



# International Commission of Agricultural and Biosystems Engineering

## Newsletter 126

September 2021

*"...to serve - on a world-wide basis and through its members - the needs of humanity by fostering mutual understanding, improvement and rationalisation of sustainable biological production systems while protecting nature and environment and managing landscape through the advancement of engineering and allied sciences..."*



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International Exposition of Machinery for Agriculture and Gardening, 19-23 October 2021, Bologna, Italy.	
XI Congreso Iberico de Agroingenieria November 11-12, Online.	
2022 Agricultural Equipment Technology Conference February 14-16, Omni Louisville Hotel, Kentucky	
Land.Technik 2022, February 25-26, Hannover, Germany,	
ASABE 2022 Annual International Meeting, Houston, Texas, USA	
AgEng 2022, November 22-23, Berlin, Germany	
CIGR World Congress: Kyoto, Japan 2022	

Web: [www.CIGR.org](http://www.CIGR.org)

Journal: [www.CIGRjournal.org](http://www.CIGRjournal.org)

Contact us: [secretarygeneral@CIGR.org](mailto:secretarygeneral@CIGR.org)



Tomas Norton  
CIGR Workgroups Coordinator  
Katholieke Universiteit Leuven  
Belgium

**It is with great pleasure that give you an update on some of the most interesting developments within the CIGR Technical Sections.**

As we know, the Technical Sections (TS's) form the core working bodies of the CIGR. Within each Technical Section (TS) a different field of science and technology is developed and promoted towards the realisation of the CIGR Mission. Members from all across the world are invited to join and contribute to our activities. Of course the coordination of the efforts in the TS needs close attention and for this we are grateful to the dedicated professionals who give their time to do this on a voluntary basis. We currently have 7 active TS's that are chaired by senior scientists, who are highly respected in their fields. Together the TS chairs and I form the Technical Board of CIGR, where we aim to synergise efforts across the TS's.

With the pandemic, the last couple of years have not been easy for the TS's, as many of the meetings they generally contribute to have been postponed or cancelled. Nevertheless the TS chairs and I have used this as a moment to review the recent activities and identify room for improvements that can be made to make grow our sections. The many things that we discussed have been published in the CIGR June 2021 newsletter and will not be repeated here.

However, a key point of our discussions was how to appeal to early-stage researchers as involving younger generation of scientists is key to the sustainability of the sections. I would like to expand this challenge more in this foreword. In particular I would like to focus on 3 points: (1) who is eligible to

join a TS, (2) how can we reach these new members; and (3) what new activities can be developed within the TS. Below I deal with each point separately:

**Who can join the Technical Sections?**

The CIGR statutes have clearly defined the scope of the membership for each TS in the following paragraph:

“Each individual member of CIGR (Every member of a regional or national society that is member of CIGR is member of CIGR) can join one or possibly no more than two Technical Sections following his/her own field of interest, without any extra fee payment.”

Therefore, to be named as a (official) member of the Technical Section one just needs to be a member of CIGR. In Technical Section II (TSII) we have also opened the doors to members outside the CIGR, who while not official members of the TS can indeed greatly contribute with knowledge that supports the functioning to the TS. For example given the focus on housing of animal and plants in TSII we also would like to count on support of animal and plant scientists. So even if you know people that are not agricultural engineers or members of the CIGR but who could make a contribution to the sections then please direct them towards to the most relevant section chair.

**Reaching out to new members**

Reaching motivated people to join our sections is a challenge. Currently the Technical Board have are working on “Expressions of Interest” that will be shared with the regional or national societies for promotion within their own membership. Once ready these expressions of interest will be also published upcoming CIGR newsletters and on the CIGR website.

**New section activities**

Traditionally TS's meet every 2 years at the International CIGR conferences/congresses, where

symposia are often organised according to the theme of each TS. Every other year the TS's are involved in sponsoring meetings that align with the TS themes. However, the corona pandemic put a severe halt to this traditional approach and while we hope to return to some normality soon it did give the opportunity to think of new initiatives.

