9th International Scientific Conference

ENGINEERING FOR RURAL DEVELOPMENT

PROGRAMME

The Conference is supported by

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Conference languages – English, Russian, Latvian

Jelgava, Latvia, May 27 – 28, 2010
PROGRAM COMMITTEE

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Armins Laurs, Dr.sc.ing.
Gunars Godmanis, Lecturer
Jolanta Krisuna
Aina Priekule
Aigars Kunkulis
Thursday, 27 May

9^15 – 10^00  Registration of participants,
Faculty of Engineering, LUA, 5 J.Cakstes boulevard, 2nd floor

10^00 – 12^00  Plenary session
Faculty of Engineering, Room 429

10^00 – 10^10  OPENING SPEECH
Maris Kirsis
Dean of the Faculty of Engineering, Latvia University of Agriculture (LUA)

10^10 – 10^35  ENGINEERING EDUCATION – NEW APPROACH AND NEW
STYLE. Guna Civcisa, Jolanta Janauska, Iveta Mezinska, Janis Mazais,
Janis Mikelsons, Janis Rudnevs, Narimants Salenieks, Riga Technical
University, Latvia

10^35 – 11^00  DEVELOPMENT OF ENGINEERING EDUCATION DURING LAST
20 YEARS IN RUSSIA. Vladimir Romanenko, St-Petersburg State
University of Technology and Design, North-West Institute of Printing,
Russia

11^00 – 11^25  CONTRIBUTION OF THE RESEARCH INSTITUTE OF
AGRICULTURAL MACHINERY DURING 50 YEARS OF ITS
EXISTENCE. Arvids Vilde, Dainis Viesturs, Semjons Ivanovs, Andrei
Ilsters, Imants Ziemelis, Ruta Balode, Latvia University of Agriculture,
Research Institute of Agricultural Machinery

11^25 – 11^50  RESEARCH IN BIOSYSTEMS ENGINEERING IN LATVIA
UNIVERSITY OF AGRICULTURE. Gints Birzietis, Kaspars Vartukapteinis,
Latvia University of Agriculture, Faculty of Engineering

11^50 – 12^00  ABOUT THE CONFERENCE PROGRAMME
Aivars Aboltins, Vice-chairman of the Organizing Committee of the
Conference

12^00 – 13^00  Lunch

13^00 – 15^00  Work in sections

15^00 – 15^30  Coffee break

15^30 – 17^30  Work in sections

Regulations:
Presentations – 10 minutes
Discussions – 5 minutes

18^00  Excursion to LUA Library and Museum (Jelgava Palace)

19^00  Conference dinner
2 Liela Str., Jelgava Palace, Silver Hall
1. MATHEMATICAL SIMULATION OF BEET VIBRATIONAL EXTRACTION
Volodimir Bulgakov¹, Semjons Ivanovs²
¹Ukrainian Academy of Agrarian Sciences, ²Latvia University of Agriculture

2. ASSESSMENT OF A LASER SCANNER ON AGRICULTURAL MACHINERY
Detlef Ehlert, Michael Heisig, Rolf Adamek
Leibniz-Institute for Agricultural Engineering Potsdam-Bornim, Germany

3. CONTROLLED TRAFFIC FARMING
Jiri Masek, Milan Kroulik, Frantisek Kumhala
Czech University of Life Sciences

4. MAINTENANCE COSTS OF INTENSIVELY USED SELF-PROPELLED MACHINES IN AGRICULTURAL COMPANIES
Juri Olt, Ulo Traat, Arne Kuut
Estonian University of Life Sciences

5. ADHESIVE BONDS DEGRADATION
Miroslav Muller, Petr Valasek
Czech University of Life Sciences

6. APPLICATION BOOM FOR CHEMICAL PROTECTION OF HOPS GROWN ON LOW TRELIS SYSTEMS
Adolf Rybka, Ivo Honzik, Petr Hermanek, Bohuslav Jost, Lenka Zampachova
Czech University of Life Sciences

