

The ISPA Report



December 2013

From the President's Desk

John V Stafford, ISPA President

Following the great success of 9ECPA in Lleida, Spain and 5ACPA in Jeju, South Korea, we look forward to the 12th International Conference on Precision Agriculture (ICPA) to be held at the Hyatt Regency in Sacramento, California, USA from July 20-23, 2014. Do book the date!

A big thank you to the organisers of the two conferences held this year – Alex Escolà and Sun-Ok Chung. Look out for special issues of the Society journal containing enhanced papers from 9ECPA. Speaking of Precision Agriculture Journal, it is good to report that the Impact Factor has now risen to 1.73. It now ranks 9th out of 57 multi-disciplinary agricultural journals! I also have a new co-editor, Dr. Paul Carter of Washington State University, USA.

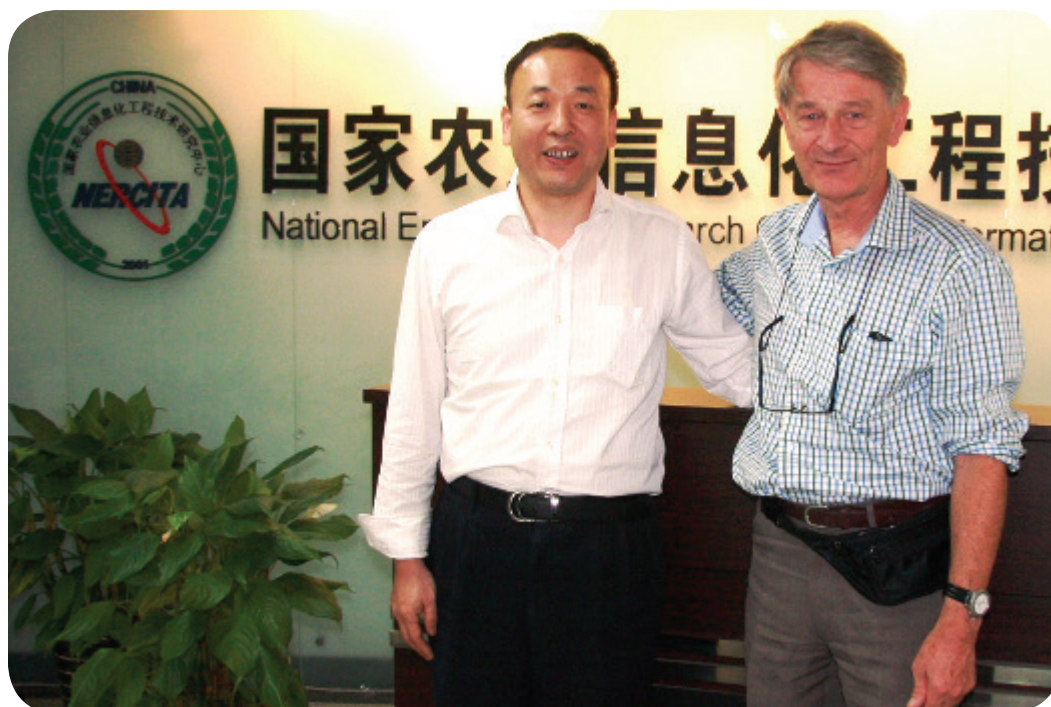
I'm pleased to announce the formation of the first ISPA Regional Chapter (or branch) – the Central China Chapter. If you are interested in forming a regional chapter then do contact the secretary, Dr. Nicolas Tremblay (Nicolas.Tremblay@AGR.GC.CA). Speaking of China, in September, I presented a keynote at the 7th international Symposium on Intelligent Information Technology in Agriculture at the invitation of Prof Zhao, Director of the China National Engineering Research Center for Information Technology in Agriculture (NERCITA). Precision Agriculture is important in China!

At 12 ICPA next year, the "P.C. Robert Young and Senior Scientist Awards" will be awarded. In addition, several awards will be made in the graduate student category to recognize their work and encourage participation in ICPA. Nominations (to the secretary) are welcome.



