# THE EFFECT OF VERTICILLIUM WILT ON VARIETIES IN THE SOUTHERN HIGH PLAINS OF TEXAS

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## Abstract

Verticillium wilt causes substantial problems in the southern High Plains of Texas. Using varieties that have lower wilt and defoliation ratings, and higher yields in *Verticillium dahliae* infested fields are recommended. Small plot variety trials were conducted in fields with a history of Verticillium wilt. Varieties that performed well in terms of lint yield, wilt and defoliation ratings were: Fibermax (FM) 2484B2F, FM 2989GB2, FM 1830GLT, FM 2322GL, NexGen 4111RF, CT 14515B2RF, and CT 13464B2RF. The acronym CT is the designation of experimental lines for DynaGro/All-Tex.

## Introduction

Verticillium wilt has been a problem in the southern High Plains of Texas since cotton was first irrigated in this region. Management of this disease requires an integrated approach (El-Zik, 1985), including using tolerant varieties, not wounding roots during the growing season, not over-watering, and crop rotation with non-hosts. Strong resistance to Verticillium wilt has not been identified in upland cotton, although some cotton varieties do tend to have better yields and less wilt in *V. dahliae* infested fields (Wheeler and Woodward, 2014). The objective of this work was to compare wilt ratings, defoliation rating, and yield across a number of commercial varieties and advanced breeding lines.

## Materials and Methods

Small plot variety trials were conducted in five locations in the Southern High Plains of Texas. Plots were 36 feet long and 2 rows wide (40-inch centers). There were 32 entries at each site, arranged in a randomized complete block design with four replications. At each site, Fibermax (FM) 2428B2F and FM 1980B2F were included as partially resistant checks, and Deltapine (DP) 0912B2RF as a susceptible check. The site locations were Plainview and Floydada which were the most northern sites, Ropesville and Slaton, which were in the middle of the Southern High Plains and Seminole, which was the most southern site. An additional southern site was lost due to poor stands. At each site, two soil samples (16 cores/sample taken at a depth of 8-inches with a narrow bladed shovel) were taken to analyze for microsclerotia density of *V. dahliae* (Wheeler and Rowe, 1995). Varieties were planted at a rate of 4 seed/foot of row with a cone planter. All sites were irrigated with a center pivot except Slaton which was irrigated with subsurface drip in every other furrow. In addition to *V. dahliae*, the Ropesville site had low levels of root-knot nematode, and the Slaton site had moderate levels of root-knot nematode. Planting dates were 9 May (Seminole), 12 May (Floydada and Plainview), 15 May (Ropesville), and 2 June (Slaton). Harvest dates were 16 October (Seminole), 9 November (Slaton), 15 November (Ropesville), 25 November (Plainview), and 8 December (Floydada).

Data collection included plant stand on both planted rows for every plot; wilt incidence, defoliation rating; and harvest weight. Wilt incidence was obtained by counting the number of plants in each plot with symptoms of Verticillium wilt, and dividing by the total number of plants in the plot. Plots were rated several times in August, and the dates that were used in the analysis were: 20 August (Plainview), 21 August (Ropesville), 25 August (Seminole), 26 August (Floydada), and 28 August (Slaton). Defoliation ratings were made as follows: 0 = no defoliation, 1 = < 34% of the leaves were defoliated; 2 = 34 to 66% of the leaves were defoliated; and 3 = > 66% of leaves were defoliated. Each row of each plot was evaluated at each of about 10 paces/plot (20 measurements per plot). Measurements were then assigned a % defoliation as the midpoint of the range of each rating, and these were averaged to estimate a % defoliation for each plot. Defoliation was rated once for each site on: 15 Sept. Plainview, 16 Sept. for Floydada and Ropesville, and 29 Sept. for Slaton. Defoliation at Seminole appeared related to dry conditions, so that site was not rated. Yield was collected with a two-row cotton stripper, where the harvest weight

was obtained by placing the stripped cotton (trash, burrs, lint, seed, etc.) into a cage on load cells to obtain total harvest weight of the plot. Samples (approximately 1000 g) were taken of the harvested cotton and ginned to estimate turnout of lint and seed. A lint sample was sent for HVI analysis.

