VALUE OF TRANSGENIC: WEED MANAGEMENT

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Abstract

A beltwide survey of cotton weed scientists was conducted to determine changes in the value of transgenic traits relating to weed control. Survey participants accounted for 96% of the cotton acreage planted in the U.S. during 2009. Results showed that the value of transgenic traits was directly related to herbicide-resistant weeds, including glyphosate-resistant (GR) Palmer amaranth, common waterhemp, horseweed, johnsongrass, ryegrass, common ragweed, and giant ragweed. At least one of these GR weeds was reported on 27% of the U.S. cotton acreage and 68% of the cotton acreage in the Mid-South and Southeast.

Although several glyphosate-resistant weeds are present across the cotton belt, the survey noted that the value of transgenic traits was influenced mostly by the presence of GR Palmer amaranth. Areas with little to no GR Palmer amaranth in the survey included Alabama, Louisiana, Mississippi, New Mexico, and Texas while states with significant infestations of GR Palmer amaranth included Arkansas, Georgia, North Carolina, South Carolina, and Tennessee. Of the 5.7 million acres where GR Palmer amaranth is not present or present at low populations, the value of Roundup Ready technology increased on 80% of these acres by a value of $9/A because of a wider window of application for Roundup Ready Flex technology, higher yields through improved germplasm, and improved weed control. Of the 2.4 million acres in states where GR Palmer amaranth is a serious pest, the Roundup Ready technology lost $19.50/A in value on 45% of the cotton acres; the loss in value was in response to increased expenses for herbicides, cultivating, and hand weeding.

Roundup Ready Flex technology is more expensive than Roundup Ready technology and survey participants were asked to determine if there was more value with the Flex technology. In areas where there was no herbicide resistance, survey participates noted there was an increase in value of $8 to $20/A because the technology offered easier, quicker, less expensive topical herbicide applications and improved weed control, and it allowed growers to maintain only one sprayer. However, each scientist aggressively stressed this technology would promote increased use of glyphosate and ALS-inhibitor herbicide chemistry which will increase the likelihood of herbicide-resistant weeds, especially GR Palmer amaranth. In areas where herbicide-resistant weeds are present, 8 of 9 scientists noted that there was no value in the Flex technology because growers were paying more for a technology that did not improve weed control options or weed control as weed management programs were identical to those previously recommended in Roundup Ready technology without Flex.

Survey participants were also asked to determine if there was a change in value of the Ignite-based program. In areas with low to no infestations of GR Palmer amaranth, there was a $5/A increase in value on 8% of the land because of improved morningglory and GR weed (horseweed, common waterhemp) control. In heavily infested GR Palmer states, the value of the Ignite-based programs had increased $19.50/A on 53% of the cotton acres due to this technology offering the most effective topical herbicide for the control of GR Palmer amaranth, GR horseweed, and GR giant ragweed as well as reducing the need for cultivation and hand weeding.

Conventional cotton is currently produced on over 417,000 acres in the U.S., with most of these acres in Texas. Survey participates were asked if growers would adopt more conventional cotton if a cultivar was developed that was equal in yield and quality to the best transgenic cultivars. Participates suggested that grower adoption of this conventional cotton would increase to 1.5 million acres. However, it was noted that some growers would likely move back to transgenic cotton the second year after experiencing the challenges of managing weeds without Roundup or Ignite.

Although 2,4-D- and dicamba-resistant cotton will likely not be commercialized until at least 2015, survey participants were asked to determine if there was potential value for these technologies. All scientists agreed that tremendous value would occur with these technologies because of the following: 1) improved management of GR

weeds, perennial weeds, and winner annual weeds; 2) elimination of intervals needed between burndown applications of 2,4-D or dicamba and planting; 3) a new mode of herbicide action available for cotton producers; 4) 2,4-D and dicamba are economical; and 5) these herbicides are effective tools to rotate with glyphosate for resistance management programs where glyphosate resistance is not present. Dicamba- and 2,4-D-resistant cotton offer growers many advantages but scientists also noted several challenges that must be addressed before these technologies could be adopted, including 1) physical drift to sensitive crops (most important), 2) sprayer contamination, 3) volatility, 4) cost of technology, and 5) accidental application to non-resistant cultivars.