

**INFLUENCE OF DIFFERENT NITROGENOUS
AND POTASSIC FERTILIZATION LEVELS ON
VEGETATIVE GROWTH, HEADS YIELD AND
CHEMICAL COMPOSITION OF BROCCOLI
(*Brassica oleracea* var. *italica*).**

BY

Mofreh Saadawy Tolba Khaled

B. Sc., Agric. Sci. (Plant production), Fac. Agric. Fayoum, Cairo Univ., 1990

M. Sc., Agric. Sci. (Olericulture), Fac. Agric. Fayoum, Cairo Univ., 1997

A THESIS

**Submitted in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy in Agricultural Sciences (Olericulture)**

**Horticulture Department
Faculty of Agriculture at El Fayoum
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ABSTRACT

Two factorial experiments, under the field conditions of El-Fayoum Governorate, Egypt during the winter seasons of 2001/2002 and 2002/2003, were achieved to assess the influences of four different N rates (60, 90, 120 and 150 Kg N fed⁻¹) and four various K levels (24, 48, 72 and 96 Kg K₂O fed⁻¹) on the vegetative growth, yielding heads capacity and chemical composition of broccoli var. Italica. Plants supplied with 150 Kg N fed⁻¹ produced heavier dry weight of the aerial vegetative parts, more number and larger area of leaves plant⁻¹ than those supplied with lower N levels. Generally, heavier weight and larger diameter of the central head, more number and heavier weight of the lateral heads as well as weight of the total heads yield were higher with 120 or 150 than 60 or 90 Kg N fed⁻¹. The contents of N, protein and total sugars increased, while those of P, K and S decreased when N application increased up to 150 Kg N fed⁻¹. Potassium levels, apparently, affected the vegetative growth at flowering time and the dose of 96 Kg K₂O fed⁻¹ was a better choice. All K levels did not influence the weight of central head, whilst the addition of 72 or 96 Kg K₂O fed⁻¹ augmented the number and weight of lateral heads, total heads yield and diameter of the central head. Nitrogen and protein contents of the head were a function of K applied rate. Moreover, increasing K applied level increased K concentration, but depressed P and S concentrations of leaves, stem and head. The treatment combination of 150-96 Kg of N-K₂O fed⁻¹, orderly recorded the best magnitudes of stem dry weight and leaves area plant⁻¹. Soils applications of N at 120 Kg N fed⁻¹ and K at 48 Kg K₂O fed⁻¹ significantly resulted in the highest mean values of central head weight and diameter and total heads yield, in the 1st season, while the addition of 150-96 Kg N-K₂O fed⁻¹, respectively, significantly, gave the greatest number of lateral heads, in the 2nd season. The combination of 60 Kg N and 96 Kg K₂O fed⁻¹ achieved the highest K content, whereas the combination of 60 Kg N and 96 Kg K₂O fed⁻¹ attained the best contents of P and S in the different plant parts, in both seasons.

Key Words: Broccoli- Fertilization – Nitrogen – Potassium – Vegetative growth – Heads yield – Chemical composition.