

Response of Varieties and Experimental Lines to Root-knot and Reniform Nematodes in 2023

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Small plot (35 feet long, two rows wide), replicated variety trials were planted at root-knot nematode fields located near Lamesa (AGCARES, low to moderate nematode pressure), Morton (Barker Farm, low to moderate nematode pressure), Morton (Clark Farm, low nematode pressure), and Lubbock County (low nematode pressure). One location was planted at a reniform nematode site in Lubbock County (Texas A&M AgriLife Research and Extension Center).

Location	Planting Date	Harvest Date	Irrigation Details
Lamesa (AGCARES)	May 31	November 2	Center Pivot, every other furrow
Morton (Barker)	May 18	November 17	Subsurface Drip, every other furrow
Morton (Clark)	June 6	November 21	Subsurface Drip, every bed
Lubbock (Jones)	June 20	November 18	Center Pivot
Lubbock (Texas A&M)	June 7	November 29	Furrow (every other furrow)

Lamesa (AGCARES): This location is the only root-knot nematode site where all herbicide transgenic traits can be tested. There were 32 entries, including three Deltapine varieties with root-knot nematode resistance, seven PhytoGen varieties with known root-knot nematode resistance, and two FiberMax varieties with partial resistance to root-knot nematode. In addition, there were 10 known nematode susceptible varieties, six experimental lines (BX) from BASF with the new AvantTM Flex herbicide technology, and four experimental lines from PhytoGen (PX). This field has been used for research trials for many years, and the root-knot nematode population is variable as a result, though averaged what would be considered a moderate population.

Results: The highest yielding variety was PHY 415 W3FE with 1,053 lbs of lint/acre, which is a new variety in 2023 and had a loan value of ¢53.30/lb for an overall top value/acre of \$561.12 (Table 1). Low plant stand may have affected the ability of some cultivars to yield well at this location. The top 10 yielding cultivars all had stands of at least 2 plants/foot of row. For the cultivars with lower ranked yields, 45% had stands of < 2 plants/foot row. Loan value of cultivars ranged from ¢47.25/lb to 55.03/lb (DP 2335 B3XF). The top 10 cultivars with the lowest average transformed root-knot nematode density ($\text{LOG}_{10}(\text{RK}+1)$) which would suggest the best resistance, 3 of 3 nematode resistant Deltapine varieties were in this group, also 3 of the 7 PhytoGen varieties, 2 of the 6 BX cultivars, and 1 of 4 PX cultivars. Only one known susceptible variety had a low $\text{LOG}_{10}(\text{RK}+1)$ value (10 lowest ranks), which indicates while the nematode population was variable, overall, it was adequate to affect cotton performance. In terms of fiber properties, micronaire was high overall with 24 entries being in the discount range (Table 2), and 8 entries in the highest discount range. The fiber length averaged between 1.02 to 1.13 inches, with the top four highest fiber lengths being associated with the new BX cultivars. Fiber strength averaged between 27.0 to 32.6 grams/tex, with the top four entries DP 2143NR B3XF, DP 2141NR B3XF, ST 6000AXTP, and a PhytoGen experimental (PX1124B236-04).

Table 1. Root-knot nematode (RK) variety trial near Lamesa: reproduction and yield.

