2024 NFREC – Quincy and NFREC – SV Cotton Variety Trial

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Purpose and Scope

In 2024, a total of 27 cotton varieties and testing lines from four companies were planted under irrigated and dryland conditions. Most of the cotton grown in Florida is in the Panhandle particularly in Jackson, Santa Rosa and Escambia Counties where the majority of cotton production is non-irrigated, however, significant irrigated acreage also exists. Due to the distinct agroclimatic characteristics of the Panhandle and Suwannee Valley, cotton variety trials under irrigated and dryland conditions are needed to better understand the agronomic performance of cotton varieties. Cotton seed is one of the major costs associated with cotton production for Florida growers. Therefore, crop variety trials ensure that new crop varieties confer tangible agronomic benefits, thereby enhancing agricultural efficiency, sustainability, and economic viability. These trials enable the identification of varieties best suited to diverse environmental conditions. Two replicated small plot trial sites were established as a Randomized Complete Block Design (RCBD) with four replications, one site at North Florida Research and Education Center (NFREC)-Quincy, FL and another site at North Florida Research and Education Center-Suwannee Valley (NFREC-SV), Live-Oak, FL.

Table 1: Cotton varieties/experimental lines evaluated at NFREC-SV and NFREC-Quincy in 2024.

Company Names	Cotton Varieties/Experimental Lines
Deltapine	DP2328 B3TXF (Thryvon)
Deltapine	DP2038 B3XF
Deltapine	DP2127 B3XF
Deltapine	DP2020 B3XF
Deltapine	DP2333 B3XF
Deltapine	DP1646 B2XF
Deltapine	DP2131 B3TXF (Thryvon)
Dyna-Gro	DG3799 B3X4
Dyna-Gro	H959 B3XF
Stoneville	ST6000 (Axant Flex Twin Link)
Stoneville	BX2557 (Experimental)
Stoneville	BX2556 (Experimental)
Stoneville	BX2533 (Experimental)
Stoneville	BX2531(Experimental)
Stoneville	BX2555(Experimental)
Phytogen	PHY415 W3FE
Phytogen	PHY475 W3FE
Phytogen	PHY545 W3FE
Phytogen	PHY 400 W3FE
Phytogen	PHY 411 W3FE
Phytogen	1130F309-04 (Experimental)
Phytogen	1140F329-04 (Experimental)
Phytogen	1140F330-04 (Experimental)
Phytogen	1140F331-04 (Experimental)
Phytogen	1150F357-04 (Experimental)
Phytogen	1150F360-04 (Experimental)
Phytogen	1150F361-04 (Experimental)

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Management

The treatments consisted of 27 varieties/experimental lines that were evaluated in small plot replicated trials at both locations planted on 36-inch rows and 20 feet length. In Quincy, irrigated cotton trial was planted on April 30th and non-irrigated trial was planted on May 1st. Due to weather conditions, cotton planting was behind in our region, last season we finished planting small plot replicated cotton variety trial in Live-Oak on May 30th (irrigated) and May 31st (non-irrigated). The irrigated cotton in Quincy was harvested on October 16th and the non-irrigated cotton was harvested on November 13 th. For cotton harvest in Quincy a cotton picker was used and the two central lines of each plot were harvested to get yield data and fiber evaluation. The irrigated cotton in Live-Oak was harvested on October 30th and the non-irrigated cotton was harvested on November 4th. For cotton harvest in Live-Oak, cotton bolls were hand-picked from the two center rows of each plot, and it was equal to 40 feet, and after harvest the total weight was measured to obtain yield data.

Fertility

Due to the difference in soil type and climate, cotton management was site specific. Total fertilization use for irrigated cotton in Quincy was 120 lbs/ac of nitrogen (N), 182.5 lbs/ac of potassium (K) and for non-irrigated cotton 90 lbs/ac of N was applied. N and K were applied in two split applications, the first application was made before planting, using the fertilizer 5-0-30 at a rate of 275 lbs/ac.

In Live-Oak, the total fertilization use for irrigated cotton was 115 lbs/ac of N, 81 lbs/ac of K, 20 lbs/ac of phosphorus (P), 5.4lbs/ac of magnesium (Mg) and 11 lbs/ac of sulfur (S). N was applied in three split applications, the first application at 15 days after planting was 200lbs/ac of 14-4-14, the second application at 45 days after planting was 300lbs/ac of 14-4-14 plus 50lbs/ac of Kmag to provide K, sulfur (S) and magnesium (Mg), and the third application at 60 days after planting was 15gal/ac of 28-0-5 applied by pivot. For non-irrigated cotton in Live-Oak was applied 98 lbs/ac of N, 109 lbs/ac of K, 28 lbs/ac of P, 11 lbs/ac of S, and 5.4 lbs/ac of Mg. N, P and K were applied in three applications, at 15, 45 and 70 days after planting.

