# TECHNOLOGIES OF AGROENGINEERS TRAINING FOR INNOVATIVE PROJECT ACTIVITY: THEORETICAL AND METHODOLOGICAL ASPECTS

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In almost all countries of the world work is being carried out on the development of land reclamation – part of methods aimed at optimizing agricultural production and the general rise in soil productivity. Under hydraulic reclamation is understood a system of measures that regulate the water regime of the territory. Irrigation, drainage, flooding, delay of surface runoff and control of soil erosion belong to hydraulic reclamation and are carried out with the help of hydraulic structures. The change of water regime should be carried out both at excess, and at insufficient moistening of the soil as for normal development of plants the soil should be moderately moistened.

The developed pedagogical technology should provide continuity of educational process in designing and designing of cars, studying of soil and water resources, their protection and preservation.

Curricula for future agricultural engineers provide the study of problematic issues of land reclamation, soil protection and water resources. As it is noted in [Pr.Soil, Pr.Pro,] throughout the period of study during lectures, laboratory-practical classes, practitioners, students study these issues relevant to modern agricultural production systematically and consistently.

During the lectures future agricultural engineers receive general theoretical knowledge, get acquainted with the algorithms for calculating machines. Laboratory-practical classes expand and deepen their knowledge of the basics of the theory, calculation and design of reclamation machines, irrigation systems, land protection and protection of soil and water resources, etc. Students develop the ability to innovative project activities especially deeply during the course and master's theses.

At the initial stage of training, future agricultural engineers study the general concepts of erosion processes.

Many scientific conferences have addressed the issue of soil and water protection. For example, at the II International Scientific Conference "Protection of Soils and Water Resources", the report was presented − «The main components of studies and research of conserving soils and water in technologies of agroengineers training.

This report partially discloses the scientific and methodological bases for soil and water exploration by future specialists in agroengineering in higher education institutions. Innovative pedagogical technology of development of project activity is based on the method of a consistent cross study of the material based on the objective relationship of disciplines and provides a qualitatively higher level of professional competencies formation of agroengineers on the basis of preservation and even multiplication of natural resources.

At the IV International Scientific Conference "Soil and Water Resources Protection 2019" candidate of Technical Sciences, Associate Professor Viktor Pryshliak, Dr. in Agriculture, Prof., Corresponding Member of the National Academy of Agrarian Sciences of Ukraine Basil Kurylo a report was made on the topic: «Soil and water resources as important objects and prerequisites for the design of agricultural machines and the formation of professional competencies of an agricultural engineer».

The report notes that in pedagogical technologies for the formation of professional competencies of future agricultural engineers in agricultural institutions of higher education, much attention is paid to the problematic issues of soil and water resources.

Some concepts and categories used in the educational process during the study of agricultural machinery and equipment by students are analyzed. Depending on the purpose, tasks, receptions of technological processes types of reclamation actions are pointed out, the example of calculation of working bodies of cars is resulted.

In general, an innovative pedagogical technology of cross training has been developed, aimed at the formation of professional competencies of future agricultural engineers. It is noted that their activity will be successful provided the efficient use of soil and water resources as important objects and prerequisites for the development of machines.

An important research and production problem is the optimization of nutrient and water regimes of the soil on the slopes. There are different scientific works devoted to the peculiarities of soil preparation for sowing crops on sloping lands, optimization and management of technological processes in these conditions.

Analysis of agricultural land reclamation measures, features of the educational process in agricultural institutions of higher education showed that the theory and calculation of sprinklers for irrigation machines in the technology of agricultural engineers training for innovative project activities require further scientific development.

Creating an optimal water regime for seed germination, growth and plant development is a very important factor that affects crop yields, quality of products grown. During their training, students study the optimal water regimes for different crops, irrigation technologies and design features of sprinklers. Scientific and pedagogical research has shown that future agricultural engineers have difficulties in calculating the working bodies of sprinklers and it should be noted that the search for optimal design parameters is important for agricultural machinery, and optimal operating modes for agricultural machinery.