Analysis of the data (stands, wilt incidence, defoliation incidence, lbs of lint/acre) were done using the general linear models of SAS (version 9.3, SAS Institute, Cary, NC). Means separation were done using the Waller-Duncan k-ratio t-test ($P$=0.05).

## Results and Discussion

The Floydada and Slaton sites had low levels of *V. dahliae* in the soil (2.5 and 2.25 microsclerotia (MS)/cm$^3$ soil; respectively) the Seminole site was intermediate (16 MS/cm$^3$ soil); and the Ropesville and Plainview sites had high densities of *V. dahliae* (48.5 and 35 MS/cm$^3$ soil, respectively). These densities tracked well with the incidence of wilt seen across the various sites and significance levels explained by variety (Tables 1-5).

Table 1. Results from a variety trial at Plainview under high Verticillium wilt pressure.

| Variety[a] | Plants/ ft row | Wilt (%) | Defoliation (%) | Turnout (%) | Yield (lbs lint/a) |
|---|---|---|---|---|---|
| FM 2484B2F | 3.12 | 21.6 | 21.8 | 31.0 | 1510 |
| NG 4111RF | 1.84 | 36.2 | 34.8 | 29.4 | 1337 |
| BX 1538GLT | 2.20 | 45.8 | 21.1 | 33.0 | 1280 |
| FM 9180B2F | 2.11 | 43.7 | 23.6 | 29.3 | 1265 |
| CT 14515B2RF | 2.48 | 23.4 | 22.7 | 29.2 | 1259 |
| FM 1830GLT | 2.00 | 28.4 | 18.3 | 31.0 | 1242 |
| FM 9250GL | 2.35 | 40.0 | 27.4 | 28.6 | 1238 |
| FM 1944GLB2 | 2.57 | 32.5 | 24.3 | 28.4 | 1209 |
| CT 13442B2RF | 2.29 | 44.2 | 26.7 | 29.4 | 1130 |
| FM 2011GT | 2.14 | 31.0 | 28.9 | 28.9 | 1122 |
| CT 13464B2RF | 2.43 | 25.5 | 21.1 | 27.9 | 1113 |
| FM 2334GLT | 1.49 | 22.8 | 19.5 | 26.7 | 1098 |
| DP 0912B2RF | 2.15 | 34.5 | 31.1 | 31.5 | 1045 |
| BX 1539GLT | 1.81 | 51.7 | 26.0 | 26.7 | 989 |
| DP 1410B2RF | 2.35 | 29.0 | 29.1 | 29.5 | 975 |
| DP 1311B2RF | 1.86 | 31.9 | 16.7 | 24.7 | 974 |
| NG 2051B2RF | 2.44 | 32.0 | 34.4 | 26.7 | 971 |
| PHY 333WRF | 2.62 | 34.1 | 36.6 | 26.3 | 948 |
| FM 1320GL | 1.54 | 37.6 | 23.9 | 27.0 | 941 |
| PHY 222WRF | 2.54 | 29.1 | 28.8 | 24.8 | 910 |
| PHY 339WRF | 2.24 | 38.8 | 22.6 | 26.2 | 910 |
| NG 3306B2RF | 2.09 | 44.1 | 33.7 | 27.2 | 870 |
| PX 2034-03WRF | 2.72 | 31.7 | 31.1 | 24.7 | 869 |
| CT 14944RF | 1.60 | 52.6 | 26.5 | 30.6 | 826 |
| NG 1511B2RF | 2.23 | 30.5 | 34.3 | 29.9 | 810 |
| DP 1321B2RF | 1.94 | 41.4 | 34.7 | 27.0 | 810 |
| CT 13014RF | 1.34 | 54.4 | 35.3 | 28.8 | 792 |
| DP 1137B2RF | 2.15 | 52.3 | 42.4 | 26.9 | 789 |
| DP 1219B2RF | 1.51 | 35.9 | 22.8 | 24.8 | 779 |
| ST 5032GLT | 2.74 | 38.1 | 42.1 | 27.7 | 775 |
| DP 1212B2RF | 1.97 | 41.6 | 50.7 | 26.1 | 701 |
| CT 14923RF | 1.32 | 60.3 | 49.9 | 28.2 | 434 |
| MSD(0.05)[b] | 0.38 | 9.6 | 8.1 | 3.5 | 126 |

