ISTRO INFO
NEWSLETTER
of the
International Soil Tillage Research Organisation

Blair McKenzie

This issue of ISTROINFO contains nothing new about ISTRO board elections, constitutional matters, the 20th ISTRO conference in Nanjing in September 2015, or about the call for young researchers to apply for funding to attend the Nanjing conference. All that will appear in a special issue of ISTROINFO focussing solely on those topics. The special issue will be distributed in early August. The conference website at http://istro2015.csp.escience.cn is, of course, regularly updated and is certainly worth checking out.

To ensure that you are eligible to vote and participate in the organization please ensure that your membership fees are up to date. If you are unsure about your membership status; simply email Treasurer Allen Torbert (Allen.Torbert@ars.usda.gov) and ask.

This ISTROINFO does have reports on ISTRO events, news about upcoming activities, new books and more on the links between ISTRO and Soil & Tillage Research, etc.

Recently, I had cause to reflect on how important "rivers" are to so much of agriculture and soil management. This of course comes from my own experience of rivers but led me further to think about how many ISTRO events have been influenced by major rivers. I grew up less than a kilometre from the River Murray (the largest river in Australia) and so from my early childhood the river could be seen from the school yard and was a major draw in the summer holidays. Of course many of the crops and pastures along the river relied on irrigation.

Thinking of recent ISTRO activities I realised that many have or will be at locations near to rivers. At the 19th ISTRO conference in Montevideo the estuary of the River Plate was an inescapable influence being over 150km wide. Even on the field trip to Colonia, miles upstream from Montevideo, we could only just make out the largest buildings of Buenos Aires away in the distance. The next triennial conference is in Nanjing situated on the Yangtze River. The longest river in Asia has clearly been important in so many things from agriculture to transport and culture.

A few weeks ago I arrived in Vukovar, Croatia to attend the Croatian Branch meeting. I arrived at 2.30am and, on checking into the hotel, was told that I could have a room with a single bed and a view of the river Danube or I could have a room with a larger bed – but no river view. Of course I chose the view and on opening the curtains in the morning was greeted with a lovely view of another of the world's waterways.

At the time I travelled I was aware from the general news media that there was substantial flooding in Bosnia, Serbia and Croatia. The flooding was from extreme rainfall and was not from the Danube but associated with a tributary - the River Sava. More than 40 people lost their lives and 100,000 homes had to be abandoned. Much of this was in areas that had no record of flooding in living memory.

Flooded fields near Vukovar - Photo courtesy of Marta Birkás.

Bojan Stipešvić was able to take Marta Birkás and me to see some of the thousands of hectares of land that was still under water in Croatia. We were not permitted into some areas where livestock deaths caused significant health risks. The flooding was different from my recent experiences of flooding. The relative flatness of the land meant that the water spread out inundating crops, infrastructure and anything else in its path. As it was late May the crops had been well established with Maize around 30cm high. Complete inundation for extended periods had destroyed the crops, left the soil anaerobic and in some cases contaminated by sewage from domestic septic tanks and fuel from farm reserves.

Infrastructure damage - Photo courtesy of Marta Birkás.

Understandably, those affected and the relevant agencies were seeking answers on how to manage the affected areas. What if any short season crops could be planted (assuming seed was available)? How quickly could the farmers get back onto the land? Would there be long-term consequences to soil quality, function and health? Would produce from flooded areas be fit for consumption? I realised that despite my training I didn't have simple answers.

The conference organizers; Bojan, Danijel Jug and other members of the Croatian Branch organized a "round table" to consider the problems from a range of perspectives. Carefully working through the issues and using the expertise and experiences of all those present brought out a number of key points which the local agencies could turn into practical advice. The media gave extensive coverage to the discussions.

One outcome for me is that as I think about the impact of climate change on soils and food production I need to think not only of drought-stress but also of uncertainty and problems of extreme events causing inundation. The link between rivers and soil management is certainly not just as irrigation.

## ⌘ Introducing a new editor of Soil & Tillage Research

The third recently appointed editor of Soil & Tillage Research is Dr Pichu Rengasamy. I first met "Renga" in the mid-1980's when he had recently finished a post-doc position with Malcolm Oades in Adelaide. As a postgraduate student I always found he had time to talk and and help those interested in soil science and in practical ways to demonstrate the importance of soil management. I recall that he was instrumental in organizing several succesful conferences on sodic soils in northern Victoria. Although I haven't seen Renga for several years I have had cause to think about him in the last few weeks as I have been talking with farmers about practical, field-based methods they can use to assess soil aggregation and stability.

