

SUGARCANE PRODUCTION COSTS IN 2012

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Projected costs and returns for the various stages of sugarcane production in Louisiana were estimated for the 2012 crop year. Production and tillage practices, as well as application rates for fertilizer, herbicides and insecticides were updated. Input suppliers and equipment dealers were surveyed in 2011 for current input prices. Specific operations for which production costs were estimated included field operations on fallow land, seedbed preparation, cutting and planting heat treated seedcane, planting cultured seedcane, field operations on plantcane, first stubble, second stubble, and third stubble, succession planting, as well as the costs of harvesting with wholestalk and combine harvesters. Costs and returns were estimated for tenant-operators, reflecting the predominant land tenure situation, and reflect a mill payment of 39 percent of production and a land rent payment of one-fifth and one-sixth shares of the "after milling crop" proceeds. Total costs of production plus overhead for crop cycles through harvest of second, third and fourth stubble were estimated and breakeven prices to cover direct and total specified production costs were estimated for one-fifth and one-sixth share rental arrangements. Summary breakeven prices to cover production costs through harvest of third stubble for alternative yield levels are shown in Table 1. These values also represent production costs per pound of sugar produced at assumed yield levels. Breakeven raw sugar yield per acre of sugarcane harvested are presented in Table 2 for a selected range of raw sugar prices.

Estimated sugarcane production costs for the 2012 crop year were based on projected input prices obtained in the fall of 2011. Projected prices for major production inputs included diesel fuel at \$3.30 per gallon, and nitrogen, phosphate and potash fertilizer at \$0.56, \$0.65, and \$0.47 per pound of active ingredient, respectively. Estimated variable production costs for specific phases of production were as follows: fallow operations and seedbed preparation - \$152 per acre, cultured seed cane - \$523 per acre, hand planting operations - \$280 per acre, mechanical planting operations - \$245 per acre, plant cane field operations - \$279 per acre, first stubble field operations - \$356 per acre, second and older stubble field operations - \$351 per acre, and harvest operations - \$169 per acre.

Allocated (unrecovered) sugarcane planting cost estimates were estimated for sugarcane planted in 2012. Published estimates for allocation of total planting costs as of January 1, 2013, for sugarcane planted the previous year, were as follows: cultured seed cane - \$1,151 per acre, propagated seed cane - \$812 per acre, hand planted whole stalk plant cane - \$770 per acre, machine planted whole stalk plant cane - \$824 per acre and machine planted billet plant cane - \$1,040 per acre. These estimates serve as a basis for the determination of sugarcane crop value associated with changes in land ownership or tenant arrangements.

Table 1. Projected breakeven selling prices for raw sugar for selected yield levels, harvest through third stubble, tenant-operators, Louisiana, 2012

| | Selected Yield Levels | | | | |
|---|------------------------------------|-------|-------|-------|-------|
| | -20% | -10% | Base | +10% | +20% |
| Cane yield per harvested acre ¹ (tons) | 27.9 | 31.4 | 34.9 | 38.4 | 41.9 |
| Sugar yield per harvested acre ² (lbs) | 6,142 | 6,910 | 7,678 | 8,446 | 9,214 |
| Sugar yield per rotational (farm) ³ | 4,671 | 5,255 | 5,839 | 6,423 | 7,007 |
| One-Fifth Land Share Rent: | | | | | |
| | -----cents per pound of sugar----- | | | | |
| Breakeven price to recover ⁴ : | | | | | |
| Direct costs | 20.0 | 18.2 | 16.9 | 15.7 | 14.8 |
| Total specified costs | 26.5 | 24.0 | 22.1 | 20.5 | 19.1 |
| Total costs plus overhead | 27.8 | 25.2 | 23.1 | 21.4 | 20.0 |
| One-Sixth Land Share Rent: | | | | | |
| | -----cents per pound of sugar----- | | | | |
| Breakeven price to recover ⁴ : | | | | | |
| Direct costs | 19.2 | 17.5 | 16.2 | 15.1 | 14.2 |
| Total specified costs | 25.4 | 23.1 | 21.2 | 19.7 | 18.4 |
| Total costs plus overhead | 26.7 | 24.2 | 22.2 | 20.6 | 19.2 |

¹ Base average farm yield across harvested acreage of plantcane, 1st stubble, 2nd stubble, and 3rd stubble (base yield of 37 tons plantcane, 36 tons 1st stubble, 34 tons 2nd stubble, 33 tons 3rd stubble).

