



15. KONGRES HRVATSKOG TLOZNANSTVENOG DRUŠTVA

Knjiga sažetaka

“Gospodarenje tlom i interdisciplinarni pristupi globalnim izazovima”



15th

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Book of Abstracts

“Soil Management and Interdisciplinary Approaches to Global Challenges”

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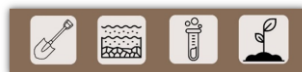
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Three-year biochar effects on soil carbon dynamics and nematode food web under miscanthus in post-conflict soils

Tatyana Stefanovska¹, Anastasiia Husieva¹, Andrzej Skwiercz², Valentina Pidlisnyuk,³Andriy Herts⁴, Oleksandr Kononchuk⁴, Victor Markiv⁴, Pavlo Shapoval⁵, Vitalii Stadnik⁵, Martyn Sozanskyi⁵

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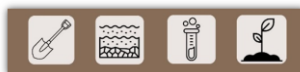
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Abstract

Field experiments assessing soil restoration practices are especially important in war-affected regions. This study aimed to assess the effects of wood-derived biochar on soil carbon fractions and the nematode food web during a three-year field experiment under *Miscanthus* × *giganteus* cultivation. The experiment was established in 2023 in Vorzel, Ukraine. Biochar produced from woody biomass residues was applied at two rates (5% and 10%) and compared with untreated control plots. Across three growing seasons, soil organic carbon (Corg), permanganate-oxidizable carbon (POXC), soil pH, and nematode community structure were analysed. The results showed that biochar influenced soil carbon dynamics, particularly the labile carbon fraction (POXC), while total organic carbon gradually increased during the study period. Biochar treatments were also associated with changes in nematode trophic structure and enrichment indicators (EI). EI ranged from 14.29 in the control to 36.16 under biochar treatment in the first year, while values between 6.94 and 52.72 were recorded in subsequent seasons. Bacterivorous nematodes dominated the community, accounting for approximately 45–64% of the total abundance, depending on the treatment and sampling time. No significant changes in soil pH were observed. Overall, the three-year field experiment in post-conflict degraded soils (Vorzel, Ukraine) indicates that wood-derived biochar can influence soil carbon dynamics and soil biological functioning under *Miscanthus* cultivation. Further studies are required to evaluate long-term carbon stabilization and the response of soil food webs to biochar amendments in perennial bioenergy cropping systems

Key words: agroecosystem, biological indicators, permanganate oxidizable carbon, soil restoration, trophic structure



Graphical abstract

