

Effect of Arginine and GA3 on growth, yield, nutritional values and chemical constituents of Faba bean plants grown under sandy soil conditions

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Abstract: Two field experiments were carried out in successive winter seasons of 2012/2013 and 2013/2014 at the newly reclaimed sandy soil conditions Researches and Production Station of National Research Centre (NRC), Al Nubaria district, Al Behaira Governorate, Egypt. The objective was to study the effects of foliar application of arginine (200ppm/l or 300ppm/l) and Gibberellic Acid (GA3) (75ppm/l or 150ppm/l) on vegetative growth, yield and yield components, as well as chemical constituents and mineral nutrients of faba bean shoots and seeds contents. Results of the combined analysis of the two seasons showed that foliar application of various concentrations of arginine or GA3 significantly improved vegetative growth of faba bean growth parameters, i.e. shoot length, root length, the fresh and dry weight of shoots and number of branches per plant as well as photosynthetic pigments contents at 75 days after sowing as compared with control treatment. Also, shoot chemical constituents i.e. total soluble sugars, total carbohydrates, poly saccharides, free amino acids, total phenol and IAA at 75 days after sowing significantly increased with foliar application treatments of arginine and GA3 as compared with control treatment. In addition the data revealed that, foliar spraying of both arginine or GA3 led to significant increases in faba bean yield and yield components as well as significant improvement of the nutritional status of faba bean plants and seeds nutrient, carbohydrates and protein content. The results showed that foliar application of arginine was more effective than GA3 in concern of growth, yield and yield components plant and seeds chemical constituents and nutritional status especially at the high concentration (300ppm/l arginin and 150ppm/LGA3).

Key words: Faba bean, Arginine, Gibberellic Acid (GA3), Sandy soil.