The purpose of the *ex post facto* study was to determine explanatory variables for sugar cane yield among small, medium and large scale growers at Ubombo Sugar. The target population of the census study was all small, medium, and large scale growers, milling their cane at the Big Bend Mill.

Data were collected using valid and reliable questionnaires. Questionnaires were self administered. Descriptive statistics of frequencies, percentages, means and standard deviations were used to describe data. One way analysis of variance (ANOVA) and the independent t-test were used to test for significant differences at an *a priori* probability of $p < 0.05$. Correlations were used to describe relationships, and stepwise regression analysis was used to determine explanatory variables for sugar cane yield.

The findings indicated that large scale farmers were getting higher yields than small and medium scale growers. However, sucrose percentage was higher with small scale than medium and large scale growers. Inputs and services were available, accessible, and affordable to all groups of sugar cane growers. Most of the sugar cane growers were within the recommended delays in implementing the crucial planting and post
harvest operations; and the man-days used per activity per hectare were within standard. Small scale sugar cane growers were less effective in training their employees. Findings also indicated that small scale farmers had inadequate knowledge of the type of chemicals used and pre and post emergency applications. Explanatory variables for sugar cane yield were distance between the farm and the mill; hand application fertilizer man-days per hectare; and labour strength. Distance between the farm and the mill had a negative influence on sugar cane yield.

Lack of training had a negative impact on sugar yield for medium scale farmers. Delays between seed cane cutting and first irrigation, age of farmer, and number of weeks between harvesting and second fertilizer application had a negative effect on sugar cane yield for large scale farmers. The research failed to reject the research hypothesis that good management and adequate inputs increases sugar cane yield. The main conclusion was that, those farmers who are furthest from the mill should consider replacing sugar cane production with other viable business ventures.

**Key words:** Sugar cane yield, sugar cane growers, predictor variables, ex post facto, Ubombo sugar, regression.