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“Agricultural development within the rural-urban continuum”

Yield of Eggplant Submitted to Different Water Tensions on Soil

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Introduction

Eggplant (*Solanum melongena* L.) is currently cultivated in 1,500 hectares in Brazil. The biggest drawback to Eggplant crop production is inappropriate soil moisture during cycle, which can be solved with irrigation. It is known that soil water matric potential can be used to indicate the right time to start irrigation (Reichardt, 1987) and that all crops are more sensitive to low potential (more negative) in certain growth stages than others. Therefore, the question is: What is the appropriate soil water matric potential to start irrigation of Eggplant? What is the most sensitive growth stage of Eggplant?

Objectives

To evaluate the effects of different soil water tensions applied at two growth stages on the productive behavior of Eggplant, Napoli cultivar, in a greenhouse in southern Minas Gerais.



Methodology

Two experiments were conducted. We used a completely randomized design with 5 levels of soil water tension (15, 30, 45, 60 and 80 kPa) and 6 replicates. Tensiometers were installed at 12.5 cm depth in experimental units of 15 kPa, 30 kPa and 45 kPa. Watermark ® was used in tensions 60 kPa to 80 kPa. **Treatments in experiment 1** - first growth stage - they were performed at 10 days after transplanting of seedlings to the time when 50% flowers were open.

Treatments in experiment 2 - second growth stage – they were performed at the end of treatments in experiment 1 until the end of the cycle. Then we evaluated plant productivity. The effect of water deficit on productivity was quantified by the relationship between relative yield decrease and relative evapotranspiration deficit ($1 - Y_r/Y_m = K_y (1 - E_{Tr}/E_{tm})$) (Doorenbos, J. & Kassan, 1994).

Results

EXPERIMENT 1

Duration of treatments: 24 days. K_y : 0.27.

There was no significant difference among treatments for yield ($\text{kg} \cdot \text{plant}^{-1}$).

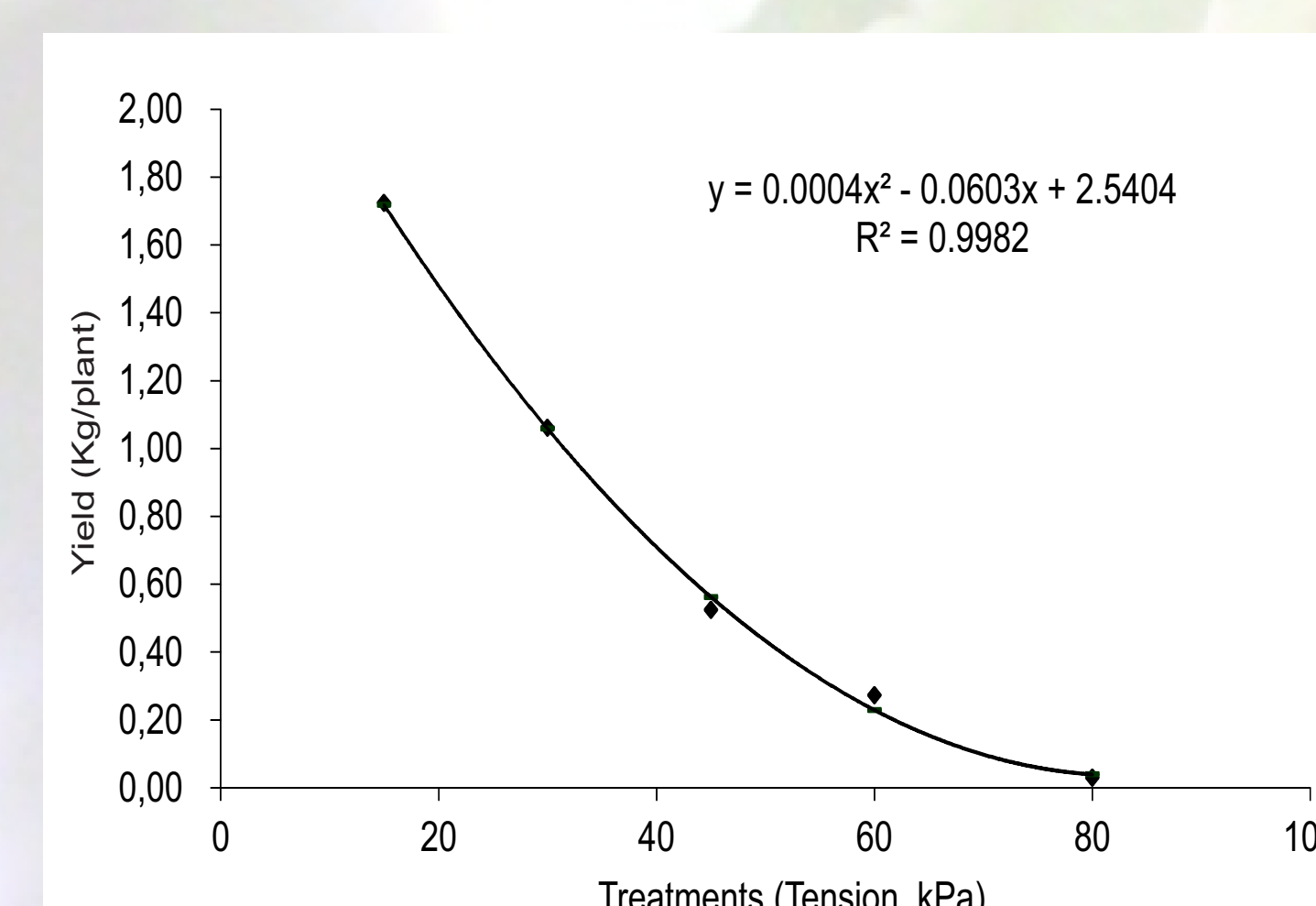


Figure 1. Effect of different soil water tensions in total yield ($\text{kg} \cdot \text{plant}^{-1}$) at the stage of Fruit formation / Harvest. UFLA Lavras / MG 2008

