Abstract

In order to investigate the effects Water deficiency and different levels of potassium on yield, yield components and percentage of essential oil of black cumin, a field experiment was carried out as a split plot based on completely randomized block design with three replications in 2014 at Abadeh Tashk, Neyriz, Iran. The main plots composed of four drought stress levels including optimum irrigation (S_1), no Irrigation at stem elongation stage to flowering (s_2), no Irrigation at flowering and grain filling period, (S_3) and no Irrigation the beginning of grain filling until grain filling period (S_4), and Four levels of potassium including without any fertilizer (K_1), 40 (K_2), 80 (K_3) and 120 (K_4) kg/h in sub plots. grain yield, percentage of essential oil, essential oil yield, Biological yield, number of seed per follicule, number of follicule per plant, Plant height, number of branch per plant, 1000 seed weight, percentage of empty follicule per plant and harvest index were recorded. Results showed that irrigation intervals had significant effects on all studied characteristics (at 1%). Stressse treatment compared with optimum irrigation reduces grain yield, biological yield and essential oil yield, but the percentage of essential oil was increased. The plant height was significantly reduced when drought stress occurred at at vegetative growth and The 1000-kernel weight was significantly reduced when drought stress occurred at kernel filling stage. Potassium all studied characteristics except percentage of essential oil increased. Interaction of potassium fertilizer and drought stress revealed significant differences for on all studied characteristics. As, optimum irrigation with use 120 kg of potassium fertilizer, in production highest yield and yield components and flowering treatment with use 40 kg of potassium sulphate fertilizer in production percentage of essential oil were in order. In general, results showed that application of potassium fertilizer possibly by moderate effects of water stress can have a positive role in improving the yield and yield components of plants.

Key words: Interaction of water and fertilizer, Grain yield, water stress, Biological yield, vegetative growth

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Evaluation of yield, yield components and percentage of essential oil of black cumin *(Nigella sativa* L.) in application with different levels of potassium and low irrigation regimes

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