Variety ^a	Lint yield ^d (lbs/a)	Value (\$) /Acre ^b	Plants /ft row	RK ^c	LOG ₁₀ (RK+1)	Turnout (%)	Loan (¢/lb)	RK Rating
PHY 415 W3FE	1,053	561.12	2.43	1,405	3.04	30.7	53.30	Resistant
PX1124B236-04	917	462.19	2.38	908	2.27	29.2	50.43	Unknown
PX1150B437-04	912	440.89	2.34	1,650	2.50	30.7	48.33	Unknown
FM 1621GL	902	445.61	2.01	8,846	3.63	32.0	49.43	Resistant
PX1122A214-04	885	441.00	2.12	11,453	3.84	30.7	49.83	Unknown
PHY 350 W3FE	837	432.02	2.29	5,400	3.47	30.0	51.63	Resistant
PHY 443 W3FE	826	390.05	2.38	3,998	3.20	30.4	47.25	Resistant
FM 2498GLT	804	403.21	2.38	11,018	3.47	30.4	50.15	Susceptible
PX1125B234-04	796	387.25	2.92	2,353	2.82	28.2	48.68	Unknown
DP 2239 B3XF	782	414.20	2.37	2,128	2.50	33.2	52.95	Susceptible
PHY 411 W3FE	773	367.71	2.04	1,480	2.24	30.9	47.60	Resistant
DP 2349NR B3XF	768	374.75	2.34	1,611	2.25	32.3	48.78	Resistant
DP 2038 B3XF	768	367.37	2.29	1,358	2.70	34.6	47.85	Susceptible
DP 2335 B3XF	754	414.93	2.09	2,420	2.95	32.2	55.03	Susceptible
PHY 332 W3FE	745	398.21	2.20	7,305	2.66	30.6	53.45	Resistant
FM 868AXTP	743	375.93	1.94	5,274	3.70	32.7	50.63	Unknown
BX2359AXTP	734	393.93	2.22	746	2.15	31.0	53.65	Unknown
PHY 400 W3FE	719	365.93	2.35	4,223	1.74	29.9	50.93	Resistant
PHY 205 W3FE	695	338.24	2.56	2,321	2.03	28.3	48.65	Resistant
DP 2141NR B3XF	695	347.25	1.94	746	1.59	30.2	50.00	Resistant
DP 2127 B3XF	692	331.45	2.22	3,751	2.51	32.0	47.88	Susceptible
NG 3299 B3XF	672	334.95	1.86	13,878	3.91	32.6	49.88	Susceptible
DP 2123 B3XF	664	345.69	1.83	16,055	4.03	28.8	52.10	Susceptible
BX2451AXTP	645	332.18	1.83	1,750	3.04	31.1	51.48	Unknown
ST 4993B3XF	631	305.16	1.93	7,295	3.81	32.3	48.40	Susceptible
FM 823AXTP	618	326.75	1.72	3,206	2.63	31.2	52.85	Unknown
BX2362AXTP	605	322.47	1.82	2,698	3.21	29.7	53.30	Unknown
ST 6000AXTP	600	320.40	2.05	410	2.50	32.1	53.40	Unknown
FM 1730GLTP	590	288.27	2.10	1,534	2.94	31.3	48.90	Resistant
DP 2143NR B3XF	560	286.61	1.69	135	1.61	29.6	51.18	Resistant
NG 3195 B3XF	525	266.34	2.17	898	2.85	30.5	50.78	Susceptible
NG 5711 B3XF	482	257.26	1.74	605	1.38	31.4	53.40	Susceptible
Prob>F	0.007	0.008	0.327	0.027	0.063	0.003	0.0004	
MSD ^e (0.05)	330	168.98		12,754		2.3	3.62	

^aBX and PX are experimental lines for BASF and PhytoGen.

^bValue/acre was the loan value (/lb) x lint yield/acre.

^cRoot-knot nematode eggs + J2/500 cm³ soil.

^dBlack bolded numbers are not significantly different than the top yielding or top valued variety.

^eMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Table 2. Fiber quality (HVI) ratings for a root-knot nematode trial near Lamesa.

Variety ^a	Micronaire	Length (")	Uniformity	Strength (g/tex)	Elongation	Rd %	+b	Leaf	Grade
BX2359AXTP	5.03^b	1.13	82.55	30.20	6.0	73.9	8.8	3.5	31-4, 41-3
BX2362AXTP	4.95	1.13	81.70	30.70	5.9	74.3	8.8	3.5	31-4, 41-3
BX2451AXTP	5.17	1.13	81.10	29.40	5.8	74.3	8.9	4.0	31-4, 41-3
DP 2038 B3XF	5.20	1.04	79.50	28.40	5.8	75.8	8.7	3.0	31-2
DP 2123 B3XF	4.81	1.09	81.05	28.30	5.5	74.2	8.5	4.0	41-1, 41-3
DP 2127 B3XF	5.43	1.05	80.45	27.00	6.0	76.5	8.9	2.5	31-1, 31-3
DP 2141NR B3XF	5.31	1.09	80.55	31.25	5.8	74.8	9.2	3.0	31-4, 32-1
DP 2143NR B3XF	5.58	1.11	81.10	31.55	5.8	74.4	9.0	3.5	31-4
DP 2239 B3XF	5.00	1.11	80.85	28.25	6.0	76.4	9.1	3.0	31-3
DP 2335 B3XF	4.74	1.10	80.65	30.40	5.3	77.1	8.7	2.5	31-1, 31-3
DP 2349NR B3XF	5.30	1.06	80.60	28.25	5.8	75.4	8.5	3.0	31-2, 41-1
FM 823AXTP	5.06	1.10	81.40	30.60	6.1	75.0	8.7	4.0	31-4, 41-1
FM 868AXTP	4.99	1.07	80.75	29.85	5.8	75.6	9.2	2.5	31-3
FM 1621GL	5.28	1.06	81.20	29.45	5.4	74.4	8.5	4.5	31-4, 41-1
FM 1730GLTP	5.09	1.05	81.35	28.80	5.1	75.8	8.2	3.5	31-2, 41-1
FM 2498GLT	5.47	1.10	81.85	29.40	5.7	75.3	8.8	3.0	31-3, 31-4
NG 3195 B3XF	4.92	1.05	79.30	27.45	5.4	75.5	8.9	3.0	31-2, 31-4
NG 3299 B3XF	5.31	1.09	81.05	29.70	5.6	75.1	9.1	3.5	31-2, 32-1
NG 5711 B3XF	4.89	1.08	79.95	28.65	6.2	76.1	8.9	2.0	31-1, 31-4
PHY 205 W3FE	4.96	1.02	79.75	27.85	5.5	75.1	9.1	3.5	31-3, 31-4
PHY 332 W3FE	4.92	1.10	80.95	29.10	6.1	74.0	9.1	3.0	31-4, 32-2
PHY 350 W3FE	5.01	1.09	81.20	28.50	5.9	75.1	9.2	3.5	31-3, 31-4
PHY 400 W3FE	4.91	1.06	80.80	30.25	5.8	74.4	9.5	3.5	31-3, 32-2
PHY 411 W3FE	5.02	1.03	80.45	29.30	6.0	76.5	8.4	3.0	31-1, 31-2
PHY 415 W3FE	4.83	1.11	80.50	30.90	6.3	74.5	9.1	3.5	32-1, 41-3
PHY 443 W3FE	5.17	1.07	80.55	30.00	6.0	74.0	9.6	3.0	32-1, 32-2
PX1122A214-04	4.58	1.03	79.00	28.60	5.8	75.4	8.8	3.5	31-3, 31-4
PX1124B236-04	5.17	1.08	81.25	31.25	6.0	74.5	8.8	4.0	31-4, 41-3
PX1125B234-04	5.54	1.06	80.90	29.00	5.5	74.6	9.0	4.0	31-4, 41-3
PX1150B437-04	5.07	1.04	79.35	29.60	6.1	74.2	9.1	3.0	31-4
ST 4993B3XF	5.17	1.04	81.10	29.70	5.9	75.6	8.4	3.5	31-2
ST 6000AXTP	5.07	1.12	81.45	32.60	6.1	75.5	9.2	2.5	31-3
Prob>F	0.0001	0.0001	0.096	0.004	0.0001	0.005	0.0001	0.068	
MSD ^c (0.05)	0.22	0.04		2.65	0.3	1.8	0.5		

