



Macro- and Microelements of Globe Artichoke as Effected by Mycorrhization and Fertilization

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Introduction

Globe artichoke is recognized as a good nutritional vegetable, also due to its good content in minerals. The accumulation of these compounds in plant tissues is influenced by various abiotic and/or biotic factors, including soil characteristics, agronomic techniques (e.g. mycorrhization and fertilization dose), and the genotype. The aim of the present work was to evaluate the influence of mycorrhization and fertilization dose on the variation of the macro- and micro-elements in the receptacle of globe artichoke.

Materials and Methods

The 'ovoli' was planted in August 2019 and arranged in a randomized block experimental design with three replicates, for soil mycorrhization and fertilization treatments (Table 1, Figure 1). The inoculation was carried out with fungi of the genus *Glomus* spp. through fertigation. The receptacles were manually separated from the other fractions of the head and oven-dried at 65°C until a constant weight was reached. The content of macro- (K, Na, Ca, Mg, N) and micro-(Mn, Fe, Zn, Cu) elements was evaluated and expressed as g or mg kg⁻¹ of dry matter (DM), respectively. The data were subjected to an one-way analysis of variance and means were separated by *LSD* test, when the *F*-test was significant.

Table 1. Schematic representation of the treatments applied in the trial.

Treatment	Mycorrhization	Fertilizer unit (kg ha ⁻¹)		
		N	P ₂ O ₅	K ₂ O
T1 ^a	+	250	80	150
T2 ^b	+	125	40	75
T3 ^c	-	250	80	150
T4 ^d	-	125	40	75

^aconventional fertilization; ^bhalf conventional fertilization; ^cconventional fertilization (witness); ^dhalf conventional fertilization

Results

Significant differences were found among the treatments under study only for the content in K, Mg, Fe and for the Na/K ratio (Figure 1). In addition, the mycorrhizal plots showed a better development of both epigeal biomass and root system (Figure 2).

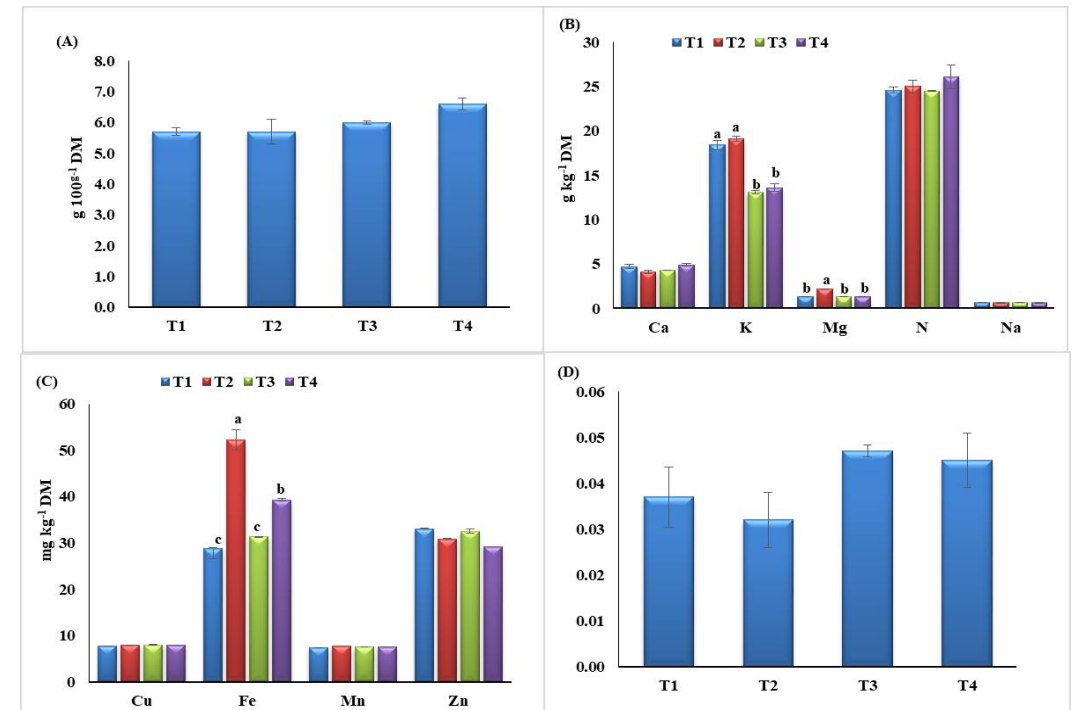


Figure 1. Effect of mycorrhization and fertilization dose on the ash (A), macro-element (B), micro-element (C) content and Na/K ratio in receptacle of globe artichoke. Different letters within each treatment significant differences for P ≤ 0.05. Bars indicate ± standard deviation. For the acronyms of the treatments under study, see table 1.

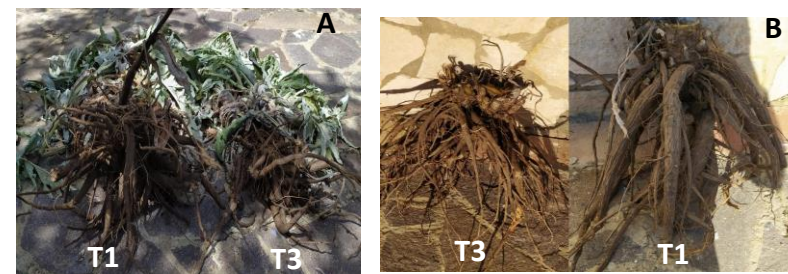


Figure 2. Effect of mycorrhization and fertilization dose on the fresh weight of the residual epigeal biomass (A) and the root system (B) of plants at the end of the production cycle.

Conclusions

The mycorrhization and fertilization dose here adopted, appear to promote the epigeal biomass and root system of the globe artichoke plants. In particular, the mycorrhizal plots accumulated more K and had the lowest Na/K ratio.