EVALUATION OF COTTON IN LARGE-PLOT ON-FARM VARIETY TESTING IN ARKANSAS FOR 2020

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Abstract

Yield is often the primary selection criteria used for variety selection. When selecting the 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 years and 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. On-farm plots were established at 9 locations with a wide range of planting and harvest dates. Lint yield and loan value was summarized across locations. While the lint yield differences were observed, it is important to remember that the varieties tested are a subset of the top performing commercially available varieties.

Introduction

Yield is often the primary selection criteria used for variety selection. When selecting the 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 years and 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. The objective of this study is to evaluate growth characteristics and lint yield, of select varieties in large-plot on-farm testing.

Materials and Methods

Replicated strips were planted the length of the field and managed according to the remainder of the field in which the study was located. Clay county location a large block variety trial where a full sized module of each variety was harvested, ginned, and marked separately for each variety. 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 with the exception of Clay county which were ginned in a commercial gin.

Results and Discussion

On-farm plots were established at 9 locations (Table 1) with a wide range of planting and harvest dates. Full season COTMAN (Table 2) indicated no unexpected stress. NAWF data was recorded for all varieties at the selected locations to calculate days to cutout. Lint yield and loan value was summarized across all locations (Table 3). Producer management of plant height was very aggressive in 2020 and may have led to yield reductions in varieties that tend to be more responsive to PGR's.

Table 1. List of Locations including planting and harvest date for the 2020 large-plot variety testing program.

	Ashley County	Clark county	Craighead County	Desha County	Lonoke County	Jefferson County	Mississippi County	Poinsett County	St. Francis County
Planting Date	5/22/2020	6/1/2020	5/19/2020	5/6/2020	5/5/2020	5/14/2020	5/25/2020	5/7/2020	5/21/2020
Harvest Date	10/23/2020	11/2/2020	11/3/2020	11/4/2020	10/21/2020	10/26/2020	11/10/2020	10/16/2020	11/7/2020
Plant Population	32670	36505	35599	34771	28403	33370	38401	32918	33543

Table 2. COTMAN – days from planting to cutout (NAWF = 5) for varieties in the 2020 large-plot variety testing program.

Variety	Craighead County	Desha County	Lonoke County	Mississippi County	Poinsett County	St. Francis County	Average to Cutout
	Days	Days	Days	Days	Days	Days	Days
NG 4098 B3XF	79	89	81	80	82	74	80.83
PHY 390 W3FE	81	91	78	80	85	75	81.67
ST 4550 GLTP	83	91	78	80	82	77	81.83
DP 2012 B3XF	79	94	82	84	82	74	82.50
DP 2020 B3XF	79	94	82	80	87	73	82.50
NG 4936 B3XF	84	91	82	82	85	75	83.17
PHY 400 W3FE	82	90	80	83	88	77	83.33
DG 3456 B3XF	82	91	87	80	86	75	83.50
DG 3535 B3XF	82	95	85	80	89	75	84.33
DP 2038 B3XF	81	98	83	84	87	75	84.67
DP 1646 B2XF	83	94	84	84	88	79	85.33
ST 4990 B3XF	86	98	84	82	88	77	85.83

Table 3. Lint yield, average yield ranking, loan values and per acre income of varieties in the 2020 large-plot variety testing program.

Variety Name	Ashley County		Clark Clounty		Clay County		Craighead 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	Lint lb/A	R	Lint lb/A	R	Lint lb/A	R	Loan Value Cents/lb	Per Acre Income
DP 2012 B3XF	1065	2-4	1125	1	1360		1740	5	1347	3	1337	1	1364	4	1743	4	1888	6	1574	6	1465	3.67	50.79	$744.02
DG 3456 B3XF	971	9	1011	6-7	1224		1810	2	1218	10	1265	4	1551	1	1794	2	1990	2	1664	1	1475	4.17	51.84	$764.52
DP 2020 B3XF	1030	6-7	1069	3	1465		1752	4	1330	4	1209	8	1326	6	1672	5	1881	7	1578	5	1427	5.39	50.93	$727.03
DP 2038 B3XF	948	11	1009	8			1910	1	1136	11	1163	10	1429	3	1899	1	2090	1	1615	4	1467	5.56	50.53	$741.03
ST 4550 GLTP	1030	6-7	1070	2			1720	7	1299	6	1246	6	1276	7	1779	3	1654	12	1656	2	1414	5.72	50.85	$719.26
NG 4936 B3XF	1059	5	1065	4	1480		1569	12	1367	2	1333	2	1243	8	1660	6	1876	8	1524	8	1411	6.11	50.36	$710.40
DP 1646 B2XF	1065	2-4	1003	10			1733	6	1371	1	1307	3	1141	11	1649	7	1941	3	1269	12	1387	6.22	51.02	$707.46
DG 3535 B3XF	952	10	1011	6-7	1502		1713	8	1286	7	1171	9	1452	2	1567	11	1895	5	1633	3	1409	6.83	50.73	$714.70
PHY 390 W3FE	1140	1	1004	9	1387		1782	3	1282	8	1246	5	1231	10	1573	10	1803	10	1481	10	1394	7.33	50.95	$710.08
PHY 400 W3FE	1065	2-4	964	11	1301		1611	10	1304	5	1150	11	1358	5	1627	9	1936	4	1510	9	1392	7.44	51.24	$713.09
ST 4990 B3XF	992	8	928	12	1425		1591	11	1279	9	1214	7	1233	9	1489	12	1739	11	1542	7	1334	9.56	51.01	$680.59
NG 4098 B3XF	877	12	1028	5	1426		1688	9	1048	12	993	12	1103	12	1636	8	1821	9	1440	11	1293	10.00	50.62	$654.32

Summary

There were some variances between varieties relative to planting date with earlier planting favoring the later-maturing varieties. While the lint yield differences were observed, it is important to remember that the varieties tested are a subset of the top performing commercially available varieties.