

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

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### 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  $\text{KH}_2\text{PO}_4$  (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  $\text{ECe}=1$  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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