High quality of the educational process is achieved when students conduct engineering and technological calculations, participate in laboratory and field research. We will give an example of the theory and calculation of nozzles and devices of sprinklers and installations which is used in scientific and technical activity and pedagogical technologies of preparation of agroengineers for innovative design activity.

Medium-jet sprinklers are used on most modern sprinklers and installations. Their designs are mostly of the same type, although they have some significant

differences.

The principle of operation is approximately as follows. The jet flowing from the barrel meets on the way a rotary deflector and a reflective blade. The front end of the rocker arm is pushed to the side, and the rocker arm is turned. When leaving the jet, the deflector rotates relative to the rocker arm. The rocker arm, twisting the spring, rotates at an angle of about 90°, then under the action of the spring returns to the previous position.

After reaching the initial position, the rocker strikes the tide on the barrel with its tide and turns it at an angle of 2–5° in the course of movement. The jet at this point hits the back of the deflector and returns it to its original position. Then the front end of the rocker is pushed out of the jet again and the process is repeated.

The barrel performs a continuous rotation. The jet irrigates the circular area. The design can work without a reflecting blade. In this case, more precise adjustment of the position of the deflector relative to the jet is required.

Common are devices with gear or tine mechanisms of rotation, which are driven by a small turbine, which rotates under the action of the main jet energy, which is formed by the device with a turbine drive.

Mechanisms are often introduced into the structure to provide the apparatus of reverse rotation within the sector of the circle for irrigation in the sector in a given direction. The angle of the sector is usually adjustable.

The jet of water flowing from the nozzle rotates the turbine. On the axis of the turbine there is a gear that rotates the worm gear. The gear through the shaft transmits rotation to the worm gear connected with the worm gear. There is an eccentric pin on the axis of the gear, which makes the frame swing. The ratchet mechanism consisting of two hinged rods, a spring and a pawl is established on a frame.

Under the action of a compressed spring, the pawl is pushed away from the stationary gear on one side, due to which a slow intermittent rotation of the sprinkler around the vertical axis is carried out. The fixed gear has a series of protruding fingers. At an emphasis of a shank of a pawl in one of them its position changes, its

other party starts to work and the direction of rotation of the device changes. Thus it is possible to carry out watering on sector.

In other designs of long-jet sprinklers, in which the driving force that rotates the barrel is the reaction of the jet, the vacuum created by the jet, a special turbine operating from a single jet or a rocker arm that oscillates, as in medium-jet devices.

The spray of the jet into droplets is determined by the ratio H/d (Table 1).

Table 1: Disintegration of the jet into drops

| *H*/*d* | Jet characteristics |
|---|---|
| up to 900 | Solid, which does not fall apart into drops |
| 900−1500 | Weak decomposition into drops, not suitable for irrigation |
| 1500−1600 | Disintegration into drops of medium size, which are suitable for irrigating grasses in meadows and pastures |
| 1700−1800 | Disintegration into droplets of medium size, suitable for irrigation of closed farms. cultures |
| 2000−2200 | Disintegration into small drops, suitable for irrigation of all crops |
| 2500−2600 | Disintegration into very small drops, suitable for irrigating seedlings of the most delicate plants and flowers |

The theoretical part of the laboratory-practical work analyzes the concept of humidity and the need to determine it at different stages of seed germination and growth and development of plants. That is, humidity is determined in order to: operating conditions of agricultural machinery; to control the technological process performed by the machine (soil moisture in layers before and after the passage of the working body of the machine, the dynamics of humidity change, etc.); to characterize the conditions of development of agricultural plants. Soil moisture can be determined directly or indirectly.

Direct measurements of soil moisture and some agricultural materials are carried out using special electrical devices. This method is convenient because it does not take much time. However, errors can often occur depending on the internal structure of the material and its condition, so such measurements should be made only when high accuracy is not required.

