

# ASIAN SEED

THE OFFICIAL PUBLICATION OF THE ASIA & PACIFIC SEED ASSOCIATION

## Tracking Crop Loss by Country

Solar signals prompt examination of emerging trends.

## Australia Seed Report

Numbers, numbers, numbers highlight surplus Down Under.

## APSA-WorldVeg Consortium

New vegetable germplasm for keen plant breeders.

## Seed For Thought

CEO of Chia Tai reflects on legacy of APSA, hybrid revolution in SE Asia.

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## Crop Loss Report 2018



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# ASIAN SEED

THE OFFICIAL PUBLICATION OF THE ASIA & PACIFIC SEED ASSOCIATION

Asian Seed & Planting Material  
Volume 24, No. 1, Jan/Feb 2017

Official Publication  
ISSN 0859-1776

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*Asian Seed & Planting Material* is published bi-monthly as the official publication of the Asia & Pacific Seed Association (APSA). APSA is a provident organisation dedicated to the promotion and improvement of the seed industry in Asia Pacific.

*Asian Seed* has a pass-on readership of 3,500 worldwide. Eighty per cent of our subscribers reside in the Asia-Pacific region and include senior executives in seed enterprises, government agencies, universities and national seed associations. Unless denoted otherwise, figures are quoted in US\$.

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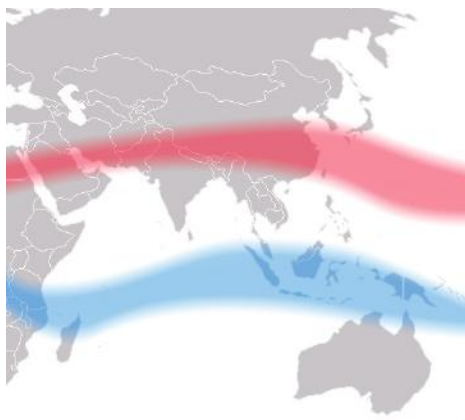
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# The Application of Tolerance in the Seed Industry



Brenda Dossey, APSA President

**Greetings and best wishes to all APSA Members celebrating the Lunar New Year and Spring Festival.**

In the current global environment, where it often seems that people are much divided in attitudes, beliefs and perceptions, the word “tolerance” keeps popping up.

From the seed industry perspective, we have used the concept of tolerance in seed testing to set parameters for understanding the test results that we all must work with and to describe the varieties we sell.

The International Seed Federation (ISF) over the years developed and has kept updated the ISF Rules and Usages for the Trade in Seeds for Sowing Purposes.

The current version, which can be downloaded from ISF's website, has been effective since 1 July 2016. You can easily access the document by searching [worldseed.org](http://worldseed.org), or typing the following shortened URL into your preferred web browser:

[tinyurl.com/ISF-seed-trade-rules](http://tinyurl.com/ISF-seed-trade-rules)

If you are an importer or exporter of seeds for sowing, this document should be of interest to you. It lays out the fundamentals

of how our contracts with each other should work.

Annex 2 contains the "Tables for Tolerances". There are four tables contained there (A through D) that cover purity tolerances by percentage, germination tolerances, purity tolerances expressed by number and maximum tolerances for comparing two seed moisture tests.

I keep a current copy of the ISF Rules stored in a resources directory on my computer for ease of reference as all the seeds we trade in our company are governed by these rules. We state this in our contracts.

I consider the ISF Rules to be a “living document” as it has been updated through the years to stay relevant for all of us who sell seed for sowing.

I suppose that is even more relevant when you take into consideration that we should have a “living document” for seed for sowing since the seeds we sell are also “living”.

The concept of tolerance is again applied in our industry by expressing various characteristics of the species and varieties that we sell by stating their agronomic tolerances. Shade tolerance, drought tolerance, disease

tolerance, salt tolerance and wear tolerance are just a few that quickly come to mind.

These are all important items to consider when choosing the appropriate species and varieties to use in various situations.

As members of an industry that supports the concept of tolerances for seed testing and tolerances as descriptors for the products we sell, I would like to suggest that we incorporate some tolerance for each other as we go through our daily lives.

In its simplest definition, tolerance is described as a permissible difference. To me, this means that we can agree to disagree, yet still work together to understand each other a little better than we did before.

The Asia and Pacific Seed Association has flourished because we have worked together as volunteers to promote the seed industry in the region in spite of our differences and our diverse backgrounds.

We are united in APSA's mission: Sustainable agriculture through the production and trade of quality seeds for the world. 🌱



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# APSA and 2018



Heidi Gallant, APSA Director

**Another new year, another set of resolutions and another clean slate of opportunities ahead of us: The Secretariat and I are starting the year very positive and excited about what we will achieve for APSA in 2018.**

Firstly, we have another new face at the APSA office with the addition of our Deputy Director to the team: Dr Kanokwan Chodchoey (May) brings seed industry and particularly seed health and seed quality experience to our team and we are delighted to welcome her to the APSA family. Read more about Dr May's background on page 33.

In other news, our membership renewals have been processed more quickly than ever before with the help of our new membership database and directory. Please be sure to renew early to avoid a lapse in membership benefits.

At the time of writing this letter, most of our Special Interest Groups and Standing Committees have had their first meetings of 2018.

