Verticillium Wilt Variety Trial Results for 2023

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The Floyd County trial was planted on 17 May. Plots were two rows wide and 35 feet long. There were 36 entries, randomized and replicated four times. Wilt incidence remained low in August, so the final wilt incidence ratings were made on 5 September. Defoliation ratings were made on 27 September. Plots were harvested on 7 November.

Results: Since average wilt incidence remained well below 20%, it is unlikely that Verticillium wilt affected yield. Defoliations ratings were also low, but there was separation between some varieties. The cultivars with the highest defoliation were BX2359AXTP (31%), BX2451AXTP (28%), DP 2127 B3XF (25%), and DP 2333 B3XF (24%) (Table 1). The assumption is that the defoliation was due to Verticillium wilt and not water stress. The benefit of any variety test is that the yielding ability of a variety is seen. Since Verticillium wilt is not severe every year, it is useful to plant a variety that yields well both in the presence and in the absence of the disease. In 2023, varieties that yielded well included FM 2202GL, DP 1822 XF, FM 2498GLT, and PHY 350 W3FE. All four of these varieties have historically performed well in both high and low disease situations in the Southern High Plains.

Fiber properties were generally good at this location, and most entries had loan values greater than $0.52/lb. Fiber length ranged from 1.05 to 1.20 inches. Entries with the best mean fiber length were BX2362AXTP (1.20”), FM 2334GLT (1.17”), and NG 4098 B3XF (1.17”) (Table 2). Fiber strength was good and ranged from 27.95 to 32.95 grams/tex. NG 4098 B3XF had the best fiber strength, but several new BX lines (ST 6000AXTP, FM 868AXTP. BX2362AXTP, and FM 823AXTP) had fiber strength of 31.9 grams/tex or greater. Loan value ranged from $0.507 to $0.5783/lb lint. Entries which had loan values of $0.57 or higher included: PHY 332 W3FE, BX2362AXTP, FM 823AXTP, DP 2239 B3XF, FM 868AXTP, and NG 3930 B3XF.

Table 1. Verticillium wilt trial (low disease) near Floydada: disease ratings and yield.

Variety[a]	Lint yield (lbs/a)	Value ($) /Acre[b]	Plants /ft row	Wilt (%)	Defoliation %	Turnout (%)	Loan (¢/lb)
FM 2202GL	**1,488**	**806.36**	3.30	1.2	8.1	32.2	54.20
DP 1822 XF	**1,359**	**761.44**	3.70	0.9	21.6	31.8	56.05
PX1125B234-04	**1,349**	695.54	3.29	3.4	16.0	29.9	51.55
AMX20T157B3XF	**1,347**	756.21	3.48	1.6	16.8	34.7	56.13
FM 2498GLT	1,324	706.09	3.51	0.6	20.3	33.3	53.35
PHY 350 W3FE	1,314	730.98	3.56	1.3	11.1	30.5	55.63
PHY 332 W3FE	1,313	759.02	3.44	0.7	14.5	31.9	57.83
PHY 415 W3FE	1,304	741.47	3.69	2.3	19.6	32.4	56.85
PHY 400 W3FE	1,281	704.93	3.51	1.5	17.4	33.7	55.03
DP 2335 B3XF	1,262	717.05	3.43	0.4	6.2	36.2	56.83
ST 5600B2XF	1,256	658.51	3.30	0.6	7.9	35.0	52.45
DP 2123 B3XF	1,245	676.17	3.63	0.8	10.5	32.4	54.30
PHY 411 W3FE	1,230	655.32	3.47	1.2	21.9	33.1	53.30
PHY 300 W3FE	1,222	660.11	3.30	2.4	20.3	31.0	54.03
AMX20T079B3XF	1,178	661.76	3.60	0.8	19.4	32.9	56.20
NG 4098 B3XF	1,173	660.40	2.95	0.8	6.7	31.7	56.30
PHY 443 W3FE	1,169	611.02	3.45	0.4	10.2	30.1	52.28
NG 3930 B3XF	1,165	664.40	3.23	0.6	14.2	32.9	57.03
BX2362AXTP	1,161	669.90	3.23	1.2	15.5	33.1	57.70
DP 2239 B3XF	1,156	662.25	3.33	1.9	12.8	34.6	57.30
FM 2334GLT	1,144	617.32	3.08	0.2	12.8	34.3	53.95
DP 2141NR B3XF	1,141	616.35	3.04	2.0	14.3	33.0	54.03
DP 2115 B3XF	1,138	623.49	3.31	1.9	13.8	35.6	54.80
FM 868AXTP	1,130	647.07	3.06	1.5	18.4	33.0	57.25
FM 823AXTP	1,128	649.31	3.01	1.4	16.5	32.2	57.55
NG 4190 B3XF	1,125	640.47	2.91	1.4	20.2	34.6	56.93
DP 2127 B3XF	1,116	565.56	3.45	0.3	24.5	34.4	50.70
DP 2333 B3XF	1,111	598.56	2.84	0.1	23.9	34.2	53.90
PX1150B437-04	1,110	587.26	3.14	0.7	19.0	30.6	52.93
BX2359AXTP	1,093	611.26	3.15	1.1	31.4	32.9	55.95
DP 2143NR B3XF	1,069	542.93	3.23	1.3	12.8	32.4	50.80
DP 2022 B3XF	1,054	578.44	3.13	0.8	11.3	28.9	54.88
BX2451AXTP	1,039	569.24	3.02	1.8	28.4	32.8	54.80
ST 6000AXTP	972	559.39	2.41	0.8	21.5	36.7	57.55
NG 5711 B3XF	963	537.03	2.60	0.8	13.9	32.6	55.78
DP 2349NR B3XF	939	506.32	3.19	0.5	10.6	31.0	53.95
Prob>F	0.0001	0.0001	0.0001	0.117	0.001	0.0001	0.0001
MSD[c] (0.05)	151	83.12	0.17		7.7	1.9	2.51

