Faculty of Agriculture
University of Banja Luka

XIII INTERNATIONAL SYMPOSIUM ON AGRICULTURAL SCIENCES

AGRORES
2024

BOOK OF ABSTRACTS

27-30 May 2024, Trebinje, Bosnia and Herzegovina

XIII International Symposium on Agricultural Sciences "AgroReS 2024"

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Publisher

University of Banja Luka
Faculty of Agriculture
University City, Bulevar vojvode Petra Bojovića 1A
78000 Banja Luka, Republic of Srpska, Bosnia and Herzegovina

Editor in Chief

Marinko Vekić

Technical Editor

Danijela Kuruzović

Edition

Electronic edition

CIP - Каталогизација у публикацији
Народна и универзитетска библиотека
Републике Српске, Бања Лука

631(048.3)(0.034.2)

INTERNATIONAL Symposium on Agricultural Sciences (13 ; Trebinje ; 2024)
Book of Abstracts [Електронски извор] / XIII International Symposium on Agricultural Sciences "AgroReS 2024", 247-30 May, 2024, Trebinje, Bosnia and Herzegovina ; [editor in chief Marinko Vekić]. - Onlajn izd. - El. zbornik. - Banja Luka : Faculty of Agriculture = Poljoprivredni fakultet, 2024

Sistemski zahtjevi: Nisu navedeni. - Dostupno i na: https://agrores.agro.unibl.org/apstrakti/. - Nasl. sa nasl. ekrana. - Opis izvora dana 22.5.2024. - El. publikacija u PDF formatu opsega 218 str.

ISBN 978-99938-93-98-1

COBISS.RS-ID 140608769

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The effect of *Bacillus spp*. isolates and calendula extract on tomato yield

Slađana Savić[1], Marina Dervišević[2], Biljana Šević[3], Jelena Maksimović[4], Magdalena Knežević[4], Zoran Dinić[4], Ivana Radović[5]

[1] *Institute for Plant Protection and Environment, Serbia*
[2] *Institute of Pesticides and Environmental Protection, Serbia*
[3] *Institute for Vegetable Crops Smederevska Palanka, Serbia*
[4] *Institute of Soil Science, Serbia*
[5] *University of Belgrade, Faculty of Agriculture, Serbia*

Corresponding author: Slađana Savić, bonita.sladja@gmail.com

Abstract

In recent years, in order to protect the environment and food safety, intensive work has been done on the development of biological fungicides, nematicides and herbicides, as well as products based on biological agents and medicinal herbs for plant protection. The aim of this research was to evaluate the effect of the application of *Bacillus spp*. and calendula extract on tomato yield. The experiment was carried out during the 2023 growing season in the field conditions using SP - 109 genotype of tomato, selected at the Institute for Vegetable Crops Smederevska Palanka. Tomato seedlings were produced in a greenhouse and were planted in the field at the end of May. The experiment was laid out in a random block system, with four replications. The number of plants per main plot was 36. The distance between the rows was 50 cm and between the plants in the row 25 cm. Five treatments were applied three times during the vegetable season (T1 - *Bacillus spp*. isolate 1, T2 - *Bacillus spp*. isolate 2, T3 - Calendula extract, T4 - Fungicide, T5 - Control). The number of fruits per plant in treatments T1 and T4 was 29. It was statistically significantly higher compared to the number of fruits per plant in treatments T2, T3 and T5 (20, 21, 20). Also, the fresh weight of fruits per plant was significantly higher in treatments T1 and T4 (847.7 and 868.5) compared to treatments T2, T3 and T5 (686.7, 680.4 and 634.4). Results of this investigation indicate that the application of biological agents, specifically selected *Bacillus spp*. isolate 1 (T1), can have effects comparable to fungicides, as evidenced by the achieved tomato yield. The future research will include investigations of the impact of *Bacillus spp*. isolates and calendula extract on the nutritional characteristics of tomato fruits.

Key words: tomato, yield, biological protection, *Bacillus spp*., Calendula extract

Acknowledgment: This work was supported by the Ministry of Science, Technological Development and Innovation Republic of Serbia under Contracts No. 451-03-66/2024-03/ 200010, 451-03-66/2024-03/200214, 451-03-66/2024-03/200216, 451-03-66/2024-03/200011 and 451-03-65/2024-03/200116.