EFFECT OF SEAWEED EXTRACT AND COMPOST TREATMENTS ON GROWTH, YIELD AND QUALITY OF SNAP BEAN

By

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أثر المعاملة بمستخلص الأعشاب البحرية والمكمورة على نمو وإنتاجية وجودة محصول الفاصوليا الخضراء

رسالة مقدمة من

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ABSTRACT

Ehab Salah El-din Hamed, Effect of Seaweed Extract and Compost Treatments on Growth, Yield and Quality of Snap Bean. Unpublished Ph.D Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2012

This study was carried out during 2009 and 2010 seasons, on snap bean, (*Phaseolus vulgaris* L.). Bronco cultivar (fine type) grown at Brnashat village, Giza governorate, Egypt, in order to investigate the effect of seaweed extract and compost treatments in two experiments. The first experiment was carried in physiology Lab., Horticultural Department, Ain Shams University, to study the effect of soaking snap bean seeds in seaweed extract (0.0, 250, 500 and 750 ppm) each of the soaking treatments was applied for four periods (0 - 5 - 10 - 15) minute under optimum temperature (27± 2 ˚C) and low temperature (18± 2 ˚C), as a preliminary experiment to study the effect on seed germination. The experiment was laid out in factorial complete randomized design with four replicates. Results indicated that soaking in seaweed extract at 500 ppm for 10 minutes stronger induced seed germination with significance difference than the other concentrations and periods. The second experiment, was carried out on the seeds resulted from the best concentration from the laboratory experiment (soaking in 500 ppm seaweed extract solution for 10 minute) since they were used as a source for planting in the field for the second experiment which carried out to study the effect of three different mixture compost levels of seaweed comparing with the regular plant compost. So the four compost mixture treatments were, 19 m^3 regular plant compost + 1 m^3 seaweed compost / feddan, 18 m^3 regular plant compost + 2 m^3 seaweed compost / feddan, 17 m^3 regular plant compost + 3 m^3 seaweed compost / feddan and 20 m^3 / feddan of regular plant compost that used as control treatment combined with four concentrations of seaweed extract (0,0 -250 - 500 – 750 ppm) as foliar applications for three times and study their effects on vegetative growth,

flowering characteristics, yield parameters and chemical composition. The experiment was laid out in a split plot design with four replicates. Results indicated that spraying plants with seaweed extract at higher rate significantly increased plant height, number of leaves per plant, average leaf area, leaf and stem fresh weight per plant, leaf and stem dry weight per plant, percentage of fruit set, compared to the control. Seaweed extract at 750 ppm tested concentration exhibited the highest significantly pods yield compared to those of the untreated check and other treatments .Spraying seaweed extract at higher rates tended to have the highest values for photosynthetic pigments, N, P, K and Mg content of leaves whereas, protein content in pods, free amino acids percentage in leaves, carbohydrates in leaves and pods. Carbohydrates fraction in leaves at both rates of 500 ppm and 750 ppm seaweed extract recorded the highest values with significance than 250 ppm and control plants. The fiber percentage in pods has no significant difference between the treatments and control.

Seaweed compost treatments showed that using 3 m^3 or 2 m^3 per feddan gave the highest value of vegetative growth, flowering characteristics, yield parameters and chemical composition.

Therefore, it is concluded that reproductive , pod yield characteristics and chemical composition of snap bean responded positively to soaking the seeds before planting in 500 ppm of seaweed extract for 10 minutes then under the field conditions, using 2 m^3 of seaweed compost combined with foliar application of seaweed extract at 750 ppm for three times.

Key words: Snap bean, *Phaseolus vulgaris*, Seaweed extarct, Seaweed compost, Growth, Yield, Nutrient value.

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