² Average yield in tons per acre multiplied by a 220 CRS.

³ Assumes standard land rotation of 20% each of fallow, plantcane, 1st stubble, 2nd stubble and 3rd stubble.

⁴ Breakeven prices are calculated by dividing grower's share of production into direct costs, total specified costs, and total specified costs plus overhead.

Table 2. Projected breakeven raw sugar yields for selected raw sugar price levels, harvest through third stubble, tenant-operators, Louisiana, 2012

| | Selected Raw Sugar Price Levels | | | | |
|-----------------------------------|--|-------|-------|-------|-------|
| | -1.0 | -0.5 | Base | +0.5 | +1.0 |
| Raw sugar price (cents per pound) | 22.0 | 22.5 | 23.0 | 23.5 | 24.0 |
| One-Fifth Land Share Rent: | | | | | |
| | -----pounds of sugar per harv. acre----- | | | | |
| Breakeven yield to recover: | | | | | |
| Direct costs | 5,881 | 5,750 | 5,625 | 5,506 | 5,391 |
| Total specified costs | 7,699 | 7,528 | 7,364 | 7,207 | 7,057 |
| Total costs plus overhead | 8,066 | 7,887 | 7,715 | 7,551 | 7,394 |
| One-Sixth Land Share Rent: | | | | | |
| | -----pounds of sugar per harv. acre----- | | | | |
| Breakeven yield to recover: | | | | | |
| Direct costs | 5,650 | 5,524 | 5,404 | 5,289 | 5,179 |
| Total specified costs | 7,396 | 7,231 | 7,074 | 6,923 | 6,779 |
| Total costs plus overhead | 7,748 | 7,576 | 7,411 | 7,254 | 7,103 |

DETERMINATION OF OPTIMAL SUGARCANE CROP CYCLE LENGTH

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As newer sugarcane varieties are adopted by producers and older varieties are phased out of production, it is important to evaluate the stubble yield pattern of newer varieties to determine the impact on optimal sugarcane crop cycle length. Given the high cost of planting a perennial crop such as sugarcane, the objective is to maximize total net economic returns from the initial planting. Over the past four to five years, approximately 10% to 14% percent of Louisiana sugarcane acreage was in third or older stubble. This percentage implies that approximately half of the second stubble acreage is being kept for production the following year and the other is being plowed out to prepare for planting a new crop. With the goal of maximizing net returns above variable costs over the entire crop cycle, estimation of the required breakeven third stubble sugar yield can aid the decision of whether to keep older stubble sugarcane tracts in production. Research is being conducted to evaluate the optimal crop cycle length which would maximize economic net returns for existing commercial varieties as well as new varieties as they are released to the industry.

Breakeven third stubble sugar yield is defined as the sugar per acre yield of third stubble required to equate total crop cycle net returns above variable costs for crops cycles through harvest of second and third stubble crops. Factors impacting the level of breakeven third stubble yield include plant cane through second stubble sugar yields, raw sugar market price, grower share of production and third stubble variable production costs. Average outfield trial sugar yields for 2009 through 2012 are shown in table 1 for plant cane through third stubble crops, along with the estimated breakeven third stubble sugar yield. Plant cane sugar per acre yields for major commercial varieties evaluated in the outfield trials averaged 9,588 pounds per acre. Average first, second and third stubble yields were estimated at 92.9%, 77.1% and 72.5% of average plant cane yields. Breakeven third stubble sugar yields were estimated for each of the major commercial varieties. This breakeven yield level varied on a sugar per acre basis, but was observed to be relatively stable on a percent of previous crop cycle yields. Estimated breakeven third stubble yields, based on outfield trial data, ranged on a sugar per acre basis, from 6,113 to 6,893 pounds per acre, but was relatively constant on a percentage basis at approximately 74% of the simple average of plant cane through second stubble yields.