[a]BX = breeding line from Bayer CropSciences; CT = breeding line from All-Tex/DynaGro; DP = Deltapine; FM = FiberMax; NG = NexGen; PHY = Phytogen; PX = breeding line from Phytogen; ST = Stoneville.
[b]MSD (0.05) is the minimum significant difference between entries at $P$=0.05.

Table 2. Results from a variety trial at Floydada under low Verticillium wilt pressure.

| Variety[a] | Plants/ ft row | Wilt (%) | Defoliation (%) | Turnout (%) | Yield (lbs lint/a) |
|---|---|---|---|---|---|
| FM 2322GL | 1.59 | 6.0 | 2.1 | 29.0 | 1214 |
| FM 2484B2F | 2.16 | 6.5 | 4.4 | 30.4 | 1207 |
| FM 2011GT | 2.11 | 6.8 | 8.9 | 30.0 | 1163 |
| PX 2042-02WRF | 2.49 | 6.1 | 12.0 | 27.3 | 1085 |
| NG 4111RF | 1.44 | 6.9 | 9.3 | 28.1 | 1043 |
| FM 2989GLB2F | 2.00 | 7.0 | 4.3 | 26.2 | 1031 |
| PHY 222WRF | 2.28 | 3.7 | 14.1 | 27.2 | 1029 |
| DP 1410B2RF | 2.45 | 3.5 | 5.6 | 26.3 | 1015 |
| FM 1320GL | 1.38 | 9.8 | 9.3 | 28.1 | 1014 |
| FM 9250GL | 1.79 | 7.2 | 8.5 | 26.9 | 997 |
| PX 2034-03WRF | 2.75 | 6.0 | 9.3 | 25.1 | 993 |
| FM 9180B2F | 1.68 | 6.4 | 10.3 | 27.6 | 992 |
| FM 2334GLT | 1.56 | 4.5 | 5.2 | 28.4 | 950 |
| BX 1538GLT | 1.86 | 8.5 | 12.4 | 28.7 | 933 |
| PHY 339WRF | 1.71 | 5.3 | 12.2 | 27.7 | 919 |
| PX 2033-03WRF | 2.61 | 6.8 | 10.8 | 21.9 | 886 |
| NG 2051B2RF | 1.68 | 5.7 | 7.7 | 21.9 | 880 |
| DP 0912B2RF | 1.79 | 7.2 | 10.8 | 28.2 | 878 |
| PHY 333WRF | 2.14 | 12.1 | 14.5 | 26.2 | 865 |
| CT 13442B2RF | 1.78 | 8.2 | 9.3 | 27.9 | 826 |
| PHY 367WRF | 1.48 | 5.1 | 15.1 | 24.7 | 811 |
| DP 1212B2RF | 1.58 | 7.6 | 14.5 | 27.1 | 804 |
| NG 4012B2RF | 1.51 | 8.2 | 7.8 | 24.0 | 796 |
| BX 1539GLT | 1.22 | 12.6 | 12.0 | 25.8 | 789 |
| DP 1311B2RF | 1.45 | 5.3 | 7.5 | 25.7 | 789 |
| DP 1219B2RF | 1.46 | 5.8 | 10.3 | 29.6 | 773 |
| DP 1133B2RF | 1.43 | 8.9 | 10.3 | 24.1 | 742 |
| ST 5289GLT | 1.49 | 4.4 | 8.3 | 26.0 | 731 |
| NG 1511B2RF | 1.58 | 3.6 | 12.8 | 25.2 | 681 |
| CT 14944RF | 1.07 | 6.4 | 13.9 | 30.6 | 670 |
| NG 3306B2RF | 1.50 | 8.9 | 17.0 | 22.2 | 633 |
| PHY 499WRF | 2.14 | 8.5 | 14.9 | 23.4 | 597 |
| MSD(0.05)[b] | 0.38 | NS | 6.0 | NS | 144 |

[a]BX = breeding line from Bayer CropSciences; CT = breeding line from All-Tex/DynaGro; DP = Deltapine; FM = FiberMax; NG = NexGen; PHY = Phytogen; PX = breeding line from Phytogen; ST = Stoneville.