7. SOME INVESTIGATIONS IN PRECISION AGRICULTURE
Arvids Vilde, Dainis Lapins, Gundega Dinaburga, Adolfs Rucins, Sandris Cesnieks, Edmunds Piris, Andris Berzins, Aigars Plume, Janis Kopmanis
Latvia University of Agriculture

8. SOME ASPECTS IN PREPARATION OF TRANSPORT AND FIELD OPERATIONS ON LARGE BULGARIAN FARMS BY USING GPS AND GOOGLE EARTH
Atanas Atanasov, Plamen Kangalov, Kaloyan Stoianov, Ivailo Angelov
University of Rousse, Bulgaria

9. USAGE OF DIFFERENT MATERIALS IN AIR HEATED SOLAR COLLECTORS
Aivars Aboltins, Janis Palabinskis, Guntis Ruskis
Latvia University of Agriculture

10. WHEELED ROBOT FOR RURAL ENVIRONMENT
Teodor Akinfiev, Manuel Armada
Technical University of Madrid, Spain

11. DIFFERENCES OF SOIL AGROCHEMICAL PROPERTIES IN CONNECTION WITH ALTITUDE IN WINTER WHEAT
Gundega Dinaburga, Dainis Lapins, Janis Kopmanis
Latvia University of Agriculture
1. BEHAVIOR OF COWS AND ITS CONSEQUENCES RELATED TO THE USE OF MILKING ROBOTS
Stanislaw Winnicki¹, Tomasz Kolodziejczyk¹, Romana Glowicka-Woloszyn², Andrzej Myczko¹, Barbara Musielska¹
¹Instytut Technologiczno-Przyrodniczy w Falentach Oddzial Poznan, Poland; ²Uniwersytet Przyrodniczy w Poznaniu, Poland

2. COMPARISON OF TMR AND PMR FEEDING SYSTEMS
Stanislaw Winnicki¹, Romana Glowicka-Woloszyn², Tomasz Kolodziejczyk¹, Waclaw Romaniuk¹, Robert Kantarowski²
¹Poznan Branch of the Institute of Technology and Life Sciences in Falenty, Poland; ²Poznan University of Life Sciences, Poland

3. ECONOMICALLY MOST EFFICIENT EQUIPMENT IN MILKING PARLOURS
Juris Priekulis¹, Andris Kurgs²
¹Latvia University of Agriculture; ²AKP GEA Westfaliasurge Ltd.

4. PRINCIPLES AND EXPERIENCES OF DESIGNING AUTOMATIC MILKING COW SHEDS
Arvo Leola
Estonian University of Life Science

5. A DAIRY HERD DYNAMIC MODEL AS A BASIC TOOL IN SIMULATION OF DAIRY HUSBANDRY TECHNOLOGICAL ADVANTAGES
Eugene V. Ternov
The Republican Unitary Enterprise “Scientific and Practical Centre of the National Academy of Sciences of Belarus for Agriculture Mechanization”

6. INNOVATIVE DEVELOPMENT OF SWINE FIDING EQUIPMENT ON A NEW TECHNOLOGICAL LEVEL
Gutman Yasiliy, Maxim Naunka
National Academy of Sciences of Belarus for Agricultural Mechanization

7. RESEARCH IN TIME BETWEEN MILKING INTERVAL AND VARIABILITY OF MILKING FREQUENCY USING MILKING ROBOTS
Armins Laurs, Juris Priekulis, Martins Purins
Latvia University of Agriculture

8. WARMING OF PIGLETS RESTING PLACES BY AIR HEAT PUMP IN DEPENDENCE ON OUTSIDE AIR TEMPERATURE
Andrievs Ilsters, Viktorija Zagorska, Zanis Jesko
Latvia University of Agriculture

9. EFFECTIVENESS OF SOMATIC CELL COUNT DETERMINATION IN THE MILKING ROBOTS
Ivars Lusis, Vita Antane, Armins Laurs
Latvia University of Agriculture

10. WORKING EFFICIENCY OF SPIRAL CONVEYOR IN TRANSPORTATION OF MIXED FEED
Ansis Salins, Juris Priekulis
Latvia University of Agriculture

