COVER CROP VALUE: MANAGING PALMER AMARANTH NOW AND IN THE FUTURE

L.E. Steckel
University of Tennessee
Jackson, TN
A.S. Culpepper
University of Georgia
Tifton, GA
G. B. Montgomery
University of Tennessee
Jackson, TN

Abstract

Cover crops have proven to be effective tools in managing Palmer amaranth in Georgia and Tennessee. Cereal rye, or cereal rye blends with either vetch or crimson clover, have shown to be the most effective cover crops to combat Palmer amaranth in these states. Glyphosate can readily control cereal rye and either dicamba or 2,4-D are often used with glyphosate to help provide complete control of the vetch or crimson clover.

These covers have been managed near cotton planting with roller crimpers to lay down the cover followed by a PRE application of herbicides. Then this is followed by timely POST applications of Liberty followed by a lay-by application of diuron plus MSMA. This strategy has proven to be a very effective method to manage Palmer amaranth. Cotton planted into these cover crops either with strip tillage, strip spraying or just planting into standing covers, has been successfully established in research in those states. However, cotton stands have typically been better where strip tillage or strip spraying was utilized.

New herbicide technologies are on the horizon. These new traits could tempt cotton growers to over rely on dicamba or 2,4-D for weed control at the expense of other herbicides and cultural practices. Past experience where a single herbicide is used for weed control at the exclusion of other herbicides or cultural weed management tactics has taught us that weed resistance can quickly develop. Integrating cultural weed management practices as well as other herbicides into a program with these new herbicide technologies will be important in improving the sustainability of cotton weed control in Tennessee and Georgia.

Termination of high residue cover crops utilized for weed suppression is imperative for the production of a successful cash crop. Cotton tolerant to 2,4-D or dicamba could increase the flexibility and efficacy of cover crop termination options while also allowing new modes of action for in-season weed control.

Currently, termination efficacy of legume cover crop species is enhanced with the addition of 2,4-D or dicamba to glyphosate. Unfortunately, these herbicides also restrict the plant back interval of cotton. Preliminary research in soybeans indicated that cover crop termination could be delayed until after cash crop planting with these new herbicide tolerant technologies. The advantages of delaying cover crop termination is increased cover crop biomass and an increase in the Palmer amaranth suppression from that cover. In the fall of 2014 a similar study was initiated in cotton.

A cover crop of hairy vetch was established and in the spring dicamba tolerant 1522 B2XF cotton was planted. Cover crop termination treatments included glyphosate + dicamba treatments that ranged from 14 DBP planting to 14 DAP in 7 d increments, cover crop comparison treatments of glyphosate + flumioxazin 14 DBP planting, glyphosate + flumioxazin 14 DBP planting fb fomesafen + acetachlor PP, and a no termination cover crop treatment, and no cover crop comparisons of no herbicide, and paraquat + fomesafen 14 DBP fb acteochlor PP. All treatments accept the no cover, no herbicide treatment were treated with glufosinate + dicamba when 4 inch Palmer amaranth was present in the plot.

All herbicide treatments were successful in terminating the cover crop. The cover crop treatments that were not sprayed for termination were controlled 83% by the planter alone 14 DAP. A uniform stand was established and herbicide injury was not apparent from any herbicide termination treatment. Time in days for Palmer to germinate and grow 4 inches was 30 days for burndown treatments that were applied 21 and 14 DBP, 37 days for burndowns applied PRE plant and 7 DAP, and 39 days for the burndown that was applied 14 DAP. The no cover, no herbicide treatment, due to high weed competition yielded less than all the cover crop or cover crop and herbicide treatments.

Palmer amaranth is the most problematic weed for growers in the southeastern and Mid-South regions of the United States. The new herbicide trait technologies will provide some new tools to manage Palmer amaranth, however, this new technology will need to be supplemented with other herbicides and management practices to remain viable in the long term. Combining these new herbicide technologies with cover crops has proven to be an effective tactic in our research. The flexibility of termination timing that will be available with the advent of these new technologies will also allow producers to maximize the effectiveness of their cover crops as weed management tools while not adversely effecting yield. When integrated cultural practices with multiple herbicide modes of action, these technologies can be used to increase the sustainability of weed control programs in cotton.