^aBX and PX are experimental lines for BASF and PhytoGen.

^bRed bolded values are in the discount range for micronaire and fiber length uniformity.

^cMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Morton (Barker Farm): This location was used for entries that contained dicamba tolerance. There were 36 entries including three root-knot nematode resistant varieties from Deltapine (DP 2143NR B3XF, DP 2141NR B3XF, and DP 2349NR B3XF) and ST 5600B2XF which is known to have nematode resistance. In addition, there was a possibility that some of the new BX cultivars had at least partial root-knot nematode resistance. There were 23 known nematode susceptible varieties in the trial, including some new ones from Deltapine and Americot with the ThryvOn™ technology. This location had a significant hail event around 2 weeks after planting, which caused stand loss. The plants took a very long time to grow out of the damage, which probably contributed to a later maturation of the plants, shorter plants, and ultimately less yield potential. The root-knot nematode pressure at this site was low to moderate, however since the field had not previously been in test plots, the variability within a replication was not as bad as at the AGCARES site. Because bolls on some of the longer season varieties did not open until very late in the growing season, this site was not sprayed with harvest aids until two days before the first freeze event. This resulted in a lot more leaf trash on the cotton.

Results: The top four yielding entries ranged from 1,070 lbs of lint/acre to 956 lbs of lint/acre (DP 2127 B3XF (nematode susceptible), ST 6000AXTP (probably nematode resistant), ST 5600B2XF (nematode resistant), and NG 4190 B3XF (nematode susceptible)) (Table 3). The top valued cultivar was ST 6000AXTP (\$583.60/acre). There were three varieties with ThryvOn technology in the test, and while thrips pressure was low at this site, DP 2328 B3TXF yielded in the top group of varieties (940 lbs/acre). Nematode reproduction (ranked as $\text{LOG}_{10}(\text{RK}+1)$) was lowest for ST 5600B2XF, DP 2143NR B3XF, BX2451AXTP, and DP 2141NR B3XF. So overall the known resistant varieties performed well, though DP 2349NR B3XF only ranked 23rd out of the 36 varieties for low nematode reproduction. The BASF experimental varieties also performed well overall with regards to low nematode reproduction ranking 3rd (BX2451AXTP), 5th (BX2362AXTP), 9th (BX2359AXTP), 11th (FM 868AXTP), 12th (ST 6000AXTP), and 13th (FM 823AXTP). In terms of fiber properties, micronaire was high overall with 18 entries being in the discount range (Table 4). Fiber lengths ranged from 1.02 to 1.14 inches (Armor 9442 XF and NG 4098 B3XF with best length). There were four varieties with discounted length uniformity and 7 in the discount range for strength. Varieties with the highest strength measurements were DP 1822 XF, NG 4098 B3XF, and ST 6000AXTF.

Table 3. Root-knot Nematode (RK) variety trial near Morton (Barker Farm).

