



# The Soil Re-Union Science for Healthy Soils

4th International and  
16th National Congress  
of the Serbian Society  
of Soil Science



Serbian  
Society of  
Soil Science



# THE BOOK OF ABSTRACTS

Vrdnik, Fruške Terme, Serbia,  
20-23. October 2025

## BOOK OF ABSTRACTS

4th International and 16th National Congress of the Serbian Society of Soil Science: "The Soil Re-Union: Science for Healthy Soils"

20-23 October 2025, Fruške terme, Vrdnik, Serbia

**Congress Organizer:** Serbian Society of Soil Science

**Co-organization:** Institute of Field and Vegetable Crops, National Institute of the Republic of Serbia

**Publisher:** Serbian Society of Soil Science, Nemanjina 6, 11080 Beograd - Zemun <https://sdpz.rs/>

**For publisher:** Jovica Vasin, President of the Serbian Society of Soil Science

**Editors:** Jordana Ninkov, Jovica Vasin and Snežana Jakšić

**Design and technical preparation:** Kitchen&GoodWolf

CIP - Каталогизacija у публикацији  
Библиотеке Матице српске, Нови Сад

631.4(048.3)

### INTERNATIONAL Congress of the Serbian Society of Soil Science (4 ; 2025 ; Vrdnik)

The book of abstracts [Elektronski izvor] / 4th International and 16th National Congress of the Serbian Society of Soil Science "The Soil Re-Union: Science for Healthy Soils", 20-23 October 2025, Fruške terme, Vrdnik, Serbia ; [editors Jordana Ninkov, Jovica Vasin and Snežana Jakšić]. -

Belgrade : Serbian Society of Soil Science, 2025

Način pristupa (URL): <https://fiver.ifvcns.rs/handle/123456789/5680>. - Opis zasnovan na stanju na dan 15.10.2025.

ISBN 978-86-80417-99-8

1. National Congress of the Serbian Society of Soil Science (16 ; 2025 ; Vrdnik)

a) Педологија -- Апстракти

COBISS.SR-ID 177872649

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Republic of Serbia  
MINISTRY OF SCIENCE,  
TECHNOLOGICAL DEVELOPMENT AND INNOVATION

This publication is co-financed by the  
Ministry of Science, Technological  
Development and Innovation of the  
Republic of Serbia.

## NATIVE *BACILLUS THURINGIENSIS*: A PROMISING BIOCONTROL AGENT AGAINST WIREWORMS

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### ABSTRACT

Wireworms, the larval stage of click beetles (*Agriotes lineatus*), represent a persistent threat to cereal crops, particularly wheat. Their subterranean lifestyle, prolonged life cycle, and wide host range make them especially difficult to manage through conventional control strategies. Chemical treatments often show limited efficacy due to uneven soil distribution, restricted translocation, and growing concerns over environmental and non-target effects. As such, sustainable and biologically-based alternatives are urgently needed. One promising avenue in integrated pest management is the use of entomopathogenic bacteria, particularly *Bacillus thuringiensis* (*Bt*). This Gram-positive, spore-forming bacterium is known for producing insecticidal crystal proteins (Cry toxins) during sporulation, which have been widely applied in the control of lepidopteran, coleopteran, and dipteran pests. The *cry11* gene encodes a  $\delta$ -endotoxin typically active against dipteran larvae, yet recent studies suggest it may have broader insecticidal potential depending on the strain and target species. In this study, we investigated the presence of the *cry11* gene in three native *B. thuringiensis* soil isolates (BHC 2.4, BHC 4.5 and BHC 4.7) using polymerase chain reaction (PCR), with the aim of identifying strains with potential bioinsecticidal activity against wireworms. The *cry11* gene was successfully detected in strain BHC 2.4, highlighting its potential as a candidate for further biological testing and application in wireworm management. Our findings contribute to the growing body of research focused on the development of locally adapted, environmentally friendly biopesticides. Further bioassays and field trials will be necessary to confirm the efficacy of *cry11*-positive strains against wireworm populations in wheat agroecosystems.

**Key words:** *Bacillus thuringiensis*, *cry11*, wireworms, wheat, biocontrol

### **ACKNOWLEDGMENT**

This research was funded by the Ministry of Science, Technological Development and Innovations of the Republic of Serbia, contract Nos. 451-03-136/2025-03/200011, 451-03-136/2025-03/200214 and 451-03-136/2025-03/200135 and by the Science Fund of the Republic of Serbia, GRANT No. 10815, The necessity of healthy crops: Development of a multifunctional bacterial inoculant for the biological protection of cereals - BioHealCrop.

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