

Sugarcane growth analysis with the application of diazotrophic bacteria and nitrogen fertilization under irrigation

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This study aimed at evaluating differences between the inoculation of diazotrophic bacteria and rates of N-fertilizer by using the growth analysis of dry matter of sugarcane. The experiment was conducted at APTA - Centro Oeste Jaú -SP, 22 ° 17 ' S and 48 ° 34 'W, with a second ratoon of SP80-3280 cultivar. The treatments consisted of three rates of nitrogen (0, 50 and 100 kg ha⁻¹ the N-fertilizer), with (I) and without (NI) inoculation of a mixture of five species of diazotrophic bacteria. Subsurface drip irrigation was applied when needed and was used to carry the N-fertilizer split in 12 portions. Plant shoot dry matter (SDM) was measured throughout the sugarcane growing cycle and dry matter accumulation sigmoidal curves were calculated. The average rates of dry matter accumulation were 5, 7, and 10 g m⁻² day⁻¹ for fertirrigated treatments with 0, 50 and 100 kg N ha⁻¹. The corresponding figures for fertirrigated and inoculated treatments were 6, 7, and 8 g m⁻² day⁻¹ for N rates 0, 50 and 100 kg N ha⁻¹. The treatment that received 100 kg N ha⁻¹ without inoculation of bacteria (NI) and the control with no N but inoculated (I) had the highest and lowest dry matter yields, with horizontal asymptotes of 39 and 17 Mg ha⁻¹ respectively. Application of mineral fertilizer caused a marked increase in dry matter yield but inoculation with diazotrophic bacteria did not significantly affect plant growth under the conditions of the present study.

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