Smart Technologies for Sustainable Agriculture

Introduction of Participants

January 18-19, 2016
London, UK

Viacheslav Adamchuk, McGill University
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*Bio***:** Dr. Adamchuk, associate professor, Dept of Bioresource Engineering, McGill University & adjunct associate professor, Dept of Biological Systems Engineering, University of Nebraska-Lincoln. Leads a Precision Agriculture and Sensor Systems (PASS) research team that focuses on the development and deployment of proximal soil and crop sensing technologies. Developed and evaluated a fleet of on-the-go soil sensor prototypes capable of mapping physical and chemical soil attributes while moving across an agricultural field. These sensors produce geo-referenced data to quantify spatial soil heterogeneity, which may be used to prescribe differentiated soil treatments according to local needs. Along with his work on sensors, Dr. Adamchuk has conducted numeric analysis of the agro-economic value of sensor-based information to aid in the successful deployment of emerging on-the-go sensing technology. Through studies on soil and crop sensor fusion and data clustering, he was able to further investigate the challenges faced by early adopters. Through his outreach activities, Dr. Adamchuk has taught a number of programs dedicated to a systems approach in adopting smart farming technologies around the world. These include active involvement in standards development, setting up pilot commercial projects and emphasis on the system approach to the evolution of agricultural production complex.

Sajjad Awan, AHDB
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Bio: Farming background with hands on experience in both irrigated and rain fed agriculture in Punjab province of Pakistan. M.Sc.(Hons) in Agriculture (Pakistan), PhD in molecular plant physiology (2011, University of Warwick); Postdoctoral researcher and dissected the Brassica oleracea genome for water and nutrient use efficiency at Warwick University Department of Life Sciences. Joined AHDB Cereals & Oilseeds in 2015 as a Research and Knowledge Exchange Manager.

Expertise: keen interest in improving plant resource use efficiency (nutrients and water) in arable and horticultural crops under constantly evolving climatic conditions. I manage a portfolio of research projects on plant nutrition, enabling farmers to increase crop production and improve farm profitability and environmental performance. Also interested in using precision agricultural tools to improve resource use efficiency in arable crops.

Outcome: The event will be a unique forum bringing together specialists in the field from both UK and Canada. This should give me a better insight into the current status and future prospects of precision agriculture in the UK in specific and Canada in general.

Louise Bermingham, Rezatec
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BIO: EO / GIS Manager, REZATEC. A skilled and versatile geospatial product developer with skill sets in data management, data processing and data delivery. Louise has more than 5 years of practical experience acquiring, processing and analysing various EO/GIS data using commercial and open source geospatial software packages. She has implemented a web GIS solution within Rezatec, which delivers data as a service through international standard protocols such as WMS, WFS and WCS. Her complementary skills include spatial databases, python, javascript and batch script automation

Expertise: I am interested in how we can effectively collect and manage a variety of data sources, such as weather, earth observation and other variables relating to crop and soil types. I am also interested in methods for combining these data types into a single web-based decision support platform with embedded analytics and visualisation techniques.

Outcome: During this seminar, I am looking forward to hearing about novel technologies and methods that are being used in agriculture today and I am also hoping to extend Rezatecs network and business opportunities through collaboration.

Asim Biswas, McGill University
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Bio: Assistant Professor of Soil Physics, Dept of Natural Resource Sciences, McGill University. Previously Environmental Research Scientist,t Commonwealth Scientific & Industrial Research Organization, Australia. Ph.D. from Department of Soil Science, University of Saskatchewan. Master's in Soil Science, University of Agricultural Sciences, India & Bachelors in soil science, Bidhan Chandra Krishi Viswavidyalaya . Born & brought up in a small farm in a remote village India.

Expertise: Research in Spatial variability information, critical for precision agriculture, involving data collection & data analysis. Developes, calibrating & validating different proximal & other sensors that can collect high density data on soil properties in short time. Working on developing & modifying various soil spatial analysis techniques in order to better understand soil variability & improve its use and management. Spatial model building & soil landscape scaling analysis. Digital soil mapping.

Outcome: I am hoping to get into the network of other scientists, industry partners and users of various precision agriculture technologies for future research collaboration and partnership development. This collaboration and network will certainly help dealing with multi-faceted problem of precision agriculture. At the same time, I will take the opportunity to share my experiences and expertise with the group.

Clive Blacker, UKTI
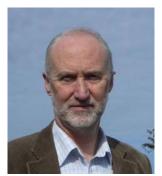Clive.blacker@ukti-invest.com

Bio: Precision Agriculture Specialist for the Agri-Tech Organisation; involved with Precision Agriculture for over 16 years and one of the pioneers of precision farming technology in the UK. CEO of Precision Decisions Ltd. Through his consulting services to the world's largest agri-engineering companies, Clive has gained extensive knowledge of the global market including Africa. 2004 Nuffield Scholarship on Precision Agriculture took him through Europe, Australia and the U.S.A. Has diversify away from the family farm and start his own business helping farmers around the world adopt and integrate precision farming techniques and applications.

Expertise: Studied agriculture at Harper Adams, on leaving worked on the Family farm and farm contracting business which on expansion offered Precision Farming technology. In 2004 started own precision farming business – Precision Decisions offering precision farming services to farmers all over the UK and in Africa. Has worked for UKTI on a part time basis for nearly 2 years, where he supports foreign direct investment into the UK.

Outcome: Wants to meet and network with Canadian companies looking to set up in the UK and to help them enter the UK market

Simon Blackmore, Harper Adams University
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Bio: A key figure in the development of Precision Farming and agricultural robotics, with a world-wide reputation. 12 years in Africa and Europe before starting his academic career. Currently Professor and Head of Engineering at Harper Adams University, Director of the National Centre for Precision Farming and running the European FutureFarm project. Extensive experience of multidisciplinary collaboration across universities, commercial partnerships and research projects, including design, building and running of laboratories and workshops. Holds seven Chairs around the world and lectures on topics including Precision Farming, biosystems instrumentation, mechatronics and Systems Analysis. Leads UK research on agricultural robotics. His personal research focuses on improving Precision Farming by developing more intelligent machines and processes, and making crop production more efficient and sustainable.

Expertise: Robotic agriculture, developing smarter machines that used spatial and temporal variability in real-time; new techniques identifying fundamental requirements for future economic, environmental and legislative drivers and for better crops.