We have a lot of activity planned for this year. One of the most exciting events on the horizon is APSA's first

in-person meeting of our committees which will take place April 24 and 25 here in Bangkok Thailand.

The new Working Group of Integrated Seed Companies (WIC), operating under the Special Interest Group-Vegetables and Ornamentals is holding its second meeting, which follows its founding meeting at the ASC2017.

Also meeting during these dates are the Standing Committees for IPR and Biodiversity, Trade and Marketing and Seed Technology and the Special Interest Groups for Cover Crops, Field Crops and Hybrid Rice.

The two-day event will conclude with a joint meeting for shared co-operation amongst the APSA committees. See page 32 for more updates from our SIGs and SCs.

Also coming up in 2018 is the APSA-World Vegetable Center Consortium Workshop, taking place May 16 and 17 in Chinese Taipei. Please register for the consortium if your company would like to take advantage of 12-month exclusivity on advanced breeding lines, becoming available from World Veg in 2018. More details on pages 26 and 27.

In July, we will organize the first Asian Cucurbit Round Table in Bangkok, in collaboration with Kasetsart University. This event is tentatively scheduled for 19-21 July and we will host over 200 cucurbit plant breeders and scientists to discuss pests and disease affecting this important crop in our region. The event also encourages public private co-operation.

August will see APSA host the 4th Expert Consultation on Phytosanitary Measures in the Asia Pacific Region. We have many more events, including the biggest ever Asian Seed Congress. Sponsorship opportunities for Asian Seed Congress 2018, to be held in Manila, the Philippines, from 12-15 Nov, are posted on our website. Last year's sponsors saw an incredible increase in clicks to their website by being posted on our conference page.

Please do not miss your opportunity for enhanced company promotion this year. Booths and trading tables always sell out really quickly so please reserve early to avoid disappointment.

Also on offer this year is private Skyboxes. Have you ever felt that the private meeting rooms were somewhat removed

from the action? The sky box solves this problem, overlooking the trading table floor but still offering all the privacy, convenience and luxury of your own private meeting room.

They have a private entrance area, special butler service and the best view in the house of the action taking place on the trading floor. You can even drape your company banner on the sky box balcony for increased corporate branding at the event. For more details, please contact Events Officer, Mike Kingpayom. ([mike@apsaseed.org](mailto:mike@apsaseed.org)).

I am feeling positive about APSA's attempts to register as an international organization in Thailand this year with increased co-operation and communication between our office and the Thailand Department of Agriculture and Kasetsart University.

As always, if you have questions or concerns, the Secretariat is happy to hear from you. Please give us a call or email one of our officers at your convenience.

The secretariat positions and titles are located on our website and they can be reached at [firstname@apsaseed.org](mailto:firstname@apsaseed.org). 🐦



APSA and the FAO are engaged in dialogue about regional food security: Pictured, from left: Mrs Kanokwan Chodchoey (APSA Deputy Director); Mrs Heidi Gallant (APSA Director); Ms Kundhavi Kadiresanis (Asst Director-General and FAO Regional Representative for Asia and the Pacific) Ms Xiangjun Yao (FAO Regional Programme Leader) and Ms Suchada Yansarasin (APSA Business Development Officer)


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# Streamlining Seed Movements

**R**ecent developments aimed at streamlining the international trade in seeds pose significant benefits for APSA members. *Asian Seed* reports:

## PRISMA PBR

The 74-member International Union for the Protection of New Varieties of Plants (UPOV) is urging greater adoption of its on-line registration tool, UPOV PRISMA PBR. 21 nations and the EU currently accept applications to participating PVP Offices in a digital format, affording easy transmission of application data for Plant Breeders' Rights. This allows users a one-stop multilingual interface to obtain intellectual property protection for varieties at home and internationally. It translates much of the information in the Technical Questionnaire automatically, and allows re-use of relevant data in subsequent applications.

To qualify for registration, new plants must be novel and not previously marketed in countries where rights are applied for; they must be distinct from other varieties; must display homogeneity; and traits unique to the new variety must be stable. The tool lets users specify differing roles (e.g.: drafter, signatory, translator, agent), is secure and confidential – and free to use till June.

## E-Passport for Seeds

The ePhyto program of the International Plant Protection Convention (IPPC) provides developing countries without existing national certification systems a simple

Generic ePhyto National System (GeNS) capable of producing, sending and receiving electronic phytosanitary certificates. It establishes a harmonized exchange tool, referred to as a 'hub', to facilitate electronic exchange based on a single communication protocol, thereby eliminating costly and complex bilateral protocols. The combination, referred to as 'the ePhyto Solution', makes it easier for countries with limited resources to transmit electronic phytosanitary certificates. It is, moreover, intended to be compatible with existing border information management systems.

At the 3rd IPPC Global Symposium on ePhyto, held 22-26 January 2018 in Kuala Lumpur, Malaysia, it was noted that the ePhyto Solution supports the benefits of Trade Facilitation Agreements (TFA). According to an IPPC press release, "the TFA is a key element in improving safe trade, and implementation of the IPPC ePhyto Solution can be an important component in improving border efficiency, increased border coordination between agencies and implementation of risk-based measures."