EXPERIMENT 2

Duration of treatments: 137 days. The highest total yield was obtained with tension of 15 kPa - yield of $1.72 \text{ kg} \cdot \text{plant}^{-1}$ (Figure 1). The response factor K_y was higher in experiment 2 – 1.49, showing greater sensitivity of eggplant to water deficit during the stage of fruit formation / harvest.

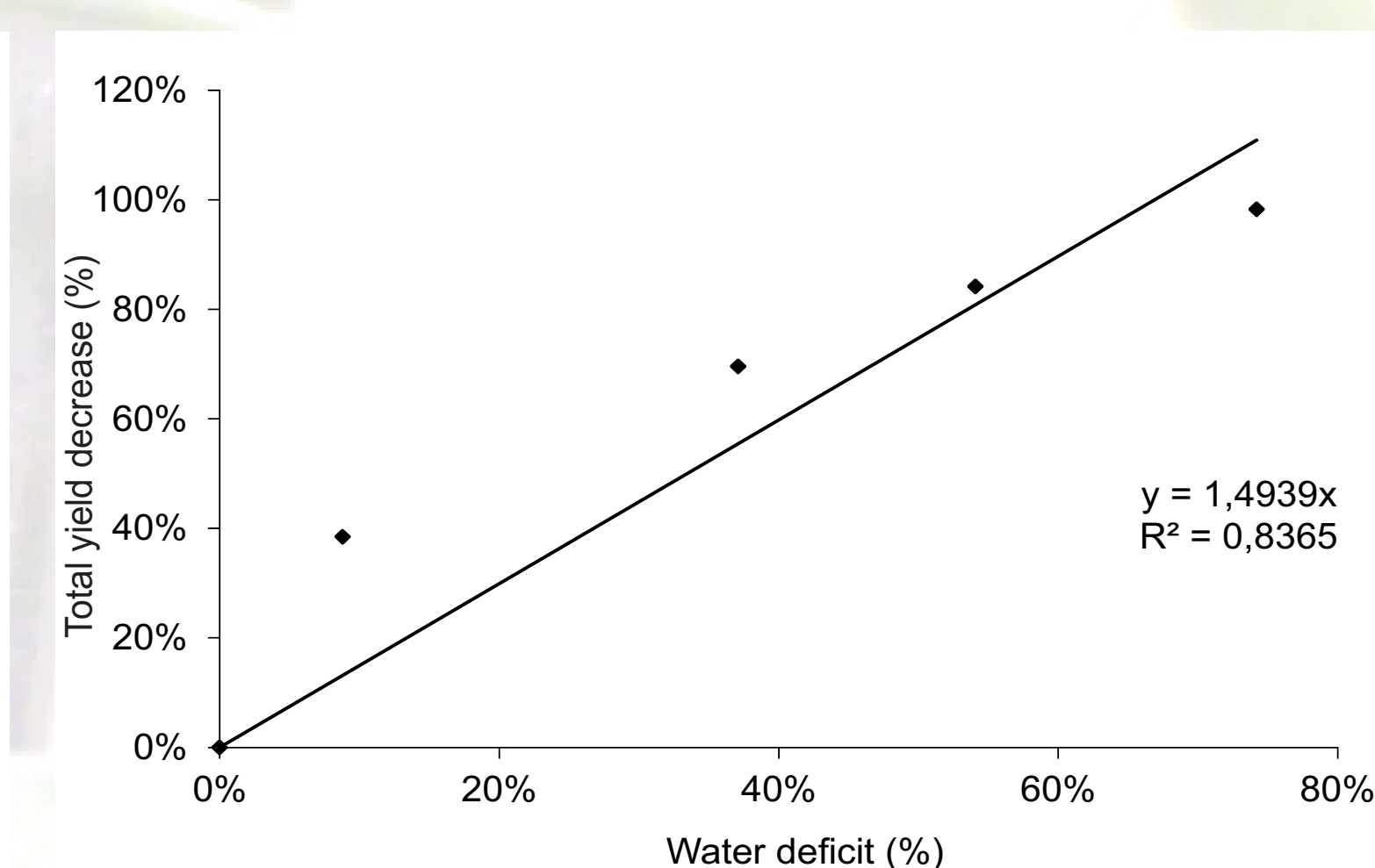


Figure 2. Production decrease due to water deficit during the stage of fruit formation / harvest of eggplant. UFLA Lavras / MG 2008

Conclusion

Eggplant was more sensitive to water deficit during the stage of fruit formation / harvest, in which production showed growth inversely proportional to soil water tension. Also, the highest productivity and plant growth were found in treatments irrigated with tension 15 kPa.



References

- REICHARDT, K. **A água em sistemas agrícolas**. São Paulo: Manole, 1987
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