The most common way to determine the moisture content of agricultural materials is to dry the samples in electric ovens at a temperature of 100−105° C. Depending on the condition of the material and its physical and mechanical properties, the sampling method, sample size and sample should be different.

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The accuracy of determining the moisture content of the material mainly depends on the quality of weighing and drying.

Students during laboratory and practical work determine the absolute humidity of the material (%) as the ratio of the mass of water to the mass of dry material.

# SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING BULGARIA

AWARDS

A

# DIPLOMA

FOR THE PARTICIPATION IN THE

## V INTERNATIONAL SCIENTIFIC CONFERENCE

## CONSERVING SOILS AND WATER

TO

*Dr in Agriculture, Prof.*
*Vasyl Kurylo*

FOR THE REPORT

*THEORETICAL AND METHODOLOGICAL FEATURES OF SOIL WATER REGIME OPTIMIZATION IN PEDAGOGICAL ECHNOLOGIES OF AGROENGINEERS TRAINING FOR INNOVATIVE PROJECT ACTIVITY*

НАУЧНО ТЕХНИЧЕСКИ СЪЮЗ ПО МАШИНОСТРОЕНЕ · СОФИЯ ·

26.08. – 29.08.2020
BOROVETS,
BULGARIA

Prof. D.Sc. Eng. Georgi Popov
*President of the Scientific-Technical Union of Mechanical Engineering*

## V INTERNATIONAL SCIENTIFIC CONFERENCE

# CONSERVING SOILS AND WATER

# PROGRAM

## ORGANIZER:

SCIENTIFIC -TECHNICAL UNION OF MECHANICAL ENGINEERING

***26.08. – 29.08.2020***

***BOROVETS, BULGARIA***

# TIME SCHEDULE

**25.08.2020 (TUESDAY)**

| | | |
|---|---|---|
| PUBLICATION OF ALL PAPERS<br>Proceedings "International Scientific Conference "Conserving Soils and Water 2020" | 17:00 | http://conserving-soils.eu |

**27.08.2020 (THURSDAY)**

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|---|---|---|
| OPENING OF THE CONFERENCE | 10:00 | http://conserving-soils.eu |
| QUESTIONS TO THE AUTHORS OF ALL PAPERS | 10:00-16:00 | office@conserving-soils.eu |
| PUBLICATION OF ALL QUESTIONS | 16:00 | http://conserving-soils.eu |

**28.08.2020 (FRIDAY)**

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| ANSWERS TO THE QUESTIONS | 08:00-12:00 | office@conserving-soils.eu |
| PUBLICATION OF ALL ANSWER | 12:00 | http://conserving-soils.eu |
| CLOSING OF THE CONFERENCE | 17:00 | http://conserving-soils.eu |