Jocelyn Boudreau, Hortau

Bio: Jocelyn Boudreau is CEO and co-founder of Hortau. He holds a Bachelor of Engineering and a Masters degree in soil physics from Laval University (Québec, Canada). Early in his career, Jocelyn worked at Laval University as a research assistant, helping with the development of a sub-irrigation system in capillary mat for container crops, greenhouse and nursery. He then acted as a tech consultant for various irrigation, soil physics and technical sales projects, before co-founding Hortau in 2002. He played a key role in the company's start-up phase, from the business plan and strategy, financing, building and managing a high-level team, as well as the execution of the company's growth strategy. Jocelyn is currently responsible for managing the company's human and financial resources, coordinating the team, strategic planning and also preparing and managing the company's board meetings. Jocelyn currently lives with his family in San Luis Obispo, Calif, operating out of Hortau's U.S. headquarters, where he works closely with the sales, marketing and tech support teams on the company's growth territory.

Jordan Boyle, University of Leeds
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Bio: Lecturer, School of Mechanical Engineering, University of Leeds & founding member of the EPSRC National Facility for Innovative Robotic Systems, a £4.3M advanced manufacturing facility. BSc and MSc in Electrical Engineering, University of Cape Town, South Africa; PhD in Computational Neuroscience, School of Computing, Leeds. Research lies on the interface of Engineering and Biology. Specific research projects have included a miniature mobile robot for use in colonoscopy & a snake-like robot controlled by a model of the C. elegans nervous system. Proponent of public engagement & outreach of all kinds; face-to-face workshops & events aimed at getting school children interested in Engineering, including organising a 3D printing demo at a CBBC event in Leeds that was attended by 40,000 people over three days

Expertise: primary areas of interest are invertebrate-inspired locomotion and navigation. With regard to locomotion, particularly interested in the interplay between the control system, body and environment. Particularly interested in invertebrate systems that achieve powerful goal-directed behaviour with extremely limited computational resources and relatively crude sensory systems. Recently become interested in the concept of long-term robotic self-sufficiency.

Outcome: the short answer is "Applications". Basically my core interest is in developing bio-inspired robots, but I want my robots to be useful so I need challenges to solve. I'm hoping that I will meet people through this meeting who can help to guide my research towards valuable and plausible agricultural applications.

Robert Bradburne, DEFRA
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Bio: Oversees the farming and biodiversity science that the Department for Environment, Food and Rural Affairs commissions and uses, including providing scientific oversight of the Agri Tech Strategy and its growing cohort of projects looking at precision agriculture solutions. Prioritises the most important topics for research & helps policy makers & Ministers to understand the results of this science and build their policies and decisions on the best available evidence. Previously worked as a crop geneticist at the John Innes Centre, understanding the genetics of new varieties of oilseed rape and wheat, bred to reduce the amount they were damaged in the fields by pests and diseases or to increase their quality to the processing industry.

Outcome: I would like to see where cooperation with Canadian researchers and businesses can best fit with the objectives of the UK Agri Tech Strategy, so that we can get the best value from our research investments on both sides of the Atlantic.

Jean Caron, Laval University
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Bio: Professor of soil physics, Soil Science and Agrifood Engineering Dept, Laval University since 1992 where he has taught soil physics, solute transport and geostatistics. Fellow Canadian Society of Soil Science (2009); Recipient of the Joseph Bombardier Award (2008); Medal of the International Society of Horticultural Science in 2011; Prix Auguste Scott Award (2015); B. Sc. in agronomy (1983);a M. Sc. in soil science (1987) from Laval; Ph.D. in soil physics at the University of Guelph (1991). With his team has received more than 25 prices and awards in provincial, national and international competitions for their contribution to science, knowledge and innovation and he is inventor on 24 patents.

Expertise: Chairholder of 6.6 M$ precision irrigation research program at Laval University & co-funded by the Natural Sciences and Engineering Research Council of Canada (NSERC). A co-founder of Hortau Inc. and Hortau Corp., North American leaders in precision irrigation technology, with about 60 employees and a strong growth in Canada and California.

Outcome: Very interested to go to the meeting to share information and extent my network with possible research partners from the UK, having many in the US, in France and in Canada but little in the UK. Establishing research collaboration is also an expected goal for going to such meeting.

Jonathan Carruthers, Rothamsted Research and Parliament Office for Science and Technology
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Bio: Jon Carruthers is the researcher and co-author of the Precision Farming POSTnote – a briefing note for MPs and Peers, written during a fellowship at the Parliamentary Office for Science and Technology (POST). He is also in the final stages of a PhD about the value of oilseed rape (canola) for bee nutrition. The PhD is based at Rothamsted Research in Hertfordshire, UK, which develops sustainable ways to increase productivity and quality in crops grown for food and energy.

Expertise: Jon is interested in developing sustainable practices in agriculture. His scientific background is in the effects of farming on ecology, and particularly insect pollinators. Precision Agriculture is of great interest in reducing the environmental impacts of farming.

Outcome: To represent the Parliamentary Office for Science and Technology (POST) and develop my network

Karem Chokmani, INRS
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Bio: Professor in remote sensing and statistical hydrology at the INRS University. PhD in geomatics & M.Sc. in agriculture engineering, Laval University; B.Sc. in agricultural engineering INAT (Tunisia). Joined the INRS in 2002 as postdoc, then as research associate in 2005 and now as professor, since 2007. Focuses on the development of remote sensing applications for spatiotemporal monitoring of water resources in a climatic change context. Also working on the development of statistical tools for the local and regional estimation of hydrological variables.

Expertise: In 2008, conducted a feasibility study to detect surface runoff from the field and wintering pens using for remote sensing data. The proposed methodology uses satellite imagery of very high spatial resolution (VHSR) and object-oriented classification techniques. Between 2011 and 2013, led a project funded by MAPAQ (Ministry of Agriculture of the Province of Quebec), which aims to develop an operational methodology for characterizing riparian strips using multispectral VHSR satellite imagery and object-oriented classification.

Outcome: Overview of R & D activities in the field of precision agriculture in the UK; Information sharing and networking in this domain; Establishing research collaborations in UAV remote sensing

Bill Dean, University of Guelph
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Bio: Dr. Bill Deen is an Associate Professor at the University of Guelph, Department of Plant Agriculture. The focus of his research program is to develop agroecosystems that are both productive and sustainable. He has studied mechanisms underlying carbon cycling, nutrient cycling and yield of crop production systems as influenced by crop species, tillage system, crop rotation, and cover crops and in recent years, bioenergy crop systems, particularly C4 perennial grass production systems and crop residue removal systems.

Expertise: Nitrogen fertilizer management in maize. Integration of remote sensed, environmental and management data into effective decision support tools.

