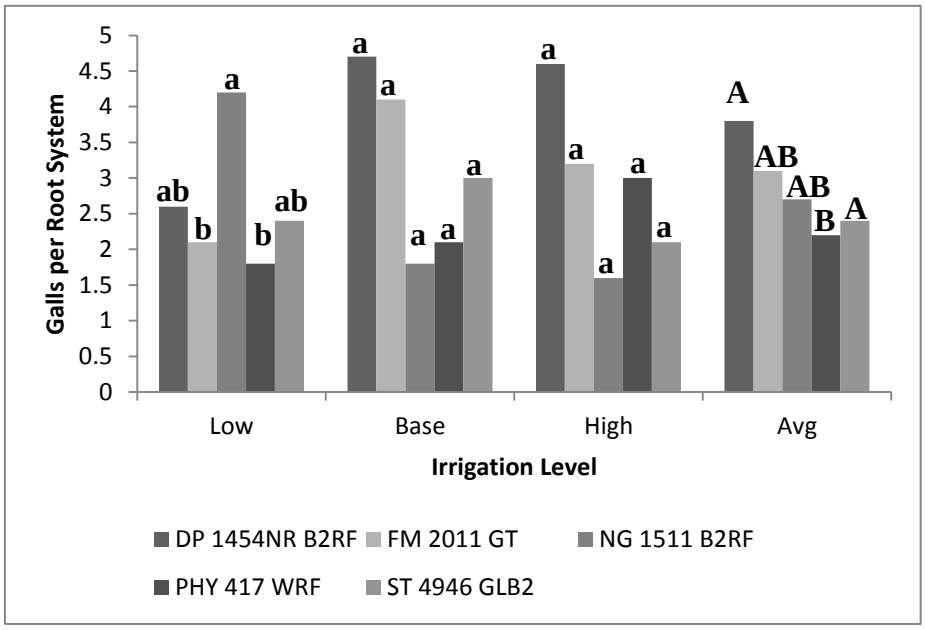

Figure 2. Effect of cultivar and irrigation levels on Root-knot nematode galls in cotton.

TITLE:

Evaluation of Americot Bollgard II® XtendFlex™ germplasm at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Wayne Keeling—Professor
Ken Lege—Director of Technical Service of Americot
Justin Spradley, Joel Webb and Martha Zwonitzer—Research Assistants

MATERIALS AND METHODS:

Plot Size:	2 rows by 30 feet, 4 replications	
Previous Crop:	Wheat harvested in 2013	
Planting Date:	May 14	
Variety:	All varieties listed in Table 1	
Fertilizer:	120-40-0	
Irrigation:	Pre-plant/Emergence	5.1”
	In-season	5.2”
	Total	10.3”
Rainfall:	7.55” (May-September)	
Harvest Date:	October 24	

RESULTS AND DISCUSSION:

Bollgard II® XtendFlex™ is genetically modified for tolerance to dicamba, glufosinate, and glyphosate herbicides. Americot, Inc. has licensed this technology and is developing new varieties which incorporate the trait. In this USDA regulated trial a number of Americot entries were evaluated for plant growth, yield and fiber quality. Varieties that are released when the trait is de-regulated will be among these tested. Yield, fiber quality and crop value data are summarized in Table 1.

Table 1. Yield and quality of Americot Bollgard II® XtendFlex™ germplasm at AG-CARES Lames, TX, 2014.

Variety/Line	Lint Yield (lbs/acre)	Lint Percent	Length (in)	Strength (g/tex)	Micronaire	Uniformity (%)	Loan Value ($/lb)	Crop Value ($/acre)
AMDG-3-6951	1353.7	0.4504	1.01	30	5.03	82.1	0.4664	561
AMDG-2-6333	1330.7	0.4573	1.03	29.4	4.93	81.2	0.4928	638
AMDG-1-5999	1326.8	0.428	1.11	29.4	4.52	81.5	0.5353	720
AMDG-5-7824	1314.9	0.4742	0.99	24.8	4.9	80.4	0.4459	572
AMDG-3-7162	1311.2	0.4407	1.04	28.9	4.94	81.2	0.4906	625
NG 3406 B2XF	1310.3	0.4567	1.06	28.2	4.72	81.9	0.5144	649
AMDG-3-7040	1310.3	0.4485	1.02	29.8	5.22	82.2	0.4696	605
AMDG-5-7739	1253.5	0.4606	1.01	25.2	4.78	80.6	0.4731	638
AMDG-2-6751	1247.7	0.4454	1.03	27.4	4.8	80.5	0.4924	575
FM 2484B2F	1241.1	0.4467	1.11	31.5	4.49	81.4	0.5374	633
AMX4350B2RF	1231.5	0.4391	1.05	27.4	4.79	81.3	0.5099	617
NG 1511 B2RF	1228.5	0.4653	1.06	29.6	4.72	81.8	0.5183	640
AMDG-3-7138	1225.8	0.4361	1.03	30.7	4.94	82.4	0.4893	636
AMDG-2-6397	1213.7	0.4431	1.05	28.8	5.08	81.5	0.4934	589
AMDG-5-8004	1211.8	0.4632	1	25.5	4.81	80.2	0.4666	580
AMDG-3-BULK	1179.9	0.4443	1.03	29.8	4.96	81.2	0.4834	570
AMDG-5-7693	1153.7	0.4473	1.03	25.7	4.64	80.1	0.4816	515
NG 4111 RF	1103.3	0.437	1.04	30.1	4.62	82.3	0.503	585
AMDG-2-6489	1103.1	0.4566	1	27.8	5.04	80.5	0.4489	485
AMDG-1-BULK	1092.4	0.4359	1.06	28.7	4.75	81.2	0.5226	570
AMDG-1-6044	1084	0.4405	1.05	27.9	4.62	80.1	0.5099	602
AMDG-4-7377	1058.3	0.4482	1.03	27.7	4.41	80	0.4956	496
NG 3405 B2XF	1056.8	0.4535	1.01	24.6	4.71	80.5	0.4678	520
NG 3348 B2RF	1026.3	0.4338	1.02	28	4.4	80.4	0.4891	488
AMDG-2-BULK	1020.8	0.4566	1	26.7	5.17	80.7	0.4399	445
NG 5315 B2RF	1016.3	0.4737	1.08	28.1	4.9	81.8	0.5203	549
AMDG-1-6202	1005.5	0.4334	1.04	30.2	4.63	79.9	0.5059	539
NG 5007 B2XF	996.8	0.4705	1.05	26	4.65	80.4	0.495	557
LSD	211.3	0.0157	0.05	2.3	0.38	1.8	0.0383	165
Grand Mean	1121.6	0.4458	1.04	28.2	4.74	81	0.4948	555
CV	16.05	2.11	2.75	4.79	4.84	1.31	4.63	17.79

TITLE:

Performance of Bayer CropScience varieties as affected by irrigation level at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Wayne Keeling—Professor
Justin Spradley, Joel Webb, Martha Zwonitzer—Research Assistants

MATERIALS AND METHODS:

Plot Size: 4 rows by 50 feet, 4 replications

Planting Date: June 11

Varieties:
FM 1320GL
FM 1830GLT
FM 2011GT
FM 2322GL
FM 2334GLT
FM 2484B2F
ST 4747GLB2
ST 4946GLB2

Herbicides:
trifluralin – 1.5 pt/A – April 11
Caparol – 1.5 pt/A – May 31
Roundup – 1 qt/A – July 12
Roundup – 1 qt/A – August 3

Fertilizer: 100-34-0 applied pre-plant and in-season

Irrigation:

	Low	Base	High
Pre-plant	5.1”	5.1”	5.1”
In-season	3.2”	7.7”	10.2”
Total	8.3”	12.8”	15.3”

Harvest Date: November 13

RESULTS AND DISCUSSION:

Six FiberMax and two Stoneville varieties were evaluated under dryland and three levels of irrigation (sub-surface drip). Irrigation levels were base (0.18 in/day pumping capacity, and +/- 50% of the base amount). This trial was replanted June 11, due to inconsistent stands resulting from a lack of rainfall in May and difficultly achieving adequate planting moisture with pre-plant drip irrigation. When averaged across varieties, increased yields were produced with increased irrigation level. When averaged across irrigation level, no difference in yield was determined among varieties. Irrigation level did not affect fiber qualities as measured by loan value, although differences were determined among varieties when averaged over irrigation level. Gross revenues ($/A) increased with increased irrigation level, but was not affected by variety. Results of this trial 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).

Variety	Irrigation Level				Average
	Dry (0.0)	Low (3.2)	Base (7.7)	High (10.2)	
			lbs/A		
FM1320GL	320 A	535 A	800 A	953 A	**552 A**
FM1830GLT	333 A	630 A	758 A	1134 A	**714 A**
FM2011GT	389 A	681 A	759 A	1164 A	**748 A**
FM2322GL	355 A	614 A	747 A	1041 A	**689 A**
FM2334GLT	396 A	601 A	797 A	1085 A	**720 A**
FM2484B2F	310 A	571 A	781 A	1067 A	**682 A**
ST4747GLB2	338 A	656 A	867 A	1045 A	**727 A**
ST4946GLB2	359 A	645 A	966 A	1002 A	**743 A**
Average	**350 D**	**617 C**	**809 B**	**1077 A**	--
			cents/lb		
FM1320GL	53.98 D	57.74 C	56.40 A	56.04 A	**56.04 B**
FM1830GLT	57.33 AB	57.24 A	57.58 A	57.42 A	**57.39 A**
FM2011GT	55.21 CD	53.73 C	56.25 A	55.84 A	**55.26 B**
FM2322GL	56.39 ABC	55.19 BC	54.36 A	56.78 A	**55.68 B**
FM2334GLT	57.13 AB	57.24 A	56.78 A	57.58 A	**57.18 A**
FM2484B2F	57.38 A	57.01 AB	56.33 A	57.57 A	**57.07 A**
ST4747GLB2	55.35 CD	55.71 ABC	56.94 A	55.66 A	**55.92 B**
ST4946GLB2	55.78 BC	54.39 C	56.9 A	55.76 A	**55.71 B**
Average	**56.07 A**	**56.03 A**	**56.44 A**	**56.58 A**	--
			$/A		
FM1320GL	173 A	293 A	451 A	535 A	**363 A**
FM1830GLT	191 A	361 A	437 A	651 A	**410 A**
FM2011GT	215 A	367 A	426 A	650 A	**414 A**
FM2322GL	201 A	339 A	408 A	591 A	**385 A**
FM2334GLT	226 A	344 A	453 A	625 A	**412 A**
FM2484B2F	178 A	326 A	439 A	644 A	**397 A**
ST4747GLB2	187 A	366 A	494 A	582 A	**407 A**
ST4946GLB2	200 A	351 A	550 A	561 A	**415 A**
Average	**196 D**	**343 C**	**457 B**	**605 A**	--

TITLE:

Results of the dryland cotton variety performance test, and the dryland advanced strains test at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Jane K. Dever—Professor; Carol M. Kelly—Assistant Research Scientists; and Valerie M. Morgan—Research Associate

MATERIALS AND METHODS:

Test:	Cotton variety, dryland
Planting Date:	May 15nd
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 31ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant Caparol @1.5pt/A applied after planting Stable @2oz/A applied June13th
Fertilizer:	11-40-0 lbs/A applied pre-plant 27 lbs/A nitrogen applied through fertigation
Irrigations:	3.3 acre-in applied pre-plant
Rainfall:	13.6 inches in season
Harvest Aid:	Bollbuster @1 qt/A+ET @ 2oz/A + 1% crop oil applied Oct. 4th ET @ 3oz/A + 1% crop oil applied Oct. 18th ETX @ 1oz/A + 1 pt/A gramoxone + 1% crop oil applied Oct. 31
Harvest Date:	November 20

RESUTLS AND DISCUSSION:

Cotton variety

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

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

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

Twenty-six cotton varieties from 5 different seed companies were submitted for variety testing at 5 locations, including the dryland location at AG-CARES in Lamesa. Average yield was 428 pounds of lint per acre with a test coefficient of variation of 14.4 and 73 pound least significant difference. The highest yielding variety was PHY 333 WRF with a yield of 549. The next 5 varieties in the test were not significantly different than the highest yielding variety (Table 4). PhytoGen, FiberMax and Deltapine brands were all represented in this top tier. Yields for the test ranged from 549 pounds of lint per acre to 325 pounds of lint per acre in 2014. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 72%, with a range from 60-85%. All of the varieties tested had storm resistance ratings from 4-6 with the test average of 5. Plant height averaged 28 inches and ranged from 26-30 inches across all varieties.

Fiber quality results can be found in table 4A. Average fiber length was 1.02in with a range of 1.07-.96 in. Average strength was 27.1g/tex with a range of 30.9-24.0g/tex. Micronaire averaged 4.6 with a range of 5.1-3.9.

Advanced strains

Eleven cotton strains and 5 commercial check varieties were entered for testing at 5 locations, including the dryland location at AG-CARES in Lamesa. Average yield was 335 pounds of lint per acre with a test coefficient of variation of 24.2 and 96 least significant difference. The highest yielding stain was 11-1-301FQ with a yield of 452. The next 6 strains in the test were not significantly different than the highest yielding strain (Table 5). Yields for the test ranged from 452 pounds of lint yield per acre to 221 pounds of lint per acre in 2014. Relative maturity of the varieties as indicated by percent open boll on a given date averaged 73% with a range from 65-79%. All of the strains tested had storm resistance ratings from 4-7 with a test average of 6. Plant height averaged 25 inches and ranged from 22-27 inches across all strains.

Fiber quality evaluations were not available at the time of the 2014 Annual Report publication.

Table 4. Yield and agronomic property results from the dryland regional cotton variety performance test at the AG-CARES farm in Lamesa, 2014.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	7-Oct	Resistance	Height
PhytoGen PHY 333 WRF	549	31.8	44.6	43.5	35.4	5.3	8.1	6.4	36.4	69	4	29
FiberMax FM 2011GT	493	31.3	43.2	40.9	32.7	5.5	9.2	7.1	31.8	60	5	28
FiberMax FM 4747GLB2	492	29.1	42.5	36.8	29.7	5.3	8.7	5.5	35.1	71	5	29
PhytoGen PHY 339 WRF	483	32.6	45.9	37.8	31.2	4.6	7.9	5.2	33.1	76	5	29
Deltapine DP 1219 B2RF	470	29.6	41.9	41.2	33.1	4.5	7.4	5.4	34.8	78	4	29
Deltapine DP 1321 B2RF	470	31.8	44.4	40.7	33.2	4.8	8.2	5.9	33.4	69	5	30
Stoneville ST 4946GLB2	468	29.4	43.6	40.3	33.7	6.2	9.8	7	35.9	76	5	28
Deltapine DP 1044 B2RF	457	29.4	43.3	38.9	31.3	4.4	7.6	5.4	31.3	83	4	27
NexGen NG 4111 RF	456	30.5	45	39.8	31.9	5	8.4	5.8	33.9	63	5	29
All-Tex CT 14515 B2RF	455	32.6	45.1	41.5	34.3	5.4	9	6.6	34.3	73	5	28
PhytoGen PHY 499 WRF	442	29.6	41.2	41.4	34	4.7	7.6	5.8	33.2	84	5	28
Deltapine DP 0912 B2RF	440	28.7	42.8	40.2	33.4	4.9	8.3	5.9	33.2	71	4	29
NexGen NG 3306 B2RF	427	29.8	44.5	40.3	34.1	4.8	8.4	5.9	32.9	76	5	30
FiberMax FM 2484B2F	426	30.3	44.1	42.4	34.7	4.5	8.4	6.3	30.2	75	5	27
PhytoGen PHY 367 WRF	417	29.3	43.5	40.8	33.9	4.5	8.1	7	27.5	69	4	28
FiberMax FM 2334GLT	413	32.9	41.8	45	36.2	4.6	7.3	6.4	32.5	85	5	27
FiberMax FM 1320GL	405	31.7	46.9	38.2	30.7	5.3	8.9	5.8	34.7	68	6	28
PhytoGen PHY 222 WRF	402	29.8	42.3	41.3	32.1	4.2	8.2	5.9	29.5	71	5	27
FiberMax FM 1944GLB2	396	27.8	42.7	40	32.2	5.2	9.1	6.2	33.5	80	5	26
FiberMax FM 9250GL	394	28.3	45.8	38.5	31.2	5.8	9.6	6.2	35.9	64	5	27
All-Tex CT 13442 B2RF	387	28.4	42.4	40.2	34	5.1	8.7	6.2	33	69	4	26
FiberMax FM 1830GLT	378	31.7	41.9	42.5	34.6	4.8	7.5	6	34.6	78	5	27
FiberMax FM 2322GL	378	32.6	40.3	43.2	34.6	5.1	8.6	7	31.4	58	5	29
NexGen NG 1511 B2RF	359	26.7	42.4	41.1	34.1	4.8	8.6	6.5	30.3	74	4	28
All-Tex Nitro-44B2RF	354	26.5	43	37.6	31	4.8	9	5.8	31.3	66	4	26
PhytoGen PHY 725 RF	325	27.7	44	37.2	30	4.5	8.9	5.7	29.6	65	4	28
Mean	428	30.0	43.4	40.4	32.9	4.9	8.4	6.1	32.8	72	5	28
c.v.%	14.4	3.4	3.5	2.7	3.2	4.7	3.3	0.5	6.7	11.0	18.9	5.9
LSD 0.05	73	1.2	1.8	1.9	1.8	0.4	0.5	0.7	3.8	9	1	2

