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## Response of winter wheat to foliar fertilization with microelements\*

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### Abstract

Foliar fertilization with micronutrients is an important element of winter wheat cultivation, especially with intensive agricultural practices. Micronutrients improve macronutrient utilization, plant health, and yield volume and quality. A field experiment with winter wheat of the RGT Kilimanjaro variety was carried out in the seasons 2021/2022 and 2023/2024 at the University of Rzeszów Experimental Station in Krasne, near Rzeszów. The aim of the study was to investigate the effect of winter wheat foliar fertilization with micronutrients, i.e. zinc (Zn), iron (Fe), copper (Cu), manganese (Mn), molybdenum (Mo) and boron (B), as compared to the control treatment. A one-factor experiment was established on a brown soil, quality class IIIa, good wheat complex. The levels of absorbable macronutrients (P, K, Mg) in the soil were high, while the levels of micronutrients (Fe, Zn, Mn, Cu, B) were found to be medium. The weather conditions during the plant vegetation period varied over the years of the research, which modified the effects of foliar fertilization. The difference in grain yield between 2022 and 2023 was 1.4 t ha<sup>-1</sup>. The SPAD (Soil Plant Analysis Development) measurement showed that foliar fertilization with Cu and Mn was the most effective treatment, increasing the grain yield by 0.19 t ha<sup>-1</sup> and 0.15 t ha<sup>-1</sup>, respectively, compared to the control treatment. This was the result of an increase in the Grains Number per Spike (GNS) and the Thousand Grain Weight (TGW) after spraying with these microelements. Grain Protein Content (GPC) increased significantly after the application of Cu, Mo, Mn and Zn. Foliar fertilization differentiated the grain macronutrient and micronutrient values, but not always favorably, which resulted from synergism or antagonism between individual elements.

**Keywords:** *Triticum aestivum* L., nutrients, foliar fertilization, plant nutritional status, yield

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