Example new initiative: In the meeting of the TSII Section Board on 7/7/2021 it was agreed to start up sub-group actions that will run for at least one year at a time. These actions would support directly the mission of the CIGR by producing a deliverable each year, which will be disseminated on the CIGR website. These actions will encourage the involvement/leadership of young researchers. The actions to be initiated in 2021 include:

- Education in Animal Environments and Precision Livestock Farming
- Emissions monitoring and modelling
- Greenhouse and plant factories

If anyone finds these topics of interest and would like to join one of these actions, then don't hesitate to contact me: [tomas.norton@kuleuven.be](mailto:tomas.norton@kuleuven.be)

Finally, I would like to express my thanks to the chairs of the TS's for all their hard work and dedication in maintaining strong and active Sections within the CIGR. I look forward to meeting you in person at the CIGR congress in Kyoto 2022 and continuing our collaboration. Thanks to:

- José Manuel Monteiro Gonçalves, Chair of Section I: Land and Water
- Francisco Rovira Mas, Chair of Section III: Plant production:
- R. Cengiz Akdeniz Chair of Section VI: Energy in Agriculture
- Oliver Schlüter, Chair of Section VI: Bioprocesses
- Dionysis Bochtis, Chair of Section V: System Management
- Patrizia Busato, Chair of Section VII: Information Technology.

Kind regards,  
Tomas Norton  
Chair of CIGR Technical Board

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## Call for contributions to CIGR Journal Special Issue on Artificial Intelligence and Data Science



Hossein Bonakdari  
Editor  
University of Laval  
Canada



Gareth Lagerwall  
Co Editor  
University of Kwazulu-Natal  
South Africa

### **You are invited to contribute to the CIGR Journal special issue on “Artificial Intelligence in Agricultural and Biosystems Engineering”.**

Recent developments in high-quality measurement technologies led to the rapid generation of large, unstructured, datasets. This created the need for new techniques and tools for data analysis, and models able to describe, predict and prescribe, that aim towards sustainable development and health in fields related to Agricultural Engineering. As a result, there is an increased interest in the use of Artificial Intelligence and Data Science (AI/DS) techniques to many of the problems currently faced by our society. It is apparent that these AI/DS supported tools will revolutionize many aspects of future agriculture and natural resources. AI/DS promises to address many difficult problems in the domain of agriculture that are of interest in many parts of the world. As often happens with emerging technology, AI/DS methods are opening new opportunities for agricultural practitioners over a wide range of applications.

The goal of this issue is to make available to the world community of agricultural and biosystems

engineers, and related professionals, a collection of scientific papers on the current state of the art and recent developments of AI/DS applications the field. This special issue will shed light on many of the ongoing research activities on application of AI/DS techniques into a single open-source document as well as current trend. It will consolidate original research on the application of different techniques on AI/DS and machine learning to address social, political, economic, safety, health, and technological issues of agricultural and biosystems challenges and opportunities including, but not limited to:

- Agriculture and Society
- Energy
- In-farm, extra farm and regional logistics
- Animal Systems
- Plant Systems and Postharvest Technology
- Food Science and Technology
- Soil and Water
- Precision Aerial Application.
- Waste Management
- GHG Emissions, Climate change and Adaptation
- Machinery and Robotic Systems
- Image Analysis for Agricultural Processes and Products
- Monitoring, Control and Data Analysis

To be considered for this special collection, please submit an abstract to the editors by December 1<sup>st</sup>, 2021. Your manuscript will be subject to the peer review process of the CIGR journal. For more information or submitting an abstract please contact Profs. Bonakdari and Lagerwall.at:

[hossein.bonakdari.1@ulaval.ca](mailto:hossein.bonakdari.1@ulaval.ca) and  
[Lagerwall@ukzn.ac.za](mailto:Lagerwall@ukzn.ac.za).

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## Final Agricultural Engineering in Africa Report Available for Download



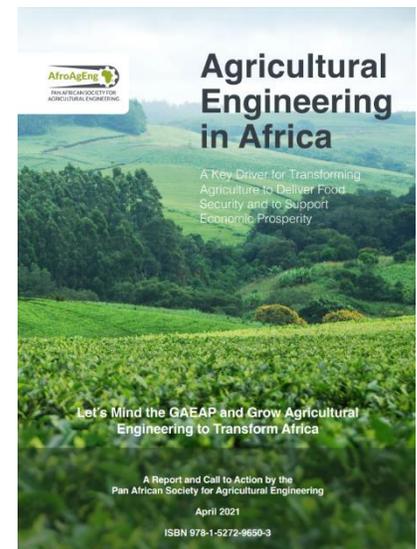
Umezuruike Linus Opara  
CIGR Past President  
CEng FIAgrE FSAIAE FNIAE  
South Africa

The Pan African Society for Agricultural Engineering has issued its final report: “Agricultural Engineering in Africa: A Key Driver for Transforming Agriculture and Deliver Food Security to Support Economic Prosperity”.

