YIELD AND ECONOMIC EVALUATION OF COTTON VARIETIES FROM LARGE-BLOCK ON-FARM TESTS IN NORTHEAST ARKANSAS

Allison Howell
Bill Robertson
University of Arkansas System, Division of Agriculture
Little Rock, AR
Andy Vangilder
FarmSource Ag
Wilson, AR
David Cagle
Cagle Farms
Rector, AR
Barbi Anderson
Graves Gin
Rector, AR

Abstract

Many different cotton varieties and technologies are available to farmers today. Small plot cotton variety trials are conducted all throughout the south and in Arkansas and provide valuable information on the performance of cotton varieties. They provide the yield of each, but not the quality. Little information is available with regard to fiber quality from a commercial ginned study. Discounts associated with excessive leaf and micronaire are common in Arkansas. A cotton variety may yield well, but that does not mean that it will be the most profitable. The objective of this research is to assess and compare yields of each variety along with quality and price. Ten varieties were planted and treated the same throughout the growing season. At the end of the year the varieties were ginned separately to observe quality differences.

Introduction

Conducting on-farm variety trials provides universities, seed companies, and producers with valuable information in regards to cotton varieties. Producers and researchers all over the south and in Arkansas organize test plots on their farms to be able to better understand which varieties do best in their locations. There is, however, a downside to working with the small plot data. Although they may provide great yield information, they do not take into account the quality of the cotton. Nor is the cotton put into the loan. Many farmers rely on this data and plant the varieties that yielded well. At the end of the season they might not earn as much as they planned, simply because of quality discounts after ginning.

Materials and Methods

An eighty-acre field located on David Cagle's farm near Hargrave Corner between Rector and Piggott, Arkansas was utilized for this study. Five cotton companies including: Bayer, Americot, Monsanto, Dow, and CPS, picked two varieties and donated seed for each variety for this study. Seventy-two rows of each variety were planted. Cagle treated the study area just as he would any other field of cotton. Fifty-four rows from each variety were picked on different dates. Plots were picked on different dates according to readiness for harvest into a separate module for each variety. The loan rate was based on standard HVI analysis and represents an average for all bales in the module.

Results and Discussion

Sampling and selling each variety separately shows the differences in quality of each variety as well as the yield and the price earned from each acre (Table 1). The base loan rate is 49.49 cents per pound of cotton according to the USDA Commodity Credit Corporation. All of the varieties defoliated and performed well, but there were differences in leaf (Table 2). These differences were associated with variety characteristics. The number of bales per module ranged from thirteen to seventeen. There was not a lot of variability within a variety for staple. All of the varieties were at least in the base range for micronaire. Thirty percent of the varieties were in the premium range. There were

no discounts for mic. Some varieties have higher turnouts than others depending on seed size and weight. For example, Phytogen 300 has a large seed giving it a lower turnout compared to Deltapine 1725, which has a smaller seed and a higher turnout.

Table 1. Variety performance, lint yield, fiber quality, and gross revenue for all varieties tested in Clay County in 2017.

Variety	Date Picked	Lint Yield (lb/Acre)	Turnout %	Grade	Leaf	Staple	Strength g/tex	Mic	Uniformity	Loan Rate Cents/Lb.	Per Acre Income
DP 1725 B2XF	10-17-2017	1644	43.17	31-1	2.5	37.1	31.7	3.9	80.8	54.3	$893.39
DG 3385 B2XF	10-12-2017	1644	42.53	31-1	2.2	37.0	30.7	4.8	82.4	54.3	$892.06
ST 5020 GLT	10-17-2017	1670	38.97	41-1	3.4	38.9	32.5	4.4	82.0	52.6	$878.92
PHY 300 W3FE	10-18-2017	1574	37.26	41-1	3.4	37.0	31.9	4.4	82.8	54.1	$851.58
NG 3522 B2XF	10-12-2017	1533	38.81	31-1	1.9	36.0	29.4	4.5	81.7	53.9	$826.85
NG 4601 B2XF	10-13-2017	1493	41.40	21-2	2.1	37.9	32.6	4.6	82.2	54.8	$818.35
DP 1518 B2XF	10-12-2017	1522	38.82	31-2	3.2	38.0	30.9	4.2	81.1	53.6	$816.71
PHY 340 W3FE	10-12-2017	1535	40.99	31-2	4.0	38.0	32.3	4.6	82.7	52.5	$806.82
DG 3445 B2XF	10-17-2017	1415	40.60	31-1	2.7	37.9	33.4	4.0	82.8	54.6	$772.47
ST 4949 GLT	10-12-2017	1400	40.13	31-1	3.1	36.0	30.4	4.4	81.6	53.4	$748.49

Table 2. Leaf grade expressed as a percent of the 13 to 17 bales per variety in Clay County in 2017.

Variety	Leaf Grade 1-2%	Leaf Grade 3%	Leaf Grade 4%	Leaf Grade 5%
DP 1725 B2XF	47	53	0	0
DG 3385 B2XF	0	93	7	0
ST 5020 GLT	0	59	41	0
PHY 300 W3FE	0	63	37	0
NG 3522 B2XF	100	0	0	0
NG 4601 B2XF	13	87	0	0
DP 1518 B2XF	0	81	19	0
PHY 340 W3FE	0	7	86	7
DG 3445 B2XF	30	70	0	0
ST 4949 GLT	82	18	0	0

Summary

Although small plot cotton variety trials contain useful data, they do not get the quality of the cotton or put it into the loan. Implementing a big block on-farm test and taking it to the gin separately requires more work from both the farmer and the gin, but the data is extremely helpful. Producers are worried about making a profit more than high yields. Doing a big block type of test adds more beneficial data to their toolbox to prepare for the upcoming cropping season which could also lead them to be more profitable. Some cotton varieties may be high lint yielders, but others may be better quality and bring more dollars per acre even though they might not have picked as much as another variety. While this form of test plot requires a lot more work, it can greatly help local farmers and seed salesman to better understand how cotton varieties in our area do in a whole-field situation on Northeast Arkansas soils.

Acknowledgements

Andy Vangilder with FarmSource Ag in Rector, Arkansas, started this big block variety plot when he was a County Extension Agent a few years back. I would like to thank David Cagle from Rector, Arkansas, for donating his field and his time to make this test possible. Also, without the hard work from Barbi Anderson and Graves Gin in Rector, Arkansas, this test would be just like any other small plot variety test.