



THE MINERAL CONTENT OF THE POTATO

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Abstract: Minerals are the basic elements of metabolism and have a structural and indispensable role for the realization of metabolic functions in the human and plant organism. They are responsible for water balance in the body, for the transmission of impulses in nerves and muscles, and healthy bone substance could not be possible without sufficient mineral consumption. The potato is a particularly important plant for human nutrition, animal feed and industrial processing. The potato provides the body with minerals such as magnesium, phosphorus, potassium, calcium, or zinc. Potassium is an essential mineral because it helps the body function properly. The experiment was done for 2 years, 2022-2023, on the Carerra potato variety, and the potato crop was sown mechanized, and the maintenance work was also done mechanized, and the land was fertilized with manure 20t/ha. and complex fertilizers N100P80K0 :500 kg/ha. , in the town of Cralovaț, Timiș county. This study aimed to monitor the content of minerals Ca, K, Mg, Mn, Cu and Zn and evaluate some quality parameters in *Solanum tuberosum* tubers. These determinations were made by atomic absorption spectrophotometry. This two-year study was conducted to investigate the influence of fertilization and cultivar on potato tuber quality. The results were within the limits provided in the specialized literature.

• Introduction

Minerals are the basic elements of metabolism and have a structural and indispensable role for the realization of metabolic functions in the human and plant organism.

Knowing the mineral content of potato tubers allows regulating their nutrition in order to obtain quality harvests. Thus, potassium is necessary for the transport and storage of carbohydrates, regulation of the water regime, reduces susceptibility to diseases; calcium improves tuber storage and skin quality and reduces susceptibility to diseases, magnesium is indispensable for the formation of chlorophyll, manganese needed for the photosynthesis process; zinc participates in the synthesis of auxins, and copper influences the metabolism of nitrogen and carbohydrates.

• Material and method

Research within the stated theme was carried out in an experimental field in Cralovaț, Timiș County, and then in the research laboratories of the Agrochemistry discipline within the Faculty of Agriculture in Timisoara.

The experiment was carried out on a potato crop of the Carerra variety, for two years, 2022-2023. The culture was fertilized with manure (20t/ha) and with complex fertilizer N100P80K0 (500kg/ha).

For the experiment I used both whole, skinned potato tubers and peeled potato tubers. The minerals Ca, K, Mg, Mn, Cu and Zn were determined by atomic absorption spectrophotometry.