11. RESEARCH OF RAIN WATER USING POSSIBILITIES
Edmunds Visockis¹, Rasma Deksne¹, Erika Teirumnieka¹, Marina Kobakhidze²
¹Rezekne Higher Education Institution, Latgale Sustainable Development Research Institute, Latvia; ²Shota Rustaveli State University, Georgia
1. INTERMEDIATE REGULARITIES ON THE ENERGETICAL PARAMETERS OF THE TRACTOR ENGINES
   Arvids Vilde, Edmunds Pirs
   Latvia University of Agriculture

2. THEORETICAL MODEL OF EXPLOITATION OF AUTOMOBILES OPERATED WITH BIOETHANOL-GASOLINE MIXTURE FUELS
   Aivars Aboltins, Dainis Berjoza, Vilnis Pirs
   Latvia University of Agriculture

3. RESEARCH INTO MODELS OF CHOICE OF TRACTOR AGGREGATES
   Nikolajs Kopiks, Dainis Viesturs
   Latvia University of Agriculture

4. SIMULATION OF PRESSURE OSCILLATION IN HYDRAULIC HITCH-SYSTEM
   Janis Laceklis-Bertmanis, Edgars Repsa, Eriks Kronbergs
   Latvia University of Agriculture

5. EXPERIMENTAL INVESTIGATION IN ACCELERATION OF VEHICLES
   Andris Linins, Dainis Berjoza
   Latvia University of Agriculture

6. EVALUATION USABILITY OF WATER ADSORPTION AND RECTIFICATION IN DEHYDRATION OF BIOETHANOL
   Gunars Bremers¹, Gints Birzietis, Anita Blija¹, Arnolds Skele¹, Adolfs Rucins¹, Aleksejs Danilevics²
   ¹Latvia University of Agriculture; ²Latvia University

7. INVESTIGATION OF IMPACT OF BIOFUEL BLEND ON ARCTIC DIESEL FUEL PROPERTIES
   Aivars Birkavs, Gints Birzietis, Ilmars Dukulis
   Latvia University of Agriculture

8. THE SPECIFIC PECULIARITIES OF RAPESEED FUEL USAGE DEPENDING ON OIL CHEMICAL STRUCTURE
   Vladimirs Baks, Ilmars Dukulis
   Latvia University of Agriculture

9. COMPARISON OF MODEL CALCULATIONS AND EXPERIMENTAL RESULTS OF DIESEL ENGINE FUELLED WITH BIODIESEL
   Ruslans Smigins, Aivars Aboltins
   Latvia University of Agriculture

10. MOST WIDESPREAD CAR FUEL SYSTEMS IN LATVIA
    Janis Mistris, Gints Birzietis
    Latvia University of Agriculture
1. THE APPLICATION OF THE CONSUMED CURRENT SPECTRAL ANALYSIS FOR THE MONITORING OF BEARING UNITS OF INDUCTION MACHINES
Aleksandrs Gasparjans¹, Aleksandr Terebkov¹, Anastasia Zhiravetska²
¹Maritime Academy of Latvia; ²Riga Tehnical University, Latvia

2. PULSE DENSITY MODULATION CIRCUIT
Janis Greivulis, Janis Donins
Riga Technical University, Latvia

3. ANALYSIS OF HEATING VALUE VARIATIONS IN STORED WOOD
Nerijus Ciganas, Algirdas Raila
Lithuanian University of Agriculture

4. ADAPTIVE SELF-TUNING UP MODEL FOR NON-STATIONARY PROCESS SIMULATION
Andris Sniders
Latvia University of Agriculture

5. LOCAL ENERGY RESOURCES IN THE INTEGRATED SYSTEM OF ENERGY PRODUCTION AND USE
Andris Upitis, Viktorija Zagorska, Miervaldis Kristapsons, Zanis Jesko
Latvia University of Agriculture

6. PECULIARITIES OF DOMESTIC WATER HEATING BY SOLAR COLLECTORS
Ilze Pelece, Henriks Putans, Viktorija Zagorska, Liene Kancevica, Imants Ziemelis
Latvia University of Agriculture