***time for presentation 10-12 minutes,***
***questions after each presentation***

**26.08.2020 (WEDNESDAY)**

10:00 **OPENING OF THE CONFERENCE**

http://conserving-soils.eu

| SOIL | | | | |
|---|---|---|---|---|
| 1 | EFFECT OF CLAY ON THE FRACTIONS OF POTENTIALLY TOXIC ELEMENTS IN CONTAMINATED SOIL | Ing. Vejvodová K., doc. Ing. Ph.D. Drábek O., Ing. Ph.D. Ash C., RNDr. Ph.D. Tejnecký V., Ing. Němeček K., prof. Dr. Ing. Borůvka L. Faculty of Agrobiology, Food and Natural Resources, Czech University of Life Sciences, Prague | 10 | CZ |
| 2 | MICROBIAL INDICATORS AND THEIR RELATIONS WITH HYDROPHOBICITY IN SPOLIC TECHNOSOLS UNDER DIFFERENT VEGETATION | Kostadinka Nedyalkova, Galina Petkova, Irena Atanassova Nikola Poushkarov Institute of Soil Science, Agrotechnologies and Plant Protection, Sofia | 26 | BG |
| 3 | PHYSICO-CHEMICAL PROPERTIES OF LIGNITE MINE RECLAIMED SOIL FORMED UNDER 19 DIFFERENT TREE SPECIES IN SOKOLOV, CZECH REPUBLIC | Ing. Spasić M., doc. Ing. Ph.D. Drábek O., RNDr. Ph.D. Tejnecký V., RNDr. CSc. Vacek O., prof. Dr. Ing. Borůvka L. Faculty of Agrobiology, Food and Natural Resources, Czech University of Life Sciences, Prague | 11 | CZ |
| 4 | ANALYSIS OF METHODS FOR ASSESSMENT OF SOIL POLLUTION | Borisov, I. E., Eng. Nalbatski, T. V. Rakovski National Defence College, Sofia | 14 | BG |
| 5 | APPROACHES FOR RECLAMATION OF EMBANKMENTS FROM THE EXTRACTION OF POLYMETALLIC ORES WITH SOIL IMPROVERS FROM WASTE AND R. ACETOSELLA, AND R. PATIENTIA | Ekaterina Serafimova[1], Veneta Stefanova[2] [1]University of Chemical Technology and Metallurgy, Sofia [2]University of Forestry, Sofia | 18 | BG |
| 6 | GROWTH ANALYSIS OF SWEET PEPPER FOR INVESTIGATION EFFECT OF WOOD ASH AND POULTRY LITTER ON PLANT | Ekaterina Serafimova University of Chemical Technology and Metallurgy, Sofia | 19 | BG |
| 7 | THE INFLUENCE OF LONG-TERM AGRICULTURAL USE OF SOILS OF THE DRY SUBTROPICAL ZONE OF AZERBAIJAN ON ITS MORPHOLOGICAL AND AGROCHEMICAL PROPERTIES | PhD., Assist.Prof., Ramazanova F. M. National Academy of Sciences of Azerbaijan, Institute of Soil Science and Agrochemistry, Baku | 21 | AZ |
| 8 | EFFECT OF THE IMPLEMENTATION OF AGRO-TECHNICAL AND AMELIORATIVE MEASURES IN SOILS WITH POOR TECHNOLOGICAL AND PEDOLOGICAL PROPERTIES | Ivan Dimitrov, Martin Nenov, Vanya Lozanova, Iliyana Gerasimova N. Poushkarov Institute of Soil Science, Agrotechnologies and Crop Protection | 25 | BG |
| 9 | ASSESSMENT OF CHEMICAL COMPOSITION OF SOIL SOLUTION OF WATER REPELLENT SOILS FROM MARITZA-IZTOK COAL BASIN | Assoc. Prof. PhD Tsetska Simeonova, Assoc. Prof. PhD Maya Benkova, Assis. Prof. PhD Luyba Nenova, Prof. Dr. Irena Atanassova Nikola Poushkarov Institute of Soil Science, Agrotechnologies and Plant Protection | 33 | BG |
| 10 | EROSION STATUS OF SOILS IN THE LAND OF GENERAL TOSHEVO | Avgusta Stepchich, Milena Mitova Nikola Poushkarov Institute of Soil Science, Agrotechnologies and Plant Protection | 37 | BG |

| WATER | | | | |
|---|---|---|---|---|
| 11 | EVAPOTRANSPIRATION AND BIOPHYSICAL COEFFICIENTS OF LARGE-FRUITED TOMATOES GROWN IN UNHEATED GREENHOUSES UNDER DRIP IRRIGATION | Assoc. Prof. PhD R. Kireva, Prof. PhD M. Mihov Institute of Soil Science, Agro-Technology and Plant Protection “Nikola Pushkarov", Sofia | 1 | BG |
| 12 | WATER - YIELD RELATIONSHIPS OF LETTUCE PLANTS FOR DIFFERENT IRRIGATION | Bilal Acar Department of Farm Building and Irrigation, | 5 | TR |



