

Bio, Mineral and Organic Fertilization Increase Head Yield, Enrich Mineral Content and Nutritional Value of Broccoli



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Heads

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Abstract : Two field experiments were carried in sandy soil opened field using drip irrigation system during two successive winter seasons in 2012/2013 and 2013/2014. This work aimed to investigate the effect of mineral and organic fertilizers with or without bio-fertilizers inoculation on yield, mineral content and nutritional value of broccoli heads. Five treatments of bio-fertilizers were applied using a mixture of nitrogen fixing and phosphorus solubilizing microorganisms (*Azotobacterchroococcum*, *Bacillus megaterium*, *Arbiscular mycorrhizae*, *Bacillus polymyxa*). Four equations of mineral and organic fertilizers were applied. Applying mixture of *Azotobacterchroococcum* and *Arbiscular mycorrhizae* recorded the highest values of total heads yield, heads mineral content, *i.e.* N, P, K, Ca and Mg and nutritional value of broccoli heads expressed as crude protein, total chlorophyll and total carotenoids contents. Fertilizer equation of 75% mineral + 25% organic of the recommended fertilizer units exhibited the highest values of total heads yield, the mineral content (P, K, Ca and Mg) and nutritional value of heads as compared with the other treatments. Fertilizer equation of 25% mineral+ 75% organic of the recommended fertilizer units achieved the highest vitamin C content of broccoli heads. The combined effect of the two mixtures of *Azotobacterchroococcum*+ *Arbiscular mycorrhizae* with equation of 75% mineral+ 25% organic of the recommended fertilizer units recorded the highest values of total heads yield, mineral content and nutritional value of broccoli heads except for vitamin C content. The highest vitamin C content was obtained by the equation of 25% mineral +75% organic fertilizer without bio-fertilization.

Key words: Broccoli; Bio-fertilizers; Mineral fertilizers; Organic fertilizers; Yield; Nutritional value; Mineral content.

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