Effect of combined biological seed treatment and priming on growth characteristics and phosphorus and potassium concentrations in *Nigella sativa* L.

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(Received: Sep. 04-2013 ; Accepted: Feb. 04-2014)

Abstract

In order to study the effect of the combined biological seed treatment and priming on growth characteristics and phosphorus (P) and potassium (K) concentrations in Nigella sativa L., an experiment was carried out in the greenhouse of Agricultural Faculty, University of Birjand, with a factorial CRD statistical design in 2011. Factors included: 1. Bacteria treatments: a. (*Pseudomonas sp* 168), b. (*Pseudomonas sp* 187), c. (compose of *Pseudomonas sp* 168 and *Pseudomonas sp* 187), and d. (without Bacteria treatment); 2. priming with KH_2PO_4 (50 mM concentration); and 3. no priming. Soil sample was taken from Bidokht village, sieved and transported to pots of 3 kg (pH=7.8 and ECe= 1 dS/m). Pots were irrigated based on the field capacity moisture. Results showed that biological treatments caused a significant increase in shoot dry weight and in both P and K concentrations of shoot. Priming showed an excessive effect of biologic fertilizer on the two elements' concentrations in the shoot of *Nigella sativa* L. in the sixth week, and shoot dry weight as well. Highest shoot concentrations of K and P were observed in (*Pseudomonas sp* 168+priming) and (*Pseudomonas sp* 168+187+priming), respectively. Therefore, the combined application of priming and biologic seed treatments can be recommended for increasing the P and K concentrations in the medicinal plants.

Keywords: Seed priming, Osmopriming, Sustainable agriculture.

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