

Effect of fertilization with magnesium sulphur and microelements od seed yield and quality of common buckwheat

Wpływ nawożenia magnezem i siarką oraz mikroelementami
na plonowanie i jakość nasion gryki siewnej

**Wojciech Kozera, Barbara Murawska, Tomasz Knapowski, Bożena Barczak,
Ewa Spychaj-Fabisiak, Krystian Nowak, Edward Majcherczak**

*Department of Agricultural Chemistry, Faculty of Agriculture and Biotechnology,
University of Science and Technology in Bydgoszcz, Poland
e-mail: kozera@utp.edu.pl*

In respect of functional characteristics, buckwheat (*Fagopyrum esculentum* Moench.) is recognized as a cereal crop. Cultivation of this plant arouses a growing interest due to dietetic values of groats and other food products obtained from it. Substantial merit of this species is the possibility of cultivation in different soil conditions and indifference towards the day length, thanks to which it flowers and give fruits in conditions of Poland, irrespective of the sowing time. Mineral fertilization is one of the main factors modifying the quantity and quality of agricultural crops yield. It is of particular importance in its use to take into consideration the elements which lack in soils of our country, which include sulphur and magnesium.

The aim of the conducted study was to estimate the response of the common buckwheat cultivar Hruszowska to soil fertilization with magnesium and sulphur and foliar fertilization with microelements. The strict field experiment was conducted over 2012–2014 in a productive field of the Profeed company at Trzeciowiec (N 53°15', E 18°11'), in the Kuyavian-Pomeranian voivodeship. The soil in which the experiment was carried out belonged to light soils, soil quality class III b with slightly acid reaction. It was characterized by a low abundance in assimilable forms of phosphorus and magnesium and with a moderate content of available potassium. In this study, the pre-plant application amounted to the following rates per hectare: nitrogen – 20 kg in the form of ammonium nitrate 34%, phosphorus – 60 kg P₂O₅ – as 40% triple superphosphate and potassium in an amount of 60 kg K₂O as 60% potash salt. The 1st order factor was fertilization with magnesium and sulphur (n=4). Magnesium (20 kg ha⁻¹) was applied in the form of magnesium chloride, whereas sulphur (20 kg ha⁻¹) in the form of Vigor which contained 90% S. The 2nd order factor was foliar fertilization with microelements used in the form of the fertilizer Mikro Plus – a liquid mixture of micronutrients (B – 0.3%, Cu – 0.15%, Fe – 2.4%, Mn – 1.0%, Mo – 0.06%, Zn – 0.4%) in the form of durable chelates (EDTA/EDDHA). The previous crop in each growing season was spring barley. Climatic conditions varied in individual years of the study – mostly total precipitations.

The applied fertilization with magnesium, sulphur and microelements significantly modified the quantity of nutlet yield and protein yield of buckwheat, and resulted in a change in the chemical composition of the seeds. The highest yield of nutlets (1.6 t·ha⁻¹) and protein (206 kg·ha⁻¹) was found after the combined application of magnesium and sulphur. In consequence of the use of combination of these elements, also the highest contents of mineral components in the seeds were usually obtained. As a result of foliar application of microelements it was indicated that a significant increase in the yield of buckwheat nutlets amounting to 3.3%, whereas protein yield increased by 2.3%, as compared with the control treatment. The quantities of obtained seed and protein yields and the mineral composition of nutlets were strongly differentiated in individual years of the study.