APSA

VIRTUAL TECHNICAL SESSION 2020

Program Book

23rd – 25th November 2020

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1:05 pm - 1:25 pm	OECD Report on the Impact of COVID-19 on Seed Sector	Mr. Csaba Gaspar - OECD Seed Schemes Program Manager
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Standing Committee on Seed Technology

TIME (GMT+7/ICT)	PROGRAM	SPEAKER
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4:50 pm - 5:00 pm	Session Summary	Dr. Manish Patel - Co-Chair, SC Seed Technology
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TUESDAY THE 24TH OF NOVEMBER 2020

Standing Committee on Intellectual Property Rights & Biodiversity

TIME (GMT+7/ICT)	PROGRAM	SPEAKER
ITPGRFA / Biodiversity		
3:00 pm - 3:05 pm	Welcome Speech	Dr. May Kanokwan Chodchoey - Executive Director, APSA
3:05 pm - 3:10 pm	Opening Remarks	Dr. Arvind Kapur - Chair, SC IPR & BIO
3:10 pm - 3:30 pm	General Introduction of Digital Sequence Information (DSI) on Genetic Resources Q&A Session	Ms. Anke van den Hurk - Deputy Director, Plantum
3:30 pm - 3:40 pm	Showcase Viddeo from The International Rice Research Institute (IRRI)	Dr. John Damien Platten - Senior Scientist, IRRI
3:40 pm - 3:50 pm	Showcase Video from World Vegetable Center	Dr. Roland Schafleitner - Head of Molecular Genetics Flagship Program Leader - Vegetable Diversity and Improvement, WorldVeg Dr. Maarten van Zonneveld - Genebank Manager, WorldVeg
3:50 pm - 4:00 pm	Q&A Discussion	
4:00 pm - 4:30 pm	Online Coffee Break	
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4:30 pm – 5:10 pm	Presentations from UPOV and Non-UPOV Countries	
	Thailand (Non-UPOV Country)	Dr. Boonyanath Nathwong - Vice President, THASTA
	The Philippines (Non-UPOV Country)	Dr. Gabriel Ortega Romero - Executive Director, PSIA
	China (UPOV 1978)	Dr. Cui Yehan - Division Director, Division of PVP Examination, Ministry of Agriculture and Rural Affairs
	Australia (UPOV 1991)	Mr. Nik Hulse - Chief of Plant Breeder's Rights, IP Australia
5:10 pm – 5:30 pm	Online Panel Discussion	Moderator: Dr. May Kanokwan Chodchoey - Executive Director, APSA
5:30 pm – 5:40 pm	Session Summary	Mr. Casper Van Kempen - Co-Chair, SC IPR & BIO Dr. May Kanokwan Chodchoey - Executive Director, APSA
5:40 pm	Session Close	

WEDNESDAY THE 25TH OF NOVEMBER 2020

Special Interest Group on Field Crops

TIME (GMT+7/ICT)	PROGRAM	SPEAKER
12:00 pm - 12:05 pm	Welcome Speech	Dr. May Kanokwan Chodchoey - Executive Director, APSA
12:05 pm - 12:10 pm	Opening Remarks	Dr. Frisco Malabanan - Chair, SIG Field Crops
12:10 pm - 12:40 pm	Fall Army Worm	Dr. B. M. Prasanna, Director, Global Maize Program, CIMMYT
12:40 pm - 1:10 pm	Hybrid Rice Breeding Innovation with Bio Technology	Prof. Peng Hai, Director, Joint Molecular Biology Laboratory, Development Center for Science and Technology of MARA and Jianghan University
1:10 pm - 1:15 pm	Online coffee break, video from sponsor	
1:15 pm - 1:40 pm	Breeding innovation to provide genetic gains to farmer's field	Mr. Michael Quinn, Leader, Excellence in Breeding program, CIMMYT
1:40 pm - 1:55 pm	SIG Field Crops Update on Current Activities (WIC Field Crops)	Dr. Frisco Malabanan - Chair, SIG Field Crops
1:55 pm - 2:00 pm	Session Summary	Dr. Chua Kim Aik - Co-Chair, SIG Field Crops
2:00 pm	Session Close	

Special Interest Group on Vegetables & Ornamentals

TIME (GMT+7/ICT)	PROGRAM	SPEAKER
3:00 pm - 3:05 pm	Welcome Speech	Dr. May Kanokwan Chodchoey - Executive Director, APSA
3:05 pm - 3:10 pm	Opening Remarks	Mr. Michel Devarrewaere - Chair, SIG V&O
3:10 pm - 3:55 pm	Overview of Gene bank in Asia, Crop wild relatives and its importance in climate-smart breeding Q&A Session	Dr. Maarten Van Zonneveld - Genebank Manager, World Vegetable Center Dr. Benjamin Kilian - Senior Scientist & Project Manager, Global Crop Diversity Trust
3:55 pm - 4:25 pm	Systems Approach Concept by ISF and Industry View	Ms. Merel Langens - Chair of ISF Systems Approach Working Group
4:25 pm - 4:30 pm	Online Coffee Break	
4:30 pm - 4:50 pm	Working Group of Integrated Vegetable Seed Companies – Action Summary (included SIPI update) Q&A Session	Dr. Sumitra Kantrong - Chair, WIC Mr. Rahul P. Ashok - Co-Chair, WIC
4:50 pm - 5:00 pm	SIG V&O Presentations on Past Activities & Report on APSA R&D Advisory Committee	Mr. Michel Devarrewaere - Chair, SIG V&O Dr. Yan Shupeng - Co-Chair, SIG V&O
5:00 PM	Session Close	

Standing Committee on International Trade & Quarantine
Speaker's Biography & Abstract

Ms. Aarti Misal
Senior Researcher
World Benchmarking Alliance

Biography

Aarti Misal is leading the research for the Access to Seeds Index. Prior to joining World Benchmarking Alliance, Aarti has worked with several seed companies based in India and has experience in providing market intelligence data for companies involved in Foods and Beverages, Seeds, Agricultural Commodities, and Agrochemical sector. She has comprehensive knowledge of Intellectual Property and Plant Variety Protection, Biosafety and Regulatory affairs and Agribusiness Consultancy. Aarti believes that the private sector has a crucial role to play in advancing the SDGs, and benchmarking is a powerful tool in a way to measure and incentivize business impact towards a sustainable future.

