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CHEMICAL COMPOSITION AND QUALITY OF SPINACH PLANT (*Spinach oleracea L.*) AS AFFECTED BY MINERAL FERTILIZATION AND SOME RESIDUAL PLANT EXTRACTS.

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ABSTRACT

Two pot experiments were carried out under the green house of Faculty of Agriculture.; El-Mansoura University during the two successive winter seasons of 2006-2007 and 2007-2008 to study the substitution of some organic extracts which prepared from potato, tomato and fruit leaves instead of a part of mineral fertilizer to produce a safe yield of spinach plant. Twelve treatments were arranged in complete randomize block design with 3 replicates, which were the simple possible combination between four treatments of plant extracts (0, Potato extract, Tomato extract and fruit leaves extract) for foliar spraying and three treatments of N, P and K fertilizers (0, 50 % and 100 %) of recommended doses as soil addition and their combination .

The obtained results can be summarized as follow:

- Spraying of residual plant extracts either in a single form or in combination with mineral fertilization led to a positive effect on the growth and yield of spinach plants.
- Increasing the rate of N, P and K fertilization from 50 to 100 % RD significantly increased the mean values of N, P and K contents in the leaves of spinach plant; such effect had no significant effect on the values of Fe (mg/100g).
- The accumulation of nitrate and nitrite in spinach fresh leaves increased as the level of mineral fertilizers increased. Foliar spraying of residual plant extracts which contain micronutrients in the presence of mineral fertilizers resulted in pronounces decrease in the values of NO_3-N and NO_2-N in spinach plant.
- Foliar spraying of plant residual extracts as solely had no significant effect on the mean values of total oxalate, while such effect significantly increased the values of soluble oxalate as compared to the untreated plants. There is no significant difference between the average values of total oxalate in spinach plant due to an addition of N, P and K fertilizers combined with spraying of residual plant extracts as compared to the same values obtained from the plants treated with N, P and K fertilizers only.
- Under the same condition of this investigation it could be recommended that; soil addition of N+P+K fertilizers at the rate of 50% from the recommended doses for spinach plant coupled with foliar spraying of potato foliage residual extract is considered as the best treatment for producing a safe yield of spinach plant.

Keywords: residual plant extracts, mineral fertilizers, oxalate, nitrate, nitrite, spinach plant.

INTRODUCTION

Spinach (*Spinach oleracea* L.) is one of the major leafy vegetables, which is widely cultivated in Egypt. Spinach is a good source of vitamin A, B_1, B_2 and C, as well as minerals such as calcium, iron and magnesium (Kawazu *et al.*, 2003). Nonetheless, its nutritive value in human diets is limited to a large extent because it is also rich in oxalate and nitrate.