### Why did you take on being an editor of S&TR?

When I was contacted by the STILL team, I accepted the offer thinking I will get an experience in this new role and contribute to Soils community.

### From your research what stands out as giving you the most satisfaction?

I have the most satisfaction in my research on soil structural stability as related to the soil solution composition which led to the recent concept of CROSS which is based on the ionicity of clay-cation bonding. The theoretical and experimental derivation involved in CROSS , were based on a decade of observation and inference from my experiments on dispersive soils.

### Who inspires you?

My inspiration on soil chemistry is primarily due to Professor L.R.Ganesan in India and later Professor Garrison Sposito of USA through his books on Soil Chemistry.

### Who were your mentors?

Professor V.A.K. Sarma was my mentor during my doctoral program and Professor Malcolm Oades was my mentor during my postdoctoral research.

Pichu Rengasamy

What 3 words sum you up?

Soil chemical physicist.

What was the best advice you were ever given?

"Keenly observe, make inference and try to prove through experimentation"

What do you do in your spare time?

Reading magazines and helping my wife and children in household chores

What was the last non-work book you read and what is your favourite film?

The last non-work book I read was "White Tiger" written by Aravind Adiga which won the Mann Booker fiction prize a couple of years ago. My favourite film : The Beautiful Mind.

This completes the introductions of the new editors of Soil & Tillage Research. I hope that the 3 interviews have shown the strong connection each has with ISTRO related science, and emphasises the links between ISTRO and Soil & Tillage Research.

## ⌘ First report of ISTRO Working Groups F and B meeting in Maringá, Brazil

The ISTRO working groups "Visual soil examination and evaluation (VSEE)" and "Subsoil compaction" had a successful joint meeting 26-29 May 2014. 25 researchers from 9 countries met in Maringá, PR, Brazil. The workshop included two days of presentations and discussions, and two field days with demonstrations of VSEE methods.

A general conclusion was that the VSEE methods work well also in tropical soils, but that some modifications are needed. Soil compaction was identified as a major problem in the tropical soils that were addressed during the field days. Scientists of the two ISTRO working groups share similar research interests, but the interaction between soil compaction research and VSEE could be improved. Future research needs and outreach activities were identified and discussed.

We would like to thank the host, Rachel Guimarães and her team (Craig Rogers, Cássio Tormena) for the excellent organization of the workshop. A more detailed report will follow in the September issue of ISTROINFO.

## ⌘ Report of ISTRO Croatian branch meeting in Vukovar

The 7th international conference "Agriculture in Nature and Environment Protection" has been held in Vukovar, Croatia, from 28-30 May 2014., organized by "Agroglas", Croatian beweekly agriculture magazine, and the Croatian Soil & Tillage Research Organization, under the auspice of ISTRO.


7. Međunarodni znanstveno-stručni skup "Poljoprivreda u zaštiti prirode i okoliša"

Stres biocenoze

Očekivane štete od poplava:

5.178

Some of the press coverage of the round-table session on flooding

Within the five sections (Plenary section, Steps to Sustainable Livestock, Improvement of plant production, Plant breeding, Sustainable Future of Agriculture) scientist and experts from Croatia, Hungary, Serbia, Slovenia and Scotland, UK, presented 55 papers (20 of them as posters) about ways of sustainable and nature beneficial agriculture production, innovative crop growing systems, animal welfare and food safety. In light of the recent flooding of the River Sava, in Croatia, Bosnia&Herzegovina and Serbia, more than 20 experts present at the conference held a round table discussion on agricultural aspects of remediation of flood affected areas.

The post-conference event took place at a local organic farm, where delegates were introduced to the organic farming way of life. Local meals were prepared and served by the beautiful scenery of the Slavonia and Baranya plain region. This is where the rivers Drava and Danube form one of the most interesting eco-systems in Europe, Kopački Rit, which is full of wildlife and has interwoven with human activities since the dawn of mankind.


7. Međunarodni znanstveno-stručni skup "Poljoprivreda u zaštiti prirode i okoliša"

Najbolji posteri

Ekotržnica privukla veliku pozornost Vukovaraca

Presentation session and other "cultural" activities.

## ⌘ Update on Global Soil Partnership

http://www.fao.org/globalsoilpartnership/en/

Members may recall that ISTRO is a member of the Global Soil Partnership organized by the FAO and that we have members on a number of the groups working on the different "Pillars".