Data Collection

The data was collected throughout the season to evaluate several agronomic traits to understand how different cotton varieties behave in each location. The data colleting consisted of plant emergence rate, plant height, number of nodes, number of nodes above white flower, yield and lint quality. In Quincy, the irrigated cotton emergence rate was evaluated three times 5, 8 and 22 Days After Planting (DAP), and the non-irrigated cotton emergence was evaluated with 6, 11 and 22 DAP. This evaluation was performed randomly in 20 feet in each plot. Plant height and number of nodes data were measured twice, in June and July, for these measurements five randomized plants from each plot were used. Due to the two hurricanes, Debby and Helene, that hit Florida last year, our on-farm cotton trails in Jefferson County were completely compromised and unable to harvest, therefore these plots were lost.

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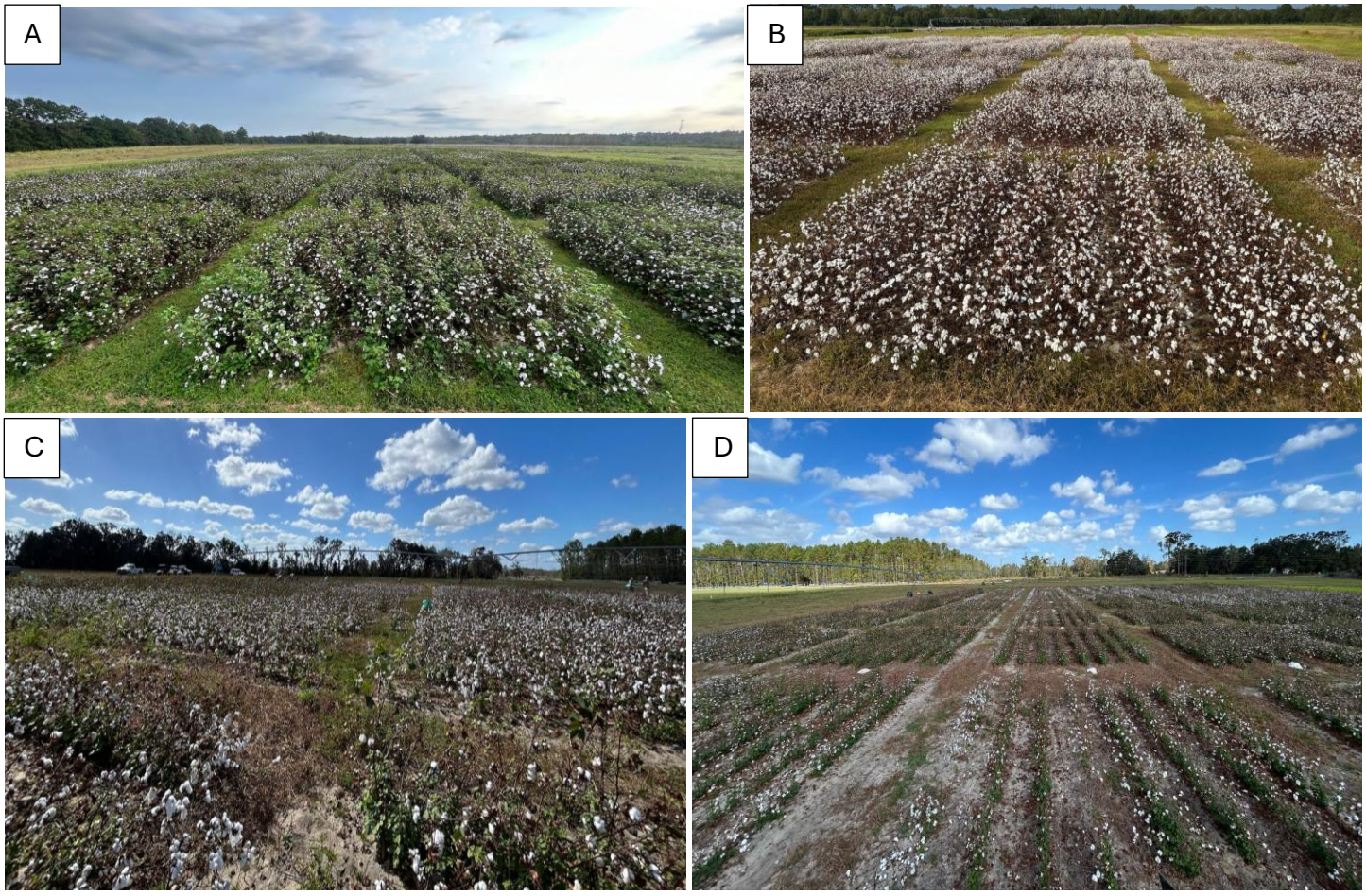