Abstract

The South and Southeast Asia regional landscaping report contain an overview of the seed sector landscape in the region as well as in each country in scope. The first regional Access to Seeds Index for South and Southeast Asia was published in 2019. The regional index evaluated the efforts of 24 leading seed companies to improve access to quality seeds of improved varieties for smallholder farmers in the region. The Index seeks primarily to identify leadership and good practices, providing an evidence base for the discussion on where and how the seed industry can step up its efforts. The second South and Southeast Asia regional landscaping report feature selected seed companies for the 2021 Access to Seeds Index assessing their effort to support smallholder farmer productivity. It also includes an overview of regional actors active in seed sectors and how the World Benchmarking Alliance and the Access to Seeds Index aim to collaborate with selected key actors.

Mr. Csaba Gaspar
Seed Schemes Program Manager,
Organisation for Economic Co-operation and Development (OECD)

Biography

Csaba Gaspar is the Programme Manager of the Organisation for Economic Co-operation and Development (OECD) Seed Schemes. In this capacity he ensures the co-ordination of the implementation of the OECD's international seed varietal certification systems in the 61 participating countries of the Seed Schemes.

Mr Gaspar has an MSc in Horticulture with specialisation in Biotechology as well as an MSc in Geo-Information Systems (GIS). He has 18 years of experiences in standardisation and certification of agricultural products such as agricultural seeds, fruits & vegetables, and forest reproductive materials. Before joining the OECD in 2006 he worked for the National Food Chain Safety Office of Hungary as inspector and coordinator of international relations. He was the Chair of the Specialised Session on Standardisation of Dry and Dried Produce and Vice-Chair of the Working Party 7 on Agricultural Quality Standards of The United Nation Economic Commission for Europe in 2005 and 2006.

Abstract
The necessary restrictions on movement and transport put in place by governments to protect their people from COVID-19 have the potential to seriously affect the production, certification, distribution and cost of seed. In such uncertain times, countries cannot afford this additional risk to their food systems. As such, the OECD Seed Schemes Delegates have been working together with the Secretariat to assess the impact of COVID-19 on the seed sector and develop solutions that ensure high quality seed production and international trade continues uninhibited. The OECD published the results in a blog: Policy responses to COVID-19 in the seed sector to inform policy makers and other stakeholders of the challenges facing the industry.

In order to successfully support the seed sector through this unprecedented crisis, policy makers need greater visibility over seed breeding, production, certification and trade. As such, the OECD Seed Schemes in collaboration with the Japanese government, is in the process of analyzing the resilience of the international seed market during the COVID-19 pandemic, including a case study of the Asian seed market. ISF and APSA are key partners in this work. In addition, the OECD is currently exploring the feasibility to develop a digital seed information system that provides countries with greater visibility over seed production, certification, and potentially flows.

Standing Committee on Seed Technology
Speaker's Biography & Abstract

Dr. Shigeru Tanabe
Manager - Quality Management
Sakata Seed Corporation

Biography
Dr. S. Tanabe obtained PhD in 1995 from Okayama University by his research on the cell biology during sexual life-cycle of basidiomycetes and studied as post-doctoral fellow at the Research Center for Genetic Ecology, Tohoku University and National Agriculture and Food Research Organization (formerly National Institute of Agrobiological Sciences: NIAS). At Tohoku University, he studied the sexual cell morphogenesis of zygomycetes, and at NIAS, he studied the interaction between rice blast fungus and rice cells, especially using molecular biological techniques. In this study, he analyzed the function of proteins secreted by the blast fungus using genetically modified fungus and joined a project of large-scale expression analysis to create a database of gene expression in rice cells with blast infection using microarrays. In 2012, he joined Sakata Seed Corporation, where he performed biochemical testing as a leader of the Molecular Testing Team using various DNA markers. Currently, he is the manager of the Quality Control Section 1 in the Quality Control Department, he manages the Molecular Testing Team and the Seed Health Testing Team to improve the efficiency and the accuracy of their testing.

Abstract
Regarding the seed purity testing, we have two options: grow-out (GO) testing at fields and biochemical testing with molecular markers. While GO testing have the absolute advantage of being able to confirm a trait as a variety, there are several risks, such as the time it takes to obtain the test results, and weather conditions can make the test impossible or difficult to determine. Biochemical testing, especially DNA testing, have a great advantage in that they can provide results in a short period of time, and they are also easy to judge the results and can be performed for a variety of testing. However, it must be taken into account that DNA testing are based on single molecule and do not

reflect whole trait, require information such as genomic information for the marker development, and require investment in specialized equipment.

As for the DNA markers to be used, it is necessary to choose from a wide variety of markers to suit the purpose. The final decision as to which method to use will depend on the balance between the profit and the testing costs. DNA technology is advancing and the accuracy and the efficiency of DNA testing is improving every day. Due to recent factors related to the seed business, such as increasing global weather variability, the demand for faster commodity supply and so on, DNA testing is likely to become increasingly important.