86 participants from 36 countries and 20 international or regional associations attended the Symposium, which was supported by funding from the Standards and Trade Development Facility, and the governments of Australia, Canada and the US, with project links to Asian Development Bank and World Bank Group efforts. The Hub and GeNS

are taking off with pilots worldwide: eight countries – Argentina, Australia, Chile, China, Korea, The Netherlands, New Zealand and the US – are in various stages of connecting to the Hub, and over 10,000 test electronic certificates were transferred in 2017. Ghana, Samoa and Sri Lanka expect to move ahead with GeNS in 2018.

## Risk Assessment

Risk-based measures are at the heart of ReFreSH, an initiative by the American Seed Trade Association and the US Department of Agriculture which will substitute lot-by-lot shipment assessments with accreditation of exporting firms, thereby cutting costs dramatically and reducing time for approval. Thus, instead of needing to test individual lots of seed, companies can opt to get accredited based on risk assessments leveraging best industry management practices for seed pests. Initially piloted in North America, the aim is a globally accepted system.

Under ReFreSH, phytosanitary measures will be proportioned to assess pest risk by evaluating intended use of seeds, and by determining whether seeds are a pathway for pests. The current focus on consignment-by-consignment inspection will be re-directed towards accrediting producers and production processes as the basis for phytosanitary certification. Producing and exporting companies will be accredited by their National Plant Protection Organizations (NPPOs).

*Watch this space for more updates, developments on the above and beyond! 🌱*

## VSAT To Lead Hort Group

The Vegetable Sector Accelerated Taskforce (VSAT) – key stakeholders in the newly formed National Seed Association of Myanmar – has been appointed as a lead partner in the Horticulture Working Group of the Myanmar Agricultural Network (MAN). The news was announced at a meeting on 30 January at MAN's Head Office in Yangon. Founded in 2015, VSAT is a public-private sector platform that promotes vegetable sector development in Myanmar. Other key partners in the Horticulture Working Group are Mercy Corps, YOMA Strategic Holdings, JJ Pun, Swisscontact, the Embassy of the Netherlands, East-West Seed and Limagrain Group. Established in 2013, MAN has several active Working Groups. In addition to Horticulture, there are also groups for Rice; Coffee; Oil & Pulse Seeds; Agri Finance and Mobile Services; and the Seed Sector. APSA is a lead partner in the latter, along with YOMA Strategic Holdings, Agro Bio Products, Aventine, Bayer Crop Science, CP Yangon, East-West Seed, ICCO-Cooperation, Seed Asia and the Seeds Energy Agro Group. MAN is among five country networks supported by Grow Asia, which is a multi-stakeholder partnership platform that catalyzes action on inclusive and sustainable agricultural development in Southeast Asia. Other networks are established in Cambodia, the Philippines, Vietnam and Indonesia.



Photo: USDA



# Southern Seed Surplus

Australia traders move US\$222mn worth of seed in 20-month period

There are some interesting seed trade trends to highlight in Australia, which is a key APSA member country, and a leading producer, exporter and importer of various types of sowing seed. Before we jump into the data, let's recap some important developments in seed Down Under.

Be sure to mark your calendars: From 3-6 June, the International Seed Federation (ISF) and Australian Seed Federation (ASF) are co-hosting the World Seed Congress, which will take place in Brisbane, Queensland.

Meanwhile, Australia's seed industry stakeholders are anticipating a number of key developments on the national agenda, as highlighted last issue in summaries from our National Seed Association meeting last November in Bangkok.

Namely, the Australian government is in the process of reviewing

import conditions for seeds for a number of crop families: *Apiaceae*, *Solanaceae*, *Brassica* and *Cucurbit*. The first draft Pest Risk Analysis (for *Apiaceae*) was released late last year for public comment. Also, the Australian Biosecurity Plant Division released a draft review of import conditions for cucurbitaceous crop seeds, which will affect trade of various types of cucurbit crops, including cucumber, melon, pumpkin and zucchini. The draft is expected to be finalized early this year, and is the first of several PRAs lined up for review in the coming year.

For all the other updates from the ASF, be sure to check out the report in last issue, which can also be accessed from [apsaseed.org](http://apsaseed.org). Now on to the numbers!

## 96k Tonnes/Year

No less than 160,440 tonnes of sowing seed worth US\$222 million moved across Australian borders during a recent 20-month period. That equates to an average of about 8,000 tonnes of seed per month,

or 96,000 t / year, making the seed market worth at least US\$133mn/ year. The

types of sowing seed logged and analyzed include field crops (maize, rough paddy, soya bean, sugar beet, barley, cotton, groundnut, millet, oats, seed potato, sorghum and wheat); forage (alfalfa, clover, fescue, ryegrass and Kentucky bluegrass); and various types of herbaceous flowering plants, fruits, spores and vegetables.

During the focus period, Australia had a 42-million-dollar seed trade surplus, calculated from \$232mn in exports against \$190mn in imports. Exports accounted for 132,735 t of seed, while 27,705 t was imported. The average value of imported seed was \$6,862/t, in stark contrast to exported seed, worth just \$1,754/t.