Outcome: Identify research networking opportunities, particularly related to application of precision agriculture to nitrogen management

Andrew Diprose, Ubiqutek

Bio: Andrew is an executive director of Ubiqutek, the electrical weed control specialists. He joins from Alpha FMC which he joined as a start-up and help grow into the largest dedicated management consultancy dedicated to the asset and wealth management industry.

Expertise: Ubiqutek are pioneering the use of electricity to control weeds, both as a professional hand-weeder in the horticultural industry and an automated tractor mounted version for the agricultural industry.

Outcome: Extending network and identifying new markets and business opportunities.

Sam Durham, National Farmers Union

Bio: Sam is NFU Chief Land Management Adviser, leading on a sustainable intensification, knowledge exchange and government funded advice and managing teams working on a range of land management issues including the Basic Payment Scheme, land agency matters, rural crime and the agricultural industry environment initiatives. Sam has an Ecology degree and is a qualified primary school teacher. His work history includes managing an island nature reserve and a variety of conservation land management projects, a campaigner with environmental and international development NGOs and national coordinator for the Campaign for the Farmed Environment.

Outcome: To ensure the farmer's voice is heard.

Tristan Eagling, KTN
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Bio: Tristan holds a PhD from Rothamsted Research and has spend the last 2 years working for the KTN. My role for the KTN has been to improve the profitability of UK plant and crop-based businesses by improving their uptake of innovation from the science base. This has involved working with a lot of very innovative precision agriculture projects in the arable crop sector. Particularly around the use of aerial/satellite data to improve yields.
Outcome: I hope to gain understanding about research needs of the Canadian industry and meet potential collaborators for UK companies and academics.

Mark Else, East Malling Research

Expertise: Research focuses on understanding and manipulating crop and environmental interactions to deliver improved resource use efficiency, marketable yields and quality of fresh produce. A major focus is the development and integration of precision irrigation and fertigation systems into commercial production to help improve on-farm resource use efficiency, productivity and consistency of produce quality. In tandem, innovative imaging systems are being developed to ease the integration of these low-input approaches into commercial practice, so that consistency of cropping, plant performance, and crop responses to abiotic and biotic stresses can be monitored and measured in real time to inform and improve on-farm decision making.

Richard Godwin, Harper Adams University
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Bio: Dick holds Emeritus, Honorary and Visiting Professorships from Cranfield University, Czech University of Life Sciences and Harper Adams University respectively and Honorary Doctorates from the Slovak University of Agriculture and Harper Adams University. He supervises research programmes & provides academic leadership. Previously a researcher/teacher/trainer in the field of agricultural engineering, soil management and precision agriculture at the former Cranfield University at Silsoe, the University of Illinois & Macdonald College of McGill University. Contributions have resulted in an improved fundamental understanding of soil - machine systems; the development of improved soil engaging tools and methods, soil and water management, and precision farming techniques. He has spent considerable time transferring the principles to designers, advisors and farmers to improve agricultural production systems, the sustainability of soils, and the improvement of the environment.

Expertise: Yield recording, Cereals grains, Straw/hay bales, Roots, Grass; Variability assessment, Soil, EM38, Soil compaction, Cereal growth, Seed placement; Development of Practical Guidelines for farmers; Economics; Traceability and Automatic Chemical Application; Intra-row Mechanical Weed Control; Controlled Traffic Farming; Teaching material e.g. "Elements of Precision Agriculture"; Delivery of undergraduate, postgraduate and professional development programmes.

Outcome: As a co-organiser of this event, my main aim is to help develop collaborative work in the area, so as to assist in the economic increase in both national and international food production in an environmentally sustainable manner. A secondary aim is to help younger colleagues interact and to continue to build bridges across the Atlantic!

Bruce Grieve, University of Manchester
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Bio: Fellow of the Institute of Engineering & Technology (UK) and a Fellow of the Higher Education Academy (UK). Before joining the University of Manchester, as Director of the e-Agri Sensors, he gained 18 years of industrial experience in the fields of on-line analysis and measurement R&D within multinational pharmaceutical and biotechnology companies. Whilst employed by Syngenta (www.syngenta.com), the post at Manchester arose as corporate strategy following his secondment to the company's New Business Development unit, in 2005, where he worked with the Syngenta Business Scouting team to determine how sensors and informatics systems may be deployed within new integrated products for Sustainable Agriculture & Food. Since commencing an academic career in 2007, he has attracted £1.5M of direct industrial funding from Syngenta which has been leveraged to a total of £5M against UK & EU government and other industrial funds to support projects within his team. Previously Dr Grieve has been the industrial manager on a number of UK Research Council and DTI supported projects. He has been awarded a Royal Academy of Engineering Senior Fellowship to progress his e-Agri research at the University of Manchester (www.manchester.ac.uk/eee/e-agri) and has held a number of funding board roles with UK Research Councils and the UK Technology Strategy Board (TSB), including a continuous membership of the EPSRC's peer review college for over ten years.

Outcome: primarily new commercial opportunities for the agri-sensor technologies that we have been developing.

Bettina Hamelin, NSERC

Bio: As Vice-President of NSERC's Research Partnerships Directorate, Dr. Bettina Hamelin is responsible for a range of programs designed to stimulate increased public/private collaboration and technology transfer and to maximize the benefits that university and college research provides to Canada. Bettina has more than 15 years of experience in the biotech and international pharmaceutical industry as well as 10 years of academic experience as a tenured professor at the Faculty of Pharmacy at Université Laval.

Prior to joining NSERC Bettina held a variety of positions at Pfizer Canada, most recently as Canadian Medical Lead, Vaccines, and Head, Strategic Research Partnerships, Western Canada. Passionate about R&D, she excels at bringing together unlikely partners to attract and leverage funds from diverse sources. She is known for pioneering novel public-private partnership models, and breaking down barriers between federal, provincial and private sector stakeholders.

Early roots in biology and chemistry (Vordiplom, Universität Kaiserslautern, Germany) have lead Bettina to complete a B.Sc. in pharmacy and a Doctor of Pharmacy, both from the University of Kentucky, U.S. and an EMBA in Healthcare from the University of British Columbia, Canada.

Paul Harris, Glacier Farm Media

Bio: Paul has 20 years' experience in the media industry within the UK and Canada, most recently as Director (European B2B Markets) for Glacier Media. Glacier is a full-service media company headquartered in Canada with operations in North America, Asia and the UK. One of Glacier's primary areas of focus is Agriculture. As well as producing the Western Producer newspaper in Canada, Glacier owns a diverse portfolio of Agriculture Media assets within Canada, including weather data, digital media products, print magazines and large outdoor farm shows.