Mr. Kodi Ganesh Poorna Chandra Rao
APAC Seeds Quality Head
Syngenta

Biography

Poorna obtained his Masters in Plant Breeding from Andhra Pradesh Agricultural University, Tirupati. He is currently APAC Seeds Quality Head in Syngenta and based out of Thailand. As a seed professional, he has 25 years of multi-disciplinary experience in Seed Operations, Seed and Crop Protection Quality Management. His areas of expertise include end-to-end seed quality, trait stewardship, ISO, ISTA, BIO ETS quality management, Six Sigma, Lean, Operational Excellence and bringing in automation, digitalization and overall efficiency improvement in Seed quality operations. During his career, he established seed labs, introduced company-specific corn and cotton vigor tests, introduced new IS tools and SAP system for laboratory management, and established genetic purity tests with SNP markers for field corn. He is a QMS lead auditor, OPEX practitioner and has good expertise in investigation and root cause analysis. He also innovated/contributed to the development of seed testing equipment such as seed divider, seedling planter, vigor test watering machine, seedling evaluation machine and physical purity analyzer.

Abstract

The agricultural sector is extremely dependent on the provision and quality of seeds for a productive harvest. Seed business has grown steady in the last four decades and therefore the production supply cycle of quality seed has become the need of the hour and depends on reliable & repeatable test methodology and timely availability of quality test results that confirms the quality and standards of the seed being delivered to the growers. There's a challenge of time for the incoming harvest and supply which within the seed industry is addressed in having a robust field quality assurance system that guarantee the genetic purity of the seed. There are number of methods employed across the crops to confirm the seed genetic purity like Gel electrophoresis (Isozyme test), Simple Sequence Repeat (SSR) markers, Restriction Fragment Length Polymorphism (RFLP), Single nucleotide Polymorphism (SNP) and also the traditional morphological comparison test called Grow-out test (GOT). In general, within the major Field crops (Corn, Rice, Cotton, Sunflower) of the private seed industries the choice of an appropriate genetic purity test method in turn depends on the business requirements and majority of the players use the more cost-effective GOT that encompasses a disadvantage of time factor followed by Isoenzyme electrophoresis and SNP tests. SNP tech is more sensitive as it detects variations on DNA sequence base level and faster than grow outs as SNP analysis is made directly with the DNA molecule obtained from individual seeds. Grow out determinations require that the material gets the reproductive stage to evaluate the hybrid phenotypic characters. This difference on time for getting the results between each methodologies makes that the production Usage decisions are taken with SNP results or a quicker test than the GOT. The price of test increase proportionally from GOT to SNP and so is the investment required to establish the DNA testing platforms. A well calibrated SNP test for the available gene pool of a company supports in better

inventory management and release of product to the market. Alternately, there are private genotyping labs willing to produce services of genetic purity testing which will be reached out with necessary confidentiality agreements.

Dr. Wilco Ligterink
Team Leader Crop Innovation
Keygene

Biography
Wilco Ligterink studied Molecular sciences at the Wageningen Agricultural University where he did both his B.Sc. and M.Sc with topics ranging from the development of a transformation protocol of Archeabacteria to a study on the working of retinoic acid receptors in human cell lines.

In 1995 he started his Ph.D. at the Vienna Biocenter in Austria where he worked on stress signal transduction in plants in the group of Heribert Hirt, mainly focusing on the molecular and biochemical characterization of mitogen activated kinases (MAPKs). In march 2000 he successfully defended his thesis with the title: “Stress-induced signal transduction mechanisms in plants”. In 1999 he moved back to Wageningen to work as a post-doctoral fellow on signal transduction in Phytophthora infestans at the Phytopathology department of Wageningen University.

From 2003 to 2018 he has been working at the Plant Physiology department of Wageningen University, where he has been working on a broad variety of topics in relation to seed biology and abiotic stress tolerance and teaching of several courses at B.Sc., M.Sc. and post-graduate level on plant physiology, seed biology, genetics/plant breeding and advanced molecular analysis. Since 2018 he is working for the agro-biotech company KeyGene where he is responsible for research and project management for field crops and ornamentals in the area of molecular genetics and plant physiology.

Abstract
Seed quality comprises key agronomic traits, such as dormancy, germination, seed and seedling vigour (stress tolerance), after-ripening, seed storability (ex-situ conservation), the ability to generate a usable plant and purity of seed batches. Improvement of seed quality is of continuing importance for plant breeders. Likewise, methods to test seed quality are of equal importance. On important aspect of seed quality testing is testing for genetic purity. In my presentation I will address important developments in image analysis and DNA analysis technology and discuss the (possible) use of these technologies in genetic purity testing. In respect to image analysis I will discuss different approaches to obtain images and subsequently on ways to analyze these including the use of machine learning algorithms. Additionally, several types of DNA analysis are or will become suitable for genetic purity testing. This is mainly by using specific markers or in the future possibly sequence based. In both cases it will be important to consider what to screen for and I will briefly touch upon ways to obtain markers for seed quality. Specific markers are in general used in PCR based approaches for SNP detection. Additionally, fast developments in next generation sequencing (NGS) technologies might make these the fundament for genetic purity tests in the future.

Dr. Chiara Delogu
ISTA Variety Committee,
International Seed Testing Association (ISTA)

Biography

From the beginning of her career she has been involved in the development of methodologies regarding variety characterization and the evaluation of the genetic purity and identity of seed lots.

Her primary interest deals with biochemical and genetic profiling in the framework of new Variety Registration and Plant Breeders Right protection. Over the years, in addition to traditional techniques related to the description of biochemical profiles (seed storage proteins and isoenzymes) she has promoted the use of more innovative methodologies linked to the use of DNA based molecular markers (SSR, SNP). SSR protocols have been published in the official criteria for national varieties listing (soybean, rice). Since 2008 she is a member of the ISTA Varietal Committee, as a member of DNA Working Group and leader of the protein WG. In this framework she organized and participated in activities aimed to the validation of analytical protocols based on both biochemical and DNA based methods for their inclusion into the ISTA Rules.