[b]MSD(0.05) is the minimum significant difference between entries at $P$=0.05.

Table 3. Results from a variety trial at Ropesville under high Verticillium wilt pressure and low root-knot nematode pressure.

| Variety[a] | Plants/ ft row | Wilt (%) | Defoliation (%) | RKN | Turnout (%) | Yield (lbs lint/a) |
|---|---|---|---|---|---|---|
| FM 2989GLB2 | 2.52 | 38.8 | 24.2 | 7410 ab | 29.5 | 1,022 |
| FM 2484B2F | 2.76 | 32.8 | 23.4 | 4920 abc | 26.7 | 1,010 |
| NG 4111RF | 2.06 | 30.7 | 31.7 | 1505 a-f | 31.2 | 877 |
| FM 1830GLT | 1.72 | 28.3 | 21.1 | 5970 abc | 27.1 | 874 |
| CT 13464B2RF | 2.68 | 43.8 | 24.4 | 1410 b-f | 27.0 | 812 |
| DP 1441RF | 2.70 | 29.9 | 36.1 | 2820 a-f | 28.1 | 804 |
| ST 4747GLB2 | 2.76 | 31.2 | 30.4 | 3060 a-d | 25.0 | 777 |
| PHY 339WRF | 2.14 | 28.9 | 34.2 | 9000 ab | 30.0 | 771 |
| FM 2011GT | 2.73 | 45.5 | 44.0 | 420 c-f | 24.3 | 748 |
| FM 9180B2F | 2.59 | 55.9 | 34.6 | 2310 a-e | 26.4 | 721 |
| FM 1320GL | 1.44 | 30.7 | 36.7 | 1200 def | 25.2 | 703 |
| PX 2042-02WRF | 2.83 | 41.1 | 41.5 | 1530 efg | 20.7 | 688 |
| DP 1410B2RF | 2.80 | 35.7 | 37.8 | 10,050 a | 25.3 | 664 |
| ST 4946GLB2 | 2.80 | 30.4 | 49.9 | 795 c-f | 27.0 | 664 |
| PX 2034-03WRF | 3.20 | 43.1 | 52.0 | 1410 b-f | 24.4 | 660 |
| PHY 367WRF | 2.25 | 50.3 | 47.2 | 900 fg | 28.2 | 658 |
| BX 1539GLT | 1.98 | 26.5 | 38.5 | 1150 a-f | 26.3 | 639 |
| FM 1944GLB2 | 2.75 | 35.4 | 36.3 | 1795 a-f | 21.7 | 629 |
| BX 1538GLT | 2.45 | 49.1 | 37.1 | 2635 a-f | 23.9 | 597 |
| DP 1044B2RF | 2.02 | 29.8 | 30.5 | 1290 a-f | 25.0 | 575 |
| PHY 417WRF | 2.77 | 28.2 | 50.7 | 240 gh | 24.8 | 549 |
| PHY 222WRF | 2.84 | 25.8 | 56.2 | 1560 a-f | 24.3 | 544 |
| DP 1219B2RF | 1.83 | 36.1 | 29.0 | 3630 a-f | 23.0 | 542 |
| PHY 427WRF | 2.81 | 30.8 | 53.8 | 300 h | 24.2 | 541 |
| ST 5032GLT | 2.70 | 26.3 | 48.4 | 4570 a-d | 22.3 | 506 |
| PHY 333WRF | 2.84 | 33.6 | 61.2 | 1400 a-f | 23.8 | 495 |
| DP 0912B2RF | 2.45 | 33.3 | 41.9 | 1050 b-f | 22.7 | 494 |
| CT 13014RF | 1.89 | 31.4 | 52.2 | 4140 abc | 29.9 | 468 |
| DP 1137B2RF | 1.68 | 34.8 | 39.1 | 3630 a-e | 25.0 | 453 |
| DP 1321B2RF | 2.30 | 35.7 | 48.0 | 1920 a-f | 17.5 | 403 |
| PHY 495W3RF | 2.51 | 48.9 | 50.3 | 950 b-f | 21.1 | 386 |
| CT 14923RF | 1.99 | 36.4 | 69.1 | 1620 efg | 24.3 | 259 |
| MSD(0.05) | 0.30 | 11.7 | 13.9 | | 5.2 | 140 |