This effort began at the June 2014 at the African Union Summit in Malabo, Equatorial Guinea, where Heads of State and Government adopted an extraordinary set of concrete goals for agriculture to be attained by 2025. The Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods articulates a new set of goals showing a more targeted approach to achieve the agricultural vision for the continent which is shared prosperity and improved livelihoods for the African Continent. The Malabo Summit reconfirmed that agriculture should remain high on the development agenda of the African Continent, and that it is a critical policy initiative for Africa’s economic growth and poverty reduction. To achieve its ‘Commitment to Halving Poverty by the year 2025, through Inclusive Agricultural Growth and Transformation’, the leaders agreed on the need to sustain annual agricultural GDP growth of at least 6%, and to create job opportunities for at least 30% of the youth in agricultural value chains. Similarly, while committing to ending hunger in Africa by 2025, African leaders resolved to facilitate, among others, sustainable and reliable production; supply of appropriate knowledge, information, and skills to

users; efficient and effective water management systems notably through irrigation; suitable, reliable, and affordable mechanization and energy supplies; and to halve the current levels of postharvest losses, by the year 2025.

This report focusses on Agricultural Engineering and highlights its crucial role in Africa as a key driver for transforming agriculture to deliver food and water security, sustainable agricultural production, and thus to support economic prosperity. The harsh facts which face Africa are well known and well documented by a broad range of organizations. The role of Agricultural Engineering in helping to address these is less well known and this report articulates and highlights the contributions and impact the profession makes towards sustainable food production, post-harvest handling and processing systems, both now and in the future.



The report addresses several strategic directions, including the need to raise the profile of Agricultural and Biosystems Engineering, reform and modernize education, promote and grow the profession amongst all stakeholders, create opportunities and remove barriers, and ensure sustained efforts into the future.

You are invited to download and share the full report <https://pasae.org.za/publications.html>.



Stéphane Godbout  
Co-chair  
IRDA  
Canada



René Morissette  
Co-chair  
Agriculture and Agri-food Canada  
Canada

Abstracts for the Joint CIGR/CSBE-SCGAB Meeting held May 11-14 in Quebec, Canada, are now available.

These can be found at:

[5th CIGR and AGM Quebec City 2021](#)  
[Regular Sessions](#)

[Special Session on Biochar](#)

[Special Session on Biogas](#)

[Special Session on Hydrological Modelling: a Tool for Resilient and Sustainable Agriculture](#)

[4th international Symposium on Gas Emissions and Dust from Livestock \(EMILI\)](#)

[9th Concrete for sustainable agriculture International Symposium](#)

[Innovations to Meet Animal Production Challenges Symposium](#)

[World Congress on Computers in Agriculture and Natural Resources](#)

Abstracts from other CSBE-SCGAB Technical Conferences can be found [here](#), including the 17th CIGR World Congress.

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## Call for Expression of Interest: Smart Agriculture Technologies

We would like to announce the compilation of new encyclopedia on “Smart Agriculture Technologies” to be published by Springer Nature in 2022. This new contribution will target non-professionals and laypersons interested in understanding more about agricultural technologies at an introductory level. Currently over 200 entries have been identified covering many different technological topics of relevance to modern agriculture. This encyclopedia will be based upon established knowledge and provides a general overview of a subject, it is not equivalent to a review or research paper.

We are now looking for experts to contribute to this work and welcome collaborations with members of CIGR with knowledge on different Smart Agriculture Technologies. If you are interested to contribute to this initiative, please email Prof Qin Zhang ([qinzhang@wsu.edu](mailto:qinzhang@wsu.edu)) or Prof Tomas Norton ([tomas.norton@kuleuven.be](mailto:tomas.norton@kuleuven.be)) with an expression of interest that includes (1) the topic you would like to contribute and (2) a short CV showing your publications.

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# Invitation to the Third International Workshop on Machine Learning for Cyber-Agricultural Systems



Wei Guo  
CIGR AI/DS Workgroup  
University of Tokyo  
Japan

Dear Colleagues,

On behalf of the organizers, we are pleased to invite you and your team/students to the **Third International Workshop on Machine Learning for Cyber-Agricultural Systems (MLCAS 2021)**. It will be held on November 2<sup>nd</sup>~4<sup>th</sup>, 2021 online based on GMT+9(Tokyo, Japan), GMT-5(Ames, U.S.A). <https://mlcas2021.github.io/>

In this JST-CREST sponsored and USDA-NIFA, US NSF CPS program supported event, we are hoping to bring together a large group of academic and industrial Researchers and practitioners at the intersection of machine learning, cyber-physical systems, plant sciences and agriculture for two days of stimulating conversation and cross-pollination of ideas.

Apart from plenary talks, we will have contributed research papers and posters, academic and industry panels, and a machine learning based plant phenotyping competition. Here are some of the key dates for your reference.

