COTTON YIELD LOSSES FROM RANDOM AND UNIFORM STAND REDUCTIONS

Gene Stevens
University of Missouri-Delta Center
Portageville, MO
Michael A. Jones
Clemson University
Florence, SC
Mark Zarnstorff
National Crop Insurance Services
Overland Park, KS
David Dunn
Andrea Phillips
University of Missouri
Portageville, MO

Abstract

Field experiments were conducted at Portageville, Missouri and Florence, South Carolina to evaluate effects of skippy stands in cotton rows and low plant populations on cotton lint yield and fiber properties. Plots included checks with 4 seeds planted per foot of row and treatments with 50%, 60%, 70%, 80%, and 90% cotton stand losses. Each plot was 40 feet long and 4 rows wide with four replications per treatment. Methods of reducing stand were (1) blending conventional cotton seeds with glyphosate resistant seeds and spraying glyphosate herbicide on emerged plants (2) hand thinning specific plants in each row based on random numbers generated with computer software and (3) planting low rates of seeds in plots based on treatment. Glyphosate herbicide spraying and hand thinning was done at first square growth stage. In Missouri, furrow irrigation was applied as need based on rainfall amount and water deficit calculations. The test site in South Carolina was non-irrigated. Final plant populations in check plots averaged 3.2 plants per row foot in South Carolina and 2.8 plants per row foot in Missouri. Lack of rainfall in South Carolina produced drought conditions and low cotton lint yields. In Missouri, plots with 10% stands averaged 293 lb lint/acre less than the untreated check (22% yield loss). In South Carolina, the 10% stand treatment produced 89 lb lint/acre less than the untreated check (17% yield loss). Regression analysis showed that counting row skips less than 3 feet was a poor predictor of cotton lint yield loss. Relative yields compared to the checks for both states, increased as plants per foot of row increased. Relative yield = 0.1323x +0.7461 with x = plants per foot of row (R2=0.51). As the number of 3 foot or greater skips per 40 feet of row increased, relative cotton yields decreased. Relative yield = -0.0283x +0.9478 with x = number of 3 feet or greater skips per 40 feet of row (R2=0.45). Cotton fiber tests conducted on Missouri samples showed that micronaire increased significantly as the number of 3 feet row skips increased. However, lint from cotton plots with the greatest stand reductions had micronaire below 4.9 and would not be discounted in price.