[a]BX = breeding line from Bayer CropSciences; CT = breeding line from All-Tex/DynaGro; DP = Deltapine; FM = FiberMax; NG = NexGen; PHY = Phytogen; PX = breeding line from Phytogen; ST = Stoneville.

[b]MSD(0.05) is the minimum significant difference between entries at $P$=0.05.

[c]Nematode counts (RKN) were transformed with LOG10 and mean separation tests were based on the transformed values. Entries with the same letters are not significantly ($P$=0.05) different.

Table 4. Results from a variety trial at Slaton under low Verticillium wilt pressure and moderate root-knot nematode pressure.

| Variety[a] | Plants /ft row | Wilt (%) | Defol (%) | RKN[c] | Turn out (%) | Yield Lbs lint/a | Loan ($/lb) | Yield X Loan ($/acre) |
|---|---|---|---|---|---|---|---|---|
| FM 2011GT | 2.79 | 4.6 | 11.4 | 6390 ab | 32.8 | 1832 | 0.560 | 1026 |
| DP 1311B2RF | 2.46 | 11.1 | 18.0 | 2590 abc | 32.4 | 1744 | 0.539 | 940 |
| ST 4946GLB2 | 2.92 | 9.0 | 31.5 | 1500 abc | 30.6 | 1637 | 0.521 | 853 |
| FM 2484B2F | 2.96 | 8.9 | 5.4 | 7440 ab | 29.9 | 1514 | 0.562 | 850 |
| DP 0912B2RF | 2.74 | 14.2 | 26.5 | 8975 ab | 31.7 | 1573 | 0.539 | 848 |
| ST 4747GLB2 | 3.14 | 7.6 | 18.7 | 13,895 abc | 29.2 | 1576 | 0.533 | 840 |
| PHY 367WRF | 2.69 | 7.4 | 24.5 | 3575 abc | 28.0 | 1475 | 0.560 | 826 |
| DP 1212B2RF | 2.75 | 14.2 | 49.6 | 4730 abc | 30.9 | 1460 | 0.561 | 819 |
| CT 14515B2RF | 2.82 | 7.1 | 16.0 | 23,590 a | 28.9 | 1484 | 0.547 | 812 |
| FM 9250GL | 2.83 | 8.0 | 31.3 | 6530 ab | 29.2 | 1511 | 0.536 | 810 |
| NG 3306B2RF | 2.53 | 16.9 | 33.2 | 9140 ab | 29.6 | 1407 | 0.574 | 808 |
| DP 1321B2RF | 2.51 | 13.7 | 36.1 | 6780 abc | 32.0 | 1434 | 0.562 | 806 |
| FM 1320GL | 2.23 | 9.1 | 40.7 | 5355 ab | 31.1 | 1422 | 0.562 | 799 |
| BX 1538GLT | 2.58 | 15.3 | 28.8 | 5010 abc | 33.8 | 1518 | 0.524 | 796 |
| PX 2033-03WRF | 3.05 | 11.8 | 23.8 | 4145 ab | 29.9 | 1434 | 0.546 | 783 |
| FM 2334GLT | 2.26 | 7.9 | 8.5 | 13,920 ab | 30.7 | 1344 | 0.581 | 780 |
| NG 1511B2RF | 2.65 | 13.8 | 42.2 | 9210 ab | 32.4 | 1424 | 0.544 | 775 |
| DP 1133B2RF | 2.75 | 12.7 | 21.5 | 4215 abc | 27.3 | 1342 | 0.563 | 755 |
| NG 4111RF | 2.49 | 9.8 | 25.1 | 8760 ab | 29.8 | 1318 | 0.572 | 754 |
| FM 2322GL | 2.50 | 6.9 | 12.8 | 4350 ab | 29.8 | 1410 | 0.535 | 753 |
| PHY 417WRF | 3.00 | 11.6 | 30.7 | 200 c | 30.2 | 1445 | 0.521 | 752 |
| DP 1410B2RF | 3.00 | 11.0 | 9.1 | 9450 ab | 29.0 | 1364 | 0.543 | 740 |
| FM 9180B2F | 2.64 | 14.2 | 18.6 | 13,650 ab | 30.2 | 1310 | 0.564 | 738 |
| BX 1539GLT | 2.24 | 21.4 | 16.8 | 6120 ab | 31.0 | 1276 | 0.537 | 685 |
| PHY 499WRF | 2.88 | 12.5 | 38.0 | 5100 ab | 30.3 | 1328 | 0.506 | 672 |
| PHY 222WRF | 2.84 | 12.3 | 42.8 | 2750 bc | 27.2 | 1226 | 0.545 | 668 |
| PX 2042-02WRF | 3.06 | 08.3 | 20.3 | 3270 ab | 23.7 | 1265 | 0.527 | 667 |
| DP 1044B2RF | 2.48 | 12.8 | 16.2 | 4415 abc | 27.4 | 1251 | 0.520 | 651 |
| FM 8270GLB2 | 2.82 | 9.0 | 29.9 | 8280 ab | 27.9 | 1149 | 0.564 | 648 |
| CT 13442B2RF | 2.46 | 16.7 | 22.8 | 3450 ab | 30.6 | 1147 | 0.564 | 647 |
| PHY 495W3RF | 3.00 | 13.7 | 41.5 | 6220 ab | 30.1 | 1247 | 0.488 | 608 |
| NG 2051B2RF | 2.64 | 7.8 | 32.0 | 9565 ab | 26.3 | 1141 | 0.523 | 596 |
| MSD(0.05) | 0.27 | 6.8 | 12.1 | | 2.04 | 223 | 0.039 | 121 |