***time for presentation 10-12 minutes, questions after each presentation***

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| | STRATEGIES | Faculty of Agriculture, University of Selcuk, Konya | | |
| **13** | ANALYSIS OF CLIMATIC VARIABILITY AND DETERMINATION OF THERMAL AND PLUVIOMETRIC LIMITS IN ALBANIA'S SOUTHWESTERN LOWLAND AREA (VLORA) | Adrian Doko[1], Simir Krasniqi[2], Ada Fyshku[3], Ilir Topi[1], Albert Kopali[1]<br>[1]Department of Agro-environment and Ecology, Agricultural University of Tirana, Albania<br>[2]Department of Vocational Education, Prizren, Kosovo<br>[3]Department of Science and Plant Technologies, Agricultural University of Tirana, Albania | 7 | AL/XK |
| **14** | STUDY OF THE INFLUENCE OF THE IRRIGATION REGIME ON THE QUANTITY AND QUALITY OF TOMATOES GROWN IN PLASTIC GREENHOUSES | Assoc. Prof. PhD R. Kireva, Prof. PhD M. Mihov<br>Institute of Soil Science, Agro-Technology and Plant Protection “Nikola Pushkarov", Sofia | 2 | BG |
| **15** | ENVIRONMENTAL CONSEQUENCES OF WATER POLLUTION | Eng. Nalbatski, T. V., Borisov, I. E.<br>Rakovski National Defence College, Sofia | 15 | BG |

## MACHINES AND TECHNOLOGIES

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| **16** | EXPERIMENTAL RESEARCH OF AGRICULTURAL BRIDGE UNIT IN THE STATE OF HARROW AGGREGATE | Prof. Eng. Volodymyr Bulgakov[1] PhD., Prof. Eng. Semjons Ivanovs[2] PhD., Prof. Eng. Valerii Adamchuk[3] PhD., Prof. Eng. Volodymyr Kuvachov[4] PhD., Prof. Eng. Zinoviy Ruzhylo[1] PhD., Eng. Yevhen Ihnatiev[4] PhD.<br>[1]National Scientific Centre “Institute for Agricultural Engineering and Electrification”, Ukraine,<br>[2]Latvia University of Life Sciences and Technologies, Latvia,<br>[3]National University of Life and Environmental Sciences of Ukraine,<br>[4]Dmytro Motornyi Tavria State Agrotechnological University, Ukraine | 3 | UA/ LV |
| **17** | DRONES IN THE AGRICULTURE SECTOR | Borisov, I. E.<br>Rakovski National Defence College, Sofia | 16 | BG |
| **18** | DATA ANALYSIS REQUIRED FOR VINEYARD DISEASE PREDICTION | MSc. Elena M. Jovanovska, Prof. PhD. Eng. Ivan Chorbev<br>Faculty of Computers Science and Engineering, Ss. Cyril and Methodius University in Skopje | 23 | MK |
| **19** | CHANGES IN THE AGROCHEMICAL STATUS OF HAPLIC VERTISOLS DEPENDING ON THE AGRO-TECHNICAL MEASURES | Vanya Lozanova, Ivan Dimitrov, Iliyana Gerasimova<br>Institute of Soil Science, Agrotechnologies and Plant Protection "N. Poushkarov" | 27 | BG |
| **20** | CONSTRUCTION OF A NEW CALCULATION MATHEMATICAL MODEL OF THE VIBRATION PROCESS OF EXCAVATION OF THE ROOT BODY FROM THE SOIL, TAKING INTO ACCOUNT ITS ELASTIC DAMPING PROPERTIES | Prof. Eng. Volodymyr Bulgakov[1] PhD., Prof. Eng. Ivan Holovach[1] PhD., Eng. Volodymyr Volskyi[2] PhD., Eng. Yevhen Ihnatiev[3] PhD.<br>[1]National University of Life and Environmental Sciences of Ukraine<br>[2]National Scientific Centre “Institute for Agricultural Engineering and Electrification”<br>[3]Dmytro Motornyi Tavria State Agrotechnological University | 32 | UA |
| **21** | APPLICATION OF RECYCLED PLASTICS IN TRIBOSYSTEMS OF SEEDING MACHINES | Assoc. Prof. Derkach O.[1], Makarenko D.[1], Assoc. Prof. Kabat O.[1], Kachanov V.[1], Apanovich A.[1], Derkach P.[1,2] | 29 | UA |