Figure 3A: Non-irrigated cotton variety evaluation trial at NFREC-Quincy, FL. 3B: Irrigated cotton variety evaluation trial at NFREC-Quincy, FL. 3C: Non-irrigated cotton variety evaluation trial at NFREC-SV, FL. 3D: Irrigated cotton variety evaluation trial at NFREC-SV, FL.

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Table 2: Fiber evaluation.

Parameters	Definition	Range
Micronaire	Micronaire is a measument of both fiber fineness and maturity.	Premium range: 3.7-4.2 Base range: 3.5-3.6 or 4.3-4.9 Discount range
Fiber Length	The average length of the longer half of the fibers.	Extra-long: >1.26 Long: 1.11-1.26 Medium: 0.99-1.10 Short: <0.99
Fiber Strength	Fiber strength as measured on the High Volume Instrument is the force (in grams) required to break a bundle of fibers one-tex unit in mass.	Very strong: >31 Strong: 29-30 Average: 26-28 Intermediate: 24-25 Weak: <23
Length Uniformity	Length uniformity index is the ratio between the "mean length" of the fibers and the "upper half mean length".	Very high: >85 High: 83-85 Intermediate: 80-82 Low: 77-79 Very low: <77

(https://www.cottoninc.com/wp-content/uploads/2017/02/Classification-of-Cotton.pdf)

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Table 3: NFREC – Quincy site irrigated cotton trial yield and lint quality information.

Company Names	Varieties/Experimental lines	Lint (Lbs/ac)	Gin (%)	Color Grade	Leaf Grade	Mic	Fiber Length (in)	Fiber Strength (g/tex)	Uniformity
Deltapine	DP2127 B3XF	1435 a	43 ghijk	54	7	4.6	1.08	29	83.1
Phytogen	1140F331-04 (Experimental)	1398 ab	45 defgh	56	8	4.2	1.14	31	55.1
Stoneville	BX2555 (Experimental)	1384 ab	47 b	54	8	3.8	1.13	31	61.3
Deltapine	DP2333 B3XF	1380 ab	44 fghij	58	7	4.3	1.11	29	81.7
Deltapine	DP 1646 B2XF	1318 abc	44 fghij	51	7	4.2	1.20	29	82.1
Stoneville	ST6000 (Axant Flex Twin Link)	1285 abcd	46 b	56	8	4.1	1.18	34	83.1
Stoneville	BX2531 (Experimental)	1255 abcde	43 ijk	54	8	3.8	1.17	31	61.9
Stoneville	BX2557 (Experimental)	1246 abcdef	45 cdefg	58	7	4.4	1.15	33	82.9
Stoneville	BX2533 (Experimental)	1239 abcdef	42 k	48	6	4.3	1.15	30	63.4
Phytogen	1150F361-04 (Experimental)	1212 abcdefg	44 fghij	58	5	4.0	1.14	33	82.2
Phytogen	1150F357-04 (Experimental)	1191 abcdefg	42 ijk	62	8	4.2	1.12	32	83.9
Deltapine	DP2038 B3XF	1177 abcdefg	48 a	51	7	4.4	1.07	28	81.1
Phytogen	1140F330-04 (Experimental)	1174 bcdefg	44 ghijk	61	8	4.0	1.16	31	82.7
Deltapine	DP2328 B3TXF (Thryvon)	1150 bcdefg	45 bcde	58	8	4.0	1.15	29	81.6
Phytogen	113OF309-04 (Experimental)	1104 cdefg	44 efgh	61	8	4.1	1.12	30	83.1
Deltapine	DP2020 B3XF	1103 cdefg	42 jk	61	8	4.1	1.17	30	83.5
Phytogen	PHY400W3FE	1102 cdefg	44 efgh	61	8	3.8	1.13	30	61.2
Phytogen	PHY475W3FE	1097 cdefg	44 ghijk	62	7	4.0	1.10	28	59.9
Phytogen	PHY411W3FE	1068 cdefg	45 bcdef	62	8	4.5	1.08	31	82.0
Phytogen	1140F329-04 (Experimental)	1052 defg	44 efghi	62	8	3.9	1.13	30	81.7
Deltapine	DP2131 B3XTF	1046 defg	46 bcd	58	5	4.0	1.16	29	82.4
Phytogen	PHY415W3FE	1020 efg	43 hijk	69	8	4.2	1.15	31	61.8
Stoneville	BX2556 (Experimental)	1018 efg	44 efgh	61	8	3.5	1.15	30	61.4
Phytogen	PHY545W3FE	992 fg	44 efgh	62	8	3.7	1.07	28	61.1
Phytogen	1150F360-04 (Experimental)	987 fg	42 jk	62	8	4.0	1.17	32	83.3
Dyna-Gro	DG3799B3X4	979 g	46 bc	58	8	4.0	1.14	30	61.3
Dyna-Gro	H959B3XF	971 g	43 hijk	62	8	4.1	1.14	30	61.2
Mean		**1162**	**44**	**59**	**7**	**4.1**	**1.14**	**30**	**73.7**

