Seed Quality
APSA teamed up with ISTA Vigour Committee, Thai Dept of Agriculture in Seminar & Workshop

IYPH 2020
Find out what’s going on in Asia-Pacific for the FAO’s International Year of Plant Health

2019 Asian Seed Congress Review
Proceedings of all the meetings, technical sessions of ASC in KL

Founding Father of APSA Passes
Remembering his legacy – the career of Dr. Kuldip R. Chopra

Kuldip R. Chopra
1933 – 2020
The International Seed Federation and the South African National Seed Organization warmly invite you to the ISF World Seed Congress 2020 in Cape Town, South Africa, from 8–10 June. Enjoy the generosity of our people, with the "I am, because we are" spirit of ubuntu against the unforgettable backdrop of the South African landscape.

www.worldseedcongress.com

Organizers
In this issue

9
Seed Quality Management
APSA teamed up with ISTA’s Seed Vigour Committee and Thailand’s Dept of Agriculture to organize a seminar, workshop in Bangkok.

14
International Year of Plant Health
This year, NPPOs all over the Asia-Pacific region are rallying to raise awareness about plant health, which starts with seed health.

17
ASC 2019 Report
Kuala Lumpur hosted the 26th Asian Seed Congress: a comprehensive review of all of the proceedings, meetings and technical sessions.

38
Mourning Light
One of APSA’s founding fathers recently passed away and is remembered by family and colleagues in this tribute to his work, life and contributions to the Asian seed industry.
Hope for the Best, Prepare for the Worst: Seed Resilience

Welcome to the first quarter issue of *Asian Seed and Planting Material*. I feel distinctly most reading this will agree the year thus far has kept us fully engaged with political and economic developments of regional and global significance.

In their relation to food, seeds are fundamental to security and global wellbeing – as the vulnerability of international supply chains to unanticipated disruption in 2020 makes plain.

Swift and secure seed movements across borders depend on intricate distribution networks, reliable data, and a transparent regulatory framework. So disruptions – whether arising from political crises, pandemic diseases or unfounded alarm — must be anticipated by contingency planning that takes into account worst-case scenarios.

I have been informed by some members that they are feeling the impact of restrictions on international business and travel arising from Covid-19; others have expressed concern over the future.

As president of APSA, whose mission is to ensure the supply of quality seed, I want to assure members we are closely monitoring the current crisis and how it might affect international trade.

APSA’s Executive Committee is in constant discussion about developing plans for dealing with the Covid-19 outbreak, the resulting restrictions on movements of people and commodities, and across-the-board plunge in trade and consumption.

As a result, the second Asian Cucurbits Round Table (ASRT 2), scheduled 21-23 July, has been postponed until next year. APSA’s Mid-Terms are still on for 2-3 April, however, and will be held via teleconferencing.

Presently regarding ASC 2020, we are in regular communication with representatives from both the China Seed Association and the China National Seed Trade Association.

They are optimistic in the near term, confident that measures undertaken by the government of China are showing positive results.

Meanwhile, the APSA Executive Committee is weighing information from various quarters for accuracy to ensure members’ and stakeholders’ interests are served.

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We have tentatively agreed to wait till the end of April before deciding how ASC 2020 will be arranged and final announcement will be made thereafter.

In the digital age, with news cycles traveling at hyperspeed, it is often difficult to sift rumor from fact. It is certainly no time for panic, still less for making rash, uninformed decisions.

Thus, at the EC, we will continue to hope for the best, but also be prepared for the worst. At this point, we shall continue business as usual to the extent possible – but cautiously, with our ears to the ground, alert to changes, day-by-day, week-by-week, in order to provide stakeholders with timely information.

Let me close this letter by noting that challenges come – and they go. So let’s keep calm, maintain our composure, make rational decisions, and stay flexible.

Resilience has defined our strength in the past, and will ensure our survival moving forward.
Creating Tomorrow Today

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TAKII SEED
Creating Tomorrow Today
First of all, on behalf of the APSA Secretariat and Executive Committee, I extend our deep condolences to Dr Chopra’s family for their loss. Dr Chopra was a founding member of APSA and throughout his life he was dedicated to improving the seed sector. Without his foundational efforts, APSA might never have been born – so for us, too, his passing is quite regrettable news. (Learn more of Dr Chopra’s achievements on page 37)

In this first Asian Seed issue of the year, we would like to introduce APSA’s Executive Committee members, including those elected at the last Annual General Meeting in November (see page 38). I do really believe that we can move forward together as a team to accomplish APSA’s mission – which is sustainable agriculture through production and trading of quality seeds for the world. We have also made some changes in the structure of our SIGs and SCs and aim to form the Working Group of Integrated Field Crop Companies this year.

Moving on to the seed sector’s main agenda presently, I urge all to join the FAO’s International Year of Plant Health initiative. Materials and communication guidelines shared by the FAO can be found on their website, and can be used to boost awareness of the need for clean seed production at your company. We are working on the PVP Laws in the Asia and Pacific Region report with our IPR and Biodiversity committee. In our first collaboration among APSA’s Working Group for Integrated Vegetable Companies (WIC), the International Seed Testing Association (ISTA) and Thailand’s Department of Agriculture, we recently conducted a seminar and workshop. (see page 10) In another collaboration, APSA SC International Trade and Quarantine and ISF’s Phytosanitary Committee are aligning comments to NPPOs for WTO notifications.

The SC ITQ committee is also planning activities to promote IYPH 2020 and the 6th Phytosanitary Expert Consultation, while collaborating with ASTA and Plantum to share views from a global perspective on the new draft Indian seed bill.

As all these new initiatives cannot, and should not, be done by APSA alone, we feel the need for working together to send the same message on our main seed industry agenda – thus I feel strongly that this year is one of partnership and collaboration.

We want also to show more initiative in sharing the great work done by breeders with consumers: so APSA and the World Vegetable Center were scheduled to host a session during the Micronutrient Forum. Unfortunately, the conference has been postponed due to Covid-19 concerns. When those abate, we will keep members updated on the outcome of this new and exciting collaboration.

I must end this letter with a big “Thank You!” to our members, who have continually supported the core mission of APSA. I think we have already received a good percentage of membership renewals this year.

We hope to meet all of you again at the AGM this year during Congress 2020.

Concerning the latter, we do really take member concerns in this regard seriously, so please do not hesitate to send yours directly to me.

The APSA Secretariat and EC members are currently reviewing all possible options to make sure we can again host Congress successfully this year.

Dates and venue will be officially confirmed by early May: thus registration is delayed till June, 2020 to ensure clarity regarding Congress' organization.
New Year Greetings from the APSA Secretariat

APSA’s team, led by Executive Director Dr. Kanokwan Chodchoey (3rd right), presents a New Year basket to Dr. Chongrak Wachirrat, Acting President of Kasetsart University (3rd left); also with: APSA Event Manager Mike Kingpayom (1st left); APSA Membership Coordination Manager Komsak Kaming (2nd left); APSA Administrative Office Manager Weeranuch Mhadlhoo (2nd right) and APSA Technical Coordination Manager, Kunaporn Phuntunil (1st right).

APSA team present an APSA Calendar to Dr Sermsuk Salakpetch, Director-General of Thailand Department of Agriculture.

APSA team present New Year basket to Mr. Tawee Maskhao, Deputy Director-General of Thailand Department of Agricultural Extension.

APSA team present a New Year basket to World Vegetable Center’s Dr. Pepijn Schreinemachers (left) and Delphine Larrousse (2nd left).

APSA team present a New Year basket to reps of Thailand’s National Science and Technology Development Agency (NSTDA) and the National Center for Genetic Engineering and Biotechnology BIOTEC-NSTDA, here represented by Dr. Channarong Seepiban (2nd left), Dr Oraprapai Gajanandana (3rd left) and Miss Sasiwimon Boonanunt (3rd right).

APSA team present a New Year basket to Dr. Juadee Pongmaneerat, Secretary General of Thailand National Bureau of Agricultural Commodity and Food Standards.

APSA team present a New Year basket to Mr. Sudsakorn Pattarakulnit, Director-General of Thailand Rice Department.
Seed Trade Blooms as Demand Booms

Figures analyzed by APSA show that in 2018* more than US$4.14 billion worth of sowing seed was traded to or from countries in the APSA region (East, Central, West, South and Southeast Asia; Oceania; the South Pacific) constituting 13.19% of global seed exports, and 19.83% of imports – worth US$11.67bn and US$13.12bn, respectively.

Hence APSA’s US$4.1 billion share of the international sowing seed trade represents roughly 16.7% of the US$24.8bn WTO market.

That figure represents trade in seed for forage, field, vegetable and ornamental crops reported by World Trade Organization (WTO) countries, and logged by the International Trade Commission. Trade in seed potato, seed for various spices, oil seeds and oleaginous fruits is not included. (See end notes)


International trade in sowing seed grew in 2018, with APSA country exports increasing year-on-year by 4.8% and imports up 6%, while averages for all WTO countries were up 7.2% and 3.7% respectively.

Top APSA Exporters
Surpassing China as the region’s top seed exporter in 2018 was India, with exports of US$284.3 million – 18.4% of APSA seed exports and about 2.4% of the WTO total. Exceptional growth was recorded in maize seed (+69% to US$69.1mn) and unhusked paddy (+47% to US$91.1mn).

Second-place China saw year-on-year export increases, by 8.3% to US$215.5mn – taking 1.85% of global, and 14% of APSA, market share. Thailand ran third with exports worth US$195.7mn (1.6% world, 12.7% APSA); followed by Israel (US$156.5mn), New Zealand (US$135.7mn), Japan (US$115.7mn) and Australia (US$99.6mn).

Top APSA Importers
Chinese sowing seed imports totaled US$477.9mn in 2018 (by far the most in APSA), a 15% y-o-y increase over 2017. Second was ASC 2019 hosts, Malaysia, logging US$384.2 mn – a 22% jump; then Japan (US$235.3mn), Pakistan (US$201.9mn), Turkey (US$172mn), South Korea (US$168mn) and India (US$121.4mn).

APSA Growth Markets
Several countries logged substantial export growth in 2018 over 2017: the Philippines (55%), Pakistan (51%), India (45%), Turkey (36%), Jordan (32%), Georgia (28%) and Indonesia (21%). The highest increase occurred in Kyrgyzstan, an explosive y-o-y jump of 364%; the Central Asian nation’s overall export value nonetheless trails most other APSA...
<table>
<thead>
<tr>
<th>Country / Territory</th>
<th>2018 Seed Trade Balance (US$ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exports</td>
</tr>
<tr>
<td>Thailand</td>
<td>195.71</td>
</tr>
<tr>
<td>India</td>
<td>284.30</td>
</tr>
<tr>
<td>Israel</td>
<td>156.52</td>
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<tr>
<td>New Zealand</td>
<td>135.76</td>
</tr>
<tr>
<td>Singapore</td>
<td>11.69</td>
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<tr>
<td>Hong Kong</td>
<td>56.83</td>
</tr>
<tr>
<td>Indonesia</td>
<td>15.50</td>
</tr>
<tr>
<td>Chinese Taipei</td>
<td>28.65</td>
</tr>
<tr>
<td>Georgia</td>
<td>2.09</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>0.36</td>
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<tr>
<td>Kazakhstan</td>
<td>18.46</td>
</tr>
<tr>
<td>Jordan</td>
<td>10.84</td>
</tr>
<tr>
<td>UAE</td>
<td>4.42</td>
</tr>
<tr>
<td>Australia</td>
<td>99.63</td>
</tr>
<tr>
<td>Myanmar*</td>
<td>7.07</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>20.53</td>
</tr>
<tr>
<td>Turkey</td>
<td>82.69</td>
</tr>
<tr>
<td>Philippines</td>
<td>12.69</td>
</tr>
<tr>
<td>Iran</td>
<td>2.50</td>
</tr>
<tr>
<td>South Korea</td>
<td>51.38</td>
</tr>
<tr>
<td>Japan</td>
<td>115.76</td>
</tr>
<tr>
<td>Pakistan**</td>
<td>3.03</td>
</tr>
<tr>
<td>China</td>
<td>215.50</td>
</tr>
<tr>
<td>Malaysia***</td>
<td>7.01</td>
</tr>
<tr>
<td>Other APSA Countries</td>
<td>0.15</td>
</tr>
<tr>
<td>All APSA Countries</td>
<td>1,539.08</td>
</tr>
</tbody>
</table>

* Myanmar figures shown do not include data reported for exported maize sowing seed and exported rough paddy, which could not be verified
** Pakistan figures shown do not include data reported for imported soya sowing seed and exported rough paddy, which could not be verified
*** Malaysia figures shown do not include data reported for imported soya sowing seed, which could not be verified

Leading import growth was the Philippines (up 69.5%), followed by Myanmar (47%), Malaysia (22%), Pakistan (20%), Hong Kong (18.8%) and Israel (18.7%).