Table 4A. Fiber quality results from the dryland regional cotton variety performance test at the AG-CARES farm in Lamesa, 2014.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
PhytoGen PHY 333 WRF	4.5	1.04	79.8	27.2	6.8	4	69.2	8.2	42-2,51-2
FiberMax FM 2011GT	4.3	1.03	79.5	27.3	6.9	3	71.3	8.6	41-3,41-4
FiberMax FM 4747GLB2	4.6	1.02	78.4	24.0	5.4	3	70.8	8.0	41-4,51-1
PhytoGen PHY 339 WRF	4.4	1.04	80.4	28.1	8.3	2	69.8	8.3	51-3,52-1
Deltapine DP 1219 B2RF	4.6	1.01	77.7	27.5	7.2	2	73.4	8.0	41-2,41-3
Deltapine DP 1321 B2RF	4.9	0.99	79.8	27.1	9.1	3	69.4	9.1	42-1,52-1
Stoneville ST 4946GLB2	4.9	1.00	80.4	28.0	9.2	2	69.4	8.9	42-2,52-1
Deltapine DP 1044 B2RF	4.9	1.01	80.1	27.1	9.5	3	71.3	8.3	41-1,52-1
NexGen NG 4111 RF	4.8	0.98	80.0	28.3	8.6	1	70.1	9.1	42-1,42-2
All-Tex CT 14515 B2RF	5.1	1.00	79.9	27.9	9.1	1	74.2	8.2	41-1
PhytoGen PHY 499 WRF	4.8	1.00	80.1	27.9	9.9	3	70.8	8.6	41-4,42-2
Deltapine DP 0912 B2RF	5.0	0.96	78.9	25.1	7.6	3	69.7	8.7	42-2,52-1
NexGen NG 3306 B2RF	4.9	1.07	82.1	30.6	8.6	2	71.7	8.3	41-4
FiberMax FM 2484B2F	4.2	1.03	79.1	26.1	6.7	2	71.0	7.9	41-2,51-3
PhytoGen PHY 367 WRF	4.6	0.98	78.6	25.3	8.3	4	68.3	8.7	41-4,52-1
FiberMax FM 2334GLT	4.8	1.05	79.9	27.1	6.6	1	71.2	8.0	41-2,41-4
FiberMax FM 1320GL	4.5	0.98	78.5	26.8	7.5	2	69.0	8.8	41-4,52-1
PhytoGen PHY 222 WRF	4.9	0.99	79.7	26.1	8.9	2	70.3	9.1	42-1,42-2
FiberMax FM 1944GLB2	4.7	1.04	79.3	25.9	6.0	2	72.1	7.5	41-4,51-1
FiberMax FM 9250GL	4.2	1.04	79.0	25.1	6.2	3	68.7	9.1	41-4,52-1
All-Tex CT 13442 B2RF	4.4	1.02	80.2	27.6	8.6	2	73.0	8.5	41-1,42-1
FiberMax FM 1830GT	4.6	1.04	80.0	26.6	5.8	2	71.7	7.9	41-4,51-1
FiberMax FM 2322GL	4.5	1.02	79.7	27.6	6.4	2	71.7	8.6	41-3,41-4
NexGen NG 1511B2RF	4.7	1.02	79.4	26.3	8.8	3	69.2	8.8	42-2,52-1
All-Tex Nitro-44B2RF	3.9	1.04	79.3	27.7	7.8	4	69.3	8.5	41-4,52-1
PhytoGen PHY 725 RF	4.2	1.06	80.2	30.9	8.4	2	69.0	9.0	42-2,52-1
Mean	4.6	1.02	79.6	27.1	7.8	2	70.6	8.5	
c.v.%	2.5	2.5	1.0	5.4	5.3	45.2	2.8	5.6	
LSD 0.05	0.2	0.04	1.4	2.5	0.7	2	3.4	0.8	

Table 5. Yield and agronomic property results from the dryland advanced cotton strains performance test at the AG-CARES farm in Lamesa, 2014.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	7-Oct	Resistance	Height
11-1-301FQ	452	27.8	46.5	37.4	28.5	5.6	11.0	7.0	29.7	75	5	25
11-11-505BB	414	26.3	46.4	36.6	27.5	4.4	9.3	5.8	27.9	79	6	25
11-11-607BB	409	27.9	44.4	37.7	30.3	5.5	9.9	6.5	31.7	71	5	25
11-11-307BB	377	28.1	47.6	35.6	27.3	5.6	11.4	6.8	28.9	79	6	23
11-2-402GD	361	29.1	44.4	38.9	30.5	4.9	9.5	6.5	29.4	76	7	25
11-1-402FQ	359	26.7	45.8	37.3	30.2	4.8	10.6	6.6	27.1	76	4	26
11-1-702FQ	357	27.8	46.1	39.0	29.5	4.8	10.4	7.0	26.7	71	5	25
11-13-201D	355	27.6	46.7	37.8	29.5	4.9	9.5	6.2	29.5	71	5	27
FiberMax FM 989	350	28.5	43.5	38.6	29.9	5.2	9.4	6.3	31.6	78	5	24
Deltapine DP 491	326	28.6	45.1	37.0	28.4	4.8	9.3	6.0	29.6	76	5	26
11-11-708BB	317	28.7	46.2	39.9	30.7	5.0	10.7	7.5	26.6	69	6	27
Paymaster HS 26	271	26.9	47.4	36.2	27.7	4.1	8.7	5.5	27.0	69	6	23
11-18-128N	270	26.5	44.5	38.0	28.9	5.2	9.4	6.4	31.3	71	6	25
11-18-312N	269	27.2	45.5	38.4	26.7	4.6	10.2	6.7	26.0	65	5	23
Paymaster PM 145	245	30.0	46.6	37.5	29.1	4.6	10.1	6.5	26.8	71	6	24
FiberMax FM 958	221	29.0	44.1	40.2	29.7	5.1	9.6	6.9	30.1	73	6	22
Mean	335	27.9	45.7	37.9	29	4.9	9.9	6.5	28.7	73	6	25
c.v.%	24.2	2.4	1.8	2.1	4.9	7.0	4.1	5.1	7.0	9.5	15.7	7.4
LSD 0.05	96	0.8	1.0	1.4	2.5	0.6	0.7	0.6	3.5	8	1	2

TITLE:

Results of the pivot irrigated cotton variety performance test, advanced strains, and preliminary strains at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Jane K. Dever—Professor; Carol M. Kelly—Assistant Research Scientist
Valerie M. Morgan—Research Associate

MATERIALS AND METHODS:

Test:	Cotton variety, pivot irrigated
Planting Date:	May 22
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 31ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant Caparol @1.5pt/A applied after planting Staple @2oz/A applied June19th
Fertilizer:	11-40-0 lbs/A applied pre-plant 27 lbs/A nitrogen applied through fertigation
Irrigations:	3.3 acre-in applied pre-plant 5.8 acre-in applied May-September
Harvest Aid:	Bollbuster @1 qt/A+ET @ 2oz/A + 1% crop oil applied Oct. 10th ET @ 3oz/A + 1% crop oil applied Oct. 18th ETX @ 1oz/A + 1 pt/A gramoxone + 1% crop oil applied Oct. 31
Harvest Date:	November 21

RESULTS AND DISCUSSION:

<u>Cotton variety test</u>

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

Lint yield is determined by the stripper-harvested plot weight and a lint percentage (gin turnout) determined from a ~600g grab sample collected randomly from the harvested plot

material. Boll size, and pulled and picked lint percent are determined from a 50 boll sample obtained from 2 replications of each entry. Maturity and storm resistance ratings are a visual assessment of percent open bolls and a 1(very loose, considerable storm loss) to 9(very tight boll, no storm loss) storm resistance rating.

Twenty-six cotton varieties from 5 different seed companies were submitted for variety testing at 5 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 837 pounds of lint per acre with a test coefficient of variation of 15.8 and 156 pound least significant difference. The highest yielding variety was DP 1219 B2RF with a yield of 1029 pounds of lint per acre; also a top performer in the dryland trial. The next 10 varieties in the test were not significantly different than the highest yielding variety (Table 1). Deltapine, Stoneville, PhytoGen, NexGen, and FiberMax brands were all represented in this top tier. Yields for the test ranged from 1029 pounds of lint per acre to 612 pounds of lint per acre in 2014. Plant height ranged from 21-27 inches with a test average of 25 inches. Relative maturity of the varieties as indicated by percent open bolls on a given date averaged 74%, with a range from 56-84%. Storm resistance ratings ranged from 3-7 with the test average of 5.

Fiber quality results can be found on Table 1A. Average fiber length was 1.05in with a range of 1.10-1.01. Average strength was 29.2g/tex with a range of 30.9-24.1. Micronaire averaged 4.8 with a range of 5.1-4.3.

Advanced Strains

Eleven strains and 5 commercial check varieties were entered for advanced strains testing at 5 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 875 pounds of lint per acre with a test coefficient of variation of 14.0 and 145 pound least significant difference. FM 989 was the top yielder with 1065 pounds of lint per acre, 3 strains as well as PM HS 26 were not significantly different from the highest yielding strain (Table 2). Yields in the trial ranged from 1065 pounds of lint yield per acre to 699 pounds of lint yield per acre in 2014. Plant height ranged from 21-25 inches with a test average of 23 inches. Relative maturity of the strains as indicated by percent open boll on a given date averaged 81%, with a range of 70-88%. Storm resistance ratings ranged from 4-7 with an average of 5.

Fiber quality evaluations were not available at the time of the 2014 Annual Report publication.

Preliminary Strains

Twenty-five strains, 2 commercial checks, and 5 strains from the NMSU program were entered for preliminary strains testing at 3 locations, including the irrigated location at AG-CARES in Lamesa. Average yield was 667 pounds of lint per acre with a test coefficient of variation of 15.8 and 124 pound least significant difference. 12-18-314V was the top yielder with 898 pounds of lint yield per acre. Five other strains were not significantly different from the highest yielding strain (Table 3). Yields in the trial ranged from 898 pounds of lint yield per acre to 374 pounds of lint yield per acre in 2014. Plant height ranged from 18-27 inches with a test average of 22. Relative maturity of the strains as indicated by percent open boll on a given date averaged 78% with a range of 51-90%, storm resistance ratings ranged from 4-8 with an average of 6.

Fiber quality evaluations were not available at the time of the 2014 Annual Report publication.

Table 1. Yield and agronomic property results from the irrigated cotton variety performance test at the AG-CARES research farm in Lamesa, 2014.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	10-Oct	Resistance	Height
Deltapine DP 1219 B2RF	1029	32.5	43.9	39.5	32.6	5.0	8.3	5.9	33.5	74	4	26
Stoneville ST 4946GLB2	982	32.4	44.5	39.4	32.8	6.8	10.5	7.4	36.0	71	5	23
PhytoGen PHY 333 WRF	982	31.1	42.1	40.7	32.7	5.7	9.2	6.8	33.6	69	3	25
Deltapine DP 0912 B2RF	958	32.1	42.9	39.5	32.0	5.4	8.7	6.2	34.5	81	4	26
NexGen NG 3306 B2RF	946	32.4	45.3	40.1	33.2	5.6	9.2	6.6	34.3	79	5	27
FiberMax FM 2011GT	943	32.9	43.7	41.5	33.7	6.2	9.9	7.5	34.4	84	6	25
FiberMax FM 4747GLB2	943	30.8	44.1	38.9	31.5	5.5	10.0	6.8	31.4	69	5	25
Deltapine DP 1321 B2RF	920	31.5	42.7	41.1	33.3	5.3	9.2	6.9	31.3	74	4	25
PhytoGen PHY 367 WRF	920	30.8	42.6	40.1	32.2	5.2	8.8	6.3	32.9	70	4	25
Deltapine DP 1044 B2RF	891	31.4	44.1	38.0	30.3	4.8	8.8	5.9	30.7	74	4	25
PhytoGen PHY 499 WRF	873	32.1	43.2	40.4	32.9	5.3	9.1	6.6	32.1	73	4	26
FiberMax FM 9250GL	868	30.8	45.7	38.2	30.7	5.8	10.1	6.6	33.3	83	6	25
NexGen NG 1511 B2RF	866	32.4	42.0	42.6	34.4	5.2	8.8	7.1	31.3	80	4	25
All-Tex CT 14515 B2RF	835	31.9	44.8	39.1	31.7	5.8	10.2	7.0	32.5	70	5	26
FiberMax FM 2484B2F	824	31.4	44.1	39.8	32.2	5.1	9.7	6.8	29.4	83	5	23
PhytoGen PHY 339 WRF	821	31.8	44.0	41.0	33.6	4.9	8.2	6.2	32.3	73	5	27
NexGen NG 4111 RF	790	31.6	45.0	41.7	33.7	5.6	9.6	7.1	32.6	75	5	26
All-Tex CT 13442 B2RF	789	32.4	43.6	39.3	32.0	5.7	9.4	6.7	33.8	74	4	25
PhytoGen PHY 222 WRF	786	31.6	43.4	40.3	32.1	5.0	9.1	6.8	30.2	76	4	23
FiberMax FM 1320GL	780	31.2	44.5	39.7	32.3	5.7	9.2	6.6	34.4	80	7	23
FiberMax FM 1944GLB2	741	29.5	44.1	38.6	31.1	5.7	9.6	6.5	33.6	76	6	24
All-Tex Nitro-44B2RF	696	30.4	45.8	39.1	31.7	5.7	9.9	6.8	32.6	70	5	23
PhytoGen PHY 725 RF	664	28.4	44.1	37.7	29.9	5.3	9.8	6.3	31.2	56	3	26
FiberMax FM 1830GLT	654	33.5	42.9	39.7	33.3	5.8	8.5	6.3	36.6	71	5	21
FiberMax FM 2322GL	651	32.6	41.2	43.4	34.0	5.5	9.2	7.8	30.5	63	4	26
FiberMax FM 2334GLT	612	32.4	41.9	43.0	34.6	5.0	8.1	6.8	31.7	75	5	22
Mean	837	31.6	43.7	40.1	32.5	5.5	9.3	6.7	32.7	74	5	25
c.v.%	15.8	3.0	2.3	1.6	1.8	5.1	3.1	3.0	5.1	6.9	15.6	8.6
LSD 0.05	156	1.1	1.2	1.1	1.0	0.5	0.5	0.3	2.9	6	1	2

Table 1A. Fiber quality results from the irrigated cotton variety performance test at the AG-CARES research farm in Lamesa, 2014.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
Deltapine DP 1219 B2RF	4.8	1.07	80.9	30.9	8.2	2	75.3	8.2	41-1
Stoneville ST 4946GLB2	5.1	1.03	81.1	30.1	8.8	2	74.4	8.3	41-1
PhytoGen PHY 333 WRF	4.8	1.07	81.8	28.5	7.7	2	72.7	8.4	41-3
Deltapine DP 0912 B2RF	5.4	0.98	79.9	27.1	9.4	1	73.7	8.3	41-1
NexGen NG 3306 B2RF	5.1	1.10	81.2	30.7	9.3	2	71.1	8.5	41-1,52-1
FiberMax FM 2011GT	4.4	1.05	80.7	28.7	7.1	3	72.8	8.0	41-1,51-1
FiberMax FM 4747GLB2	5.0	1.05	79.0	24.1	6.3	2	73.2	7.5	41-2
Deltapine DP 1321 B2RF	5.1	1.03	81.7	29.9	10.3	1	73.6	8.5	41-1,41-3
PhytoGen PHY 367 WRF	4.5	1.03	80.3	28.6	8.5	3	72.1	8.4	41-3,41-4
Deltapine DP 1044 B2RF	5.0	1.04	81.3	29.3	9.6	1	74.7	8.2	41-1
PhytoGen PHY 499 WRF	4.8	1.04	81.4	31.3	10.1	2	74.0	8.1	41-1,41-4
FiberMax FM 9250GL	4.5	1.02	78.6	26.2	6.1	3	71.8	8.1	41-2,41-4
NexGen NG 1511B2RF	5.1	1.02	79.8	29.1	9.9	3	70.8	8.7	41-3,42-2
All-Tex CT 14515 B2RF	5.0	1.06	81.5	30.5	9.5	2	75.8	8.2	31-2,41-1
FiberMax FM 2484B2F	4.6	1.05	80.4	29.2	7.2	2	77.6	7.6	31-1,41-1
PhytoGen PHY 339 WRF	4.3	1.03	79.7	28.9	8.6	2	73.6	7.8	41-1,41-2
NexGen NG 4111 RF	4.6	1.05	81.2	30.1	8.0	2	71.8	8.9	41-3,42-1
All-Tex CT 13442 B2RF	4.8	1.03	80.1	29.1	9.1	2	74.4	8.4	41-1,41-3
PhytoGen PHY 222 WRF	4.8	1.01	80.4	27.9	8.7	3	69.5	8.6	41-4,52-1
FiberMax FM 1320GL	4.8	1.05	81.0	29.6	8.2	3	71.5	8.6	41-3,41-4
FiberMax FM 1944GLB2	4.9	1.06	80.2	29.0	6.7	2	73.8	7.3	41-2,51-1
All-Tex Nitro-44B2RF	4.3	1.10	81.1	31.3	8.5	3	72.8	7.6	41-2
PhytoGen PHY 725 RF	4.5	1.10	81.9	33.3	8.5	2	72.7	8.7	41-3,42-1
FiberMax FM 1830GT	4.7	1.10	80.7	29.0	6.6	2	73.3	7.3	41-2,51-1
FiberMax FM 2322GL	4.9	1.04	79.3	28.6	6.6	3	73.8	8.4	41-1,41-3
FiberMax FM 2334GLT	4.9	1.07	80.5	28.2	7.0	1	72.9	7.5	41-2,51-1
Mean	4.8	1.05	80.6	29.2	8.2	2	73.2	8.1	
c.v.%	3.2	1.5	1.1	3.3	7.1	29.8	2.7	2.9	
LSD 0.05	0.3	0.03	0.5	1.6	1.0	1	3.3	0.4	

Table 2. Yield and agronomic property results from the irrigated advanced cotton strains performance test at the AG-CARES research farm in Lamesa, 2014.

