

Evaluations of Production Function and Water Productivity of Peanut Plant (cv.Guil) under Irrigation Conditions and Nitrogen Fertilizer

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Abstract

The inputs of water and fertilizer are important in agricultural production, with a shortage of each one reducing the yield of the product. The role and importance of each of the factors of water and fertilizer separately can be effective in increasing yield. The purpose of this study was to evaluate the effect of irrigation and nitrogen fertilizer on production function and water productivity in peanut plant in Guil cultivar. The experiment was conducted as a split plot based on randomized complete block design with 3 replications, in 2009 in Astaneh Ashrafiyeh. The main treatments included: without irrigation (control) and irrigation with intervals of 6, 12, and 18 days, while the sub treatments were nitrogen fertilizer rates of 0, 30, 60, and 90 kg ha⁻¹. A quadratic equation was used to estimate the water-fertilizer production function. The results of production function estimation indicated that seed yield increased with nitrogen fertilizer up to 60 kg ha⁻¹. But, with a gradual increase in nitrogen fertilizer, yield was reduced. Increasing nitrogen fertilizer from 60 kg ha⁻¹ in different amounts of water consumed had no effect on yield increase. Water productivity and the water utilization rate in the irrigation interval of 6 days, with consumption of 328 mm, was the highest. In the irrigation interval of 6 days and consumption of 60 kg N-fertilizer ha⁻¹, the maximum amount of water productivity was 0.96 kg m⁻³.

Keywords: Shelling percentage, Water use, Yield component

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