**APSA Trade Balance**

Among APSA countries with positive seed trade balances, seven were notable: Thailand (US$163.9mn), India (US$162.8mn), Israel (US$107.9mn), New Zealand (US$31.6mn), Singapore (US$5.6mn), Hong Kong (US$3.9mn) and Indonesia (US$2.38mn). Most APSA countries depend on inbound seed for domestic crops and re-export. Meanwhile demand grows, not only in terms of quantity, but especially for quality seed – lending urgency to the drive for cooperation in overcoming such challenges as climate volatility, spreading pests, and uncertain geopolitical factors.

NB: Reported figures cover vegetable, ornamental and forage seed (traded using the HS code prefix of 1209...); maize (100510); rough paddy (100610); cotton (120721); soybean (120110); and two types of wheat – durum (100111) and meslin (100191).

Not counted are seed potatoes, seeds of tobacco, herbs, spices or oleaginous fruits and plants, such as palm, melon or hemp. Also omitted are maize seed and rough paddy exports from Myanmar; rough paddy from Pakistan; and soya bean seed imports to Pakistan and Malaysia, as data for these could not be verified via reciprocal mirror data from partner countries.

APSA is in the process of compiling trade data from 2019 and will report on the latest trends in Q2 or Q3. For details contact Steven@apsaseed.org
Held 17 - 18 February in Bangkok, the 2020 Seed Quality Management (SQM) Seminar, organized by the Asia and Pacific Seed Association (APSA) and International Seed Testing Association (ISTA), was joined by some 100 participants representing more than 40 organizations from 14 countries: Thailand, the Philippines, Hong Kong, China, South Korea, Japan, Australia, Bangladesh, India, Sri Lanka, Pakistan, France, the UK and the US.

SQM was followed by the 2020 Seed Vigour Testing Workshop, 19 - 21 February.

Seminar participants represented seed testing laboratories; corporate Quality Assurance, supply chain, inventory and marketing departments; government agencies and research institutes.

Thailand Department of Agriculture Director-General Dr Surmsuk Salakpetch and APSA Vice President Mr Wichai Laocharoenpornkul presided. Both emphasized the importance of seed quality standards.

“We are pleased to welcome all of you here concerned with seed quality management, and those of you who know how important it is to deliver quality seeds to farmers,” said Mr. Wichai. “This is in fact the first time APSA and ISTA are collaborating to co-organize this type of capacity-building workshop.”

The Department of Agriculture’s Dr. Surmsuk affirmed that capacity-building in seed quality management aligns with the Thai government’s strategy to develop a regional seed hub. She said international seed testing methods, protocol and certification standards would drive seed sector development: “Without quality seeds, our breeders and farmers cannot produce” in sufficient quantity and quality.

She then defined the latter: “Quality seed is a term we hear often, but what does it mean? For technical and commercial people, there are specific, quantifiable and measurable parameters, such as germination rate, moisture content, physical purity, shelf life, seed health and seed vigour.”

The ensuing two days featured a dozen presentations and interactive round table discussions with eight seed quality experts. Four from ISTA’s Seed Vigour Committee (ISVC) focused on technical and laboratory aspects:

- Dr Alison A. Powell (ISVC Chair and lecturer at the University of Aberdeen)
- Mrs Marie-Helene Wagner (ISVC Co-chair and GEVES-SNES researcher in France)
- Mr Tim Loeffler (ISVC member from Bayer Crop Science in the US)
- Dr Stan Matthews (ISVC member and lecturer at the University of Aberdeen)

Commercial, research and marketing discussions were led by:

- Dr Malavika Dadlani (former Joint Director of Research and Head, Division of Seed Science and Technology, Indian Agricultural Research Institute, New Delhi)
- Dr Rob Pronk (Global Marketing Manager, INCOTEC)

Both emphasized the importance of seed quality standards.
and Seed Vigour Testing Workshop

Group BV)  
• Dr Sumitra Kantrong  
(Chiatai Seeds, and Chair of  
APSA’s Working Group of  
Integrated Vegetable Seed  
Companies)  
• Dr Kanokwan Chodchoey  
(APSA Executive Director)

Following the seminar’s conclusion, the four ISVC reps led the 2020 Vigour Testing Workshop for about 40 participants, hosted at the Seed Testing Laboratory and Certification building, part of the Department of Agriculture’s Seed Research & Development Division, near Kasetsart University in Bangkok.

Director of Thailand’s Seed Research and Development Division, Ms. Chuntana Kongnakhon noted that her facility conducts the four main seed tests: viability (the standard germination or tetrazolium test); moisture content; physical purity; and seed vigour.

Workshop participants then got practical hands-on experience sampling, testing and analyzing various field crop and vegetable seed samples using the four common Vigour Testing methods:

• Accelerated Aging (AA)  
• Radicle Emergence (RE)  
• Controlled Deterioration (CD)  
• Electrical Conductivity (EC)

ISVC Chair Dr. Alison Powell later noted that participants had many “interesting comments, insights and ideas”, adding, “I’ve never seen discussion groups go so well. They really interacted.” For example, there was talk about implementing vigour testing within molecular breeding R&D and within participants’ own production lines. “Overall this went well,” she said, “and I look forward to future collaborations between ISTA and APSA.”

Event presentations are available in digital format on APSA’s website, exclusively for seminar and workshop participants, at present. They will be made available for APSA members at a later date. Please email kuna@apsaseed.org for access or more information.
The meeting, which is the annual flagship event of the National Seed Association of India, featured a number of lively technical sessions to promote dialogue, discussion and discourse on how to best develop and strengthen the Indian seed sector. Various common topics were covered, including Farmers and Breeders Rights; varietal development and innovation, seed certification and registration systems and all related regulations and laws outstanding, including a status update of the 2019 Draft Seed Bill.

A number of noteworthy highlights drew national press coverage. Namely, Uttar Pradesh State Agriculture Minister Surya Pratap Shahi revealed plans at the Congress to create special seed zones across his state to make quality seeds available to farmers; moreover, Agriculture Minister Narendra Singh Tomar promised to prioritize the fast-track of seed certification and export applications; and the NSAI President pushed for government stimulus and for establishing seed hubs across all of India’s agro-climatic zones.

Another hot topic addressed was the status and update of the 2019 Draft Seed Bill, as Union Minister for Agriculture of India pledged all possible support to help the seed industry to grow.

Five technical sessions were held on 16 and 17 February as follows:

The opening session on February 16 afternoon, titled “Progress in innovation for harnessing Genetic Gains for Plant variety improvement”, was chaired by Dr Kuldeep Singh, Director, and National Bureau of Plant Genetic Resources (NBPGR).

The second session, also on February 16, “Trends in seed industry: Potential Drivers for profitable agriculture” was chaired by Dr S K Malhotra, Agriculture Commissioner, MoAF, Govt of India

The third session, held on February 17 morning, “Key enablers for the growth of seed business” was chaired by Dr VK Gaur, the Chairman and Managing Director of India’s National Seeds Corporation

The fourth session, held on February 17 afternoon, “Seed quality regulation and IPR regime in India” was chaired by Dr KV Prabhu, Chairperson at the Protection of Plant Varieties and Farmers’ Rights Authority, Govt. of India; and co-chaired by Dr D K Yadava, Assistant Director General (Seeds), ICAR.

The fifth and final session of the Congress was NSAI’s CEO forum, which brought together 10 panelists to deliberate on the topic of “Envisioning Indian seed industry in the next decade: Priorities for shaping an action agenda”. It was chaired by Shri S K Pattanayak, Director General, ASCI, Hyderabad/ Joint Secretary (Seeds), MoAF, Govt of India.

The NSAI is working on a comprehensive report of the proceedings. For more information, visit nsai.co.in/isc2020/
Introducing China’s Credit Key Companies – Tops in Chinese Seed

As credit is the life-blood of business the Chinese Seed Association has, since 2011, introduced a system whereby seed entrepreneurs and established firms can construct a reliable credit rating to be referenced by investors, banks and farmers alike. These credit ratings cover in their assessment comprehensive quality, competitiveness, management, credit records, and finance; while comprehending along the way corporate culture; quality controls; random inspections; corporate honor – transaction and credit records of companies and their senior managers; quality inspection records; evaluation by industry professionals; consumer records; and social responsibility records.

According to the CSA, the two most important determiners are credit records and finance, accounting for 34% and 25%, respectively, of the total score. Assessments are performed according to a “transparent, standardized format, and thus the credit status accorded such seed enterprises is established in a scientific manner”. Moreover, preliminary examinations and recommendations from provincial seed associations, seed control stations, and bureaus are prerequisites to the provincial seed associations, seed control examinations and recommendations from scientific manner”. Moreover, preliminary examinations and recommendations from provincial seed associations, seed control stations, and bureaus are prerequisites to the CSA examination, evaluation and credit rating. Review boards comprise financial and seed industry professionals.

The aim is a reliable credit score for each enterprise and the results are not dissimilar to those of firms serving the broader investment market such as Moody’s, Standard and Poor’s or Fitch. CSA ratings are considered a “brand activity” in China, and are widely consulted.

Evaluations are carried out annually, and valid for three years. Firms are scored thus: A, AA and AAA – the latter being best.

Credit Companies, Credit Key Companies and Credit Star Companies

Rated firms are distinguished as “credit companies”, “vegetable credit key companies”, “credit key companies”, and “credit star companies” in Chinese terminology, with the key companies all having AAA ratings, and the star companies considered the “Top Ten” among the latter. So, while all credit stars are credit keys, not all credit keys are credit stars; similarly, all credit keys are credit companies but only a few credit companies are accorded the coveted credit key status.

Here it must be observed that all credit companies -- whether stars, keys, or not -- are firms granted official seed production and operating licenses.

790 companies had been evaluated by the end of 2019, with 360 presently accredited according to the following breakdown: AAA, 117 firms; AA, 165; A, 78. Together they account for about 70% of China’s seed trade.

Rated firms fall into two categories: “credit key companies” produce seed only for field crops, while “vegetable credit key companies” produce only vegetable seed. More than 200 companies applied for “credit key” status, while 60 applied for the vegetable “credit key”. 57 seed companies successfully achieved the former, and 20 the latter.

Below, we present two lists, the Credit Star Top Ten and the top ten Vegetable Seed Credit Key Companies. Note that while all Credit Star companies are AAA rated, the Vegetable Seed Credit Key Companies are not, as rating criteria for the two groups differ; they are nonetheless considered the “strongest” firms in the vegetable seed sector.

For the full list of companies, visit aspaseed.org/news/china-seed-industry-2020/

The top ten credit key companies

<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name (Chinese)</th>
<th>Company Name (Chinese)</th>
<th>Company Website</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yuan Longping High-tech Agriculture Co., Ltd.</td>
<td>袁隆平农业高科技股份有限公司</td>
<td><a href="http://www.ipht.com.cn/">http://www.ipht.com.cn/</a></td>
<td>AAA</td>
</tr>
<tr>
<td>2</td>
<td>Beidahuang Kenfeng Seed Co., Ltd.</td>
<td>北大荒垦丰种业股份有限公司</td>
<td><a href="http://www.kenfeng.com.cn/">http://www.kenfeng.com.cn/</a></td>
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<td>3</td>
<td>Shandong Denghai Seeds Co., Ltd.</td>
<td>山东登海种业股份有限公司</td>
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<td>4</td>
<td>Jiangsu Dahua Seed Enterprise Co., Ltd.</td>
<td>江苏省大华种业集团有限公司</td>
<td><a href="http://www.31dth.com/">http://www.31dth.com/</a></td>
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<tr>
<td>5</td>
<td>Winall Hi-tech seed Co., Ltd.</td>
<td>安徽华农高科技种业股份有限公司</td>
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<td>Chana National Seed Group Co., Ltd.</td>
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<td>7</td>
<td>Liaoning Dongya Seed Limited Company</td>
<td>辽宁东亚种业有限公司</td>
<td><a href="http://www.fuyouseeds.cn/">http://www.fuyouseeds.cn/</a></td>
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<td>8</td>
<td>Beijing Lantron Seed Co., Ltd.</td>
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<td>9</td>
<td>Beijing Kings Nower Seed Science and Technology Co., Ltd.</td>
<td>北京金色农华种业科技股份有限公司</td>
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<td>10</td>
<td>Join Hope Seeds Co., Ltd.</td>
<td>九丰禾业种业股份有限公司</td>
<td><a href="http://www.jiuheseed.com/">http://www.jiuheseed.com/</a></td>
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The top ten vegetable credit key companies

<table>
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<tr>
<th>No.</th>
<th>Company Name (Chinese)</th>
<th>Company Name (Chinese)</th>
<th>Company Website</th>
<th>Rating</th>
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<tr>
<td>1</td>
<td>Guangdong Provincial Improved Variety Introduce Service Corp.</td>
<td>广东省良种引进服务公司</td>
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<td>2</td>
<td>Known You Seed(China)Co., Ltd.</td>
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<td>宁波微萌种业有限公司</td>
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<td>京研益农 (北京) 种业科技有限公司</td>
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<td>青岛金妈妈农业科技有限公司</td>
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Welcome to 2020, the International Year of Plant Health 2020

According to the Food and Agricultural Organization of the United Nations (FAO) some 40% of food crops are destroyed yearly by pests and disease. Thus, to highlight the significance of plant health to global food security, the FAO declared 2020 the International Year of Plant Health. The official launch was held 2nd December at FAO headquarters in Rome, where, in his opening remarks, East Asia’s first FAO Director-General Mr Qu Dongyu noted that: “Plants... are the single most important pillar of human nutrition,” adding that, “healthy plants are not something we can take for granted.”