Welcome to the December 2013 issue of the ISPA Report, the official newsletter of the International Society of Precision Agriculture. Inside you will find highlights from the very successful 2013 Asian and European Conferences on Precision Agriculture, and an update on the 2014 International Conference. We hope to see many of you at the 12th ICPA next July in Sacramento, California, USA. Also in this issue is a country report from Finland and an interesting article on data sharing and meta-analysis by Nicolas Tremblay, our ISPA Secretary. We hope you enjoy this issue, and as always if you have suggestions of items to include in future issues, please let me know.

Ken Sudduth
ISPA Newsletter Editor



ISPA President John Stafford and Prof. Chunjiang Zhao, Director of the National Engineering Research Center for Information Technology in Agriculture

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Events

10-12 February 2014

Agricultural Equipment Technology Conference

Louisville, Kentucky, USA
www.asabe.org/meetings-events

8-13 June 2014

20th World Congress of Soil Science

Jeju, South Korea
www.20wcsc.org

13-16 July 2014

ASABE Annual International Meeting

Montreal, Quebec, Canada
www.asabemeetings.org

20-23 July 2014

12th International Conference on Precision Agriculture

Sacramento, California, USA
www.ispag.org/icpa

29-31 July 2014

InfoAg 2014

St. Louis, Missouri, USA
www.infoag.org

2-5 November 2014

ASA-CSSA-SSSA Annual Meetings

Long Beach, California, USA
www.acsmeetings.org

12-16 July 2015

10th European Conference on Precision Agriculture

Bet-Dagan, Israel

Make your plans to attend and present at the 12th ICPA

The International Society of Precision Agriculture (ISPA) is pleased to announce the 12th International Conference on Precision Agriculture (ICPA) to be held at the Hyatt Regency in Sacramento, California, USA from July 20-23, 2014.

Precision agriculture techniques, technologies and their applications are now 'mainstream agriculture' and can certainly help towards solving the problems and challenges that face agricultural production worldwide. Following the success of the 11th Conference which attracted 450 delegates from 37 countries, we are confident that the 12th Conference will be a great success, complementing its sister conferences, ECPA and ACPA. Look for full details on the ISPA web site (www.ispag.org).

As with previous conferences, oral and poster sessions will report current research in PA, application of research will be highlighted in practitioner 'A to Z' sessions and the latest technologies will be on show in the commercial exhibition. Overarching all that, there will be extensive networking opportunities leading, hopefully, to collaboration in research and international research proposals. Situated in the heart of California agriculture, field trips will be organized to view the latest research and applications of PA.

The "P.C. Robert Young and Senior Scientist Awards" will be awarded at the 12th Conference. In addition, several awards will be made in the graduate student category to recognize their work and encourage participation in ICPA.

Over 300 Abstracts submitted by the December 21 deadline!

Abstracts received for the 12th International Conference on Precision Agriculture will be reviewed for suitability based on scientific content and clarity. Abstracts meeting these criteria will be accepted for presentation as either oral or poster presentations at the Conference. Authors will be informed about their abstracts by February.

Abstracts have been received in all these topic areas:

- Food Security and Precision Agriculture
- Sensor Application in Managing In-season Crop Variability
- Spatial Variability in Crop, Soil and Natural Resources
- Precision Nutrient Management
- Precision Conservation Management
- Precision Horticulture
- Precision Crop Protection
- Precision Dairy and Livestock Management
- Remote Sensing Applications in Precision Agriculture
- Engineering Technologies and Advances
- Profitability, Sustainability and Adoption
- Proximal Sensing in Precision Agriculture
- Emerging Issues in Precision Agriculture (Energy, Biofuels, Climate Change, Standards)

New Attitudes *Nicolas Tremblay, ISPA Secretary*

We live in a time of opportunities. The new technologies provide us with way more data than we'll ever be able to value. This new reality calls for new attitudes: reconsideration, sharing and standardization.

