

Evaluation of the effect of Zinc and Selenium spray application on hop yield and quality

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INTRODUCTION

Humulus lupulus L. produce cones that are used as aromatizing and flavouring agents in beers. Hop has a rapid growth, requiring a high nutritional support for a good development of the plants. Foliar fertilization is recently suggested a sustainable choice to provide plant macro and micronutrients. Until now, zinc (Zn) is known to increase plant growth, while selenium (Se) showed a positive effect against biotic and abiotic stresses in several plant species, and no studies have been performed on hop. Zn, known to affect plant growth, and Se, with potential positive effect against biotic and abiotic stresses.

MATERIAL AND METHODS

Cascade cultivar plants were grown in field condition and microelements were applied using spray fertilization. The field trial, comprised a common fertilization for all plants followed by three different applications of microelements (T1: Zn; T2: Se; T3: Zn+Se), compared with a control (C: base fertilization). Each condition were tested on plants per 3 row. The analysis were performed using HPLC-UV for bitter acids determination, using ICE-4 as a standard. Essential oil yield were determined using steam distillation.

CONCLUSIONS

Each fertilization plans differently affect hop quality and quantity. Alpha acids show their higher content in T1, compared to C and T3. Essential oil yield was higher in hops treated with T1 and T2. The results indicate a positive influence of Zn on the quantity of bitter acids, oil yield and on the hop cones production per plants. The experiment, allowed the enhancing of the quality of hop cones.

OBJECTIVE

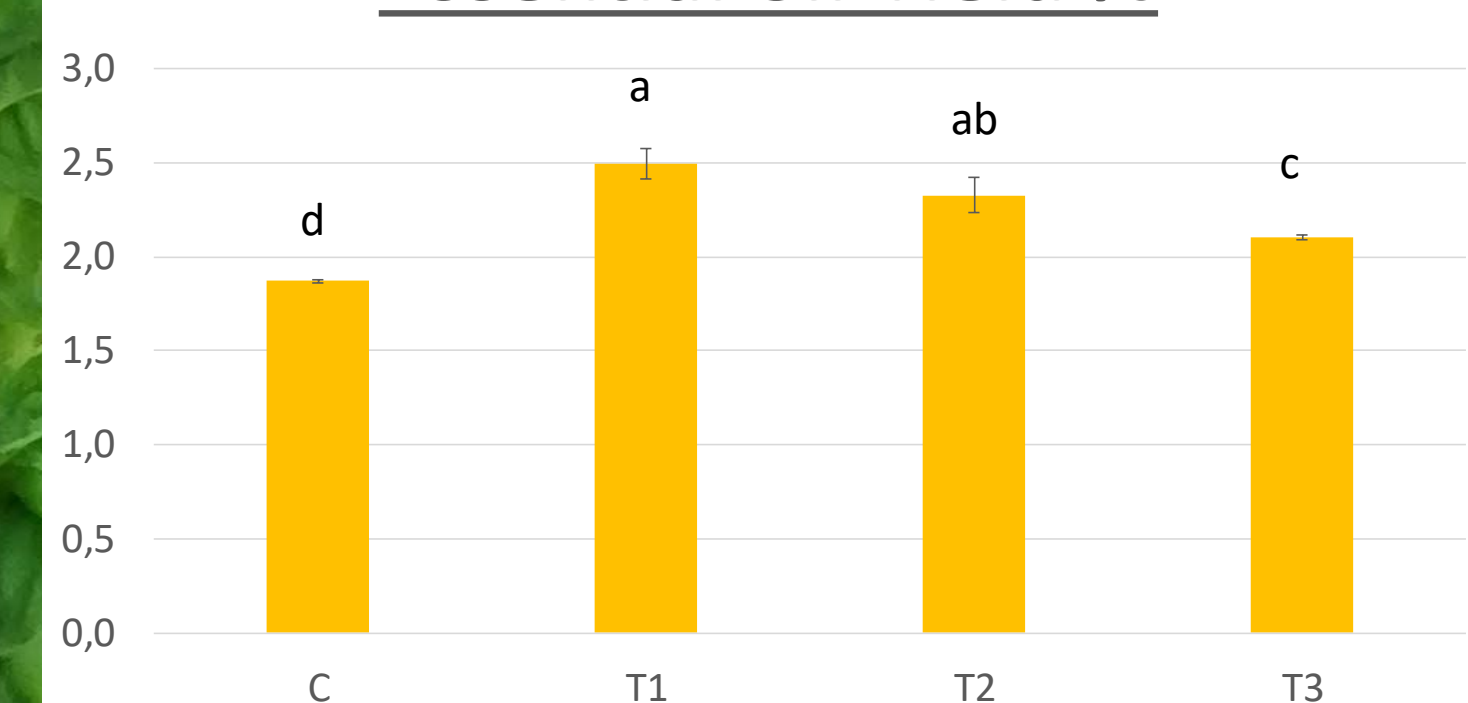
The present study aims to understand the effect of different microelements (Zinc – Zn, Selenium – Se, and their combination), applied using foliar fertilization on the quality of hop cones (cv. ‘Cascade’).