Our representatives are Peter Weisskopf on Pillar 1 Soil Management; Oswaldo Ernst on Pillar 2 Soil Awareness and Education and Lars Munkholm on Pillar 3 research gaps and priorities. Each of the Pillars have been working on developing "Draft Pillars of Action". For example in Pillar 2, Oswaldo has worked with the 25 other representatives, 7 Intergovernmental Technical Panel Advisors and secretarial support provided from FAO Pillar 2 to prepare their document. It has over 43 recommendations for governments and agencies – too many to list here. Information on all the Pillars is available at the website above.

The 2nd Global Soil Partnership general assembly will be at the FAO headquarters in Rome on 22-24 July. Attendance is open provided you register (but no costs are covered). If any ISTRO member is attending, please let me know and we can distribute information to ISTRO members.

## ⌘ Uruguayan Soil Congress 2014

**VI Meeting of the Soil Science Society of Uruguay in association with ISTRO Branch Uruguay August 6-8, 2014**

**Registration and Abstract submission: April 30, 2014 (see Instructions for papers in www.suelos.com.uy).**

The Soil Science Society of Uruguay (SUCS) and the ISTRO Branch Uruguay invite researchers, educators, public and private companies, professionals, farmers and students related to the study, management and use of the soil.

Keynote speakers include: Dr Walter Baetghen Columbia University; on Variability and change climate in the agricultural sector: Dr Miguel Cabrera University of Georgia; on Hormones and antibiotics in surface runoff: Dr Gervasio Piñeiro, University of Buenos Aires; on Following the dynamics of C and N in soil using stable isotopes: Dr Ariel Szogi; USDA Intensive animal production waste management and Dr Armen Kemanian; Pennsylvania State Unviersity and Dr Norbert Claassen; Universität Göttingen.

Topics for scientific or technical papers as oral presentations or posters can cover the following topics:
1. Physical, Chemical, Biochemical, and Biological Soil Properties.
2. Soil Fertility and Plant Nutrition.
3. Soil and Water Management and Conservation. Irrigation and Drainage.
4. Classification, Mapping and Soil Mineralogy.
5. Soil Quality and Environment.
6. Applied Technology: Precision Agriculture. Soil sampling.
7. Agronomic Systems. Bioenergy.
8. Climatology and modeling.
9. Use and handling of agro-industrial waste.
10. Teaching of Soil Science.

**Early registration by 30 April is:**
Members US$150; students US$100 and non-Members US$200.

## ⌘ 20th Triennial ISTRO Conference.

**Nanjing, China 14-18th September 2015**

Full updates in the next issue.

Website now in operation!

http://istro2015.csp.escience.cn/dct/page/1

**Abstract submission is now open! Guidelines for oral and poster abstracts now on the website**

**Registration is now open.**

**Scientific Program – Topics Announced**

Soil erosion and degradation of soil quality in upland agriculture

Subsoil compaction: cause, effect and control

SOC sequestration and management

Soil biology and biodiversity:

Biophysics: the interaction between biology and soil architecture

Earth critical zone: coupled hydrological and nutrients transport across scales

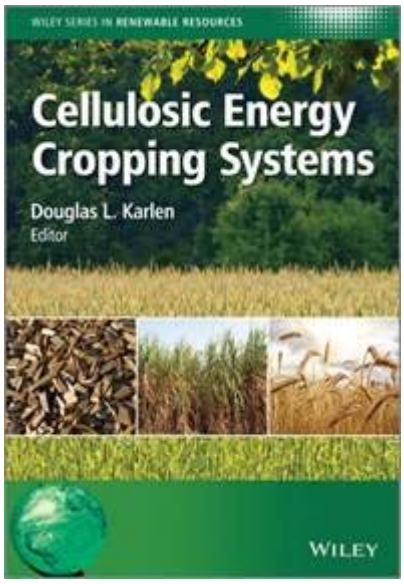
Biogeochemical processes in paddy soils

Agricultural sustainability and Climate change

Tillage and seeding equipment design and modeling

Farmer and consultant's research experiences and needs

## ⌘ New book




ISBN: 9781119991946 Price: £100.00/ €117.40 / $155.00

This book was conceived and initiated by Dr. David I. Bransby, who strongly believes that "research should not be an end in itself, but the first step in a process for generating and transferring information or technologies that are of value to the communities we serve." David chose to focus the book on plant biomass because even though fats and oils can be used for bioenergy production, plant biomass is more abundant than animal biomass and thus offers much greater potential for energy production. Plant biomass can provide a variety of inputs including starch, oil, and sugar, but it is the lingo-cellulose (cellulosic) biomass itself that is most abundant. Composed of cellulose, hemi-cellulose, and lignin these cell wall components are renewed on an annual basis around the globe.