## Outbound

Most types of Australian field crop seed were exported at values well below the mean. For example, meslin wheat seed traded at an average \$224/t; cotton \$317; maize \$333; sorghum \$490; paddy \$727; millet \$728; oat \$838 and seed potato \$874.

Notable field crop seed exceptions that traded at above-average rates include sugar beet and barley. A total of 38 tonnes of the former was exported at the average rate of \$8,198/t, while 29 t of the latter was exported at the rate of an





## AVERAGE TRADE PRICE TRENDS: VEGETABLE SEED



astonishing \$156,000/t. Top importers of Australian barley seed were Vietnam, China, Germany, Japan, South Korea, Malaysia and Chinese Taipei.

Traded at an even higher premium than barley, Australian melon seed was exported at the staggering average rate of \$1,862/kg, which would equate to \$1.86mn/t;

however the total volume of this type of seed exported during the focus period was just 51 kg, imported by New Zealand, France and the US.

Although field crop seed represented more than 77% of exported volume, these types of staple grain seeds accounted for just 21% of the market, which was dominated by forage crop seeds (55%) even though these types of livestock-supporting seeds accounted for just 15% of the

exported volume.

Though vegetable seeds made up only about 3% of exported volume, this type of lucrative commodity claimed more than 18% of the market.

### Inbound

Of the 27,705 tonnes of sowing seed imported into Australia during the focus period, field crops made up just 5% volume, compared to seed of forage crops, which made up nearly 80% of all seed imports. An overwhelming majority of imported forage crop seeds were

ryegrass (*Lolium multiflorum lam.*), making up 67% of all inbound volumes, though only representing 15% market share.

Not surprisingly, vegetable seeds were the most lucrative import category, claiming just over half the market, while making up just 7% of inbound consignments.

### Wholesome Veggies

Vegetable varieties made up half of all of Australia's (4,183 t, \$43mn) of exported seeds, though only about 7% of imports (not counting coriander or melon cultivars).

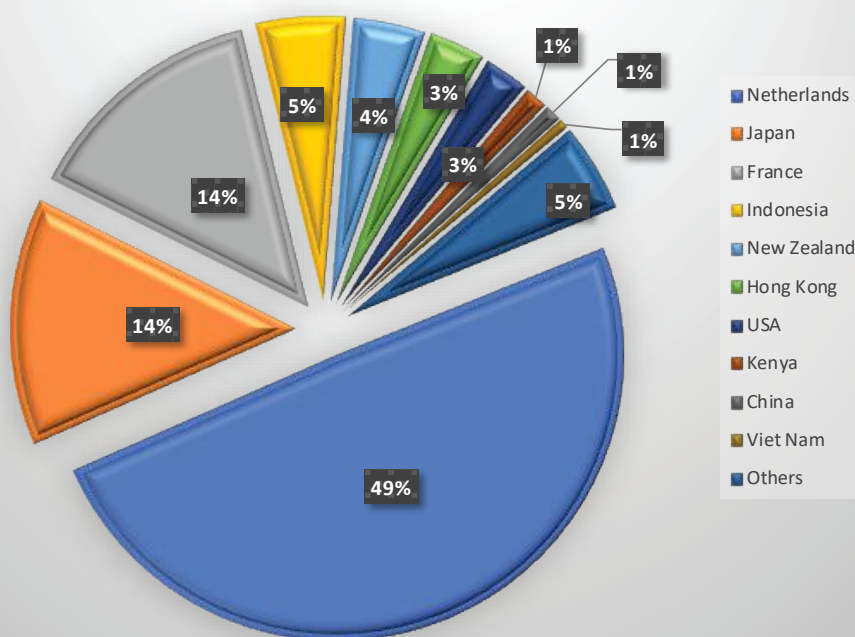




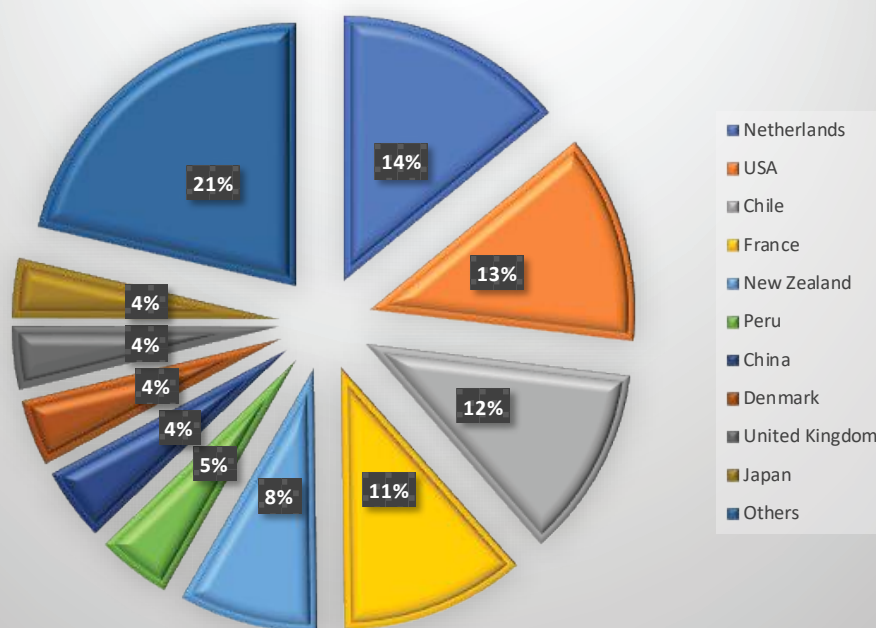


# Top Veg Seed Partners

## Top Markets for Australian Vegetable Seed



## Australia's Top Vegetable Seed Suppliers



**MARKET SHARE:**  
The pie graphs here highlight Australia's top veg seed partners as measured by a percentage of the value of trade during the focus period. In terms of volume, however, New Zealand was Australia's top supplier while Indonesia was the top importer of Australian veg seed.