[a]AMX, BX, and PX are experimental lines for Americot, BASF, and PhytoGen.
[b]Value/acre was the loan value (/lb) x lint yield/acre.
[c]MSD is the minimum significant difference based on the Waller Duncan k-ratio t test.

Table 2. Fiber quality (HVI) ratings for a Verticillium trial near Floydada.

Variety[a]	Mic-ronaire	Length (“)	Unif-ormity	Strength g/tex	Elon-gation	Rd %	+b	Leaf	Grade
AMX20T079B3XF	**4.98[b]**	1.16	82.70	29.80	7.1	78.7	8.2	2.5	31-1
AMX20T157B3XF	4.85	1.13	82.05	30.00	7.8	78.7	7.6	2.5	21-2, 41-1
BX2359AXTP	4.80	1.15	81.85	30.20	6.9	79.0	7.6	3.0	21-2, 41-1
BX2362AXTP	4.85	1.20	83.65	32.15	6.7	78.8	8.0	3.0	31-1
BX2451AXTP	4.92	1.11	81.25	28.80	6.5	78.2	8.0	2.0	21-2, 41-1
DP 1822 XF	4.89	1.15	81.75	31.95	6.2	77.9	7.2	3.0	31-1, 41-1
DP 2022 B3XF	4.46	1.11	80.90	29.10	5.6	79.0	6.6	3.5	31-1, 41-1
DP 2115 B3XF	**5.06**	1.13	81.35	29.15	7.2	79.9	7.6	2.5	21-2, 31-2
DP 2123 B3XF	4.94	1.13	80.90	29.60	5.9	77.9	7.6	3.0	31-1, 41-1
DP 2127 B3XF	**5.38**	1.08	81.65	28.75	6.5	79.9	7.7	2.5	31-1, 31-2
DP 2141NR B3XF	**5.24**	1.13	81.90	30.90	6.7	78.8	8.1	2.0	31-1
DP 2143NR B3XF	**5.41**	1.12	81.75	30.90	6.7	78.0	8.0	2.5	31-1, 41-1
DP 2239 B3XF	4.81	1.15	82.05	29.20	7.0	80.2	8.0	2.0	11-2, 31-2
DP 2333 B3XF	**5.16**	1.12	80.80	29.10	6.2	80.2	7.6	2.0	21-2, 31-1
DP 2335 B3XF	4.52	1.15	81.60	31.15	6.0	80.1	7.2	2.0	31-1, 31-2
DP 2349NR B3XF	4.84	1.09	81.25	29.65	6.6	79.2	8.1	2.0	21-1, 31-2
FM 823AXTP	4.47	1.14	82.25	31.90	6.9	80.5	7.4	2.5	21-2, 31-1
FM 868AXTP	4.63	1.12	81.85	32.40	6.7	79.1	8.2	2.5	21-2, 31-1
FM 2202GL	4.73	1.08	81.70	32.15	6.7	77.5	7.7	3.5	31-2
FM 2334GLT	**5.10**	1.17	81.85	30.10	6.0	80.1	6.8	2.0	21-2, 41-1
FM 2498GLT	**5.11**	1.10	80.85	29.70	6.2	79.6	7.6	2.5	31-1
NG 3930 B3XF	4.82	1.15	83.25	29.85	6.7	79.1	8.0	3.0	31-1
NG 4098 B3XF	4.67	1.17	81.80	32.95	6.5	77.7	7.6	4.0	31-1, 41-1
NG 4190 B3XF	4.69	1.13	82.50	27.95	6.5	80.1	7.3	2.5	31-1
NG 5711 B3XF	4.90	1.12	82.20	29.70	7.0	80.0	8.0	2.0	21-2, 31-1
PHY 300 W3FE	4.75	1.09	81.85	28.75	6.1	76.8	7.6	2.5	31-2, 41-1
PHY 332 W3FE	4.89	1.15	82.30	31.20	6.8	78.9	8.4	2.5	21-2, 31-1
PHY 350 W3FE	4.89	1.11	81.80	27.95	6.8	79.4	7.7	3.0	31-1, 31-2
PHY 400 W3FE	4.56	1.10	80.90	31.45	6.3	78.8	7.7	3.0	31-1, 31-2
PHY 411 W3FE	4.88	1.05	81.35	31.15	6.6	81.0	7.2	3.0	31-1
PHY 415 W3FE	4.76	1.12	81.50	31.00	6.8	77.5	8.4	3.5	31-1
PHY 443 W3FE	**5.24**	1.10	82.20	32.50	6.7	78.3	8.4	2.5	21-2, 31-1
PX1125B234-04	**5.27**	1.10	81.00	30.55	6.3	77.5	7.2	3.0	31-2, 41-1
PX1150B437-04	4.84	1.07	80.70	31.05	7.0	77.9	7.9	2.5	31-1, 41-1
ST 5600B2XF	**5.36**	1.11	82.65	31.50	7.4	78.1	8.6	2.0	21-1, 31-2
ST 6000AXTP	4.79	1.14	82.30	32.70	6.6	80.3	7.7	2.5	21-1, 31-1
Prob>F	0.0001	0.0001	0.002	0.0001	0.0001	0.0001	0.0001	0.013	
MSD[c] (0.05)	0.2	0.04	1.36	1.77	0.2	1.6	0.6	1.3	

