VARIETY PERFORMANCE IN FIELDS WITH VERTICILLIUM WILT IN THE TEXAS SOUTHERN HIGH PLAINS

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Abstract

Verticillium wilt has been the most yield limiting disease for cotton production in the Southern High Plains of Texas since 2004. Cultivars that perform consistently well in the presence of this disease were identified by a series of small plot, replicated trials in producer's fields. The top yielding cultivars when combining 2007 and 2008 tests included: NexGen (NG) 2549B2RF, Fibermax (FM) 9058RF, FM 9180B2RF, AFD 5064F, FM 9063B2RF, and Deltapine (DP) 104B2RF. Other cultivars that were in the top yield group in at least one individual site in 2008 included FM 1740B2RF, Phytogen 425RF, NG 3348B2RF, DP 164B2RF, and DP 161B2RF.

Introduction

Verticillium wilt has been the most yield limiting disease for cotton production in the Southern High Plains of Texas since 2004. Management strategies for this disease include variety selection, crop rotation with nonhosts, and not over watering the crop. In the 1990's, the primary variety grown in this region was Paymaster (PM) HS-26, which had partial resistance to Verticillium wilt. Around 2000, a shift began from growing stripper varieties to picker varieties. Verticillium wilt is now a problem in many fields in the Southern High Plains of Texas, even in years where the weather is not conducive for disease. The fungal spores in the soil, called microsclerotia, have the ability to survive for many years, even in the absence of a host. Given the levels of microsclerotia in the soil in this region, Verticillium wilt is anticipated to be a widespread problem for many years.

Starting in 2005, a variety testing program in producer's fields was initiated in this region. The results of this program are used to make recommendations to producers on their variety choices for fields with Verticillium wilt problems.

Methods

Six on-farm trials were conducted at locations confirmed for the presence of Verticillium wilt. At each location, 32 cultivars (usually a combination of varieties and a few experimental lines) were planted in a randomized complete block design with four replications. Plots were 35 ft. long, and two rows wide (40-inch centers). The cultivars were planted at a rate of four seed per ft. of row. Temik 15G (aldicarb) was applied at 5 lbs/acre at planting in the furrow at all sites. At 30 – 45 days after planting, the number of plants in each row was counted. From the end of July to approximately the first of September, the number of plants with symptoms of Verticillium wilt in each plot (both rows) were counted, with approximately three sets of ratings per site. Plots were harvested with a two-row cotton stripper and weights obtained from a load-cell system for each plot were recorded. A sample of two of the four replications was saved from the harvested cotton (lint + seed + trash) and ginned to determine turnout. A sample of the ginned lint was sent to the Fiber and Biopolymer Research Institute, Lubbock, TX for HVI testing.

Floydada, TX: The soil had an average of 8 microsclerotia (ms) of *V. dahlie*/cm^3 soil. This field was irrigated with a center pivot system. The site was planted on 30 April and harvested on 28 October.

Slaton, TX: The test site averaged 292 ms/cm^3 soil. This site was irrigated with a center pivot system. This site was planted on 22 May and harvested on 6 November.

Ropesville, TX: There was an average of 52 ms/cm^3 soil at this site. This site was irrigated with a center pivot system and root-knot nematode was present as well as Verticillium wilt. This site was planted on 16 May and harvested on 5 December.

Lamesa, TX: There was an average of 16 ms/cm^3 soil in the test site. This site was irrigated with a center pivot system. This site was originally planted on 21 May, but was subsequently hailed out and replanted on 2 June. It was harvested on 2 December.

Garden City, TX: There was an average of 36 ms/cm^3 soil at the test area. This site was irrigated with drip irrigation under every row. This site was planted on 8 May and harvested on 7 November.

Seminole, TX: This cotton at this site was strongly affected by Fusarium wilt so no results will be presented.