These seeds went to 49 countries, but a majority (95%) went to just six. More than half (55%) of the veg seeds, or 2,288 tonnes, went to Indonesia. Other leading importers were Hong Kong and the Netherlands (both 11%), Japan (8%), France (6%) and New Zealand (4%).

Veg seeds were exported at an average of \$10/kg; Australia's top

export market was the Netherlands, which imported 470.43 t worth \$22mn, just under half of the market, equating to an average of \$44/kg.

The second biggest market for Australian vegetable seed was Japan, which imported 353 t worth \$6.7mn, or nearly 15% of the market, at an average \$18/kg; France imported 242 t worth \$6mn

or 13.5% share, with an average price of \$24 per kg.

Though Indonesia imported more Australian vegetable seeds than any other country during the focus period, it obtained the seed at the most economic price, about 89 cents per kg, totaling up to \$2.1 million worth of seed, under 5% of the market.

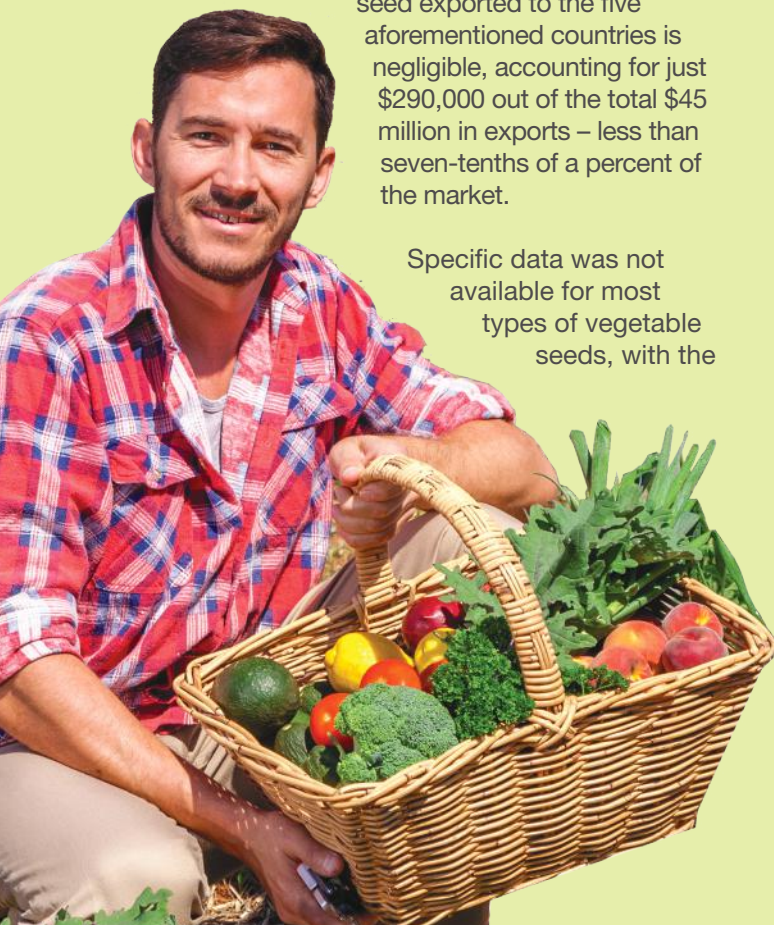
Other countries who imported Australian seed at below-average rates were Hong Kong (\$2.9/kg); Vietnam (\$4.9/kg); South Korea (\$5.1/kg); Singapore (\$6.2/kg); India (\$8.6) and China (\$9.6/kg).

On the other end of the value spectrum, countries that paid the highest premiums for Australian vegetable seed were Uruguay (\$11,750/kg), Portugal (\$4,000/kg), Norway (\$682/kg), Maldives (\$458/kg) and Canada (\$314/kg).

Though these values appear anomalous when compared to the mean traded price, it should be noted that the total value of vegetable

seed exported to the five aforementioned countries is negligible, accounting for just \$290,000 out of the total \$45 million in exports – less than seven-tenths of a percent of the market.

Specific data was not available for most types of vegetable seeds, with the



exception of cabbage and other similar types of *brassica* seeds (code no. 12099110), of which Australia exported 621 tonnes, valued at nearly \$8mn.

This seed went to 24 countries, with six trading partners dominating 98% of the demand in terms of volume: Hong Kong (70%); France (11.3%); Japan (5.4%); Vietnam (5%); the Netherlands (4%) and New Zealand (1.8%).

