

## **COMPARISON OF SURVEY RESULTS AND BUDGET RECOMMENDATIONS FOR MISSISSIPPI COTTON PRODUCTION**

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### **Abstract**

This poster evaluates the differences in cost structures for Mississippi cotton production based on MSU-ES recommendations and cost structures developed from producer surveys sponsored by the Mississippi Department of Revenue and carries out by the National Agricultural Statistics Service. Across the three production system comparisons, the MSU budgets overestimated fungicide and herbicide costs relative to values reported in the survey by a substantial margin. In the Delta region, reported fertilizer use was lower than budget recommendations for both the furrow irrigated and dryland production systems but higher for non-Delta dryland. In the case of the 2014 crop year, the outstanding yields that were reported led to underestimates by MSU of the ginning and hauling charges, along with underestimates of harvest aid costs in the non-Delta region.

### **Introduction**

The cotton enterprise budgets developed by Mississippi State University Extension Service (MSU-ES) are prepared to provide general information for several different uses, and provide information concerning general levels of cost and returns. This poster compares results from annual surveys of production practices for Mississippi cotton producers with cotton production recommendations from MSU-ES for the 2014 crop year. This poster focuses on comparisons of total direct costs, with particular attention paid to plant nutrient and pesticide costs.

### **Methods and Procedures**

The comparisons in this poster are derived from enterprise budgets generated for data collected from individual cotton producers and enterprise budgets developed by MSU-ES personnel for the 2014 crop year. Enterprise budgets are developed based on an annual survey of Mississippi cotton producers that is carried out by the NASS for MSU-ES under a contract with the Mississippi Department of Revenue. For the 2014 crop year, 88 usable surveys were obtained.

The field operations and input quantities from each survey were input into the Mississippi State University Budget Generator to develop producer costs on a per acre basis from a standard set of input prices.

Direct costs include estimated costs of repairs and maintenance (R&M) for all machinery and include fuel costs for powered machinery. Direct costs related to machinery are estimated on an hourly basis and are then converted to a per-acre basis using the performance rate for the particular operation. Other components of direct costs include quantities of materials used in production multiplied by the price per unit of these inputs, custom rates, hourly wage rates, and interest charges on operating capital.

Annual fixed cost estimates for machinery are based on a budgeting technique which computes the annual capital recovery charge. When a combination of machines or equipment is required to perform a single operation, the total cost per acre for all equipment used in the operation is estimated. The fixed cost of machinery ownership is calculated by first computing the capital recovery factor and then using it to estimate the annual capital recovery charge.

### **Results and Discussion**

In 2014, 69% of the FSA certified cotton acreage was reported to be from the Delta region (Figure 1). In 2014, 43% of the respondents in the MSU Cropping Practices Survey were from the Delta region. In this poster, results will be presented for furrow irrigated production systems in the Delta region which made up 16% of the total respondents, dryland cotton production in the Delta region which made up 20% of the total respondents and dryland cotton production in the non-Delta region which made up 39.8% of the total respondents.



Figure 1. Cotton planted acreage, 2014. Source: NASS Crop Data Layer (USDA-NASS).

The survey to budget comparison for furrow irrigated cotton production in the Delta region for the Bollgard II Roundup Ready production system is shown below in Table 1. The MSU budget was \$131.02 per acre higher than the reported results in the survey. This differential is primarily attributed to the higher fertilizer, fungicide and herbicide estimates in the MSU budget relative to reported values (\$136.98 per acre). The higher reported ginning and hauling costs relative to the MSU budget is accounted for by the excellent yields reported for the 2014 crop year. The reported yields in the survey were 1288 pounds per acre, compared with the budget target of 1100 pounds per acre.

Table 1. Comparison of 2014 MSU Cropping Practice Survey and MSU Budget Projected Costs for Furrow Irrigated Cotton Production in the Mississippi Delta Region.

	Survey	% of TDC	MSU Budget	% of TDC	Difference
Fertilizer	\$ 80.33	13.1%	\$ 120.50	16.1%	\$ 40.17
Fungicides	\$ -	0.0%	\$ 20.00	2.7%	\$ 20.00
Herbicides	\$ 38.65	6.3%	\$ 115.46	15.4%	\$ 76.81
Ginning & Hauling	\$ 140.94	22.9%	\$ 121.00	16.1%	\$ (19.94)
Harvest aids	\$ 17.98	2.9%	\$ 11.92	1.6%	\$ (6.06)
Insecticides	\$ 39.17	6.4%	\$ 41.62	5.6%	\$ 2.45
Growth regulators	\$ 3.33	0.5%	\$ 3.60	0.5%	\$ 0.27
Seed	\$ 30.46	5.0%	\$ 33.30	4.4%	\$ 2.84
Technology fee	\$ 58.93	9.6%	\$ 67.05	8.9%	\$ 8.12
Labor	\$ 28.15	4.6%	\$ 33.36	4.4%	\$ 5.21
Diesel	\$ 62.31	10.1%	\$ 52.09	6.9%	\$ (10.22)
R&M	\$ 38.62	6.3%	\$ 36.75	4.9%	\$ (1.87)
Interest	\$ 9.18	1.5%	\$ 12.91	1.7%	\$ 3.73
Other Direct	\$ 66.78	10.9%	\$ 80.15	10.7%	\$ 13.37
Total Direct Cost	\$ 614.83		\$ 749.71		\$ 134.88
Fixed Cost	\$ 162.81		\$ 158.95		\$ (3.86)
Total Specified Cost	\$ 777.64		\$ 908.66		\$ 131.02

The survey to budget comparison for dryland cotton production in the Delta region for the Bollgard II Roundup Ready production system is shown in Table 2. The MSU budget was \$69.09 per acre higher than the reported results in the survey. This differential is primarily attributed to the higher fertilizer, fungicide and herbicide estimates in the MSU budget relative to reported values (\$93.17 per acre). The higher reported ginning and hauling costs along with harvest aid costs relative to the MSU budget is accounted for by the excellent yields reported for the 2014 crop year. The reported yields in the survey were 1244 pounds per acre which was very close to irrigated yields in the Delta, compared with the budget target of 900 pounds per acre.