Abstract

ISTA approach to variety testing: ISTA is the International Association for Seed Testing (including sampling), Seed Science and Technology. It is a science-based, governments-driven non-profit organization, legally independent from industry and third parties, under Swiss law. The mission of the association is to promote research in all areas of seed science and technology and to develop, adopt and publish standard procedures for sampling and testing seeds, and to promote their uniform adoption in seeds moving across international trade. Internationally recognized and validated methods are collected in the ISTA International Rules for Seed Testing which are constantly updated thanks to the activity of the technical committees. The Variety Committee is responsible for Chapter 8 of the ISTA Rules which deals with methods of variety verification. ISTA's objective for variety verification is the determination of the extent to which a seed sample conforms to the species or cultivar for which it is claimed. The traits compared may be morphological, physiological, cytological, or chemical but the varietal identity of the sample under study is always verified by comparison with a reference sample of the variety. Variety Committee activities are mainly focused on the development of DNA based methods for variety testing. Methods for wheat and maize, based on SSR markers are included in the Rules, but additional species (pea, oat, and barley) and a new marker type (SNP) are now under study, as well as a specific approach for accredited laboratory evaluation by proficiency testing. A strategy of marker linked to specific trait is underway for determination of annual types in perennial ryegrass varieties. The trueness of seed lots to a variety is strictly related to the quality of the material and to its commercial value. Testing methods based on morphological traits and/or genetic profile are available. An overview of the two different approaches will be given in the presentation.

Standing Committee on Intellectual Property Rights & Biodiversity
Part 1: ITPGRFA / Biodiversity
Speaker's Biography & Abstract

Ms. Anke van den Hurk
Deputy Director
Plantum

Biography

Ms. Anke van den Hurk is currently the Deputy Director, Plantum NL, The Dutch association for breeding, tissue culture, production and trade of seeds and young plants. She is part of the core management team of Plantum and is particularly responsible for the international activities of the association. Furthermore, she is responsible for the vegetable seed department of Plantum, international corporate social responsibility and the biodiversity dossier, in particular the debate on Access and Benefit Sharing (ABS).

She represents the seed sector in the international meetings of the Convention on Biological Diversity (CBD), the Nagoya Protocol and the International Treaty on Plant Genetic Resources for food and Agriculture (IT PGRFA) and is actively involved in the implementation of the international agreements in Europe and other countries.

Within the seed sector, she is leading various committees related to these issues, such as the Sustainable Agriculture Committee of the International Seed Federation (ISF), and the Working Group Biodiversity of the European Seed Association (ESA). She has served on the Executive Committee of APSA (2010-2016) and has been an important member of the IPR & BD, as well as Trade & Marketing Standing Committees.
With an MSc in Plant Breeding, Ms. Anke, before joining Plantum about 20 years ago, was working as a breeder in vegetables for Nunhems Seeds; as Research Fellow on biodiversity conservation in Italy and Colombia at Bioversity, and as a teacher at an agricultural university in Mekele, Ethiopia.

Abstract

General introduction of Digital sequence information (DSI) and genetic resources. Digital Sequence Information (DSI) do you know what it is? Digital Sequence Information (DSI) do you use it, or don't you know if you use it in your breeding programmes? Digital Sequence Information (DSI) why do you need to know about it?

In this presentation you will get an introduction on Digital Sequence Information. First of all, the term DSI will be discussed and the possible meaning it could have. Secondly, it will be discussed why to talk about this topic in the APSA meeting. To do plant breeding in a more and more effective manner, plant breeders use different technologies and information. It will be discussed if this information could be considered DSI. This then will be followed by information on the political discussion on DSI and benefit-sharing. The benefit-sharing is expected from those users and at least the private users of DSI. So, in other words, does it mean that you have to pay for information and if so, how much?

Lastly, you will get an update on the position of the various industry groups and the interactions they have with policy makers. Can APSA and the National Seed Associations assist in these interactions and if so how?

Dr. John Damien Platten
Senior Scientist,
International Rice Research Institute (IRRI)

Biography

John (Damien) Platten is a graduate of the University of Tasmania in plant developmental genetics. His post-doctoral research at CSIRO in Australia identified genes responsible for improved salinity tolerance in durum wheat. His work at IRRI has involved identifying stable QTLs and genes responsible for salinity tolerance in rice, genome sequencing and marker design, and deployment of major genes into elite varieties to introduce these into the breeding programs. He is currently the head of the Breeding Innovations and Informatics unit, overseeing activities including genomics, gene deployment, biometrics and breeding program modernization.

Abstract

Sequencing information is making significant contributions to the reliability and efficiency of rice breeding. Its chief impact is through enabling marker-assisted selection; genome sequence data enables the identification of far more reliable and higher density markers. Marker design has become routine rather than a fishing exercise. Reliable markers in turn enable a host of applications such as QTL profiling, variety purity QC and variety typing, and recombinant selection around target genes. These applications enable the design and production of precision genotypes, enhancing the impact of genes whilst simultaneously reducing undesirable effects.

Dr. Roland Schafleitner
Head of Molecular Genetics Flagship Program Leader - Vegetable Diversity and Improvement, World Vegetable Center

Biography

Roland Schafleitner is currently the Flagship Program Leader Vegetable Diversity and Improvement at World Vegetable Center, Taiwan. Prior to this position, he worked as a Plant Biotechnology Research Scientist and Project Manager, Germplasm Enhancement and Crop Improvement Division, International Potato Center (CIP), Lima, Peru. His major research interests are on the mobilize crop biodiversity for breeding improved varieties, phenomics & genomics.