The incidence of wilt, yield (lbs of lint/acre), and value of the crop ([yield x loan value] – seed and technology fees) were analyzed by SAS version 9.1, using PROC GLM if the data set was complete (no missing values) or PROC MIXED if there were missing values. Each site, which contained a different combination of cultivars, was analyzed separately. A correlation analysis was conducted on wilt incidence, plant stand, yield, and when available, lint properties and value of the crop/acre with $P \leq 0.05$. A relative yield, relative wilt, and relative value of the crop was calculated for each plot in each site, by dividing the plot values for that site, by the highest average cultivar value for that site. For example, if the highest average yield for a site was 1500 lbs of lint/acre, then each plot yield would be divided by 1500, which would put the average cultivar yield on a 0 to 1 scale. The tests were divided into long season (Garden City in 2007 and 2008, Lamesa in 2007 and 2008, and Seminole in 2007) and short season (Floydada in 2007 and 2008, Slaton in 2008, Levelland in 2007, and Ropesville in 2008) sites, and the average relative wilt and yield was calculated for each variety. A variety had to present in at least two tests for the long or short season groupings to be included.

Results

Floydada, TX: The highest yielding varieties at this site were: Fibermax (FM) 9180B2RF, NexGen (NG) 2549B2RF, FM 9058RF, and FM 9063B2RF (Table 1). The incidence of wilt on 28 August at this site ranged from 9% (Paymaster 2141B2RF) to 30% (NG 3331B2RF) (Table 1). The loan values ranged from $ 0.446/lb to $0.545/lb, and the highest valued variety was FM 9180B2RF at $798/acre (Table 1). Incidence of wilt measured on 1, 11, and 28 August was negatively correlated with yield and value/acre ($P < 0.05$). Plant stand was positively correlated with yield and value/acre. Wilt incidence on 28 August was negatively correlated with plant stand.

Slaton, TX: The highest yielding varieties were AFD 5064F, Deltapine (DP) 104B2RF, FM 9058RF, FM 1740B2RF, NG 1572B2RF, Phytogen (PG) 425RF, FM 9180B2RF, and FM 1880B2RF (Table 2). The incidence of wilt on 29 August ranged from 11 (Stoneville [ST] 4427B2RF and PG 315RF) to 37% (NG 1572B2RF). Loan values ranged from $0.433/lb to $0.546. The highest valued cultivars were: AFD 5064F ($466/are), PG 425RF ($415/acre), DP 104B2RF ($404/acre), FM 9058RF ($397/acre), and FM 1740B2RF ($398/acre) (Table 2). Incidence of wilt measured on 29 July, 19 and 29 August was positively associated with loan value, yield, and value of the crop/acre.

Ropesville, TX: On 19 September, there was an average of 832 root-knot nematodes/500 cm^3 soil in the test site, and the population density ranged from an average of 33 to 2,600 across the cultivars (Table 3). The top yielding cultivars were NG 2549B2RF (995 lbs/acre), AFD 5064F (977 lbs/acre), and NG 3348B2RF (894 lbs/acre). Incidence of wilt ranged from 10 (Phytogen 315RF) to 42% (Cropland Genetics [CG] 3035RF) on 26 August. Lint HVI values were not available at the time of this presentation. Yield was negatively correlated with incidence of wilt on 15 and 26 August, and with root-knot nematode density sampled on 19 September. Yield was positively associated with plant stand. Wilt on 26 Aug. was negatively associated with plant stand.

Lamesa, TX: The top yielding variety at this site was NexGen 2549B2RF (Table 4). The incidence of wilt ranged from 3 (NG 2549B2RF) to 19% (DP 141B2RF) (Table 4). Lint HVI values were not available at the time of this presentation. Yield was correlated negatively with wilt incidence on 2 and 17 September and positively with plant stand.