[a]BX = breeding line from Bayer CropSciences; CT = breeding line from All-Tex/DynaGro; DP = Deltapine; FM = FiberMax; NG = NexGen; PHY = Phytogen; PX = breeding line from Phytogen; ST = Stoneville.
[b]MSD(0.05) is the minimum significant difference between entries at *P*=0.05.
[c]Root-knot nematode/500 $cm^3$ soil were transformed with LOG10 and mean separation tests were based on the transformed values. Entries with the same letters are not significantly (*P*=0.05) different.

Table 5. Results from a variety trial at Seminole under moderate Verticillium wilt pressure.

| Variety[a] | Plants/ ft row | Wilt (%) | Turnout (%) | Yield (lbs lint/a) | Loan ($/lb) | Yield X Loan ($/acre) |
|---|---|---|---|---|---|---|
| CT 14515B2RF | 2.07 | 29.0 | 32.0 | 1467 | 0.541 | 794 |
| FM 1830GLT | 1.82 | 30.4 | 36.1 | 1463 | 0.539 | 788 |
| FM 2484B2F | 2.34 | 17.2 | 32.0 | 1416 | 0.537 | 761 |
| CT 14944RF | 1.54 | 43.1 | 36.9 | 1348 | 0.564 | 760 |
| DP 1441RF | 2.25 | 35.1 | 32.7 | 1451 | 0.522 | 757 |
| DP 1454NRB2RF | 1.56 | 34.1 | 33.9 | 1295 | 0.570 | 738 |
| DP 1359B2RF | 2.19 | 32.9 | 33.2 | 1302 | 0.558 | 726 |
| CT 13014RF | 1.69 | 37.0 | 35.1 | 1286 | 0.553 | 711 |
| DP 1311B2RF | 1.50 | 28.8 | 32.7 | 1269 | 0.558 | 708 |
| ST 6448GLB2 | 1.78 | 31.7 | 33.1 | 1230 | 0.575 | 707 |
| NG 5315B2RF | 1.45 | 54.1 | 32.5 | 1196 | 0.578 | 691 |
| DP 1252B2RF | 1.25 | 49.3 | 36.0 | 1176 | 0.574 | 675 |
| FM 1944GLB2 | 2.11 | 26.2 | 29.6 | 1292 | 0.519 | 670 |
| DP 1321B2RF | 2.02 | 26.6 | 31.9 | 1207 | 0.547 | 659 |
| FM 9180B2F | 2.07 | 31.5 | 28.7 | 1227 | 0.528 | 648 |
| BX 1538GLT | 1.85 | 40.2 | 31.9 | 1271 | 0.508 | 646 |
| DP 0912B2RF | 2.28 | 26.7 | 31.4 | 1241 | 0.516 | 640 |
| PX 2034-03WRF | 2.56 | 27.0 | 27.5 | 1262 | 0.506 | 638 |
| DP 1137B2RF | 1.78 | 35.1 | 31.2 | 1123 | 0.564 | 633 |
| CT 13464B2RF | 2.08 | 16.9 | 31.7 | 1303 | 0.485 | 632 |
| NG 4012B2RF | 1.75 | 30.0 | 30.6 | 1141 | 0.552 | 629 |
| FM 1320GL | 1.62 | 20.6 | 32.5 | 1202 | 0.521 | 626 |