[a]AMX, BX, and PX are experimental lines for Americot, BASF, and PhytoGen.
[b]Red numbers indicated discounted cotton due to high micronaire.
[c]MSD is the minimum significant difference based on the Waller Duncan k-ratio t test.

The Hale County location was planted on May 22. There were also 36 entries at this location, with the same plot size and arrangement. Thrips were a severe problem at this site, and damage ratings indicated much less thrips injury on the ThyvOn™ varieties compared to all other varieties. No spray applications were made to control the thrips. The three thrips resistant varieties in the trial were DP 2328B3TXF, DP 2317 B3TXF, and AM 9383 B3TXF. Wilt incidence was also low at this site for much of August. A final wilt rating was taken on 1 September, and part of one replication did show significant Verticillium wilt at that time, but it was not consistent across the test or even that replication. Defoliation ratings were taken on 26 September. The plots were harvested on November 6.

Results: None of the varieties had sufficient incidence of Verticillium wilt by the end of August to cause much impact on yield. The entries with the highest defoliation were AM 9383 B3TXF (38%), BX2359AXTP (37%), Armor 9371 B3XF (30%), and FM 868AXTP (29%) (Table 3). The highest yielding varieties included Armor 9442 XF, FM 2398GLTP, Armor 9371 B3XF, and DP 2127 B3XF. However, these are not varieties that are expected to yield the best in the presence of significant Verticillium wilt, based on historic performances. The best yielding thrips resistant variety was DP 2328 B3TXF, which ranked 13th best in yield, though it was not significantly different than the highest yielding variety. Fiber quality was good overall in this test. Loan values ranged from $0.5256 to $0.5783/lb lint. There were some entries again with high micronaire (seen in red in Table 4). Fiber length ranged from 1.08 to 1.22 inches, with NG 3930 B3XF = 1.22” and Armor 9442 XF=1.21”. Fiber strength ranged from 27.55 to 33.20 grams/tex, with ST 6000AXTP having the longest fiber length.

Table 3. Verticillium wilt trial (low disease) near Plainview: disease ratings and yield.