Estimated required third stubble breakeven yields are relatively constant when expressed on a percentage basis. Table 2 presents an estimation of optimal sugarcane crop cycle length for a typical commercial farming situation. Average outfield sugar yields were factored down to represent average commercial farm level yields. Grower gross revenue, variable cost and net return above variable cost are estimated for three different crop cycle lengths. With a projected third stubble yield of 6,192 pounds per acre, net economic returns would be maximized by keeping the field in production for harvest of a third stubble crop. Estimated required third stubble breakeven sugar yield for this example is 5,761 pounds per acre (a function of the prior plant cane through second stubble yields) below the expected yield of 6,192 pounds.

Table 1. Outfield sugar per acre yields, plant cane through third stubble, 2009-2012

| Variety | Plant Cane ¹ | Crop Age | | | BE Third Stubble ² |
|------------------------|-------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | First Stubble ¹ | Second Stubble ¹ | Third Stubble ¹ | |
| ----- (lbs/acre) ----- | | | | | |
| HoCP 96-540 | 9,345 | 8,654 | 6,926 | 6,081 | 6,151 (74.0%) |
| L 99-226 | 9,702 | 9,273 | 7,568 | 6,864 | 6,537 (73.9%) |
| L 99-233 | 9,558 | 8,298 | 6,949 | 6,432 | 6,113 (73.9%) |
| HoCP 00-950 | 9,666 | 8,572 | 7,058 | 7,072 | 6,229 (73.9%) |
| L 01-283 | 9,190 | 9,330 | 8,154 | 7,886 | 6,592 (74.1%) |
| L 01-299 | 9,629 | 10,067 | 8,273 | 8,249 | 6,893 (73.9%) |
| L 03-371 | 9,738 | 8,623 | 7,535 | 7,143 | 6,376 (73.9%) |
| HoCP 04-838 | 9,849 | 8,805 | 7,113 | 6,194 | 6,338 (73.8%) |
| Ho 05-961 | 9,617 | 8,546 | 6,961 | 6,619 | 6,189 (73.9%) |
| Average | 9,588 | 8,908 (92.9%) ³ | 7,393 (77.1%) ³ | 6,949 (72.5%) ³ | 6,234 (73.9%) |

¹ Source: Louisiana Sugarcane Variety Survey, LSU AgCenter.

² Estimated breakeven third stubble yield based on actual plant cane through second stubble yields. Percentage value equals breakeven third stubble yield expressed as a percent of the simple average of actual plant cane through second stubble yields.

³ Percentage values are stubble sugar yield per acre as a percent of the plant cane sugar yield per acre.

Table 2. Evaluation of optimal crop cycle length for commercial farm scenario

| Sugar Yields, Grower Revenue, Variable Cost, Net Returns ¹ | Harvest of Plant Cane Through First Stubble | Harvest of Plant Cane Through Second Stubble | Harvest of Plant Cane Through Third Stubble ⁴ |
|--|--|---|---|
| Sugar yields/harvested acre: ² | | | |
| Plant cane (lbs/acre) | 8,600 | 8,600 | 8,600 |
| First stubble (lbs/acre) | 7,998 | 7,998 | 7,998 |
| Second stubble (lbs/acre) | -- | 6,622 | 6,622 |
| Third stubble (lbs/acre) | -- | -- | 6,192 |
| Average yield per harvested acre | 8,272 | 7,683 | 7,292 |
| Revenue/total farm acre ³ | \$655 | \$709 | \$731 |
| Variable cost/total farm acre ³ | \$454 | \$471 | \$480 |
| Net return/total farm acre ³ | \$201 | \$239 | \$250 |

¹ Commercial scenario based on a \$0.27/lb raw sugar market price, 39% mill share, 1/6 landlord share.

² Sugar yields factored to represent typical average yields on commercial farm.

³ Grower revenue share (50.8%), variable cost and net return above variable costs.

⁴ Breakeven third stubble yield estimated to be 5,761 lbs/acre, 74% of plant cane through second stubble average.