Seven countries accounted for 94% of the overall veg seed export market value; namely, the Netherlands (40%); Japan (15.8%); France (14%); Hong Kong (11.6%); Kenya (5.6%); New Zealand (4.2%) and Vietnam (2.7%).

In 20 months Australian seed importers brought in 2,003 t of vegetable varieties worth \$95.8mn, equating to an average price of \$48/kg. Though these seeds came from 40 nations, more than 94% of them came from just 10: New Zealand (32%); United States (21%); Denmark (15%); Netherlands (8.3%); France (4.3%); Germany (3.2%); Italy (2.6%); United Kingdom (2.5%); China (1.9%) and Chile (1.7%).

The top ten market leaders supplying vegetable seed to Australia during the period were the Netherlands (13.7%); US (13%); Chile (11.6%); France (11%); New Zealand (8.3%); China (5.1%); Peru (4.5%); Denmark (4.1%); Japan (3.9%) and the United Kingdom (3.6%).

Seeds from a quarter of the 40 supplying countries were traded below the mean price: seed from Pakistan averaged \$37/kg; US \$29; Austria \$24.8; Hong Kong \$14.2; Denmark \$12.7; New Zealand \$12.1; Poland \$9.2; Germany \$7.3; Hungary \$5.1 and Indonesia \$2.2.

The most expensive vegetable germplasm brought to Australia came from Iceland (\$24,000/kg); Guatemala (\$9,323/kg); Turkey (\$4,086/kg); Latvia (\$3,748/kg); Switzerland (\$1,478/kg); Brazil (\$1,200/kg) and Israel (\$1,175/kg).

Trade data was not available for specific varieties of most of the imported vegetable seed. 🌱

## ABOUT THIS REPORT

*The analysis, observations in this report are based on international trade data reported by the UN Trade Commission, which cites Australia Bureau of Statistics as its primary source for these figures. Unless where otherwise stated, the data covers a 20-month period – from March, 2016 to October, 2017. APSA does not provide any guarantees about the validity or accuracy of the data, tables, charts or analysis, which can be corroborated by querying the UN Trade Commission database, directly. The report is intended to highlight general trends, but does not represent the full picture of seed trade, particularly in respect to domestic demand and consumption. Specific queries about domestic trends should be addressed to the Australian Seed Federation (asf.asn.au/),*

### OTHER NOTES ABOUT THE DATA:

- Melon seeds (120770) are grouped into fruit and spores category, not vegetables;
- Field crops include maize (100510); paddy (100610); soya (120110); sugar beet (120910); durham wheat (100111); meslin wheat (100191); barley (100310); cotton (120721); groundnut (120230); millet (100821); oats (100410); seed potato (070110); and sorghum (100710).
- Forage crops include Alfalfa (120921); Clover "*Trifolium spp*" (120922); Fescue (120923); Kentucky blue grass "*Poa pratensis L.*" (120924); Ryegrass "*Lolium multiflorum lam.*, *Lolium perenne L.* (120925) and other, unidentified varieties (120929).
- Most varieties of seed classified as fruit and spores (120999); herbaceous flowering plants (120930) and vegetables (120991) are not specified, with the exception of coriander (090921), cumin (090931); Juniper berries and seeds of anise, badian, caraway or fennel (090961).





# Seed Movements



# Crop, Climate Calamity

Our sun has entered into a phase of historically-low output, and seed industry stakeholders would be wise to take heed. *Asian Seed* reports.

## DISCLAIMER

*The views and opinions expressed in this article are based on independently corroborated research by the Asian Seed editorial team and do not necessarily reflect the official position of APSA. Readers are encouraged to do their own research. Expert feedback, opinions and contributions – whether complementary or contrary – are welcome, and should be sent to: [Steven@apsaseed.org](mailto:Steven@apsaseed.org)*

The sun, which is the enabler of photosynthesis, and an undeniable influencer if not driver of Earth's climate systems – factors which crop seed production directly depend on – has already begun what could be an extended state of slumber.

Consensus among solar physicists is that the coming decade should prove to be turbulent if not interesting times on Planet Earth; measurements of sunspots, solar wind, space weather, cosmic rays and other solar-influenced geomagnetic forces observed during the current Solar Cycle 24 – which began in 2008, and is set to conclude by 2020 – pre-empt a historically-weak Solar Cycle 25, which is on track to be one of the quietest cycles in terms of sun activity in centuries, if not millennia.

Indeed, a growing number of climate scientists portend the upcoming cycle to be the start of a new Grand Solar Minimum (GSM). Some have suggested that the cycle could begin earlier than expected, as soon as 2019.

Harbingers include: total solar irradiance (TSI), geomagnetism, cosmic ray flux, volcanism and cloud albedo. Already in 2018 – and at least since 2016 – the effects of a weakening sun on agricultural productivity are plain.

As the sun goes to sleep during Grand Solar Minima, Earth's climate and weather

systems wake up. Extreme weather events and great transformations can take place, driven primarily by atmospheric chemistry linked to the sun – that is to say, without factoring for human influences on weather and climate.

Nonetheless, adverse effects on regional and global food production arising during the most recent GSMs are well-documented. For example, during the “Little Ice Age”, a relatively cool period between the 17<sup>th</sup> and 19<sup>th</sup> centuries marked by two GSMs (the Wolf and Maunder minima), food famines and shortage-induced unrest were the norm.