Variety ^a	Lint yield (lbs/a)	Value (\$) /Acre ^b	Plants /ft row	RK ^c	LOG ₁₀ (RK+1)	Turnout (%)	Loan (¢/lb)	RK Rating
DP 2127 B3XF	1,070	524.96	2.04	1,460	3.10	30.5	49.05	Susceptible
ST 6000AXTP	1,069	583.60	1.46	630	2.16	30.0	54.58	Unknown
ST 5600B2XF	965	495.66	2.12	55	1.02	27.9	51.35	Resistant
NG 4190 B3XF	964	538.89	2.08	968	1.51	27.9	55.93	Susceptible
DP 2038 B3XF	956	395.38	2.41	1,455	2.41	31.3	41.38	Susceptible
AR 9371 B3XF	954	488.45	1.99	2,336	3.31	31.1	51.20	Susceptible
DP 2328 B3TXF	940	461.19	1.91	5,315	3.68	26.4	49.05	Susceptible
DP 2115 B3XF	928	463.47	2.26	3,940	3.18	30.4	49.93	Susceptible
DP 2333 B3XF	927	487.91	2.11	1,815	3.05	29.5	52.63	Susceptible
NG 3195 B3XF	914	447.53	1.99	639	2.65	29.5	48.95	Susceptible
DP 2335 B3XF	913	505.62	2.50	3,095	2.52	27.5	55.38	Susceptible
NG 4098 B3XF	905	501.82	2.11	398	2.35	24.9	55.45	Susceptible
NG 3299 B3XF	904	446.46	1.86	370	2.52	28.2	49.53	Susceptible
AR 9413 XF	889	411.87	2.30	904	2.45	29.7	46.33	Susceptible
DP 2349NR B3XF	880	462.99	2.11	1,270	2.60	28.4	52.65	Resistant
AR 9512 B3XF	866	436.34	2.14	1,073	1.64	27.7	50.40	Susceptible
FM 868AXTP	856	433.57	2.25	485	2.06	27.1	50.65	Unknown
DP 2141NR B3XF	841	418.96	2.44	66	1.37	26.0	49.95	Resistant
AR 9442 XF	828	461.09	1.84	1,200	2.79	22.9	55.50	Susceptible
DP 2239 B3XF	827	448.07	2.11	1,564	2.67	30.1	54.18	Susceptible
DP 1822 XF	819	444.99	2.71	2,166	3.23	26.9	54.35	Susceptible
AMX20T157B3XF	816	432.07	2.49	1,143	2.61	27.0	52.95	Unknown
BX2362AXTP	807	437.23	2.21	615	1.42	26.7	54.18	Unknown
AMX160030AB3XF	800	442.80	2.62	1,029	2.78	29.8	55.35	Unknown
ST 4993 B3XF	792	395.24	2.34	1,053	2.32	29.0	50.00	Susceptible
DP 2012 B3XF	790	405.00	2.66	938	2.29	27.9	51.25	Susceptible
DP 2143NR B3XF	790	401.19	2.46	90	1.13	24.8	50.80	Resistant
FM 823AXTP	775	431.52	2.05	831	2.23	27.8	55.68	Unknown
ST 4990 B3XF	772	432.31	2.34	1,705	1.76	25.1	55.98	Susceptible
BX2359AXTP	767	402.81	2.42	270	1.99	25.3	52.50	Unknown
DP 2123 B3XF	752	395.65	2.68	1,688	2.99	25.0	52.63	Susceptible
DP 2317 B3TXF	748	364.13	2.41	858	2.00	25.1	48.68	Susceptible
DP 2022 B3XF	745	345.79	1.93	1,910	2.54	21.9	46.43	Susceptible
BX2451AXTP	728	364.58	2.03	51	1.34	25.4	50.08	Unknown
AMX20T079B3XF	698	316.78	2.74	423	2.41	25.0	45.40	Unknown
AM 9383 B3TXF	697	331.30	1.64	526	2.66	22.5	47.55	Susceptible
Prob>F	0.003	0.0001	0.0001	0.005	0.128	0.001	0.0001	
MSD ^e (0.05)	251	111.75	0.37	2896		2.9	5.22	

^aAMX and BX are experimental lines for Americot and BASF.

^bValue/acre was the loan value (/lb) x lint yield/acre.

^cRoot-knot nematode eggs + J2/500 cm³ soil.

^dBlack bolded numbers are not significantly different than the top yielding or top valued variety.

^eMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Table 4. Fiber quality (HVI) ratings for a root-knot nematode trial near Morton (Barker Farm).