				Agronomic Properties						% Open		
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	10-Oct	Resistance	Height
FiberMax FM 989	1065	30.1	46.8	39.6	31.3	5.6	10.6	7.3	30.0	73	5	24
11-1-301FQ	1050	28.3	48.1	37.8	30.3	6.7	12.0	7.8	32.7	79	6	24
Paymaster HS 26	954	27.1	49.6	35.1	27.3	6.0	10.8	6.3	33.0	86	6	22
11-11-307BB	935	29.8	50.8	36.5	27.6	6.6	13.0	8.0	30.0	85	5	22
11-11-505BB	930	26.8	49.2	36.4	28.0	5.5	10.6	6.4	31.1	84	5	23
11-1-702FQ	892	27.8	48.3	38.1	27.9	5.9	12.1	7.9	28.7	80	6	24
11-11-708BB	890	29.4	47.1	40.0	30.5	5.6	10.8	7.6	29.7	83	6	25
Deltapine DP 491	887	28.4	47.2	38.7	29.7	5.7	10.7	7.1	31.2	70	5	24
11-1-402FQ	885	27.4	48.3	38.7	29.0	5.5	10.8	7.0	30.1	86	4	24
11-2-402GD	871	29.7	46.6	38.9	28.4	5.5	10.5	7.2	29.9	83	5	21
11-11-607BB	840	27.8	46.6	38.3	28.5	5.6	10.9	7.2	29.6	84	6	24
11-13-201D	807	27.4	48.5	38.0	30.0	5.7	10.2	6.6	33.2	83	5	24
11-18-128N	786	26.4	45.7	37.1	27.8	5.9	11.1	7.0	31.3	76	5	23
11-18-312N	750	25.8	46.9	36.7	27.8	6.1	11.8	7.3	30.7	74	6	24
Paymaster PM 145	740	29.5	47.6	39.7	29.9	6.0	10.5	7.3	32.2	88	5	22
FiberMax FM 958	699	30.3	46.5	40.6	30.3	5.9	11.0	7.9	30.2	80	7	21
Mean	875	28.2	47.7	38.1	29.0	5.8	11.1	7.2	30.8	81	5	23
c.v.%	14.0	3.8	2.5	1.9	5.9	7.6	2.7	3.1	8.1	6.4	13.6	8.2
LSD 0.05	145	1.3	1.4	1.3	3.0	0.8	0.5	0.4	4.4	6	1	2

Table 3. Yield and agronomic property results from the irrigated preliminary cotton strains performance test at the AG-Cares farm in Lamesa, 2014.

				Agronomic Properties								
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	% Open Bolls	Storm	
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	10-Oct	Resistance	Height
12-18-314V	898	29.3	47.2	37.9	30.8	6.4	11.3	7.3	33.3	78	6	22
13-2-1009FQ	805	28.7	46.9	39.1	27.7	5.2	11.3	7.5	27.0	74	6	24
13-9-218S	805	29.3	48.4	37.7	29.8	5.7	11.0	7.0	30.7	73	6	22
13-3-714DS	798	30.4	45.5	42.0	30.2	5.3	8.6	6.6	33.9	84	7	20
13-29-201N	796	29.4	46.3	39.0	32.6	5.5	10.3	7.0	30.9	81	5	22
13-11-109BB	795	29.4	48.1	39.2	28.7	6.1	11.6	7.8	30.5	78	5	21
11-14-807V	756	26.3	47.4	36.0	27.0	6.2	11.7	7.0	31.5	80	5	23
12-1-820FQ	755	30.9	45.9	40.7	31.3	5.5	10.0	7.3	30.4	86	5	22
Deltapine DP 491	743	29.2	46.4	38.8	29.1	5.8	11.0	7.3	30.8	71	5	22
11-14-507V	741	27.7	49.1	35.8	28.1	6.1	11.4	6.7	32.3	79	6	23
12-20-407N	736	28.0	44.2	38.0	26.9	5.6	11.7	7.7	27.7	81	6	22
13-2-501FQ	719	27.5	48.4	35.8	25.9	4.6	10.4	6.1	27.4	84	7	22
12-20-707N	707	25.1	49.6	35.2	23.1	6.0	13.0	7.2	29.2	80	6	21
12-20-402N	690	27.4	46.1	38.2	28.9	5.6	11.0	7.2	29.8	80	6	22
13-2-1004FQ	688	29.5	45.2	38.9	28.5	4.6	9.9	6.6	26.8	88	7	21
FiberMax FM 958	682	28.2	46.1	39.0	29.8	5.8	11.2	7.6	29.7	80	6	22
Acala 1517-08	675	25.9	46.2	37.0	28.0	6.0	11.4	7.0	31.8	51	4	27
13-2-1005FQ	659	30.0	47.0	38.4	28.7	5.2	11.0	7.2	27.7	80	6	21
13-2-802FQ	653	26.7	44.6	39.6	29.0	5.0	9.5	6.8	29.2	85	6	21
13-9-1001S	644	30.3	43.7	41.6	31.0	5.1	8.6	6.6	31.6	79	5	22
12-20-1206N	641	25.4	48.0	36.5	26.8	5.1	9.9	6.0	31.5	89	6	20
13-2-913FQ	640	27.8	45.7	38.0	28.2	6.3	11.7	7.6	31.4	75	6	21
13-2-1111FQ	634	28.2	48.2	38.0	29.1	5.0	10.3	6.7	28.2	88	6	20
13-11-702BB	616	27.4	48.3	38.8	30.4	5.5	10.3	7.0	30.9	84	7	21
13-18-203D	601	27.6	49.1	37.1	27.2	4.9	9.7	6.0	30.6	83	7	21
13-2-905FQ	594	28.3	44.6	40.2	28.4	5.3	11.1	7.9	27.0	79	5	21
NM12P1005	518	29.4	42.0	43.7	32.1	5.1	10.1	8.3	26.8	69	4	23
13-2-1109FQ	506	27.7	44.7	39.7	28.2	4.3	10.9	7.7	22.2	88	5	21
NM12P1002	506	26.1	46.1	38.1	30.3	5.2	9.9	6.3	31.4	60	6	22
NM12P1004	501	31.5	44.3	41.1	31.4	5.4	11.0	8.2	27.1	70	4	22
12-1-1104FQ	461	27.9	46.3	37.3	27.3	4.7	10.5	6.5	26.7	90	8	18
NM13W1011	374	25.6	42.2	38.8	27.4	4.9	10.8	7.2	26.1	58	4	24
Mean	667	28.2	46.3	38.6	28.8	5.4	10.7	7.1	29.4	78	6	22
c.v.%	15.8	2.9	2.4	2.1	3.7	6.3	3.2	3.8	6.6	7.6	16.3	7.3
LSD 0.05	124	1.0	1.3	1.4	1.8	0.6	0.6	0.5	3.3	7	1	2

TITLE:

Results of the Root-Knot Nematode (RKN) cotton variety performance test and nursery at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Jane K. Dever—Professor
Carol M. Kelly—Assistant Research Scientist
Valerie M. Morgan—Research Associate

MATERIALS AND METHODS:

Test:	R-K Nematode Variety
Planting Date:	May 20nd
Design:	Randomized complete block, 4 replications
Plot Size:	2-row plots, 31ft
Planting Pattern:	Solid
Herbicide:	Trifluralin @1.3 pt/A applied pre-plant Caparol @1.5pt/A applied after planting Staple @2oz/A applied June19th
Fertilizer:	11-40-0 lbs/A applied pre-plant 27 lbs/A nitrogen applied through fertigation
Irrigations:	3.3 acre-in applied pre-plant 5.3 acre-in applied May-September
Harvest Aid:	Bollbuster @1 qt/A+ET @ 2oz/A + 1% crop oil applied Oct. 10th ET @ 3oz/A + 1% crop oil applied Oct. 18th ETX @ 1oz/A + 1 pt/A gramoxone + 1% crop oil applied Oct. 31
Harvest Date:	November 19

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 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.

Twenty cotton varieties and experimental strains, from 5 different seed companies were submitted for variety testing in a field where root-knot nematodes were known to have been present. Average yield was 1054 pounds of lint per acre with a test coefficient of variation of 13.1 and 136 pound least significant difference. The highest yielding variety, DP 1558NR B2RF, with a yield of 1414 pounds of lint per acre, was significantly different from all other tested varieties in 2014 (Table 6). Yields for the test ranged from 1414 pounds of lint per acre to 810 pounds of lint per acre. DP 1454NR B2RF allowed the lowest level of nematode reproduction in 2014 while obtaining a yield of 1246 pounds of lint per acre (Table 6). Two other varieties, a new variety DP 1558NR B2RF, and an experimental variety Monsanto 14R1455 B2R2 equaled the low nematode reproduction in DP 1454NR B2R2, and produced 1414 pounds and 1232 pounds of lint per acre respectively.

Fiber quality results can be found in table 6A. Average fiber length was 1.07in with a range of 1.13-1.04in. Average strength was 30.5g/tex with a range of 32.8-28.5g/tex. Micronaire averaged 4.7 with a range of 5.2-4.3.

Root-knot Nematode Nursery

One hundred seventy-four individual plant selections harvested in 2013 and screened in the greenhouse during 2014 were planted in a nursery under pivot irrigation in Lamesa where RKN numbers were high. The nursery was planted in 1 row, 31ft, un-replicated plots on May 20th. One hundred forty individual plant selections and boll samples were harvested in 2014, along with 16 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 2015 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 2015.

Table 6. Yield and agronomic property results from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm in Lamesa, 2014.

		Agronomic Properties								% Open				Log 10
		% Turnout		% Lint		Boll	Seed	Lint	Seed per	Bolls	Storm		Root-knot	(mean sep.
Designation	Yield	Lint	Seed	Picked	Pulled	Size	Index	Index	Boll	7-Oct	Resistance	Height	/500 cc soil	P=0.05)
Deltapine DP 1558NR B2RF	1414	33.5	43.3	40.6	32.7	7.0	9.4	6.8	41.8	54	5	29	390	def
Deltapine DP 1454NR B2RF	1246	33.0	44.1	39.4	31.5	5.7	9.7	6.8	33.0	69	5	33	30	f
Monsanto 14R1455 B2R2	1232	34.8	42.8	42.1	33.6	6.6	9.9	7.6	36.7	59	5	31	450	def
Stoneville ST 4946GLB2	1222	32.7	45.6	37.9	31.4	6.8	11.0	7.1	36.3	65	6	28	3060	abc
FiberMax FM 2484B2F	1171	32.3	46.2	39.9	30.2	5.6	9.8	6.8	33.0	75	6	30	5820	ab
FiberMax FM 2011GT	1108	32.6	44.2	38.2	31.0	7.0	10.9	7.3	36.7	71	6	29	3780	abcd
PhytoGen PHY 427 WRF	1086	33.3	46.7	37.8	31.1	5.4	9.2	5.9	34.4	75	5	30	360	cde
PhytoGen PHY 499 WRF	1070	31.9	43.4	37.2	30.3	5.4	9.3	6.1	32.6	78	4	28	3540	abc
PhytoGen PHY 417 WRF	1064	33.3	45.0	40.0	32.4	4.9	8.1	5.8	34.0	68	5	31	90	ef
Stoneville ST 4747GLB2	1048	30.3	44.8	37.6	30.2	6.0	10.2	6.5	34.9	69	6	29	3750	ab
NexGen NG 1511 B2RF	1019	33.4	44.0	38.6	31.7	5.7	9.8	6.6	33.7	75	5	31	3390	ab
FiberMax FM 1320GL	1010	32.9	44.0	38.6	31.6	6.0	10.1	7.0	33.1	71	6	30	1710	bcde
Bayer CropScience BX 1539GLT	994	32.1	46.1	39.3	32.1	5.3	10.0	6.7	31.1	80	6	28	13350	abc
FiberMax FM 2322GL	984	34.6	41.6	41.8	32.8	5.9	9.9	7.6	32.2	68	6	31	2730	ab
FiberMax FM 1830GLT	947	33.2	42.1	42.4	34.7	5.5	9.0	6.9	33.9	81	5	28	9870	ab
NexGen NG 4111 RF	939	31.1	45.4	37.4	30.4	5.8	10.1	6.4	34.4	68	6	30	6630	a
PhytoGen PHY 367 WRF	933	29.8	43.7	40.6	37.1	5.5	9.2	6.8	33.0	75	4	31	1275	def
NexGen NG 3306 B2RF	908	32.2	45.6	37.9	31.0	5.3	10.1	6.5	31.0	74	5	31	5490	ab
FiberMax FM 2334GLT	878	32.9	41.5	40.4	32.5	5.7	8.4	6.3	36.3	78	5	30	14970	a
Bayer CropScience BX 1538GLT	810	32.2	43.2	39.4	32.4	6.4	10.3	7.1	35.1	83	6	28	6540	a
Mean	1054	32.6	44.2	39.3	32.0	5.9	9.7	6.8	34.3	72	5	30		
c.v.%	13.1	2.5	2.3	2.2	4.4	4.8	3.7	5.3	3.7	10.0	13.8	6.5		
LSD 0.05	163	0.9	1.2	1.5	2.2	0.5	0.6	0.6	2.2	9	1	2		

Table 6A. Fiber quality results from the irrigated root-knot nematode cotton variety performance test at the AG-CARES farm in Lamesa, 2014.

Designation	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade
Deltapine DP 1558NR B2RF	4.7	1.09	81.6	32.8	8.3	1	77.3	8.9	21-2,31-1
Deltapine DP 1454NR B2RF	4.5	1.04	81.5	30.0	8.8	1	78.2	8.5	21-2,31-1
Monsanto 14R1455 B2R2	5.2	1.08	82.7	32.8	8.8	2	76.7	9.0	31-1,31-3
Stoneville ST 4946GLB2	5.0	1.08	82.8	32.0	9.0	1	74.9	8.8	31-4,41-1
FiberMax FM 2484B2F	4.4	1.11	81.9	31.1	7.3	1	77.1	7.6	31-2,41-1
FiberMax FM 2011GT	4.6	1.08	81.6	29.7	7.3	2	75.3	7.8	31-2,41-2
PhytoGen PHY 427 WRF	4.7	1.06	81.7	29.7	9.0	1	72.4	7.9	41-1,41-2
PhytoGen PHY 499 WRF	4.7	1.05	82.0	31.4	11.2	2	73.2	8.2	41-1
PhytoGen PHY 417 WRF	4.3	1.04	80.6	29.8	9.8	2	75.4	8.5	31-1,41-3
Stoneville ST 4747GLB2	4.8	1.10	81.4	27.3	6.2	3	74.8	7.1	41-1,41-2
NexGen NG 1511 B2RF	5.2	1.05	82.2	29.9	9.4	1	72.7	8.6	41-3
FiberMax FM 1320GL	4.6	1.03	80.7	29.8	8.6	2	73.7	8.0	41-1,41-2
FiberMax FM 2007GLT	4.4	1.11	81.3	31.2	8.0	2	77.4	7.4	31-2,41-1
FiberMax FM 2322GL	4.6	1.08	80.2	30.5	6.7	2	75.1	8.0	31-2,41-1
FiberMax FM 1830GLT	4.8	1.11	80.6	29.5	7.0	1	74.9	7.3	41-1,41-2
NexGen NG 4111 RF	4.8	1.05	80.8	31.1	9.2	1	75.2	8.9	31-2,31-4
PhytoGen PHY 367 WRF	4.5	1.06	80.2	28.5	9.9	3	73.1	8.5	41-1,41-3
NexGen NG 3306 B2RF	4.8	1.11	82.9	32.8	9.3	1	75.6	8.4	31-2,41-1
FiberMax FM 2334GLT	4.9	1.13	82.6	31.3	6.9	2	74.5	7.6	41-1,41-2
FiberMax FM 1900GLT	4.8	1.06	79.9	29.3	6.6	3	73.8	7.6	41-1,41-2
Mean	4.7	1.07	81.4	30.5	8.3	1	75.0	8.1	
c.v.%	4.6	1.5	1.1	2.4	5.3	48.4	2.0	3.4	
LSD 0.05	0.4	0.03	1.6	1.3	0.8	1	2.6	0.5	

TITLE:

Effect of variety and nematicide treatment on root-knot nematode density and cotton yield.

AUTHOR:

Terry Wheeler—Professor

MATERIALS AND METHODS:

Varieties:	FiberMax (FM) 1944GLB2 and Stoneville (ST) 4946GLB2
Planting date:	19 May
Plot size:	4-rows wide, 36 ft long; 4 replications RCBD
Soil sampling dates:	9-July AND 11-November
Harvest:	10-November

RESULTS AND DISCUSSION:

Plant stand was affected by variety and variety x treatment (Table 1). ST 4946GLB2 had a higher stand (3.11 plants/ft row) than FM 1944GLB2 (2.61 plants/ft row). With FM 1944GLB2, Temik 15G treated plots had higher stands than seed treated with Gaucho alone, or Aeris (Table 1).

Root-knot nematode density in July and November were not significantly affected by treatment (Table 1), though root-knot nematode density was lower for ST 4946GLB2 in November (413/500 cm^3 soil) than for FM 1944GLB2 (846/500 cm^3 soil). There were no differences between chemical treatments for yield (Table 1). FM 1944GLB2 had lower yields (923 lbs of lint/acre) than ST 4946GLB2 (1,098 lbs of lint/acre). ST 4946GLB2 has partial resistance to root-knot nematode, and this was reflected in the lower nematode density and higher yield relative to FM 1944GLB2. There was no evidence that the chemical treatments would improve yield in addition the resistant variety response.

Table 1. Effect of variety, seed treatments, Velum Total, and Temik 15G on cotton stand, nematode reproduction, plant vigor, maturity, and yield.

Treatment[a]	Plants/ft row		Root-knot/500 cm^3 soil				Lint Yield (lbs/acre)	
			July		November			
	FM[b]	ST	FM	ST	FM	ST	FM	ST
Gaucho	2.5 bc	3.3 a	890	730	475	265	1,024	1,142
Temik 15G	2.9 a	3.3 a	2,070	750	1,385	600	950	1,022
Velum Total + Aeris	2.7 ab	3.1 a	1,740	630	470	270	909	1,080
Aeris	2.7 abc	2.7 b	415	380	1,220	385	905	1,043
Gaucho + Fluopyram	2.6 abc	3.3 a	250	2,340	840	840	845	1,161
Aeris + Vydate CLV	2.4 c	3.0 ab	775	955	685	120	904	1,142

[a]Gaucho, Aeris, and Fluopyram were applied to the seed; Temik 15G was applied in the furrow at planting at 5 lbs/a; Velum Total was a liquid nematicide/insecticide applied in the furrow at planting at 18 oz/acre; Vydate CLV was a foliar nematicide applied at pinhead size square and 2 weeks later at 17 oz/acre/application.

