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Assessing the effect of water management regimes on the growth of Tomatoes in Abeokuta, South West Nigeria

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Abstract

The erratic nature of rainfall pattern in parts of the world, had compelled need for consistent works on understanding crops response to different environments to enable identification of the varieties of crops with resistance to drought to ensure food sustainability in drought prone regions. The experiment was conducted in a screen house at Federal University of Agriculture, Abeokuta (FUNAAB) behind College of Environmental Resources Management (COLERM) to study the effect of water management regimes on growth of two tomato varieties. The experimental design was a Complete Randomized Design (CRD) with a 3x2 factorial arrangement in which there were three water management regimes and two varieties of tomatoes. The two tomato varieties used were Roma V. F. and Ibadan Local, under different water management regimes such as alternate wetting and drying (AWD), continuous drying (CD) and continuous flooding (CF). The agronomic parameters were plant height, number of leaves and leaf area which were monitored on a regular basis. The results showed that there was significant difference under the different water regimes; growth was best observed under alternate wetting and drying compared to continuous flooding and continuous drying. The mean plant height under different water regimes were AWD (29.68cm), CF (21.99cm) and CD (21.92cm). The mean leaf area of the crop was AWD (25.54cm^2), CF (16.45cm^2) and CD (19.27cm^2) while the mean number of leaves of the crops were AWD (36). CF (27), and CD (25). Tomatoes in AWD moisture availability yielded highest fruit yield of 17.90 kg/ha followed closely are those under CF with 16.60 kg/ha while the least yield of 14.10 kg/ha was obtained under CD. The research confirmed that alternate wetting and drying (AWD) favours plant height, leaf area and number of leaf more than continuous flooding (CF) and continuous drying (CD). Alternate Wetting and Drying is a very good water management option for the production of Ibadan Local in this environment.

Keywords: Water management regimes**,** Tomatoes, South West, Nigeria

1. Introduction

Water is an important component of life and is required for all the various biochemical and physiological processes involved in plant growth and development. Adequate moisture availability is necessary for optimum leaf development, maintenance of leaf greenness, assimilate production and partitioning as well as total dry matter yield. Water stress has adverse or deleterious effects on crops; the

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Furthermore, sufficient water supply at these two stages is crucial to meet the demand of water for high-intensity. Evapotranspiration induced by high temperatures and flourishing leaf area, and vital for enlargement of fruit cells and metabolism of fruit nutritional substances; therefore, single fruit weight increased in treatments with sufficient water supply compared with those exposed under soil moisture deficit.

5. Conclusion

In conclusion, the result showed that water management regimes have major impacts on tomato varieties. The research also confirmed that under different water management regimes, alternate wetting and drying (AWD) favours plant height, number of leaves and leaves area more than continuous flooding (CF) and continuous drying (CD. Regardless of water management option, Ibadan Local (V2) shows more productivity or better performance in terms of plant height, number of leaves and leaf area more than Roma V. F. (V1). Alternate Wetting and Drying is a very good water management option for the production of Ibadan Local in this environment, the savannah-forest transition zone of south west Nigeria

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