Gareth Hector, Glacier Farm Media

Bio: Gareth leads the sales and marketing team for Glacier's European B2B Markets. With in-depth knowledge of the Canadian and global energy, agriculture and mining sectors, Gareth has worked with companies the world over from national SMEs to international majors all seeking to expand or cement new and existing trade opportunities. In addition, Gareth has also served as publisher and director on leading UK and international technical trade journals covering; CSR, construction, environment, mining, finance and investment.

Emma Hennessey, UK Science & Innovation Network
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Bio: I am deputy head of Science and Innovation at the UK Foreign and Commonwealth Office, and also deputy head of the Science and Innovation Network. Prior to this, I worked on science policy in the UK Department of Environment, Food and Rural Affairs, where I also spent many years managing research programmes on agriculture (including GM crops, horticulture, livestock science and plant genetic resources) and environmental issues, with a particular focus on water quality and availability

Expertise: My current portfolio includes managing the Science and Innovation Network to support UK growth and to contribute to global challenges. This work includes identifying areas of UK expertise and matching them to opportunities overseas. The UK has particular expertise in space and satellites and, building on my agriculture background, I am interested to explore how precision agriculture can help support farming and food production.

Outcome: I am hoping to meet a lot of key stakeholders at the meeting, as well as using the opportunity to build my knowledge of precision agriculture

Paul Hutton, Cranfield Aerospace

Paul is CEO at Cranfield Aerospace Ltd (CAe). CAe is an aerospace market leader in rapid prototyping of new aerospace concepts, and modifications to existing aerospace platforms, to meet the most challenging issues facing the industry today.

Utilising its aerospace reputation established over 30 years combined with its EASA/MOD approvals to: design, build, test and fly airborne systems, CAe provides a comprehensive range of services for both manned aircraft and unmanned airborne vehicles (UAVs/drones). CAe also provides a unique product portfolio including Cassius - a uniquely capable autonomous low cost surveillance UAV/drone for commercial and military applications.

Sarah Jackson, MetOFFICE

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Bio: Since June 2012, I have been working as the Met Office's Head of Strategic Engagement with Defra. This involves coordinating the advice the Met Office provides on all aspects of the weather and climate relevant to Defra policy areas and the wider Defra network. Including providing advice on either too much or too little rainfall. and how the Met Office can support Animal & Plant Health and the wider requirements of the UK farming community. Throughout my career at the Met Office I have focused on research into the impact of weather. The goal has been to develop operational services to help businesses and government both mitigate the risks from adverse weather and use weather to their advantage. In recent years I have overseen the Met Office's work to provide advice on the spread on animal diseases such as Foot and Mouth and Bluetongue.

Maryse Lassonde, Canada Royal Society/FQRNT

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Bio: Professor Lassonde completed a Bachelors degree in Psychology at the Université de Montréal and a Ph.D. at Stanford University. She then went on to become professor first at the Université du Québec à Trois-Rivières (UQTR, 1977-1988) and then at the Université de Montréal. Since the beginning of her career, Professor Lassonde has studied several topics, including cognitive development in infants and cerebral plasticity in blind individuals. She is a Fellow of the Canadian Psychological Association (1994), of the Royal Society of Canada (1997), of the Canadian Academy of Health Sciences (2010) and held a Canada Research Chair in Developmental Neuropsychology from 2001 to 2013. She has received several other awards and distinctions. Among them, Professor Lassonde was named Knight, National Order of Quebec in 1999 and Officer of the Order of Canada in 2012. She has published 5 books, and over 300 book chapters and articles in scientific journals. She is a member of several editorial committees and has been named honorary professor at the University of Auckland and at the Université de Paris V in 2007. Since January 2012, Professor Lassonde has become the Scientific Director of the Quebec Natural Sciences and Technology granting agency. She is the President of the Royal Society of Canada.

Outcome: to see whether we could develop a tripartite network (UK-Canada-Quebec)

Jack Lomas, SenSat
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Bio: Jack comes from a consulting background with several years' experience at IBM in strategy and organisational transformation across various industries. With a deep interest in tech and innovative problem solving, Jack leads the agriculture division with a passion in helping farmers increase sustainability.

Outcome: build relationships with colleagues in the industry and help develop our position as an innovator within the agricultural industry.

Chandra Madramootoo, McGill University
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Bio: BSc, MSc and PhD in agricultural engineering from McGill University. Joined the academic ranks of the Faculty of Agricultural and Environmental Sciences at McGill in 1984. Areas of expertise include water management, irrigation, drainage, agricultural research, and international agriculture development. Appointed James McGill Professor in 2000. Prof. Madramootoo established the McGill Institute of Global Food Security in 2010 and was the Founding Director of the Brace Centre for Water Resources Management.

Research covers various aspects of water resources management, and soil and water engineering - looking extensively at the hydrology and water quality of surface and subsurface drained fields, the development of innovative technologies to predict crop water requirements, and the impacts of various water management practices on greenhouse gas emissions. Project leader of many large scale water and environmental research projects in Quebec, the Caribbean, Asia etc. President of the International Commission on Irrigation and Drainage (ICID) from 2008 to 2011. Currently Chair of the Governing Board of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), one of the 15 Centers supported by the Consultative Group on International Agricultural Research (CGIAR), and headquartered in Hyderabad, India.

Expertise: Works in the area of precision irrigation. Conducting research on the most innovative technologies for applying precise amounts of water to fields of varying spatial soil and land form properties. Interest is in the accurate measurement of soil properties and environmental factors, using high end sensors, as well as computer models, which will enable the application of precision irrigation technologies

Outcome: Learning new analytical tools; exchange of ideas and information; networking with UK colleagues working in PA.

Caroline Martin, High Commission of Canada
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Bio: Caroline Martin joined the Canadian High Commission in London in November 1998 as the Manager of the Science & Technology Programme. Her main responsibilities are: to assist in brokering research partnerships and collaborations between Canadian and British researchers in the public and private sectors; to monitor, analyse and evaluate strategic S&T trends, policies and programmes; and to showcase Canadian science and innovation capabilities within the UK.

Prior to taking up this role, Caroline was an Associate Lecturer in Chemistry at the University of Cambridge (95-98), and a Post-Doctoral Research Fellow at University College London, (94-95). Caroline gained a PhD in organometallic chemistry and catalysis from The University of Edinburgh in 1994.

