

THE IMPACT OF DIFFERENT ORIGINS AND CONCENTRATIONS MICROPLASTICS ON SOIL AND BUCKWHEAT (FAGOPYRUM ESCULENTUM L.) CARBON AND NITROGEN

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Microplastic pollution is a well-documented issue in aquatic ecosystems and is increasingly being studied in agroecosystems. Recent research has demonstrated that microplastics can affect plant growth and soil properties, posing a potential threat to agricultural production and crop quality. Buckwheat has been identified as a promising model crop for assessing plant responses to harmful substances, as it can thrive in poor soil conditions and exhibits strong reactions to environmental stressors such as microplastics. However, limited information is available on how different types and concentrations of microplastics impact buckwheat.

This laboratory experiment examined how different concentrations (0.05%; 0.1%; 0.3%; 0.5%) of polyethylene (PE) and polypropylene (PP) microplastic particles in soil affect the soil and the grown buckwheat. The control was grown in soil without any microplastic. The experiment was done under controlled conditions and any secondary contamination with microplastics was avoided. After the experiment, soil and buckwheat samples were analyzed. Results showed that no significant changes in total carbon and total nitrogen were determined in all analyzed groups. These findings suggest that buckwheat responds to microplastic-induced stress. However, further in-depth research is needed to better understand the interaction between microplastic exposure and the plant's defense mechanisms.

Keywords: microplastics, buckwheat, polyethylene (PE), polypropylene (PP)