He also observed that climate volatility and human activities pose new and urgent challenges. “Plant health is increasingly under threat,” he said. The FAO chief pointed out that ensuring plant health worldwide is critical and called on all to contribute.

UN Secretary General Mr António Guterres echoed his sentiments: “This International Year, and throughout this Decade of Action,” he urged, “let us dedicate the necessary resources and increase our commitment to plant health. Let us act for people and planet,” meanwhile promoting the UN’s 17 Sustainable Development Goals. The IYPH is considered key to reaching the organization’s 2030 Agenda for Sustainable Development.

The IYPH slogan is “protecting plants, protecting life” and it is hoped all partners will join the FAO and International Plant Protection Convention (IPPC), sharing best practices and working hand-in-hand to make it a success.

IPPC Secretary Mr Jingyuan Xia in his closing remarks described major activities slated for 2020. A panel discussion on plant health at FAO’s headquarters ensued thereafter. To engage the general public, the FAO launched a photo contest with amateur and professional photographers sharing photos of healthy and unhealthy plants.

In the APSA region, various initiatives are underway. During the 5th Expert Consultation for Phytosanitary Measures in August, 2019, representatives from National Plant Protection Organizations (NPPO) highlighted some of these initiatives. The following list is not exhaustive:

- **Australia**: Plant Health Australia (PHA) is hosting a Website focused on IYPH activities there, with content approved by the Australian IYPH steering committee. Publicity is the aim, and a Lego-construction farmer the mascot – the latter designed to reflect farmers everywhere while catching the attention of national political leaders, entertainment and news organs.

- **China**: The China National Seed Trade Association (CNSTA) last November hosted the “Special Forum on Plant Health and Variety Protection” at the Harbin Seed Congress. To continue to raise awareness about Plant Health this year, the Chinese government is making educational cartoons, while the Chinese NPPO has devised a “total working plan” for IYPH2020. Furthermore, the government has granted US$100,000 to the IPPC.

- **India**: India has organized a number of plant health focused events such as the XIXth International Plant Protection Congress at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Hyderbad, November 10th - 14th in 2019; 7th International Conference on Phytopathology in Achieving UN Sustainable Development Goals held on January 16th - 20th in New Delhi by the Indian Phytopathological Society (IPS); International Conference on Virology (Virocon 2020) on Evolution of Viruses and Viral Diseases is being held from 18-20 February, 2020. In addition, professional organizations involved in plant protection – such as those related to entomology, plant pathology, virology, nematology, weeds etc – are organizing relevant seminars and conferences.

- **Myanmar** is pushing plant health in a changing climate, noting that the Fall Armyworm devastation may be considered an early warning of what could come if general insouciance persists. Another theme related to plant health this year concerns healthy seeds for safe consumption across the whole supply chain or “Healthy Plants for Healthy Humans”. Finally, Myanmar is bringing out mobile plant protection apps under the heading Technological Advances for Plant Health.

- **The Philippines**: A seminar for students on plant health was held in November 25-26, 2019, and a Bubble Run organized in February, in line with the celebration commemorating the 90th Anniversary of the Bureau of Plant Industry (BPI). Promotional videos and other materials are being distributed during trainings and seminars throughout the year.

- **Nepal**: Seed health is the theme during and the NPPO has allocated funding to undertake IYPH events. Those include: organizing a workshop and televised discussion; publishing articles and making videos for dissemination throughout the mass communications network; holding a rally; an address by the Minister of Agriculture; an awareness campaign; hoardings; and plant clinics.

The FAO notes that protecting plants from pests and diseases is more cost effective than treatment; pests and disease are often impossible to eradicate once established. Preventing their spread can save governments, farmers and businesses billions while ensuring access to quality food and limiting impact on ecosystems. Prevention also facilitates trade and market access for developing nations.

To that end both the IPPC and the FAO stress the importance of adhering to harmonized international phytosanitary regulations and standards, of adopting environmentally friendly integrated pest management techniques, and empowering plant protection organizations with expanded human and financial resources. The latter including greater investment in plant-health related research, outreach, strategic partnerships and collaborative action.
some 120 quality-control, production and lab managers from a dozen Thailand-based seed production companies participated in a workshop December 12 on diagnostics, testing and sampling for Tomato brown rugose fruit virus (ToBRFV).

The Workshop, titled “Surveillance measures of ToBRFV on tomato and pepper seeds in Thailand”, was held at the Charoen Thani Hotel, Khon Kaen, in Thailand’s Northeastern region.

Organized jointly by APSA and the Thai Seed Trade Association (THASTA), it was held in collaboration with Thailand’s Department of Agriculture (DoA) and the National Science and Technology Development Agency (NSTDA).

In recent months, testing for pospiviroids and tobamoviruses is mandatory for exporters of pepper and tomato seed because – as we recently reported – the National Plant Protection Organizations (NPPOs) of the EU and the US introduced new phytosanitary requirements in November 2019 for imports thereof.

The EU requirements came after Germany and Italy reported outbreaks on tomato crops in 2018. An Italian pest risk analysis showed the organisms Solanum lycopersicum L. and Capsicum annum were “of significant plant health concern to the EU.” The new requirements effectively end field testing and mandate “ToBRFV-free passports” for movements of pepper and tomato seed originating within the EU.

In the US, testing by the US Animal and Plant Health Inspection Service (APHIS) detected six pospiviroids of quarantine significance: Columnea latent viroid (CLVd), Pepper chat fruit viroid (PCFVd), Potato spindle tuber viroid (PSTVd), Tomato apical stunt viroid (TASVd), Tomato chlorotic dwarf viroid (TCDVd) and Tomato planta macho viroid (TPMVd; synonym Mexican papita viroid).

“As a result of this import requirement,” reads an APHIS notice, “tomato and pepper seeds are no longer eligible for importation using a small-lots-of-seed permit.” No exceptions are listed.

In turn, all seed shipments to the EU must be tested and certified free from ToBRFV, while those to the US must be free from pospiviroids and ToBRFV.

“It is very important for seed production companies to be aware of the latest testing methods and phytosanitary certificate requirements,” said APSA Executive Director, Dr. Kanokwan Chodchoey.

APSA collaborates via the private-public-partnership platform with government and academic stakeholders to develop educational and capacity-building opportunities for members of the private sector.

The ToBRFV workshop was an example.

It opened with remarks by Vice President of THASTA Dr Boonyanath Nathwong, who welcomed participants, noting that the main focus was to ensure seed companies in Thailand understand the new requirements and are prepared to comply so that impact on trade is minimal.

Next, APSA Executive Director Dr. Kanokwan Chodchoey presented an overview of international seed trade trends related to phytosanitary measures, challenges and opportunities. She explained the advantages of the Global Systems Approach to Phytosanitary Clearance for International Seed Movement.

From the DoA’s Plant Protection Research and Development Office, Ms Preyapan Pongsapich reviewed the Tomato brown rugose fruit virus (ToBarnovirus, ToBRFV), its history and the latest rules and regulations, outlining respective sampling and testing protocol at her office.

This was followed by a talk on production plot care and pest management principles and guidelines by Thai Seed Trade Association and APSA Executive Committee member Dr. Sumitra Kantrong.

Assoc. Prof. Dr. Petcharat Thummabenchapone of Khon Kaen University’s Plant Science and Agricultural Resources Plant Pathology Section reviewed steps in carrying out seed production plot inspections and collecting samples for testing.

Building on that. Ms Wanpen Srichart, from the DoA’s Plant Protection Research and Development Office, gave a talk on preparing equipment for plot-testing officials. Finally, from the same DoA office, Ms Wasana Rungsawang detailed the steps in testing for ToBRFV and related viroids required for export certification.
Invasive pest attacks are the bane of agriculture around the world; not only do they hinder production potential, but they threaten income, livelihood, food security and agriculture sustainability.

Pertaining to the continued invasiveness of such pests in the tropical and sub-tropical areas of Asia and Africa, the UN declared 2020 as the International Year of Plant Health. Correspondingly, Indian fields, already infested by invasive pest eight times in the past 15 years, again saw the arrival of Fall armyworm in 2019. A highly invasive pest with substantial appetite, it landed first in Karnataka and quickly became a nationwide nuisance. Before the Government of India woke up to the dangers of the dreaded pest, the South Asia Biotechnology Centre (SABC), a not-for-profit organization, launched a massive Project SAFFAL – Safeguarding Agriculture & Farmers against Fall Armyworm, a multi-year project supported by FMC Corporation. Project SAFFAL aims at safeguarding agriculture and farmers against FAW in India, incorporating efforts in alignment with 2020 International Year of Plant Health.

As FAW threatens the already ascending production graph of maize in India, the project was thus implemented in collaboration with critical stakeholders from agricultural value chains who face a potential threat from FAW. Following notification of FAW landing in Karnataka and its consecutive spread to neighbouring Telangana, Andhra Pradesh and Tamil Nadu, SABC immediately undertook field surveys. Varying degrees of infestation of the pest in all maize-growing areas of Karnataka, Maharashtra, Madhya Pradesh, Andhra Pradesh, Southern Rajasthan, Chhattisgarh, Gujarat, Tamil Nadu, Bihar, Bengal and Andhra Pradesh were noticed. Realizing the potential of spread, Project SAFFAL catalyzed the mobilization of key stakeholders to work together with farmers, the scientific community, SAUs and governments at Centre and States. Through the address of the knowledge gap, an array of information about FAW was dispersed via farm demonstrations in collaboration with both public and private sector institutions. The IPM package of practices recommended by the Ministry of Agriculture and Farmers’ Welfare was also showcased to build capacity and skills of smallholder farmers for countering the pest.

Such information dispersal entailed organization of 15 massive farmers’ campaigns across 11 major maize growing areas in India. And the campaign spree continues in other states and regions focused on maize cultivation. The insightful campaigns were complemented with educational posters on the pest life cycle, and IPM practices translated in local languages like Kannada, Marathi, Tamil, Telugu, Hindi, Bengali and Gujarati. By distributing over a hundred thousand posters & pest monitoring kits such as pheromone traps and lures, the project raised awareness on the pest and its management among the smallholder farmers, extension workers, officials, agri-students, local journalists, researchers, dealers of agriculture inputs and NGOs.

To further strengthen the aim and objectives of Project SAFFAL, intense support from government functionaries remains strong. One of the challenges identified is the need to either subsidize or exempt the IPM inputs such as pheromone traps and lures, safety kit (PPE), botanicals, biologicals and safer agriculture pesticides from the Goods & Services Tax (GST) regime. Currently, such inputs promoting the cause of organic farming are placed under 18 % GST. Even the extension material like the awareness posters, placards, hoardings campaign bear the GST taxes. Moreover, the new chemicals such as chlororantraniliprole & spinetoram and other combinations like cytantraniliprole + thiamethoxam, which are known for their safety, should also be registered on priority so that compulsory seed treatment can be advocated without any loss of time. Simultaneously the Department of Agriculture must ensure the availability of good quality botanicals and biologicals already proved to be effective on the similar species of FAW. Conclusively, the concerted efforts empowered through intelligent private and public collaborations assume a significant role in empowering the humble Indian farmers. Thus, the Indian experience of dealing with the Fall Armyworm is an example worth replicating in neighbouring South & Southeast Asian countries suffering from the FAW invasion. To protect maize from FAW, adhere to the goals of the International Year of Plant Health, a lot has been done and a lot more awaits in the future.