Geoff McBride, STFC
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Bio: Currently with the Science and Technology Facilities Council Futures Programme as the Horizon Scanning and Futures Analyst providing research and strategic advice focused on the Grand Challenges of Defence, Security, and Resilience, Energy and Environment, Global Food Security, and Healthcare. Conducts analysis of these themes and their dependencies interacting with the UK Science Base by leading workshops and creating futures publications and products as an enabler for the UK Science Strategy. Represent STFC at the BIS Heads of Horizon Scanning meetings working with Government Depts. on strategic analysis, Global Challenges, and on the Emerging [8 Great] Technologies. Secondary role is as the Theme Leader for Global Food Security & Agri-Tech, I represent STFC in this theme at the Research Councils UK Cross Council Programme Coordination Group the aim of which is to greater understand the challenges and link STFC capabilities to potential solutions and the application of funding to the UK academia.

Expertise: I have been working in Futures Analysis since 2009 I have worked with and alongside the Horizon Scanning community. My expertise includes: Horizon Scanning and Futures Analysis techniques; Open Source Intelligence Techniques; Global Challenges; Global Food Security and Agri-Tech; Micro-nano technologies [MNT]; Space Technology; Image Analysis

Outcome: Networking on behalf of STFC looking at synergies and opportunities in all areas of the STFC portfolio.

Theresa Meacham, BBSRC
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Bio: Theresa Meacham, Senior International Programme Manager, BBSRC. Theresa has recently started working as a Senior International Programme Manager for the Biotechnology and Biological Sciences Research Council (BBSRC). In this role she works with counterpart funding agencies in other countries, alongside partners and stakeholders in the UK, to derive maximum benefits from scientific research investments.

Theresa has previously worked in BBSRC's Agriculture and Food Security team where she was responsible for the Precision agriculture portfolio. She has also worked for the Global Food Security programme (GFS), which is a Government programme to ensure better collaboration and coordination of research across the public sector. Before joining BBSRC, Theresa studied Biological Sciences at Oxford University and completed a PhD at the University of Edinburgh, investigating how measurements and models of Carbon storage in forests can be improved.

Expertise: I have previously been responsible for the Agriculture and Food Security portfolio of BBSRC, which has included Precision Agriculture. In this role I have provided strategic input into the direction of research funding.

Outcome: I am interested in information sharing around precision agriculture and extending my network.

Alex Melnitchouck, Bayer CropScience
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Bio: Alex holds his Ph.D. in Agricultural Sciences and second Master's Degree in Soils and Environmental Sciences, backed up by over 20 years of work experience at the international level. He is a member of Alberta Institute of Agrologists (P.Ag.). His area of expertise encompasses various aspects of spatial data management and analysis in agriculture and environment including aerial and satellite imagery, soil and yield data, prescription and as-applied files. His main research interests comprise spatial variability of growing conditions, environmental modeling, approaches to delineation of management zones and economic benefits of precision agriculture. Alex is an author of more than 50 publications in scientific journals and proceedings of conferences. Hobby: skiing, basketball, music.

Outcome: information sharing and extending your network, establishing a particular research collaborations, and identifying new markets and business opportunities.

Aubert Michaud, IRDA

Bio: Aubert holds a doctorate from Laval University in soils, as well as a bachelor's and master's in the same field from McGill University. Between 1987 and 1997, Aubert worked at MAPAQ to help the agricultural sector transition to agricultural practices in soil conservation by coordinating continuing education activities, farm trial networks, and programs of technical and financial support for agricultural enterprises. At IRDA since 1998, Aubert works with his team to describe the processes of diffuse contamination of surface water in agricultural areas and to develop tools to better face this problem. Aubert is also an associate professor in the civil engineering and the soil and agri-food engineering departments at Laval University.

Paul Miller, NIAB/TAG
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Bio: A trained agricultural engineer involved with research and development relating to agricultural machinery. During his time at the Silsoe Research Institute (where he became Director of Technology in 2000), Paul gained considerable first- hand experience in all aspects of crop spraying and fertiliser application and that led to him receiving prestigious awards for his work on spray drift and the targeted application of herbicides. He was also responsible for a wider range of applied agricultural engineering research including soil cultivations and agricultural systems analysis. He was President of the Institution of Agricultural Engineers (2006-08) and has been a Research Fellow with the Home-Grown Cereals Authority with work on precision farming technologies. Paul joined The Arable Group in 2005 to set up the Silsoe Spray Applications Unit that is now part of NIAB. In 2010, he took on the role of Technical Secretary to The Douglas Bomford Trust with an office at Cranfield University and was appointed as a Specialist Adviser to Silsoe Spray Applications Unit on a part-time basis; a role he retired from in 2014 to become an independent consultant with interests in most aspects of mechanised farming and precision agriculture with a strong focus on the improved application of agricultural chemicals. On 1st January 2016, Silsoe Spray Applications Unit became a stand-alone company with Paul as one of the Directors.

Expertise relating to Precision Agriculture: Improved application of plant protection products, including: Targeted "spot" and "patch" application; Spray drift prediction and management; Automated machine control options; Characterising crop canopies; Mainly for fertiliser inputs but also PPP's: Cost/benefits of using new technologies; Including precision approaches to arable systems.

Outcome: To gain a realistic assessment of the potential for a joint research project with Canadian partners that would involve organisations in the UK with which I have close associations and that would attract appropriate funding support; To assess the applicability of research that I am currently directly involved with in Canadian situations; To identify any new opportunities for research activities in either Canada, the UK or both where myself and colleagues could make a good technical contribution that would attract appropriate financial support.

Shamal Mohammed, Consultant
Shamal.mohammed@gmail.com

Bio: Dr Shamal Mohammed is an innovative business/research and development consultant, a national expert, R&D leader and strategist in agriculture technology. Currently working with number of commercial companies to develop data analytical capabilities to empower agronomists, improve decision making and drive commercial values. Whilst at AHDB, Shamal developed many new relationships and partnerships in the areas of precision technology, soil and water, crop nutrition and the impact of cropping on the environment. Took on responsibility for leading a £1.6m program of soils R&D on behalf of AHDB. Extensive experience in precision farming and land management. PhD. in the application of remote sensing and geographic information systems, Cranfield University (2010). Visiting Research Fellow at Cranfield University where he researched the application of fusion of multi-source and multi-sensors in soil management. Involved in national and international conferences, forums and discussions on smart agriculture. Key panel member of the government funded AgriTech Informatics Centre (£12m) and produced a recommendation providing technical assessment. A Chartered Scientist and member of British Society of Soil Science.