| ST 5289GLT | 1.77 | 30.1 | 33.0 | 1178 | 0.524 | 617 |
| DP 1044B2RF | 2.02 | 29.8 | 30.9 | 1183 | 0.504 | 597 |
| ST 4747GLB2 | 2.42 | 16.3 | 29.2 | 1305 | 0.452 | 590 |
| PHY 575WRF | 1.99 | 56.8 | 28.4 | 1153 | 0.510 | 588 |
| PHY 599WRF | 1.03 | 63.8 | 30.9 | 1084 | 0.532 | 577 |
| PHY 367WRF | 1.75 | 35.3 | 29.3 | 1222 | 0.468 | 572 |
| CT 14923RF | 1.65 | 48.9 | 31.8 | 1085 | 0.517 | 561 |
| PHY 427WRF | 2.08 | 28.2 | 28.7 | 1126 | 0.483 | 544 |
| PHY 417WRF | 2.41 | 24.3 | 30.0 | 1146 | 0.474 | 543 |
| FM 8270GLB2 | 2.38 | 12.5 | 27.8 | 1014 | 0.491 | 497 |
| MSD(0.05)[b] | 0.32 | 17.1 | 2.2 | 184 | 0.054 | 88 |

[a]BX = breeding line from Bayer CropSciences; CT = breeding line from All-Tex/DynaGro; DP = Deltapine; FM = FiberMax; NG = NexGen; PHY = Phytogen; PX = breeding line from Phytogen; ST = Stoneville.
[b]MSD(0.05) is the minimum significant difference between entries at $P$=0.05.

The partially resistant check variety FM 2484B2F was among the greatest yielding (ranked between 1 and 4 at all sites) varieties across all the sites, as well as having among the least wilt and defoliation. Other varieties that consistently performed well across all the measured categories included NexGen 4111RF, FM 2989GLB2, and new varieties (in 2014) FM 2322GL, FM 1830GLT, CT 14515B2RF and CT 13464B2RF. The CT designation is for experimental lines for DynaGro/All-Tex.

## Summary

Verticillium wilt when present, is a strong driving factor that influences yield. Some varieties consistently perform better in Verticillium fields and should be planted when producers anticipate Verticillium wilt problems. While no new variety is consistently performing at a higher level than the recommended check, FM 2484B2F, there were at

least three new varieties/breeding lines introduced in 2014 that appeared to perform consistently well in Verticillium wilt fields (FM 2322GL, FM 1830GLT, and CT 14515B2RF).

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