N FERTILIZER AND INOCULATION OF DIAZOTROPHIC BACTERIA: SUGAR YIELS AND ECONOMIC RETURN

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The objective of this work was to evaluate the effect of N fertilizer and inoculation of diazotrophic bacteria on sugar production and economic return (ER) due to N fertilization on the plant cane cycle. Two trials in non-irrigated areas were set up in Sales Oliveira, Brazil, on March 23 and May 12, 2009. The experiments were split plots with four replications. Three varieties of sugarcane were placed in the main plots and the fertilizer treatments in the subplots: control (no N) and the rates 30, 60, and 90 kg N ha^{-1} applied as urea in the furrow. In addition, a mixture of five species of diastrophic bacteria were inoculated in plants that received no N and 60 kg N ha^{-1}. The subplot consisted of five rows 10 m long, spaced at 1.5 m. Sugar production in kg ha^{-1} (SUG) was calculated by multiplying the stalk yield (TCH) and the amount of total recoverable sugars (TRS) of plant cane at harvest. To calculate the ER the final price of the ATR's in São Paulo State of the 2009/2010 season (R$ 0.35/kg) and the cost of cutting, loading and transport (CCT) for manual harvesting of R$ 22.70 per ton plus the cost of the nitrogen fertilizer (R$ 2.44 per kg N). Data of the three varieties was pooled together for the sugar yield and economic return calculations. Sugar yield responded linearly to N application (SUG = 19,152 + 41.44N) but the highest economic return (R$ 4,852.20/ha) was obtained with 70 kg ha^{-1} of N (EC = 4,162 + 19.66N - 0.14N^2) in Experiment 1. Inoculation did not affect sugar yields or economic return in any of the two sites.

Keywords: Sugarcane, nitrogen fertilization, diazotrophic bacteria, BNF, Sugar yield

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