GRAIN SORGHUM AND SOYBEAN AS REPLACEMENT CROPS FOLLOWING A FAILED COTTON STAND

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Abstract

Glyphosate-resistant Palmer amaranth is a widespread problem in North Carolina and other southeastern cotton-producing states. Preemergence herbicides are a necessity in managing this weed. When a cotton stand failure occurs and it is too late to replant cotton, growers must replant to another crop. Soybean and grain sorghum are the most feasible replant crops. However, there are questions concerning the impact of cotton preemergence herbicides on the replacement crops. For most preemergence herbicides, it is generally understood how soybean or sorghum will respond, but there are questions about soybean and sorghum response to diuron and fluometuron. Research in the 1970's and 1980's on heavy soils in the Mid-South indicated either crop could be replanted with minimum injury if planting was delayed 6 to 9 weeks after cotton herbicide application. Similar research has not been conducted on coarse-textured soils typical of cotton production in the Southeast. Research was conducted at two locations each with soybean and grain sorghum in North Carolina in 2013 as replacement crops on typical southeastern soils. Treatments consisted of a factorial arrangement of cotton herbicides by planting delays by tillage. Cotton herbicides were none, diuron at 0.75 lb a.i./acre, and fluometuron at 1.0 lb a.i./acre. Soybean or sorghum was planted 3, 6, or 9 weeks after cotton herbicide application. These crops were planted either no-till or following deep disking. Soils ranged from sands to sandy loams, all with low organic matter. Both sorghum and soybean were more sensitive to fluometuron than diuron, and soybean was more sensitive to both herbicides than sorghum. Soybean was visibly injured and stand was reduced when replanted 3 weeks after cotton herbicide application, but only fluometuron reduced yield. Greater injury was noted when the land was tilled prior to soybean planting. No injury, stand reduction, or yield reduction was noted when soybean was planted 6 or 9 weeks after cotton herbicide application. There was a strong soybean yield response to planting delays; yields declined about 25% with each successive planting delay. Regardless of the injury, greatest yields were obtained with the 3-week planting delay. Only minor sorghum injury (<3%) was noted with any treatment, and stand was not reduced. There was no effect of treatments on yield at one location. At the second location, no yield reduction was noted with either herbicide or any planting delay when sorghum was planted no-till. Fluometuron, but not diuron, reduced sorghum yield when the sorghum was planted following disking.