The top 5 cotton varieties in non-irrigated small plots at NFREC-Quincy were **DP 2127 B3XF** (1435 lbs/ac), **1140F331-04** (1398 lbs/ac), **BX2555** (1384 lbs/ac), **DP2333 B3XF** (1380lbs/ac) and **DP 1646 B2XF** (1318 lbs/ac).

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Table 4: NFREC – Quincy site non-irrigated cotton trial yield and lint quality information.

Company Names	Varieties/Experimental lines	Lint (Lbs/ac)	Gin Turnout (%)	Color Grade	Leaf Grade	Mic	Fiber Length (in)	Fiber Strength (g/tex)	Uniformity
Deltapine	DP2333 B3XF	1497 a	44 cdefg	41	4	4.3	1.14	30	82.9
Deltapine	DP2127 B3XF	1489 ab	41 fghi	41	5	4.6	1.09	29	84.3
Stoneville	BX2557 (Experimental)	1461 abc	43 cdefg	51	6	4.4	1.16	34	83.5
Phytogen	1150F361-04 (Experimental)	1389 abcd	43 cdefg	48	5	4.2	1.17	32	84.5
Deltapine	DP2038 B3XF	1373 abcde	47 a	51	6	4.3	1.09	28	82.3
Deltapine	DP2328 B3TXF (Thryvon)	1369 abcde	44 bcde	44	4	4.2	1.16	29	83.5
Stoneville	BX2531 (Experimental)	1352 abcdef	42 efg	48	5	3.9	1.17	32	83.7
Phytogen	PHY411W3FE	1325 abcdefgh	43 cdefg	46	6	4.4	1.11	30	83.1
Phytogen	1140F331-04 (Experimental)	1316 bcdefghi	42 defg	52	7	4.2	1.14	31	83.8
Dyna-Gro	H959B3XF	1314 bcdefghi	42 fghi	51	6	4.0	1.16	30	83.4
Deltapine	DP 1646 B2XF	1300 bcdefghi	42 cdefg	38	4	3.8	1.22	30	83.9
Phytogen	PHY475W3FE	1295 bcdefghi	41 ghi	58	6	4.3	1.17	32	82.5
Stoneville	BX2555 (Experimental)	1264 cdefgghij	46 ab	46	5	4.1	1.18	32	83.7
Phytogen	PHY415W3FE	1254 cdefghij	43 cdefg	45	5	4.2	1.20	33	85.0
Phytogen	PHY400W3FE	1244 cdefghij	44 abcd	51	6	4.1	1.16	32	82.8
Stoneville	BX2533 (Experimental)	1237 defghij	39 i	55	7	3.9	1.15	30	83.6
Stoneville	BX2556 (Experimental)	1221 defghij	44 cdefg	58	6	3.7	1.17	31	83.0
Phytogen	1140F329-04 (Experimental)	1191 defghij	43 cdefg	46	6	4.1	1.14	32	83.2
Stoneville	ST6000 (Axant Flex Twin Link)	1168 efghijk	44 cdefg	51	6	3.8	1.16	32	83.1
Deltapine	DP2131 B3XTF	1165 efghijk	42 defg	44	5	3.8	1.20	29	82.9
Phytogen	PHY545W3FE	1145 fghijk	45 abc	55	6	4.3	1.11	30	83.3
Deltapine	DP2020 B3XF	1137 fghijk	40 hi	51	6	4.0	1.16	30	83.7
Phytogen	1140F330-04 (Experimental)	1129 ghijk	43 cdefg	46	6	4.2	1.17	31	84.1
Dyna-Gro	DG3799B3X4	1116 hijk	42 cdefg	51	6	3.9	1.18	30	82.8
Phytogen	1150F360-04 (Experimental)	1100 ijk	42 efg	55	7	4.2	1.20	33	84.4
Phytogen	1150F357-04 (Experimental)	1062 jk	42 defg	41	5	4.2	1.14	34	85.3
Phytogen	113OF309-04 (Experimental)	969 k	43 cdefg	47	5	3.7	1.14	31	83.4
Mean		**1255**	**43**	**49**	**6**	**4.1**	**1.16**	**31**	**83.5**

