

Micronutrient fertilizers based on blackcurrant seeds - evaluation of utilitarian properties in field conditions

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In the last 20 years, biosorption was developed as an efficient tool in wastewater treatment of heavy metal ions (Das et al., 2008) or in organic pollutants removal (Aksu, 2005). The new application of this process is the production of micronutrient fertilizers (Tuhy et al., 2014). The most valuable fertilizers are those characterized by the highest micronutrients Transfer Factor. The bioavailability of nutrients, efficiency and usefulness of fertilizer can be estimated in *in vivo* (Tuhy et al., 2013) and *in vitro* tests (Samoraj et al., 2013). The most useful *in vivo* methods of the evaluation of nutrients bioavailability from fertilizers are vegetation tests in field conditions (Tuhy et al., 2013).

The aim of the present work was to examine the effect of the application of blackcurrant seeds post-extraction residues enriched via biosorption with Zn(II), Mn(II) and Cu(II), as micronutrient fertilizer for the biofortification of maize in comparison with commercial micronutrient fertilizer in field tests.

Crop yield and crop quality were assessed and multielemental analysis of grains was conducted for the evaluation of the biofortification of maize grains with micronutrients and assessment of bioavailability of nutrients from fertilizers. Grain yield obtained for maize treated with different doses of micronutrients delivered with blackcurrant seeds (8.8 Mg/ha) was higher than in control group (8.3 Mg/ha) and commercial reference product (8.3 Mg/ha).

Bioavailability of micronutrients from enriched biomass was shown to be higher than from reference commercial fertilizer. The application of blackcurrant seeds residues with micronutrients led to the biofortification of maize grains with zinc, manganese and copper.

Corn grains biofortified with micronutrients can be used as staple food or feed preventing from micronutrient malnutrition. New preparations are cheap and biodegradable carrier of nutrients which are released in controlled way.

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References

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