Beware of the Fall Armyworm...before it is too late

by Bhagirath Choudhary & Yashika Kapoor; South Asia Biotechnology Centre (SABC), New Delhi, India
ASC celebrates 26 Years

Organized jointly by the Asia and Pacific Seed Alliance (APSA) and the National Seed Association Malaysia (NSAM), last November’s 26th Asian Seed Congress in Kuala Lumpur, Malaysia was attended by some 1,500 delegates from over 50 nations — making it the largest ASC ever. The region’s premier seed industry meeting, comprising APSA members and delegates from Malaysian organizations, was held 25 – 29 November at the Kuala Lumpur Convention Centre (KLCC).

Steering the National Organizing Committee was NSAM in partnership with Malaysia’s Department of Agriculture (DoA), the Malaysian Agricultural Research and Development Institute (MARDI) and Universiti Putra Malaysia (UPM), with support from the Ministry of Agriculture and Agro-Based Industry, the Ministry of Tourism Malaysia and the Malaysia Convention and Exhibition Bureau.

The ASC, open only to members or by invitation, comprises business meetings, trade exhibition, technical sessions, entertainment and APSA’s Annual General Meeting. Commercial and non-governmental seed-related organizations, government agencies and research institutes involved in seed policy, research and development attend. The AGM was held 28 November. (See page 29)

This was the second ASC meeting in KL; the first was in 2006. Chiang Mai, Bangkok (four times), Manila (three times), Pattaya, Brisbane, Shanghai, Macau, Kaohsiung, Goa, New Delhi, Bangalore, Hyderabad, Chiba, Kobe, Jakarta, Bali, Seoul, Incheon and Ho Chi Minh City have also played host.

The Opening Ceremony began with an address by APSA President Tahir Saleemi, who noted that Asian Seed Congress delegates “are one body with the same goals, dependent on one another in a symbiotic relationship,” before highlighting pressing priorities. “Piracy, IPR, Phytosanitary hurdles and climate change are the main challenges,” he said, “not only for the seed industry but also as relates to world food security,” adding that a harmonized and transparent “systems approach” to phytosanitary certification must be developed “as quickly as possible”.

President Tahir cited climate change for farmers’ production losses and resulting high market prices. The imperative, thus, is to “educate each stakeholder in the value chain on the effects of climate change.”

Mr Tahir was followed at the podium by Dr Uma Rani Sinniah, President of the National Seed Association Malaysia, who noted that her organization comprises government agencies, seed companies, universities, and research organizations. She talked of the near future, and that the US$40 billion global seed market was projected to swell to US$61.3 billion in five years. Domestically, she explained, “the Ministry of Agriculture and Agro-Based Industries is attempting to transform and speed up the development of the agricultural sector, with particular interest in the seed sector.”

She said that, though research institutes and universities are churning out new varieties of staple crops such as rice, “major crops such as fruits, vegetables, field crops, herb, flowers and others are still in need of improvement,” and added that the Malaysian government and local seed industry might “capitalize on the experts present” during ASC 2019 to work together to improve Malaysia’s seed industry. “Alternatively,” she said, “Malaysia can offer incentives to international companies to conduct R&D and produce seeds here.”

Mr Tahir noted, for Mr Groot – a Laureate was screened. As Mr. Groot as the 2019 World Food East-West Seed’s Simon N. Laoharoonpornkul; Dr Kanokwan Chodchoey; Prof Dr Uma Rani Sinniah; YBhg. Dato’ Salahuddin bin Ayub; Mr Tahir Saleemi; Mr Mohd Nasir Bin Warris; Ms Brenda Dossey; and Dr Chua Kim Aik.

"With climate change standing at our doorsteps," he told the ASC, "it is important that seeds of great quality...high yielding, early maturing, pest and disease tolerant, and extreme-climate tolerant varieties" be developed. He noted that the seed industry in Malaysia is quite small – with only one domestic and one international company in production based there – but welcomed more seed companies to seek opportunity for research collaboration as well as to produce seeds, and urged use of “this platform to share views, business proposals and knowledge.

“I am confident that with the commitment of everyone here today, we will be able to work together to develop effective and efficient strategies concerning seed production and delivery.”

Following the Minister’s speech, a video presentation honoring East-West Seed’s Simon N. Groot as the 2019 World Food Laureate was screened. As Mr. Tahir noted, for Mr Groot – a
Progress is steady yet certain for a number of initiatives in focus by APSA’s 20-member Working Group of Integrated Vegetable Seed Companies (WIC), who met on 24 November ahead of ASC 2019.

Presided over by WIC Chair and APSA Executive Committee member, Dr Sumitra Kantrong (Chia Tai Seeds) and Co-chair Rahul Pagar (HM. Clause), the meeting covered updates on a number of initiatives, including:

- Seed Innovation and Protection Initiative (SIPI)
- Members Adoption of APSA’s Code of Conduct
- Development of APSA educational materials update
- Plant Breeding Innovation Position Paper
- Seed Quality Management and Seed Vigour Testing Workshop;
- India’s draft seed bill 2019

On the creation of SIPI – an independent group dedicated to Intellectual Property Rights education and enforcement in the Asia Pacific seed industry – progress is on track, despite some delays.

SIPI will function similarly to the Anti-Infringement Bureau (AIB) in Europe and Seed Innovation and Protection Alliance (SIPA) in the Americas.

The SIPI Working Group, chaired by Rijk Zwaan India’s Mr Harry Singh, are still awaiting legal guidance regarding the new SIPI entity. It was suggested that SIPI – which is separate from APSA. Pilot programs were proposed during last year’s Mid-Terms for three countries: China, India and Thailand.

The issue will be addressed again, with more details on operational planning, during the APSA 2020 Mid-Term Meeting in April.

The Working Group, aside from the chair, comprises Limagrain’s Mr Jack Metzlaar; Vilmorin-Mikado’s Madoka Koshibe; Celestial Seeds’ Mr Wang Zhiping; Nunhems BV/BASF’s Mr Liu Wei; Acsen Hyveg’s Mr Senthilnathan Sengottuvelu and Nongwoo Bio’s Mr Jinman Lee (since resigned and requires replacement).

To tackle the issue of IP patent infringement, the WIC was presented with the final versions of two new posters concerning plant variety protection and interdicting seed piracy. A video from the APSA Standing Committee of IPR & Biodiversity on plant breeder rights is in the works and will be presented during the 2020 Mid-terms in April.

Regarding the APSA Position Paper on Plant Breeding Innovation (PBI): Work is largely finished on APSA’s PBI Position Paper, which is based on ISF’s Position Paper on the same topic. The PBI Position Paper Committee – Mahyco’s Dr Rajesh Ramdas Wankhare, East-West Seed’s Dr Mary Ann Sayoc, Beijing Jewelry Seed’s Mr Zhang Wei, Bayer’s Mr Michael Leader (the committee chair) and volunteer Dr Arvind Kapur from Acsen Hyveg -- will present a draft presentation at the APSA Mid-Terms.

The WIC Code of Conduct was finalized and signed by WIC Members. The Code of Conduct, represents a company-level commitment to good behavior, but is not legally binding. It will provide a basis for establishing industry-wide accepted protocol, guidelines and expectations for facilitating healthy competition, with special attention given to seed production and resource management best practices. The pioneering signatories will next discuss plans for capacity-building and training activities related to the Code of Conduct.

The report by the FAO and APSA on regional seed laws was presented for comment prior to publication by the FAO. Plans were confirmed for the Seed Quality Management Seminar and Seed Vigour Testing Workshop. (see page 10)

Finally, an update was given on efforts to expand ISF’s work on disease resistance nomenclature. APSA is carrying on the work in the Asia-Pacific region, with a working group established and relevant crops agreed upon. The pathogen list had not yet been fixed. A project proposal and funding request will be presented at the Mid-Term meeting. The aim is to establish a fixed terminology for pathogens and protocols for determining “resistance”.

The working group comprises: the chair, Dr Sumitra Kantrong from Chia Chai; East-West Seed’s Dr Mary Ann Sayoc; Mahyco’s Dr Rajesh Ramdas Wankhare; Acsen Hyveg’s Mr Senthilnathan Sengottuvelu; Rijk Zwaan India’s Mr Sanjay Bish; Syngenta China’s Dr Peter van der Toorn; and Known You’s Ms Linda Chang. 

Working Group: Integrated Vegetable Seed Companies
IPR, PVP In Focus at Congress Workshop

The ASC 2019 Workshop on November 25 focused on Intellectual Property and Plant Variety Protection (IP/PVP). APSA Executive Director Dr Kanokwan Chodchoey introduced the hashtag #Saynotoseedpiracy during her welcoming remarks and exhibited the organization’s poster, which was to be used in a first-ever ASC social media campaign.

The campaign and competition would go on to prove a success, with hundreds of delegates posting on their personal social media profiles #Saynotoseedpiracy to caption their “selfies” in front of the poster, placed throughout the venue. This initiative amounted to thousands of Likes and Shares on Facebook, Twitter, LinkedIn and WeChat. Finally, two winners stood out with the most likes: the posts of the WIC’s very own Dr Mary Ann Sayoc (East West Seed) and Rahul Pagar (HM.Clause).

If APSA’s poster was designed to spread the anti-flibustering message generally, the Workshop, with presentations by four speakers, aimed at addressing the nuts and bolts of seed sector IPR.

The first was industry consultant Dr Michael Turner, from the United Kingdom, who afforded an overview of plant variety registration and protection fresh from his work surveying IP legislation in the Asia - Pacific region with APSA’s Standing Committee on Intellectual Property Rights (IPR) and Biodiversity. He said variety registration and protection are determined by comparing similarities with differences and strengths with weaknesses, thereby leading to established legal status for given varieties – with accompanying benefits. Thus, order is brought to the market by identifying varieties more clearly and confirming their value. Initially, Dr Turner explained, seed laws were enacted to protect farmers from poor quality seeds.

Now, however, they have expanded to include registration of approved varieties on a National List, a concomitant of which is standardized species characterization – hence the concept of Distinctness, Uniformity and Stability (DUS) to define varieties.

While inclusion on the National List provides some protection for varieties, he said, it does not prevent theft. He ended his session by observing that linking regulation and other information using an online system provides distinct benefits, as modern technology makes identifying, authenticating and agronomic confirmation much more widely accessible than was hitherto possible.

Australian Seed Federation head and Seed Regulatory Lead for Asia and Africa at Bayer Crop Science Mr Michael Leader, speaking on behalf of CropLife Asia in his capacity as a seed and biotechnology regulatory affairs expert, discussed PVP challenges. He said the effects of illegal seeds are lower quality, farmer exploitation and reduced field productivity. Worse, they undermine both intellectual property rights and the cycle of innovation, which today involves digital breeding, targeted breeding, biotechnology, applied seed technology, digital and agronomic solutions.

In southern Asia, he said, farmers have little awareness of these aspects and ignore IPR issues as enforcement is limited. So prevailing laws and regulations must be updated as the problem of seed counterfeiting is growing at an alarming rate and actually amounts to organized crime, with counterfeits achieving significant market share in several countries: Thailand (30%); Vietnam (20%); and the Philippines (10%).

To overcome the problem, he concluded, joint advocacy of strong IP safeguards – as PVP, Essentially Derived Varieties (EDV) and trait patents – is necessary, and the safeguards included in amended seed laws and regulations. Mr Leader concurred during Q&A that seed traceability is similarly important, adding that work to improve it is underway.

Corteva Agriscience APAC and GC Brand Protection Leader Mr Herbt Feng, of China, then introduced CropLife Asia’s updated enforcement guidebook. He advocated stronger intelligence gathering and industry collaboration, while noting many types of infringement: counterfeit seeds; IPR infringement via generic registration and its opposite, IPR infringement without generic registration; and via unpacked seeds.

Seed pirate decision-making, he said, might be influenced by increasing risks or decreasing opportunities. The former could involve jail sentencing, exposure, or stricter customs enforcement; the latter, introducing customized products or crop solutions.

Mr Feng said effective enforcement comprises increasing awareness, removal of technical barriers, government agencies’ engagement and higher transparency. Meanwhile, process filings under trademark law, patent law, criminal law, seed law and the PVP Acts must be simplified.

Finally, Corteva Agriscience Global Seed Policy Leader Mr Marc Cool, from the US, focused on the definition of Essentially Derived Varieties (EDV), and their use in IPR enforcement. He said EDVs are predominantly derived from initial varieties, while retaining expression of essential characteristics, and that UPOV91 differs from UPOV78 owing to inclusion of the EDV concept and protection extended to harvested materials.

EDVs, he explained, answer the “Am-I-related?” question by using standard marker sets to indicate similarity percentage and genetic conformity.

In practice, new varieties are compared to PVP-protected varieties using standard morphological, agronomic and DNA markers, with three expected outcomes -- not distinct; distinct but an EDV; or distinct and thus free to sell. He emphasized that breeders themselves must apply the EDV concept as PVP offices have no role in enforcement.