Variety[a]	Lint yield (lbs/a)	Value ($) /Acre[b]	Plants /ft row	Wilt (%)	Defoliation %	Turnout (%)	Loan (¢/lb)
Armor 9442 XF	**1,125**	**633.15**	2.73	7.7	6.2	30.8	56.28
FM 2398GLTP	**1,077**	**583.17**	2.64	4.3	12.0	32.6	54.16
Armor 9371 B3XF	**1,057**	**603.90**	2.31	2.7	**30.4**	33.4	57.16
PX1122A214-04	**1,033**	**559.68**	3.41	2.2	6.2	32.1	54.18
DP 2127 B3XF	**1,032**	**570.83**	2.84	2.8	21.5	33.4	55.34
FM 868AXTP	**1,007**	**579.75**	2.67	8.9	**29.4**	32.6	57.60
DP 1822 XF	**1,003**	**577.17**	3.34	0.8	6.8	30.6	57.53
DP 2115 B3XF	**1,003**	**561.50**	2.98	10.8	7.8	31.7	56.01
NG 3930 B3XF	**1,001**	**559.58**	3.37	3.7	14.3	32.8	55.93
Armor 9512 B3XF	**997**	**555.59**	2.62	1.3	2.5	31.2	55.74
FM 1621GL	**994**	**522.58**	2.89	3.2	4.4	32.0	52.56
Armor 9413 XF	**985**	**533.64**	2.75	5.1	11.6	33.4	54.19
DP 2328 B3TXF	**974**	**559.18**	2.36	1.1	20.9	34.4	57.41
FM 2334GLT	**957**	**522.54**	2.87	0.5	6.4	30.2	54.63
PX1124B236-04	**934**	**519.91**	2.78	5.3	5.8	28.2	55.68
BX2359AXTP	**927**	**536.09**	2.78	4.7	**36.6**	31.2	57.83
DP 2317 B3TXF	**924**	**515.59**	3.29	2.1	9.1	31.0	55.80
DP 2012 B3XF	**921**	**527.36**	2.98	2.0	8.5	31.1	57.26
DP 2123 B3XF	**916**	**499.68**	3.15	4.5	5.2	30.2	54.58
FM 823AXTP	**914**	**511.79**	2.82	4.2	3.9	31.9	56.01
AMX20T079B3XF	**903**	**512.71**	3.43	2.7	14.0	32.3	56.81
AMX160030AB3XF	**893**	**508.28**	3.24	4.2	9.1	33.1	56.95
ST 6000AXTP	**884**	**510.04**	1.98	3.9	8.3	34.0	57.73
BX2451AXTP	**873**	**498.31**	2.64	2.9	17.8	31.3	57.08
FM 1830GLT	**853**	**490.62**	3.07	0.8	9.1	31.7	57.50
ST 4990B3XF	**852**	**488.17**	3.21	4.9	15.9	30.7	57.28
PHY 205 W3FE	**852**	457.35	3.03	4.4	4.4	28.9	53.68
AMX20T157B3XF	**848**	472.15	3.57	4.7	11.8	32.5	55.71
NG 3299 B3XF	**833**	454.18	2.36	4.3	9.1	32.0	54.54
FM 1730GLTP	**812**	465.93	2.84	3.2	8.3	30.6	57.38
FM 2202GL	807	435.38	3.18	1.7	2.3	30.2	53.95
NG 3195 B3XF	800	461.86	2.45	1.9	12.2	32.3	57.75
PX1125B234-04	748	395.75	2.78	1.3	8.5	28.6	52.89
AM 9383 B3TXF	739	396.70	2.97	4.5	**37.9**	28.6	53.68
BX2362AXTP	735	421.89	2.95	1.7	5.8	30.6	57.38
PHY 210 W3FE	694	375.45	3.32	1.3	9.1	29.2	54.08
Prob>F	0.02	0.01	0.0001	0.003	0.0001	0.0001	0.0002
MSD[c] (0.05)	317	168.76	0.46	5.7	9.1	1.7	2.6

[a]AMX, BX, and PX are experimental lines for Americot, BASF, and PhytoGen.
[b]Value/acre was the loan value (/lb) x lint yield/acre.
[c]MSD is the minimum significant difference based on the Waller Duncan k-ratio t test.

Table 4. Fiber quality (HVI) ratings for a Verticillium trial near Plainview.