Variety ^a	Micronaire	Length (")	Uniformity	Strength (g/tex)	Elongation	Rd %	+b	Leaf	Grade
AM 9383 B3TXF	4.58	1.06	80.50	25.40	7.4	78.5	7.6	4.5	31-1, 31-2
AMX160030AB3XF	4.92	1.11	81.30	26.85	7.6	78.5	7.4	4.0	31-2
AMX20T079B3XF	5.15	1.07	80.65	25.35	7.1	76.6	8.2	4.0	31-2
AMX20T157B3XF	4.91	1.07	81.20	26.59	7.6	78.7	8.1	3.0	31-1
AR 9371 B3XF	5.22	1.06	80.30	26.01	6.6	81.5	7.2	3.0	21-2
AR 9413 XF	5.02	1.06	80.60	24.90	6.2	79.7	7.2	4.0	31-2
AR 9442 XF	4.83	1.14	81.50	28.90	8.5	78.0	6.9	4.5	31-2, 41-1
AR 9512 B3XF	4.98	1.06	80.40	27.85	6.2	80.2	7.1	4.0	31-1, 31-2
BX2359AXTP	5.17	1.11	81.65	27.70	6.8	79.1	7.6	3.5	31-1, 31-2
BX2362AXTP	5.02	1.12	82.00	28.05	7.0	77.9	7.6	4.0	31-2
BX2451AXTP	4.98	1.06	80.25	26.65	6.6	77.9	7.8	4.5	31-2
DP 1822 XF	5.05	1.13	80.80	30.50	6.3	78.9	7.5	4.0	31-1
DP 2012 B3XF	4.86	1.08	80.60	26.15	6.5	79.9	7.6	4.0	31-1
DP 2022 B3XF	4.68	1.07	79.75	25.30	5.9	77.6	6.5	5.5	41-1, 41-2
DP 2038 B3XF	5.19	1.02	78.85	25.60	6.8	80.9	7.5	3.0	21-2, 31-1
DP 2115 B3XF	5.31	1.07	80.90	27.30	7.3	79.1	7.6	4.0	31-1, 31-2
DP 2123 B3XF	4.97	1.08	81.25	27.20	6.1	78.2	7.5	4.5	31-1, 31-2
DP 2127 B3XF	5.45	1.05	81.80	26.51	6.7	80.9	7.4	3.0	31-1
DP 2141NR B3XF	5.45	1.08	80.60	28.35	6.8	77.8	8.1	4.0	31-1, 31-2
DP 2143NR B3XF	5.47	1.09	81.05	28.20	6.9	78.0	8.1	4.0	31-1, 31-2
DP 2239 B3XF	5.04	1.12	80.45	26.70	7.0	80.6	7.8	3.5	21-1, 31-1
DP 2317 B3TXF	4.60	1.08	81.10	25.10	6.4	80.4	7.3	4.0	31-1
DP 2328 B3TXF	4.57	1.09	79.15	25.45	6.5	80.7	7.2	3.0	31-1
DP 2333 B3XF	5.00	1.08	80.10	26.85	6.3	81.5	7.1	3.0	31-1
DP 2335 B3XF	4.57	1.10	79.90	27.40	6.3	81.0	7.2	3.5	31-1
DP 2349NR B3XF	5.03	1.08	81.75	27.45	6.9	80.2	7.8	3.0	21-2, 31-1
FM 823AXTP	4.74	1.11	82.30	28.65	7.1	80.8	7.1	4.0	31-1
FM 868AXTP	4.93	1.05	80.40	27.50	6.9	78.7	7.5	4.0	31-2
NG 3195 B3XF	5.08	1.07	81.10	26.00	6.5	80.8	6.9	3.5	31-1
NG 3299 B3XF	5.19	1.05	81.15	29.50	6.3	79.6	7.9	3.0	31-1
NG 4098 B3XF	4.42	1.14	80.00	30.45	6.5	76.6	8.1	4.5	31-2, 41-1
NG 4190 B3XF	4.77	1.12	81.90	27.60	6.8	81.2	7.3	3.0	21-2, 31-1
ST 4990 B3XF	4.81	1.12	82.20	27.35	7.5	81.1	6.5	3.5	31-2
ST 4993 B3XF	4.89	1.04	81.05	28.70	6.8	80.3	7.8	3.0	21-1, 31-1
ST 5600 B2XF	5.53	1.10	82.80	29.00	7.3	77.3	8.8	3.0	21-4, 31-1
ST 6000AXTP	5.08	1.10	81.80	29.85	6.9	79.5	7.3	4.0	31-1, 31-2
Prob.>F	0.0001	0.0001	0.01	0.0001	0.0001	0.0001	0.0002	0.053	
MSD ^c (0.05)	0.27	0.04	2.16	1.34	1.8	1.8	0.8	1.9	

^aAMX and BX are experimental lines for Americot and BASF.

^bRed bolded values are in the discount range for micronaire, fiber length uniformity, and fiber strength.

^cMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Morton (Clark Farm): This test was originally designed for a Fusarium wilt/root-knot nematode field, with a small number of varieties and a high number of replications per variety. Unfortunately, the test was hailed out several weeks after planting and it was necessary to move the test to a different location where it was unknown whether there was significant presence of the Fusarium wilt fungus and root-knot nematode. It turns out that there was no Fusarium wilt at the replant site, and very low densities of root-knot nematode. This field had drip irrigation under every bed and yielded very well, considering the hot, dry growing season. There were three root-knot nematode susceptible varieties, three root-knot nematode resistant varieties, and two experimental BASF varieties (that were moved up to FiberMax variety status) that may have root-knot nematode resistance.

Results: Yield was excellent across all varieties (Table 5). DP 2012 B3XF and FM 868AXTP yielded more than DP 2317 B3TXF and FM 823AXTP. Both DP 2143NR B3XF and DP 2141NR B3XF have the highest level of root-knot nematode resistance (2 genes, homozygous). It was clear for the nematode densities that these two varieties had stronger resistance than other varieties tested. Loan values were good to excellent across all varieties. Fiber properties were good overall at this location, with no discounts seen for the averages of micronaire, fiber length, fiber uniformity, or fiber strength. The best fiber length, strength, and fiber length uniformity were associated with FM 823AXTP (Table 6).

Table 5. Root-knot Nematode (RK) variety trial near Morton (Clark Farm).

Variety	Lint yield (lbs/a)	Value (\$) /Acre ^b	Plants /ft row	RK ^c	LOG ₁₀ (RK+1)	Turnout (%)	Loan (¢/lb)	RK Rating
DP 2012 B3XF	1,524	805.29	3.08	269	2.04	29.9	52.83	Susceptible
FM 868AXTP	1,513	851.69	2.76	246	1.45	28.8	56.28	Unknown
DP 2141NR B3XF	1,472	845.72	2.68	62	0.28	27.7	57.45	Resistant
DP 2349NR B3XF	1,470	803.57	2.21	313	1.25	30.3	54.65	Resistant
NG 3195 B3XF	1,459	832.98	2.37	452	1.55	30.6	57.10	Susceptible
DP 2143NR B3XF	1,428	786.72	2.15	7	0.19	28.5	55.10	Resistant
DP 2317 B3TXF	1,394	797.32	3.04	649	1.90	28.6	57.18	Susceptible
FM 823AXTP	1,315	758.55	2.50	575	1.79	28.5	57.68	Unknown
Prob.>F	0.002	0.018	0.001	0.19	0.001	29.9	0.243	
MSD ^e (0.05)	103	62.98	0.31		1.06			

^bValue/acre was the loan value (/lb) x lint yield/acre.

^cRoot-knot nematode eggs + J2/500 cm³ soil.

^dBlack bolded numbers are not significantly different than the top yielding or top valued variety.

^eMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Table 6. Fiber quality (HVI) ratings for a root-knot nematode trial near Morton (Clark Farm).

Variety	Micronaire	Length (“)	Uniformity	Strength (g/tex)	Elongation	Rd %	+b	Leaf	Grade
DP 2012 B3XF	4.21	1.10	81.20	26.10	7.3	82.5	7.4	3.0	21-1, 21-2
DP 2141NR B3XF	4.55	1.13	80.60	26.60	7.5	81.5	7.9	3.0	21-1
DP 2143NR B3XF	4.61	1.09	80.70	26.25	7.5	81.5	7.9	3.0	21-1, 21-2
DP 2317 B3TXF	4.20	1.12	81.90	26.50	7.1	83.1	7.2	3.0	21-1, 21-2
DP 2349NR B3XF	4.20	1.13	81.25	26.05	7.6	81.2	7.6	2.5	21-1, 31-1
FM 868AXTP	4.27	1.11	81.10	27.20	7.6	81.1	7.8	3.0	21-2
FM 823AXTP	3.90	1.16	82.00	27.45	7.6	82.4	7.2	2.5	21-2, 31-1
NG 3195 B3XF	4.40	1.11	81.75	26.85	7.1	82.1	7.4	3.0	21-2
Prob.>F	0.007	0.031	0.588	0.05	0.004	0.084	0.002	0.643	
MSD ^b (0.05)	0.28	0.04		0.96	0.2		0.3		

^bMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Lubbock County (Root-knot nematode site): This location was planted very late. The variety test consisted of 12 entries (dicamba tolerance only) and included four known root-knot nematode resistant varieties, five susceptible varieties, one experimental line from Americot and two experimental lines from BASF. The test site has a long history of significant root-knot nematode problems, but in 2023, the nematode pressure was low.

Results: Cotton lint yields were low for all entries (427 to 578 lbs lint/acre), and there was no obvious yield advantage for entries with resistance to root-knot nematodes. Loan values ranged from an average of \$46.10 to 56.35 (FM 823AXTP) (Table 7). Three of the nematode resistant varieties (DP 2143NR B3XF, DP 2141NR B3XF, and ST 5600B2XF) and BX2451AXTP had much lower nematode reproduction than other varieties. Fiber properties were generally acceptable, and the longest and strongest fiber and best fiber length uniformity were associated with BX2451AXTP (Table 8).