Dr. Maarten van Zonneveld
Genebank Manager
World Vegetable Center

Biography

Maarten van Zonneveld (The Netherlands) joined WorldVeg in November 2017 to manage the Center's genebank operations. From 2006 – 2013 he worked on ex situ and in situ conservation and sustainable use of genetic resources of crops and tree species in South America with Bioversity International, Colombia. From 2013 – 2017 he worked in Central America with Bioversity International, Costa Rica on conservation of plant genetic resources and in participatory research with farmers and forest communities for climate change adaptation, varietal selection, and seed testing. Maarten supported national institutions from Bolivia

and Peru in expanding their national Capsicum pepper collections, and in the screening and regeneration to strengthen these important and diverse collections. He has experience with the International Treaty and the Nagoya protocol. Maarten has a background in GIS and in diversity analysis to screen plant genetic resources

Standing Committee on Intellectual Property Rights & Biodiversity
Part 2: IPR online panel discussion: Barriers of UPOV 1991 Acceptance
Speaker's Biography & Abstract

Dr. Boonyanath Nathwong
Vice President
Thai Seed Trade Association (THASTA)

Biography

Dr. Boonyanath Nathwong currently the Director of Regulatory Affairs, Bayer CropScience, Thailand. A post – graduate in Plant Biotechnology from John Innes Centre, Norwich (UK), Dr. Boonyanath was a Researcher at the National Center for Genetic Engineering & Biotechnology (BIOTEC), Thailand, prior to her joining the seed industry. She is the Vice President of the Thai Seed Trade Association (THASTA) and an Executive Committee member of the Seed Association of Thailand. She is a member of the Secretary of the Seed Hub Executive Committee of the Ministry of Agriculture, Govt. of Thailand, as also of its Plant Variety Protection Committee and Sub – Committee for Strategy for 4 Economic Crops. Dr. Boonyanath earlier served on the Committee of Biosafety Guidelines Development & GM Food Risk Assessment Working Groups and the Institutional Biosafety Committee of Thammasat University and BIOTEC.

Dr. Gabriel Ortega Romero
Executive Director
Philippines Seed Industry Association (PSIA)

Biography

Dr. Gabriel Romero is the Executive Director of The Philippine Seed Industry Association (PSIA). Prior to that, he was the Senior Regulatory & Scientific Affairs Lead of Monsanto Philippines for 10 years. He also served as Genebank Manager, Director of Crop Biotechnology Center and Acting Deputy Executive Director for Research at the Philippine Rice Research Institute. He holds a Ph.D. in Genetics from University of California, Davis, USA, and a Master of Philosophy in Plant Breeding from the University of Cambridge, UK, and a BS in Biology from the University of the Philippines at Los Baños. Among his awards are The Outstanding Young Men (TOYM), Outstanding Young Scientist from the National Academy of Science and Technology, and Faces of Biotechnology from the Department of Agriculture.

Dr. Cui Yehan
Division Director, Division of PVP Examination
Ministry of Agriculture and Rural Affairs (MARA)

Biography

Dr. CUI Yehan obtained his Ph. D in crop physiology from Wye College, University of London (now part of the Imperial College). Currently he is Division Director of Plant Variety Protection (PVP), Development Center of Science and Technology, Ministry of Agriculture and Rural Affairs (MARA), P. R. China. Since 2019, he has been the Vice President, the Council of the UPOV.

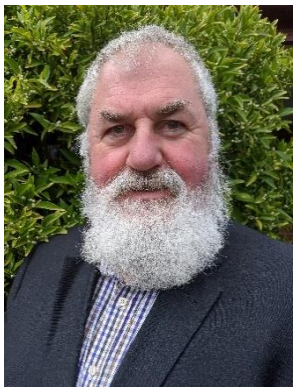
As a member of the founding team, Dr. Cui has intensive experiences related to PVP aspect in MARA, from its establishment to the development over 20 years. Beyond that, he dedicated a decade to develop food safety standard and quality assurance program in MARA of China.

Specifically, to PVP in China, Dr. Cui actively engaged in enhancement of the PVP legislation and its enforcement, as well as the improvement of PVP examination efficiency and quality assurance scheme in MARA. As principal PVP examiner, he is responsible for organizing the timely revision of PVP Regulations in China, aiming to be in line with the 1991 Act of the UPOV Convention. In addition, he organized several projects, involving related ministry agencies and provincial organizations, for example, elaborating technical examination guidelines by applying DNA fingerprint technology for plant species, aiming for EDV variety identification. Till to date, satisfied results were gained for main crops such as rice, maize etc. Furthermore, he shared his intensive knowledge in PVP with his counterparts in Asia for PVP promotion. Globally, he also attended activities among UPOV and non UPOV members, seeking cooperation opportunity within the UPOV Convention framework.

Abstract

Plant Variety Protection Development in P.R. China:

In China the PVP legal system was established in 1997. Two years later, China joined UPOV, the PVP Regulations was in conform with the 1978 Act of the UPOV Convention. Since then, the PVP Regulations has played significant roles to facilitate the plant breeding innovation and advanced seed industry development in China. From 2017 onwards, the annual PVP application received in China has ranked top one for the 3 consecutive years among UPOV members. With the further development of open-up policy and economic reform, the Chinese government determined and set higher goals on the IP protection, including the PVP in agriculture and forestry field. To fulfill more effective protection, the current PVP Regulations which was launched more than 20 years ago, need to be revised. The principal aim for its revision is to enhance PVP protection level and establish more strengthened protection system for innovation in plant breeding sector, such as introducing EDV related provisions, and extend breeder's right into the whole chain of seed and seedling production activities etc. Once revised, PVP legislation in China shall be upgraded, in line with the 1991 Act of the UPOV Convention.



Mr. Nik Hulse
Chief of Plant Breeder's Rights
IP Australia

Biography

Nik Hulse is the Chief of the Plant Breeders Rights (PBR) Office located in IP Australia, Canberra, the Government agency responsible for administering Intellectual Property in Australia.

