A MULTIPLE YEAR STUDY TO EVALUATE COTTON TOLERANCE TO METRIBUZIN

J. Kichler
S. Culpepper
University of Georgia
Tifton, GA

Palmer amaranth continues to plague cotton production. A 2019 survey of 1737 Georgia growers indicated that Palmer amaranth was by far the most challenging pest in all of agriculture. One area where improved management methods are needed is preventing its emergence after corn harvest. Metribuzin is extremely effective on Palmer amaranth and also serves as an alternative mode of action compared to PPO herbicides, such as Valor or Reflex, which are often being over used. However, current metribuzin label restrictions prevent cotton planting for at least 12 months. Thus, two field experiments were conducted to determine cotton sensitivity to metribuzin on Georgia soils and to determine the potential for shortening its rotational interval.

Experiment one

Experiment one in Moultrie, GA, determined cotton tolerance to direct applications of six metribuzin rates (0, 0.031, 0.06, 0.125, 0.25 and 0.5 lb ai/A) during 2017, 2018, and 2019. This experiment was replicated four times and each herbicide treatment was applied preemergence (PRE) or preplant incorporated (PPI). The PPI treatments were incorporated to the depth of 2-3 inches using a roto-tiller.

Cotton was extremely sensitive to metrizbizin when applied directly to the crop with severe visual injury coupled with a significant reduction in cotton stand, height, and yield when metribuzin was applied at rates of 0.06 lb/A or greater. At 0.031 lb/A, visual injury and cotton height reductions were at most 13% with stand and yield no different than the non-treated control. In two years, PPI applications were more damaging than PRE applications while PRE applications were more damaging during another year. This result was likely a response to rainfall/irrigation events occurring over the first 14 days after planting. Years when the PPI applications were more damaging, conditions were drier during cotton emergence.

Experiment two

Experiment two consisted of applying metribuzin at 0, 0.25 (1X rate) and 1.0 lb/A 150 days prior to no-till or strip-till planting cotton. This experiment was replicated four times and conducted in 2018 and 2019. A maximum of 4% visual injury was noted in 2018 from metribuzin applied at 1.0 lb/A in the no- till production system only; no other treatment caused visual injury. Metribuzin did not influence cotton stand, growth, or yield in either year. Significant increases in cotton stand (128 to 99 plants per plot), early-season height (15.9 to 14.2 cm) and seed yield (3581 to 3052 lbs/A) were noted when comparing the strip-till to the no-till production system when averaged over both years, respectively.

In conclusion, cotton is very sensitive to metribuzin and if rates are greater than 0.031 lb ai/A at planting, injury can be significant. Initial data suggests metribuzin degradation is occurring rapidly in Georgia and 150 days is more than enough to protect growers from even a 4X rate.