Table 7. Root-knot Nematode (RK) variety trial in Lubbock County.

Variety ^a	Lint yield (lbs/a)	Value (\$)/Acre ^b	Plants /ft row	RK ^c	LOG ₁₀ (RK+1)	Turnout (%)	Loan (¢/lb)	RK Rating
DP 2038 B3XF	578	266.57	2.71	289	2.33	32.9	46.10	Susceptible
DP 2335 B3XF	566	306.11	2.71	1,573	2.88	27.2	54.13	Susceptible
DP 2349NR B3XF	528	290.70	2.25	838	2.17	29.7	55.03	Resistant
DP 2127 B3XF	491	246.51	2.47	625	2.57	31.2	50.18	Susceptible
ST 5600B2XF	488	245.70	2.35	79	1.01	26.9	50.40	Resistant
AMX160030AB3XF	480	261.00	2.73	1,315	2.87	31.2	54.43	Unknown
ST 6000AXTP	462	260.34	1.59	1005	2.17	30.2	56.35	Unknown
DP 2143NR B3XF	448	233.06	2.51	180	1.27	26.8	52.05	Resistant
DP 2328 B3TXF	444	248.06	1.94	3,923	3.02	27.7	55.90	Susceptible
DP 2141NR B3XF	443	226.06	2.09	20	0.48	25.9	51.00	Resistant
BX2451AXTP	434	233.57	2.09	148	1.62	27.7	53.88	Unknown
DP 2333 B3XF	427	220.38	2.11	1,955	3.10	30.7	51.58	Susceptible
Prob.>F	0.235	0.285	0.059	0.091	0.0003	0.001	0.094	
MSD ^d (0.05)			0.91		1.19	0.025		

^aAMX and BX are experimental lines for Americot and BASF.

^bValue/acre was the loan value (/lb) x lint yield/acre.

^cRoot-knot nematode eggs + J2/500 cm³ soil.

^dMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Table 8. Fiber quality (HVI) ratings for a root-knot nematode trial in Lubbock County.

Variety ^a	Micronaire	Length (")	Uniformity	Strength (g/tex)	Elongation	Rd %	+b	Leaf	Grade
AMX160030AB3XF	4.81	1.10	81.20	27.15	7.8	77.6	8.1	4.0	31-1, 31-2
BX2451AXTP	4.76	1.11	81.95	28.00	6.8	77.5	8.8	4.0	21-4, 31-1
DP 2038 B3XF	4.89	1.02	80.15	26.20	6.9	79.7	8.2	3.0	21-1, 31-1
DP 2127 B3XF	5.10	1.06	81.60	27.55	6.7	78.2	8.2	4.0	21-2, 31-2
DP 2141NR B3XF	4.59	1.10	81.25	29.30	7.0	74.9	10.9	3.0	22-1, 23-1
DP 2143NR B3XF	5.12	1.09	80.85	29.30	7.0	75.7	9.1	4.0	31-3
DP 2328 B3TXF	4.47	1.12	80.80	28.10	6.7	78.7	8.8	3.5	21-1, 31-1
DP 2333 B3XF	4.92	1.06	80.20	27.25	6.5	78.2	9.2	2.5	21-2, 21-3
DP 2335 B3XF	3.79	1.09	79.65	27.20	6.2	77.4	9.6	3.0	21-3, 21-4
DP 2349NR B3XF	4.50	1.09	81.80	28.30	6.9	77.5	9.0	4.0	21-2, 31-2
ST 5600B2XF	4.59	1.08	81.25	28.95	7.6	73.7	11.1	3.5	22-2, 23-2
ST 6000AXTP	4.15	1.13	82.20	31.15	7.1	77.0	9.3	3.5	22-1, 31-1
Prob.>F	0.001	0.013	0.267	0.004	0.001	0.001	0.001	0.321	
MSD ^c (0.05)	0.42	0.05		1.78	0.2	1.4	0.8		

^aAMX and BX are experimental lines for Americot and BASF.

^bRed bolded values are in the discount range for micronaire, and fiber length uniformity.

^cMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Lubbock County (Reniform Nematode): This test consisted of six reniform nematode resistant varieties, four susceptible varieties, three experimental lines from BASF, and three experimental lines from PhytoGen. All the experimental lines were thought to have reniform nematode resistance to be included in the test. The test had moderate to high reniform nematode pressure.

Results: PHY 411 W3FE had significantly higher yield than any other varieties and higher value/acre than any other variety (Table 9). Numerically all the reniform nematode resistant varieties yielded higher than any of the susceptible varieties. The experimental entries, with the exception of BX2362AXTP, were also resistant to reniform nematode. However, BX2362AXTP was found to be nematode susceptible. Reniform nematode densities were all much lower for the resistant varieties than for the susceptible varieties. Micronaire was high and in the discount range for 6 of the 16 entries (Table 10). Fiber length was somewhat short and ranged from 1.02 to 1.12 inches (BX2362AXTP, PHY 332 W3FE). PHY 332 W3FE had a nice combination of fiber length, length uniformity, and strength.