[b]FM=FiberMax 1944GLB2, ST=Stoneville 4946GLB2.

TITLE:

The effect of cropping system and irrigation rate on root-knot nematode density in winter of 2014.

AUTHORS:

Terry Wheeler—Professor
Nick Ryan and Jimmy Grant

MATERIALS AND METHODS:

Sampling date: 12-December

Two composite soil samples were taken on each span from 3 to 7, consisting of 20 soil cores taken to a depth of 12 inches. Soil samples were assayed for plant parasitic nematodes. The treatments were irrigated cotton wedges (pies 1, 2, 3, and 5), dryland cotton (pie 4), and wheat (pies 6 and 7).

RESULTS AND DISCUSSION:

The highest population of root-knot nematode was found in the dryland cotton wedge (average of 813 root-knot/500 cm^3 soil). The irrigated cotton wedges were intermediate (354 root-knot/500 cm^3 soil), and the wheat wedges were the lowest (0 root-knot nematode/500 cm^3 soil). Two wedges that have been used for a variety/water treatment study were not sampled, since the majority of the varieties planted on that trial are partially resistant to root-knot nematode. There was no effect of irrigation rate on root-knot nematode density in 2014. Generally, the higher irrigation rates have higher densities of root-knot nematode, but with all the rainfall in May and June at AGCARES that may have reduced the impact of irrigation on nematode reproduction. It is atypical for a dryland area to have higher root-knot nematode densities than irrigated areas. It is possible that the dryland area was used to grow more root-knot susceptible varieties compared to the irrigated wedges in 2014. Using partially resistant varieties can greatly reduce root-knot nematode density. Clearly the wheat rotation is almost completely eliminating root-knot nematode, so even nematode susceptible varieties could be planted in that area for 2015.

TITLE:

Small plot evaluation of root-knot nematode resistant varieties under varying irrigation levels at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

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

MATERIALS AND METHODS:

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

Soil type: Amarillo fine sandy loam

Planting date: 21-May

Cultivars:

Dyna-Gro 2355B2RF	Deltapine 1044B2RF
Deltapine 1454 NR B2RF	Deltapine 174RF
FiberMax 2011GT	FiberMax 2484B2F
NexGen 1511RF	Phytogen 367WRF
Phytogen 417WRF	Phytogen 427WRF
Phytogen 499WRF	Stoneville 4747GLB2
Stoneville 4946GLB2	Stoneville 5458B2F

Irrigation:

	Low	Base	High
Preplant	5.05”	5.05”	5.05”
In Season	3.0”	4.4”	6.0”
Total	8.05”	9.45”	11.05”

Harvest date: 29-Oct

RESULTS AND DISCUSSION:

No differences in yield were observed among varieties in any of the trials; however, yields did vary by irrigation rate (Figure 1). Under low irrigation (8.05”), yields averaged 596 lb ac^{-1} ranging from 467 to 695 lb ac^{-1} for FiberMax 2484B2F and Phytogen 427WRF, respectively. Yields averaged 801 lb ac^{-1} under the base irrigation rate (9.45”) and were numerically highest for Phytogen 499WRF (937 lb ac^{-1}) and lowest for Phytogen 417WRF (620 lb ac^{-1}). Yields averaged 889 lb ac^{-1} under high irrigation (11.05”) ranging from 812 to 970 lb ac^{-1} for Stoneville 5458B2F and FiberMax 2011GT, respectively. Nematode reproduction differed by variety and irrigation level. Fiber quality differed by variety and was affected by irrigation level (data not shown). Subtle differences in loan values were found among varieties when averaged across irrigation levels ranging from \$0.4768 to \$0.4998 ac^{-1} for Stoneville 4747GlB2 and FiberMax 2484B2F, respectively. Differences in loan values were more negatively affected by low irrigation (\$0.4727 ac^{-1}) compared to the base (\$0.4934 ac^{-1}) and high (\$0.5048 ac^{-1}) irrigation levels.

The use of nematode resistant varieties such as, Deltapine 1454 NR B2RF, Deltapine 174RF, FiberMax 2011GT, Phytogen 367WRF, Phytogen 417WRF, Phytogen 427WRF, Stoneville 4946GLB2, and Stoneville 5458B2F limited root-knot reproduction compared to

susceptible varieties, such as Dyna-Gro 2355B2RF, FiberMax 2484B2F, NexGen 1511B2RF, Phytogen 499WRF, and Stoneville 4747GLB2 (Figure 1). Likewise, irrigation level had a pronounced effect on the level of nematode reproduction, where nematode populations increased with increased irrigation. Despite this relationship, nematodes are more damaging under stressful conditions. While yields and loan values of some susceptible varieties were similar to those of partially resistant varieties, changes in populations of plant parasitic nematodes may impact productivity of susceptible varieties in subsequent years. Additional studies are needed to better understand the performance of these and other varieties in fields with a history of root-knot nematodes.

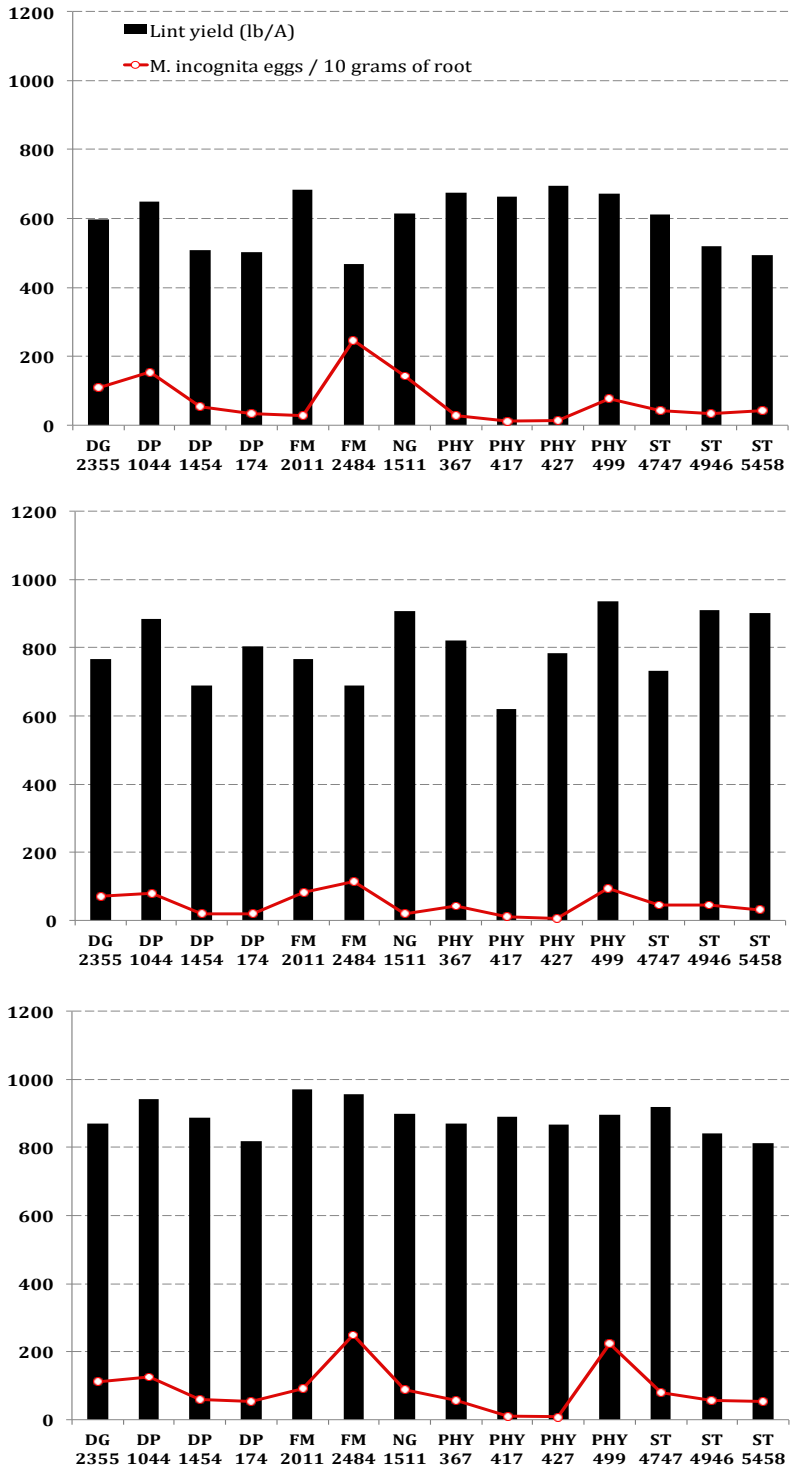

Figure 1. Lint yields (bars) and Root-knot nematode reproduction (lines) associated with fourteen cotton varieties grown under three irrigation rates [low (top), base (middle) and high (bottom)]. Yields were not different between varieties among the three irrigation rates.

TITLE:

Evaluation of new cotton varieties and advanced breeding lines with partial resistance to root-knot nematodes at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Jason Woodward – Extension Plant Pathologist
Ira Yates, Bobby Rodriguez and Debra Dobitz – Technicians.

MATERIALS AND METHODS:

Plot size:	2-rows by 35 feet	
Soil type:	Amarillo fine sandy loam	
Planting date:	21-May	
Cultivars:	Deltapine 1044B2RF	Deltapine 1454 NR B2RF
	Deltapine 1558 NR B2RF	Mon Exp I
	Phytogen 367WRF	Stoneville 4946GLB2
Design:	Randomized complete block with six replications	
Harvest date:	29-Oct	

RESULTS AND DISCUSSION:

Moderate nematode pressure was observed when roots were observed 45 days after planting; however, differences in galling (on a 1-5 scale) were not observed between varieties (data not shown). Although the varieties evaluated had different relative maturities, growing conditions experienced during the growing season allowed for all varieties to mature. Lint percentages were greatest for Mo Exp I (34.3%), Deltapine 1454NR B2RF (33.6%) and Deltapine 1558NR B2RF (33.2%) (Table 1). Lint yields for the trial averaged 878.4 lb ac^{-1} and differed among varieties. Yields ranged from 806.2 to 951.7 lb ac^{-1} for the susceptible variety Deltapine 1044B2RF and the newly released partially resistant variety Deltapine 1558NR B2RF, respectively. Fiber quality parameters differed among varieties. Overall, micronaire values were high with a trial average of 4.8. In contrast, staple length values were relatively low (averaging 1.04 inches). Strength was lowest for Phytogen 367WRF (28.0 g tex^{-1}) and greatest for Deltapine 1558NR B2RF and Mon. EXP I (32.0 g tex^{-1}). The resulting loan values ranged from \$0.4892 to \$0.5247 lb^{-1} for Phytogen 367WRF and the experimental Monsanto line, respectively. Gross revenue averaged \$445.74 ac^{-1} and were greatest for Mon Exp I, (33.6%) 1558NR B2RF, Stoneville 4946GLB2, and Deltapine 1558NR B2RF totaling \$492.78, \$489.92, \$459.84, and \$440.67 ac^{-1}, respectively. These studies indicate that differences in yield, fiber quality and profitability exist among cotton varieties that possess partial resistance to the root-knot nematode. Similar results were observed in other studies examining these varieties and breeding lines in northern locations; however, the yield potential of full season varieties was negatively affected when the growing season was shortened because of adverse environmental conditions experienced during the latter part of the growing season. Additional studies are needed comparing these and other partially resistant varieties or breeding lines in fields with a history of root-knot nematodes.

Table 1. Performance of commercially available cotton varieties and an advanced breeding line at AG-CARES, 2014[†].

Variety	Turnout (%)	Lint yield (lb ac^{-1})	Micronaire (units)	Length (inches)	Strength (g tex^{-1})	Loan price ($ lb^{-1})	Gross revenue ($ ac^{-1})
Deltapine 1044B2RF	31.7 cd	806.2 b	4.77 c	1.03 cd	29.4 c	0.4981 b	401.92 b
Deltapine 1454NR B2RF	33.6 ab	886.4 ab	4.90 b	1.03 cd	29.3 c	0.4947 b	440.67 ab
Deltapine 1558NR B2RF	33.2 abc	951.7 a	5.05 a	1.05 a	32.0 a	0.5140 ab	489.92 a
Mon. EXP 1	34.3 a	934.4 a	4.95 ab	1.07 ab	32.0 a	0.5247 a	492.78 a
Phytogen 367WRF	32.3 bcd	796.2 b	4.43 d	1.01 bc	28.0 c	0.4892 b	389.31 b
Stoneville 4946GLB2	31.0 d	895.4 ab	4.88 b	1.04 d	30.9 b	0.5112 ab	459.84 ab

[†] Deltapine 1044B2RF served as the susceptible check; whereas, Phytogen 367WRF and Stoneville 4946GLB2 served as commercial standards. The remaining entries (Deltapine 1454NR B2RF, Deltapine 1558NR B2RF, and Mon. EXP 1) contain two nematode resistance genes. Data are the average of six replications. Values within a column followed by the same letter are not statistically different.

TITLE:

Evaluation Bayer CropScience nematicide seed treatment combinations at AG-CARES, Lamesa, TX, 2014.

AUTHORS:

Jason Woodward – Extension Plant Pathologist
Ira Yates, Bobby Rodriguez and Debra Dobitz – Technicians
Russ Perkins – Technical Service Representative, Bayer CropScience

MATERIALS AND METHODS:

Plot size:	2-rows by 25 feet, 4 replications
Soil type:	Amarillo fine sandy loam
Planting date:	21-May
Varieties:	FiberMax 2484B2F Stoneville 4946GLB2
Design:	Split-plot (seed treatment as whole plots, and variety as sub-plots)
Harvest date:	29-Oct

RESULTS AND DISCUSSION:

Excellent stands, averaging 82.5% emergence, were achieved in the trial and differences in stand were not observed among the different seed treatment combination. Likewise, increasing rates of Velum did not affect germination or stand establishment. Slight differences in stand were observed between the two varieties with FiberMax 2484B2F having slightly higher stands that Stoneville 4946GLB2. An opposite trend was observed regarding vigor, where early growth for Stoneville 4946GLB2 was greater than that of FiberMax 2484B2F. No differences in vigor were observed among seed treatments; however, plots treated with Aeris tended to have numerically lower vigor ratings than plots receiving Velum. Mid-season gall ratings were made; however, differences in seed treatments were not observed (data not shown). Yields for all plots receiving nematicide treatments (Velum or Aeris) were numerically higher than the base fungicide or base fungicide treatment plus Gaucho treatments. Velum applied at 5.06, 6.33, 7.59 and 8.86 oz cwt^{-1} resulted in yields of 699.5, 661.9, 658.9 and 767.9 lb ac^{-1}, respectively, compared to 615.9 and 649.5 lb ac^{-1} for treatments that received Aeris. Yields were higher for Stoneville 4946GLB2 (757.8 lb ac^{-1}) than FiberMax 2484B2F (583.9 lb ac^{-1}). Although preliminary, results from this study indicate that Velum can be used in the management of root-knot nematodes in cotton. Additional studies evaluating seed treatments containing Velum are needed to fully capture the value of such treatments for the management of nematodes. Furthermore, studies evaluating in-furrow applications of Velum have been conducted in the High Plains and will be continued next growing season.

Table 1. Effect of seed treatment combinations on stand, vigor and lint yield of two cotton varieties at AG-CARES, 2014.

Treatment, (rate)	Stand count (plants ft^{-1})		Vigor (1-5 scale)		Lint yield (lb ac^{-1})	
1. Base (†)	3.20	a††	4.0	a	615.9	b
2. Base + Gaucho (9.49 oz/cwt)	3.29	a	4.0	a	649.5	b
3. Base + Gaucho (9.49 oz/cwt) + Velum (5.06 oz/cwt)	3.32	a	4.1	a	699.5	ab
4. Base + Gaucho (9.49 oz/cwt) + Velum (6.33 oz/cwt)	3.14	a	4.5	a	661.9	b
5. Base + Gaucho (9.49 oz/cwt) + Velum (7.59 oz/cwt)	3.58	a	4.3	a	658.9	b
6. Base + Gaucho (9.49 oz/cwt) + Velum (8.86 oz/cwt)	3.30	a	4.3	a	767.9	a
7. Base + Aeris (18.98 oz/cwt)	3.21	a	3.9	a	659.7	b
8. Base + Aeris (18.98 oz/cwt) + Velum (5.06 oz/cwt)	3.43	a	3.9	a	666.4	b
Variety mean						
FiberMax 2484B2F	3.55	A	3.9	B	583.9	A
Stoneville 4946GLB2	3.06	B	4.3	A	757.8	B
Split-plot analysis						
Treatment	0.3666		0.3992		0.0812	
Variety	0.0001		0.0245		0.0001	
Treatment × Variety	0.7162		0.5818		0.4257	

† The base treatment consisted of standard rates of Vortex FL, Spera, Allegiance FL and Evergol Prime. ††Means within a column followed by the same letter are not statistically different.

TITLE:

Cotton yield response to cotton fleahopper acute infestations as influenced by irrigation level treatments, Lamesa, TX, 2014.