In terms of test methodology and percentage thresholds, Mr Cool offered the example of maize: if a new variety is 95% similar in terms of genetic distance (GD), it is considered an EDV. If GD is lower than 91%, it is an independent variety. However there is a grey area between 91 – 95%, wherein pedigree must be proved.

Technical guidelines for defining thresholds include: validated germplasm pedigrees; public markers; and genetic similarity analyses. EDVs are established for maize, perennial ryegrass, oilseed rape, cotton, lettuce and button mushroom.

Meanwhile, it is important to develop new EDV-system specifics as different breeding methods -- for example, point mutations via CRISPR or backcrossing with native traits and insertion of GM traits -- impact EDV testing.

Mr Cool said breeders must balance IP rights protection with breeders’ access, and, when asked whether backcrosses are considered EDVs, explained that, if backcrossing changes the nature and character of a variety, it is not considered an EDV. However, if it has a high percentage of similarities, it is – and thus licensing is required for its release.
APSA President congratulates #ASC2019KualaLumpur and #SayNoToSeedPiracy social media campaigns winners: Rahul Pagar of HM.Clause (left) and Dr. Mary Ann Sayoc of East-West Seeds (right).

Planting Golden Memories

WORK HARD, PLAY HARDER: Nothing like good drinks, with good food, people and music to top off a great day of seed business!

APSA Best Booths: From left: CNUS was selected for best overall booth design, for the second year in a row; Incotec this year won the Most Educational Booth, while Green World Genetics was awarded for having the most receptive and/or knowledgeable service staff.
The APSA Award is given to nominees from the ASC host country’s private and public sectors in recognition for their contributions to the seed industry; APSA President Tahir Saleemi and NSAM President Prof Dr Uma Rani Sinniah congratulate the 2019 winners: Dr Chua Kim Aik (private sector, left photo) and Mr Mohd Nasir Bin Warris (public sector, right photo).

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APSA’s Standing Committee for Intellectual Property Rights and Biodiversity held their technical session on 27 November during ASC 2019. The two-part session was chaired by SC IPR & Bio Chair Dr Arvind Kapur and Co-Chair Mr Casper van Kempen.

The first portion covered the International Treaty on Plant Genetic Resources for Food & Agriculture (ITPGRFA) with three 20-minute presentations:

The first was a Report on the Results of the Governing Body delivered by Ms Anke van den Hurk, Deputy Director at Plantum, who participated as a seed sector representative in the Convention on Biological Diversity (CBD), the Nagoya Protocol and the International Treaty on Plant Genetic Resources for food and Agriculture (ITPGRFA).

The second, from ASC 2019 Host Country Malaysia, was Malaysia and the ITPGRFA by Dr. Mohd Shukri Bin Mat Ali, Deputy Director of Genetic Resources, National Focal Point for ITPGRFA, Conservation Management Programme, Gene Bank and Seed Center, Malaysian Agricultural Research & Development Institute (MARDI), who discussed his country’s experiences as a Contracting Party to the ITPGRFA since 2003. Issues addressed included Treaty conformity and Malaysia’s National Agrofood Genebank (MyGeneBank™).

The third was on Developments in Biodiversity Legislation/Access and Benefit Sharing in India from Dr Shivendra Bajaj, Executive Director at the Federation of Seed Industry of India (FSII) and Alliance for Agri Innovation (AAI).

Talks were followed by Q&A discussion.

The session’s second portion focused on IPR & UPOV Status with five 30-minute presentations:

The first, on the Status of Seed Legislation and Policies in the Asia-Pacific Region, was from Dr Pepijn Schreinemachers, Program Leader - Enabling Impact, World Vegetable Center, whose areas of discipline include scaling approaches, monitoring tools, knowledge management, and impact evaluation.

The second was from seed industry consultant Dr Michael Turner, who presented his work with APSA’s Standing Committee on Intellectual Property Rights (IPR) and Biodiversity in surveying from July to October last year the status of IP legislation for plant varieties in the Asia and Pacific Region, its effectiveness in securing the rights of plant breeders, and interested parties’ awareness thereof.

The third was APSA’s IP Position Paper, presented by Dr. Arvind Kapur.

The fourth covered the Plantum and Oxfam reports, and was delivered via conference call by Mrs Judith de Roos-Blokland, Legal Counsel, Plantum, and Mr Bram de Jonge, Seed Policy Advisor, Oxfam Novib. The reports related to a project in which those organizations and Euroseeds undertook to increase clarity and find common ground regarding the private and non-commercial use exception (Article 15.1.i) of the UPOV 1991 Convention.

Fifth was the Plant Variety Protection Update on Experience and Challenges delivered by Mr Tomochika Motomura, Technical/Regional Officer (Asia) UPOV, and Mr Nguyen Thanh Minh, Director of the Plant Variety Protection Office of Vietnam, on EAPVP.

The day-long session concluded with a round table discussion moderated by Dr Mary Ann Sayoc, Public Affairs Lead, East West Seed (Philippines).
Two pest management experts presented views on the Fall Armyworm (Spodoptera frugiperda) invasion of Asia for APSA’s SIG Field Crops. Focus was on proven approaches to containment and control.

Dr BM Prasanna, Director of the Global Maize Program at the International Maize and Wheat Improvement Center (CIMMYT) and of the Maize Research Program at the Consultative Group for International Agricultural Research (CGIAR), spoke on Integrated Pest Management (IPM) for Fall Armyworm in Maize Production. Dr Prasanna described ways for seed companies to “develop effective, coordinated, and flexible approaches to manage Fall armyworm within the endemic areas, especially in hybrid maize seed production hubs.”

A Grassroots Approach to Management of Fall Armyworm in India was the theme of the address by Dr Bhagirath Choudhary, founder director of the non-profit South Asia Biotechnology Centre (SABC) in New Delhi and board member of the Indian Ministry of Commerce & Industry’s Agricultural & Processed Food Products Export Development Authority (APEDA). He dilated on the salient features of the grassroots approach: addressing the knowledge gap; and comprehending the nature of Fall Armyworm, its biology, life cycle, feeding habits, adverse economic impact assessment, distribution, migration, and best practices for effectively managing the pest.

APSA’s Hybrid Rice session saw Dr Bingbing Wang, Chief Executive Officer at BioBin Data Science Co., and adjunct professor of Hunan Agriculture University in Changsha, China deliver a talk on the latest biotechnology applications. Focus was on gene editing technology for developing desired traits in rice, especially those related to taste, fragrance and disease-resistance.

Dr Wang explained application of large-scale genotyping technology, including SNP array and KASP/Taqman SNP assays, and whole-genome and target sequencing -- now widely applied in rice breeding to facilitate marker assisted selection, marker assisted backcrossing, germplasm characterization and fingerprinting. He also introduced breeding software available for managing Big Data, as well as the training of Genome Selection models for predicting performance of varieties based on genotypic profiles.

The session concluded with a round table discussion on future SIG activities moderated by SIG Hybrid Rice Chair Dr Frisco Malabanan and Co-Chair Ms Zhu Xiaobo.
The SIG Veg & Orn meeting agenda at ASC 2019 included the sunflower trade, knowledge transfer, pesticide trends and remote-sensing tech. At the three-hour meeting 26 November were five expert speakers:

The first presentation was an overview of the sunflower ornamental market, delivered by Mr Takahiro Ando, General Manager of International Sales and Marketing at Takii, a leading Japanese company. He explained how the Helianthus annuus, or sunflower, originated in the New World, and was not actively bred as an ornamental plant globally till the early 20th century -- thereafter delving into everything sunflower during his 30 minute talk.

The second saw Mr Herve Thieblemont, Regional Seed Business Development Lead, Asia, Syngenta Foundation, discussing Knowledge Transfer for Small Holding Farmers. Mr Thieblemont introduced the Syngenta Foundation for Sustainable Agriculture (SFSA) business models for Africa and Asia, designed to fulfill farming community needs by deployment of modern technology and innovation in activating value chains.

The third, from Mr Stuart Morris, Director East-West Seed Knowledge Transfer, East – West Seed Foundation, was on Promoting Vegetable Production as a Rewarding Livelihood: A Win-Win for Farmer and Company, in which he described how his company supports intensive training for farmers as precursor to commercial activity in less developed and emerging markets; he also explained the role of the non-profit East-West Seed Knowledge Transfer Foundation in showcasing profitable and sustainable production practices.

The fourth talk centered on The Need to Reduce Pesticide Misuse and Improve Food Safety in Vegetable Production from Dr Pepijn Schreinemachers, Program Leader – Enabling Impact, World Vegetable Center. His presentation highlighted alarming trends in pesticide use while noting the attendant health risks to farm workers and consumers, environmental damage and impact on the bottom line. He also covered safer pest management methods, differentiation of products based on food safety attributes and Good Agricultural Practices (GAP).

The fifth was on Remote Sensing Technologies for Seed Companies from Mr Jurgen Decloedt, Business Development Manager, VITO, who reviewed current state-of-the-art remote sensing technologies and applications in the seed industry while also looking at the direction such technology is likely to take in the years to come. He said two-remote sensing applications are especially useful in seed production: an app called MapEO, to speed up and improve the phenotyping process; and WatchITgrow, a multi-satellite-based solution for monitoring multiplication and production fields.

SIG Veg & Orn Chair Mr Michel Devarrewaere also reviewed the group’s main activities last year, including the Study Tour to Israel and the 3rd Asian Solanaceous Round Table in Bangalore India.
APSA’s SC Seed Tech held a 90-minute panel discussion moderated by SC Seed Technology Chair Mr Johan van Asbrouck, Managing Director of Rhino Research, and Co-Chair Dr Manish Patel at ASC 2019 concerning the impact of seed technology on seed enterprise bottom lines.

“Everyone knows the idiom ‘missing the train’,” said van Asbrouck, “but just as bad could be ‘taking the wrong train’.” Seed cleaning, treatments, upgrading, pelleting, priming, and optical sorting were among topics addressed.

The four seed tech panelists were: Mr Eduard Fito of Semillas Fito (and ISF President); Mr Arthur Santosh Attavar from Indo American Hybrid Seeds; Mr Abdul Awal Mintoo of Lal Teer (and now an APSA EC Member) and Mr Jack Metzelaar from Limagrain.

“Standing Committee on Seed Technology”

Panelists from left to right: Eduard Fito, Arthur Santosh Attavar, Abdul Awal Mintoo and Jack Metzelaar

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Systems Approach, ePhyto, ISPM38, IYPH 2020 and ISTA accreditation were on the agenda for APSA’s SC ITQ technical session. Three speakers figured:

Dr Szabolcs Ruthner, Regulatory Affairs Manager at the International Seed Federation (ISF) introduced the Systems Approach concept and updated participants on the international digital phytosanitary certification ePhyto system. The former could be adopted by National Plant Protection Organizations (NPPOs) instead of existing pest risk management options as it accounts for the entire seed production and distribution chain. Dr Ruthner discussed it in context with adoption of ISPM38 on the International Movement of Seed, and, about the latter, said electronic equivalents of conventional paper phytosanitary certificates are not merely digital copies of paper certificates, but “contain the data of certificates in a specific electronic format as prescribed in ISPM12.”

Datin Jatil Aliah Binti Tamin, Deputy Director at the Plant Biosecurity Division of Malaysia’s Department of Agriculture, looked at implementation of ISPM38 in the ASC 2019 host country, and described Malaysia’s planning for the UN’s International Year of Plant Health or IYPH 2020, which includes workshops and capacity-building courses on plant and seed disease management, identification and diagnostics, molecular techniques and integrated approaches. She also covered Malaysia’s strategy for containing invasive pests such as the Fall Armyworm and South American Leaf Blight.

Dr Mary Ann Sayoc, Group Lead, Public Affairs, East-West Seed International, delivered a talk entitled Multi-Stakeholder Initiative Against Child Labor: The East-West Seed Experience, in which the issue of child labor in seed supply chains is addressed. She described East-West Seed’s initiatives to combat the practice.

Dr Andreas Wais, Secretary General of the International Seed Testing Association (ISTA) reviewed the ISTA Accreditation System and Procedures for laboratories from the public and private sectors. His talk included testing for GMOs and Seed Health, covering types of seed, samples and seed lots.
Annual General Meeting No. 1

The first Annual General Meeting (AGM) of the Asia and Pacific Seed Alliance was held on the afternoon of 28th November. Among the highlights include the election of eight new Executive Committee members; review and approval of budgets for 2020 and 2021, and the audited 2018 reports for APSA operations in Thailand and Singapore; as well as the polling and ratification of proposed to additions and amendments to APSA's constitution.