Expertise: Proximal soil sensing; Data analytic; Soil and water management; Remote sensing and GIS applications in agriculture; Translating Science into commercial product/service; R&D and business development

Outcome: Information sharing; Extending my network; Building collaborative research program between UK and Canada (Research and commercial) partners; Helping commercial partners to expand their service

Maurice Moloney, Global Institute for Food Security
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Bio: Executive Director and Chief Executive Officer of the Global Institute for Food Security (GIFS) as of October 1, 2014. Prior to joining GIFS, was the Group Executive for Food, Health and Life Sciences at the Commonwealth Science Industries Research Organization (CSIRO), Australia. At CSIRO, was responsible for all life sciences R & D and for the many industrial and company relationships that this involves. 2010 to 2013, Director and Chief Executive of Rothamsted Research UK.

Founder of SemBioSys & served as President 1994-1998 & then Chief Scientific Officer 1998-2010. Prior to founding SemBioSys, Professor, Dept. of Biological Sciences, University of Calgary, pursuing research on seed-specific gene expression, herbicide resistance & the plant cell cycle. 1995-2003 Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair in plant biotechnology. Previously, head of Cell Biology Group at Calgene Inc., where he developed the first transgenic oilseed plants using canola as the model. This resulted in a landmark patent in plant biotechnology and eventually became the basis of RoundUp Ready® and Liberty Link® Canola, which now commands 90 percent of the canola acreage in Canada.

Served on the advisory board of the National Research Council's Plant Biotechnology Institute. Served on government committees, including BBSRC's Committee of National Institutes of Biosciences, NSERC Council, CFI, National Research Council PBI (Canada) and the Networks of Centres of Excellence programs. Co-president of the International Society for Plant Molecular Biology (ISPMB) Congress in 2000 and serves on the ISPMB board. B. Sc. Chemistry, Imperial College, London, and was awarded his doctorate in plant biochemistry from De Montfort University/Leicester Polytechnic. He was honoured by the University of Lethbridge with a DSc honoris causa in 2004 and by De Montfort University in 2011. Dr. Moloney has served as a consultant for several major Agribusiness companies, including Monsanto, Dow AgroSciences and Bayer CropScience.

Abdul Mouazen, Cranfield University
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Bio: Senior lecturer in Agricultural and Environmental Engineering, and a leader of the Agricultural Systems Engineering Group. Background in the application of engineering principles to soil and water management, with specific applications in soil dynamics, tillage, traction, compaction, mechanical weeding, soil remediation and management. Major research projects include: soil management in controlled and non-controlled traffic systems; agricultural engineering soil mechanics; numerical modelling of soil-tyre and soil-tillage tools interaction; development of sensors for agriculture, food and environment; near infrared spectroscopy and chemometric tools and mechanical weeding. Currently working on the use of proximal sensors for precision management of farm resources. Born in Syria, B.S. in Agricultural Engineering and M.Sc. in Horticulture (Aleppo University, Syria) and, Ph.D. degree in Agricultural Sciences (Hungarian Academy of Sciences). Currently serves as a member of the Editorial Board of Soil and Tillage Research, Biosystems Engineering, Soil Research and Soils.

Expertise: 12-year's experience in proximal and remote sensing for precision agricultural applications, and is member of Global Proximal Soil Sensing Committee. His experience in vis-NIR spectroscopy and chemometric tools enabled him to develop one of three internationally patented on-line (vis-NIR) measurement systems of soil properties. Abdul has been coordinating two major PA projects (FarmingTruth funded by the European Space Agency & FarmFUSE, funded by EU-FP7 under ICT-AGRI) and a partner of a third project (Tru-Nject, funded by Innovate UK) on site specific nutrient management of farm input based on satellite and proximal soil and crop data. Recently led Cranfield team to win a major fund (£18 M) from the UK government to create Agricultural Engineering Precision Innovation Centre (Agri-EPI) in the UK, in collaboration with three UK academic partners and 75 national and international industries.

Outcome: I hope to explore opportunities for collaboration including available funding streams between the UK and Canada.

Justine Pawelec, Quebec Government Office in London
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The Québec Government Office in London was opened in 1962. It represents the Québec government in the United Kingdom, Republic of Ireland and the Nordic Countries. The Economic Affairs team: Carry out economic and strategic monitoring; Support companies in their efforts to identify markets or partnerships; Promote Québec as an economic and commercial partner; Support Québec trade missions; Support Québec's investment prospecting initiatives; Forge ties with economic institutions; Increase Québec exports to the territory; and Support foreign companies setting up operations or already operating in Québec with respect to their professional needs for relocating to Québec.

Expertise: Limited expertise in Precision Agriculture, and I see my role more as an observer, than an active participant. My mandate at the Québec Government Office in London is to promote Québec as an economic and commercial partner and international partnership in applied research. Therefore this event will prove useful to better understand where we stand technology wise in agriculture and how a multi-sectoral approach could support Canada's agriculture productivity and sustainability.

Outcome: is to promote Québec as an economic and commercial partner and international partnership in applied research. Therefore this event will prove useful to better understand where we stand technology wise in agriculture and how a multisectoral approach could support Canada's agriculture productivity and sustainability

Dr. Sven Peets, Harper Adams University
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Bio: Lecturer in mechatronics in agricultural engineering at Harper Adams University since 2011. Main teaching duties are instrumentation and electrics, mechatronics, research methods and precision farming technology. Sven's current research activities are development of a strawberry harvesting robot (part funded by Innovate UK and BBSRC), CTF on grassland, and rural energy systems. His research interests are precision farming, radio frequency identification, traceability, automation in agriculture, ISOBUS, and human-machine interface.

BSc and MSc degrees in agricultural energy engineering, Estonian Agricultural University. PhD programme titled "Specification, design and evaluation of an automated agrochemical traceability system" in agricultural engineering, Cranfield University Silsoe in 2009. Then a researcher at the Estonian University of Life Sciences where he was involved in developing undergraduate curriculum biosystems engineering.

Outcome: I am hoping to extend my network, share contacts, and find new ideas in precision farming. I am also interested in research collaboration, funding and new business opportunities.

Tony Pridmore, University of Nottingham

Bio: Tony Pridmore is Professor of Computer Science at the University of Nottingham, where he leads the Computer Vision Laboratory. His research interests centre on image analysis and computer vision, particularly object detection, 3D reconstruction, visual tracking and their application to bioimage analysis.

Much of Tony's current work is directed towards the development of integrated plant phenomics technologies. He is a co-Director of both the University's Centre for Plant Integrative Biology and the newly constructed Hounsfield Facility for Rhizosphere Research, a unique installation providing automated extraction of 3D structural descriptions of plants from X-ray data. Tony co-Chairs the UK Plant Phenotyping Network (UKPPN) and is active in the European Plant Phenotyping Network (EPPN).

