

Effect of Different Rates of Potassium Fertilizer on the Growth, Productivity and Quality of Some Broccoli Cultivars under New Reclaimed Soil Conditions

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Abstract: Two field experiments were conducted at the agricultural experimental station of National Research Centre, at El-Nobaria region, Beheira Governorate, Egypt, during two successive winter seasons 2012/2013 and 2013/2014 to study the effect of different rates of potassium fertilizer (20, 40 and 60 kg K₂O/fed.) on growth, production and quality of three broccoli cultivars, i.e., Calabrese American, Calabrese France and Southern Star Hybrid in sandy soil under drip irrigation system.

Results indicate that Southern Star Hybrid cultivar was superior in its vegetative growth; i.e., leaves number, fresh weight of spears and total plant; main spear yield; physical head quality, (mean head weight and head diameter); chemical head quality (vitamin C); N% in leaves and stems; P% in stems and spears as well as K% in stems and spears followed by Calabrese France and Calabrese American, respectively. On the other hand, Calabrese American were the tallest plants, heaviest leaves and stems fresh weight, highest leaves and spears dry weight and best TSS but Southern Star hybrid heads were the best vitamin C content and Calabrese France cultivar gave the highest values of branches number, stem dry weight and protein percentage.

Potassium levels differed statistically in their effect on the vegetative growth of broccoli plants (plant height, leaves numbers per plant, fresh weight of leaves, stems and spears; dry weight of leaves, stems and spears; main spear yield; physical heads quality (weight, height and diameter); chemical head quality (TSS, vitamin C and protein percentage); N, P and K% of leaves, stems and heads. The highest vegetative growth was obtained by adding 40 kg K₂O/fed., followed by 60 kg K₂O/fed., which came in the second order. The lowest values of vegetative growth; main head yield; physical heads quality and N, P and K of broccoli leaves, stems and heads were obtained by 20 kg K₂O/fed. The results indicated that combined effect of cultivars and mineral potassium levels caused statistical increases in vegetative growth, yield, physical heads quality; N% in stems and K% leaves of broccoli. The highest vegetative growth, yield and chemical contents were obtained by the combined effect of Southern Star Hybrid cultivar with 40 units K₂O/fed.

Keywords: Broccoli, Cultivars, K fertilizer, Yield, Quality, TSS, Vitamin C and Protein.