Garden City, TX: The highest yielding cultivars at this site included: FM 9180B2RF, FM 1740B2RF, DP 164B2RF, DP 161B2RF, FM 1880B2RF, and DP 143B2RF (Table 5). Incidence of wilt ranged from 26 (NG 3348B2RF) to 64% (Americot 1550B2RF) on 13 August and was negatively correlated with loan value, yield, value/acre, fiber

length, strength and uniformity. The highest valued cultivars were: FM 1740B2RF ($896/acre), FM 9180B2RF ($894/acre), DP 164B2RF ($883/acre), DP 161B2RF ($842/acre), and CG 4020B2RF ($822/acre) (Table 5).

Table 1. Variety test in a small plot field trial infested with Verticillium wilt near Floydada, TX in 2008.

Variety	Lbs of Lint/Acre	$/ Acre[2]	% Lint	Loan Value ($/lb)	% Wilt on 28 Aug.	Plants / ft. row
Fibermax 9180B2RF	1,579 a[1]	798 a	33.0	0.545	12.2 de	3.7 ab
NexGen 2549B2RF	1,514 ab	681 bc	32.3	0.489	20.7 a-e	3.3 d-i
Fibermax 9058RF	1,488 abc	693 b	32.3	0.502	13.7 cde	3.6 abc
Fibermax 9063B2RF	1,476 a-d	672 bcd	30.2	0.499	12.2 de	3.4 a-e
AFD 5065B2RF	1,320 c-f	620 b-f	29.9	0.513	19.6 a-e	3.1 e-k
NexGen 1551RF	1,313 c-f	650 b-e	31.5	0.530	15.0 cde	3.4 a-f
Paymaster 2141B2RF	1,311 c-f	595 c-h	33.1	0.500	9.3 e	3.7 a
NexGen 3550RF	1,311 c-f	541 f-m	29.9	0.446	14.0 cde	3.2 d-j
Stoneville 4554B2RF	1,306 c-f	604 c-g	32.0	0.510	26.3 abc	2.8 kl
Deltapine 104B2RF	1,302 c-f	545 f-l	30.4	0.466	11.4 de	3.5 a-e
NexGen 1572RF	1,284 d-g	583 d-i	32.6	0.487	20.0 a-e	3.3 c-g
Stoneville 4498B2RF	1,280 efg	528 g-m	30.9	0.462	15.1 cde	3.1 e-k
Cropland Genetics 3020B2RF	1,275 efg	567 e-j	29.8	0.494	14.1 cde	3.1 e-k
NexGen 3273B2RF	1,263 e-h	553 f-k	29.2	0.485	17.1 a-e	2.8 kl
Deltapine 117B2RF	1,246 e-h	520 g-m	29.1	0.467	18.6 a-e	3.3 c-h
Phytogen 315RF	1,236 e-i	541 f-m	31.2	0.480	15.8 b-e	3.5 a-d
Cropland Genetics 3520B2RF	1,229 e-j	522 g-m	28.8	0.476	16.3 a-e	3.5 a-d
Phytogen 375WRF	1,211 e-j	519 g-m	30.7	0.472	17.8 a-e	3.7 a
Cropland Genetics 3035RF	1,174 e-k	507 h-n	32.0	0.480	23.6 a-d	2.9 kl
NexGen 4377B2RF	1,153 e-k	466 k-o	30.3	0.455	17.4 a-e	2.7 l
NexGen 4370B2RF	1,141 f-k	485 j-n	29.8	0.475	16.8 a-e	2.8 kl
Americot 1664B2RF	1,139 f-k	508 h-n	29.4	0.499	14.1 cde	3.0 f-l
NexGen 1556RF	1,106 g-k	510 h-n	28.0	0.503	17.3 a-e	3.0 g-l
Stoneville 4427B2RF	1,095 g-k	427 no	28.8	0.447	19.4 a-e	2.9 jkl
Deltapine 121RF	1,093 g-k	496 i-n	29.9	0.502	17.3 a-e	3.3 b-g
NexGen 3331B2RF	1,074 h-k	462 l-o	30.9	0.485	29.5 a	2.9 h-l
Stoneville 5327B2RF	1,051 ijk	458 l-o	30.6	0.496	20.4 a-e	3.0 g-l
NexGen 3538RF	1,042 jk	501 i-n	26.2	0.524	20.0 a-e	2.1 m
Stoneville 5283RF	1,041 jk	448 mno	31.0	0.482	21.3 a-e	2.9 i-l
Americot 1504B2RF	990 k	386 o	26.5	0.451	20.6 a-e	3.3 c-g

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]$/acre was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 2. Variety test in a small plot field trial infested with Verticillium wilt near Slaton, TX in 2008.