Paul Raymer, Practical Precision Inc.

Bio: Paul is the co-owner of Practical Precision Inc. He received his certification in Mechanical Engineering Technology from Fanshawe College – specializing in Mobile Equipment Design. Paul has a wide range of agricultural, industrial, and military experience; working on various engineering teams such as John Deere and General Dynamic. Paul has been instrumental in creating a tablet computer for GreenSeeker units that simplifies the mapping process. He has also brought the SoilOptix technology to Canada and is busy validating the information that can be gleaned from the sensors.

Mario Rivero-Huguet, UK Science and Innovation Officer, Montreal
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Bio: Mario is responsible for UK Science and Innovation Network (SIN) activities in Quebec and the Atlantic Provinces, where he seeks to establish, foster, or strengthen collaboration and partnerships in research science (health sciences, aerospace, clean technology, etc.) between the UK and Canada's East. He possesses a Master's degree in Chemistry from the University of Leipzig in Germany and a Doctor of Philosophy in Environmental Health from McGill University with particular emphasis on innovative technologies to remediate soils contaminated with carcinogenic compounds. Mario worked in Ottawa for Canada's International Development Research Centre as specialist in Environmental Health, committed to action-oriented and community based research approaches. He has also worked as McGill Faculty lecturer and for the Commission for Environmental Cooperation in North America in projects related to the heightened vulnerability of certain communities to environmental pollutants.

John Stafford
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Bio: B.Sc. Cybernetics & Instrument Physics, University of Reading. Ph.D research topic'The failure of lubricants in sliding contacts'. Chartered Engineer, Chartered Environmentalist, Fellow Institution of Agricultural Engineers, Member International Society for Precision Agriculture (President Elect, President and Past-President).

Expertise: Led PA research at SRI 1990-99. Initiated European Conference on Precision Agriculture series 1997. Proceedings editor for biennial ECPA. Editor-in-Chief Precision Agriculture journal (Springer) vol 1 (2000) to present. *Outcome:* networking and developments / research PA

Vladimir Stoiljkovic, Satellite Applications Catapult
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Bio: Vladimir Stoiljkovic is the business development manager at Satellite Applications Catapult. He holds a PhD degree from the University of Leeds, has published over 40 technical papers, holds six patents and is a Senior Member of the IEEE. The Satellite Applications Catapult is an independent, not-for-profit company. The Catapult helps organisations to use, and benefit from, satellite technologies. It brings together multi-disciplinary teams to generate ideas and solutions in an open innovation environment.

Stewart Sweeney, OMAFRA
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Bio: Environmental Management Branch at OMAFRA since 2001. He is the lead soil mapping scientist for the Ministry. He is the developer of the Ontario Agricultural Resource Inventory (AgRI) geospatial layer. It is now approaching coverage of almost 10 million acres of the province as a seamless polygon framework of agricultural and rural landscape features. This has lead to the development of a broad range of new approaches include precision agriculture, crop production management practice mapping, soil erosion modelling, soil health mapping, soil carbon mapping, and an array of ecosystem health mapping from pollinator to songbird to turtle habitat to aquatic habitat water quality. Ph.D. Soil Science, University of Guelph, Honours B.Sc. & M.Sc. Earth Sciences, University of Waterloo.

Expertise: Involved in research and applications of multi-scale image analysis of soil features and soil landscapes since the 1980's. Expertise includes & ranges from soil micromorphology through soil genesis and mapping to soil chemistry, physics and biology and remote sensing/terrain analysis. My role as Ontario's lead soil mapping scientist includes components related to scientific innovation to evaluate and develop new methodologies for the province's soil resource characterization and mapping.

Outcome: Seeking research collaborations focused on precision characterization and property measurement/monitoring of soils – particularly those developed in glaciated landscapes. They have short-range variability that impacts crop performance. The dynamic and spatially-variable nature of these "young" (less than 10,000 year old) soils has not been appreciated appropriately in the field-level precision agricultural practices aimed at the development of management zones. These intrinsic soil characteristics confound interpretations and extrapolations of soil sensing results, crop yield index maps and, ultimately, crop management prescriptions. Discussions with the "brain-trust" brought together for this workshop on these issues will be incredibly enlightening.

James Taylor, Newcastle University
James.taylor6@newcastle.ac.uk

Bio: Joined Newcastle University in early 2014 to establish a strong Precision Agriculture Research presence in the North of England. Previously worked in Australia, France and the USA on understanding the amount of variability and the drivers of production variation in cropping systems. This is includes annual cereal crops, field horticulture and perennial horticultural systems. Ultimately the aim of my endeavours is to better inform growers on how to respond to the variability in their crops to their advantage. Based at Cockle Park Farm, which is currently being transformed from a very conventional production system into the principle Precision Farming platform for the University.

Expertise: I currently oversee 2 large collaborative projects on spatial decision support systems for potatoes and cereals in the UK. I am also a Co-Investigator on two international Agri-tech projects. The first is in China, funded through the Newton Fund, to improve Precision Agriculture services to family-run farms in China, and the second is a USDA-funded project, in collaboration with several American universities, to develop a spatial crop load decision system for US viticulture. I also teach dedicated precision agriculture courses at undergraduate and postgraduate level at Newcastle University.

Outcome: I hope to learn more about the active research that is occurring in both the UK and Canada, but especially in Canada. I am also keen to meet and to establish links with Canadian researchers and industry in the Precision Agriculture domain.

Richard Tiffin, University of Reading; Agrimetrics Ltd.

Bio: Prof Richard Tiffin is Chief Scientific Officer of Agrimetrics Ltd and Professor of Applied Economics at the University of Reading, UK. Recently launched, Agrimetrics will provide a one-stop-shop for businesses, universities and research organisations to integrate data across the whole food chain, utilising smart analytics to identify solutions that would otherwise evade insight.

Professor Tiffin read Agriculture at the University of Newcastle and completed a PhD in Agricultural Economics at the University of London. He lectured in Agricultural Economics at Newcastle and at Durham's department of Economics, before joining the University of Reading in 2000 where he was appointed Professor of Applied Economics in 2006. Currently, Professor Tiffin's research group is developing an empirical framework to better understand the cognitive underpinnings of dietary choice.

Professor Tiffin has published widely in academic journals and books: his research findings are frequently reported in the international and national press and he has appeared as an expert commentator on national television and radio. He also sits on a number of advisory panels and research committees.