Variety[a]	Mic-ronaire	Length (“)	Unif-ormity	Strength g/tex	Elon-gation	Rd %	+b	Leaf	Grade
AM 9383 B3TXF	4.63	1.12	81.70	27.55	7.0	77.0	6.9	3.0	41-1
AMX160030AB3XF	4.94	1.16	81.35	28.70	7.1	78.0	7.7	3.5	31-1, 31-2
AMX20T079B3XF	**5.18**	1.15	82.50	30.40	6.7	77.6	8.1	3.0	31-1
AMX20T157B3XF	**4.98**	1.14	81.85	29.90	7.2	77.9	7.8	2.5	31-1, 41-1
Armor 9371 B3XF	4.86	1.16	82.40	28.60	6.2	79.7	7.1	2.0	31-1, 31-2
Armor 9413 XF	**5.09**	1.10	81.15	27.90	5.4	78.7	6.8	3.0	31-2, 41-1
Armor 9442 XF	4.70	1.21	81.90	31.40	7.7	78.2	6.7	3.5	31-2, 41-2
Armor 9512 B3XF	**5.21**	1.14	81.55	31.40	5.8	78.6	6.7	3.0	31-1, 41-2
BX2359AXTP	4.89	1.19	82.40	30.80	6.3	79.9	7.5	2.5	21-2, 31-2
BX2362AXTP	**4.96**	1.17	82.00	31.05	6.5	78.2	7.8	2.5	31-1, 31-2
BX2451AXTP	4.94	1.16	81.60	28.85	6.5	79.6	7.6	2.5	31-1, 31-2
DP 1822 XF	4.86	1.19	81.75	31.70	5.9	78.8	7.7	3.0	31-1, 31-2
DP 2012 B3XF	4.91	1.16	82.35	29.55	5.8	80.9	8.0	2.0	21-1, 31-1
DP 2115 B3XF	**5.00**	1.16	82.95	30.75	6.9	78.7	7.0	3.0	31-1, 41-1
DP 2123 B3XF	4.88	1.17	81.80	30.45	5.6	77.6	6.8	3.0	41-1
DP 2127 B3XF	**5.30**	1.12	81.95	28.75	6.1	79.9	7.3	2.5	31-1, 31-2
DP 2317 B3TXF	4.72	1.14	81.05	28.75	5.7	78.0	6.4	2.0	31-2, 41-2
DP 2328 B3TXF	4.83	1.15	81.40	29.00	6.0	81.4	7.2	2.0	21-2, 31-1
FM 823AXTP	4.93	1.15	81.85	31.55	6.7	78.9	6.9	2.5	31-2, 41-1
FM 868AXTP	4.53	1.19	81.95	32.50	6.5	79.3	7.7	3.0	31-1
FM 1621GL	**5.10**	1.09	80.65	29.30	5.7	77.3	7.2	4.5	41-1
FM 1730GLTP	4.72	1.16	82.35	33.15	5.6	79.7	7.1	3.0	31-1, 31-2
FM 1830GLT	4.65	1.16	81.85	30.80	5.9	80.5	7.5	3.0	31-1
FM 2202GL	4.70	1.08	81.35	33.00	6.2	76.2	7.8	4.0	31-2, 41-1
FM 2334GLT	4.87	1.18	82.00	31.05	5.6	77.7	6.5	2.5	41-1, 41-2
FM 2398GLTP	**5.25**	1.13	81.30	28.95	6.0	77.4	6.5	2.5	31-2, 41-2
NG 3195 B3XF	4.83	1.14	81.75	30.70	6.0	81.0	7.8	2.0	21-2
NG 3299 B3XF	**5.23**	1.12	82.90	32.30	6.2	78.8	7.2	2.0	31-1, 41-1
NG 3930 B3XF	4.90	1.22	82.35	29.70	7.3	79.7	6.8	2.0	31-2, 41-1
PHY 205 W3FE	4.79	1.08	80.90	30.80	5.8	78.1	7.1	3.0	31-2, 41-1
PHY 210 W3FE	4.93	1.08	81.25	29.75	5.6	79.4	7.6	3.0	21-2, 31-2
PX1122A214-04	4.66	1.08	80.75	32.00	6.3	79.3	7.3	3.0	31-1, 31-2
PX1124B236-04	4.93	1.13	81.05	31.75	6.4	77.2	7.3	3.5	31-2, 41-1
PX1125B234-04	**5.53**	1.10	81.45	29.85	5.8	75.9	6.9	3.5	41-1, 41-2
ST 4990B3XF	4.85	1.19	82.10	28.85	7.0	81.3	7.3	2.0	31-1
ST 6000AXTP	4.56	1.17	82.90	33.20	6.6	80.1	7.2	2.5	31-1
Prob>F	0.0003	0.0001	0.108	0.0001	0.0001	0.0003	0.023	0.001	
MSD[c] (0.05)	0.37	0.05		1.5	0.3	2.4	1.2	1.2	

[a]AMX, BX, and PX are experimental lines for Americot, BASF, and PhytoGen.
[b]Red numbers indicated discounted cotton due to high micronaire.
[c]MSD is the minimum significant difference based on the Waller Duncan k-ratio t test.