Variety	Lbs of Lint/Acre	$/Acre[2]	Loan Value ($/lb)	% Lint	% Wilt on 29 Aug.	Plants/ ft. row
AFD 5064F	943 a[1]	466 a	0.546	26.2	13.6 d-h	2.9 a-e
Deltapine 104B2RF	935 a	404 a-c	0.498	27.2	20.2 b-f	3.1 a
Fibermax 9058RF	906 ab	397 a-c	0.499	27.4	24.5 bc	2.9 a-f
Fibermax 1740B2RF	899 abc	398 a-c	0.513	29.0	20.2 b-f	3.0 abc
NexGen 1572B2RF	891 a-d	343 b-i	0.433	30.5	37.4 a	2.5 d-i
Phytogen 425RF	866 a-e	415 ab	0.540	26.6	17.7 c-h	3.1 ab
Fibermax 9180B2RF	848 a-f	363 b-f	0.503	26.6	14.6 d-h	2.9 a-d
Fibermax 1880B2RF	825 a-g	375 b-d	0.531	25.4	12.3 e-h	2.7 a-f
Fibermax 9063B2RF	787 b-g	356 b-h	0.532	26.8	20.5 b-f	2.9 a-d
NexGen 4377B2RF	780 b-g	318 f-k	0.482	25.3	19.7 b-g	2.5 f-j
Stoneville 4554B2RF	776 b-g	353 b-h	0.536	26.1	17.6 c-h	2.1 jk
Stoneville 4498B2RF	776 b-g	326 d-j	0.502	26.8	21.1 b-e	2.8 a-f
Cropland Genetics 3520B2RF	772 b-g	326 d-j	0.503	26.0	12.6 e-h	2.9 a-e
Stoneville 5283RF	735 c-h	314 f-l	0.502	27.4	19.7 b-g	2.5 e-i
Phytogen 375WRF	733 c-h	309 f-l	0.493	27.2	16.4 c-h	2.6 c-g
Cropland Genetics 3020B2RF	729 d-h	298 f-m	0.495	24.3	13.0 d-h	2.3 g-j
Stoneville 5327B2RF	717 e-i	292 g-m	0.496	27.6	24.6 bc	2.2 ijk
NexGen 1551RF	712 e-i	338 c-i	0.538	25.2	21.9 bcd	2.5 d-i
Cropland Genetics 3035RF	708 e-i	257 j-m	0.436	25.8	26.9 b	1.8 k
NexGen 3331B2RF	692 f-i	276 i-m	0.483	26.7	19.0 b-g	2.2 ijk
Phytogen 315RF	690 f-i	275 i-m	0.483	24.0	10.7 gh	2.9 a-d
NexGen 4370B2RF	690 f-i	292 g-m	0.508	23.3	16.6 c-h	2.6 c-h
Americot 1504B2RF	682 f-i	277 i-m	0.494	23.5	16.9 c-h	2.7 a-f
Stoneville 4427B2RF	648 ghi	243 lm	0.474	24.3	10.7 gh	2.2 hij
Americot 1664B2RF	595 hi	248 j-m	0.520	26.0	12.9 d-h	2.6 d-h
NexGen 1556RF	578 hi	250 j-m	0.511	22.5	18.7 b-g	2.9 a-d
NexGen 3538RF	554 i	226 m	0.491	20.7	18.1 b-h	2.1 jk

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]$/acre was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 3. Variety test in a small plot field trial infested with Verticillium wilt near Ropesville, TX in 2008.