The meeting opened with remarks from APSA President Mr Tahir Saleemi, who reviewed the organization's activities during the preceding year: collaborations with Thailand’s National Science and Technology Development Agency (NSTDA), the Indian Council of Agricultural Research (ICAR), the World Vegetable Centre (WoldVeg), the International Seed Testing Association (ISTA), the Asia-Pacific Association of Agricultural Research Institutions (APAARI), the United States Department of Agriculture (USDA), the American Seed Trade Association (ASTA), the University of California at Davis (UC Davis) and Wageningen University & Research in the Netherlands; events such as the 5th Expert Consultation on Phytosanitary Measures in the Asia-Pacific, the 3rd Asian Solanaceous Roundtable, and the Seed Production Study Tour in Tel Aviv and Jerusalem; and communications initiatives such as making Asian Seed a quarterly; Plant Breeding Innovation videos in three languages and a poster on the same topic; and a poster promoting Intellectual Property Rights.

Elections were held thereafter to fill eight Executive Committee vacancies for the term 2020 - 2022: five for Corporate Members; one Major Country seat, for Japan; one for the Singapore Resident and one in the Associate Category. 14 were nominated, 12 of whom withdrew.

Candidates were then afforded three minutes each on stage to introduce themselves to voters (Singapore candidate Mr Teck Wah Koh, who could not be present, made his introduction via video). The three-member Election Committee – Mr Avtar Singh Dhindsa, Mr Koshibe Madoka, Mr Wang Zhiping – then came on stage and voting, by show of hands (using yes or no cards), began.

Takahiro Ando won election by simple majority to the Japanese seat; Teck Wah Koh to Singapore’s; Abigail Struxness to the Associate category; and Abdul Awal Mintoo, Chua Kim Aik, Senthilnathan Sengottivelu, Sumitra Kantrong, and Wei-Ting Chen to the Corporate seats.

Thereafter members voted on APSA constitutional changes, which required approval from 75 percent of those present to pass; members from all categories could vote. Results were as follows:

New additions came in the form of Articles 8, 13 and 48A – all of which passed without objection. Article 8 inserts immediately after Article 7 the following: “8. This Article is not used.” Article 13 inserted immediately after the definition of “Associate Member” the following: “calendar year' includes a financial year or financial period of the Company.” Article 48A contains the following: ‘48A. The Members may, at a General Meeting, adopt a code of conduct concerning the Company’s governance values and all the Members shall follow such code of conduct as amended from time to time.”

Amendments were then proposed: those concerning Articles 42, 107, and the removal of Article 116 passed without objection; amendments to Articles 62 and 98 failed. The Article 42 amendment inserts the following at the end of the existing Article 42: “For the purposes of this Constitution, ‘no proxy voting is allowed’ means that a representative or proxy of a member is not allowed to vote for any Member that (i) did not appoint him or (ii) he is not an employee or officer of.”

Article 107 now inserts immediately following “on behalf of the Company”, the words: “provided that the documents for opening, operating, and closing of the bank accounts are signed jointly by the Executive Director and a director authorised by all the members of the Executive Committee....”

Article 116, which stated that the “Company’s financial year will begin on the first day of January and end on the thirty-first day of December of each year” was removed because the AGM must be held within six months of the close of the fiscal year and within the same calendar year; therefore, as APSA’s AGM could not otherwise be held towards calendar year end, the change was approved.

The amendment to Article 62 proposed revising it thus: “62. The Immediate Past President will automatically be an Executive Committee member for a period of two years. At the end of such period of two years, the Immediate Past President will step down from the Executive Committee.” That of Article 98 proposed that the Immediate Past President’s term in office be increased from one year to two years, with the wording thus: “98. The Immediate Past President shall serve for a term of two years.” The object of the amendments was to ensure that the Executive Committee always has the same number of members – 16. Neither passed owing to objections from more than 25% of active members attending the AGM.

In other AGM business, members approved for fiscal year 2020 appointment of auditors for APSA’s Singapore and Thailand accounts.

Finally, the contributions from the following outgoing EC members were acknowledged with tokens of appreciation:

Ms Brenda Dossey (immediate past president); Mr Daniel Gleeson; Mr Isaac Luchi; Mr Muhammad Asim Butt; Dr Tso-Chi Yang; Mr Tsukasa Kawakami; Dr Mi-Hee Yang; and Mr John Mizicko.
National Seed Associations Meeting

On November 27, APSA President Tahir Saleemi set the tone of APSA’s annual gathering of National Seed Association representatives, highlighting it as “one of the most important meetings of Congress.” APSA now lists among its members 24 seed associations. Of these, thirteen gave a presentation at this year’s NSA meeting, summaries from which are listed below in alphabetical order. See link in end info for full details.

**Australian Seed Federation**
ASF comprises a four-member Board of Directors, a five-member Policy Council, a President (Michael Leader) and a Secretariat. The Policy Council consists of representatives from the Northern, Eastern, South Eastern, Southern and Western regions. 

**Bangladesh Seed Association**
BSA was formed in 2002 at government behest. The association is registered with the Registrar of Joint Stock Companies and Farms (RJSC). Its Executive Committee comprises 20 members, elected to two-year terms, divided into two groups, Seed Industry and Seed Dealers.

**China National Seed Trade Association**
CNSTA was founded 1988 and is a nationwide non-profit acting as a bridge between the seed industry and regulatory authorities with the mission to promote seed movement and trade. Membership numbers 172, and includes R&D institutes, seed companies, service agencies and others.

**Chinese Seed Association**
CSA is a nationwide non-profit, headquartered in Beijing, founded in 1980, with 1.249 members – including 987 seed companies – comprising nine chapters and five committees. General Meetings are held every five years. The 245-member Council meets yearly.

**Federation of Seed Industry of India**
FSII membership is by invitation only and includes 17 international and 23 domestic seed companies representing 56% of India’s market share and 70% of research spending. IP creation and protection are core values.

**Indonesian Seed Association**
Known as Asbenindo in Indonesian, the NSA has some 70 members and five technical committees: Inter-Agency Relationship; Food Crop Seeds, with three sub-committees on rice, corn, and soybean and bean seeds; Horticulture Crop Seed, with three sub-committees on seeds for vegetable and leafy plants, annual fruits, and tubers; Plantation and Forestry Plant Seeds and Communication and Information.

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**Website:** [asf.asn.au](http://asf.asn.au), **Email:** enquiry@asf.asn.a

**Website:** [fsii.in](http://fsii.in), **Email:** info@fsii

**Website:** [asbenindo.org](http://asbenindo.org), **Email:** sekretariat@asbenindo.org

**Website:** [bsa7222@yahoo.com](mailto:bsa7222@yahoo.com)

**Website:** [cnstaseed.org](http://cnstaseed.org), **Email:** weihong_tian@cnstaseed.org

**Website:** [cnsa.agri.gov.cn](http://cnsa.agri.gov.cn), **Email:** zzxhma@163.com

**Website:** [asbenindo.org](http://asbenindo.org), **Email:** sekretariat@asbenindo.org
National Seed Association of India
NSAI has more than 450 members comprising small, medium and large enterprises. Policy is set by an elected Governing Council. Implementation is via the Office Bearers -- the president, vice president, general secretary, and treasurer -- working through the Secretariat, whose officers include the executive director, program director, assistant director, senior manager and assistant manager ....

Korean Seed Association
Founded in 1965, KOSA has 59 vegetable seed company members and is managed by a Board of Directors of 13, which includes the association's president and five vice-presidents. Meetings, activities and events are organized and coordinated by the KOSA Secretariat ....

Seed Association of Pakistan
SAP was established in 2010 as the sole legal representative of Pakistani seed industry under the Trade Organizations Act. It has 200 member companies which own nearly 80% share of the Pakistani seed market, which is currently valued at $300 million. The private seed companies produce more than 90% of the cotton and wheat and over 80% of rice seed in ....

Thai Seed Trade Association
THASTA was established in 2001 under Thailand’s Ministry of Commerce, with three membership categories – Ordinary (local seed production, research and development, and trade and marketing companies); Extraordinary (foreign seed companies and other local seed related companies); and Honorary. Membership includes R&D, production, marketing, import/export, wholesale and retail entities, and numbers more than 155 ....

Turkish Seed Union
TURKTOB was founded and legally registered in 2008, with seven sub-unions covering seed industrialists and producers (915 members), seedlings (151), saplings (845), ornamentals (763), seed growing (43,452), seed distribution (6,813) and plant breeding (287). The Executive Committee has seven members, one from each sub-union ....

For full summaries of all of these NSAs, including details about their respective structure, activities and strategic plans, visit tinyurl.com/nsa-apsa
Mr. Tahir Saleemi
President
An APSA EC member since 2014, Tahir was nominated to be Vice-President in 2016 and stepped up as president in 2019. He is the CEO of Haji Sons, a renowned family-owned seed and extension services company based in Lahore, Pakistan, which supplies fertiliser, irrigation solutions and high quality vegetable and field crop seeds and seedlings to local farmers, greenhouses and for export. An MBA Graduate from Pakistan’s Qaud-i-Azam University in Islamabad, and an Executive Committee member of the Seed Association of Pakistan (SAP), Mr. Saleemi has more than two decades’ experience in the international business of seeds, chemicals, irrigation systems and horticulture.

Mr. Wichai Laocharoepornkul
Vice President
Elected to the EC in 2016, Mr. Wichai Laocharoepornkul was nominated as Vice President in 2019, and is the General Manager of Seed Business at East-West Seeds Company Limited, as well as a representative of the Thailand Seed Trade Association. Mr. Laocharoepornkul holds a master’s degree from the University of Central Queensland and is a graduate of Mahidol University. When not hard at work, Mr. Laocharoepornkul dedicates his time to his wife and two children. Prior to working in the seed industry, he gained extensive experience in the pharmaceutical industry.

Mrs. Zhu Xiaobo
Elected in 2018 (2019-2021), Mrs. Xiaobo holds a Bachelor's Degree in Horticulture from Huazhou Agricultural University, as well as an Associate Degree in vegetable breeding from Jiangnan University, China. Currently, she is a General Manager of Wuhan Qingfa-Hesheng Seed Co., Ltd. In addition, she is a member of Field Crops Section Boards, ISF, and Vice President of China Seed Trade Association. She has previously served as a Co-Chair of APSA's Special Interest Group (SIG) for Hybrid Rice.

Mr. Wei-Ting Chen
Elected in 2019 (2020-2022), Wei-Ting Chen is currently the President at Chia-Hwa Nursery Co., Ltd. and since 2018 the Vice President at Known-You Seed Co., Ltd. He has also previously served as the leading vegetable seed company’s Vice General Manager (2017-2018) and as Senior Administrator and Director (2005-2017). He has an MBA from the University of California, San Diego in addition to a Master of Science in Agronomy (Biostatistics) from the National Taiwan University, where he also obtained his Bachelor of Science in Agronomy. He possesses in-depth knowledge in statistics, seed production, plant breeding, and big data analysis, including bioinformatics, statistical modeling, design of experiments, and multivariate analysis

Mr. Takahiro Ando
Elected in 2019 (2020-2022), Takahiro is a Japanese national who fills APSA’s quota for at least one representative from a Main Country, as defined by the Constitution (China, India and Japan). A seasoned seed industry executive, Mr. Takahiro has more than 25 years’ experience in international seed business, having worked for several subsidiaries of Takii & Company, in Japan, United States, Indonesia and the Netherlands. He is currently the General Manager of International Sales and Marketing Department at Takii & Co., Ltd., a role he assumed last year. He has held various positions with Takii since joining in 1994.

Mr. Wei-Ting Chen
Elected in 2019 (2020-2022), Dr. Sumitra is Assistant VP at integrated Thai agriculture company Chia Tai, and Chairs APSA's Working Group of Integrated Vegetable Companies. Dr. Sumitra holds a PhD (Science of Life Environment and Conservation) from Kagoshima University in Japan, with M. Sc. (Plant Virology) from Saga University, Japan and B. Sc. (Plant Pathology) from Khon Kaen University in Thailand. A highly accomplished executive in the vegetable seeds industry with a strong research, lab, and quality assurance background, Dr. Sumitra's core competencies span both technical and operational aspects, with expertise in seed physiology, testing, diagnostics, marker development, strategic procurement, inventory, delivery and customer service management, seed supply chains and quality systems management.
the Committee

Dr. Yan Shupeng
Elected in 2018 (2019 - 2021) Dr. Yan is from China and holds a Ph.D in Agricultural Economics from Shenyang Agriculture University in China and a Master’s Degree in Business Administration from the University of Iowa, in the US. Currently he is the General Manager of China Vegetable Seed Technology Co.,Ltd. and also a Vice President of Haidian Seed Chamber of Commerce and Vice President of the China National Seed Association (CNSA) vegetable sub-committee. He serves as Co-chair for APSA’s Special Interest Group for Vegetables and Ornamentals (SIG Veg & Orn).