Reconsideration

Everything we do in the field should be tagged with a GPS coordinate. Latitude, longitude, altitude and time; four dimensions that allow anyone to paste a wealth of meta-information on soil, satellite images and weather conditions. As well, we should reconsider the experimental procedures and the statistical approaches we are using. A block design was likely a good choice decade ago when we were living in this old world of data scarcity. But is it still the case when we can describe in great detail the spatial variation of the site, when we have the ability to precisely position our sampling operations and access to geostatistics to handle the spatial relationships of the variables we are interested in? This is what precision farming is all about, isn't it? On another scale, we should consider the option of merging experimental results from regions far apart and learn from the contrast of soil, management procedures

and weather conditions. This is what we have been able to do using meta-analysis in [Tremblay et al. 2012](#). *Agron. J.* 104: 1658-1671.

Sharing

Our paper above has made use of meta-analysis to test the influence of soil texture and weather conditions on corn responses to N rate over a wider range of conditions, and estimates the magnitude of the effect more precisely, much more convincingly than a single study would have ever been able to do. A good explanation of the unique value of meta-analysis can be found in [Parent and Bruulsema 2013](#). But meta-analysis proceeds from sharing, either through already published papers or the core databases themselves. How many valuable experimental databases are lost forever already a few years after they have been collected? Sadly, the figure is probably close to 100%... In today's world, it should be a good idea to collect, archive and make available the bulk of data and meta-data painstakingly produced by researchers all around the planet in an "open source" framework. Can we dream of the precision farming equivalent to [The Cochrane Collaboration](#) which holds the

largest collection of records of randomised controlled health care trials in the world? For a start, if you have N response data available for corn, canola, spring wheat and potato and you are willing to share them, you can fill this short [survey](#). By doing so, you can contribute to the Development of decision-support components for optimal N fertilizer applications at the field scale (2013-2016), an Agriculture and Agri-Food Canada Science and Technology Branch Research Project. Thanks in advance!

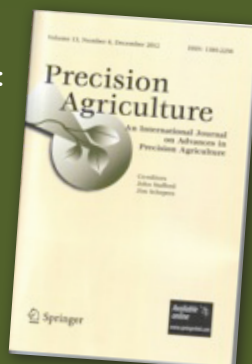
Standardization

With the idea of sharing, come the needs for standardization and agreements on the use of data not far behind. Data sharing will only come smoothly if the users can agree on a minimal set of standards. These have yet to be defined but there are initiatives in Canada ([Geoconnection](#)) and the US ([AgGateway](#) who are working on data standardization for agriculture in general and for Precision Ag with their [SPADE](#) standards). Don't miss the 12th ICPA where we have envisioned making the standards discussion an emphasis with standardization as a topic in the call for papers.

NEW! Full access to papers in *Precision Agriculture*

Check out this new benefit of ISPA membership:

- Login as member at www.ispag.org
- Click the Members tab at the upper far right
- Select "Precision Agriculture journal"
- Journal website will open in a new window
- Click "Browse Volumes & Issues" to see all that are available



ISPA Founding Sponsor



About ISPA

The mission of ISPA is to advance the science and practice of precision agriculture globally, primarily by facilitating information exchange among precision agriculture scientists, students and practitioners.

The officers of ISPA, listed below, welcome your input as we continue to enhance your Society.

President John Stafford
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Country Report – Finland

Liisa Pesonen, Timo Oksanen

Located in the northern Europe, Finland is one of the northernmost countries in the world where significant agricultural production takes place. Typical arable crops in Finland are: barley, oats, wheat, rye, rapeseed, potato, and sugar beet.

The total area of agricultural land is 2.3 million hectares, which is divided into about one million field plots. Farms are typically family owned and the quantity has decreased steadily during last decades being at the moment 65000 farms. An average cultivated area per farm is 35 hectares. Six percent of farms have more than 100 ha fields and they cover about 25% of total acreage in Finland.

