Weed Control Cost Estimates from the 2012 Cotton Budgets: Implications of Glyphosate Resistance

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RESEARCH PROBLEM

The incidence of weeds resistant to glyphosate across the Cotton Belt has no doubt impacted the cost of weed control in cotton fields. As land grant universities prepare their cotton budgets each year, they make assumptions regarding the technology, chemistries, rates and timings required to adequately control weeds in a typical cotton field for the scenario being budgeted. It is hypothesized that states with higher incidence of weed resistance will budget higher relative costs for weed control than was the norm before herbicide resistance appeared.

BACKGROUND INFORMATION

Each year land grant universities develop cost of production estimates for the major agricultural enterprises in their state. In the case of cotton, these are commonly called cotton budgets. Usually the agricultural economics faculty cooperates with other specialists working in cotton to describe a production scenario to be budgeted. Most states produce multiple cotton budgets, each representing a different cotton-producing region in their state and/or a different cotton-production practice commonly used by their cotton growers. Budgets differ in their estimates of the cost of production due to the production practices assumed in each budget and the input prices assumed from state to state.

RESEARCH DESCRIPTION

In the summer of 2012, cotton enterprise budgets from nine land grant universities were collected to compare herbicide cost estimates from state to state. The nine states represented by their respective universities were Texas, Louisiana, Arkansas, Mississippi, Tennessee, Alabama, Georgia, South Carolina and North Carolina. The budgets and supporting information were collected from Extension websites. These web addresses are included in the literature cited section of this manuscript.

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RESULTS AND DISCUSSION

North Carolina was represented by three cotton budgets in 2012 (Unknown, 2012). They were titled conventional, strip-till, and tidewater. Total cost for herbicide and application was $57.90 for the conventional budget; $52.73 for strip-till; and $81.67 for the tidewater budget. Glyphosate was used in every budget and Prowl and Direx were used in the conventional and strip-till budgets. The tidewater budget had a different herbicide usage which included Valor, 2,4-D, and Staple. Generic glyphosate and Roundup Max were used in the tidewater budget as well.

South Carolina was represented by four cotton budgets, but all had the same total cost for weed control (Ferreira, 2011). Glyphosate, Prowl, and Caparol were used in these budgets. An application of Prowl during the month of March was included followed by three in-season applications consisting of glyphosate and Caparol.

Georgia has four cotton budgets; two are conventional tillage (irrigated and non-irrigated) and the other two are strip-till (irrigated and non-irrigated) (Shurley and Smith, 2012). The conventional budgets have 3 herbicide applications and the strip-tillage budgets have 4 herbicide applications. The authors of these budgets state that a herbicide program designed to control glyphosate-resistant Palmer Amaranth (pig weed) is assumed in each budget. They go on to say these management practices are expensive, costing the land owner $65 per acre without a Monsanto rebate program or $45 per acre with the rebate for the herbicide alone. The total cost for weed control once applications costs are included was $108 per acre.

Alabama has four cotton budgets; two for north Alabama (conventional and reduced tillage) and two for south Alabama (conventional and reduced tillage) (Runge, 2011). All four budgets have three herbicide applications including burn-down/planting, post, and lay-by. All four budgets utilize the Roundup Ready Flex technology and their weed control costs range from $39 to $50 per acre. A quick reference guide is available on the web site to address resistant weeds in cotton.

Tennessee has four cotton budgets (Danehower, 2012). Two budgets utilize the Roundup Ready Flex technology (conventional and no-till) and two utilize the BG II technology (conventional and no-till). The conventional tillage budgets use Cotoran 4L, Roundup Power Max, Dual Magnum, Gramoxone SL, and Valor herbicides. The no-till budgets use these same herbicides plus Roundup Power Max and Clarity in a burndown operation. The burndown operation adds $6.42 to the total cost of herbicides for these two budgets. The four budgets have an average price of $50 for total cost of herbicides and application. The total costs of the two no-till budgets are approximately $7 per acre more than the conventional till budgets.

Arkansas has six cotton budgets, three of which are Roundup Ready Flex and three of which are Liberty Link (Flanders, 2011). Both sets of budgets have different irrigation methods (furrow, center pivot and dryland). Weed control cost in the Roundup Ready Flex budgets was $56.76 per acre. The cost of weed control in the Liberty Link budgets was $75.93 per acre. The Liberty Link budgets use Ignite in the place of glyphosate.
Mississippi also has six cotton budgets, three of which are for the Delta region and three for the non-Delta region (Gillis, 2011). Each of these two areas has three budgets, two Roundup Ready Flex budgets (conservation till and no-till) and one Liberty Link budget utilizing conservation tillage. Weed control costs in the Roundup Ready Flex budgets are $67.72 and $63.94 for the Delta and non-Delta regions respectively. The Delta budget has an applied by air application method that was not used in the non-Delta budgets. Weed control costs in the Liberty Link budgets are $95.19 and $91.41 for the Delta and non-Delta regions respectively.

Louisiana has four cotton budgets, all of which utilize the Roundup Ready Flex technology and all contain $80.46 for weed control (Paxton, 2011). The budgets are divided by irrigation method and soil type.

Texas has nine cotton budgets (Klose, 2012). One is Roundup Ready Flex; three are Roundup Ready (with different irrigation methods); and four budgets are conventional. Weed control costs range from $10.46 per acre to $31.30 per acre across the nine scenarios. Glyphosate resistance was apparent in Texas for the first time in the 2012 crop. There will probably be more Liberty Link budgets in 2014, particularly in District-2 (Lubbock area) and in District-6 (far West Texas area).

**PRACTICAL APPLICATION**

Dollar amounts budgeted for weed control in 2012 in nine Cotton Belt states were greatest in Georgia and Louisiana at $108 and $81 per acre, respectively. Mississippi also had two Liberty Link budgets that contained $95 and $91 per acre in weed control. The remaining Mississippi budgets plus those in Arkansas and South Carolina had weed control costs ranging from $57 to $76 per acre. Alabama and Tennessee had more modest amounts budgeted for weed control ranging from $39 to $53 per acre. The Texas budgets had $30 per acre or less budgeted for weed control.

South Carolina, Georgia, Alabama and Louisiana utilized the Roundup Ready Flex technology exclusively in all of their 2012 cotton budgets. Arkansas and Mississippi had cotton budgets for the Roundup Ready Flex technology and the Liberty Link technology. Tennessee and Texas still had some cotton budgets that utilized the Roundup Ready technology and varieties that were conventional with regard to weed control technology.

Weed resistance and transgenic cotton seed have certainly changed the face of cotton budgets. Land grant universities are taking varied approaches to budgeting for these changes.

**LITERATURE CITED**