Mr. Casper van Kempen
Re-elected to the EC in 2018 (2019-2021), Mr. van Kempen is from the Netherlands. He has a master’s degree in Economics from Rotterdam University, in the Netherlands, as well as in Agricultural Economics from Reading University in the UK (and in Business Administration from IMD in Lausanne, Switzerland. Having spent 17 years in international assignments abroad, Casper has held several international senior sales and marketing management positions in flower and vegetable seed companies. He took up his present position at the Anti-Infringement Bureau for IP Rights on Plant Material, Brussels, in 2010.

Ms. Abigail Struxness
Elected in 2019 (2020-2022), Abigail directs the American Seed Trade Association’s international programs and works to develop and promote policies which allow for the greater movement of seed worldwide. Asia is a priority region for ASTA members and international programs. Prior to ASTA, Abigail worked at the Agriculture Transportation Coalition in Washington, D.C. She has a degree in International Political Economy.

Mr. Abdul Awal Mintoo
Elected in 2019 (2020-2022), Mintoo is the Chairman of Lal Teer Seed Limited, a Bangladeshi company that specializes in the development, production and distribution of Hybrid, HYV and OP seeds of various types of Rice and vegetable crops. He has twice led the Federation of Bangladesh Chambers of Commerce and Industries (FBCCI) and was recently elected as the President of Bangladesh Seed Association (BSA). Since its inception, Mr. Mintoo has engaged his Lal Teer team in frontier research for agricultural development in Bangladesh in collaboration with international interest groups to address various challenges afflicting Bangladeshi farmers. Mr. Mintoo has attended and played pivotal roles in various seed industry technical groups, meetings, conferences, events and consortiums in Asia and around the world.

Mr. Senthilnathan Sengottuvelu
Elected in 2019 (2020-2022), Mr. Senthilnathan is the Executive Chairman at Acsen Hyveg Private Limited, and is an active member of APSA’s Working Group of Integrated Vegetable Companies. A Mechanical Engineering graduate with post-graduate credentials in Business Management, Senthilnathan has extensive executive and association experience in the seed, textiles and energy industries. He has been on the Management Board of Rasi Group since 1999, and was previously the Executive Director of Rasi Seeds. He has served as a member of the Southern India Mills’ Association, the Tamil Nadu state Agri and Food Processing panel convener of the Confederation of Indian Industries. Moreover, he was the chairman of Confederation of Indian Industries- Salem and is a Founding Board member of Indian Texpreneurs Forum.

Dr. Chua Kim Aik
Elected in 2019 (2020-2022), Dr. Chua Kim Aik is the founder and CEO of Green World Genetics Sdn Bhd, a fully-integrated (R&D, research, production & distribution) vegetable seed company, headquartered in Malaysia. The company focuses mainly in tropical crops. Dr. Chua holds a Doctor of Philosophy, the area of study is Strategy Management in Global seed industry. In addition, he has forty years’ experience in the seed industry and has worked in many countries. His vast experience and expertise spans sales and marketing, seed production, seed R&D and corporate and strategic management at both small and medium enterprise and multinational scales. (See article on page 36)

Teck Wah Koh
Elected in 2019 (2020-2022) Teck Wah Koh is currently the Head of Legal, APAC for Syngenta Asia Pacific Pte Ltd in Singapore, and is responsible for legal affairs of both Syngenta’s Crop Protection and Seeds businesses in APAC. He possesses a LLB from the London School of Economics, University of London. Teck Wah was called to the Malaysian Bar in 1985 and went into private legal practice in Kuala Lumpur, Malaysia. Teck Wah has been working for Syngenta since 2000. He has been responsible for providing legal support to Seeds Business units dealing with rice, maize (both conventional and GM) and vegetable crops operating across 12 countries in APAC, and has attended to various legal matters, including M&A transactions, set up of new businesses and JVs, resolving LTO issues and seeds related liability issues. He is also a member of Syngenta’s APAC Regional Leadership Team, and is on the Board of Directors of the various Syngenta legal entities in Singapore.
Chia Tai Open Field Days

Chia Tai reinforces its leadership in quality seed production, underlining its commitment to elevate Thai agriculture during ‘Chia Tai International Field Day 2020’

Chia Tai, Thailand’s leading integrated agricultural company, from 10-14 February held ‘Chia Tai International Field Day 2020’ to showcase the outstanding strengths of its quality seed production through its R&D center in Hang Dong, Chiang Mai. Various varieties featured in demonstration plots, as well as quality agricultural products, were presented at the event. Highlights also included a variety of dishes created from fresh, tasty and safe vegetables and fruits, reinforcing Chia Tai’s vision to deliver innovative agriculture for a better and sustainable quality of life to everyone across the region.

‘Chia Tai International Field Day 2020’ was hosted by the Seed Business of Chia Tai under the concept of ‘Growing Better, Together.’ The event showcased 410 varieties of vegetables and fruits developed by means of Chia Tai’s cutting-edge innovation.

“Chia Tai has been hosting ‘Chia Tai International Field Day’ to showcase our capability of plant variety research and development to agriculturists and business partners from all over the world. With the usage of technology and innovation in advanced plant breeding, Chia Tai develops quality seeds immune to diseases and environmental changes. We believe that quality seeds determine a beginning to efficient cultivation.

‘Chia Tai International Field Day is one of the activities which illustrate Chia Tai’s intention to deliver its agricultural innovation, covering the entire chain of the agricultural industry. Starting from leveraging quality factors of production to delivering fresh and safe agricultural products, Chia Tai aims to create security for farmers and confidence for consumers,” said Mr. Manas Chiaravanond, Chia Tai CEO.

Moreover, the event included an exhibition showcasing cutting-edge innovation.

About Chia Tai
Chia Tai Company Limited was established in 1921. It is now one of Asia’s leading agricultural companies with its business covering the entire chain of the agricultural industry, starting from quality seeds, fertilizers, plant protection, to cultivation technology and delivery of safe and quality products.

Determined to unceasingly develop products and services, Chia Tai was among the first companies in Thailand to develop hybrid seeds. It has high potential to develop breeds to create security for farmers and confidence for consumers. Chia Tai has up to 10 R&D stations in Thailand and other countries and seven subsidiaries across Asia and the US with over 1,300 employees.

Chia Tai’s principle in doing business is firmly based on business ethics and professionalism, with its goal to develop products and services that deliver agricultural innovations for a better and sustainable quality of life for people across the region.
Chia Tai’s capability of plant variety research and development that meets international standards, which includes biotechnology for plant breeding. Highlights were tissue culture with the use of double haploids to shorten the development process, and DNA technology, such as a molecular markers, to develop more advanced varieties in a shorter period, also enhancing accuracy and efficiency in selecting strong varieties with immunity to diseases.

Another highlight of Chia Tai International Field Day 2020 was a tasting session of special dishes created from fresh, delicious and safe products grown from quality seeds. These included watermelon jellys created from Sonya Plus watermelons with their signature bold, red pulp and fresh, sweet taste; ice-cream from Royal Rich purple sweet corns and pumpkin tarts from Chia Tai’s Mini Ball pumpkins, distinctive for their firm pulp and characteristic sweet taste in a small and practical size. In addition, participants were tempted with aromatic pandan-like cucumber snacks, made from small-sized cucumbers with distinct pandan-like fragrance emanating from their trunk, fruit and flowers.

Chia Tai International Field Day 2020 reflected Chia Tai’s dedication to leveraging know-how and technology in plant variety development for all stakeholders. In addition to providing high quality seeds to agriculturists, Chia Tai aims to elevate the Thai agriculture industry, and improve both farmers’ and consumers’ quality of life. Through the event, Chia Tai has successfully reinforced its strengths, vision and preparedness in anticipation of its 100th anniversary milestone, strongly positioned to deliver agricultural innovations for the better and sustainable quality of life for people across the region.
Our Man in Malaysia

New APSA EC recounts his four decades of seed industry experience

Dr Chua Kim Aik is CEO of Green World Genetics Sdn Bhd (GWG), a fully-integrated vegetable seed company in Malaysia. He was selected for the 2019 APSA Award (Industry), and subsequently elected to APSA’s Executive Committee (see pages 30-31 for all EC intros). Dr. Aik recently sat down with APSA’s Kunaporn Phuntunil for a revealing interview.

Dare to dream - heading home for tropical seeds

I grew up in a farming community in Cameron Highlands, 200 kms away from Kuala Lumpur and have worked in the seed industry for the last 40 years. I developed seed production in China, India, and Thailand.

While most multinational companies only produced temperate seeds, I noticed the need for tropical seeds. In 2007, when I turned 50 years-old, I decided to resign my positions as Regional Head for Seed Production and Country Head for Syngenta in China – and go back to Malaysia. I thought, “If I do not do it now, I will never have a chance to do it.”

So I came back to Malaysia and set up a seed production company – a total value chain company. I really think our country must have our own seed, otherwise we will risk food insecurity.

Inside view of Malaysian seed industry

In the past, the seed industry in Malaysia was very quiet. Farmers did not get a good choice of quality seeds. Nevertheless, for the past ten years, the seed industry in Asia is starting to evolve. In Malaysia, the transformation from OP to Hybrid is proceeding very fast. Over the last ten years, seed in the market for food crops has become almost 100% hybrid. Among leafy crops, most are hybrid, except kankun (Ipomoea aquatica), choy sum and lettuce.

GWG is the first private company started to develop breeding programs for tropical crops. Private companies are not interested in this because they do not have the germplasm and lack human capital – so we have had to depend about 90% on imports.

However, I see a lot of opportunity for Malaysia’s seed industry. We have all the resources, a good business environment, well-founded strategic planning, not much language barrier and good weather. Companies can breed tropical, sub-tropical and temperate crops in the country. Still, we should focus on tropical products as two-thirds of the world’s population is in the tropical zone. The potential is huge, so it is time to explore this big market. Besides, foreigners can own 100% of seed companies in Malaysia. You can set up your own research stations and seed companies without constraint – unlike in other ASEAN countries requiring local partners.

I would say the challenges facing Malaysia’s seed industry involve lack of such resources as human capital and germplasm – despite Malaysia being among those countries with the greatest biodiversity!

Young Entrepreneur Program

After considering the challenges our seed industry faces, my team and I are trying to change the perception that “Malaysian agriculture is not very glamorous” and encourage young people to join in this agri sector; and I am happy to inform you that so far we are quite successful. Through the “STEP CONCEPT” and the “Young Entrepreneur Program”, we have trained more than 200 students in the past 12 years. They become our staff or partners. The program has trained young graduates to be “agro entrepreneurs”, knowing everything from the laborers’ work to management.

Aside from that, we are moving into modern farming to develop the seed industry in Malaysia: we teach proper chemical use and how to select the best seeds through more efficient crop management. We hope to produce hybrid crops with fewer and less toxic chemicals – which will attract more youngsters to join the agricultural sector.

We hope this initiative can sustain the industry, because if young people become partners, they will stay in the country. I am very happy when they start their own companies. I would say this industry is like a big cake – and I only want a small piece.

Seedsmen in a small world

The seed industry is a small world and we all know each other. I think of the seed business as a “heart business”; because – to do it – your heart must be good. You cannot be naughty. If you haven’t a good heart, if you give poor seeds to farmers and they fail, impact on the whole family is great.

On the other hand, if you produce good seeds, get good crops, get funds for the family to send the children to school, you feel satisfied.

You cannot just provide poor seed – and farmers die – and you don’t care.
I would describe my journey in seed and communications as a happy coincidence that started 15 years ago. My first stint was in the Philippine Senate where I worked as a speechwriter and then later as media and communications director for a senator. It was an excellent first job for a fresh graduate, a kind of trial by fire. I gained firsthand knowledge on the most effective means of shaping policy and reforms: legislation, institution-building, and partnerships. My then boss Senator Edgardo J. Angara was a staunch advocate of agriculture as a way to create national competitiveness.

My parents too were both very involved in agriculture, and their influence on me has been huge. My passion though, from the very beginning, has been writing. I studied Journalism in university, and then later I did my Masters in International Studies through a scholarship from the Spanish government.

I set foot in the world of seed in 2011 when I joined East-West Seed, a vegetable seed company whose clients are smallholder farmers in the tropics. My role was to develop the external and internal communications strategy of the company, plan and execute communications activities, and develop content for media.

Working in both public and private sectors has not only gained me unique perspectives from each side but, more importantly, reinforced my belief that neither can do it alone. Both sectors have a role to play, and must share the space and work together.

