

Effect of Different Amounts of Water and N-fertilizer on Peanut Yield and Its Components

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Abstract

Proper and efficient use of water and fertilizers, in addition to increasing productivity, increase crop yield. In order to study the effects of drip irrigation management and nitrogen fertilizer levels on yield of peanut, an experiment was conducted in Astaneh Ashrafiyeh, Guilan province, in 2012 and 2013 using split plot in a randomized complete block design with three replications. The main plot included water treatments consisting of no irrigation and application of 60%, 80%, and 100 percent water requirement. Sub plots included nitrogen fertilizer levels i.e. 0, 30, 60 and 90 kg.ha⁻¹. The results showed that pod yield were similar in treatments of %80 and 100 percent crop water requirement corresponding to 2385 and 2452 kg.ha⁻¹ in 2012. In 2013, the yields were, respectively, 2383 and 2448 kg.ha⁻¹. The highest pod yield was obtained in 60 kg.N.ha⁻¹ treatment in 2012 and 2013, amounting to, respectively, 2351 and 2667 kg.ha⁻¹. Seed yields in 2012 and 2013 were obtained in 100 percent crop water requirement, with 1885 and 1877 kg.ha⁻¹, respectively, which were significantly higher compared to the treatment without irrigation. In the fertilizer treatments, the average yield of 60 kg N.ha⁻¹ in 2012 and 2013 was, respectively, 1829 and 2012 kg.ha⁻¹. In water treatments, water productivity based on biomass yield varied between 1.03 and 1.68 kg.m⁻³ and, based on pod yield, it was observed between 0.37 and 0.63 kg.m⁻³, in 2012 and 2013. The water productivity values of seed yield in the 100% water requirement in the crop years 2012 and 2013 were 0.28 and 0.40 kg.m⁻³, respectively. Therefore, considering the results of yield and water productivity, management practice of 100% water requirement and 60 kg.N.ha⁻¹ is the most appropriate method for peanut cultivation in the study area.

Keywords: Production Function, Seed yield, Water Use, Water productivity.

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