

## **ECONOMIC DRIVERS OF THE COTTON ACREAGE SHIFT IN LOUISIANA**

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### **Abstract**

This research attempts to address the economic factors that influence the shift away from cotton plantings in the northeastern region of Louisiana in favor of corn and soybean crops. Aside from the increase in grain prices that began in 2007, the current market outlook for corn and soybeans indicates that cotton can compete economically for a larger share of acreage in this region. Planted acreage, yield level, MYA price data, and enterprise budgets were examined for corn, cotton, and soybeans across selected cotton-producing parishes so that net returns could be calculated. A web-based decision tool was developed to assist producers in comparing net returns of cotton, corn, and soybean crops relative to expected market price, yield level, land rent, and variable production costs per acre.

### **Introduction**

In 2013, Louisiana plantings for cotton, corn, and soybean crops totaled 130,000; 680,000; and 1,120,000 acres respectively. Again, strong market prices for corn and soybeans coupled with above average yields for these grain crops collectively affected producers' decisions to devote a significant portion of their acreage away from cotton and into corn and/or soybeans. Consistently high input prices; lower market prices versus narrowing profit margins; and high stocks further contribute to a reduction in cotton planting in the state as well as in the Mississippi River delta region.

Moving into the new crop year, prices for corn and soybeans are expected to fall. For 2013, the U.S. produced a record corn harvest of 13.989 million bushels; with the December 2013 corn price estimated to be \$4.31 per bushel, down \$2.56 from December 2012. The NASS *Agricultural Prices* report indicated that the soybean price was \$13.00 per bushel, \$1.30 lower than a year ago. Cotton price was estimated at 74.5 cents per pound, 2.7 cents higher than last December. As these commodity prices return to a normal trend, the question arises: will this decline in grain prices boost cotton acreage in the U.S. - particularly the Mid South?

### **Materials and Methods**

The 2012 crop year was a record-setting year for Louisiana field crops. Louisiana corn production was 173 bushels per acre. Cotton production for the state yielded 1,020 pounds of lint per acre while soybean yield reached 46 bushels per acre (USDA NASS 2013). These yield levels marvel in comparison to the 2011 final statewide reporting of 135 bushels per acre for corn, 846 pounds per acre for cotton, and 36 bushels per acre for soybeans. However, 2013 crop yields for Louisiana 'trumped' the record-setting 2012 year. Reported yield levels per acre are expected to be: 180 bushels for corn, 1,306 pounds for cotton, and 47 bushels for soybeans.

In order to examine the objective of evaluating the competitiveness of cotton compared to corn and soybean crops in northeastern Louisiana, agronomic conditions associated with those native to Tensas Parish was chosen to serve as a representative farming location. All crops are produced using 8-row equipment on 38 inch rows. For corn production in this region, fertilizer and seed budget line-items compose 51% of total variable costs per acre for dryland and 48% of irrigated corn. Fertilizer and seed technology fees constitute the largest majority of production expenses for cotton at 39% for dryland and 37% for irrigated production. For soybeans, fertilizer and herbicide expenditures represent 35% for dryland and 31% for irrigated production. When considering the use of irrigation, the additional pumping fuel cost should also be considered. A poly-pipe irrigation system was assumed to apply 10.5 inches of water in three applications over 160 acres. Pumping costs for a poly-pipe irrigation system increase the fuel expenditure by approximately \$37 per acre for corn and cotton and \$26 per acre for soybeans. Production costs in 2013 reflect modest increases from costs in the previous year specifically a \$32 per acre increase in corn, a \$15 increase in cotton, and a \$5 increase in soybean costs.

Yield data from USDA NASS from 2000 to 2011 was obtained to compare the measure of average yield for cotton, corn, and soybeans at the parish (Tensas), regional (LA NASS District 3), and state level. To evaluate the competitiveness of cotton under alternative market prices and yield levels in northeastern Louisiana, data observations indicate that cotton yields in Tensas Parish are greater than both the regional and state averages by 38.5 pounds per acre and 52.2 pounds per acre, respectively. Given a cotton price estimate of \$0.70 per pound, this equates to roughly a \$20 to \$30 increase in gross income per acre when a land rent (20%) is assumed in examining location specific observations. A corn yield comparison across locales reveals that Tensas Parish yields are lower than regional and state averages by 10 and 4.9 bushels per acre, respectively. Opposite the effect that cotton yields had on a farm's gross income, the difference in corn yield equates to a reduction in gross income in the range of \$23 to \$47 per acre when using a \$6.00 unit price assuming a 20% land rent. In the case of soybean production, a comparison across the same location points results in Tensas Parish yield being 0.25 and 2.8 bushels per acre greater than the regional and state averages. Assuming a \$13.00 soybean price and a 20% rent, gross income can be expected to increase between \$3 and \$29 per acre.

### **Results and Discussion**

A net return comparison farm planning/decision tool was developed for Louisiana cotton, corn, and soybean producers in November 2013. This management tool is a spread-sheet based decision model developed to assist row crop producers in making production decisions based on expected net return comparisons between production of cotton, corn, and soybeans, using alternative expectations related to variable production costs, expected crop yields, and expected crop market prices. Net returns above variable production costs are the appropriate values to use in making production decisions among crops in the short-run period of one crop year. For a given crop year, fixed production expense, including primarily equipment depreciation and interest, would not change as a result of which crops are produced in that year. Net returns above variable production costs and land rent charges are calculated and the difference between these values gives an estimate of the net return advantage of one crop over the other at assumed levels of cost, yield, and price.

