

# Effect of Foliar Application of Zinc on Seasonal Dynamics of Mineral Nutrients by Grapevine (*Vitis vinifera* L.)

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## INTRODUCTION

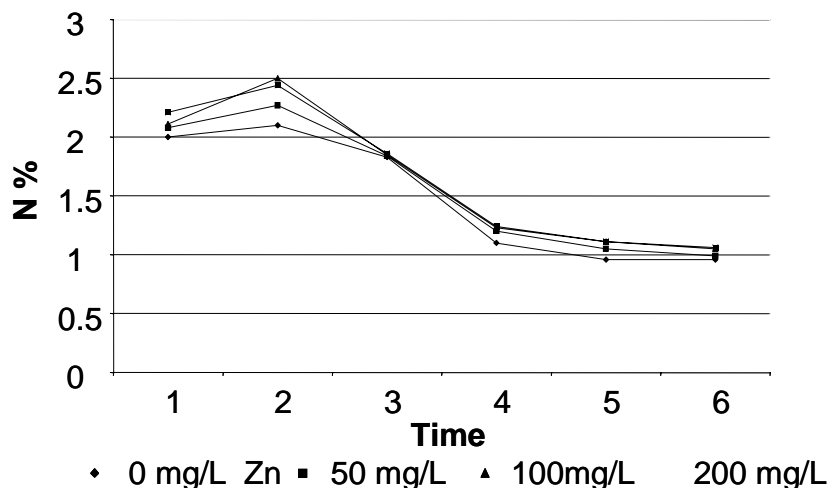
Grape (*Vitis vinifera* L.) is one of the most popular and preferred fruit crops in the world (EL-Salhy 2001). Halwani Lebanon and Kamali cultivars are table grapes and the most important seeded grape varieties grown in Iraq (Alimam 1998). Zinc plays an important role as a metal component of enzymes, as a functional, structural or regulatory co-factor for a large number of enzymes, in carbohydrate metabolism, protein synthesis and in the synthesis of tryptophan, and as a precursor for the synthesis of IAA (Marschner 1986). This study aimed to recognize the effect of Zn-EDTA spraying on N, P, K, Fe and Zn concentrations in grapevine petiols and berries and on the dynamics of these elements during the growth season.

## METHODS

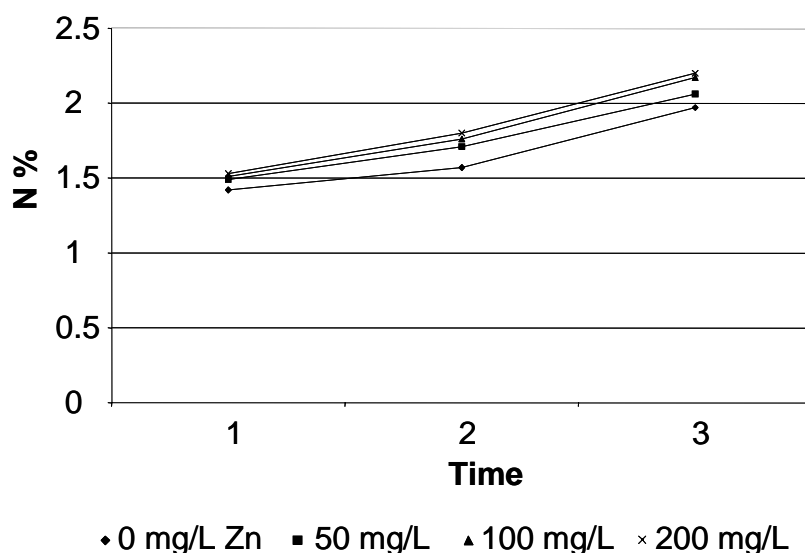
The present investigation was carried out during two successive seasons in 2005-2006 with Halwani Lebanon and Kamali grapevine cultivars at the Nineveh Horticulture station in Mosul, Iraq. These cultivars were trained on a cane system with four canes (each with 12 eyes) and six renewal spurs (each with 2 eyes). This study looked at the effects of four levels of foliar applications of Zn-EDTA (0, 50, 100 and 200 mg L<sup>-1</sup>) on the seasonal dynamics of N, P, K, Fe and Zn concentrations of grapevine leaf petiols and berries. Spraying took place before the flowering and fruit setting stages. The petiols from both cultivars were sampled six times: before spraying with Zn-EDTA at the end of April and in full bloom, after fruit setting of three weeks, in the veraison stage of berries, during the 2<sup>nd</sup> fruit growth on August, 1<sup>st</sup>, and during fruit ripening (at fruit harvesting). The berries from both cultivars were sampled three times: during fruit setting stages on the 7<sup>th</sup> of June, in veraison stage of berries and at the ripening (at Harvesting fruits).

## RESULTS AND DISCUSSION

The results show that N, P, K, Fe and Zn concentrations in petiols differed according to the growth seasons (Fig.1). There were differences in the status of mineral nutrients between petiols and berries of the studied cultivars. The N, P, K, Fe and Zn concentrations increased in the petiols and berries of both cultivars and in both seasons with increasing levels of foliar Zn-EDTA application. The N, P, K, Fe and Zn concentrations in petiols were high at the beginning of the growth season but decreased towards the end of the growth seasons in both seasons and cultivars. The results also show that N, P, K, Fe and Zn concentrations in the berries were low in the beginning growth stages of berries, but the nutrient content of the berries increased towards veraison and ripening stages (Fig. 2). The macro- and micronutrients used for the growth of shoots and berries transitioned from leaves to plant tissues and berries and were used in many bio-processes in the plant. There are fourty figures in this research.



**Fig. 1. Effect of foliar application of Zn-EDTA on N content of petiols in 2005**



**Fig. 2. Effect of foliar application of Zn-EDTA on N content of berries in 2005**

## CONCLUSIONS

Foliar application of Zn-EDTA led to an improvement of macro- and micronutrients in the petiols and berries of both grape cultivars and in both seasons to effectively increase yield and improve fruit quality of Halwani and Kamali grapevines.

## REFERENCES

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