Variety	Lbs of Lint/Acre	% Lint	% Wilt 26 Aug.	Plants/ ft row	Root-knot nematode /500 cm^3 soil
NexGen 2549B2RF	995 a[1]	29.4	13.3 cd	2.4 a-e	300
AFD 5064F	977 ab	27.9	20.7 a-d	2.6 ab	167
NexGen 3348B2RF	894 abc	28.5	20.7 a-d	2.3 b-f	567
Deltapine 104B2RF	840 bcd	26.4	17.1 bcd	2.4 a-d	800
Fibermax 9180B2RF	824 cd	28.2	15.1 bcd	2.8 a	767
Fibermax 9058RF	761 cde	26.9	24.4 a-d	2.4 a-f	2,600
Paymaster 2141B2RF	752 def	27.2	18.7 bcd	2.3 b-g	600
AFD 5065B2F	724 def	25.2	24.8 a-d	2.2 b-h	467
NexGen 3410RF	680 efg	24.3	21.9 a-d	2.1 c-h	200
NexGen 1551RF	678 efg	27.7	25.8 a-d	2.4 a-d	167
Fibermax 9063B2RF	677 e-h	27.3	18.0 bcd	2.4 a-f	1,767
NexGen 1572RF	638 e-i	26.8	32.9 abc	2.4 a-e	533
All-Tex 65016RF	635 f-i	23.4	21.3 a-d	2.0 c-i	533
Phytogen 315RF	613 f-j	27.4	9.7 d	2.5 abc	1,233
NexGen 3538RF	575 g-j	23.6	35.9 ab	1.6 ij	233
Cropland Genetics 4020B2RF	573 g-k	25.3	21.4 a-d	2.1 b-h	1,033
Deltapine 117B2RF	569 g-k	26.0	16.2 bcd	2.1 c-h	433
Stoneville 5327B2RF	563 g-l	27.2	13.6 cd	1.9 e-j	633
Cropland Genetics 3020B2RF	539 h-m	25.6	15.7 bcd	1.8 hij	1,167
Cropland Genetics 3520B2RF	538 h-m	25.5	14.8 bcd	2.1 b-h	867
Stoneville 4498B2RF	478 j-m	25.2	15.2 bcd	2.0 d-j	1,033
Phytogen 375WRF	471 klm	24.7	15.7 bcd	2.3 b-h	1,000
NexGen 1556RF	471 klm	23.6	18.3 bcd	2.4 a-d	1,750
NexGen 3273 B2RF	462 klm	24.4	21.8 a-d	1.8 hij	333
Americot 1504B2RF	438 klm	23.4	28.2 a-d	1.9 f-j	1,233
NexGen 3331B2RF	426 lm	25.9	10.5 d	2.0 d-j	1,267
Cropland Genetics 3220B2RF	418 m	26.1	28.7 a-d	1.8 g-j	1,467
Stoneville 4554B2RF	416 mn	25.6	23.3 a-d	1.6 ij	1,233
Cropland Genetics 3035RF	278 n	26.1	42.4 a	1.5 j	583

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

Table 4. Variety test in a small plot field trial infested with Verticillium wilt near Lamesa, TX in 2008.