To this day I still get asked, “Why seed?” I think seed is a fascinating product and the sector around it is absolutely vital. I find it an exciting challenge to communicate its value to society and to find ways to advance the industry through dialog. I am a firm believer in the power of storytelling.

I jumped at the opportunity to join ISF because I wanted to get to know the seed sector from a global perspective. It’s interesting to look at the issues from this vantage point and connect the dots. My focus is to ensure ISF communications align with its Key Strategic Objectives, which are Innovation, Seed Movement; Protecting IP; Biodiversity; and Engagement – together with our members as well as partners like the FAO, OECD, UPOV, ISTA, WFP and others. Communications is not separate from, but rather a supportive function for these strategic objectives. Practically, this means two things for me:

The first is storytelling. As the global representative of the private seed sector, ISF has a responsibility to relate the significance and impact of quality seed to greater global challenges like food security, nutrition, and protecting the environment. On this ISF embraces the UN Sustainable Development Goals (SDGs). Though all 17 SDGs are important to the seed industry, to me four stand out as priorities: #2 (Zero Hunger), #13 (Climate Action), #15 (Life on Land) and #17 (Partnerships).

The SDGs are a good platform for communicating the challenges and progress, especially the positive work already being carried out in the seed sector. Many people in the industry such as plant breeders, pathologists, seed technologists, quality managers, NPPOs, and regulators have been contributing to these goals for many years.

Aside from identifying the stories, we must also consider audiences as advocates. We may be effective in relaying messages within our networks, but often we are preaching to the converted. Hence, I see a growing need to communicate further down the value chain. The best way to convince society of the seed sector’s value is to get other voices to speak positively on our behalf, e.g., sharing the perspectives of farmers or consumers like you and me. That means touching on topics that are closer to home – not just talking about seeds, but also about food and health in general.

Secondly, my focus at ISF is engaging communication professionals in the seed sector to build a network for exchanging resources, sharing experiences and learning from one another. ISF has a global communications group with members from Regional and National Seed Associations and seed companies around the world. We just had our first face-to-face meeting and workshop as part of ISF’s spring meetings in Porto, where we mapped out communications priorities and linked current campaigns and resources. I am very inspired by the potential of this group – such expertise in one room!

We believe it’s important that the seed industry presents itself as one solution to food security and sustainable food systems, but not necessarily the one and only solution. We’re one actor among many trying to make the world better by offering solutions and options to farmers and consumers.
“It's the result of quality seeds”

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The light of Asian Seed flickers

Remembering the late Indian seed pioneer and APSA co-founder

Dr Kuldip Raj Chopra, Researcher, entrepreneur, co-founder and honorary lifetime member of APSA, passed away on 6th February, aged 86. Obsequies were held in Hyderabad. A seed industry giant, Dr Chopra’s career spanned more than half a century – his influence felt by farmers in their fields, in academia, business, and in government.

Born 7 November 1933 in Lahore, in what is now Pakistan, he was the third of seven children and was affectionately named Kuldip (‘Kul’ means ‘family’ and ‘dip’ means ‘light’, so his name literally means ‘light of the family’). After primary school, he attended a government high school in Lahore before moving in 1947 to Allahabad, in Uttar Pradesh, central India. There he attended Allahabad Agricultural Institute, graduating in 1953, before going on to pursue his Master’s in Agriculture Botany in 1956 and his PhD in Agronomy from the University of Nebraska.

His professional career began as a research assistant with the All India Coordinated Maize Improvement Project wherein the Indian Council on Agricultural Research (ICAR), state agriculture universities and the Rockefeller Foundation cooperated in collecting, characterizing and developing stable, high yielding lines of disease and pest tolerant germplasm for adaptable Maize Hybrids (1957-59) at the Indian Agricultural Research Institute (IARI) in New Delhi. “The mid-fifties were a crucial period in India’s agricultural sector,” he recalled in 2017 during an Asian Seed interview. “Crop yields were low because no organized mechanism for dissemination of new varieties and new technologies yet existed.

“Agriculture was an area overseen by the states, and there was hardly any coordination — even among scientists working on the same project — among states.”

To overcome such bottlenecks, in 1955, India’s government asked the Rockefeller Foundation, which had programs in Mexico and Columbia, to help systematize India’s agricultural research, production of superior genotype seeds and marketing. The Foundation sent two experts whose 1956 report led to establishment of the country’s All India Coordinated Projects system for each major crop, starting with maize in March, 1957.

“Destiny brought me in touch with Dr U.J. Grant, who was then the Rockefeller Foundation’s Deputy Director General and Maize Breeder. Thus my professional career began.”

As a junior maize breeder for the Rockefeller Foundation, Dr Chopra conducted maize improvement work at four main- and nine sub-stations, from 1959 to 1961, resulting in release of four maize hybrids. It was the beginning of India’s entry into the “Hybrid Era” and the country’s first “green revolution”.

He then detoured to the US for education: “From 1961 to 1964, I studied at the University of Nebraska, Lincoln, where I obtained a PhD in Agronomy, before joining as a breeder in the All India Sorghum Improvement Project, from 1964 to 1966.”

Among the most versatile plants in cultivation, sorghum provides food, molasses, fodder, alcoholic beverages, and biofuels, among others, ranking in the world’s top five cereal crops. Like maize, its use is ubiquitous in the food industry – and it was his work with sorghum that inspired Dr Chopra to found his own business.

“Destiny again guided me,” he said, in acting on the advice of a Rockefeller Foundation Sorghum Breeder, Dr Lee House, to take advantage of private sector opportunities: “I was one of the few qualified professionals to resign a secure government job,” he observed wryly.

Superior hybrids and varieties having been released during the late sixties, USAID and the Rockefeller Foundation were assisting in establishment of India’s seed production, processing, quality control and marketing networks. Dr Chopra set up a small company in the country’s nascent private seed sector – the Mahendra Hybrid Seed Company. Focus was on maize; sorghum; sunflower and oilseeds; Pearl millet; cotton and fiber crops; and temperate and tropical horticultural varieties.

From 1971 to 2002, as Founder and shareholder, he led Mahendra to become one of the leading, research-based companies specializing in improvement, production, processing and marketing of proprietary and publicly bred varieties.

Remembering the late Indian seed pioneer and APSA co-founder
Since 2004 Dr Chopra was shareholder and Founder of Biostadt Mhseeds Pvt Ltd, with a similar mandate as his role in Mahendra. Dr Chopra led the new entity till retirement in 2014.

He never abandoned the public sector, however, working from 1973 onwards as a consultant with the Food and Agriculture Organization of the United Nations (FAO), the World Bank and their affiliates in seed industry development: "Over the years, I’ve done over 28 consultancies," he told APSA, "the most recent ones concerned setting up R&D systems." He advised on privatization of government-controlled systems; farm seed production; and establishing effective seed production and marketing networks in both command and free market economies, while also conducting training programs for FAO and World Bank-sponsored trainees.

Former International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Deputy Director General and GRSV Consulting Services co-founder Dr CL Laxmipathi Gowda, reflecting on their work together, had this to say about his colleague: "Dr K.R. Chopra was a visionary, and the doyen of partnership research. His contribution to initiate the Public - Private Sector Partnership with ICRISAT deserves mention.

"The whole CGIAR (Consortium of International Agricultural Research Centers) system was undergoing a financial crunch in the late 1990s, and that affected funding for R&D at ICRISAT. This funding crunch would have long-term negative impact on private sector seed companies dependent on the hybrid parents of sorghum and Pearl millet for their commercial hybrid programs.

"The ICRISAT team comprising myself, K.N. Rai and Belum Reddy had several rounds of discussion with Dr K.R. Chopra and G. Harinarayana on generating funding from private sector seed companies to augment ICRISAT’s R&D in sorghum and Pearl millet crop improvement programs.

"That led to initiation of the ICRISAT - Private Sector Hybrid Parents Research Consortium for Sorghum and Pearl Millet in 2001. Seed companies agreed to contribute funding and become members." Members got priority access to the elite hybrid parents used to develop superior commercial hybrids.

"Starting with about 12 members in 2001," said Dr Gowda, "the consortium had more than 50 members in 2009, enabling ICRISAT to receive nearly US$1.2 million to support crop improvement research. The partnership enhanced synergies between the social equity of public institutions’ research and efficient delivery of hybrid seeds by the private sector.

He said this model has been emulated by several public sector institutions in India and a few CGIAR Centers. "The greater part of credit for this bold and innovative venture," he averred, "should go to Dr K.R. Chopra."

Life took a new turn for Dr Chopra when ICAR sent an FAO-sponsored team of young seed entrepreneurs from Africa to visit Mahendra in 1973: "FAO team leader Dr Wagner – a senior officer from the FAO seed unit in Rome – was highly impressed by our in-house R&D, production and quality control systems," he recalled.

That led to an offer from the FAO to study seed sector infrastructure in Cameroon and Sri Lanka, and development of quality seed production and sales networking programs focused on bolstering the countries’ nascent private sectors.

His report on the project was commended by the FAO, and resulted in more such work from 1974 till 1998 with that organization and the World Bank: "It brought additional income, and a good use of free time away from my company responsibilities," he explained. "I preferred consultancies in Asia, and between 1992 and 1998 my assignments were primarily in Bangladesh, Sri Lanka, Nepal, Burma and China."

His experiences convinced him that what was needed were: exposure to neighboring countries’ success stories and a forum for interaction; judicious use of funding for small R&D projects; government support to minimize risk of failure; access to new technology; and a platform for transacting business.

As a director and past president of the Seed Association of India (SAI) – seeing the benefits it provided to new seedsmen; membership from both private industry and government, of companies large and small; and interaction with public sector agencies on issues of policy – he had a good idea of what that platform might look like: "I always got positive response whenever I discussed creation of a regional forum with seed entrepreneurs and officials of countries I visited," he said. "The question was how and who would take the initiative."

The FAO, with its regional office in Bangkok, appeared to Dr Chopra most suited, so he discussed creating such a forum with Mr Mogens Leminous, to whom he reported after each consultancy. Lemonius had since the early 1980s developed a regional network of seed industry contacts as part of an FAO project.

Thus, in 1992, the FAO regional office, under the leadership of Dr RS Paroda, called a meeting in Bangkok of senior agricultural officials, policy makers and seed entrepreneurs from the Asia Pacific region. Dr Chopra and Mr Lemonius presented an outline of their proposal, which – to their considerable surprise – received overwhelming support.

A Preparatory Committee was constituted and Dr Chopra elected chairman. The FAO, at Lemonius’ persistent urging, committed US$2 million as seed money for initial expenses; office space was provided by Thailand’s Department of Agricultural Extension – and APSA was born.

The Committee met five or six times over the ensuing years, drafting the constitution and bylaws. In 1994 the first of APSA’s Asian Seed Congresses was held, in Chiang Mai, led by Lemonius, and attended by some 200 delegates, with representation from companies large and small, and associate members from Europe and the US. Notable APSA contributors during that seminal period included Mr RS Arora, Mr Simon N. Groot and Mr Manas Chiaravanond.

At the second ASC in New Delhi, in 1995, hosted by the Seed Association of India, over 500 delegates registered and Dr Chopra was elected incoming President.

In addition to his work with the SAI and APSA, Dr Chopra was also president of the All India Seed Growers and Merchants Association from 1990 to 1996; was a member of several state and national seed-related bodies, of the Confederation of Indian Industries and the National Technology Council.

He authored many monographs published by the FAO and World Bank, including: Seed Enterprise Development and Management; Technical Guidelines for Sorghum and Millet Seed Production; Sorghum Seed Technology; and Global Assessment of Hybrid Rice Technologies for Breeding and Seed Production, and likewise presented numerous technical papers at national and international conferences.

Besides many regional, state, FAO and APSA awards, Dr Chopra received in 1994 ICRISAT’s most prestigious scientific honor – the Distinguished Scientific Achievement Award.

Dr Chopra is survived by his wife, Mrs Hemlata Chopra, two daughters, son Dr Rakesh Chopra, six grandchildren, and three great-grandchildren.

In addition to his honors, family and successful businesses, he leaves behind him a wealth of fond memories.

We are deeply grateful to him.
Dr Chopra steps up as APSA President during Asian Seed 1995.

Right: APSA's first president, Muhamad Sidik, from Indonesia.

Dr Chopra with his wife Mrs Hemlata Chopra.

Sharing dais with Dr R.S. Paroda, DG ICAR, Dr Manmohan Attavar CEO Indo American Seeds.

Delivering Key note address during First National Seminar organized by Seed Association of India.


Three of five APSA Honorary Lifetime Members, from left to right, Mr. Simon Groot, Dr Kulkip Raj Chopra and Mr Mogens Lemonius.
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