VARIETAL MIXTURE IN UPLAND COTTON (GOSSYPIUM HIRSUTUM) WITH EMPHASIS ON YIELD AND ECONOMIC STABILITY

Blake L. Szilvay
Keith L. Edmisten
Randy Wells
North Carolina State University
Raleigh, NC
Guy D. Collins
North Carolina State University
Rocky Mount, NC
Jared R. Whitaker
University of Georgia
Tifton, GA

Abstract

Variety selection is one of the most important decisions a grower can make. However, there is not one variety that will outperform competitors in every environment, and attempts to predict which variety will perform best in subsequent year's is improbable for all soils or environments. Blending varieties that perform well in contrasting environments may help spread the risk when accounting for the uncertainty of weather.

Using historical data collected from multiple on-farm and official variety trials in 2015 and 2016 across the state of North Carolina and the NC State Extension's NC Cotton Variety Performance Calculator, the following 5 varieties were chosen. The varieties include Deltapine 1538 B2XF, Phytogen 312 WRF, DP 1646 B2XF, NexGen 3522 B2XF, and Stoneville 4848 GLT. There are 8 treatments total and include each variety planted alone, all five mixed in equal proportions, DP 1538 mixed with DP 1646, and PHY 312 with ST 4848. Stand counts are taken at the beginning of the season and yield and fiber quality are collected to evaluate stability of variety mixtures compared to each variety of the mixture planted alone. Trials were conducted in 13 locations in 2017 and 11 locations in 2018. Experiment was analyzed by PROC MIXED of SAS for Windows 10, version 1803, in SAS 9.4 software using a mixed model [y = location + mixture + mixture x location]. The random components (errors) are rep, rep(location), and mixture x rep(location). Contrasts used in analysis can be found in Table 1.

Table 1. **Varieties**

Comparison	DP 1538	DP 1646	PHY 312	ST 4848	NG 3522	Mix A	Mix B	All 5	μ
Mix A v. solo	0	0	1	1	0	-2	0	0	**0**
Mix B v solo	1	1	0	0	0	0	-2	0	**0**
All 5 v. solo	1	1	1	1	1	0	0	-5	**0**

DP = Deltapine, PHY = Phytogen, NG = NexGen, Mix A = PHY312+ST4848, Mix B = DP1538+DP1646, All 5= all single varieties mixed, solo = singled out variety treatments of accompanied mix.

When the locations were pooled together and separated by years, there was no significant effect on yield by mixing varieties. Fiber quality was not consistent enough to make any conclusions when analyzed in this way. Further analysis of this data is being conducted and will focus on the difference between locations.

Acknowledgements

The authors would like to thank the NC Cotton Producers Association and Cotton Incorporated for their support in this research.