Information required to be entered by the producer for each crop includes: (a) variable production cost per acre, (b) expected crop yield per acre, and (c) crop share rent percentage or cash rent payment per acre. Data values which can be entered by the user are in blue text. In addition, the user can change the range of cotton prices, cotton yields, corn prices and soybean prices evaluated by changing the first value listed for each crop in the worksheet. The worksheet calculates net returns above variable costs and land rent for each crop and shows the difference between the two net returns in the table. Therefore, the values shown in the table can be interpreted as the advantage in net returns per acre for one crop (whose market prices are listed along the left side of the table) compared to the other crop (whose market prices are listed along the top of the table). For the range of market price combinations for which the crop on the left has a net return advantage over the other crop, those cell values with positive net return differences will be shaded in yellow. As values for variable cost, yield and rent are changed, the corresponding net return differences and highlighted cells with a net return advantage will change accordingly. Figures 1 and 2.

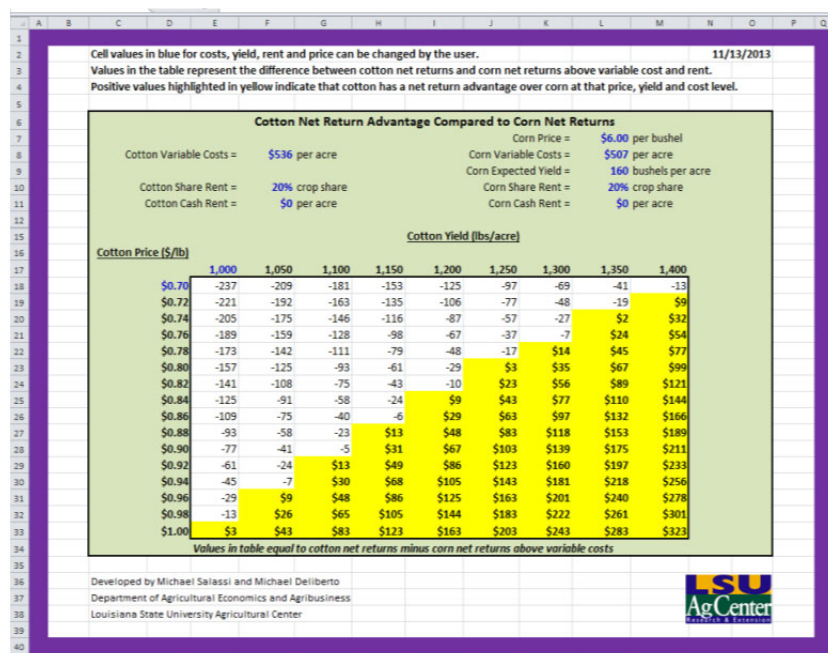


Figure 1. Cotton versus corn net return comparison.

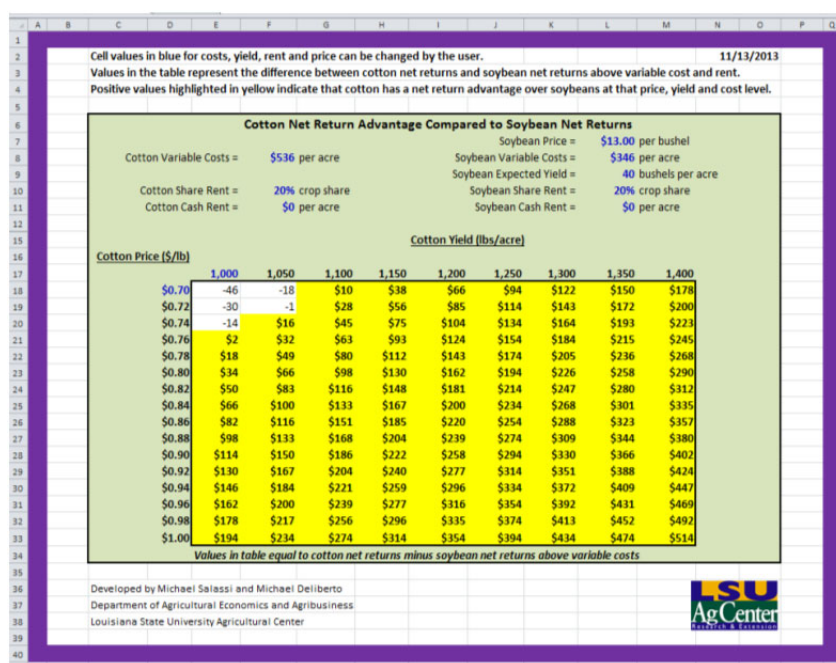


Figure 2. Cotton versus soybeans net return comparison.

### Summary

The potential for a yield increase in one or multiple crops translates into a farm manager deciding at which price and yield combination that would best maximize income to their operation by allocating additional acres to that crop(s). Combining a price decline against production gains amongst competing crops often complicates planting decisions across an operation. This decision tool can aid a producer in evaluating crops returns under alternative land rents and expected production cost per crop.

### **References**

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