EVALUATION OF COTTON IN LARGE-PLOT ON-FARM VARIETY TESTING IN ARKANSAS FOR 2021

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Abstract

When selecting varieties for planting, don't simply choose the top yielding variety at any single testing location or year, but look at the averages of several locations. Each variety has its strengths and weaknesses. The challenge is to identify these characteristics and adjust management strategies to enhance strengths while minimizing the weaknesses. The objective of this study is to evaluate growth characteristics and lint yield, of select varieties in large-plot on-farm testing. Replicated strips were planted the length of the field and managed according to the remainder of the field in which the study was located. The study was harvested with the producer's equipment. Grab samples were collected for lint fractions and fiber quality analysis. Lint yield was summarized across locations. The relative ranking among varieties were fairly consistent across locations.

Introduction

Yield is often the primary selection criteria used for variety selection. When selecting varieties for planting don't simply choose the top yielding variety at any single testing location, but look at the averages of several locations. Each variety has its strengths and weaknesses. The challenge is to identify these characteristics and adjust management strategies to enhance strengths while minimizing the weaknesses.

The best experience is based on first-hand, on-farm knowledge. Evaluate yield and quality parameters of unbiased testing programs to learn more about new varieties. Plantings of new varieties should be limited to no more than 10 percent of the farm. Acreage of a variety may be expanded slightly if it performs well the first year. Consider planting the bulk of the farm to three or four proven varieties of different maturity to reduce the risk of weather interactions and to spread harvest timings.

Materials and Methods

Replicated strips were planted with the producer's planter the length of the field. The study was managed according to the remainder of the field in which the study was located. Two varieties chosen by the seed company were entered for this study: Bayer, Americot, BASF, Phytogen, and Nutrien. The study was harvest with the producer's equipment. Grab samples were collected for lint fraction and fiber quality.

Results and Discussion

On-farm plots were established at 7 locations (Table 1) with a wide range of planting and harvest dates. Differences between varieties were observed for locks of seed cotton on the ground at harvest. Estimates of yield loss were recorded prior to and after harvest (Table 2) Yields were summarized across all locations (Table 3). Later planting dates did impact performance of later maturing varieties. However, the relative ranking among varieties were fairly consistent across locations.

Table 1. Planting, harvest dates, and final plant population for the 2021 Arkansas large-plot variety testing program.

	Ashley County	Desha County	Jefferson County	Lonoke County	Mississippi County	Poinsett County	St. Francis County
Planting Date	5/22/2021	5/7/2021	5/19/2021	5/16/2021	5/19/2021	5/20/2021	5/23/2021
Harvest Date	10/19/2021	11/4/2021	10/27/2021	10/5/2021	11/6/2021	11/1/2021	11/15/2021
Plant Population	35599	32689	34899	33752	36618	29594	41922

Table 2. Estimated lint yield loss from seed cotton on ground in the 2021 Arkansas large-plot variety testing program.

	Estimated Lint Yield Loss (lb/A)	
Variety	Preharvest	Postharvest
ST 4993 B3XF	12	118
PHY 411 W3FE	16	135
PHY 400 W3FE	23	130
NG 3195 B3XF	27	117
DP 1646 B2XF	34	90
NG 4936 B3XF	35	130
DP 2020 B3XF	43	134
DG 3644 B3XF	50	131
DP 2127 B3XF	70	131
DP 2038 B3XF	74	152
DG 3456 B3XF	77	178
ST 5091 B3XF	80	120

Table 3. Lint yield and ranking (R) of varieties in the 2021 Arkansas large-plot variety testing program

Variety Name	Ashley County		Desha County		Jefferson County		Lonoke County		Mississippi County		Poinsett County		St. Francis County		Average Rank	
	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R
NG 3195 B3XF	1469	2	1357	6	1390	3	1126	5	1854	4	1639	2	1905	1	1534	3.3
PHY 411 W3FE	1562	1	1671	1	1460	1	1120	6	1631	11	1659	1	1716	4	1546	3.6
DP 2127 B3XF	1460	3	1320	9	1291	9	1190	3	1915	2	1601	3	1807	2	1512	4.4
DP 2038 B3XF	1425	4	1314	10	1407	2	1281	1	1946	1	1532	5	1627	10	1505	4.7
ST 5091 B3XF	1384	6	1386	4	1377	4	1180	4	1734	6	1517	6	1642	7	1460	5.3
ST 4993 B3XF	1323	8	1437	3	1335	6	1099	7	1600	12	1569	4	1651	6	1431	6.6
DP 1646 B2XF	1353	7	1362	5	1356	5	1004	10	1858	3	1495	7	1494	11	1417	6.9
DG 3456 B3XF	1242	12	1329	7	1325	8	1247	2	1804	5	1399	8	1464	12	1401	7.7
PHY 400 W3FE	1389	5	1258	12	1331	7	1068	9	1647	8	1370	10	1716	3	1397	7.7
DP 2020 B3XF	1316	9	1457	2	1199	12	935	12	4674	7	1389	9	1636	9	1801	8.6
DG 3644 B3XF	1304	10	1324	8	1234	11	1092	8	1642	9	1280	12	1641	8	1360	9.4
NG 4936 B3XF	1302	11	1307	11	1274	10	971	11	1637	10	1302	11	1666	5	1351	9.9
LSD P=.05	75.6		165.7		79.5		Not replicated		84.5		153.2		121.2			

Conclusion

There were some differences between varieties relative to planting date with earlier planting favoring the later-maturing varieties. While the lint yield differences were observed, the ranking by yield of varieties relative to one another across locations is a suitable method of evaluating variety performance.