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Impact of some antioxidants on growth and productivity of two snap bean cultivars under Fayoum conditions

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SUMMARY

Poulista and Xera are the most important snap bean cultivars growing under El- Fayoum conditions, for both local market and export. Antioxidant substances are organic compounds, i.e., organic acid or hormones. Recent studies concentrated on the beneficial effects of these antioxidant substances to improve plants performance. Therefore, an experiment was carried out during the fall seasons of 2016 and 2017 in a private farm at El-Fayoum Governorate, Egypt to study the effect of 7 antioxidant substances, i.e., indole -3- acetic acid, indole -3- butyric acid, ascorbic acid, citric acid, salicylic acid, tartaric acid and oxalic acid as a foliar application, each at the rate of 50 mM, on growth characters, green pods yield and pod qualities of Poulista and Xera plants. Seeds of both cultivars were sown in September; experimental design was spilt plot. Antioxidant applications were done after 20, 30 and 40 days from planting. Results showed that Xera cultivar was the higher in pod length, pods weight/ plant, chlorophyll a, b and total chlorophyll content in leaves compared with Poulista cultivar. Moreover, Poulista was higher in carbohydrates and amino acid content in stem compared with Xera cultivar.

All foliar antioxidant applications significantly increased all growth characters, pods yield and pod quality and chemical composition of carotenoids, chlorophyll a, b and total chlorophyll, as well as, carbohydrates and amino acid contents in leaves, stem and pods of snap bean plants compared with the control treatment. The superior application was oxalic acid followed by ascorbic acid, respectively, while citric acid gave the highest content of amino acid in stem. The remarkable growth and production improvement in Xera or Poulista cultivar obtained when plants treated with oxalic or ascorbic acid 3 times (20, 30, 40 days) from planting at the concentration of 50 mM.