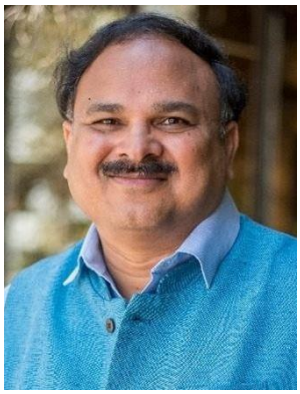
After completing his BSc at the Australian National University (ANU) in 1984, he joined the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's leading Government agency for scientific research, where he was involved in the breeding of new plant varieties, particularly wheat and oilseeds. During this time, he also completed his postgraduate studies in plant genetics through the ANU. In 1995 he joined the PBR Office as an Examiner and became Senior Examiner in 1996. He has examined field trials of over 600 new plant varieties throughout Australia. He has been an active participant in international plant breeding related meetings for many years, in particular, including meetings of the International Union for the Protection of New Varieties of Plants (UPOV). From 2012 to 2014 he was the chair of the UPOV Technical Working Party for Ornamental Plants and Forest Trees (TWO). From 2018 to 2020 he was the chair of the UPOV Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT) and the Vice-Chair of the UPOV Technical Committee. Currently he is the Chair of the UPOV Technical Committee.

Abstract

Experience of Australia in adopting UPOV 91: farm saved seed and end point royalties.

In 1987 Australia enacted the Plant Variety Rights Act, 1987 (PVR Act) to conform with the 1978 revision of the Convention of the International Union for the Protection of New Varieties of Plants (UPOV 78). In 1994 the PVR Act was replaced with the Plant Breeder's Rights Act, 1994 (PBR Act) to conform with the then recently revised 1991 version of the UPOV Convention (UPOV 91). Preceding the introduction of the PBR Act there was parliamentary debate but, generally, broad support for the new legislation from grower and breeder organisations. The Government's intention in moving to UPOV 91 conformity was to provide increased stimulus to innovation by encouraging investment in plant breeding and technology transfer, thus allowing access to new plant varieties. The new PBR Act included coverage for all plant species as well as changes to the scope and exceptions to the breeder's right. In particular, it included the farm saved seed (FSS) exemption. Initially there was some uncertainty as to the application of FSS and its limitations. However, high profile Court cases in the late 1990's helped to clarify some of the uncertainty around FSS and exhaustion of the breeders right. This led to the industry-driven system for collecting royalties known as end point royalties (EPR's). This system of royalty collection has transformed the way in which major crop varieties in Australia are managed to the benefit of both breeders and growers. The system of EPR's is very effective in Australia as it relies on relatively few collection points in the supply chain and a collaborative industry. The implementation of a similar royalty collection system in other UPOV member countries would depend on their particular circumstances. However, the Australian example shows how it is possible for breeders and growers to work together within contractual arrangements and within the UPOV 91 obligations in relation to FSS for their mutual benefit.

Special Interest Group on Field Crops
Speaker's Biography & Abstract



Dr. B.M. Prasanna
Director of Global Maize Program
International Maize and Wheat Improvement Center (CIMMYT) & CGIAR Research Program MAIZE

Biography

Prasanna is the Director of Global Maize Program at the International Maize and Wheat Improvement Center (CIMMYT) and also directs the CGIAR Research Program MAIZE. Prasanna has been leading CIMMYT's efforts, together with international and national partners, in tackling the challenges of Fall Armyworm in both Africa and Asia. He provides technical oversight for an array of multi-institutional projects on development and deployment of elite, stress resilient and nutritionally enriched maize varieties in the tropics of sub-Saharan Africa, Asia and Latin America, besides application of novel tools and technologies for enhancing genetic gains and breeding efficiency.

Abstract

Sustainable Management of Fall Armyworm in the Asia-Pacific: Need for Implementing a Well-Coordinated R&D Strategy

The Fall Armyworm (FAW; *Spodoptera frugiperda*) has emerged as a serious threat to the maize crops in both Africa and Asia. In Asia, the pest was first reported in India in mid-2018, and since then in several countries in the Asia-Pacific. The pest clearly poses a serious threat to millions of maize-based farming households, particularly when layered upon other drivers of food insecurity. Sustainable control of FAW requires an integrated pest management (IPM) strategy, including effective integration of host plant resistance, environmentally safer pesticides, biological control, agro-ecological management, and good agronomic practices. Multi-disciplinary and multi-institutional synergies are the need of the hour to develop, test, and urgently deploy science- and evidence-based IPM packages relevant for Asia's diverse agro-ecologies, socio-economic contexts, and maize value chains. On the host plant resistance front, CIMMYT has been implementing an intensive breeding program for identification of diverse sources of native genetic resistance to FAW. More than 6000 maize genotypes, including inbred lines and pre-commercial hybrids from CIMMYT, have been screened so far under FAW artificial infestation in screenhouses at Kiboko, Kenya, leading to identification and validation of promising inbred lines and pre-commercial hybrids. A set of first-generation FAW-tolerant CIMMYT maize hybrids will be announced for Africa by the end of 2020. CIMMYT is also intensifying its efforts on breeding for native genetic resistance to FAW in Asia. Among the FAW-endemic countries in Asia, Philippines and Vietnam are so far the only countries where *Bt* maize is under commercial cultivation. In both countries, *Bt* maize is reported to offer significant protection against the pest. Testing and deployment of *Bt* maize against FAW in other countries in the Asia-Pacific would require appropriate support from policy makers and regulatory authorities. In those countries where Bt maize has been already deployed, insect resistance management and proper stewardship would be critical for the transgenic technology to offer sustainable protection against the pest. Pyramiding transgenes with different modes of action (e.g., *Cry* + *Vip* genes) could be more effective and durable compared to single-gene deployment.