Variety	Lbs of Lint/Acre	% lint	% Wilt 17 Sept.	Plants/ Ft. row
NexGen 2549B2RF	1,141 a[1]	27.1	3.2 f	3.1 a-e
Deltapine 104B2RF	869 b	24.0	9.6 b-f	3.0 a-g
NexGen 3348B2RF	833 bc	25.0	8.6 b-f	2.7 a-i
All-Tex AridB2RF	740 cde	24.4	12.4 a-d	2.7 a-i
Phytogen 375WRF	738 c-f	24.6	11.5 b-e	3.1 a-f
All-Tex 65018RF	722 c-f	24.1	11.0 b-e	2.6 d-j
Fibermax 1880B2RF	716 c-g	22.7	7.5 b-f	2.9 a-g
Fibermax 9063B2RF	713 c-g	24.9	5.7 c-f	3.1 a-f
NexGen 3273B2RF	704 d-g	23.7	8.5 b-f	2.6 c-i
Deltapine 161B2RF	669 d-h	20.5	8.3 b-f	3.1 a-d
Fibermax 960B2R	668 d-h	24.0	10.3 b-e	2.8 a-i
All-Tex Apex B2RF	661 d-i	21.6	10.8 b-e	2.8 a-i
Americot 1622B2RF	652 e-i	21.7	6.7 b-f	3.2 ab
Cropland Genetics 4020B2RF	642 e-j	20.9	8.8 b-f	3.2 abc
Fibermax 1740B2RF	624 e-k	25.1	5.5 def	2.9 a-h
Stoneville 5458B2RF	617 f-l	21.3	6.2 c-f	2.9 a-g
Stoneville 4554B2RF	595 g-m	22.7	10.5 b-e	2.6 d-j
Fibermax 9180B2RF	582 h-m	23.4	9.0 b-f	2.7 a-i
Deltapine 164B2RF	558 h-n	20.8	10.1 b-f	2.4 hij
Americot 1532B2RF	550 h-o	21.0	6.6 b-f	3.2 a
Phytogen 485WRF	549 h-o	20.9	13.5 ab	2.7 a-i
NexGen 4377B2RF	543 i-o	23.1	10.9 b-e	2.1 j
All-Tex 65016RF	525 j-o	19.3	7.4 b-f	2.5 f-j
Cropland Genetics 3220B2RF	501 l-p	20.9	12.5 abc	2.6 b-i
Deltapine 141B2RF	492 m-p	20.6	19.0 a	2.7 a-i
Americot 1550B2RF	478 m-p	19.0	12.6 abc	2.6 d-j
NexGen 4370B2RF	451 nop	20.7	8.4 b-f	2.6 d-j
All-Tex 65333RF	381 p	19.0	13.5 ab	2.6 e-j

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

Table 5. Variety test in a small plot field trial infested with Verticillium wilt near Garden City, TX in 2008.

