RESPONSE OF COVER CROPS TO LOW RATES OF SOIL-APPLIED COTTON HERBICIDES

Z.D. Lancaster
J.K. Norsworthy
M.G. Palhano
L.T. Barber
Departament of Crop, Soil, and Environment Science, University of Arkansas
Fayetteville, AR

Abstract

Establishment of a cover crop is essential for full agricultural benefits including weed suppression. With the sowing of most cover crops immediately following a subsequent summer crop, there is risk that residual herbicides applied to the previous cotton crop may persist and damage the subsequent cover crop. With some federal support being linked to use of cover crops as a means to reduce tillage and increase weed suppression, there is widespread interest among growers to plant a wide assortment of cover crops, many of which have not been thoroughly researched in Midsouth cropping systems. Hence, a field study was conducted in the fall of 2014 and 2015 at the Arkansas Agricultural Research and Extension Center in Fayetteville to evaluate the sensitivity of cover crops to herbicides that are commonly used in Midsouth production systems. This experiment was a split plot with 16 cover crops serving as main plots and 17 residual herbicides applied at a 1/16X rate (simulated four half-lives) as subplots with four replications. After application, all the treatments received 1.3 cm of overhead irrigation to activate the herbicides. Stand counts were taken after two weeks, and injury was evaluated at two and four weeks after cover crop planting. Even though the experimental design was a split plot, the data are presented as randomized completely block, since the objective of the study is identify which cover crop is tolerant or sensitive to a specific herbicide. For each herbicide tested, there were some that exhibited tolerance and others that were sensitive. Data will only be presented on cotton herbicides (7 treatments) and winter cover crops (11 crops). All cover crops showed tolerance (<5% injury) to trifloxysulfurone and diuron. Cereal cover crops showed sensitivity to pyroxysulfone and *S*-metolachlor, with the greatest injury being 12% in the rye cover crop. Broadleaf cover crops showed sensitivity to fluometuron, fluridone, flumioxazin, and *S*-metolachlor, with the greatest injury resulting from crimson clover effected by fluridone with 55% injury. This research shows that there is potential for injury from common residual herbicides used in cotton with further research needed on the potentially risky cover crop/herbicide combinations.