**Registration Open:** 18, Aug 2021 [at here](https://forms.gle/kbRhL8AWRSc8JpGVA)  
<https://forms.gle/kbRhL8AWRSc8JpGVA>

**Registration Fee:** Free

**Workshop date:** November 2~4, 2021

**Paper submission [at here:](https://cmt3.research.microsoft.com/MLCAS2021)**

<https://cmt3.research.microsoft.com/MLCAS2021>

## Important Dates

**Submission open:** Wednesday, September 1st, 2021

**Paper (extended abstract) deadline:** Friday, October 1st, 2021

**Decision sent to authors:** later in October 2021

**Workshop date:** November 2nd~4th, 2021

## Competition:

Crop Yield Prediction Integrating Genotype and Weather Variables Using Machine Learning.

The competition details for participation are [provided here](#).

<https://eval.ai/web/challenges/challenge-page/1251/overview>

## Important Dates

Sep 3: Start Date

Sep 18: Team composition Deadline

Oct 18: Final Submission Deadline

Oct 25: Announcement of Results

## Award Amounts

1st prize: \$2000; 2nd prize: \$1500; 3rd prize: \$1000

We sincerely hope to see you and your team/students at MLCAS this year. Please feel free to let me know if you have any questions.

## The organizers,

Wei, GUO, Seishi, Ninomiya, and Masayuki, Hirafuji.

Graduate School of Agricultural and Life Sciences, The University of Tokyo  
members of CIGR.

Soumik Sarkar Agronomy,

Iowar,Ganapathysubramanian.

Department of Mechanical Engineering, Iowa State University.

Asheesh K (Danny), Singh. and Arti, Singh .

Department of Agronomy,Iowa State University.

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## Invitation to Join CIGR Section II: Structures and Environment

Be part of an active community focussing on cutting edge developments in technologies related to indoor plant and animal housing and management.

Grow your research network and become more visible in the community.

Lead and/or contribute to dissemination actions of CIGR Section II.

### **Eligibility:**

Professionals or PhD students are eligible to apply. Only applicants that can demonstrate a link between their career and the mission and objectives of CIGR Section II are advised to apply (see ANNEX for information on the Section)

### **Required:**

A one-page CV highlighting your career including your most relevant research/development outputs. A ½ page motivation describing the reasons you would like to join the section and the contributions that you could make

### **Conditions of Section Membership:**

You must be a member of CIGR. Every member of a regional or national society that is member of CIGR is member of CIGR as well, thus being entitled to use all CIGR facilities and services at special membership conditions as well as to be elected to any CIGR body. Please check the national societies that are currently members of CIGR here:

[https://www.cigr.org/members\\_organizations](https://www.cigr.org/members_organizations)

Each individual member of CIGR can join no more than two Technical Sections following his/her own field of interest, without any extra fee payment.

Send your application to Prof Tomas Norton Chair of Section II ([tomas.norton@kuleuven.be](mailto:tomas.norton@kuleuven.be))

For more information see:

<https://www.cigr.org/SectionII>

### **Overview of CIGR Section II:**

#### **Mission:**

The mission of CIGR-Section II is to promote and advance science, engineering and technology involved in the development Farm Buildings and

Structures with special attention given to efficiency of resource use, the reduction of emissions, the health and welfare of humans and animals. Social, environmental, and economic impacts of these technologies will be at the heart of our attention to realize sustainable development for both developed and developing countries.

### **Objectives:**

- Improving the knowledge on processes leading to better indoor environments for animals or crops
- Improved crop and animal modelling for building performance evaluation and development.
- Environmental assessment of impacts from animal buildings and greenhouses.
- Development and applicability of technologies for environmental control of the farm buildings and related physical processes, leading to strengthening the discipline of controlled environment agriculture.
- Improving the knowledge on emission processes from animal buildings as affected by animal building design and farming practices.
- Enhance knowledge of manure management, relevant technologies, standards and control measures.
- Improved technologies for higher performance animal production, through precision livestock farming systems.

### **Scope:**

- Developments in latest modelling and simulation tools CFD modelling (Building simulation)
- Natural ventilation design (Ventilation)
- Developments in emission modelling and measurement techniques (Emissions)
- Precision Livestock Farming technologies (Precision Livestock Farming)
- Crop monitoring and control technologies for greenhouses (Greenhouse technology)
- Climate-neutral farming with respect to building design and operation (Climate neutral Buildings)
- Housing animals in hot climates (Hot climate Housing)

- Developments in modelling heat loss and gas production from animals and crops (Animal and crop modelling)
- Information and Communication Technology (ICT) developments that support the objectives of the Section (Sensors and IT)

**Disciplines:**

- Civil engineering

- Biosystems and Agricultural engineering
- Electrical engineering
- Mechanical engineering
- Civil engineering
- Statistics
- Computer Science
- Agronomy
- Animal Sciences (inc. Ethology)
- Veterinary Science
- Crop sciences

## ASABE Member Hours: Introduction to Circular Economies

The ASABE Membership Development Council is pleased to present a five-part Member Hour series on [Transforming Food and Agriculture to Circular Systems](#), an ASABE initiative that seeks to build momentum, partnerships, and strategies that will transform current linear systems into resilient, circular systems.