Table 2. Comparison of 2014 MSU Cropping Practice Survey and MSU Budget Projected Costs for Dryland Cotton Production in the Mississippi Delta Region.

	Survey	% of TDC	MSU Budget	% of TDC	Difference
Fertilizer	\$ 84.79	14.2%	\$ 109.40	17.0%	\$ 24.61
Fungicides	\$ -	0.0%	\$ 20.00	3.1%	\$ 20.00
Herbicides	\$ 53.58	9.0%	\$ 102.14	15.9%	\$ 48.56
Ginning & Hauling	\$ 137.01	22.9%	\$ 99.00	15.4%	\$ (38.01)
Harvest aids	\$ 26.74	4.5%	\$ 11.92	1.9%	\$ (14.82)
Insecticides	\$ 34.96	5.8%	\$ 35.62	5.5%	\$ 0.66
Growth regulators	\$ 3.29	0.5%	\$ 2.40	0.4%	\$ (0.89)
Seed	\$ 32.71	5.5%	\$ 33.30	5.2%	\$ 0.59
Technology fee	\$ 60.88	10.2%	\$ 67.05	10.4%	\$ 6.17
Labor	\$ 25.14	4.2%	\$ 27.29	4.3%	\$ 2.15
Diesel	\$ 35.33	5.9%	\$ 29.10	4.5%	\$ (6.23)
R&M	\$ 20.99	3.5%	\$ 28.80	4.5%	\$ 7.81
Interest	\$ 8.55	1.4%	\$ 11.40	1.8%	\$ 2.85
Other Direct	\$ 74.32	12.4%	\$ 64.44	10.0%	\$ (9.88)
Total Direct Cost	\$ 598.29		\$ 641.86		\$ 43.57
Fixed Cost	\$ 76.83		\$ 102.35		\$ 25.52
Total Specified Cost	\$ 675.12		\$ 744.21		\$ 69.09

The survey to budget comparison for dryland cotton production in the non-Delta region for the Bollgard II Roundup Ready production system is shown below in Table 3. The MSU budget was \$15.77 per acre higher than the reported results in the survey. This differential is primarily attributed to the higher fungicide, herbicide and fixed cost estimates in the MSU budget relative to reported values (\$68.40 per acre). This was partially offset by higher reported ginning and hauling costs, higher harvest aid costs and fertilizer costs relative to the MSU budget. This can

be accounted for by the excellent yields reported for the non-Delta dryland crop in 2014. The reported yields in the survey were 1155 pounds per acre compared with the budget target of 750 pounds per acre.

Table 3. Comparison of 2014 MSU Cropping Practice Survey and MSU Budget Projected Costs for Dryland Cotton Production in the Mississippi Non-Delta Region.

	Survey	% of TDC	MSU Budget	% of TDC	Difference
Fertilizer	\$ 125.98	21.4%	\$ 102.09	17.6%	\$ (23.89)
Fungicides	\$ 2.96	0.5%	\$ 20.00	3.5%	\$ 17.04
Herbicides	\$ 36.55	6.2%	\$ 61.77	10.7%	\$ 25.22
Ginning & Hauling	\$ 128.51	21.8%	\$ 82.50	14.3%	\$ (46.01)
Harvest aids	\$ 21.56	3.7%	\$ 11.92	2.1%	\$ (9.64)
Insecticides	\$ 18.47	3.1%	\$ 35.62	6.2%	\$ 17.15
Growth regulators	\$ 5.68	1.0%	\$ 2.40	0.4%	\$ (3.28)
Seed	\$ 38.81	6.6%	\$ 33.30	5.8%	\$ (5.51)
Technology fee	\$ 60.63	10.3%	\$ 67.05	11.6%	\$ 6.42
Labor	\$ 32.86	5.6%	\$ 41.60	7.2%	\$ 8.74
Diesel	\$ 43.06	7.3%	\$ 38.88	6.7%	\$ (4.18)
R&M	\$ 27.33	4.6%	\$ 34.42	5.9%	\$ 7.09
Interest	\$ 9.00	1.5%	\$ 10.07	1.7%	\$ 1.07
Other Direct	\$ 37.59	6.4%	\$ 37.00	6.4%	\$ (0.59)
Total Direct Cost	\$ 588.99		\$ 578.62		\$ (10.37)
Fixed Cost	\$ 98.47		\$ 124.61		\$ 26.14
Total Specified Cost	\$ 687.46		\$ 703.23		\$ 15.77

### **Conclusion**

Across the three production system comparisons, the MSU budgets overestimated fungicide and herbicide costs relative to values reported in the survey by a substantial margin. MSU budget recommendations are designed for dealing with herbicide resistant weeds that may not be present in every case. In the Delta region, reported fertilizer use was lower than budget recommendations for both the furrow irrigated and dryland production systems but higher for non-Delta dryland. In the case of the 2014 crop year, the outstanding yields that were reported led to underestimates by MSU of the ginning and hauling charges, along with underestimates of harvest aid costs in the non-Delta region.

### **References**

MSU. Mississippi State University Department of Agricultural Economics Budget Report 2011-05. December, 2011. Starkville, MS.