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## Optimising Water Use in Irrigated Rapeseed Areas in Brazil

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### Abstract

Rapeseed is the third most produced oilseed in the world. It is also the third major source of edible oil, following soybean and palm. It was introduced in Brazil in 1974 and is currently cultivated in 33 thousand hectares. Rapeseed crop has high potential to contribute to Brazilian agribusiness expansion, as it is appropriate to the second harvest in winter (locally called 'safrinha' - small crop) in grain production systems in Midwest Brazil. However, the crop area increase will definitely depend on generation or adaptation of technology, such as irrigation to raise crop yield, as investments in rapeseed researches have been extremely limited in South America. Therefore, the objective of this investigation is to define management irrigation criteria for farmers, determining time and amount of irrigation especially in the Southern Region of the state of Minas Gerais, Brazil, thus contributing to income raise for farmers, as well as crop expansion. For this purpose, two trials were carried out in a totally randomised experimental design. The first trial, experiment 1, comprised 4 treatments and 4 repetitions, totalizing 16 experimental plots with application of four different water tensions on soil: 20, 40, 80, and 120 kPa. The second trial, experiment 2, comprised 5 treatments and 4 repetitions with application of 5 different irrigation depths: 50; 75; 100; 125, and 150 % of relocation depth up to field capacity. According to the variance analysis, by F test 5 % probability, different water tensions on soil affected number of pods, total green matter, total dry matter, and yield. The highest yield was verified under 20 kPa tension. Different irrigation depths showed no significant influence on assessed parameters due to precipitations during application of treatments. It is possible to conclude that water retained at 25 cm depth under 20 kPa tension is a good indicator of the right time to start irrigating rapeseed crop, as under these conditions we obtain the maximum crop potential yield. Also, we concluded that the determining factor for yield increase in irrigated rapeseed crop is irrigation frequency instead of amount of applied water.

**Keywords:** Irrigation, rapeseed, water depth, water tension on soil, yield