

## EFFECT OF SPRAYING WITH ZINC AND MANGANESE AT DIFFERENT STAGE OF POTATO GROWTH ON QUALITY OF POTATO TUBER (*SOLANUM TUBEROSUM* L.) DESIREE CLASS: AS A ROLE OF FRIENDLY BIOCHEMICAL HEALTH

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**ABSTRACT :** A field experiment was conducted to study the effect of foliar application of zinc and manganese at different stage of potato growth on some quality characteristics of potato tuber (*Solanum tuberosum* L.) class (Desiree) fertilized with organic matter in silt clay loam texture soil in one of the agricultural fields in Department of Horticulture, Faculty of Agricultural Engineering Sciences, University of Baghdad for the spring season 2012. A randomized complete block design RCBD was used with three replicates including two factors the first factor is foliar application includes the treatment ( $T_0$  water spray only,  $T_1$  spraying with zinc at  $60 \text{ mg l}^{-1}$ ,  $T_2$  spraying with manganese at  $30 \text{ mg L}^{-1}$  and  $T_3$  spraying with zinc at  $60 \text{ mg L}^{-1}$  + Spraying with manganese at  $30 \text{ mg L}^{-1}$ ) and the second factor is the stage of potato growth includes the treatments ( $F_1$  spraying in the vegetative growth,  $F_2$  spraying in tuber initiation and  $F_3$  spraying at tuber bulking). Addition of organic manure (mixture of equal amounts of cows, sheep and chicken) at  $50 \text{ tons.ha}^{-1}$  for all treatments at 10 days before planting. The results showed the significant effect of zinc and manganese spraying at different stage and their interactions, the treatment  $T_3F_1$  has recorded the highest dry matter for tubers at 16.17% with an increase of 24.57% compared to the treatment  $T_0F_1$  and recorded the highest Starch percentage at 10.40% with an increase of 42.08% compared to the treatment  $T_0F_2$ .

**Key words :** Foliar application, zinc, manganese, potato, desiree CV.

### INTRODUCTION

Potato, *Tuberosum solanum* L. is one of the four most important crops in the world as a main crop after wheat, maize, rice and tuberous crops, which play a major role in the economic and nutritional system by providing adequate food alongside and other strategic crops to cover growing population requirements (Hassan, 1999 and Bowen, 2003), the world production of this crop in 2007 reached a record 684.729 thousand tons per year, an increase rate of 4.5% over the previous ten years and a cultivated area of more than 20 million hectares. In Arab countries Iraq comes the fourth stage after Egypt, Algeria and Morocco to spread potato cultivation in the last two decades with an area of 51 thousand hectares in 2005 and a productivity of  $15.843 \text{ ton.ha}^{-1}$ . Potato yield in Iraq in 2014 was 646660 ton with area planted 40600 hectares with a production rate of  $15.9 \text{ ton.ha}^{-1}$  (FAO, 2017). Human consumption recorded (per capita/year) in America, Canada, Egypt and Iraq 50.26, 75.22, 21.50 and 30.45 kg, respectively (FAO, 2008).

Potato is a stress-tolerant soil-growing crop of soil

during its relatively short growth (90-120 days). It requires quantities of macronutrients and micronutrients to obtain optimal growth, high productivity and tubers quality. In addition, the balance between the growth of the soil and air parts is very important in quantifying this is achieved through the provision of the nutrients needed by the plant at different stages of growth (Al-Shabibi, 2003), potatoes are rich in nutrients, with dry matter ranging from 15-29%, 10-25% starch, 1-2% protein and 100 calories. It is an important source of energy for carbohydrates containing at 1.17%, 0.1% fat, 1% minerals, 70% potassium, magnesium, iron, iodine, manganese, calcium, manganese and others. In addition, they contain vitamins, especially vitamin C, vitamin B and vitamin A (Kralovic, 2000). AL-Fadhly (2018) found that sprinkling with (Zn + Mn) have given higher concentration of N, P, K in tubers.

Zinc is a micronutrient essential to plant and has a major role in the development of plant growth and productivity. It contributes to many of the plant's biological and physiological processes such as photosynthesis and