The top 5 cotton varieties in non-irrigated small plots at NFREC-Quincy were **DP 2333 B3XF** (1497 lbs/ac), **DP 2127 B3XF** (1489 lbs/ac), **BX2557** (1461 lbs/ac), **1150F361-04** (1389 lbs/ac) and **DP 2038 B3XF** (1373 lbs/ac).

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Table 5: NFREC – SV site irrigated cotton trial yield and lint quality information.

Company Names	Varieties/Experimental lines	Lint (Lbs/ac)	Gin (%)	Color Grade	Leaf Grade	Mic	Fiber Length (in)	Fiber Strength (g/tex)	Uniformity
Phytogen	PHY545W3FE	746 a	48 a	31	2	4.4	1.14	30	83.8
Deltapine	DP2127 B3XF	741 ab	46 ab	31	2	4.8	1.07	29	83.6
Phytogen	PHY400W3FE	630 ab	45 abc	32	4	4.1	1.08	30	83.9
Stoneville	BX2555 (Experimental)	594 abc	42 abcde	35	2	4.5	1.12	31	83.8
Phytogen	1150F361-04 (Experimental)	574 abcd	44 abcde	35	3	4.2	1.19	30	84.3
Stoneville	BX2557 (Experimental)	550 abcd	39 abcde	32	3	4.1	1.16	31	84.8
Phytogen	1150F360-04 (Experimental)	545 abcd	37 abcde	32	3	3.9	1.17	34	84.8
Stoneville	BX2556 (Experimental)	492 abcd	43 abcd	31	2	4.4	1.17	33	84.5
Deltapine	DP2328 B3TXF (Thryvon)	478 abcd	43 abcd	38	2	4.6	1.12	29	83.8
Deltapine	DP 1646 B2XF	478 abcd	40 abcde	31	1	4.1	1.19	29	84.7
Deltapine	DP2131 B3XTF	475 abcd	43 abcd	31	2	4.5	1.14	33	84.6
Deltapine	DP2333 B3XF	473 abcd	41 abcde	31	2	4.4	1.14	31	84.5
Phytogen	1140F329-04 (Experimental)	462 abcd	43 abcde	32	2	4.2	1.15	31	84.2
Deltapine	DP2038 B3XF	456 abcd	37 abcde	32	2	4.3	1.07	27	81.8
Stoneville	BX2531 (Experimental)	450 abcd	34 bcde	32	3	4.1	1.12	29	81.9
Phytogen	1140F331-04 (Experimental)	442 abcd	32 de	28	3	4.3	1.12	32	84.8
Phytogen	PHY415W3FE	441 abcd	43 abcd	31	2	4.6	1.13	33	83.7
Dyna-Gro	H959B3XF	414 abcd	36 abcde	31	2	3.7	1.17	34	84.0
Phytogen	PHY475W3FE	368 bcd	40 abcde	31	3	4.3	1.13	30	85.0
Phytogen	PHY411W3FE	359 cd	34 bcde	31	2	4.4	1.12	30	84.4
Phytogen	113OF309-04 (Experimental)	324 cd	38 abcde	32	2	4.2	1.16	32	85.3
Phytogen	1150F357-04 (Experimental)	308 cd	34 cde	32	3	3.8	1.18	33	85.4
Deltapine	DP2020 B3XF	299 cd	37 abcde	31	3	4.0	1.18	31	85.0
Stoneville	BX2533 (Experimental)	287 cd	43 abcd	28	2	4.2	1.14	30	82.9
Dyna-Gro	DG3799B3X4	286 cd	30 de	31	2	4.4	1.16	32	84.5
Stoneville	ST6000 (Axant Flex Twin Link)	233 d	28 e	29	1	3.4	1.19	30	84.5
Phytogen	1140F330-04 (Experimental)	216 d	30 de	29	3	4.0	1.15	32	84.1
Mean		**449**	**39**	**31**	**2**	**4.2**	**1.14**	**31**	**84.2**