Join us as we kick off the series with an introductory presentation by James Jones and Sue Nokes, Fellows of both ASABE and the National Academy of Engineering, who recently led an NAE Forum on Complex Unifiable Systems.

See below for the full schedule of Member Hour lineup. Sign up for any or all!

**Thursday, September 16, 1 pm**

James W. Jones, PhD, and Sue E. Nokes, PhD, PE  
[An Introduction to Circular Economies in Agriculture](#)

**Thursday, September 30, 1 pm**

Ebenezer Miezah Kwofie, PhD

[When Circularity Becomes Central to Our Global Food Security Agenda](#)

**Thursday, October 14, Noon**

William (Joe) Sagues, PhD

[Coupling Circularity with Carbon Negativity](#)

**Thursday, October 28, 1 pm**

Stephanie Herbstritt, PhD Student

[Waste to Worth: A Case Study of the Renewable Natural Gas Circular Economy in Pennsylvania](#)

**Thursday, November 9, Noon**

Keith Kline and Mike Levy, CLE

[Circular Economy Standards Initiatives in the International Organization for Standardization \(ISO TC323\): Status, Issues, Opportunities](#)

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## NIAE Capacity Development and Training Program



BA Adewumi  
Chairman,  
Professional Development  
Committee of NIAE  
Federal University of Agriculture  
at Abeokuta  
Nigeria

The Nigerian Institution of Agricultural Engineers (NIAE) initiated a monthly series of virtual presentations focused on a capacity development and continuous training program for its members. Training shall be in various areas and not limited to:

- Water-Energy-Food nexus
- Climate change and mitigation
- Infrastructures
- Sustainable Development Goals (SDGs) and its implementation
- Technical and Vocational Skills Development
- Legislation matters.
- Entrepreneurship

We are living in the AI world, and we must adopt and utilize this technology in all areas of Agricultural and Bioresources Engineering. Engineering and associated professions must rise to this reality and challenge and become adequately trained to utilize the tools of AI for the benefit of our stakeholders.

To start this series, Dr. Rufus Dirinfo conducted a presentation of Artificial Intelligence in Agriculture. The presentation can be seen [here](#).

We had about 75 participants, including our senior leadership and champions, NEC members, members of different NIAE Committees, NIAE members throughout Nigeria and junior colleagues. This shows the relevance of the AI.

Despite the challenges of AI in Nigeria, we must completely adopt it. We are all encouraged to promote AI in every area we find ourselves. We must also ensure personal development programme to educate ourselves in AI.

Finally, I also would like to recognize NIAE National Chairman, Prof Folarin Alonge, NEC and the Nigeria AI Group for the positive activities towards the progress of NIAE.



Rufus Dirinfo  
CIGR AI/DS Workgroup Member  
Lagos State Polytechnic  
Nigeria



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## 7th International College Students Intelligent Agricultural Equipment Innovation Competition

### To all Universities, Colleges, and Institutes:

International College Students Intelligent Agricultural Equipment Innovation Competition (Hereinafter referred to as the "competition") aims to cultivate students' innovative spirit and practical ability, stimulate innovation and entrepreneurship inspiration, and promote the cultivation of innovative and entrepreneurial talents in the field of agricultural equipment engineering and international exchange and cooperation for students majoring in agricultural engineering. The competition has become extremely influential in the field of agricultural equipment engineering and has achieved remarkable results in cultivating students' innovation and entrepreneurship ability and comprehensive quality. According to the regulations, the competition is held once a year. The first and second competitions were held by Jiangsu University. The third, fourth, fifth and sixth competitions were held by Southwest University, Fujian Agriculture and Forestry University, Anhui Agricultural University and Shandong University of Technology, respectively. Now relevant matters are hereby notified as follows

### I. Purpose of the competition

With the theme of "innovation-driven to achieve rural revitalization", the competition aims to cultivate modern agricultural equipment innovation and entrepreneurship talents with "strong professional knowledge and hands-on ability, as well as excellent innovation and entrepreneurship ability" urgently needed by the industry, and creates a comprehensive international education platform, contributing to the innovative development of modern agricultural equipment industry.

### Organizers

The 7th International College Students Intelligent Agricultural Equipment Innovation

Those wishing to participate in the competition but are not able or do not wish to travel due to the current public health situation may submit their materials and participate online.

