SUITABILITY OF COVER CROPS FOR THE MIDSOUTH

M.G. Palhano
J.K. Norsworthy
C.J. Meyer
Department of Crop, Soil and Environmental Science, University of Arkansas
Fayetteville, AR
L.T. Barber
Lonoke Extension Center
Lonoke, AR

Abstract

Cover crops suppress weed emergence through allelochemicals and a physical residue barrier. Federal conservation payments are accessible for farmers that want to embrace cover crops as a means to reduce tillage and increase weed suppression. A field experiments was conducted in 2014 and 2015 at the Arkansas Agricultural Research and Extension Center in Fayetteville to evaluate the value of various cover crops in suppressing weed emergence and protecting cotton yield. Experiments were designed as a randomized complete block with a split plot with 7 cover crops serving as a main plot and the residual and nonresidual herbicide programs as a sub-plot. The non-residual herbicide program was designed to assess weed emergence in each cover crop throughout the growing season, and the residual side was used to assess the effect of cover crop on seedcotton yield. No cover, cereal rye, wheat, oats, hairy vetch, crimson clover, Austrian winterpea, and rapeseed were used as cover crop treatments. Biomass of each cover crop was collected at cotton planting. Cotton stand counts were collected at 2 weeks after planting. Palmer amaranth density and visual estimates of weed control were evaluated 2, 4, 6, and 8 weeks after cotton planting. Seedcotton yield was also determined. In both years, cereal rye and wheat had the highest biomass production whereas the amount of biomass present in spring did not differ among the remaining cover crops. All cover crops initially diminished Palmer amaranth emergence. However, cereal rye had the greatest suppression, with 83% less emergence than in no cover crop plots. Brassica and legume cover crops had only a minor impact on Palmer amaranth emergence. For these cover crops, physical suppression of the Palmer amaranth and other weeds from the cereal residues is most likely the greatest contributor to reducing weed emergence in this experiment. Similar to weed suppression, as biomass production increased there was greater difficulty in establishing a stand of cotton, which led to a negative impact of all cover crop on seedcotton yield in 2014. It is possible that the reduced stand was a result of the moist conditions that occurred at the time of planting. In 2015, only a minor negative effect of cover crop on cotton stands was observed. Seedcotton yield in the legume and brassica cover crop plots were statistically the same when compared with the no cover crop plot. However, the seedcotton yield collected from cereal cover crop plots was significantly lower than from other treatments. It is likely that the cereal residue triggered nitrogen immobilization, leading to the reduced yield. Special nitrogen management may be needed to alleviate this problem.