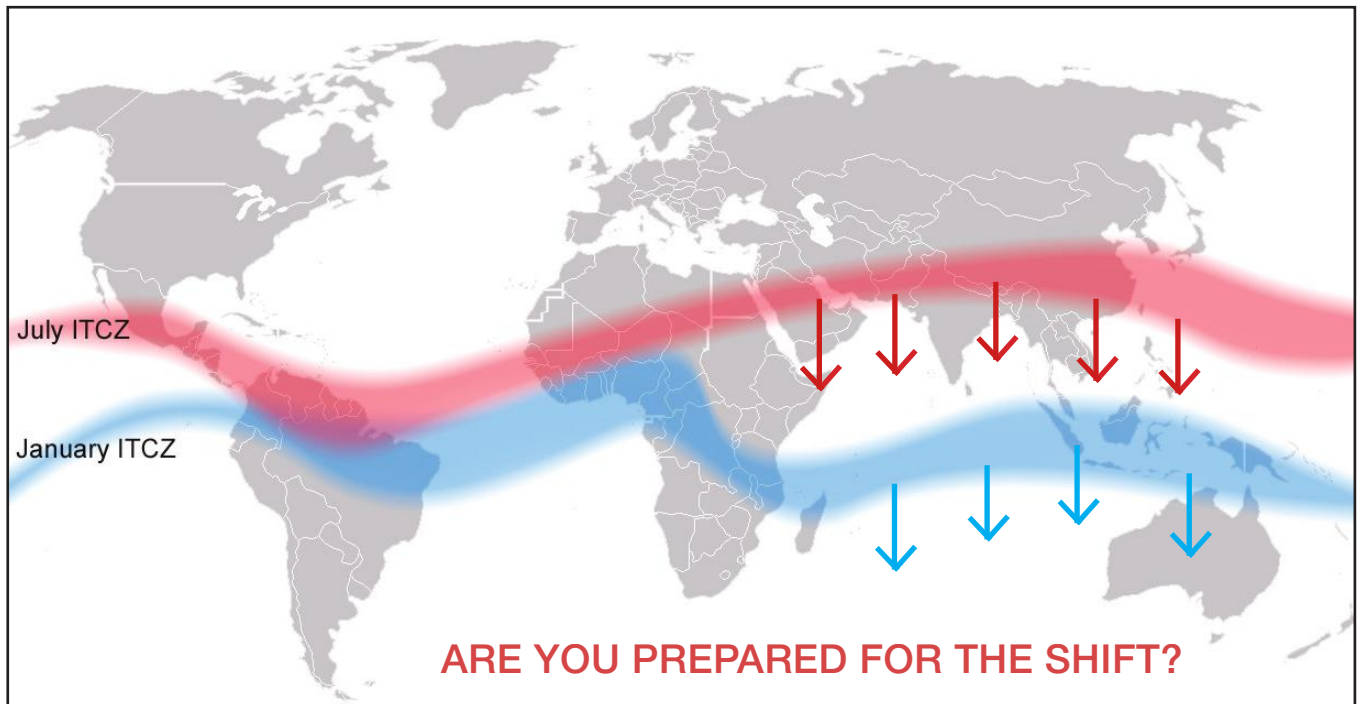
If, indeed, a new GSM is upon us, history teaches us to beware of the following:

- 1) Less sunshine reaching the planet's surface (TSI)
- 2) More clouds blanketing the earth's lower atmosphere (cosmic ray-induced cloud albedo)
- 3) Extreme and rapid changes in rainfall patterns (shifting rain belt, see next page)
- 4) An uptick in large-scale volcanic eruptions

Combined, these factors will alter seasons, and thereby impact productivity across the planet's conventional grain and green belts, which are forecast to shift away from temperate zones and towards subtropical or tropical regions.







Global seed production will be affected. Can we better implement programs for effective geographic and crop-wise seed breeding and multiplication? You bet, but first we need to look at how these changes affect agriculture.

The clock is ticking, and we must act quickly but wisely. The good news is that changes in climate and weather influencing agricultural productivity are to some degree predictable.

### AN EVER-FLUID ITCZ

To better grasp long-term weather patterns and climate, it is essential to understand tropical rain belt mechanisms. Formally known as the Intertropical Convergence Zone (and familiarly as the “doldrums”), it is a belt of low pressure that straddles the equator between 15 degrees north and south latitude. The ITCZ powerfully influences global weather, affecting jetstreams, monsoons and rainfall patterns.

Every year, the ITCZ migrates from its northernmost position in January to its southernmost in July, oscillating between the seasons (see image). This annual migration is forced by temperature budgets (the flow of incoming and outgoing energy is called Earth’s ‘energy budget’), especially over large land masses, and brings southwesterly monsoons to South and Southeast Asia during the Northern Hemisphere spring and summer periods, typically from June to November.

Then, during the other six months of the year, cooler weather in higher latitudes forces a southward migration of the ITCZ, which coincides with northeasterly monsoon winds that bring wet and windy weather to subtropical and tropical areas, especially the temperate and subtropical coasts lining the South China Sea.