***time for presentation 10-12 minutes,***
***questions after each presentation***

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| | | [1]Dnipro State Agrarian and Economic University<br>[2] Borys Grinchenko Kyiv University | | |
| **22** | INVESTIGATION OF THE POWER INTERACTION OF THE PLOUGHSHARE DIGGER WORKING BODY WITH THE SOIL AND SUGAR BEET ROOT FOR THE CONDITIONS OF ITS VIBRATORY DIGGING | Prof. Eng. Volodymyr Bulgakov[1] PhD., Prof. Eng. Ivan Holovach[1] PhD., Prof. Eng. Zinoviy Ruzhylo[1] PhD., Eng. Yevhen Ihnatiev[2] PhD.<br>[1]National University of Life and Environmental Sciences of Ukraine<br>[2]Dmytro Motornyi Tavria State Agrotechnological University | 35 | UA |
| **23** | MICROWAVE-POWERED COLD PLASMA SURFACE TREATMENT OF FRESH PLANT PRODUCTS: CURRENT STATE AND FURTHER STEPS TOWARD APPLICATION IN AGRICULTURE | Ivan Atanassov[1], Mila Rusanova[1], Todor Bogdanov[2] , Krasimir Rusanov[1], Plamena Marinova[3], Evgenia Benova[4]<br>[1]AgroBioInstitute, Agricultural Academy;<br>[2]Medical Faculty, Medical University–Sofia;<br>[3]Faculty of Forest Industry, University of Forestry;<br>[4]Faculty of Physics, Sofia University | 38 | BG |
| **24** | TECHNOLOGIES FOR MAINTAINING THE SOIL SURFACE OF PERENNIALS | Ivan Mortev<br>Institute of Soil Science, Agro-Technology and Plant Protection “Nikola Pushkarov", Sofia | 39 | BG |
| **25** | SOIL CULTIVATION MACHINES FOR PERENNIALS | Ivan Mortev<br>Institute of Soil Science, Agro-Technology and Plant Protection “Nikola Pushkarov", Sofia | 40 | BG |
| **26** | COMPARISON OF THE PRECISION OF DRY SIEVE ANALYSIS VERSUS WET SIEVE ANALYSIS FOR SOME SELECTED NATURAL CLAY VERITIES | Eng. Suresh Aluvihara<br>University of Peradeniya | 6 | LK |

