ABSTRACT

Common bean (*Phaseolus vulgaris* L.) is the most sensitive crop to salinity stress with an eventual result a severe depression in growth and yield. Many attentions are paid to alleviate the deleterious impact of salinity stress using different materials which reflect inadequate influence on human health and terrestrialecosystem.The scope of the current study was to assess the main and interaction effects of two natural and safety materials; potassium humate as soil applicationand ascorbic acid as foliar spraying on growth and productivity of common bean plants cv. Bronco. Therefore,two field experiments were conducted during the summer seasons of 2012 and 2013 in the Experimental Farm, Faculty of Agriculture, Fayoum University. The experimental layout was a split- plot system in a Randomized Complete Blocks Design with three replications.Potassium humate levels (0, 50, 100 and 150 kg fed^{-1}) were randomly distributed in the main plots whilst, ascorbic acid concentrations (0, 100, 200 and 300 mg L^{-1}) were allocated in the sub-plots.

Gained results displayed that soil application of potassium humate at 100 kg fed^{-1}or ascorbic acid at 100 and/or 200 mg L^{-1} reflected the best significant positive influences on plant height, stem diameter, canopy dry weight and leaf area and their components $plant^{-1}$.Soil application of potassium humate at 50 and/or 100 kg fed^{-1} together with sprayingascorbic acid at 100 and/or 200 mg L^{-1} associated with the best significant results on stems and canopy dry weight and total leaves area $plant^{-1}$.

Number and weight of green pods plant^{-1}, total green pods fed^{-1}, number of dry pods plant^{-1}, weight of 100 dry seeds, dry seed yield plant^{-1} and fed^{-1} were positively responded to soil application of potassium humate at 100 kg fed^{-1} andspraying ascorbic acid at 200 mg L^{-1} while, average green pod weight did not respond. The sound of interaction between the two studied factors on total green pods and dry seeds yield and their components was absent.

Soil application of potassium humate at 100 and/or 150 kg fed^{-1} or ascorbic acid at 200 and/or 300 mg L^{-1} attained maximum mean values of total leaf chlorophyll and carotenoids content. The dual influence of the two investigated factors on leaf photosynthetic pigments content was not significant.

Leaf N, P, K, T. S. S and free proline contents went, significantly, forward due to soil application of potassium humate especially at 100 and/or 150 kg fed^{-1} Moreover, leaf N, P, T. S. S and free proline contents went, significantly, forward due to foliar application of ascorbic acid especially at 200 and/or 300mg L^{-1}. The combined treatments effect of the two studied factors on leaf N, P, K, T. S. S and free proline contents was at par. Leaf Cl and Na contents were, truly, depressed owe to application of potassium humate or ascorbic acid especially at 150 kg fed^{-1}or 300 mg L^{-1}, orderly.However, the interaction of the two studied factors on leaf Cl and Na contents was not intrinsic.

The content of protein and carbohydrates in dry seeds were,significantly, augmented when the plants were fertilized with potassium humate or foliar sprayed with ascorbic acid especially at 150 kg fed^{-1} or 300 mg L^{-1}, consecutively. All combined treatments

of potassium humate levels and ascorbic acid concentrations did not show any influence in these respects.

Key Words: Bean (*Phaseolus vulgaris* L.), Potassium humate, Ascorbic acid, Salinity, Vegetative growth, Yield, Chemical composition.