

**2nd INTERNATIONAL MULTIDISCIPLINARY
CONFERENCE FOR YOUNG RESEARCHERS**
Sustainable Development Trends and Challenges under COVID-19

**Cellulose-destroying bacteria's activity of chernozem
soils by different methods of tillage and Leanum
usage**

Zakharchenko Elina ¹, Datsko Oksana ¹, Shevchenko Mykola ³, Kalnaguz Alex ²

¹ Department of Agrotechnologies and Soil Science, Faculty of Agrotechnologies and Nature Resource Management, Sumy National Agrarian University, H. Kondratieva Str., 160, 40030 Sumy, Ukraine

² Department of Tractors, Agricultural Machines and Transport Technologies, Faculty of engineering and technology, Sumy National Agrarian University, H. Kondratieva Str., 160, 40030 Sumy, Ukraine

³ Department of Agriculture named after O. M. Mozhejko, Agronomy faculty, State Biotechnological University, Kharkiv, m/d Dokuchayvske 2, 62483, Kharkiv region

* Correspondence: datsko.oksana.nikol@gmail.com

Background: Cellulose-destroying bacteria are one of the key microorganisms that exist in the soil. After all, as the name suggests, their main function is cellulose decomposition, which is the basis of all plant cells. Bacteria that can decompose cellulose live in both aerobic and anaerobic conditions. This means that the species composition of organisms that perform the same functions is different. But their main difference, of course, is the products released after "digestion" by cellulose-destroying bacteria of plant residues. Under anaerobic conditions, the decomposition products are carbon dioxide and methane, while under aerobic conditions - water and carbon dioxide (Malinovska & Gavrilov, 2014). Anthropogenic impact on the soil biological activity is significant, especially in the last decades (Tony Yang et al., 2021). Different tillage, norm, dosage, form, and terms of fertilizers, application of soil probiotics influence the soil microbiome (Ágnes Oláh, Zsuposné, 2010; Tsyuk et al., 2018). The aim of our study was to identify the activity of the soil microbiota, namely cellulose-destroying bacteria, in the area of studying the effect of soil pro- prebiotic "LEANUM" and tillage in the field experiment. The research was conducted on corn plots. **Methods:** Cellulose-destroying bacteria activity was analyzed by the method of applying linen cloth by Mishustin and Petrova. For the experiment, the linen textile was cut into pieces of 5*7 cm, after they were numbered, weighed, and covered with a transparent plastic sheeting. The soil was dug up to 35 cm in three times repetition for each variant, one of the walls of which had to be perfectly flat (to ensure the best contact of the cloth with the soil). Linen pieces were located at a depth of 0-10, 10-20, and 20-30 cm, three at each depth. The experiment was started in the phase of 10 leaves and continued until the phase of milk maturity of corn. It should also be noted that tillage options are plowing and flat cultivation to a depth of 25-28 cm, as well as disking to a depth of 15-18 and 6-8 cm. Soil pro-prebiotic "LEANUM" was used during sowing in the form of powder and liquid, and also carried out 2 treatments on the leaf. The application rate corresponds to the manufacturer's recommendations. At the end of the experiment, statistical data processing was performed. **Results:** It was found that the highest percentage of tissue weight loss was at a depth of 10-20 cm and amounted to 10.94%, and the lowest - at a depth of 0-10 cm (8.36%). In general, the option where cellulose-destroying bacteria worked the least was plowing in one treatment per leaf with a rate of 3.46% loss at a depth of 10-20 cm. The highest activity of bacteria has been found in the variant without pre-sowing treatment of seeds, but with two spraying of LEANUM, the percentage of losses on this variant was 31.12%, for tillage - subsurface cultivation to a depth of 25-28 cm. **Conclusions:** The activity of cellulose-destroying bacteria is highest at a depth of 10-20 cm, while at a depth of 20-30 and

**2nd INTERNATIONAL MULTIDISCIPLINARY
CONFERENCE FOR YOUNG RESEARCHERS
Sustainable Development Trends and Challenges under COVID-19**

0-10 cm bacteria also work, but with less intensity. Further research is needed to obtain more accurate results.

Keywords: Zea mays, cellulose-destroying bacteria, soil probiotic, soil tillage, leanum

**2nd INTERNATIONAL MULTIDISCIPLINARY
CONFERENCE FOR YOUNG RESEARCHERS
Sustainable Development Trends and Challenges under COVID-19**

Content of Book of Abstracts

Content of Book of Abstracts.....	9
AGRICULTURAL ENGINEERING SECTION	12
Search for compacted soil - Device development	13
Influence of Lozova Machinery units on crop residues incorporation	14
Modeling the rolling of a rigid cylinder on the soil surface.....	15
Winter wheat variability by grain productivity and quality under local conditions of Ukrainian North Steppe	16
Challenges and Problems of Development of the Seed Industry in Ukraine.....	17
Investigation of the movement of moisture after harvesting winter wheat in a ball of soil 300 mm with different soil cultivation technologies: No-Till, Mini-Till and classic technologies with plowing	18
Study on optimal sous vide squid (<i>Illes argentinus</i>) process	20
AGROBIOLOGY SECTION	22
Conversion of N-acyl Amidines to Amidoximes: A Convenient Synthetic Approach to Molnupiravir (EIDD-2801) from Ribose	23
Effects of water stress on garlic under <i>in vitro</i> conditions for drought resistance assessment: Response to osmotics.....	24
Effects of Different Drying Methods on Organoleptic Properties of Traditional Vietnamese Beef and Buffalo Jerky	25
Cellulose-destroying bacteria's activity of chernozem soils by different methods of tillage and Leanum usage	26
Traditional llama husbandry in two Andean regions.....	28
Structural and aggregate composition of soil under siderates on <i>Ginkgo biloba</i> L organic plantation	29
Effects of low temperature on the weight of guinea pigs.....	30
ECONOMICS SECTION	32
Investment gap in SDG 2 and 12: the case of top agro-holdings in Ukraine and the Czech Republic	33
Statistical analysis of Ukrainian e-commerce development against the background of trends in Central and Eastern Europe.....	35
Global value chain in agribusiness.....	37



**2ND MULTIDISCIPLINARY
CONFERENCE FOR YOUNG
RESEARCHERS**

**Sustainable Development Trends and Challenges
under COVID-19**

BOOK OF ABSTRACTS

**Monday-Tuesday, November 29.-30., 2021 Sumy,
Ukraine**

ISBN: 978-80-213-3158-7

Publisher: Czech University of Life Sciences Prague

2nd MULTIDISCIPLINARY
CONFERENCE FOR YOUNG
RESEARCHERS
Sustainable Development Trends
and Challenges under COVID-19

Book of Abstracts



BOOK OF ABSTRACTS

In your hands you are holding Book of Abstracts, which was published both as an E-Book of Abstracts and traditional printed BoA.

We hope, you will enjoy reading through all the accepted abstracts to this conference.



WELCOME!

The core aim of this conference was to provide opportunities for early career academics from a range of disciplines to share their research through the conference podium, as well as to receive informal in-depth feedback through discussions and to enable them to establish contact with professionals and other institutions.



ABOUT ORGANIZERS

The conference is co-organized by: Czech University of Life Sciences Prague, Sumy State University, Sumy National Agrarian University, Bila Tserkva National Agrarian University, Dnipro State Agrarian and Economic University, Kharkiv National Agrarian University named after V.V. Dokuchayev and State Biotechnological University with the support from AgriSciences Platform.



VENUE

Our 2nd Multidisciplinary conference for Young Researchers took place in Sumy – at Sumy State University. In the North-Eastern part of Ukraine.