AUTHORS:

Megha Parajulee—Professor
Abdul Hakeem—Research Associate
Stanley Carroll—Research Scientist
Wayne Keeling--Professor

MATERIALS AND METHODS:

Plot Size:	4 rows by 300 feet, 3 replications
Planting Date:	May 16, 2014
Cultivar:	DP 1454 B2RF
Fertilizer:	120-40-0
Pre-plant Irrigation:	Low = 5.05 inches; High = 5.05 inches
In-season Irrigation:	Low = 3.0 inches; High = 6.0 inches
Herbicides:	Prowl® – 3 pt/A (April 14); Roundup PowerMax® – 1 qt/A + Dual® 1 pt/A (June 13); Roundup PowerMax® – 1 qt/A (July 8)
Insect Treatments:	Control (zero cotton fleahopper); Cotton fleahopper infested (5 nymphs per plant)
Insect Release Date:	July 10, 2014 (fleahopper susceptible stage)
Harvest Date:	October 20, 2014 (hand-harvested)

Cotton fleahopper feeding injury was evaluated in a high yielding cotton cultivar, DP 1454 B2RF, as affected by irrigation level. Two seasonal irrigation levels were evaluated, High (11.05") and Low (8.05"), under a center pivot irrigation system. The experiment consisted of 2 irrigation levels (high and low) and two cotton fleahopper augmentation treatments (5 fleahopper nymphs per plant versus no fleahopper augmentation as control). Each treatment plot consisted of 5 plants and the entire test was replicated three times, with a total of 12 experimental units.

Conditions conducive to cotton fleahopper emergence were simulated in a laboratory environment in order to induce hatching of overwintered eggs embedded in the woolly croton stems that were collected from the Texas Brazos Valley, and emerged cotton fleahoppers were subsequently reared using fresh green beans as a feeding substrate. A single release of nymphal 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. The cotton fleahopper release was conducted on July 10, immediately following the pre-release plant mapping, by aspirating third- to fourth-instar cotton fleahopper nymphs from the laboratory colony, transferring them into 0.75" X 1.5" plastic vials, then cautiously and methodically depositing them onto the terminals of plants in each treatment plot at the rate of 5 nymphs per plant; the control plots received no fleahoppers. 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 17 and 25, leaf chlorophyll measurements on July 25, and a pre-harvest complete plant mapping and harvesting on October 20, 2014.

RESULTS AND DISCUSSION:

Although the crop was at a highly cotton fleahopper susceptible stage, the augmented cotton fleahopper density of 5 nymphs per plant caused much lower levels of fruit abscission than we had anticipated. It is likely that a higher level of cotton fleahopper mortality occurred immediately after the release. It is generally expected that 20% of the released insects survive and feed on plants to cause the injury impact. Thus, we had expected 1 cotton fleahopper nymph per plant to cause the injury, which is much above the currently practiced treatment threshold. Nevertheless, it was clear that augmentation of fleahoppers caused significant injury to cotton squares and fruit abscission rates were 16% and 9% for 'Low' and 'High' water regimes, respectively (Fig. 1). It is also evident that the fleahoppers caused higher levels of injury under 'Low' water regime compared to that under a 'High" water regime, suggesting that the ability of cotton fleahoppers to inflict injury to water-stressed plants is greater than that for fully water-turgid plants or the water-stressed plants may be more susceptible to cotton fleahopper injury. Lint yield was not significantly impacted by the fleahopper augmentation treatment, but the yield was numerically lower in fleahopper augmented plots compared to that in control plots (Fig. 2). Lint yield values were 1,030 and 918 lbs per acre for 'Low' water regime and 1,638 and 1,579 lbs/acre for 'High' water regime in control and fleahopper augmented plots, respectively (Fig. 2). The effect of fleahopper on lint yield was numerically more pronounced under 'Low' water regime compared to that for 'High' water regime, indicating plants' greater ability to compensate for fleahopper-induced fruit loss under high irrigation production system.

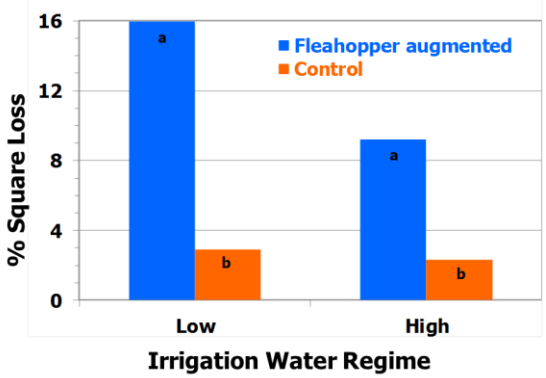

Fig. 1. Average percentage square loss following a simulated acute infestation of cotton fleahoppers, achieved by augmenting 5 nymphs per plant during the second week of squaring, under low and high irrigation regimes, Lamesa, Texas, 2014.

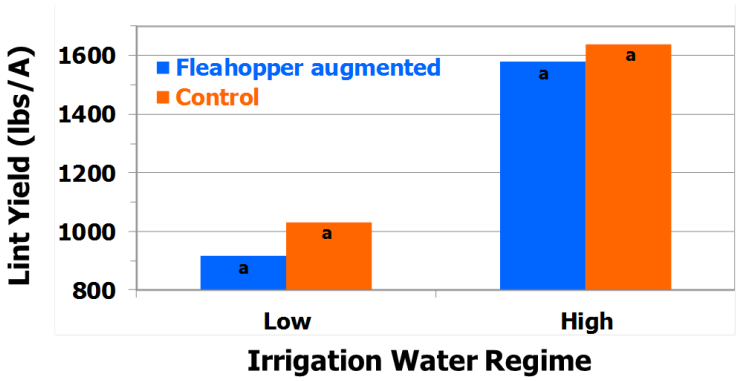

Fig. 2. Average lint yield following a simulated acute infestation of cotton fleahoppers, achieved by augmenting 5 nymphs per plant during the second week of squaring, under low and high irrigation regimes, Lamesa, Texas, 2014.

TITLE:

Demonstrating Soil Health Promoting Practices to Increase Water Holding Capacity and Yield in Deficit-Irrigation Agriculture, AG-CARES

AUTHORS:

Paul DeLaune – Associate Professor
Jamie Foster – Associate Professor
Wayne Keeling – Professor
Katie Lewis – Assistant Professor

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:	December 2, 2014 (cover crop); Cotton will be planted after cover crop termination
Termination:	April 10, 2015 (cover crop)

This research aims to evaluate the effects of incorporating single and mixed species cover crops into long-term, reduced tillage cotton systems. We will determine 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, and will be terminated in the spring of each year. Prior to termination, cover crops will be harvested to calculate biomass and C:N ratios. Soil core samples will be taken annually to a depth of 60 cm from each treatment. Sampling will occur at project initiation, prior to cash crop planting each year (years 1-3) and a final sampling after the third cash crop. Soil moisture will be measured throughout growing season via neutron attenuation with access tubes installed within each demonstration plot to a depth of 1.5 m. Readings will be taken at 20 cm increments bi-weekly throughout the year.

RESULTS AND DISCUSSION:

This experiment was initiated in 1998 to compare the long-term effects on cotton yield of conventional tillage and no-tillage. The no-till blocks have been planted in a rye cover crop and have had minimal soil disturbance since the study began. This three-year study (2014 – 2017) will quantify the impact of conservation tillage, cover crops, and crop rotation on soil carbon and soil water holding capacity and subsequent yield and economics on deficit-irrigated crop production. Management practices to be compared include conventional tillage, no-till with a rye (*Secale cereal* L.) cover crop, and no-till with a mixed species cover crop of hairy vetch (*Vicia villosa* Roth), radish (*Raphanus sativus* L.), winter pea (*Pisum sativum* L.), and rye. The mixed species cover crop was planted within plot areas that have been historically cropped with rye.

Soil samples collected prior to planting cover crops in 2014 were analyzed using the Soil Health Tool (ver. 4.4) developed by Rick Haney (USDA-ARA, Temple) and the results are presented below (Fig. 1). Soil organic C and plant available P_2O_5 were generally greater with the no-till, rye cover crop system (128 mg/kg and 86 lbs/acre, respectively) compared to the conventional till (100 mg/kg and 60 lbs/acre, respectively). Organic nitrogen (N), total plant available N [as NH_4^+-N + 70% of NO_3^--N + (microbially active C*organic N*4)], and NO_3^--N were greater in the no-till, rye cover system (16.7 mg/kg, 15.9 lbs/acre, and 5.9 lbs/acre, respectively) compared to conventional cotton (13.6 mg/kg, 9.53 lbs/acre, and 1.83 lbs/acre, respectively). Approximately 124 lbs more K_2O per acre was present in the no-till, rye cover compared to conventional. Calculated using to the Soil Health Tool and based on dollars per acre of nutrients currently in the soil, the no-till, rye cover crop system resulted in greater nutrient value ($287.06/acre) than conventional cotton ($205.88/acre). Soil health ratings were also greater for the no-till, rye cover crop system.

Table 1. Effects of management practices on soil organic C and N, plant available nutrients, and soil nutrient value and health.

Cropping System			Plant Available Nutrients					
	Organic C	Organic N	NO_3^--N	N[1]	P_2O_5	K_2O	Nutrient Value[2]	Soil Health[3]
	mg/kg		lbs/acre				$/acre	
Conventional	100	13.6 b[4]	1.83 b	9.53 b	61	330 b	205.88 b	3.09 b
No-Till, Rye Cover	128	16.7 a	5.88 a	15.9 a	86	454 a	287.06 a	4.07 a
P-value	0.077	0.005	0.004	0.026	0.077	0.0003	0.001	0.006
CV, %	12.78	4.53	21.79	17.85	17.66	3.41	5.03	6.25

[1] N: calculated as NH_4^+-N + 70% of NO_3^--N + (microbially active C*organic N*4).
[2] Nutrient Value: value in dollars per acre of nutrients currently in the soil.
[3] Soil Health: calculated to include a weighted contribution of microbial activity and water extractable organic C and N.
[4] Within columns, means with the same letters are not significantly different at α=0.05.

TITLE:

Replicated LEPA Irrigated RACE Variety Trial at AG-CARES, Lamesa, TX, 2014

AUTHORS:

Mark Kelly—Extension Agronomist - Cotton
Kristie Keys—Extension Assistant – Cotton
Tommy Doederlein—EA-IPM Dawson/Lynn Counties
Gary Roschetzky—CEA-ANR Dawson County

OBJECTIVE:

The objective of this study is to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under LEPA irrigated production on the Texas High Plains

MATERIALS AND METHODS:

Varieties:	NexGen 1511B2RF, PhytoGen 499WRF, FiberMax 2334GLT, PhytoGen 417WRF, Stoneville 4946GLB2, FiberMax 2011GT, PhytoGen 367WRF, NexGen 3306B2RF
Experimental design:	Randomized complete block with three (3) replications
Seeding rate:	Planted 4.0 seeds/row-ft into terminated rye cover crop on prepared, listed 40 inch rows using a commercial John Deere MaxEmerge XP vacuum planter
Plot size:	4 rows by variable length (253-872 ft)
Planting date:	19-May
Weed management:	A burndown application of 2,4-D at 1 qt/A wasmade on 26-March. Pendimethalin (Prowl H@) at 3 pt/A) and glyphosate (RoundUp PowerMax at 32 oz/A) were applied preplant and incorporated on 16-April. Post-emergent applications of glyphosate (RoundUp PowerMax at 32 oz/A) were made on 3-June and 1-August. The trial was cultivated with sweeps on 25-June and hoed by hand on 6-Aug.
Irrigation:	4.75 inches of irrigation were applied preplant, with 8.1” applied during the growing season for a total of 12.85” of irrigation applied.
Rainfall:	Based on the nearest Texas Tech University – West Texas Mesonet station at Lamesa, rainfall amounts were: April: 0.25" August: 0.45" May: 1.26" September: 6.42" June: 3.67" October: 0.02” July: 1.24" Total rainfall: 13.31"

Fertility Management:	A pre-plant application of 10-34-0 at a rate of 110 lb/A was made on 1-April. 120 lbs N applied in-season with irrigation.
Plant growth regulators:	None were applied at this location.
Harvest aids:	An application of ethephon (Boll Buster at 1 qt/A) and pyraflufen (ET at 2oz/A) with 1% v/v COC was made on 4-Oct. This was followed by an application of pyraflufen (ET at 3 oz/acre) and 1% v/v COC on 18-Oct. and an application of pyraflufen (ETX at 1 oz/A) and paraquat (Gramoxone Inteon at 1 pt/A) with 1% v/v COC on 31-Oct.
Harvest:	Plots were harvested on 24-Oct. using a commercial John Deere 7445 with burr extractor. Harvested material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.
Gin turnout:	Grab samples were taken by plot and ginned at the Texas A&M AgriLife Research and Extension Center at Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the Texas Tech University – Fiber and Biopolymer Research Institute for HVI analysis, and USDA Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.
Ginning cost and seed values:	Ginning costs were based on $3.00 per cwt. of burr cotton and seed value/acre was based on $250/ton. Ginning cost did not include check-off.
Seed and Technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (4.0 seed/row-ft) for the 40-inch row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://plainscotton.org/Seed/PCGseed14.xls.

RESULTS AND DISCUSSION:

Agronomic data including plant population and nodes above white flower (NAWF) are included in Table 1. Significant differences were noted for most yield and economic parameters (Table 2) except lint and seed turnouts. Lint yields ranged from a low of 541 lb/A for PhytoGen 499WRF to a high of 809 lb/acre PhytoGen 417WRF. Lint loan values averaged $0.0.4904/lb across varieties. Lint value averaged $332.82/acre and ranged from a high of $388.26/acre for PhytoGen 417WRF to a low of $282.55/acre for PhytoGen 499WRF. When subtracting ginning and seed and technology costs, the net value/acre averaged $314.68. Differences among varieties were observed at the 0.10 significance level for net value and values ranged from a high of $377.68/acre to a low of $247.75/acre for PhytoGen 417WRF and PhytoGen 499WRF respectively.

Significant differences were observed for most fiber quality parameters at this location (Table 3). Micronaire values averaged 4.6 with a high of 4.8 for both NexGen 1511B2RF and PhytoGen 499WRF and a low of 4.3 for FiberMax 2011GT. Staple averaged 32.7 with a high of

33.8 and low of 31.5 for PhytoGen 499WRF and NexGen 1511B2RF respectively. Uniformity and strength values were not significantly different with uniformity averaging 80.5% and strength averaging 28.8 g/tex. Elongation showed significant differences with an average of 8.2%, a low of 6.6% (PhytoGen 499WRF) and a high of 9.4% (FiberMax 2334GL). Leaf grades varied with most varieties testing between 3 and 4. Finally, Rd or reflectance (avg. 71.4), and +b or yellowness (avg. 8.5) values resulted in color grades of mostly 41.

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

ACKNOWLEDGEMENTS:

Appreciation is expressed to Wayne Keeling and Danny Carmichael, Texas A&M AgriLife Research Systems Agronomist - Lubbock and Research Associate - AGCARES, Lamesa. Further assistance with this project was provided by Jane Dever and Valerie Morgan - Texas A&M AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate funding for HVI testing from the Cotton Fibers Initiative Fund.

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Table 1. In-season plant measurements results from the 2014 Dawson County Irrigated RACE, AG-CARES Farm, Lamesa, TX.

Entry	Plant Population		Nodes Above White Flower (NAWF) for week of:	
	plants/row ft	plants/acre	28-Jul	5-Aug
FiberMax 2011GT	3.4	45,012	4.4	2.9
FiberMax 2334GLT	3.8	49,731	4.9	4.1
NexGen 1511B2RF	3.4	43,923	5.2	3.4
NexGen 3306B2RF	3.5	45,375	5.2	3.2
PhytoGen 367WRF	3.3	43,560	5.7	3.8
PhytoGen 417WRF	3.6	47,553	5.6	3.9
PhytoGen 499WRF	3.3	43,560	5.5	3.7
Stoneville 4946GLB2	3.9	51,546	5.1	3.4
Test average	3.5	46,283	5.2	3.5
CV, %	10.5	10.3	10.3	15.9
OSL	0.4167	0.3603	0.1713	0.2264
LSD	NS	NS	NS	NS

For NAWF, numbers represent an average of 5 plants per variety per rep (15 plants per variety)
CV - coefficient of variation
OSL - observed significance level, or probablity of a greater F-value

Table 2. Harvest results from the Dawson County LEPA Irrigated RACE Variety Trial, AG-CARES Farm, Lamesa, TX, 2014.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		---------	lb/acre	---------	$/lb	----------		----------	$/acre	----------	
PhytoGen 417WRF	36.7	49.4	2206	809	1090	0.4802	388.26	136.28	524.54	66.18	80.68	377.68 a
Stoneville 4946GLB2	37.1	51.2	2064	765	1058	0.4710	360.32	132.21	492.53	61.92	82.66	347.94 ab
NexGen 3306B2RF	35.2	51.2	1861	655	952	0.5188	340.04	119.01	459.05	55.84	74.77	328.44 ab
FiberMax 2011GT	36.6	48.2	1877	686	905	0.4870	334.31	113.07	447.38	56.31	67.75	323.31 ab
FiberMax 2334GL	37	48.1	1872	694	900	0.4878	338.38	112.51	450.89	56.17	82.73	311.99 bc
NexGen 1511B2RF	36.6	47.4	1860	680	882	0.4607	313.29	110.22	423.5	55.79	74.77	292.94 bc
PhytoGen 367WRF	35.5	51.3	1737	617	891	0.4953	305.41	111.35	416.76	52.12	77.27	287.36 bc
PhytoGen 499WRF	37.5	47.6	1443	541	686	0.5222	282.55	85.75	368.3	43.28	77.27	247.75 c
Test average	36.5	49.3	1865	681	920	0.4904	332.82	115.05	447.87	55.95	77.24	314.68
CV, %	7.6	6.0	11.6	11.6	11.6	3.4	11.4	11.7	11.5	11.6	--	14.3
OSL	0.39659	0.4731	0.0292	0.0274	0.0133	0.0046	0.0934†	0.0134	0.0622†	0.0291	--	0.0829†
LSD	NS	NS	377	138	188	0.0288	54.66	23.47	73.92	11.32	--	64.63

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probablity level
CV - coefficient of variation
OSL - observed significance level, or probability of a greater F-value
LSD - least significant difference at the 0.05 level, † indicates significance at the 0.10 level, NS - not significant
Note: some columns may not add up due to rounding error