SUBMISSION DEADLINE EXTENDED  
TO OCTOBER 31 2021

competition is organized by the following collaborating institutions:

#### 1. Organizers:

- International Commission of Agricultural and Biosystems Engineering (CIGR)
- Chinese Society of Agricultural Machinery (CSAM),
- Chinese Society of Agricultural Engineering (CSAE),
- Synergistic Innovation Center of Jiangsu Modern Agricultural Equipment and Technology (SICJMAET)
- International University Consortium for Agricultural Engineering (IUCAE).

#### 2. Co-organizer:

China Agricultural Machinery Distribution Association (CAMDA).

### II. Competition Requirements

#### 1. Participants:

Student of junior-college, undergraduate and graduate may apply in teams of two to five members.

#### 2. Entry categories:

The entries are divided into three classes: A, B and D.

#### Class A: Scientific or Technological Inventions in Intelligent Agricultural Equipment

Class A is divided into the following:

- A1: Invention of intelligent tillage equipment,

- A2: Invention of intelligent planting equipment,
- A3: Invention of intelligent field management agricultural equipment,
- A4: Invention of intelligent harvesting agricultural equipment,
- A5: Invention of intelligent agricultural equipment for preliminary processing in field,
- A6: Basic parts (hydraulic parts, transmission system, sensors, electric drive, navigation system, etc.)
- A7: Other intelligent agricultural equipment.

#### Class B: Robotics

Fruit trees fertilizer robot competition.

#### Class D: Conceptual Design

The works refer to the conceptual designs of intelligent agricultural machinery and smart agriculture that are forward-looking and future oriented.

### **III. Registration**

#### **1. Competition registration.**

Registration for the competition will open from June 1st, 2021 to October 30th, 2021.

Universities and colleges are required to select excellent work to participate in the competition. Teams in class A shall send the application document, the R&D report, and attachments (Annex 1, PDF format) to ds\_secretary@163.com. Teams in class D shall send the application document, the R&D report and attachments (Annex 1, PDF format) and the virtual concept model presentation video (720P, 200M or less) to ds\_secretary@163.com, before October 30th, 2021. The registration form for Class B (Annex 2) shall be sent to ds\_secretary@163.com. before October 30th, 2021.

#### **2. Final competition, entries presentations and awards (mid-to late November 2021)**

The participating teams will submit the application form together with the R&D report and attached paper manuscripts (Class A and D in five copies, Class B in two copies), maximum 30 pages, printed on both sides of A4 paper). In addition, please send the design draft of the post (JPG picture

format, exhibition board size 0.9m×1.2m) to ds\_secretary@163.com.

During the finals, Class A and D cases will be judged on site. The participating teams must bring relevant prototypes, physical models, software, virtual concept model and presentation video to the scene for exhibition; Class B cases will compete with each other on site.

### **IV. Award Types**

#### **1. Student awards**

There are top prizes (may be declared vacant), first prizes, second prizes and excellence prizes. During the competition, the judges will determine the number of prizes based on the entire number and quality of the entries.

#### **2. Outstanding supervisor award**

The competition will award the “Outstanding Supervisor Award” to the supervisors of the top prize entries.

### **V. Other matters**

#### **1. Please visit the following websites to keep updated:**

- The official website of the competition (<http://uiaec.ujes.edu.cn/>).
- Official website of the International Commission of Agricultural and Biosystems Engineering (<http://cigr.org>).
- Official website of the Chinese Society of Agricultural Machinery (<http://www.agro-csam.org>).
- Official website of the Chinese Society of Agricultural Engineering: (<http://www.csae.org.cn>).

#### **2. Cost and international travel expenses.**

For international competitors, expenses in China (accommodation, travel, and meals) during the competition will be covered by SICMAET. International travel expenses shall be borne by oneself. African students may apply 2000-3000RMB for travel subsidies.

### 3. Contact of the organizer:

Competition Secretariat: Mr. Hou of Jiangsu University, Email: ds\_secretary@163.com.

### 4. Other related information

Additional information will be released on the competition's official website <http://uiaec.uj.s.edu.cn/>.

