ASSESSING THE EFFECTS OF COVER CROPS ON GEORGIA COTTON

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Abstract

The interest in using cover crops to reduce input costs, more effectively utilize soil moisture, improve soil health, and improve weed control while reducing the development of herbicide resistance has grown. However, more research is needed to better understand the influence of cover crop systems on cotton stand and yield. Three experiments were conducted during 2016 and 2017 to achieve this objective.

In 2016 and 2017, two large plot (18 feet wide, > 250 feet long) experiments were conducted in Moultrie, GA. A small plot (12 feet wide by 35 feet long) experiment was conducted in TyTy, GA in 2017. Treatments at each location compared rye, clover, or rye + clover blends on cotton stand and yield. When rye was the only cover crop, 20 units of N was applied within 2 weeks of planting rye and again at time of planting cotton. Cover crops were rolled 7 DBP (days before planting) in 2016 and 10 DBP in 2017. DP 1538 B2XF cotton was planted in early May at each location and a Liberty-based weed management system was used to maintain each experiment weed free.

During 2016 in Moultrie, cover crop treatments included 1) rye 90 lb./A, 2) clover 12 lb./A, 3) rye 30 lb./A + clover 12 lb./A, 4) rye 60 lb./A + clover 12 lb./A, and 5) rye 90 lb./A + clover 12 lb./A. Levels of dry weight biomass at planting were 7720, 9977, 12164, 10945, and 12502 lb./A for the aforementioned treatments, respectively. Cotton stand was uniform without gaps at 1 week; however, by 1 month after planting, gaps in the stand greater than 1 foot were 58, 149, 165, 204, and 238 for the aforementioned treatments. Maturity was delayed by each system with clover which was likely related to stand loss and extra N provided late in the cotton crop. Seed yield noted no statistical differences ranging from 2183 to 2465 lb./A; trends for higher yields were noted with the more consistent stand.

During 2017 in Moultrie, cover crop treatments included 1) rye 90 lb./A, 2) clover 12 lb./A, 3) rye 30 lb./A + clover 12 lb./A, 4) rye 60 lb./A + clover 12 lb./A, 5) rye 90 lb./A + clover 12 lb./A, 6) rye 30 lb./A + clover 6 lb./A, 7) rye 60 lb./A + clover 6lb/A, 8) rye 90 lb./A + clover 6 lb./A, and 9) conventional tillage. Levels of dry weight biomass at one month after planting included 4049, 5688, 5466, 4420, 4668, 3587, 2675, 3911 and 342 lb./A for the aforementioned treatments, respectively. No significant gaps (1 to 3 foot) in stand was noted among any treatment. Seed cotton yields ranged from 2423 to 2999 lb./A. The clover 12 lb./A + rye 90 lb./A (2999 lb./A) and clover 12 lb./A (2973 lb./A) were the highest yielding treatments and the rye 60 lb./A + clover 6 lb./A (2423 lb./A) was the lowest yielding treatment.

Treatments in TyTy during 2017 were identical to those in Moultrie during 2017 with the addition of rye alone at 60 lb./A. Treatments containing rye 90 lb./A and the blends containing rye at any rate plus clover at 12 lb./A produced significantly more biomass compared to rye at 60 lb./A or any blend of rye and clover 6 lb./A. Neither cotton stand nor seed cotton yields (2502 lb./A to 2665 lb./A) were influenced by cover crops.