The core pillars of FAW R&D strategy should be: a) evidence-based decision making at the national, regional and continental levels; b) building sustainable local capacities to identify, develop, validate, and deploy appropriate technologies, practices, and approaches; c) private sector engagement to

increase efficiency, achieve scale, spur innovation, and support sustainable dissemination systems for IPM-based FAW control; and d) strategic coordination to leverage the capacities of partners across Asia-Pacific to facilitate rapid and efficient knowledge and technology development, demonstration and transfer. To maximize impact and efficiency, there is a strong need to identify short- and medium-term, high-priority actions to mitigate and manage the FAW threat, while rapidly mainstreaming the best practices and technologies at the national level.

Prof. Dr. Peng Hai
Director, Joint Molecular Biology Laboratory, Development Center for Science and Technology, Ministry of Agriculture and Rural Affairs (MARA) and Jianghan University

Biography

Dr. Hai Peng born in May, 1975. He is currently the executive vice-president of the Institute of Systems Biology of Jianghan University, a member of the working group of the National Committee for Standardization of Biochemical Detection, a part-time researcher at the National Key Laboratory of Hybrid Rice, Director of the Laboratory of the New Plant Variety Test Center of Ministry of Agriculture and Rural Affairs (MARA) during May 2018-May 2019. He is currently in charge of the "Hubie Provincial Center for Agro-biological Germplasm Gene Testing and Identification" and "Joint Laboratory for Plant Molecular Biology, Development Center for Science and Technology, MARA and Jianghan University", and the technical director of the Global Animal and Plant Resources Molecular Detection and Germplasm Health Laboratory. He invented novel DNA identification techniques which have the advantages of accuracy, efficiency, digitization, intelligence and localization. His novel technologies were widely used in plant, microbial and personal identification, were included in the main points of work of the Seed Industry Development Division of MARA in 2019, and were selected in the 2019 National White Paper on intellectual property Protection. His novel technologies support the scientific implementation of the national essentially derived variety system, the seed industry strategy of Hainan Free Trade Port and the protection clause of variety rights in seed Law. In the field of DNA identification, he has more than 20 authorized patents, published over 10 papers in NAR、PNAS and other journals, lead the developments of important national standards on DNA identification of plant varieties, GMO and pathogens.

Abstract

Existing plant variety DNA identification technologies and GMO identification technologies have obvious defects in accuracy, efficiency, digitization, intelligence and localization. We have originally developed MNP maker method and target region sequencing technology to identify plant varieties and GMO, respectively. The accuracy and detection efficiency of the invented technologies have been improved by hundreds of times, the detection results have been digitized, the result analysis has been networked and intelligent, and then the co-construction and sharing of variety DNA fingerprints of has been realized. Using our invented technologies, ordinary technical staff can precisely identify plant varieties and GMO in ordinary laboratories with simple experiment operations. Based on our invented technologies, we got 60 authorized patents, published technical papers on NAR journal, constructed DNA fingerprinting database of more than 10,000 Chinese authorized plant varieties, released national standard of "plant variety identification MNP marker method" (GB/T 38551-2020) which can identify the variety authenticity and essential derived variety (EDV) of 16 crop species, and released national standard of "Determination for ingredients of genetically modified plants—Target sequencing methods" (GB/T 38570-2020) which can identify all the GMO events derived from any know GMO elements in any plant species. The two national standards and variety DNA fingerprint database have

been widely applied in the DNA identification for plant variety breeding, quality control, authorization, anti-counterfeiting and rights protection.

Mr. Michael Quinn
Leader, Excellence in Breeding program
International Maize and Wheat Improvement Center (CIMMYT)

Biography
Michael leads EiB's overall strategy, partnerships and operations. He has extensive experience in the commercial development of germplasm through breeding and R&D management. Prior to EiB, Michael was principal wheat breeder and R&D manager for eastern Australia at InterGrain, Senior Wheat Breeder for eastern Australia at LongReach Plant Breeders, principal hybrid wheat breeder at Australian Grain Technologies, and durum wheat breeder at the University of Adelaide – Australia.

Abstract
Breeding innovations for genetic gains in farmer's fields.

CGIAR Excellence in Breeding (EiB) is accelerating the modernization of crop breeding programs targeting the developing world. We work to achieve a bold vision, which is that, "CGIAR-NAREs breeding networks generate rates of genetic gain ≥1.5% p.a. and that the average area weighted age of varieties in farmers' fields is <10 years." Drawing from innovations in the public and private sectors, EiB helps breeding programs meet this challenge through system-level coordination and holistic partnerships that include expert guidance, resources, shared service platforms, and access to cutting edge technologies and practices. As an R&D network, CGIAR provides germplasm indirectly to farmers through partnerships, and EiB has developed a model for effective CGIAR-NAREs breeding networks and for germplasm handover from breeding programs to seed sector partners. This model is built on ensuring joint decision-making with partners for final stage promotion of germplasm, and provision of high-quality performance data supporting confidence of investment in taking new varieties to market.

Special Interest Group on Vegetables & Ornamentals
Speaker's Biography & Abstract

Dr. Maarten van Zonneveld
Genebank Manager
World Vegetable Center

Biography

Maarten van Zonneveld (The Netherlands) joined WorldVeg in November 2017 to manage the Center's genebank operations. From 2006 – 2013 he worked on ex situ and in situ conservation and sustainable use of genetic resources of crops and tree species in South America with Bioversity International, Colombia. From 2013 – 2017 he worked in Central America with Bioversity International, Costa Rica on conservation of plant genetic resources and in participatory research with farmers and forest communities for climate change adaptation, varietal selection, and seed testing. Maarten supported national institutions from Bolivia and Peru in expanding their national Capsicum pepper collections, and in the screening and regeneration to strengthen these important and diverse collections. He has experience with the International Treaty and the Nagoya protocol. Maarten has a background in GIS and in diversity analysis to screen plant genetic resources.