Download the rules and application forms at [Rules and Application Forms](#). This zip file includes:

**Annex 1:** Application Form for Classes A, D

**Annex 2:** Summary List of Works

**Annex 3:** Member List of Organization

**Annex 4:** Class A,D Evaluation Rules

**Annex 5:** Rules of Class B Seedling Transplanting Robot Competition

International Commission of Agricultural and Biosystems Engineering

Chinese Society of Agricultural Machinery

Chinese Society of Agricultural Engineering

Synergistic Innovation Center of Jiangsu

Modern Agricultural Equipment and Technology

International University Consortium for

Agricultural Engineering

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## Book Review: Fundamentals of Tractor Design by Karl Renius

The farms and their technical equipment are as varied as the soil and climate regions – as individual as the farmers themselves. The tractor is the only permanent factor on the farms. You might think. The tractor is certainly the most important agricultural machine, but a closer look indicates that it is not yet a basic piece of adequate mechanization all over the world. And wherever it is used, the tractor technology must explicitly be adjusted to the local profile and level of agricultural mechanization. The resulting requirements determine the function, the design, and the equipment of tractors worldwide.

The book of Prof. Dr.-Ing. Dr. h.c. Karl Th. Renius "Fundamentals of Tractor Design" offers exactly these fundamentals for the development, understanding, classification and practical design of the relevant technologies. It describes the text in a pleasantly concise form, but at the same time extremely precise – “to put it in a nutshell” - the diverse, complex technical details as typically required.

In particular, the clear engineering structure in this diversity supports a sustainable understanding of the relationships. The large number of graphics created with the utmost care as didactical understandable representations, as detailed drawings, or diagrams as well as the tables full of

facts making the book a real treasure chest for the reader.

The book by Prof. Renius “Fundamentals of Tractor Design”, which is based on more than 50 years of experience of the author in different areas of agricultural machinery and tractor engineering, is a valuable, globally outstanding work.

Shortly after its publication, the book has become a standard work within the Agricultural Engineering community. There is nothing like it.

*Prof. Dr. Ludger Frerichs,*  
Full Professor and Head of the Institute  
of Mobile Machinery and Commercial  
Vehicles,  
Technical University of Braunschweig  
Braunschweig, February 28, 2020

*Renius, Karl Th.:*  
**Fundamentals of Tractor Design**

1st ed., Springer-Verlag 2019.

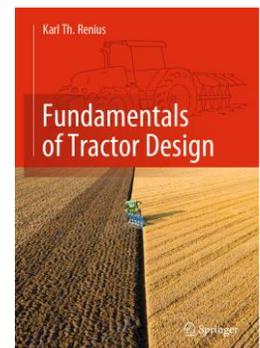
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303 pages, 471 pictures/graphics  
(often in colour), 123 tables, 135  
exercises, and 577 references.



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## Call for contributions to CIGR Handbook VII: Production of Non-food Materials



**Zhi Chen**  
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**China**



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**CIGR Honorary President**  
**Poland**



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**USA**

**You are invited to submit a Chapter for Handbook VII on production of non-food materials.** To submit a chapter please contact the editors at [secretarygeneral@cigr.org](mailto:secretarygeneral@cigr.org)

The synthesis of inorganic chemical compounds -carbon dioxide and water- in chlorophyll plants stores energy from solar radiation. This energy is often consumed in the form of food and feed.

Photosynthetic processes allow not only to store solar radiation energy for food and feed, but also to produce natural industrial raw materials with a non-food purpose.

The use of these materials is diverse, such as the production of natural fertilizers (e.g. compost), natural fabrics (e.g. cotton, wool), clothing, footwear and accessories (animal skins and fur), pharmaceutical and cosmetics (herbs, beeswax) as well as biofuels (see CIGR Handbook Vol. V). The use of raw materials is increasing, such as starch and cellulose used in biodegradable food packaging production.

The fundamental advantages of natural biological raw materials - plants and animals - are their biodegradability and reproducibility. For example, packaging from these materials can be broken down by microorganisms in a short period of time, generally a few months, while the decomposition of plastic packaging may take hundreds of years.

Products used by humans (e.g., clothing, cosmetics) that are made from raw materials of biological origin are usually non-allergenic and thus gain widespread social approval of consumers.

The production of non-food and biological raw materials may be a financially attractive alternative to the production of food and fodder raw materials. In many industrialized countries where there is overproduction of food, farmers are looking for alternatives that will ensure a stable and profitable operation.

The usefulness of non-food biological raw materials for industrial processing is determined by their physical, chemical, and biological properties. These properties are represented by metrics and parameters that may take the form of standards. For example, the suitability of cotton for processing is, based on fiber length, break strength and color. The usefulness of herbs for the cosmetics industry is determined by the content of essential oils and their chemical structure. Contamination, microbiological feathers and down of birds, determines their suitability to produce bedding and clothing.

Physical, chemical, and biological parameters of biological non-food raw materials are determined by the original makeup of the source of the material, the production environment, processes used in production, handling, storage, and transportation, as well as manufacture. Each of these stages requires the use of engineering for the efficient use of the resource, ensure sustainability and social responsibility.