Table 9. Reniform nematode variety trial in Lubbock County.

Variety ^a	Lint yield (lbs/a)	Value (\$) /Acre ^b	Plants /ft row	Reniform /100 cm ³ soil	Turnout (%)	Loan (¢/lb)	RK Rating
PHY 411 W3FE	1,052	516.85	3.56	220	27.1	49.13	Resistant
PX1124B236-04	835	407.02	3.34	204	24.0	48.73	Resistant
BX2359AXTP	775	406.75	3.10	200	24.9	52.50	Resistant
PX1125B234-04	757	360.44	3.36	381	22.5	47.63	Resistant
PHY 443 W3FE	736	359.18	3.37	420	22.6	48.80	Resistant
PHY 332 W3FE	712	386.48	3.73	254	23.4	54.30	Resistant
PX1150B437-04	709	353.54	3.19	360	23.7	49.90	Resistant
BX2451AXTP	702	383.99	2.85	147	24.2	54.70	Resistant
DP 2143NR B3XF	691	358.15	3.41	200	22.0	51.85	Resistant
PHY 205 W3FE	620	308.76	3.27	250	21.4	49.80	Resistant
DP 2141NR B3XF	603	301.81	3.25	147	23.4	50.03	Resistant
DP 2127 B3XF	545	265.57	3.19	891	27.5	48.75	Susceptible
DP 2038 B3XF	451	232.85	3.36	447	26.1	51.60	Susceptible
NG 3195 B3XF	430	218.87	2.81	960	22.6	50.93	Susceptible
BX2362AXTP	371	201.22	3.33	1,010	21.9	54.20	Susceptible
DP 2317 B3TXF	364	184.48	3.38	957	21.2	50.75	Susceptible
Prob.>F	0.0001	0.001	0.0001	0.0001	0.006	0.104	
MSD ^c (0.05)	100	51.55		328	3.2		

^aBX and PX are experimental lines for BASF and Corteva (PhytoGen).

^bValue/acre was the loan value (/lb) x lint yield/acre.

^cMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.

Table 8. Fiber quality (HVI) ratings for a reniform nematode trial in Lubbock County.

Variety ^a	Micronaire	Length (")	Uniformity	Strength g/tex	Elongation	Rd %	+b	Leaf	Grade
BX2359AXTP	4.79	1.11	81.25	29.35	6.7	77.7	7.4	4.0	41-1
BX2362AXTP	4.79	1.12	81.65	28.70	6.8	76.2	7.6	5.0	41-1
BX2451AXTP	4.69	1.10	80.40	27.90	6.7	77.4	7.6	5.0	31-2
DP 2038 B3XF	4.57	1.05	79.65	27.45	6.5	79.0	7.7	3.5	31-1
DP 2127 B3XF	5.48	1.06	81.95	27.70	6.4	79.1	7.1	3.0	31-2, 41-1
DP 2141NR B3XF	5.43	1.09	80.35	28.85	6.8	76.8	7.9	4.0	31-1, 41-1
DP 2143NR B3XF	5.50	1.11	81.45	29.70	6.8	77.4	7.7	4.0	31-2
DP 2317 B3TXF	4.28	1.08	80.20	25.75	6.0	78.2	7.2	4.5	31-2, 41-1
NG 3195 B3XF	4.65	1.06	79.85	28.15	6.5	78.1	7.5	4.0	31-2, 41-1
PHY 205 W3FE	3.68	1.02	80.20	28.60	6.3	77.1	7.9	4.0	31-2
PHY 332 W3FE	5.10	1.12	81.85	30.00	6.9	77.2	8.0	4.0	31-1, 31-2
PHY 411 W3FE	4.93	1.03	80.85	29.15	7.0	78.7	6.9	4.0	41-1
PHY 443 W3FE	5.27	1.06	81.10	29.05	6.8	78.0	8.2	3.0	31-1
PX1124B236-04	5.55	1.07	81.10	31.15	7.0	77.8	7.2	4.0	41-1
PX1125B234-04	5.48	1.05	80.95	27.75	6.5	78.4	7.4	4.0	31-2
PX1150B437-04	4.93	1.03	80.40	29.25	7.1	78.4	7.6	3.0	31-1, 31-2
Prob.>F	0.0001	0.0001	0.048	0.01	0.0001	0.011	0.003	0.009	
MSD ^c (0.05)	0.42	0.03	1.67	2.23	0.3	1.5	0.5	1.11	

^aBX and PX are experimental lines for BASF and Corteva (PhytoGen).

^bRed bolded values are in the discount range for micronaire, fiber length uniformity, and strength.

^cMSD is minimum significant difference at $P=0.05$, using the Waller-Duncan k-ratio t test.