Variety	Lbs of Lint/Acre	$/acre[2]	% Lint	Loan Value ($/lb)	% Wilt 13 Aug.	Plants/ ft row
Fibermax 9180B2RF	1,796 a[1]	894 a	27.5	0.533	44.2 a-h	2.7 a-d
Fibermax 1740B2RF	1,763 ab	896 a	30.7	0.542	48.1 a-e	3.0 ab
Deltapine 164B2RF	1,731 abc	883 ab	29.4	0.545	36.7 c-h	2.6 a-d
Deltapine 161B2RF	1,715 abc	842 abc	29.4	0.527	36.1 c-h	2.7 a-d
Fibermax 1880B2RF	1,661 a-d	789 b-f	28.3	0.514	26.4 fgh	2.9 abc
Deltapine 143B2RF	1,645 a-d	745 d-i	29.7	0.491	60.2 ab	2.1 cd
Deltapine 141B2RF	1,642 bcd	784 c-f	26.4	0.515	41.7 b-h	2.3 a-d
Fibermax 9063B2RF	1,625 bcd	788 b-f	25.1	0.524	40.9 b-h	3.1 a
Cropland Genetics 4020B2RF	1,600 cd	822 a-d	28.3	0.553	45.1 a-g	2.8 a-d
Phytogen 375WRF	1,598 cd	781 c-g	30.7	0.521	36.6 c-h	2.4 a-d
Fibermax 840B2RF	1,589 cd	745 d-i	29.3	0.509	32.4 d-h	2.5 a-d
AFD 5065B2RF	1,589 cd	792 b-e	26.3	0.535	42.6 b-h	3.0 ab
Deltapine 174RF	1,555 de	755 c-h	28.9	0.542	46.7 a-f	2.3 a-d
Deltapine 104B2RF	1,555 de	745 c-i	27.8	0.519	34.0 c-h	2.6 a-d
Fibermax 820RF	1,545 de	722 e-j	29.0	0.503	40.3 b-h	2.1 cd
NexGen 3348B2RF	1,540 de	783 c-f	28.7	0.547	25.8 gh	2.2 bcd
Deltapine 147RF	1,540 de	687 g-l	26.2	0.479	60.5 ab	2.2 bcd
Phytogen 485WRF	1,514 def	712 e-k	26.2	0.505	43.3 b-h	2.6 a-d
Americot 1532B2RF	1,433 efg	725 e-j	28.6	0.549	35.7 c-h	2.4 a-d
Stoneville 5458B2RF	1,430 efg	654 i-m	28.3	0.502	41.2 b-h	2.4 a-d
Stoneville 4554B2RF	1,423 efg	695 f-l	28.7	0.532	39.1 c-h	2.0 d
All-Tex 65016RF	1,408 efg	730 d-j	24.0	0.549	29.5 e-h	2.5 a-d
Americot 1622B2RF	1,375 fgh	668 h-m	27.3	0.530	49.8 a-e	2.7 a-d
All-Tex 65018RF	1,369 fgh	702 e-l	25.2	0.542	38.0 c-h	2.3 a-d
NexGen 3273B2RF	1,365 fgh	648 j-m	26.3	0.519	40.8 b-h	2.1 cd
NexGen 4377B2RF	1,338 gh	624 klm	27.7	0.510	36.2 c-h	2.3 a-d
All-Tex Titan B2RF	1,298 gh	618 klm	25.8	0.520	46.0 a-g	2.7 a-d
Americot 1550B2RF	1,256 h	582 m	29.6	0.512	64.4 a	2.4 a-d
All-Tex 65333RF	1,252 h	609 lm	28.3	0.522	53.2 abc	2.4 a-d

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]$/acre was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Tests were combined from 2007 and 2008, and into long season or short sites. NG 2549B2RF had the highest yield in the two short season sites where it was tested (Table 6). The next grouping of varieties in short season sites was FM 9058RF, FM 9180B2RF, AFD 5064F, FM 9063B2RF, and DP 104B2RF, which ranged from 0.911 to 0.874 relative yield. At the longer season sites, FM 9058RF averaged 0.907 relative yield. All other varieties at the long season sites averaged < 0.83 relative yield. This indicates inconsistent performance of varieties between the long season sites. FM 9180B2RF performed better at the short season sites (relative yield = 0.903) than the longer season sites (relative yield = 0.799). Phytogen 425RF and AFD 5065B2F also performed better in the short season sites (relative yield = 0.814 and 0.810) than the long season sites (relative yield = 0.678 and 0.688). Phytogen 375WRF performed better in the long season sites (relative yield = 0.777 than in the short season sites (relative yield = 0.670). Relative wilt ratings were poor indicators of relative yield performance in both short season and long season sites.

Table 6. The relative yield[1] and incidence of varieties when averaged over multiple tests during 2007 and 2008.