Assumes:
$3.00/cwt ginning cost
$250/ton for seed
Value for lint based on CCC loan value form grab samples and FBRI HVI results

Table 3. HVI fiber property results from the Dawson County LEPA Irrigation RACE Variety Trial, AG-CARES Farm, Lamesa, TX, 2014.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
		32nds					reflectance	yellowness		
	units	inch	%	g/tex	%	grade			color 1	color 2
FiberMax 2011GT	4.3	32.2	79.9	27.9	6.8	4.0	72.3	8.4	4.0	1.0
FiberMax 2334GL	4.7	32.2	80.5	29.9	9.4	3.7	72.4	8.5	4.0	1.0
NexGen 1511B2RF	4.8	31.5	79.4	28.1	9.2	3.7	69.7	8.7	4.7	1.7
NexGen 3306B2RF	4.7	33.8	81.7	29.8	8.5	2.3	72.0	8.6	4.0	1.3
PhytoGen 367WRF	4.5	33.3	81.0	29.2	8.4	3.3	71.1	8.7	4.0	1.7
PhytoGen 417WRF	4.4	32.5	80.3	29.0	8.7	4.3	70.8	8.5	4.0	1.3
PhytoGen 499WRF	4.8	33.8	80.2	27.8	6.6	2.0	73.6	7.8	4.0	1.0
Stoneville 4946GLB2	4.5	32.4	81.0	29.0	8.2	3.7	69.0	8.5	4.7	1.7
Test average	4.6	32.7	80.5	28.8	8.2	3.4	71.4	8.5	4.2	1.3
CV, %	3.7	2.5	1.4	4.1	4.1	26.6	1.9	3.6	--	--
OSL	0.0237	0.0318	0.3447	0.2802	<0.0001	0.0753 †	0.0211	0.0448	--	--
LSD	0.3	1.4	NS	NS	0.6	1.3	2.4	0.5	--	--

CV - coefficient of variation

OSL - observed significance level, or probability of a greater F-value

LSD - least significant difference at the 0.05 level, † indicates significance at the 0.10 level, NS - not significant

TITLE:

Replicated Dryland RACE Variety Trial at AG-CARES, Lamesa, TX, 2014

AUTHORS:

Mark Kelly—Extension Agronomist - Cotton
Kristie Keys—Extension Assistant – Cotton
Tommy Doederlein—EA-IPM Dawson/Lynn Counties
Gary Roschetzky—CEA-ANR Dawson County

OBJECTIVE:

The objective of this study is to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under dryland production on the Texas High Plains

MATERIALS AND METHODS:

Varieties:	NexGen 1511B2RF, PhytoGen 499WRF, FiberMax 2334GLT, PhytoGen 417WRF, Stoneville 4946GLB2, FiberMax 2011GT, PhytoGen 367WRF, NexGen 4111RF
Experimental design:	Randomized complete block with three (3) replications
Seeding rate:	Planted 4.0 seeds/row-ft into prepared, listed 40 inch rows using a commercial John Deere MaxEmerge XP vacuum planter
Plot size:	4 rows by variable length (253-872 ft)
Planting date:	19-May
Weed management:	Trifluralin was applied preplant and incorporated at a rate of 1.3pt/A on 9-April. A post-emergent application of glyphosate (RoundUp PowerMax at 32 oz/A) and metolachlor (Dual II Magnum at 1pt/A) was made on 13-June. The trial was cultivated with sweeps on 21-June and hoed by hand on 6-Aug.
Irrigation:	To ensure germination, 2.00” inches of irrigation was applied preplant
Rainfall:	Based on the nearest Texas Tech University – West Texas Mesonet station at Lamesa, rainfall amounts were: April: 0.25" August: 0.45" May: 1.26" September: 6.42" June: 3.67" October: 0.02” July: 1.24" Total rainfall: 13.31"

Fertility Management:	A pre-plant application of 10-34-0 at a rate of 110 lb/A was made on 1-April. 120 lbs N applied in-season with irrigation.
Plant growth regulators:	None were applied at this location.
Harvest aids:	An application of ethephon (Boll Buster at 1 qt/A) and pyraflufen (ET at 2oz/A) with 1% v/v COC was made on 4-Oct. This was followed by an application of pyraflufen (ET at 3 oz/acre) and 1% v/v COC on 18-Oct. and an application of pyraflufen (ETX at 1 oz/A) and paraquat (Gramoxone Inteon at 1 pt/A) with 1% v/v COC on 31-Oct.
Harvest:	Plots were harvested on 24-Oct. using a commercial John Deere 7445 with burr extractor. Harvested material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.
Gin turnout:	Grab samples were taken by plot and ginned at the Texas A&M AgriLife Research and Extension Center at Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the Texas Tech University – Fiber and Biopolymer Research Institute for HVI analysis, and USDA Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.
Ginning cost/seed values:	Ginning costs were based on $3.00 per cwt. of burr cotton and seed value/acre was based on $250/ton. Ginning cost did not include check-off.
Seed and Technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (4.0 seed/row-ft) for the 40-inch row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://plainscotton.org/Seed/PCGseed14.xls.

RESULTS AND DISCUSSION:

Agronomic data including plant population and nodes above white flower (NAWF) are included in Table 1. Significant differences were noted for most yield and economic parameters (Table 2). Stripper harvested lint turnout averaged 37.1% across all varieties. Seed turnouts averaged 49.4% with a high of 50.2% for NexGen varieties 1511B2RF and 4111RF and a low of 47.8% for PhytoGen 499WRF. Lint yields ranged from a low of 286 lb/acre (PhytoGen 499WRF) to a high of 393 lb/acre (NexGen 1511B2RF). Lint loan values ranged from a low of $0.4702/lb to a high of $0.4580/lb for PhytoGen 499WRF and NexGen 1511B2RF, respectively. Lint value showed significant differences with a test average of $160.12/acre. When subtracting ginning and seed and technology costs, the net value/acre averaged $114.63, and ranged from a high of $137.63 for NexGen 1511B2RF to a low of $83.26 for PhytoGen 499WRF, a difference of $54.37/acre.

Significant differences were observed for some fiber quality parameters at this location (Table 3). Micronaire values ranged from a low of 4.4 for PhytoGen 417WRF and FiberMax 2011GT to a high of 4.8 for FiberMax 2334GL. Staple averaged 31.4 across all varieties with a low of 30.0 (PhytoGen 417WRF) and a high of 32.7 (FiberMax 2334GL). Uniformity averaged 79.5%. Strength ranged from a low of 25.8 g/tex for FiberMax 2011GT to a high of 27.8 g/tex for PhytoGen 499WRF. Significant differences were observed among varieties for percent elongation, averaging 8.0 overall with a high of 8.9 and a low of 6.4 for NexGen 1511B2RF and FiberMax 2334GL respectively. Rd or reflectance averaged 69.8 and +b or yellowness averaged 9.0 across all varieties. Leaf grades averaged 3.0 and color grades were mostly 41.

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

ACKNOWLEDGEMENTS:

Appreciation is expressed to Wayne Keeling and Danny Carmichael, Texas A&M AgriLife Research Systems Agronomist - Lubbock and Research Associate - AGCARES, Lamesa. Further assistance with this project was provided by Jane Dever and Valerie Morgan - Texas A&M AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate funding for HVI testing from the Cotton Fibers Initiative Fund.

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Table 1. In-season plant measurements results from the 2014 Dawson County Dryland RACE, AG-CARES Farm, Lamesa, TX.

Entry	Plant Population		Nodes Above White Flower (NAWF) for week of:		
	plants/row ft	plants/acre	28-Jul	5-Aug	13-Aug
FiberMax 2011GT	3.6	47,190	5.1	3.7	2.5
FiberMax 2334GLT	3.1	41,019	5.1	4.3	3.4
NexGen 1511B2RF	3.1	41,019	5	3.9	2.8
NexGen 4111RF	3.3	42,834	4.7	3.5	2.5
PhytoGen 367WRF	3.1	40,656	5.1	4.1	3.3
PhytoGen 417WRF	3.4	45,012	5.7	4.7	2.9
PhytoGen 499WRF	3.4	44,649	5.6	4.3	3
Stoneville 4946GLB2	3.5	45,738	5.1	4	2.2
Test average	3.3	43,515	5.2	4.1	2.8
CV, %	8.0	7.9	11.7	18.9	13
OSL	0.2114	0.2273	0.5513	0.6834	0.0178
LSD	NS	NS	NS	NS	NS

For NAWF, numbers represent an average of 5 plants per variety per rep (15 plants per variety)
CV - coefficient of variation
OSL - observed significance level, or probablity of a greater F-value

Table 2. Harvest results from the Dawson County Dryland RACE Variety Trial, AG-CARES Farm, Lamesa, TX, 2014.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		--------- lb/acre ---------			$/lb	----------		----------	$/acre	----------	
NexGen 1511B2RF	39.8	50.2	987	3939	496	0.4580	180.02	62.00	242.02	29.62	74.77	137.63 a
FiberMax 2011GT	39.2	48.8	990	388	483	0.4445	172.32	60.33	232.65	29.70	67.75	135.20 ab
NexGen 4111RF	33.6	50.2	989	332	497	0.4592	152.5	62.12	214.62	29.68	59.30	125.64 abc
Stoneville 4946GLB2	35.2	49.4	1031	363	509	0.4575	166.13	63.68	229.81	30.94	82.66	116.21 abcd
FiberMax 2334GL	40.4	49.3	835	337	412	0.4988	168.26	51.44	219.7	25.04	82.73	111.93 bcd
PhytoGen 367WRF	36.8	49.9	909	335	454	0.4615	154.52	56.75	211.27	27.28	77.27	106.72 cde
PhytoGen 417WRF	39.0	49.7	888	346	441	0.4412	152.55	55.19	207.74	26.63	80.68	100.45 de
PhytoGen 499WRF	32.9	47.8	870	286	415	0.4702	134.68	51.93	186.61	26.09	77.27	83.26 e
Test average	37.1	49.4	937	348	463	0.4614	160.12	57.93	218.05	28.12	75.30	144.63
CV, %	10.2	8.1	7.3	7.3	7.3	3.7	7.2	7.3	7.3	7.3	--	12.0
OSL	0.1728	0.9949	0.0286	0.0037	0.0158	0.0296	0.0075	0.0158	0.0207	0.0285	--	0.0041
LSD	NS	NS	119	45	59	0.0300	20.32	7.42	27.73	3.58	--	24.16

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probablity level

CV - coefficient of variation

OSL - observed significance level, or probability of a greater F-value

LSD - least significant difference at the 0.05 level, † indicates significance at the 0.10 level, NS - not significant

Note: some columns may not add up due to rounding error

Assumes:

$3.00/cwt ginning cost

$250/ton for seed

Value for lint based on CCC loan value form grab samples and FBRI HVI results

Table 3. HVI fiber property results from the Dawson County Dryland RACE Variety Trial, AG-CARES Farm, Lamesa, TX, 2014.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
NexGen 1511B2RF	4.7	31.5	80.0	27.4	8.9	2.7	68.8	9.1	4.7	1.7
PhytoGen 499WRF	4.7	31.6	79.9	27.8	8.7	3.0	69.5	9.0	4.0	2.0
Stoneville 4946GLB2	4.8	31.1	79.5	27.7	8.6	3.7	70.1	8.9	4.0	2.0
PhytoGen 417WRF	4.4	30.0	78.0	26.1	8.5	3.7	70.5	9.4	4.0	2.0
PhytoGen 367WRF	4.6	31.4	79.6	26.3	8.1	3.3	69.1	9.2	4.0	1.7
NexGen 4111RF	4.6	31.7	79.8	27.6	7.8	2.3	67.3	9.6	4.7	2.0
FiberMax 2011GT	4.4	30.9	79.6	25.8	6.6	3.3	70.3	8.4	4.7	1.3
FiberMax 2334GL	4.8	32.7	79.7	25.9	6.4	2.3	72.6	8.2	4.0	1.0
Test average	4.6	31.4	79.5	26.8	8.0	3.0	69.8	9	4.3	1.7
CV, %	2.8	2.2	1	4.9	5.6	28.2	2.2	3.9	--	--
OSL	0.0093	0.0142	0.1183	0.2864	<0.0001	0.3556	0.0389	0.0033	--	--
LSD	0.2	1.2	NS	NS	0.8	NS	2.7	0.6	--	--

CV - coefficient of variation

OSL - observed significance level, or probability of a greater F-value

LSD - least significant difference at the 0.05 level, † indicates significance at the 0.10 level, NS - not significant

The Effects of Applying Foliar Zinc to Meet the Plant's Nutrient Requirement

Tommy Doederlein
Extension Agent - IPM, Dawson and Lynn Counties

Farm Cooperators:
Jeremy Brown - Dawson County
Johnny Ray Todd – Dawson County
Ty Stark – Lynn County

ABSTRACT:

Soil sampling is becoming an even more important management practice as fertilizer prices continue to increase. Results, from fields soil tested in 2011 through 2014, show that 81% of the fields were below the critical level of 0.28 ppm of extractable zinc available to the plant in the soil. Because of the low amount of zinc needed, low-rate foliar applications can be successfully used to treat deficiencies. In 2010, we observed some differences between treated and untreated plants including a 115% increase in yield (986 lbs./A and 458 lbs./A) leading to an 117% increase in Gross Returns of $296.33/A. The objectives were to evaluate foliar zinc applications on the growth, development and yield in irrigated and dryland cotton production systems where the zinc level is below, at or exceeds the critical level and to determine the timing of these applications. Foliar zinc applications were sprayed on ten commercially grown cotton fields. Eight fields were planted using varieties with the stacked gene technology and were soil sampled during the winter of 2013 - 2014. There were four treatments: 1) untreated, 2) early application only, 3) late application only and 4) both early and late applications. The product was a 10% liquid zinc product applied at 32 ounces per acre (0.273 lbs. zinc/acre). There were very few differences in the information gathered and no differences for yield, seed or lint, or net value for any of the test locations.

INTRODUCTION:

Fertilizer costs continue to increase dramatically. In order for producers to understand the fertility needs of their cotton crop, soil testing is a must. Results from fields soil tested in 2011 through 2014 through the Dawson/Lynn County IPM program, show that 81% of the fields were below the critical level of 0.28 ppm of extractable zinc available to the plant in the soil (Table 1). Although zinc is classified as a micronutrient, needed in small amounts, it is essential and is a constituent of enzymes and is involved with the synthesis of plant hormones that control growth. Because of the low amount of zinc needed, low-rate foliar applications can be successfully used to treat deficiencies. In 2010, we observed some differences between treated and untreated plants including a 115% increase in yield (986 lbs./A and 458 lbs./A) leading to an 117% increase in Gross Returns of $296.33/A.

OBJECTIVES:

1) To evaluate foliar zinc applications on the growth, development and yield in irrigated and dryland cotton production systems where the zinc level is below the critical level.

2) To evaluate foliar zinc applications on the growth, development and yield in irrigated and dryland cotton production systems where the zinc level is at the critical level.

3) To evaluate foliar zinc applications on the growth, development and yield in irrigated and dryland cotton production systems where the zinc level exceeds the critical level.

4) To determine the timing of foliar zinc applications in irrigated and dryland cotton production systems.

5) To determine if the application of foliar zinc is a management practice that will benefit producers on an annual basis.

MATERIALS and METHODS:

Foliar zinc applications were sprayed on ten commercially grown cotton fields. Five fields utilized a dryland production system and five fields utilized a pivot irrigated production system. All fields were planted between May 14 and May 29 except one which was planted June 16. Eight fields were planted using varieties with the stacked gene technology (Table 2). All fields were soil sampled during the winter of 2013-2014, and the soil analysis report, from the Texas A&M Soil, Water and Forage Testing Laboratory in College Station, Texas, provided the extractable zinc levels available to the plant in the soil (Table 2). Fields were classified into one of five categories based on the zinc levels in relationship to the critical level (CL) of .28 ppm. The categories were, way below CL (<0.14 ppm), below CL (0.15 - 0.26 ppm), at CL (0.27 - 0.29 ppm), above CL (0.30 - 0.44 ppm) and way above CL (>0.45 ppm) (Table 2).

A Randomized Block Design (RCBD) with four replications was initiated in each field. There were four treatments: 1) untreated, 2) early foliar zinc application only, 3) late foliar zinc application only and 4) both early and late foliar zinc applications. All treatments were applied using a Lee Spider Spray Trac at 40 p.s.i. and a total spray volume of 15 gallons per acre. Plot size was 4-rows by 100 feet in length with four rows of buffer between each treatment. The early foliar zinc applications were applied between pinhead square to first flower (July 7 - July 19), while the late foliar zinc applications occurred during boll fill, pre-open boll (July 28 - August 2). The product was a 10% liquid zinc applied at a rate of 32 ounces per acre (0.273 lbs. zinc/acre). Cost of zinc was $9.42/gallon. The product was donated by the J.C. Smith Company, San Saba, Texas.

Agronomic information was collected from 5 plants per plot and from the center 33 feet of the middle two rows of each plot. Data was collected from nine of the fields just prior to both the early and late applications using the current version of the COTMAN Expert System. The information gathered include plant population, Node of First Fruiting Branch (NFB), plant height, total nodes, total fruiting nodes (squares and/or bolls), percent fruit retention (squares

and/or bolls) and Nodes Above White Flower (NAWF).

The seed and technology cost were calculated using the Plains Cotton Growers Seed Cost Calculator and the average plant population for each field (test).
Plots were hand harvested from 10 or 20 row feet from each of the middle two rows within the center 33 feet where the agronomic data was collected. Samples were weighed then ginned at the Texas A&M AgriLife Research and Extension Center at Lubbock. Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) loan values were determined for each sample.

Because hand harvest was used to gather the cotton, the overall average lint and seed turnout percentages from each field (test) was used to calculate the lint yield and seed yield for each plot within the corresponding field (test).

The lint from the "Central" field was combined by treatment for ginning purposes therefore, there are no statistics for the HVI measures.

