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## Potential Yield of Canola under Different Irrigation Frequencies and Nitrogen Levels in Brazilian Center-West Region

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### Abstract

Canola (*Brassica napus* L.) is an oilseed crop cultivated in several regions of the world. Canola can be used for industrial purposes but in Brazil canola is used for food production and livestock feeding. In the Brazilian Cerrado region canola is grown in the off season and during this period rainfall is not sufficient to ensure the potential of maximum crop yield, so there is a need for irrigation. It is known that canola has a high demand for nitrogen, thus the application of this nutrient is essential for obtaining a good crop yield. Considering these aspects, a study was conducted at the Federal University of Grande Dourados over the years, 2012 and 2013, to evaluate the effects of different irrigation frequencies and nitrogen on morphological and productive components of canola. We used a randomised block split-plot design with four repetitions. Treatments in the plot consisted of three irrigation frequencies (no irrigation -SI, weekly irrigation -IS and irrigation three times a week -I3S). Subplots received different doses of nitrogen: 0, 30, 60, 90 and 120 kg ha<sup>-1</sup> in 2012; and 0, 60, 120, 180 and 240 kg ha<sup>-1</sup> in 2013. In both years the different irrigation frequencies significantly affected plant height (cm), dry weight (g plant<sup>-1</sup>), grain yield (kg ha<sup>-1</sup>), thousand grain weight (g), oil content (%) and oil yield (kg ha<sup>-1</sup>). The different nitrogen levels significantly affected dry weight, thousand grain weight and oil content in 2012, as well as plant height, number of pods, dry weight (g plant<sup>-1</sup>), grain yield (kg ha<sup>-1</sup>) and oil yield (kg ha<sup>-1</sup>) in 2013. It is concluded that additional irrigation should be used in the Center-west region to ensure a maximum yield potential of canola, as the highest grain yield in this study, 2,999 kg ha<sup>-1</sup>, was obtained through irrigation performed three times a week. Canola yields demonstrate a positive result with increasing levels of nitrogen, which shows the importance of using this nutrient for achieving high levels of grain yield and oil. Considering two years of evaluation, the highest grain yield was obtained with 60 kg ha<sup>-1</sup> of nitrogen.

**Keywords:** Depth of irrigation, morphological components, nitrogen, yield