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EFFECT OF APPLICATION METHODS OF POTASSIUM AND SOME MICRONUTRIENTS ON YIELD AND QUALITY OF POTATO

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ABSTRACT

Two field experiments were carried out at Ali Moubark Agric., Res. Station during two successive seasons 2007/2008and 2008/2009 on potato cv. Diamant to study the vegetative growth characters, tuber quality, tuber minerals content and total tuber yield as affected by the application methods of K-fertilizer (soil application, foliar application and soil + foliar application, either single and /or in combination with foliar application of zinc or manganese or boron) three times during plant growth i.e. at 45, 60 and 75 DAP.

Almost all the parameters of the potato plants which received 50% soil application K-fertilizer + 50% foliar application significantly increased as compared with other application methods.

On the other hand, most vegetative growth parameters were significantly increased by foliar spraying of potato plants with micronutrients and led to improve the tuber quality parameters i.e. all carbohydrate fractions, the protein of tuber, the tuber weight and total tuber yield as compared with the control.

In general, application of K-fertilizer as 50% of the recommended rate used as soil application + 50 % of that added as foliar application in combination with foliar spray of micronutrients recorded maximum values of plant growth parameters, improved tuber quality characters and obtained highest tuber yield/fed. Therefore, this treatment could be recommended for raising potato yield and improving tuber quality and reducing the productive cost under similar conditions.

INTRODUCTION

Potato is one of the most important vegetable crops all over the world. In Egypt the policy of the country aims to improve potato production so as to meet the increasing demand of the local consumption and to increase the amount of potato for exporting. Fertilization especially with potassium is considered as one of the most important factors affecting the growth and the yield of potato.

Potassium is an essential element for all living organisms. In plants, it is an important cation involved in physiological pathways (Beringer *et al.*, 1983; Duke and Collins, 1985 and Stedle, 1994). In particular, the ability of ATPases in membranes to maintain active transport is highly dependent on adequate K supply. Thus, efficient cell development and growth of plant tissues, translocation, storage of assimilates and other internal function, which are based on many physiological, biochemical and biophysical interaction, require adequate K in the cell sap (Marschner, 1995 and Ruggiero *et al.*, 1999).

Potassium is an essential element and plays an important role in protein and starch formation, activation of many enzymes, cations, anions balance, cell extension and osmoregulation (Marschner, 1995).

Potassium application is more effective for improving vegetative plant parameters, tuber quality and tuber yield. Davenport and Bently (2001)