The large number of small fields combined with the day length and climate that keeps the fields under snow cover more than four months every winter set a challenge for the farmers to carry out agricultural operations during the short growing season (May-September, typically limited to 1000 degree days/100 days). The average yield of cereals is around 3000-3500 kg/ha. Due to low yield level, the rate of used fertilizers is low, and due to hard winter circumstances the use of pesticides is modest.

When considering adaption of precision farming technologies, VRA technologies alone are not able to form a profitable technology concept. In Finnish conditions, assistance to decrease working or operation time in field and assuring work performance are important requirements for new technology. Therefore usability, reliability, compatibility, efficient information management like automated recording of field work to farm management systems and driver assisting automated functionalities in machinery are important qualities.

Several manufacturers of agricultural machines are located in Finland, selling locally and also exporting globally. AGCO manufactures Valtra tractors in central Finland. Sampo-Rosenlew, Tume, Elho, Junkkari, Vieskan Metalli and Potila are brands also manufactured in Finland. Finnish manufacturers recently developed an



Figure 1

integrated VRA system for combined fertilizer and seed drills, which operates over ISOBUS network; see Figure 1.

Research around precision agriculture in Finland is typically done in joint projects with agricultural science partners, technological partners and industry. The projects are boosting the industry to ramp up technological development integrated into the products and currently various prototypes are in different phases.

One example of basic research was the UASI project, where Unmanned Aerial Vehicles (UAV) were used for remote sensing of fields by using a lightweight hyperspectral camera. It was proven that with this approach it is possible to create separate biomass and nitrogen status maps as a service for nitrogen VRA; see Figure 2. The partners MTT, VTT and Finnish Geodetic Institute together with private companies realized a common proof-of-concept prototype.

One example from research being commercialized is SoilScout, a prototype of real-time soil property monitoring system, consisting of underground wireless modules

that allow normal field operation on top of the sensors; for instance soil moisture and temperature are measured. The inexpensive modules may operate up to ten years by transmitting information every hour.

The machinery in Finnish farms is multi-brand; there is no dominant player in Finnish market manufacturing machines for agricultural work and both national and international brands are used together in the farms. Therefore, the standards are important for the business, not only mechanical but also electrical, electronic and data exchange standards. For instance, ISOBUS is important technology to enable precision farming in the farms, to interconnect different brands and systems.

Finland has actively participated in international standardization development, not only ISOBUS for mobile machinery, but also the standards required to interchange field management data between systems and players.

Finnish farmers and agrotechnology providers have been interested in precision farming last two decades. Earliest Finnish VRA prototypes origin in the beginning of

continued on page 5

Country Report – Finland, continued



1990's and Viljavuuspalvelu Ltd has provided spatial soil analysis services for farmers from the end of 1990's. It seems that gradually the technology is reaching the maturity that fulfils also the demands of Finnish farmers. Farmers are able to realize the benefits against the technology costs. As an example, GPS based guidance systems have become popular among farmers within last couple of years. The next expectations are towards large scale adaption of ISOBUS technology, with the support of modern ICT based data acquisition and information management, enabling cost efficient precision operations in Finnish farms.

Researchers in the area of control in agriculture met in Finland in August 2013, in IFAC AgriControl2013 conference. 74 persons in 18 countries participated the conference to exchange information on challenges and advances. The main technologies discussed were robotics, dynamic modeling, control engineering, machine vision and mechatronics – in the context of agriculture.