• Results and discussions

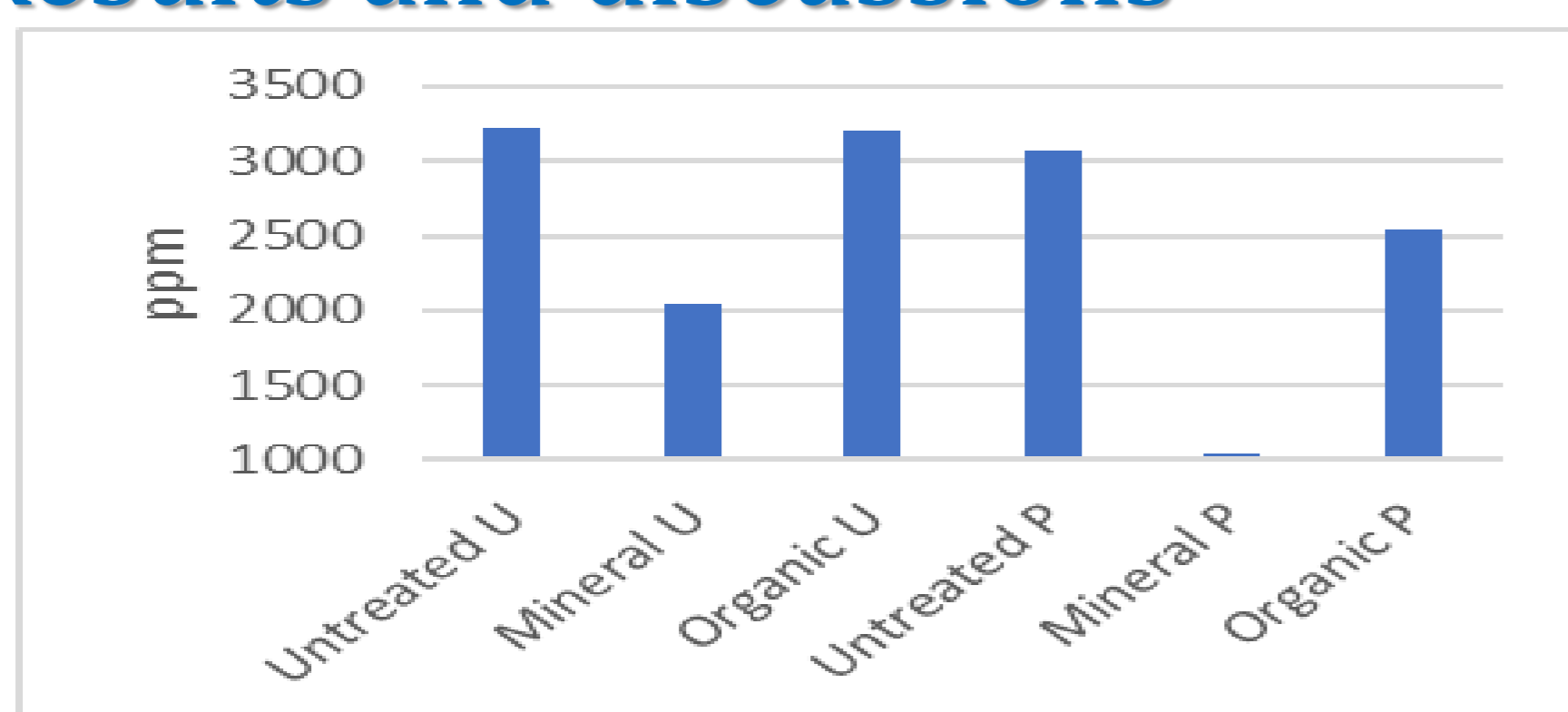


Fig.1. Potassium content in potato tubers (U – unpeeled, P – peeled)

The potassium content in potato tubers was between 1044 and 3210 ppm, the higher content being determined in unpeeled tubers. The highest content of potassium was determined in the unfertilized version, > 3000 ppm, and the lowest content in the version fertilized with mineral fertilizer. Organic fertilization led to the accumulation of a high amount of potassium in unpeeled tubers, namely 3068 ppm, while in peeled tubers the value determined was 2540 ppm.

• Conclusions

This study aimed to monitor the content of minerals Ca, K, Mg, Mn, Cu and Zn and evaluate some quality parameters in *Solanum tuberosum* tubers. These determinations were made by atomic absorption spectrophotometry. This two-year study was conducted to investigate the influence of fertilization and cultivar on potato tuber quality. The results were within the limits provided in the specialized literature.