The top 5 cotton varieties in irrigated small plots at NFREC-SV were **PHY 545W3FE** (746 lbs/ac), **DP 2127 B3XF** (741 lbs/ac), **PHY 400W3FE** (630 lbs/ac), **BX2555** (594 lbs/ac) and **1150F361-04** (574 lbs/ac).

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Table 6: NFREC – SV site non-irrigated cotton trial yield and lint quality information.

Company Names	Varieties/Experimental lines	Lint (Lbs/ac)	Gin Turnout (%)	Color Grade	Leaf Grade	Mic	Fiber Length (in)	Fiber Strength (g/tex)	Uniformity
Phytogen	PHY545W3FE	677 a	42 a	47	6	3.9	1.15	32	83
Phytogen	1140F331-04 (Experimental)	665 a	44 a	55	7	4.0	1.12	33	85
Phytogen	1150F361-04 (Experimental)	631 ab	45 a	54	6	4.3	1.21	29	84
Dyna-Gro	H959B3XF	608 ab	44 a	48	6	3.9	1.19	30	85
Deltapine	DP2038 B3XF	573 abc	42 a	41	5	4.6	1.09	29	85
Deltapine	DP2131 B3XTF	535 abc	47 a	44	5	4.4	1.19	32	85
Stoneville	BX2555 (Experimental)	531 abc	45 a	45	5	4.1	1.17	32	83
Deltapine	DP2333 B3XF	521 abc	43 a	51	6	4.4	1.17	30	84
Phytogen	PHY415W3FE	514 abc	41 a	48	5	4.1	1.16	32	84
Stoneville	BX2531 (Experimental)	503 abcd	39 a	48	5	4.1	1.18	32	84
Phytogen	1140F330-04 (Experimental)	488 abcd	41 a	48	5	4.3	1.17	32	84
Phytogen	1150F360-04 (Experimental)	481 abcd	42 a	55	7	4.4	1.21	33	85
Deltapine	DP 1646 B2XF	475 abcd	46 a	48	5	4.3	1.21	30	85
Stoneville	BX2533 (Experimental)	468 abcd	35 a	52	5	4.3	1.18	31	83
Phytogen	113OF309-04 (Experimental)	463 abcd	37 a	45	5	4.1	1.16	33	83
Deltapine	DP2127 B3XF	430 abcd	40 a	51	6	4.2	1.15	29	84
Phytogen	PHY400W3FE	428 abcd	36 a	32	6	4.1	1.13	31	84
Phytogen	PHY411W3FE	413 abcd	37 a	48	5	4.2	1.12	33	84
Phytogen	PHY475W3FE	405 abcd	42 a	44	5	4.2	1.13	31	84
Phytogen	1140F329-04 (Experimental)	402 abcd	35 a	45	4	4.4	1.17	32	84
Deltapine	DP2328 B3TXF (Thryvon)	367 bcd	43 a	54	6	4.4	1.17	28	83
Stoneville	ST6000 (Axant Flex Twin Link)	366 bcd	35 a	38	5	3.5	1.20	33	84
Stoneville	BX2556 (Experimental)	365 bcd	35 a	51	5	4.1	1.15	31	84
Phytogen	1150F357-04 (Experimental)	364 bcd	38 a	51	6	4.2	1.20	34	85
Dyna-Gro	DG3799B3X4	352 bcd	39 a	48	6	3.9	1.19	30	84
Stoneville	BX2557 (Experimental)	320 cd	38 a	35	4	3.9	1.19	30	84
Deltapine	DP2020 B3XF	226 d	40 a	41	4	4.3	1.16	29	83
Mean		**466**	**40**	**47**	**5**	**4.2**	**1.17**	**31**	**84**

The top 5 cotton varieties in non-irrigated small plots at NFREC-SV were **PHY 545W3FI** (677 lbs/ac), **1140F331-04** (665 lbs/ac), **1150F361-04** (631 lbs/ac), **H959B3XF** (608 lbs/ac) and **DP 2038 B3XF** (573 lbs/ac).