RESULTS AND DISCUSSION

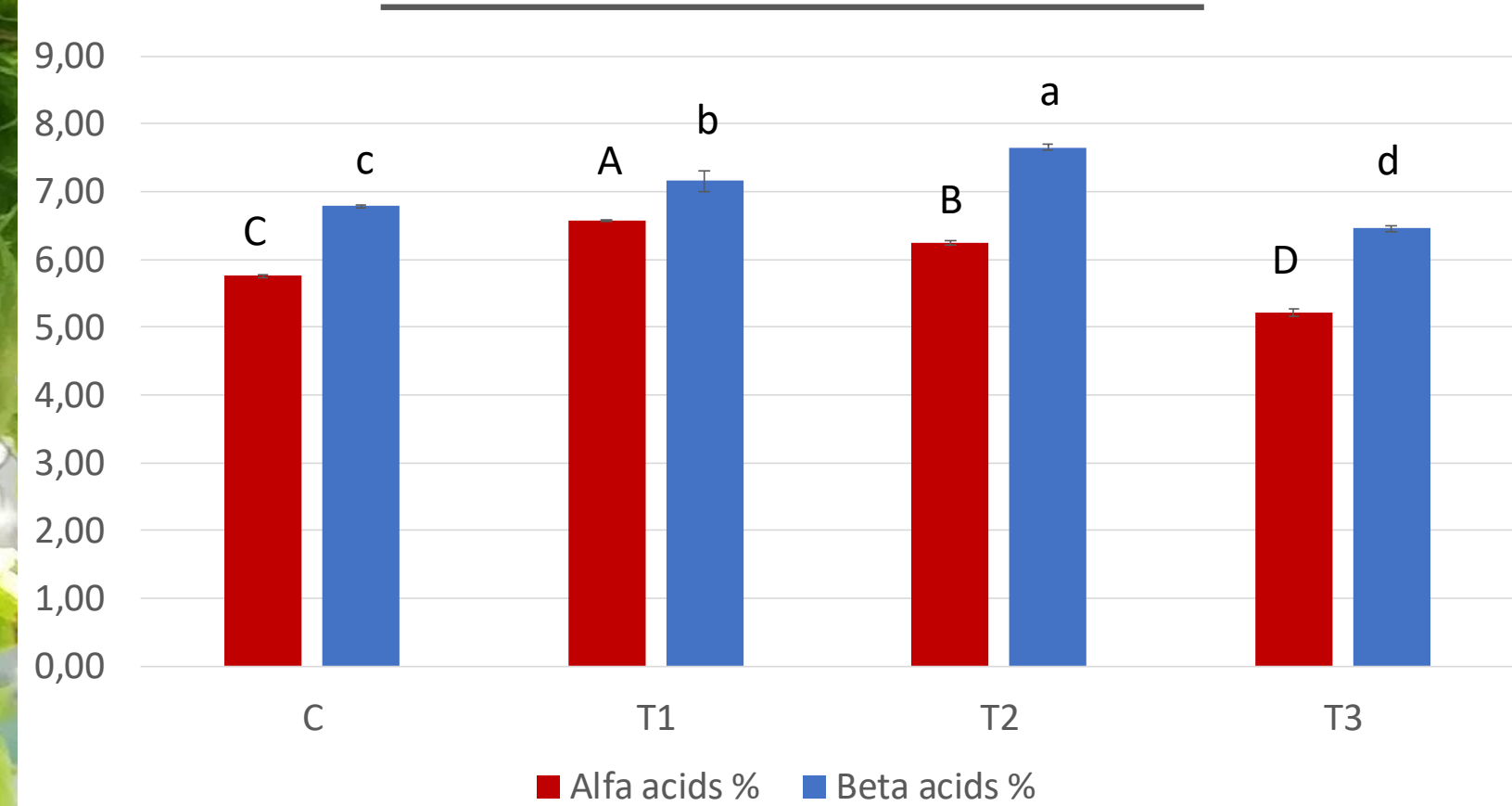
In the growing season 2022, hop yield per different fertilization plans were 1.6 Kg fresh cones per plants for C, 1.7 kg of fresh hop per plants in T1, 2.5 kg per plants for T2, and 1.9 kg of fresh hop per plants in T3.

Essential oil showed an higher content in T1, compared to T2, T3 and C. The same trend is observable in bitter acids content, thus highlighting an elicitors effect on the biosynthesis of these secondary metabolites. Cohumulone percentages on the total alpha acids content instead, did not show differences among treatments.

Essential oil Yield %



Bitter acids content %



Cohumulone % on total alpha acids