There are also numerous technologies for converting cellulosic biomass to heat, electricity and/or liquid fuels that are ready or under development. With that in mind, David set out to produce a book that provided comprehensive documentation of how cellulosic energy crops such as switchgrass, Miscanthus, and sorghum and the cellulosic fraction of sugarcane, maize and wheat residues could be sustainably produced and converted to affordable energy through liquid fuels and electricity. Unfortunately, due to an on-going battle with diabetes, David was unable to complete the project. I am very humbled to have been able to pick up the gauntlet and with the outstanding help of many of my friends and colleagues complete this very important project. It is our hope as editor and authors of this work that readers around the globe will catch hold of David's inspiration and continue the ground-breaking work in the area, building new programs where none existed before, and continuing to build an awareness of the potential benefits of bioenergy to the public at large and to policy makers. The target audience for this book is society as a whole, but especially those elected officials who are often ultimately responsible for building new programs through their critical enabling legislation.

The book is divided into five sections. The first (I) provides general background related not only to the challenges and various potential cellulosic feedstocks (Chapter 1), but also to technologies for production of liquid fuels and biochemicals (Chapter 2) or production of heat and electricity (Chapter 3). Section II hones in on each of the herbaceous crops than have been identified as potential cellulosic feedstock for not only bioenergy but also bio-product development. Miscanthus (Chapter 4), switchgrass (Chapter 5), sugarcane and energy cane (Chapter 6), sorghums (Chapter 7) and crop residues (Chapter 8) are examined in detail by reviewing their phylogeny, cultural practices, and opportunities for genetic improvement. Section III follows a similar format although the focus is on woody crops, including eucalyptus (Chapter 9), pine (Chapter 10), poplar (Chapter 11), and willow (Chapter 12).

Section IV moves toward David's ultimate goal of commercialization by reviewing critical logistical issues associated with both herbaceous (Chapter 13) and woody (Chapter 14) feedstocks. Alternate strategies for harvesting, transporting, and storing various cellulosic materials are examined. Finally, section V tackles the challenge where "the rubber meets the road" that is, moving the technology from the researchers to society as a whole.

To achieve long-term sustainability, emerging cellulosic bioenergy and/or bio-products industries must meet three crucial and equally important challenges. One is that the new enterprise(s) must be economical (Chapter 15). The second is they must not have adverse environmental impacts (Chapter 16), and finally, they must be socially

acceptable (Chapter 17). The final two chapters are intended to provide readers with case study examples of an actual bioenergy commercialization project (Chapter 18) and a glimpse at activities in Brazil, China and India (Chapter 19).

In summary, to meet ever increasing global needs for sustainable food, feed, fiber, and fuel supplies, greater attention must be given to soil, water, and air resources. Redirecting from an increased trajectory of expanded row crops to cellulosic energy crops and crop rotations is one component needed to achieve the intensified productivity required for high quality agricultural products that are economically viable, socially acceptable, and adaptable. This book is intended to help: (1) identify suitable cellulosic energy crops that are adapted to a wide range of climates and soils; 2) develop best management practices for sustainably growing, harvesting, storing, transporting and pre-processing these crops with minimal negative impacts on the environment and food production; 3) develop integrated cellulosic energy cropping systems for supplying commercial processing plants; and 4) educating landowners, technology owners, students, policy makers and the general public on how to use cellulosic energy crops to maximize the many benefits they offer. It is my hope that we have successfully provided the information in a format that will enable all of us to achieve this important 21st century goal.

## ⌘ Other upcoming meetings

**ELS 2014 - the Earth Living Skin**: Soil, Life and Climate Changes - the first Conference of a Series organized under the auspices of the Soil System Sciences Division of the European Geosciences Union. ELS 2014 will be held next 21 – 25 September 2014 in Nova Yardinia, Castellaneta Marina (TA), Italy.

The scientific program will be structured according to the proposed sessions, open to contributions. The call for abstracts was launched in November 2013. Please visit our web site at http://www.els2014.eu


http://www.plantstress.net/plantstressdocument.php?doc=117&ln=eng

**Latin America Soil Science Congress**, Cuzco Peru 9-15 November 2014 www.slsc.org.mx

**Conference on Conservation Agriculture for Smallholders in Asia and Africa** 7-11 December 2014
Bangladesh Agricultural University (BAU), Mymensingh Bangladesh
http://www.scac2014.org/

## ⌘ Final comments

The recent World Congress of Soil Science voted that the 2022 World Congress will be in Glasgow.

ISTRO INFO is the newsletter of the **International Soil Tillage Research Organisation**. (www.istro.org).



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