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EFFECT OF FOLIAR NITROGEN ON THE PRODUCTIVITY AND QUALITY OF BARLEY

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Abstract: *The experimental design consisted of a randomized, complete block design and it included four variants of foliar fertilization (0, 10, 20 and 30 L.ha^{-1}) in four replication. The size of individual trial plots was 18 m^2.*

• Introduction

Barley is among the five most common crops in the world after maize, wheat, rice and soybeans.
The main part of the production is used for fodder 55-60%, 30-40% for malt, 2-3% for food and about 5% for seeds (ULLRICH ET AL., 2010).

• Material and method

A field trial was conducted at the experimental base of the Agricultural University of Plovdiv, Bulgaria during the 2023/2024 and 2024/2025 growing season of winter barley. The influence of foliar fertilizer NitroTOP NG on Bulgarian malting variety Emon was studied. The experimental design consisted of a randomized, complete block design and it included four variants of foliar fertilization (0, 10, 20 and 30 L.ha^{-1}) in four replications. The size of individual trial plots was 18 m^2. Foliar fertilizer NitroTOP NG of the French company Soufflé had the following composition: 300 g N.L^{-1}; 1.33 g MgO.L^{-1}; l.67 g SO_3.L^{-1}. The fertilizer was applied in the barley tillering phase in early spring, and before the sowing in autumn, soil fertilization was carried out with 50 kg P_2O_5.ha^{-1} as a triple superphosphate.

• Results and discussions

A proportional increase of barley grain yield with foliar nitrogen application was observed in 2024 compared to the control (Table 2). Grain yield was higher by 26.8% or 959 kg.ha^{-1}, compared to the unfertilized control, in the variant treated with 30 liters per hectare of liquid fertilizer.

• Conclusions

Application of 10, 20 and 30 L.ha^{-1} of NitroTOP NG foliar fertilizer proven increased the grain and grain+straw yields of malting barley, compared to the unfertilized control. A rate of 30 L.ha^{-1} was highly effective under drought conditions in 2024 and the obtained grain and grain+straw yields exceeded the control by 26.8% and 16.0%, respectively. In 2025, the highest productivity (5378 kg grain and 12140 kg grain+straw.ha^{-1}) was established in treatment of 20 L.ha^{-1}. Foliar nitrogen application slightly affected the test weight of barley grain. Fertilizer rates of 20 and 30 L.ha^{-1} had a positive effect on the mass of 1000 grains in 2025. The concentration of grain protein in both experimental years met the conditions for brewing qualities, with its content averaging 9.9% in 2024 and 11.1% in 2025. Only the rate of 30 L.ha^{-1} of foliar fertilizer NitroTOP NG proven increased a grain protein concentration compared to the N_0 variant during the study period.

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