Statistical analysis was performed using ARM8 from Gylling Data Management, Inc., Brookings, South Dakota.

RESULTS:

Results from the ten foliar applied zinc fields (tests) are given in tables 3 through 32 below. Tables 3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 give the harvest and economic results, tables 4, 7, 12, 13, 16, 19, 22, 25, 28 and 31 provide the HVI fiber quality results and tables 5, 8, 11, 14, 17, 20, 23, 26, 29 and 32 give the plant mapping data.

Although there were a few fiber quality measures that were significantly different statistically, the values fell within the same range so there were no benefits provided in terms of premiums and/or discounts. For example, in Table 7, there is a statistical difference in fiber strength, however all the values place them in the "very strong" classification for degree of strength. This is also the case for mic, staple and uniformity in Table 13 and strength in Table 31.

There were three instances where reflectance (Rd) was significantly different (Tables 4, 7 and 28), two instances where mic was significantly different (Table 10 and 19) and one instance each where elongation and yellowness (+b) (Table 13) were significantly different.

There were a few differences in the plant development information gathered - plant height (Tables 3 and 20), boll set (Tables 8 and 17), total nodes (Tables 14 and 20), total squares (Table 20) and square set (Table 29).

There were two instances where lint loan value differed significantly (Tables 6 and 12).

The differences observed did not translate to any significant difference in yield (seed or lint) or net profits for any of the locations.

The results of this study were presented at the Cotton Incorporated - Texas State Support Committee Project Review held on December 3rd, 2014 in Lubbock Texas. They were also presented at the Southern Mesa Agricultural Conference held on January 22nd, 2015, in Lamesa, Texas -64 in attendance.

Results will continue to be disseminated through IPM newsletters and other local, regional and national meetings. The results will be shared and available to Extension Agents - IPM, Extension Specialists, County Extension Agents, Plains Cotton Growers, Lamesa Cotton Growers, Texas Pest Management Association, area consultants and producers, agri-businesses such as gins and dealers and any other agricultural organizations.

CONCLUSIONS:

There was no response, economically or agronomically, to foliar zinc applications regardless of the level of extractable zinc available in the soil. The growing environment (drought and heat) may overwhelm any benefit from foliar zinc applications. Fields need to have their primary needs met and may need to be showing signs of a zinc deficiency before plants can fully utilize the available and augmented nutrients to their fullest benefit. Therefore, foliar zinc applications as a routine management practice does not appear to be a sound strategy. To avoid and/or remedy a zinc deficiency in a field, follow the recommendation* of a single broadcast application every 2-3 years.

*Texas A&M AgriLife Extension Service Soil, Water and Forage Testing Laboratory

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Table 1. Acres sampled, fields sampled and percent of fields deficient in zinc in the 2011 through 2014 Dawson/Lynn IPM soil sampling program.

	2011	2012	2013	2014
Total acres sampled	19,453	6,933	12,912	10,238
Total fields sampled	81	51	76	83
Percent of fields deficient in zinc	85%	82%	76%	82%
Irrigated acres sampled	1,653	3,796	2,410	4,137
Irrigated fields sampled	25	35	24	51
Percent of Irrigated fields deficient in zinc	64%	74%	63%	71%
Dryland acres sampled	17,801	3,137	10,502	6,101
Dryland fields sampled	56	16	52	32
Percent of dryland fields deficient in zinc	95%	100%	87%	100%

Table 2. Zinc level, variety, planting and harvest date and average lint yield for six commercial cotton fields. Dawson and Lynn County, Texas, 2014.

Field	Production Type	Zinc (ppm)*	Variety	Planting Date	Harvest Date	Average Lint Yield (lbs./A)
Hodge	Dryland	0.02	DG 2355 B2RF	June 16	November 21	257
McAuley	Dryland	0.07	DG 2355 B2RF	May 28	November 17	316
Cawthorn	Pivot	0.07	FM 2484 B2RF	May 14	November 18	1,298
North Bingham	Dryland	0.08	FM 2011 GT	May 17	November 19	250
Central	Dryland	0.16	FM 2011 GT	May 15	November 20	356
Airport	Dryland	0.24	NG 4012 B2RF	May 20	November 1	553
Short	Pivot	0.25	FM 2484 B2RF	May 15	November 20	1,248
South	Pivot	0.29	NG 1511 B2RF	May 29	November 12	1,963
North	Pivot	0.42	FM 2484 B2RF	May 28	November 1	1,577
Front Grandview	Pivot	0.59	DP 1321 B2RF	May 28	November 1	1,396

*CL – 0.28 ppm

Table 3. Harvest and economics from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Hodge)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Technology Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			2,167	276	470	0.5430	149.51	46.95	196.47	65.01		104.29
Late only			1,967	250	426	0.5321	132.95	42.62	175.57	59.01		89.39
Early and Late			1,872	238	406	0.5316	137.34	40.56	181.28	60.84		90.91
Untreated			2,096	267	454	0.5293	141.85	45.41	187.26	62.88		99.58
Test Avg.	12.7	21.7	2,025	258	439	0.5300	140.41	43.88	185.15	61.94	24.81	96.04
CV, %	---	---	23.34	23.33	23.35	2.98	23.42	23.33	23.27	22.92	---	30.16
OSL	---	---	0.8174	0.8153	0.8172	0.6363	0.9037	0.8173	0.9124	0.9376	---	0.8661
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 4. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Hodge)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	3.9	1.11	82.5	30.3	8.1		74.4 a	9.5		
Late only	4.0	1.11	82.2	30.4	8.0		72.9 b	9.3		
Early and Late	4.1	1.09	81.4	29.8	8.2		74.71 a	9.8		
Untreated	3.9	1.11	81.4	30.4	8.7		74.2 a	9.4		
Test Avg.	4.0	1.1	81.9	30.2	8.2	3.3	74.1	9.5	3.1	2.3
CV, %	4.66	1.98	0.93	2.82	4.82	---	1.02	6.18	---	---
OSL	0.4865	0.3494	0.1821	0.7526	0.1439	---	0.0460	0.5932	---	---
LSD	NS	NS	NS	NS	NS	---	0.995	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 5. Plant mapping results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Hodge)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
			---------- July 18 ----------										
Early only	15972	6.2	3.6 ab	8.0	2.25	92.8							
Late only	17787	6.5	3.2 b	6.5	1.0	100							
Early and Late	16335	6.7	3.9 a	6.7	1.0	100							
Untreated	18150	7.0	3.9 a	8	2.0	100							
Test Avg.	17061	6.6	3.7	7.3	1.6	98.2							
CV, %	17.94	6.89	4.63	8.26	33.94	5.15							
OSL	0.6994	0.5000	0.0860	0.1647	0.1905	0.5000							
LSD	NS	NS	0.3982	NS	NS	NS							

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 6. Harvest and economics from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (McAuley)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			1196	309	514	0.5401bc	167.16	51.43	218.59	35.89		104.00
Late only			1187	307	510	0.5667a	173.86	51.06	224.92	35.63		110.59
Early and Late			1199	310	516	0.5490ab	170.53	51.57	222.10	35.99		105.05
Untreated			1313	340	564	0.5217c	177.79	56.45	234.25	39.40		118.51
Test Avg.	25.9	43.0	1224	317	526	0.54	172.34	52.63	224.97	36.73	76.34	109.54
CV, %	---	---	17.62	17.63	17.63	2.8	16.98	17.63	17.10	17.62	---	29.26
OSL	---	---	0.8211	0.8195	0.8224	0.0156	0.9599	0.8214	0.9451	0.8210	---	0.9128
LSD	---	---	NS	NS	NS	0.0198	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 7. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (McAuley)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	4.4	1.11	82.8	33.0 a	8.2		76.6 bc	8.1		
Late only	4.4	1.10	81.8	32.0 b	8.4		77.7 a	8.0		
Early and Late	4.5	1.08	82.3	31.7 b	8.2		77.4 ab	8.0		
Untreated	4.7	1.09	82.1	31.7 b	8.4		76.1 c	8.1		
Test Avg.	4.5	1.10	82.3	32.1	8.3	3.1	77.0	8.1	3.3	1.4
CV, %	4.91	1.85	0.67	2.28	6.15	---	0.98	2.84	---	---
OSL	0.2337	0.2798	0.1405	0.0926	0.8314	---	0.0533	0.8016	---	---
LSD	NS	NS	NS	0.948	NS	---	0.980	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 8. Plant mapping results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (McAuley)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
			July 18				July 31						
Early only	19602	8.4	7.5	11.7	3.7	66.7	12.9	8.6	5.1	80.3	2.1	93.7 a	6.4
Late only	15972	8.4	8.4	12.1	4.6	97.7	13.4	8.4	6.1	94.6	1.7	93.7 a	6.5
Early and Late	17424	8.5	8.1	12.1	4.4	96.9	13.9	8.9	6.6	98.2	1.5	72.9 b	6.7
Untreated	19965	8	7.5	11.9	4.5	93.2	13.1	7.7	5.7	95.0	1.6	100 a	6.1
Test Avg.	18241	8.3	7.9	12.0	4.3	88.6	13.3	8.4	5.9	92.0	1.7	90.1	6.4
CV, %	13.02	5.40	9.23	8.07	20.54	21.31	7.89	10.12	14.41	11.68	31.59	13.81	12.75
OSL	0.1240	0.4648	0.2571	0.9265	0.5393	0.1319	0.5968	0.3367	0.1566	0.1557	0.4548	0.0584	0.7551
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	16.126	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 9. Harvest and economics from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Cawthorn)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	%		lb/acre			$/lb	$/acre					
Early only			5365	1258	1875	0.5215	655.44	187.55	842.99	160.95		634.77
Late only			5591	1311	1954	0.5530	533.30	195.44	728.74	167.72		517.80
Early and Late			5932	1391	2074	0.5350	747.13	207.35	954.49	177.95		727.50
Untreated			5258	1233	1838	0.5367	662.31	183.80	846.12	157.73		643.47
Test Avg.	23.5	35.0	5536	1298	1935	0.54	649.55	193.54	843.08	166.09	44.91	630.89
CV, %	---	---	8.43	8.42	8.42	5.2	33.96	8.43	27.25	8.43	---	34.47
OSL	---	---	0.2504	0.2494	0.2491	0.5006	0.6101	0.2507	0.6058	0.2506	---	0.6146
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 10. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Cawthorn)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	3.3 b	1.12	81.5	29.6	7.0		73.6	9.4		
Late only	4.0 a	1.13	81.7	31.1	6.6		76.1	8.0		
Early and Late	3.5 b	1.12	81.8	30.6	6.4		73.5	9.3		
Untreated	3.7 ab	1.14	81.8	30.1	6.4		75.8	8.2		
Test Avg.	3.6	1.13	81.7	30.4	6.6	3.1	74.8	8.7	3.6	2.0
CV, %	7.78	1.61	1.07	3.62	8.96	---	3.2	12.0	---	---
OSL	0.0471	0.6245	0.9480	0.3287	0.4600	---	0.3281	0.1988	---	---
LSD	0.372	NS	NS	NS	NS	---	NS	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 11. Plant mapping results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Cawthorn)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 18 ----------					---------- July 31 ----------						
Early only	29403	6.5	4.8	9.6	4.1	100	15.6	10.4	8.5	98.1	1.7	100	8.6
Late only	29403	6.6	4.7	9.5	3.9	100	14.9	10.2	8.2	95.0	1.5	100	8.7
Early and Late	31944	6.7	4.9	9.4	3.6	100	14.0	10.3	8.4	99.0	1.8	100	8.5
Untreated	28677	6.6	4.8	9.5	3.9	100	15.2	10.5	8.3	96.1	1.8	100	8.7
Test Avg.	29857	6.6	4.8	9.5	3.9	100	14.9	10.3	8.4	97.1	1.7	100	8.6
CV, %	10.76	3.56	4.58	4.64	16.66	0	5.77	6.58	6.67	4.43	45.24	0	3.59
OSL	0.5265	0.5493	0.4975	0.8840	0.7564	1.000	0.1327	0.9107	0.9280	0.5562	0.9188	1.000	0.8525
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 12. Harvest and economics from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (North Bingham)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			728	214	303	0.3620 c	77.54	30.32	107.65	21.85		56.94
Late only			830	244	345	0.3905 b	95.32	34.55	129.87	24.90		75.31
Early and Late			914	269	380	0.3905 b	104.98	38.05	143.02	27.42		84.76
Untreated			931	274	387	0.3915 a	107.27	38.78	146.05	27.95		91.39
Test Avg.	29.4	41.6	851	250	354	0.38	96.28	35.42	131.70	25.53	29.71	77.10
CV, %	---	---	29.32	29.34	29.26	0.05	29.61	29.30	29.53	29.30	---	40.83
OSL	---	---	0.6570	0.6557	0.6576	0.0001	0.4784	0.6567	0.5252	0.6564	---	0.4762
LSD	---	---	NS	NS	NS	0.0003	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 13. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (North Bingham)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	3.8 c	0.940 c	77.20 c	21.3	4.2 c		60.0	9.3 a		
Late only	4.0 a	0.943 bc	77.35 b	22.2	4.9 a		59.9	8.9 b		
Early and Late	3.9 ab	0.948 ab	77.25 bc	22.2	5.0 a		58.9	8.7 b		
Untreated	3.9 b	0.950 a	78.00 a	22.9	4.4 b		60.2	8.7 b		
Test Avg.	3.9	0.94	77.45	22.1	4.63	2.2	59.7	8.9	6.2	1.2
CV, %	1.05	0.43	0.12	0.0	2.65	---	1.37	1.83	---	---
OSL	0.0013	0.0235	0.0001	1.000	0.0001	---	0.1832	0.0017	---	---
LSD	0.053	0.0052	0.118	NS	0.159	---	NS	0.212	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 14. Plant mapping results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (North Bingham)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
			July 7				July 26						
Early only	20691	6.7	9.4	11.0 b	5.3	100	14.8	8.7	5.6	96.7	2.7	93.1	5.8
Late only	21417	6.5	9.0	11.5 a	5.8	97.2	15.6	8.7	5.7	95.4	2.6	94.7	5.9
Early and Late	19965	6.2	9.3	11.5 a	6.3	100	14.7	8.8	5.7	97.9	2.7	94.3	5.9
Untreated	20691	6.7	9.4	11.7 a	6.0	100	15.5	8.9	5.0	97.1	3.6	96.1	5.1
Test Avg.	20691	6.5	9.3	11.4	5.9	99.3	15.2	8.8	5.5	96.8	2.9	94.6	5.7
CV, %	10.23	5.88	8.88	2.19	8.51	2.42	8.16	10.41	17.36	4.64	28.98	5.96	15.23
OSL	0.8194	0.4049	0.9105	0.0701	0.2039	0.4545	0.6790	0.9921	0.6749	0.8766	0.3713	0.8960	0.5423
LSD	NS	NS	NS	0.397	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 15. Harvest and economics from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (Central)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	%		lb/acre			$/lb	$/acre					
Early only			1175	365	475	0.4090	149.42	47.53	196.95	35.24		133.38
Late only			1094	340	442	0.3990	135.73	44.26	179.99	32.82		118.26
Early and Late			1051	327	425	0.3990	130.37	42.51	172.85	31.52		111.27
Untreated			1263	393	511	0.4335	170.24	51.09	221.32	37.89		157.48
Test Avg.	31.1	40.5	1146	356	463	0.41	146.44	46.35	192.79	34.37	25.96	130.10
CV, %	---	---	19.16	19.19	19.15	---	19.75	19.16	19.60	19.16	---	23.89
OSL	---	---	0.5617	0.5625	0.5586	---	0.2771	0.5613	0.3333	0.5612	---	0.2296
LSD	---	---	NS	NS	NS	---	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 16. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (Central)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	3.9	23.6	78.3	23.6	4.5		65.6	9.0		
Late only	4.1	21.3	76.6	21.3	5.1		64.4	9.1		
Early and Late	4.0	21.2	76.8	21.2	4.5		65.3	9.0		
Untreated	4.0	23.5	79.8	23.5	5.5		65.1	8.8		
Test Avg.	4.0	22.4	77.9	22.4	4.9	3.0	65.1	9.0	6.2	1.2
CV, %	---	---	---	---	---	---	---	---	---	---
OSL	---	---	---	---	---	---	---	---	---	---
LSD	---	---	---	---	---	---	---	---	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 17. Plant mapping results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Lynn County, Texas, 2014. (Central)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 7 ----------					---------- July 26 ----------						
Early only	19965	6.3	8.8	11.4	6.2	100	14.2	8.7	4.8	87.5	3.2 c	95.4	5.4
Late only	18876	6.2	8.5	11.3	5.9	97.9	15.0	9.5	5.5	93.7	3.4 bc	93.1	5.8
Early and Late	19602	6.3	8.1	11.3	5.8	98.1	15.0	9.4	4.5	88.6	4.1 ab	94.4	5.1
Untreated	21780	6.1	8.7	11.2	6.0	99.0	16.2	9.8	5.3	96.0	4.2 a	100	5.6
Test Avg.	20056	6.2	8.5	11.3	6.0	98.9	15.1	9.4	5.0	91.5	3.73	95.6	5.5
CV, %	7.84	7.42	11.42	4.89	11.23	2.6	6.61	8.48	20.94	9.24	13.84	7.27	16.10
OSL	0.1286	0.9302	0.7467	0.9358	0.8828	0.6637	0.1068	0.3323	0.5461	0.4649	0.0443	0.5365	0.6778
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.67	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 18. Harvest and economics from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Airport)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			1865	521	780	0.4889	255.54	77.99	333.52	55.94		238.08
Late only			2028	567	848	0.4954	281.09	84.81	365.90	60.83		264.97
Early and Late			1968	550	823	0.4846	267.54	82.34	349.87	59.06		249.54
Untreated			2047	572	856	0.4760	272.22	85.62	357.84	61.41		259.28
Test Avg.	28.0	41.8	1977	553	827	0.49	269.10	82.69	351.79	59.31	76.34	252.97
CV, %	---	---	11.2	11.21	11.21	2.87	11.59	11.19	11.42	11.19	---	13.27
OSL	---	---	0.6619	0.6577	0.6613	0.3175	0.7133	0.6608	0.7082	0.6611	---	0.6953
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 19. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Airport)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	4.3 a	1.00	80.1	27.3	5.8		74.2	8.9		
Late only	4.3 a	1.01	80.0	28.1	5.8		74.5	8.8		
Early and Late	4.3 a	1.02	80.0	28.1	5.7		73.1	9.0		
Untreated	4.0 b	1.00	79.3	27.1	5.6		73.5	9.0		
Test Avg.	4.2	1.01	79.9	27.6	5.7	3.1	73.8	8.9	3.6	2.6
CV, %	3.42	1.07	0.94	3.09	7.33	---	1.67	2.63	---	---
OSL	0.0607	0.2867	0.4386	0.2763	0.7544	---	0.4308	0.5554	---	---
LSD	0.188	NS	NS	NS	NS	---	NS	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 20. Plant mapping results from a Foliar Zinc Application demonstration in a commercial dryland cotton production system. Dawson County, Texas, 2014. (Airport)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 7 ----------					---------- July 28 ----------						
Early only		8.2	11.7 ab	13.0 ab	5.7 bc	99.0	21.6	10.0	6.2	86.6	2.5	91.7	7.2
Late only		7.9	10.8 b	12.4 b	5.4 c	97.7	23.7	9.7	6.1	85.4	2.5	95.0	7.2
Early and Late		7.9	11.3 b	13.0 ab	5.9 ab	98.1	22.5	10.2	7.0	94.5	2.6	94.6	7.4
Untreated		8.1	12.6 a	13.6 a	6.3 a	97.8	23.0	9.9	6.0	90.4	2.8	86.8	6.7
Test Avg.	30588	8.0	11.6	13.0	5.84	98.1	22.6	10.0	6.3	89.2	2.6	92.0	7.1
CV, %		5.53	7.54	3.84	6.70	2.04	6.1	5.88	9.41	9.43	34.81	10.46	10.32
OSL		0.8007	0.0948	0.0533	0.0350	0.8167	0.2105	0.7893	0.1317	0.4511	0.9453	0.6186	0.5564
LSD		NS	1.13	0.65	0.51	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 21. Harvest and economics from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Short)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			4586	1298	1738	0.5202	671.58	173.79	845.38	137.57		657.47
Late only			4390	1243	1664	0.5487	682.96	166.39	849.35	131.71		666.72
Early and Late			4429	1253	1679	0.5614	703.61	167.85	871.46	132.86		686.48
Untreated			4232	1197	1604	0.5581	667.58	160.39	827.97	126.96		653.03
Test Avg.	28.3	37.9	4409	1248	1671	0.55	681.43	167.11	848.54	132.27	47.98	665.93
CV, %	---	---	10.47	10.46	10.46	4.08	8.37	10.46	8.65	10.46	---	9.01
OSL	---	---	0.7589	0.7579	0.7569	0.1002	0.8101	0.7587	0.8682	0.7589	---	0.8632
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 22. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Short)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	4.3	1.09	80.2	30.7	6.6		75.9	7.6		
Late only	4.4	1.09	80.6	31.1	6.6		78.5	7.8		
Early and Late	4.3	1.10	81.1	30.6	6.5		78.0	7.7		
Untreated	4.4	1.11	81.2	31.9	6.4		78.2	7.4		
Test Avg.	4.4	1.1	80.8	31.1	6.5	2.9	77.7	7.6	3.3	1.4
CV, %	3.14	2.07	1.42	4.73	6.06	---	1.85	4.93	---	---
OSL	0.6207	0.8013	0.6146	0.6041	0.7798	---	0.1105	0.5608	---	---
LSD	NS	NS	NS	NS	NS	---	NS	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 23. Plant mapping results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Lynn County, Texas, 2014. (Short)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 7 ----------					---------- August 4 ----------						
Early only	31944	8.5	4.7	9.7	2.2	100	17.2	11.0	8.1	98.4	2.7	100	8.2
Late only	33033	8.2	4.9	10.0	2.8	100	17.7	10.9	7.9	98.6	2.9	100	8.0
Early and Late	31581	7.9	5.0	9.7	2.8	100	18.0	10.9	7.6	98.3	3.0	96.4	7.7
Untreated	30855	8.4	5.0	10.1	2.7	100	18.0	11.4	8.1	98.3	3.1	100	8.2
Test Avg.	31853	8.2	4.9	9.9	2.6	100	17.7	11.0	7.9	98.4	2.9	99.1	8.1
CV, %	13.08	7.41	7.17	2.53	21.19		6.74	5.77	8.33	2.67	33.20	3.60	7.94
OSL	0.9007	0.6276	0.6050	0.1618	0.4118		0.7906	0.6585	0.6767	0.9987	0.9524	0.4365	0.6551
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 24. Harvest and economics from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (South)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			6455	1964	2527	0.5556	1092.74	252.72	1345.46	193.65		1095.49
Late only			6196	1885	2426	0.5411	1019.85	242.57	1262.43	185.87		1020.22
Early and Late			6629	2017	2595	0.5395	1091.06	259.55	1350.61	198.89		1093.04
Untreated			6535	1988	2558	0.5306	1057.17	255.85	1313.02	196.05		1063.00
Test Avg.	30.4	39.2	6454	1963	2527	0.54	1065.21	252.68	1317.88	193.62	53.97	1067.94
CV, %	---	---	9.55	9.56	9.56	3.33	10.89	9.55	10.57	9.55	---	11.37
OSL	---	---	0.7800	0.7812	0.7804	0.3280	0.7893	0.7800	0.7982	0.7798	---	0.8015
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 25. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (South)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	4.7	1.08	82.2	31.0	8.7		78.4	8.2		
Late only	4.8	1.08	81.8	31.0	9.2		77.3	8.1		
Early and Late	4.9	1.07	81.6	30.6	9.1		78.2	8.0		
Untreated	4.9	1.08	82.5	31.2	9.0		77.9	8.1		
Test Avg.	4.9	1.08	82.0	31.0	9.0	3.2	78.0	8.1	3.1	1.3
CV, %	3.11	1.57	0.64	1.83	9.39	---	1.03	2.65	---	---
OSL	0.2504	0.8557	0.1376	0.4816	0.8359	---	0.3229	0.5767	---	---
LSD	NS	NS	NS	NS	NS	---	NS	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 26. Plant mapping results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (South)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 18 ----------					---------- July 31 ----------						
Early only		5.7	13.4	11.5	6.5	96.2	22.7	10	6.7	100	3.2	100	6.7
Late only		5.4	13.4	10.9	6.5	100	21.2	10	6.6	94.6	2.9	96.4	7.0
Early and Late		5.9	12.4	11.2	6.2	98.1	21.2	9.6	7.0	100	2.6	100	7.0
Untreated		5.6	13.7	11.6	6.9	98.2	23.2	9.6	6.5	97.9	2.9	96.4	6.6
Test Avg.	37752	5.7	13.2	11.3	6.5	98.1	22.1	9.8	6.7	98.1	2.9	98.2	6.8
CV, %	---	9.35	13.04	6.79	14.45	4.01	8.82	9.65	10.25	4.38	44.81	5.43	8.97
OSL	---	0.3014	0.7539	0.5538	0.8259	0.6277	0.3923	0.8874	0.7668	0.3100	0.9228	0.6309	0.7744
LSD	---	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 27. Harvest and economics from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (North)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			5080	1541	2100	0.5774	890.92	209.99	1100.91	152.41		889.18
Late only			5024	1524	2077	0.5767	879.00	207.68	1086.68	150.73		876.62
Early and Late			5164	1566	2134	0.5792	907.27	213.46	1120.73	154.93		904.12
Untreated			5533	1678	2287	0.5777	969.83	228.68	1198.52	165.98		975.58
Test Avg.	30.3	41.3	5200	1577	2149	0.58	911.76	214.95	1126.71	156.01	56.96	911.38
CV, %	---	---	14.83	14.83	14.83	0.66	15.2	14.83	15.13	14.83	---	16.16
OSL	---	---	0.7889	0.7897	0.7882	0.8223	0.7969	0.7891	0.7954	0.7890	---	0.7828
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 28. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (North)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	3.9	1.16	81.55	31.9	6.2		81.7	7.6		
Late only	3.9	1.15	81.1	32.6	6.0		81.2	7.3		
Early and Late	3.8	1.14	81.25	33.05	6.5		83.6	7.5		
Untreated	3.9	1.15	81.4	32.15	6.1		82.9	7.3		
Test Avg.	3.9	1.15	81.3	32.43	6.2	1.6	82.4	7.4	2.2	1.4
CV, %	6.35	2.28	0.82	2.34	7.61	---	1.46	2.70	---	---
OSL	0.9115	0.8087	0.8079	0.2337	0.6364	---	0.0727	0.2248	---	---
LSD	NS	NS	NS	NS	NS	---	1.55	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 29. Plant mapping results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (North)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 18 ----------					---------- July 31 ----------						
Early only		6.9	11.3	11.5	5.6	100 a	20.2	10.2	7.7	100	2.1	95.8	7.7
Late only		7.1	11.6	12.0	5.5	93.9 b	19.7	9.5	7.4	100	2.2	90.8	7.4
Early and Late		7.4	11.4	11.5	5.1	95.6 b	20.7	9.9	7.1	98.2	2.2	90.8	7.2
Untreated		7.4	11.4	11.7	5.4	100 a	21.2	9.4	7.7	98.3	1.9	95.0	7.9
Test Avg.	37752	7.2	11.4	11.7	5.4	97.38	20.5	9.7	7.5	99.1	2.1	93.1	7.6
CV, %	---	8.60	6.46	4.45	10.02	3.03	7.45	5.92	8.61	2.60	15.69	11.89	7.87
OSL	---	0.6310	0.9658	0.5026	0.6187	0.0358	0.5678	0.2042	0.4782	0.6311	0.3895	0.8713	0.4363
LSD	---	NS	NS	NS	NS	3.83	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Table 30. Harvest and economics from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (Front Grandview)

