



Green Room and University of Montenegro



GREEN ROOM SESSIONS 2018

**International GEA (Geo Eco-Eco Agro) Conference
1-3 Novembar 2018, Podgorica, Montenegro**

**Plant production, Plant protection & Food safety, Genetic resources
Phytochemistry and Medicinal Plants, Animal husbandry and Dairy production
Rural development and agro-economy, Rural Environments and Architecture
Environment protection and natural resources management, Forestry**

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Book of Abstracts



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BOOK OF ABSTRACTS

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University of East Sarajevo, Faculty of Agriculture, RS, B&H
Institute of Field and Vegetable Crops, Novi Sad, Serbia
Balkan Scientific Association of Agricultural Economists
University of Dzemal Bijedic, Mostar, Agromediterranean Faculty, B&H
University of Kragujevac, Faculty of Hotel Management & Tourism Vrnjacka Banja
Institute of Meteorology and Seismology of Montenegro
National Parks of Montenegro
Put Gross, Montenegro
Eko ekvilibrijum, Montenegro
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Perspectives of the environmental friendly wireworm control in sunflower

Sonja GVOZDENAC*, Sandra CVEJIĆ, Vladimir MIKLIĆ, Siniša JOCIĆ, Jelena OVUKA, Željko MILOVAC, Dragana MILADINOVIĆ, Milan JOCKOVIĆ, Dragana RAJKOVIĆ, Ana MARJANOVIĆ JEROMELA

Institute of Field and Vegetable Crops, Novi Sad, Serbia; sonja.gvozdenac@ifvcns.ns.ac.rs

* Correspondence: sonja.gvozdenac@ifvcns.ns.ac.rs; Tel.: +381-064-8706191

Abstract

Sunflower production in Serbia can be limited by the occurrence of insect pests among which, wireworms (larvae of the click beetles; Coleoptera: Elateridae) are becoming more prevalent in all cropping systems. Their economic importance derives from the polyphagous preferences and prolonged subterranean development. As a result of underground feeding activity, the wireworms cause severe damages to root and lower parts of stem. The most sensitive period for sunflower plants is from the emergence up to the formation of two pairs of leaves. Thus, so far, in Serbia, wireworms were mainly controlled by insecticides applied as soil and seed treatments, along with regular agro-technical measures. However, since the beginning of 2014, neonicotinoid based insecticides (mainly used for seed treatment) are banned for use in sunflower (Regulation EU 485/2013). Due to the increased environmental concerns, pest resistance problems and phasing out of the efficient insecticides, EU member states have already promoted programs and strategies for reducing the use of synthetic insecticides. Along with economic damages, Serbia faces problems with the increase of wireworm abundance each year. The mentioned facts, along with insecticide restrictions, impose a need for novel approach and implementation of new, more environmental friendly control strategies. Key components of the environmental friendly pest management are the use of biological agents (biopesticides) and breeding for more tolerant and/or less preferent genotypes. One of the most promising and environmentally safe organisms for wireworms control are entomopathogenic fungi (EPF). Additionally, these fungi can express beneficial effects on plants (promotion of plant growth, viability, conferring resistance against abiotic stresses etc.). Recently, the EPF have become an inevitable part of a new wireworm control strategy called "Attract & Kill" ("A&K"). This strategy is based on the use of attractant component, usually CO₂ for soil-dwelling pests, combined with an EPF (*Metarhizium anisopliae*, *M. brunneum* etc.). So far, field tests involving the "A&K" strategy have not been carried out in Eastern Europe and the Institute of Field and Vegetable Crops, Novi Sad (Serbia) is the first to test the mentioned strategy in Serbian agro-climatic conditions. Breeding of crops (genotypes) that are tolerant to harmful insects is another scientific approach that is gaining attention in integrated pest management. So far, wireworms were effectively controlled by chemical agents which could be the reason why there is a lack of breeding studies for plant tolerance to these pests. Because of limited chemical control options, breeding for more tolerant genotypes could play an important role in mitigating damages from wireworms in the future. Also, the mechanisms of the host-plant resistance towards these pests have not yet been fully determined and have to be more thoroughly studied. Demonstrating the feasibility of these two strategies in different agro-climatic conditions of Serbia will contribute to their wider application potential. This is in compliance with one of the most important agricultural challenges: achieving high and stable yields, and at the same time reducing the agronomic inputs for pest management and mitigating environmental pollution.

Keywords: wireworms; environmental friendly control; sunflower, entomopathogenic fungi; plant breeding