7. SEMI-SPHERICAL SOLAR COLLECTOR FOR WATER HEATING
Ilze Pelece
Latvia University of Agriculture

8. ANAEROBIC DIGESTION OF SEWAGE SLUDGE
Vilis Dubrovskis, Imants Plume, Vladimirs Kotelenecks, Eduards Zabarovskis
Latvia University of Agriculture

9. BIOGAS PRODUCTION FROM FRESH MAIZE BIOMASS
Vilis Dubrovskis, Imants Plume, Janis Bartusevics, Vladimirs Kotelenecks
Latvia University of Agriculture

10. SPECTRAL ILLUMINATION EQUIPMENT FOR GREENHOUSE PLANTS
Janis Fridrihsons, Ina Alsina
Latvia University of Agriculture

11. DEVICE OF LUMINESCENT LIGHT BULBS WITH DEFECTED FILAMENTS
Janis Fridrihsons, Aldis Lojans, Ainars Galins
Latvia University of Agriculture
1. **BRIQUETTING OF CHIPS FROM NONFERROUS METAL**  
Milan Brozek, Alexandra Novakova  
*Czech University of Life Sciences*

2. **EVALUATION OF HELICAL SPRINGS**  
Alexandra Novakova, Milan Brozek  
*Czech University of Life Sciences*

3. **FEATURES OF BIO-BRIQUETTES PRESSING WITH THE PISTON BRIQUETTING PRESS**  
Alexandru Muntean¹, Bohumil Havrlad², Victor Pobedinsky¹, Tatiana Ivanova², Grigore Marian¹  
¹State Agrarian University of Moldova; ²University of Life Sciences Prague, Czech Republic

4. **AUTOMATIC MEASUREMENT OF RESIDUAL STRESSES IN THE REPAIRED DETAILS OF FARMING MACHINES BY THE COHERENT OPTICS METHOD**  
Andrey Apalkov¹, Teodor Akinfiev¹, Manuel Armada¹, Igor Odintsev²  
¹Technical University of Madrid, Spain; ²A.A.Blagonravov Mechanical Engineering Research Institute, Moscow, Russia

5. **IMPROVING ENERGY PERFORMANCE OF EQUIPMENT FOR PRODUCTION OF PEELED VENEER**  
Jury Kalugin, Alexander Alifanov  
*Baranovichi State University, Belarus*

6. **INFLUENCE OF VISUAL CONDITION ON RESIDUAL FLEXURAL CAPACITY OF EXISTING PRECAST CONCRETE PANELS**  
Jaan Miljan, Mihkel Kiviste  
*Estonian University of Life Sciences*

7. **VISUALIZATION STORIES AS A METHOD TO STIMULATE INVENTING PROCESS**  
Aigars Atvars  
*Institute of Physical Research and Biomechanics, Latvia*

8. **POSSIBILITIES OF USE OF MECHANICAL SURFACE TREATMENT WASTE IN FORM OF POLYMERIC PARTICLE COMPOSITE FILLERS**  
Petr Valasek, Miroslav Muller  
*Czech University of Life Sciences*

9. **RESEARCH IN WELDED SIEVE QUALITIES DEPENDANCE ON ASPECTS OF PRODUCTION TECHNOLOGY**  
Gunars Verdins, Daina Kanaska  
*Latvia University of Agriculture*

10. **HERBACEOS ENERGY CROP SHREDDING SIZE DETERMINATION**  
Mareks Smits, Andris Kronbergs, Eriks Kronbergs  
*Latvia University of Agriculture*

11. **CHANGES OF ROLLING FRICTION LINK CHAIN STEP IN LINK TURNING**  
Emils Pudans, Guntars Uzklingis  
*Latvia University of Agriculture*

12. **DURABILITY OF THE ARRANGED STRUCTURE BIOMASS BRIQUETTES**  
Aivars Kakitis, Imants Nulle, Dainis Ancans  
*Latvia University of Agriculture*
1. **CONFERENCES AND COMPETENCIES: STUDENTS CONFERENCE AS ENVIRONMENT FOR COMPETENCIES FORMATION**
   Olga G. Vetrova
   *St.Petersburg State Polytechnic University, Russia*