Nicolas Tremblay, AAFC
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Bio: Dr. Tremblay is president-elect of the International Society for Precision Agriculture (ISPA). He leads an important research program for the Government of Canada and he is known for his ability to generate new knowledge for the benefit of the agricultural sector. Dr. Tremblay is currently involved in the variable rate management of N applications involving remote sensing, geomatics, geostatistics and meta-analyses. He conducts research on fluorescence techniques for the detection of stresses affecting crops. His expertise in the production of vegetable transplants is also well known. Dr. Tremblay is adjunct-professor at Laval University, University of Ottawa and at the Université de Montréal. He is President of the Commission chimie et fertilité des sols which is the official body for fertilizer recommendations in Quebec. He is a member of: American Society of Agronomy (ASA), Crop Science Society of America (CSSA), Soil Science Society of America (SSSA), and the Association québécoise des spécialistes en sciences du sol (AQSSS).

Expertise: Plant nutrition and crop management specialist
Outcome: hope event will help address issues of common interest through data sharing and the development of big data analysis strategies.

Toby Waine, Cranfield University
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Bio: Lecturer in Applied Remote Sensing. Dr Waine is an agricultural engineer with more than 15 years' experience in the following areas: Crop monitoring and area estimation using satellite and aerial digital photography based remote sensing, precision agriculture, soil property measurement including electro-magnetic induction (EMI), gas sensing, instrumentation, IT, field trials, GIS, remote sensing and the application of technology to agriculture. He is currently active in land resources monitoring, with interests in vegetation and soil monitoring using remote sensing, sampling and geospatial techniques. He is course tutor for Cranfield MSc in Geographical information management and lectures in image processing, environmental resource survey and physical principles of remote sensing.

Outcome: Looking for research collaborations to develop operational applications in precision agriculture.

Elizabeth Warham, UK Trade & Investment
Elizabeth.warham@ukti.gsi.gov.uk

Bio: Elizabeth is head of the Agri-Tech Organisation with expertise and experience in plant sciences, and technology development more broadly across the agri-food sector. Previously as head of the food, water and environment issues team in the Government Office for Science, she provided support to the Government Chief Scientific Adviser. She also led the GO-Science Review of how the Department of Health manages and uses science to inform the development of policies. Elizabeth previously worked for the former Department of Trade and Industry Technology Programme on programme delivery working closely with technological sectors and their user industries. In the UK Department for International Development she managed research programmes to develop appropriate technologies for different agricultural production systems in low- and middle-income countries (Africa, Asia, Latin America and Caribbean). She has also worked for 10 years at the International Centre for Wheat and Maize Improvement in Mexico, in the maize breeding, wheat pathology and seed health programmes

Alan Weston, SenSat
Alan.weston@sensat.co.uk

Bio: Alan has had a very successful career in business to business sales and support with companies such as Canon and Laserfiche supplying products, software and support in the areas of print and document management solutions. With Canon Alan held the position of National Service Manager and was with them for just short of 20 years.
Outcome: build relationships with colleagues in the industry and help develop our position as an innovator within the agricultural industry.

David Whattoff, SOYL Precision Crop Production
David.Whattoff@soyl.co.uk

Bio: David has worked at SOYL for 6 years working closely with both the commercial and technical teams. As Agricultural Development Manager he is responsible for new precision farming services across the business, recently focusing on variable depth cultivation and UAV technology. This focus has enabled SOYL to introduce new and unique services to their customers. David holds an MRes from Cranfield University.

Expertise: David's interest is in multi sensor data platforms for soil and crop sensing. *Outcome:* Exchange ideas and understanding on current PF practices and help develop pathways to commercialise new technologies.

Steven Wood, Digital Catapult
Steven.wood@cde.catapult.org.uk

Bio: Steven has a background is in telecommunications and the early development of the Internet. A former physicist and digital innovator, he co-founded three start-up organisations. One of these grew to operate in seven countries, employed over 100 people and served several hundred major customers in the graphic arts and the creative sectors. He is currently responsible for engagement with business and industry for the Digital Catapult in the UK. His interests lie in science and technology and its application to human and environmental challenges.

Expertise: Expertise in the application and use of data in various industrial and operational environments. Strong interest in the optimisation of supply chains – agriculture being a key example. Very interested to see what the techniques for Industry 4.0 could do to improve this sector.

Outcome: I would like to understand the scale of the opportunity for sharing data in precision agriculture and for potential partners to explore this with.

Qamar Zaman, Dalhousie University
QZaman@dal.ca

Bio: Professor of Precision Agriculture (PA), Faculty of Agriculture, Dalhousie University, Canada. Developed precision agriculture research program at Dalhousie Agricultural Campus. One of the pioneers in the field of PA having invented cost-effective automated variable rate (VR) technologies for real-time spot application of pesticides and fertilizer to increase farm profitability and reduce environmental risks. He haas US & Canadian patents for the invention of his "Variable Rate Sprayer System and Method of Variably Applying Agrochemicals." He also initiated a precision harvesting research program at Dal-AC with the blueberry industry to develop innovative harvesting technologies for blueberries to increase harvestable fruit yield for Atlantic Canada.

Expertise: Over twenty-five years of experience in teaching, research and extension from various national & international universities & international organizations. In his current position, Qamar established the Precision Agriculture Research Program (PARP) with objectives to improve the competitiveness and profitability of the blueberry industry and enhance the sustainability of rural life in Atlantic Canada. He is now one of the pioneers in the field of PA and has invented cost-effective automated variable rate (VR) technologies for real-time spot application of pesticides and fertilizers. He received the prestigious Glenn Downing Award from CSBE in recognition of his outstanding work in industry, teaching, research, and extension in the area of machinery systems.

Outcome: information sharing and extending my network, or more specific in terms of establishing a particular research collaboration.

Bernie Zebarth, AAFC
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Bio: Bernie Zebarth is a research scientist with Agriculture and Agri-Food Canada (AAFC), located at the Fredericton Research and Development Centre, Fredericton, NB. He received his BSc and MSc at the University of Guelph and PhD at the University of Saskatchewan in soil science. He started with AAFC in 1989. His research is primarily focussed on nitrogen cycling in potato rotations. More recently, he leads research on addressing issues related to soil quality and potato productivity, and on environmental impacts of potato production on water quality.

Expertise: I have a background in nitrogen cycling in soils and crops. I am relatively new to precision agriculture, and have become involved in industry led research to address declining potato productivity. This and other projects are using precision agriculture approaches to understand and manage spatial variation in soils and crops.

Outcome: I am relatively new to precision agriculture and am looking for new insights in tools, technologies and approaches I can use in my work.