## Upcoming Conferences

International Exposition of Machinery for Agriculture and Gardening, 19-23 October 2021, Bologna, Italy.



**A GREAT EIMA, AS USUAL**

The Digital Preview (EDP)

November 11/15, 2020

The Event

October 19/23, 2021 **New Date**

EIMA International is the International Exposition of Machinery for Agriculture and Gardening, a biennial event created in 1969 by FederUnacoma, the Italian Agricultural Machinery Manufacturers Federation, and organized by the federation's service division, FederUnacoma Surl, in collaboration with BolognaFiere. The Covid-19 emergency has defined a new economic and social geography with global restrictions. The international trade show calendar

has been completely revised and many events have been cancelled or postponed. EIMA International also had to revise its schedule by moving the Bologna exhibition to October 2021 and planning an important and detailed digital preview of the event for November 2020. In 2022, EIMA will return to its traditional November rendezvous.  
<https://www.eima.it/en/index.php>

XI Congreso Iberico de Agroingenieria November 11-12, Online.

## XI CONGRESO IBÉRICO DE AGROINGENIERÍA XI CONGRESSO IBÉRICO DE AGROENGENHARIA



11 Y 12 DE NOVIEMBRE 2021

VIRTUAL

Los mejores trabajos serán publicados en el Special Issue de las revistas indexadas:

 *applied sciences*

 *agronomy*

 *sensors*

ORGANIZADO POR:



Más información:

[www.agroing2021.com](http://www.agroing2021.com)  
[agroing2021@uva.es](mailto:agroing2021@uva.es)  
(+34) 979 108 360

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2022 Agricultural Equipment Technology Conference February 14-16, Omni  
Louisville Hotel, Kentucky



Join us February 2022, as we gather again, in-person, for this annual specialty conference!

For more informatoin contact ASABE Headquarters at [hq@asabe.org](mailto:hq@asabe.org)

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Land.Technik 2022, February 25-26, Hannover, Germany,

A promotional banner for the International Conference on Agricultural Engineering (LAND. TECHNIK 2022). The background is a photograph of a cornfield with green leaves and brown tassels against a blue sky. The text is overlaid on a semi-transparent white box. It includes the conference name, dates, location, and a 'Register now' button. An orange ribbon in the bottom right corner indicates the conference has been postponed to February 2022.

International Conference on Agricultural Engineering  
**LAND. TECHNIK 2022**  
February 25-26, 2022  
Hannover, Germany, Exhibition Ground

postponed to  
February 2022

Register now

For more information see <https://www.vdiconference.com/ageng/>

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Sustainable Energy for Sustainable Future. 16-19 May 2022. San Jose, Costa Rica.



An ASABE Global Initiative Conference

## *Sustainable Energy for a Sustainable Future*

May 16-19, 2022 • San Jose, Costa Rica



This conference was postponed to May 16-22, 2022. The planned venue for the meeting is the Intercontinental Hotel, Escazu, San Jose, Costa Rica. Details of the conference are available at <https://energy.asabe.org/>

### **Program Highlights**

- Novel renewable energy production technologies
- Distributed renewable energy production systems and their economic feasibility security and food security linkages
  - Regional energy solutions and their impacts on global climate change
  - Regulation and policy for regional and global energy security

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ASABE 2022 Annual International Meeting, Houston, Texas, USA



American Society of  
Agricultural and Biological Engineers

Watch for the call for abstracts to open in October!

The call for sessions is open until August 31. Connect with your [Community Program Chair](#) to submit your session

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AgEng 2022, November 22-23, Berlin, Germany



For information see <https://www.eurageng.eu/events>

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Noboru Noguchi  
Congress General Chair  
Hokkaido University  
Japan

It is a great pleasure and an honor to extend to you a warm invitation to attend “The XX CIGR World Congress 2022”, to be held December 5th - 9th, 2022 at Kyoto International Conference Center, Kyoto, Japan.

The theme of this CIGR World Congress "Sustainable Agricultural Production - Water, Land, Energy and Food" will underpin the need for collaboration and cooperation of individuals from a wide range of professional backgrounds. This congress will provide an excellent international platform for academicians, researchers, engineers, industrial participants, and students from around the world to share their research findings with global

experts in all areas related to agricultural engineering.

Kyoto has flourished as the capital of Japan for over a millennium, since 794. The city has an abundance of historically significant and unique locations, and has preserved its refined culture, historical sites, and innumerable Shinto shrines and Buddhist temples, continuing to fascinate visitors from all over the world.

We hope you will enjoy the content of the Congress, renew old friendships, make new friends, get new ideas, and above all, have a good time, as well as enjoy the city famous for its cultural traditions.

With best wishes,