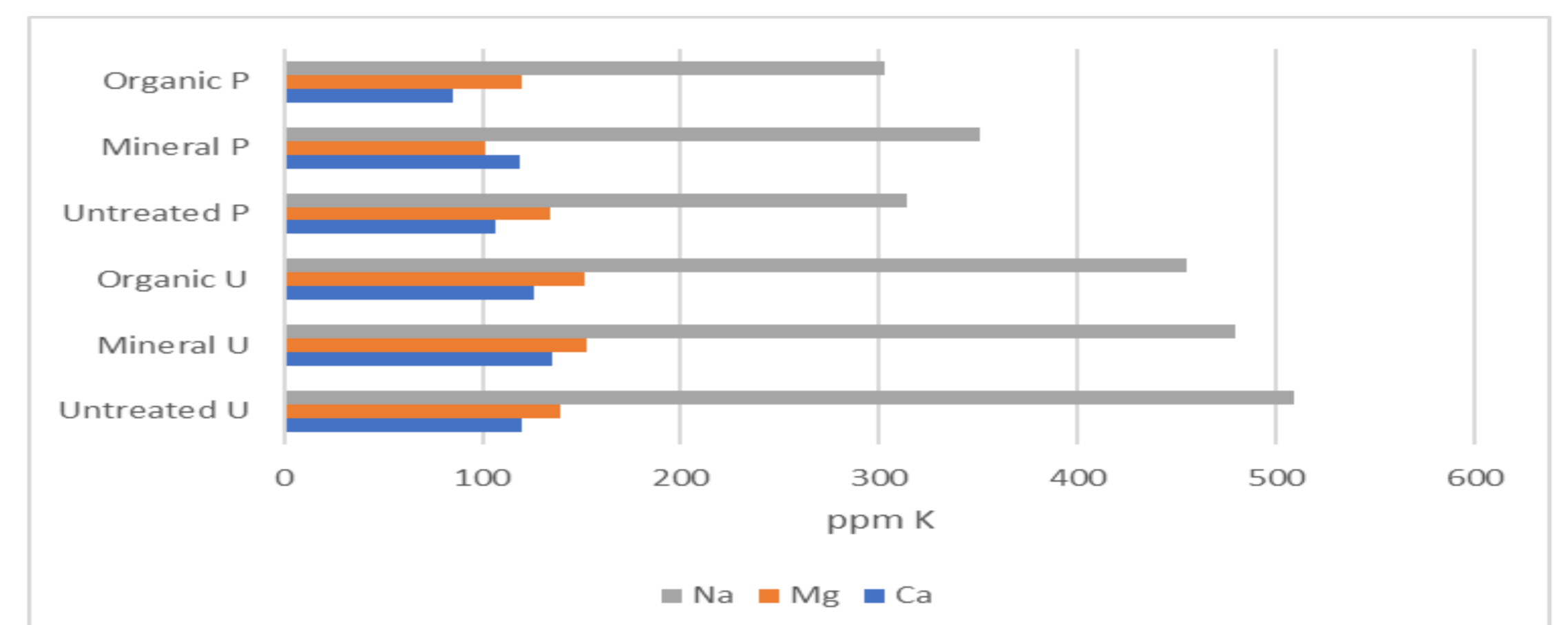


Fig. 2. Sodium, magnesium and calcium content in potato tubers (U – unpeeled, P – peeled)

The magnesium content in potato tubers is between 101 and 152 ppm, amounts above 150 ppm being determined in unpeeled tubers in the version fertilized with mineral or organic fertilizer. The highest amount of magnesium in the peeled tubers was determined in the unfertilized version.

The calcium content had values between 85 and 135 ppm, mineral fertilization leading to the highest values both in unpeeled and peeled tubers. Sodium was identified in the largest amount, with values between 300 and 510 ppm. As in the case of potassium, the highest amount was determined in the unfertilized version, in unpeeled tubers.

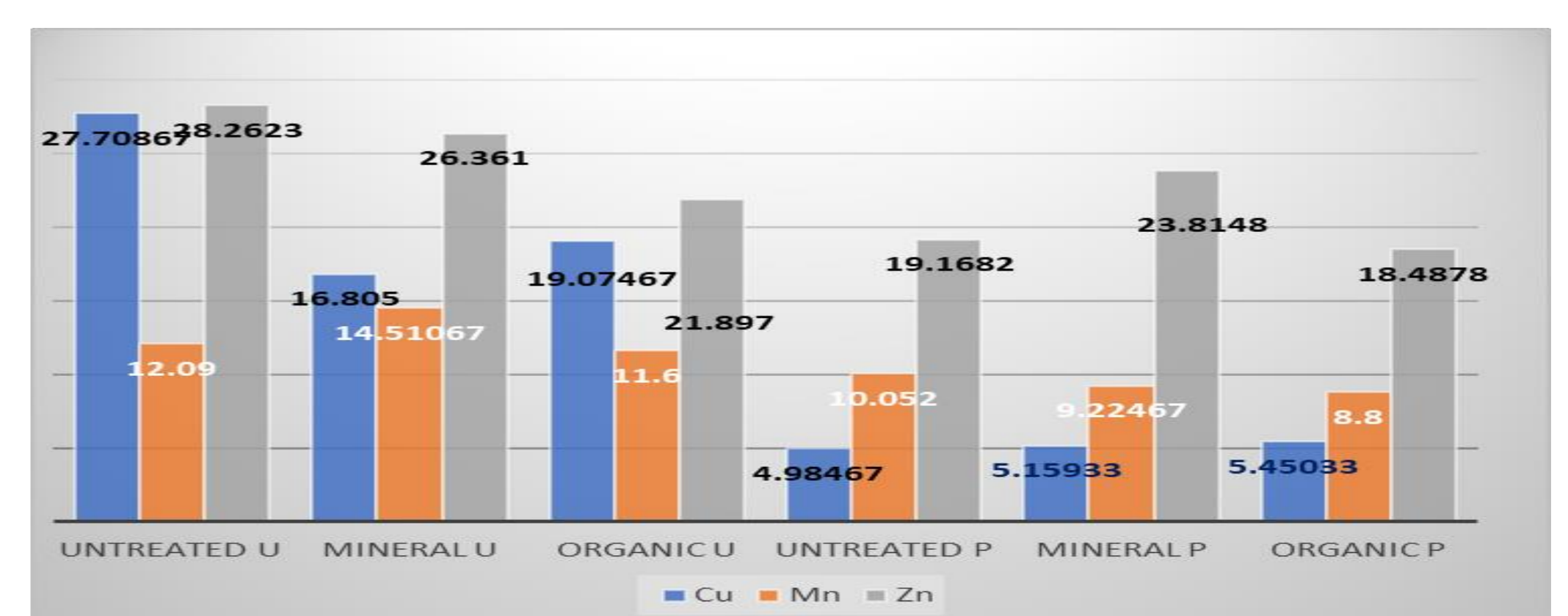


Fig. 3. Copper, manganese and zinc content in potato tubers (U – unpeeled, P – peeled)

The copper content of potato tubers is between 4.98 and 27.20 ppm, that of manganese between 8 and 14.5 ppm, and that of zinc between 18 and 28 ppm.

• Selective Bibliography

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