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Effect of seaweed (*Ascophyllum nodosum*) based plant vitamin on the growth of spinach (*Spinacia oleracea*)

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Most cultivators are very keen on maximizing the quantity and quality of crop yield due to economic benefits. To achieve a high yield of crop, an optimal nutrition level in the plant has to be maintained. Although many soils have vast reserves of plant nutrients, only a small portion of these nutrients will be available to plants. Therefore chemical fertilizers and plant vitamins are used as external stimuli to increase productivity. Seaweed is rich in macro and micronutrients and it is used to produce plant vitamins. This research project was carried out to study the effect of a plant vitamin on NPK, trace metal residue levels and the growth rate in spinach.

The experiment was designed according to the Randomized Complete Block Design (RCBD) method and the plant vitamin was sprayed on spinach leaves except on those of the control. The growth rate of spinach was determined by measuring the length of the plant and the numbers of leaves. The macro and micro nutrients present in the seaweed, the plant vitamin and the spinach leaves were determined using the Kjeldahl method for N, molybdovanadate method for P, atomic absorption spectroscopic method for metals K, Mg, Ca, Fe and Zn and the gravimetric method for S. The seaweed, the main raw material used in producing the plant vitamin, was analyzed to monitor the amount of nutrients being transferred to the plant vitamin. Statistical analysis (MINI TAB 15.0) was performed to analyze the results obtained for all parameters.

The results indicated that K is the major constituent element in seaweed and that it does not contain Ca. The plant vitamin contains all the elements which were present in seaweed in a lower percentage. Further, results revealed that the plant vitamin directly affects the NPK levels; it increases the NPK residue levels and also increases the growth rate of spinach, but does not appreciably alter the levels of Mg, Ca, Fe, Zn and S.

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