Abstract

Conservation of vegetable biodiversity in South and Southeast Asia.

The diversity of vegetable landraces and wild vegetable varieties in South and Southeast Asia is declining at a rapid pace. Improved varieties and hybrids are spreading fast, benefitting farmers in terms of higher yields and better market prices. However, they replace existing local varieties, and the loss of this diversity affects current and future global food and nutrition security as plant traits will be lost that could be essential for current and future crop production and consumption under climate change and changing consumer demands. It is therefore important to rescue the remaining landraces and wild varieties, and conserve them ex situ before these vegetable genetic resources are completely lost, and make this germplasm accessible to a wide range of users including the public sector and the private sector consisting of small, medium-sized, and large seed companies.

Despite its importance in food production and people´s diets, the ex situ conservation of cucurbit crops in genebanks is poor compared with other vegetables crops of global importance such as tomato, cabbage, and vegetable legumes. For this reason, experts from the Crop Trust, World Vegetable Center (WorldVeg), national genebanks, Asia & Pacific Seed Association (APSA), Chia Tai, East-West Seed, Rijk Zwaan and other companies and organizations have identified cucurbit genetic resources as a global priority for vegetable germplasm conservation. Expert consultations organized by the Crop Trust and WorldVeg in 2019 resulted in a global strategy for the conservation of cucurbit genetic resources. This strategy emphasizes three principal points: i) the need for more collecting; ii) stable funding to safeguard these resources and make them available to the user community; and iii) a better collaboration between the private and public sector.

Dr. Benjamin Kilian
Senior Scientist and Project <anager
Crop Trust

Biography

Benjamin Kilian is a senior scientist and project manager and in charge of all pre-breeding projects supported by the Global Crop Diversity Trust (20 crops, 50 countries). Benjamin has a particular interest in exploring ways in which crop wild relatives can be utilized in breeding programs more effectively by better linking genebanks to breeders. Benjamin completed his PhD training at the Max Planck Institute for Plant Breeding Research, Cologne, Germany. He has led various research projects at the Leibniz Institute for Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany on genetics and genomics of plant genetic resources, especially in wheat and barley and their wild relatives. Subsequently, Benjamin worked in the private sector aiming at making beneficial alleles of CWR available to breeding. His scientific interest focuses on the domestication and use of agrobiodiversity, and the role it can play for sustainable development and food security.

Benjamin has published more than 100 peer-reviewed publications including research articles and book chapters.

Benjamin currently serves on the External Advisory Board of the European Union's Horizon 2020 research and innovation programme for both the Activated Genebank NeTwork (AGENT) and Intelligent Collections of Food Legumes Genetic Resources for European Agrofood Systems (INCREASE) projects. Since 2019, Benjamin has been the chair of the external advisory board of the Germplasm Resources Unit of the John Innes Centre, Norwich, UK. He also serves on the Advisory Board of PRIMA-GENDIBAR.

Abstract

Reaching back through the domestication bottleneck to feed a hot and crowded planet.

Crop wild relatives (CWR) represent a large pool of genetic diversity which can provide the beneficial allelic variation required in breeding programs. CWR have been extremely valuable in efforts to adapt crops to changing disease pressures, farming practices, market demands, and climatic conditions. Many obstacles, however, continue to hinder the increased use of CWR in breeding. By introducing the global initiative "Adapting Agriculture to Climate Change: Collecting, Protecting and Preparing Crop Wild Relatives" and drawing on its current achievements in pre-breeding, this presentation will highlight the potential role that CWR can play in modern crop breeding. This talk will provide examples on how wild species can contribute to the development of improved crop varieties and where efforts must be focused in order to harness their value in the future.

Ms. Merel Langens
Chair of ISF Systems Approach Working Group

Biography
Over 15 years' experience in the vegetable seed industry.
Global Manager Industry Affairs - BASF Vegetable Seeds. All technical issues affecting the movement of (treated) seed, such as phytosanitary matters, seed treatments and Quality Management Systems
Previous positions:
Manager Seed Technology, Global Head Operations Technology
Chair of the ISF Systems Approach Working Group
Country Lead of the International Seed Health Initiative (ISHI-Veg) for The Netherlands

Abstract
Systems Approach, an alternative option for phytosanitary certification.

The seed business is global, and import/export of seed is essential for global food production, as well as to facilitate breeding of new plant varieties and the production of seed. As processing and seed testing is frequently centralized and seed lots are supplied to many different countries over a period of many years, re-export of seed is common and frequent.

Seed trade is growing rapidly. At the same time many countries are defining new, not harmonized and more specific phytosanitary requirements for seeds. Risk avoidance is an important factor driving new regulations. The increase in trade as well as in phytosanitary requirements results in a high degree of complexity to move seed around the globe. Further, it increasingly strains the limited National Plant Protection Organization (NPPO) resources.

Seed is often seen as an important risk factor for the introduction and spread of pests. It is important to take into consideration that only for a limited number of pests, seed is a pathway. Many countries do have requirements for pests for which there is no scientific evidence that seed is a pathway under natural field conditions.

There is a need for simplification and harmonization of the current system to ship seed internationally. The seed industry proposes a system in which seeds produced in a NPPO-approved supply chain can be imported and (re-)exported with a phytosanitary certificate, without the specification of individual pests. In other words: a phytosanitary Systems Approach for Seed as an equivalent alternative to the current consignment by consignment certification of seeds.

The Systems Approach phytosanitary certification proposed by the industry incorporates elements found in the ISPMs as well as current production practices to meet the appropriate level of protection defined by importing countries.

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