# Impact of Cover Crops on Sugarcane and Sugar Yield

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## Hypothesis

Sugarcane is a perennial crop that is commercially produced on more than 480,000 acres Louisiana. Unlike grain crops, which are often planted into stale seedbeds with minimum soil disturbance, the planting of sugarcane requires large amounts of soil to be moved in order to plant sugarcane stalks. In Louisiana, sugarcane is planted into raised-beds because they provide a more favorable growing condition during periods of high rainfall. The large amount of soil disturbance associated with planting practices and the slow rate of establishment of newly planted sugarcane provides a suitable situation for soil loss. Reducing soil loss and improving soil health has been the focus of cover crop research in other agronomic crops in the U.S., but little research has been done on sugarcane grown in Louisiana. We hypothesize that cover crops can be incorporated into production practices during the establishment of newly planted sugarcane without negatively impacting sugarcane yield parameters and farm revenue. Experiments were conducted in commercial sugarcane fields during 2017 and 2018 to investigate our hypothesis and showed that sugarcane yield parameters were not negatively affected by cover crops when drilled along the row-hips of newly established sugarcane; furthermore, gross farm revenue was increased for the plant cane crop when cover crops were established with newly planted sugarcane. We expect that these research findings will result in Louisiana sugarcane producers beginning to utilize cover crops in their production practices, thus reducing soil losses associated with the establishment of sugarcane.

## Introduction

Sugarcane producers are becoming increasingly concerned over soil losses they are experiencing due to excessive rainfall events. During these events, soil is deposited into field ditches and canals, ultimately slowing drainage, thus causing potential reductions in sugarcane yield. Producers are also faced with the increased costs associated with the removal of soil from ditches and canals. Research has shown the greatest potential for soil loss occurs during the fallow period and in the plant-cane crop prior to sugarcane root proliferation. One strategy for reducing soil loss is to incorporate cover crops into farming operations. Cover crop research in Louisiana sugarcane production has been limited to the fallow period. However, there is no research based information on planting cover crops in conjunction with newly planted sugarcane. Crop productivity and profitability must also be considered. Hence, two cover crop studies were initiated in newly planted commercial sugarcane fields in St. Mary Parish in 2017 to evaluate the impact of cover crops on sugarcane yield parameters.

**Effect of Cover Crops on Sugarcane Yield Parameters and Farm Revenue in 2018.**

| Treatment | Population (stalks/A) | Height (in) | Cane Yield (tons/A) | TRS (lb/ton) | Sugar Yield (lb/A) | Cover Crop Seed and Planting Costs ($/A) | Gross Revenue ($/A) |
|---|---|---|---|---|---|---|---|
| Cover crop | 45,339 a | 60.8 a | 55.9 a | 232 a | 12,985 a | $36.95 | $1521.25 |
| No cover crop | 45,012 a | 62.7 a | 48.8 b | 236 a | 11,548 a | - | $ 1385.76 |

- Sugarcane variety HoCP 96-540 planted 8-20-2017 in St. Mary Parish
- Experimental design: Randomized complete block, 4 replications, plot size 12 ft by 50 ft
- Sunn hemp, Bullseye radish™, and rape seed drill planted 10-13-2017 on row hips at 28, 9, and 9 lb/A, respectively
- Cover crops chemically terminated with 1 qt. Brash®, 2 lb. Tricor® DF, 0.25% v/v per acre in late February
- Stalk population and stalk height data collected on 7-2-2018
- Experiment harvested on 12-12-2018
- Yield parameters followed by the same lowercase letter are not statistically different at the P<0.05 level

**Effect of Cover Crop Termination Date on Sugarcane Stalk Population and Stalk Height in 2018.**

| Termination date | Field operation | Days after planting cane | July 2 stalk population/A | July 2 stalk height (in) |
|---|---|---|---|---|
| Jan. 25, 2018 | Cover crop terminated | 135 | 42,580 a | 51.83 a |
| Feb. 16, 2018 | Cover crop terminated | 157 | 40,220 a | 49.46 b |
| Mar. 8, 2018 | Cover crop terminated | 177 | 35,720 b | 47.98 b |
| Control | No cover crop | --- | 38,078 | 47.65 |

- Sugarcane variety L 01-299 planted 9-12-2017 in St. Mary Parish
- Experimental design: Randomized complete block, 4 replications, plot size 6 ft by 50 ft
- Austrian winter pea and hairy vetch planted 9-13-2017 on row hips and wheel furrows at 9 and 1.6 lb/A, respectively
- Cover crops chemically terminated with 1 qt. Brash®, 2 lb. Tricor® DF, 0.25% v/v per acre
- Control information was gathered from adjacent sugarcane within the same field as the experiment and winter weeds were controlled in late February
- Stalk heights or Stand counts followed by the same lowercase letter are not statistically different at the P<0.05 level

Picture 1: Austrian winter pea and hairy vetch growth 4-months after planting.

Picture 2: Sunn hemp, Bulleye radish™, and rape seed growth 3-months after planting.

## Findings

These studies demonstrate that cover crops can have both positive and negative impacts on sugarcane productivity as well as on farm profitability. When growing cover crops like Austrian winter pea and hairy vetch which vine and form dense mats on the top of sugarcane beds, stalk population and stalk height can be negatively impacted, much like winter weeds, if they are not terminated in a timely fashion. In the second study, crop productivity and profitability were increased when Sunn hemp, Bullseye radish™, and rape seed were drill planted among sugarcane, showing the potential benefits of cover crops. The $135 increase per acre in gross revenue, justifies further investigation into cover crop production in Louisiana sugarcane.