Averaged across short season sites			Averaged across long season sites		
Variety	Relative yield	Relative wilt	Variety	Relative yield	Relative wilt
NexGen 2549B2RF	1.00	0.550	Fibermax 9058RF	0.907	0.825
Fibermax 9058RF	0.911	0.615	AFD 5064F	0.829	0.440
Fibermax 9180B2RF	0.903	0.509	Deltapine 104B2RF	0.822	0.512
AFD 5064F	0.892	0.426	Fibermax 9063B2RF	0.815	0.532
Fibermax 9063B2RF	0.889	0.485	NexGen 3348B2RF	0.803	0.421
Deltapine 104B2RF	0.874	0.484	Fibermax 9180B2RF	0.799	0.631
Phytogen 425RF	0.814	0.551	Deltapine 167RF	0.797	0.659
Paymaster 2141B2RF	0.812	0.384	Fibermax 1880B2RF	0.784	0.388
AFD 5065B2F	0.810	0.508	Deltapine 161B2RF	0.779	0.492
Fibermax 1740B2RF	0.809	0.609	Phytogen 375WRF	0.777	0.581
NexGen 1572RF	0.777	0.852	Deltapine 164B2RF	0.774	0.505
NexGen 1551RF	0.750	0.607	Fibermax 1740B2RF	0.773	0.512
Deltapine 117B2RF	0.725	0.620	Deltapine 143B2RF	0.754	0.877
NexGen 3550RF	0.724	0.502	Deltapine 174RF	0.754	0.660
Stoneville 4498B2RF	0.713	0.530	Cropland Genetics 4020B2RF	0.735	0.575
NexGen 4377B2RF	0.710	0.575	Deltapine 147RF	0.726	1.00
Cropland Genetics 3520B2RF	0.709	0.453	Stoneville 4554B2RF	0.713	0.558
Cropland Genetics 3020B2RF	0.709	0.415	Phytogen 485WRF	0.710	0.701
Phytogen 315RF	0.703	0.368	All-Tex 65018RF	0.706	0.578
Stoneville 4554B2RF	0.697	0.629	NexGen 1572RF	0.704	0.937
Stoneville 5327B2RF	0.691	0.616	NexGen 3273B2RF	0.697	0.536
Deltapine 121RF	0.689	0.571	AFD 5065B2RF	0.688	0.486
NexGen 3273B2RF	0.680	0.566	Stoneville 5327B2RF	0.686	0.745
Phytogen 375WRF	0.670	0.505	Deltapine 141B2RF	0.681	0.818
Stoneville 5283RF	0.667	0.733	Phytogen 425RF	0.678	0.594
NexGen 4370B2RF	0.656	0.513	Stoneville 5458B2RF	0.677	0.479
Americot 1664B2RF	0.627	0.402	Stoneville 5283RF	0.667	0.790
Stoneville 4427B2RF	0.627	0.434	Americot 1532B2RF	0.649	0.447
All-Tex Apex B2RF	0.626	0.617	Stoneville 4427B2RF	0.647	0.443
NexGen 3331B2RF	0.619	0.658	All-Tex Apex B2RF	0.641	0.644
NexGen 3538RF	0.611	0.699	All-Tex Arid B2RF	0.640	0.586
Cropland Genetics 3035RF	0.608	0.838	All-Tex 65016RF	0.631	0.418
Americot 1504B2RF	0.599	0.627	Americot 1622B2RF	0.624	0.540
NexGen 1556RF	0.596	0.546	NexGen 4377B2RF	0.619	0.563
			All-Tex Titan B2RF	0.603	0.604
			Americot 1550B2RF	0.568	0.828
			All-Tex 65333RF	0.524	0.764

[1]Relative yield was the yield in each plot divided by the highest average yield for a variety at that site. Relative incidence of wilt was the incidence of wilt for each plot divided by the highest average wilt for a variety at that site. Each variety in the Table was tested in at least two sites, however, not all the varieties in the list were tested at each site. There were five short and five long season sites included in the list.

Summary

Some varieties consistently had better yields in fields with Verticillium wilt, regardless of location. The value/acre (lint yield x loan value minus seed and technology fees) differed by as much as $412/acre depending on variety selection. Management of Verticillium wilt can be integrated by combining variety selection with irrigation strategy, seed density, and crop rotation. However, variety selection has an enormous impact on the overall profitability of cotton planted into a Verticillium wilt field.

Acknowledgements

We appreciate the help from the producers: Ron Graves, Bruce Lehman, Wes Bradshaw, Ronnie Thornton, Raymond McPherson, and Mitchell Janis. We also appreciate the help Texas A&M Extention IPM agents Kerry Siders and Manda Cattaneo. We also want to thank the Texas Cotton State Support Committee for the funding to do these studies.