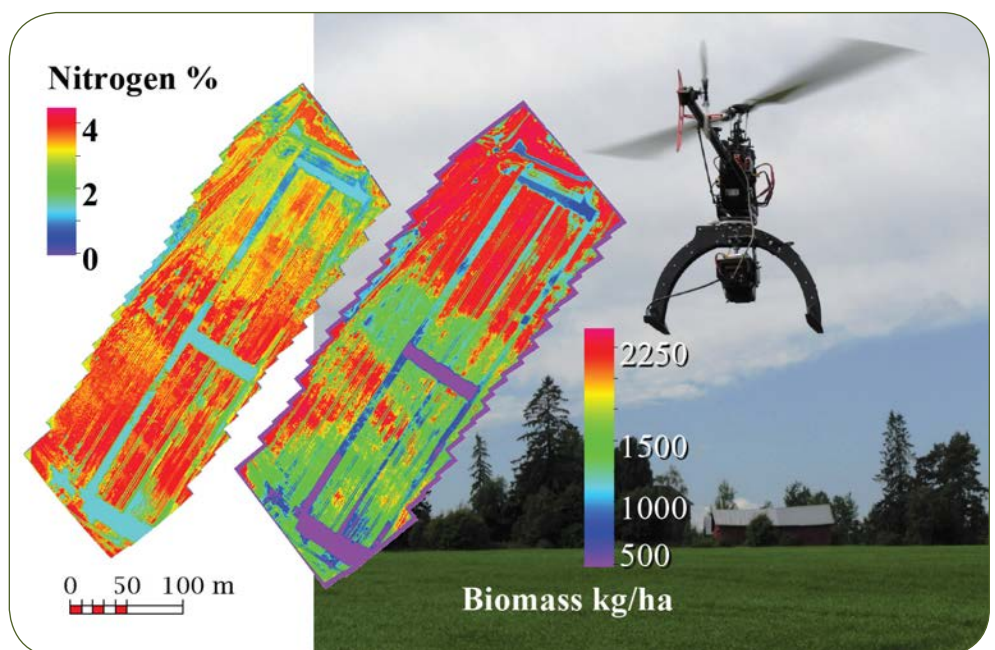


Figure 2

9ECPA Review



The 9ECPA opening ceremony was held in the auditorium of the CCCT building at the Universitat de Lleida with about 300 attendees from all over the world.



Every 9ECPA day started with a plenary session. Dr. Lowenberg-DeBoer was the first keynote speaker lecturing on *Precision Ag Technology Adoption: Past, Present & Next Steps*.



Immediately after the plenary sessions there was a long coffee break where attendees could socialize, network, and talk to the sponsors in their stands.



The field demo on the third day was hosted by the Raimat Winery of the Codorniu Group. They are currently doing precision irrigation based on thermal imagery and selective harvesting based on quality of the grapes.



The Fieldcopter project, a sponsor of the 9ECPA, showed its UAV project results as part of the field demo.



The three best oral and poster communications were presented with the ECPA/ISPA Awards by Dr. John Stafford, ISPA President.



The 9ECPA poster session was a permanent exhibition but participants were asked to visit during the coffee breaks while authors were present.



There were 3 to 4 concurrent technical sessions in each time slot, all of which were well-attended with good presentations.



9ECPA participants took time out for a group picture. You need to apply precision ag techniques to distribute attendees evenly and to have them all still at the same time!

5th ACPA Report



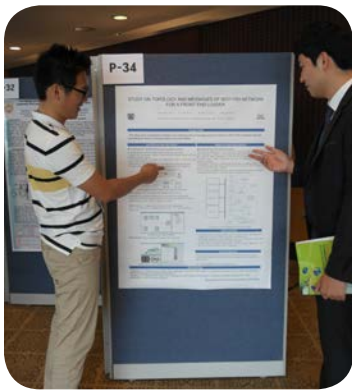
The 5th ACPA had 189 participants, shown here at the opening ceremony.



Dr. Kyou-Seung Lee, president of the Korean Society of Precision Agriculture, gives his welcoming address at the opening ceremony.



The panel discussion session included presentations by invited speakers (from left) Dr. Sakae Shibusawa, Dr. Naiqian Zhang, Dr. Simon Blackmore, and Dr. Raj Khosla.



The technical program featured 131 technical presentations - 64 talks and 67 posters.



"Outstanding Presentation Awards" were given to 17 student presenters at the farewell party.



A traditional Korean "fan dance" performance was the entertainment for the farewell party.



Many participated in the post-Conference technical tour which included the "New & Renewable Energy Exhibition" shown in the background.