2. **SOME ASPECTS OF SKILLS AND COMPETENCES IN ENGINEERING EDUCATION**
   Vladimir Romanenko¹, Larisa Malinovska², Galina Nikitina³
   ¹*St-Petersburg State University of Technology and Design, Russia;* ²*Latvia University of Agriculture;* ³*St-Petersburg Branch of the Academy of Information Technologies in Education, Russia*

3. **TRAINING TEACHERS IN UKRAINE**
   Galina Marchenko
   *Horlivka State Pedagogical Institute of Foreign Languages, Ukraine*

4. **STUDENTS CONNECTING TO PRODUCTION PROBLEMS RESOLUTIONS IN CAD/CAM AREA**
   Natasa Naprstkova
   *Jan Evangelista Purkyne in Usti nad Labem, Czech Republic*

5. **CREATION STUDY AIDS WITHIN THE STUDENTS WORKS**
   Kusmierczak Sylvia
   *J. E. Purkyne University in Usti nad Labem, Czech Republic*

6. **DESIGNING A THEORETICAL MODEL OF TRAINING ENGINEERS FOR ECOLOGICALLY SAFE INDUSTRIAL ACTIVITIES**
   Uladzimir Zuyeu, Vasily Kachurka
   *Baranovichi State University, Belarus*

7. **INTELLIGENT USE OF ENERGY IN ENGINEERING EDUCATION**
   Anda Zeidmane, Inese Ozola
   *Latvia University of Agriculture*

8. **COMPETITIVENESS OF PERSONALITY AS A NEW CONCEPT IN MODERN EDUCATION AND PEDAGOGY SCIENCE**
   Irena Katane
   *Latvia University of Agriculture*

9. **FIRST YEAR STUDENT EVALUATION OF STUDY PROCESS AT THE FACULTY OF ENGINEERING**
   Kaspars Vartukapteinis, Antonina Cukure, Janis Cukurs
   *Latvia University of Agriculture*
**Friday, 28 May**

9:30 BUS TOUR to **Training and research farm of the Latvia University of Agriculture "Vecauce"** and P.Upītis's impressive lilac garden at Dobele

~ 16:00 RETURNING TO JELGAVA

**Training and research farm of the Latvia University of Agriculture "Vecauce"** is a unique training and research centre - many-branched farm, which deals with cattle breeding and also with cultivation of plants - growing pedigree seeds, including maintenance selection. "Vecauce" is the only state farm for research and experiments in cattle-breeding and veterinary medicine science and practice, where the needed number of animals can be provided, including for experiments of diagnosing new animal diseases. "Vecauce" has also become the main place in the country, where corn is researched.

The farm occupies a significant place in the study process, and it is also an important research base. Both the University students and students of the technical and vocational schools of Latvia strengthen their practical skills there. Various field practices take place in "Vecauce" on a regular basis, and they are obligatory for all students of the university. Field practices significantly complete the theoretical knowledge acquired at the University.

Biogas plant, which uses manure and field biomass, is created in the Vecauce complex. This is the first important biogas plant in Latvia, which is set up in the cattle farm. Production of biogas is cost-effective, because it gives a possibility to cover all the needs of the farm for electric energy and heating. Vecauce is proud of the most up-to-date dairy complex in the Baltics, where milking of around 120 cows is performed by robots-milkers. The Annual Harvest Festival and a wide profile agriculture exhibition "Vecauce", where cattle breeders participate, take place at the Farm. Also animal auctions - beef cattle, sheep and small animals, agricultural machinery demonstrations and seminars are held there.
**P. Upītis's impressive lilac garden at Dobele** is the most impressive of its kind in the Baltics. The best time to visit this Latvian Orchards Institute garden is during the lilac flowering season. The 4 hectare garden is bursting with the smells and colours of more than 200 varieties of lilac. It has become traditional for classical music concerts to be staged in the gardens. A memorial museum is dedicated to the life and work of the garden's creator, Pēteris Upītis. (+371 26408655, +371 63722294, www.lvai.lv).
Address of the Conference Committee

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