IMPACT OF GLYPHOSATE RESISTANT WEEEDS IN ARKANSAS COTTON PRODUCTION

Jeremy A. Bullington
Kenneth L. Smith
Kelly J. Bryant
Ryan C. Doherty
Jason R. Meier
Cooperative Extension Service
University of Arkansas
Monticello, AR

Abstract

Glyphosate resistance weeds have become a major problem for many Arkansas cotton producers. Currently there are five confirmed glyphosate resistant weeds in Arkansas, and these weeds are having significant negative impacts on cotton production. Row crop farm sizes have increased significantly over the past 10 years, following the introduction and adoptions of glyphosate tolerant crops. Producers now must more intensely manage weeds on increasing acreage with less equipment and less labor available. Glyphosate resistant weeds are also challenging conservation tillage practices. Incorporating tillage into the system has shown to increase control of resistant weeds by disturbing their growing medium and pushing seed lower in soil seed bank. Multiple tillage operations are not an economically viable answer to the current situation, because of lack of available labor/equipment and inadequate funds. Glyphosate resistant weeds are also impacting herbicide costs. Herbicides are accounting for bigger part of the producers' budget each year. Many different herbicide options are still available, but will increase cost. Using the Roundup Ready Flex system, applying residual herbicides PRE, Mid-POST, and at layby provided the best control of Palmer amaranth. Prowl + Cotoran PRE followed by Roundup + Parrlay Mid-POST followed by Roundup + Valor at layby provided 96% control of Palmer amaranth at a cost of $63.95 per acre. Prowl + Cotoran PRE followed by Roundup + Parrlay Mid-POST at a cost of $44.77 per acre, provided 70% control of Palmer amaranth. In the Liberty Link system 100% control of Palmer amaranth was achieved with Cotoran PRE followed by Ignite Early-POST followed by Ignite Mid-POST followed by Ignite + Valor at Layby at a cost of $47.98 per acre. A computer based model showed that by using Reflex Pre-Plant followed by four applications of glyphosate POST at a cost of $51.90 would reduce the probability of the producing resistance to 30% in 7-9 years. From a system approach the cost of resistance preventions is $741.74 per acre, while the cost of curative treatment is $766.87 per acre. The next major impact is on the way technology is used. Fewer new herbicide chemistries have been introduced in the past 10 years, than in an era since the 1960's. Previously, producers have been able to simply switch chemistries to control resistant weeds, but now producers have had to shift to using new technologies to combat weed resistance. The focus from many of the industries has shifted from developing new chemicals to producing new herbicide resistant plants. In conclusion, there are several negative impacts including: increased costs, increased labor, increased management, increase technology fees, and a decrease in conservation tillage. The cost of resistance prevention is $3-12 per acre, while the cost of resistance management is $37 per acre. Arkansas's current production system is built around using glyphosate followed by glyphosate, but different herbicide options are available. The main problem is that if cotton prices do not increase enough to cover the additional increase in production, then cotton acres will continue to decrease.