Treatment	Lint Turnout	Seed Turnout	Bur Cotton Yield	Lint Yield	Seed Yield	Lint Loan Value	Lint Value	Seed Value	Total Value	Ginning Cost	Seed & Tech Cost	Net Value
	--------- % ---------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
Early only			4424	1353	1766	0.5304	718.58	176.61	895.19	132.72		712.24
Late only			4452	1362	1778	0.5187	705.72	177.76	883.48	133.58		699.08
Early and Late			4550	1392	1816	0.5307	738.26	181.66	919.93	136.51		731.42
Untreated			4827	1477	1927	0.5331	787.13	192.75	979.84	144.82		787.15
Test Avg.	30.6	39.9	4563	1396	1822	0.53	737.42	182.19	919.61	136.91	47.87	732.47
CV, %	---	---	8.86	8.86	8.86	2.43	9.24	8.86	9.12	8.86	---	9.80
OSL	---	---	0.5116	0.5109	0.5109	0.4320	0.3985	0.5114	0.4173	0.5114	---	0.3744
LSD	---	---	NS	NS	NS	NS	NS	NS	NS	NS	---	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Assumes: $3.00/cwt ginning cost; $200/ton for seed.
Lint value based on CCC loan value from grab samples and Fiber and Biopolymer Research Institute at Texas Tech University.
Net value accounts for cost of zinc.

Table 31. HVI fiber property results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (Front Grandview)

Treatment	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color Grade	
	units	inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Early only	4.6	1.06	81.5	31.0 a	9.1		78.0	8.3		
Late only	4.3	1.04	80.5	30.5 b	9.0		78.4	8.1		
Early and Late	4.5	1.05	81.4	30.3 b	8.6		78.5	8.1		
Untreated	4.3	1.06	81.2	30.5 b	8.9		77.9	8.2		
Test Avg.	4.4	1.05	81.2	30.6	8.9	3.0	78.2	8.2	2.9	1.4
CV, %	6.43	1.15	0.70	1.29	6.34	---	1.12	2.73	---	---
OSL	0.6198	0.1439	0.1216	0.0847	0.6725	---	0.6893	0.6111	---	---
LSD	NS	NS	NS	0.511	NS	---	NS	NS	---	---

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

Table 32. Plant mapping results from a Foliar Zinc Application demonstration in a commercial pivot irrigated cotton production system. Dawson County, Texas, 2014. (Front Grandview)

Treatment	Plant Stand	First FB	Plant Height	Total Nodes	Total Squares	Square Set	Plant Height	Total FB	Total Squares	Square Set	Total Bolls	Boll Set	NAWF
	#/acre	node	inches	/ plant	/ plant	%	inches	/ plant	/ plant	%	/ plant	%	avg. / plant
		---------- July 7 ----------					---------- July 28 ----------						
Early only		5.9	8.1	9.9	4.9	100	18.8	9.8	8.2	100	1.6	100	8.2
Late only		6.0	8.1	10.0	4.9	98.8	17.9	9.7	8.1	100	1.6	100	8.1
Early and Late		6.0	8.2	9.9	4.9	100	18.2	9.9	8.2	100	1.7	100	8.2
Untreated		6.0	7.5	9.4	4.4	100	17.8	9.7	7.7	100	1.9	100	7.7
Test Avg.	31363	6.0	8.0	9.8	4.8	99.7	18.2	9.8	8.1	100	1.7	100	8.1
CV, %	---	8.42	7.07	4.93	6.28	1.15	3.77	3.78	5.69		16.85		5.69
OSL	---	0.9972	0.6958	0.4189	0.1192	0.4369	0.2274	0.7183	0.4732		0.3663		0.4732
LSD	---	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within a column with the same letter are not significantly different at the 0.10 probability level.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV – coefficient of variation.
OSL – observed significance level, probability of a greater F value.
LSD – least significant difference at the 0.10 level (Duncan's New MRT), NS – Not Significant.

First FB – first fruiting branch
NAWF – Nodes Above White Flower

Appendix

Days	April			May		
	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	82	46	0	66	39	0
2	84	48	0	69	39	0
3	87	46	0	75	41	0
4	77	32	0	91	46	0
5	66	32	0	93	48	0
6	59	39	0	99	48	0
7	69	37	0	93	48	0
8	66	35	0	95	51	0
9	75	35	0	84	46	0
10	89	39	0	88	47	0
11	91	42	0	86	49	0
12	86	42	0	93	48	0
13	91	46	0	79	44	0
14	84	32	0	55	37	0
15	51	25	0	71	37	0
16	64	25	0.1	81	39	0
17	81	37	0	91	43	0
18	68	46	0	84	45	0
19	72	44	0	93	55	0
20	73	53	0	97	62	0.25
21	78	52	0	100	62	0
22	87	48	0	91	63	0
23	84	48	0	81	63	0
24	89	57	0	79	61	0
25	78	46	0	78	59	0
26	91	46	0	72	55	0
27	91	51	0	75	52	0
28	78	48	0	84	52	0
29	79	46	0	87	57	0
30	68	42	0	88	57	0
31				89	62	0

Days	June			July		
	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	91	64	0	98	73	0
2	97	68	0	91	68	0
3	96	66	0	87	62	0
4	93	66	0	84	62	0
5	105	63	0	90	64	0
6	102	63	0	91	64	0
7	93	66	0	89	63	0
8	93	61	0	91	63	0
9	85	59	0	93	65	0
10	77	55	0	93	64	0
11	84	55	0	91	64	0
12	100	60	0	88	64	0
13	87	64	0	91	62	0
14	91	62	0	95	64	1.25
15	93	63	0	96	64	0.25
16	93	63	0	84	66	0
17	91	66	0	91	66	0
18	93	63	0	79	63	0
19	91	63	0	87	62	0
20	89	64	0	93	62	0
21	82	63	0	99	70	0
22	80	63	0	99	72	0
23	77	65	0	96	66	0
24	88	68	1	98	66	0
25	88	64	1	100	64	0
26	82	64	0.25	99	64	0
27	91	65	0	99	69	0
28	99	70	0	100	69	0
29	104	70	0	91	66	0
30	99	72	0	91	66	0
31				102	66	0

Days	August			September		
	Temp. Max	Temp. Min.	Precipitation	Temp. Max	Temp. Min.	Precipitation
1	87	62	0	100	64	0
2	88	62	0	105	70	0
3	87	61	3	100	68	0
4	91	60	0	93	64	0
5	91	60	0	94	63	0
6	93	64	0	89	62	0
7	99	64	0	75	60	0
8	102	65	0	75	61	0
9	98	65	0	87	62	0
10	98	64	0	95	64	0
11	96	66	0	93	63	0
12	91	66	0	82	61	0
13	90	62	0	62	45	0
14	95	62	0	55	46	0
15	96	64	0	69	46	0
16	99	66	0	78	61	0
17	95	66	0	80	66	0
18	96	62	0	87	66	0
19	91	62	0	72	67	0
20	91	63	0	73	66	0.5
21	95	64	0	79	66	0
22	97	67	0	71	64	0
23	95	66	0	78	63	0
24	95	66	0	82	63	0.3
25	96	65	0	82	60	0
26	97	68	0	69	57	0
27	96	66	0	78	56	0
28	96	66	0	78	56	0
29	97	64	0	77	55	0
30	98	65	0	80	55	0
31	95	64	0			

Days	October		
	Temp. Max	Temp. Min	Precipitation
1	84	68	0
2	79	65	0
3	81	59	0
4	80	59	0
5	83	61	0
6	85	62	0
7	86	61	0
8	86	66	0
9	87	67	0
10	79	67	0
11	76	55	0
12	82	58	0
13	74	56	0
14	80	53	0
15	83	53	0
16	85	55	0
17	83	58	0
18	69	58	0
19	76	59	0
20	78	23	0
21	77	27	0
22	73	45	0
23	77	46	0
24	81	61	0
25	84	59	0
26	85	60	0
27	83	64	0
28	79	58	0
29	80	55	0
30	80	56	0
31	62	53	1.93