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Yield of Eggplant Submitted to Different Water Tensions on Soil

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Abstract

The Brazilian agribusiness sector is responsible for at least 22% of the Gross Domestic Product, and the sector of fruits and vegetables is responsible for 3.5% of agricultural GDP. The annual Brazilian production of vegetables reaches nearly 12.5 million tons with growth projections mainly of those with phytotherapeutic properties as the eggplant (*Solanum melongena* L.), which is being cultivated in 1,500 hectares in Brazil. It is expected an increasing demand of eggplant due to the medicinal properties of fruits such as reducing cholesterol level and also good source of minerals and vitamins. The biggest drawback to eggplant crop production is inappropriate soil moisture during its cycle. However, irrigation acts as a supplement to rain and keeps soil water rates at ideal levels for crop development, thus increasing plant growth, product quality, and yield. Appropriate irrigation management improves efficiency in water use, reduces energy consumption, and keeps suitable conditions of soil humidity and phytosanitiy. Timing criteria for irrigation scheduling may be based on soil water matric potential, yet there has been little research to evaluate the ideal time for eggplant crop irrigation. Therefore, the purpose of this investigation was to assess the effect of different water tensions on soil, applied in two phenological stages, on productive behaviour of eggplant. We carried out two greenhouse experiments with cultivar Nápoli in South Minas Gerais, Brazil. In the first trial we applied the treatments at post-transplant/bud opening phase, in the second one at fruit formation/harvest phase. Both used totally random experimental design with 5 treatments and 6 repetitions. Treatments consisted of 5 different water tensions: 15, 30, 45, 60 and 80 kPa. We used drip irrigation system managed with tensiometers installed at 12.5 cm depth in 15, 30 and 45 kPa experimental units. Watermark® was used in 60 and 80 kPa tensions. Results only showed significant differences for all assessed variables for treatments applied during fruit formation/harvest phase, which clearly demonstrated that this phase is more sensitive to high water tensions in soil, leading to decrease in crop development. Also, the highest yields were provided by irrigation under 15 kPa tension.

Keywords: Irrigation, vegetables, yield