## MANAGEMENT

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| **27** | INTEGRATED POLICIES AND PRACTICES IN SOIL AND WATER MANAGEMENT TO ACHIEVE THE OBJECTIVES OF THE EUROPEAN GREEN DEAL | Prof. Dr. Ognyan Kostov, Eng. Jechko Iordanov<br>National Association "Green Sarnitsa", Pazardzhik | 13 | BG |
| **28** | SCIENTIFIC TECHNOLOGIES AND THEIR TECHNICAL SUPPORT - MAIN FACTORS OF EFFICIENCY OF PLANT PRODUCTS PRODUCTION | DrSc., Prof. Adamchuk V. PhD., Prof. Eng. Hrytsyshyn M. PhD., Prof. Eng. Perepylytsia N. PhD.<br>National Scientific Centre “Institute for Agricultural Engineering and Electrification | 36 | UA |
| **29** | COMPUTERIZED ECOTECHNOLOGY FOR MANAGING CROP WATER STATUS MAKING AGRICULTURAL ACTIVITIES MORE EFFICIENT AND PROTECTING THE ENVIRONMENT | Prof. Ilia Christov, Ph.D. and D.Sc.<br>Poushkarov Institute for Soil Science, Agrotechnology and Plant Protection, Sofia | 28 | BG |
| **30** | THEORETICAL AND METHODOLOGICAL FEATURES OF SOIL WATER REGIME OPTIMIZATION IN PEDAGOGICAL TECHNOLOGIES OF AGROENGINEERS TRAINING FOR INNOVATIVE PROJECT ACTIVITY | Candidate of Technical Sciences, Associate Professor Viktor Pryshliak | 30 | UA |
| **31** | THEORETICAL AND METHODOLOGICAL FEATURES OF SOIL WATER REGIME OPTIMIZATION IN PEDAGOGICAL TECHNOLOGIES OF AGROENGINEERS TRAINING FOR INNOVATIVE PROJECT ACTIVITY | Dr. in Agriculture, Prof., Corresponding Member of the National Academy of Agrarian Sciences of Ukraine Vasyl Kurylo<br>Vinnytsia National Agricultural University | 31 | UA |
| **32** | UTILIZATION OF TRACTORS AND AGRICULTURAL MACHINERY | Prof. PhD M. Mihov<br>Institute of Soil Science, Agro-Technology and Plant Protection “Nikola Pushkarov", Sofia | 9 | BG |



***time for presentation 10-12 minutes,***
***questions after each presentation***

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| 33 | THE AGRO-ECOLOGICAL POTENTIAL FOR GROWING SUNFLOWER OF BULGARIA'S AGRICULTURAL LANDS | PhD Rositsa Mikova<br>Institute of Agricultural Economics | 34 | BG |

## *NEXT CONFERENCE* „Conserving Soils and Water 2021"

### *25.08 - 28.08.2021, BOROVETS, HOTEL "ELA"*



***time for presentation 10-12 minutes,***
***questions after each presentation***

VI INTERNATIONAL SCIENTIFIC CONFERENCE

## MATERIAL SCIENCE. NONEQUILIBRIUM PHASE TRANSFORMATIONS 2020

07-10.09.2020, VARNA, HOTEL AQUA AZUR

www.material-science.eu

XVII INTERNATIONAL SCIENTIFIC CONGRESS - SUMMER SESSION

## MACHINES. TECHNOLOGIES. MATERIALS 2020

09-12.09.2020, VARNA, HOTEL AQUA AZUR

www.mtmcongress.com

IV INTERNATIONAL SCIENTIFIC CONFERENCE

## CONFSEC 2020

07-10.12.2020, BOROVETS, HOTEL ELA

www.confsec.eu

V INTERNATIONAL SCIENTIFIC CONFERENCE - WINTER SESSION

## INDUSTRY 4.0

09-12.12.2020, BOROVETS, HOTEL ELA

www.industry-4.eu

IV INTERNATIONAL SCIENTIFIC CONFERENCE

## MATHEMATICAL MODELING

09-12.12.2020, BOROVETS, HOTEL ELA

www.mathmodel.eu

VI INTERNATIONAL SCIENTIFIC CONFERENCE

## HIGH TECHNOLOGIES. BUSINESS. SOCIETY 2021

08-11.03.2021, BOROVETS, HOTEL ELA

www.hightechsociety.eu

XIV CONFERENCE FOR YOUNG RESEARCHERS

## TECHNICAL SCIENCES. INDUSTRIAL MANAGEMENT 2021

10-13.03.2021, BOROVETS, HOTEL ELA

www.youngconference.com

XVIII INTERNATIONAL SCIENTIFIC CONGRESS - WINTER SESSION

## MACHINES. TECHNOLOGIES. MATERIALS 2021

10-13.03.2021, BOROVETS, HOTEL ELA

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