Farmers and seed multipliers increasingly experience what is commonly described in news reports as “unseasonable rain” or “unusual drought” (see following pages). Since the peak or maximum of Solar Cycle 24 around 2015, a key driver of this unpredictable, bad weather is shifting or expanding coverage of the ITCZ, which, in turn, is directly influenced by cosmic ray flux and diminishing solar irradiance associated with waning solar activity.

In other words, as solar magnetism wanes, the earth’s magnetic shield weakens in effect. The result is more cosmic rays penetrating the atmosphere.

Two key effects on the climate can be observed: first is an overall increase in low lying clouds, owing to cosmic ray-induced cloud nucleation, which for many tropical and subtropical zones means more precipitation, storms and floods. The second is that in many locales the rainy season does not start or end at the usual time; and sometimes it is longer, sometimes shorter, than usual.

When average temperatures in temperate climates plummet (as they tend to do during GSM), the ITCZ’s average position moves further south, oscillating and expanding in a new pattern, driven by convective forces of the relatively warmer equatorial zone. Conventionally-arid areas may bloom with rain-fed flora, attracting hosts of migrating birds, other vertebrates and invertebrates (including, need we say it, pests).

A number of recent examples show emerging rain patterns bringing deserts to life, phenomena attributable to the shifting and more active ITCZ. Specifically, many parts of Australia’s remote outback received record rainfall during 2016 and 2017, with reports rife of rare wildflower blooms and mass animal migrations. A notable instance occurred at Uluru (Ayers Rock), near Alice Springs, in the arid southern region of Australia’s Northern Territory. In late December, 2016, an unusual wave of precipitation during Australia’s summer caused the typically dry desert landmark to stream with waterfalls; flash floods presented a hazard for the unsuspecting.

The excess rain was not merely a freak episode: summer rain in that region is apparently increasing. In January, 2018 rainfall at Uluru was 64mm, more than double the January average of the previous 32 years. Likewise, record rainfall has filled Australian inland lakes to record levels in the eastern

Pilbara region of Western Australia, luring many colonies of birds at least since the start of 2017.

Agricultural productivity in some locations will be hampered by the increasingly fluid ICTZ, becoming more vulnerable to freak deluges and storminess (highlighted in the maps on subsequent pages by blue pinpoints; yellow markers indicate places where a scarcity of rain has had adverse impact on productivity). It goes without saying, therefore, that growing and harvesting seasons for specific geographical areas need continuous monitoring, tracking and re-examination.

One way to better understand the current trend is to analyze weather and crop loss reports, then compare these to trends during previous GSMs. It may be possible thereby to identify emerging deviation from recorded cycles.

Thus, though isolated weather events are explainable as arising from other drivers of atmospheric chemistry (e.g.: anthropogenic pollution and geo-engineering), climate patterns are driven primarily by the ITCZ – which is driven primarily by the sun.

## CHRONOLOGICAL CLIMATE CLUES

Inquiry into the paleoclimate of this planet reveals many clues regarding the effects on weather and climate of a Grand Solar Minimum. Looking at proxy data may help deter-

mine precipitation and cycles in flora or fauna. And this could help us determine what kinds of flora or fauna may be better-suited for emerging biomes. Armed with such foresight, and a sturdy foundation in seed breeding, disruptions can be avoided, or, at any rate, mitigated.

So let's look at a case in point: having noticed a decrease in intensity in the East Asian summer monsoon since 1920, a team of Chinese researchers, led by the Key Laboratory of Karst Dynamics' Jian-Jun Yin, used data from an aragonite stalagmite in the Lianhua Cave of central China's Wuling Mountains to link Asian summer monsoon precipitation to solar irradiation and the El Niño Southern Oscillation.

Data revealed weakening monsoons, making the area cold and dry – and more prone to drought – during the Little Ice Age, which was produced by a shift southward in the ITCZ during the era's GSM.

In another study, Stefan Polanski et al. from the University of Birmingham's School of Geography, Earth and Environmental Sciences, used multi-proxy reconstructions and climate model simulations to identify regional moisture anomaly trends in South Asia during the past thousand years, particularly during the transition period between the warmer Medieval Climate

Anomaly (900–1100 AD) and the cooler temperature of the Little Ice Age (1515–1715 AD). Their findings support the hypothesis that Indian Summer Monsoon activity tends to shift northward during extremely active solar periods (Grand Solar Maxima), and southwards during relatively inactive solar cycle periods (Grand Solar Minima).

In conclusion, regional and country focused paleoclimate studies such as the two aforementioned examples are a good starting point for plant breeders to try to make sense out of what may seem like an erratic and unpredictable climate shift happening before our eyes.

At the same time, using the past to predict the future is not fool-proof, and should only complement an integrated approach. As intellectuals, observers, researchers and scientists, we must not be complacent and downplay other important factors that were not at play in past episodes of climate change.

We may not be able to control the sun, volcanoes or jet streams, but we can control how we are affected by them, first by studying and understanding their nature; then, by making informed decisions – about how, why, when and where we produce and process seed, the basis of our sustenance and sustainability. 🌱

## MAPPING TRENDS

To help Asian Seed readers and APSA members start to track and identify emerging climate and weather trends and patterns – whether in respect to the adverse impacts on agricultural productivity from flooding, drought, frost, snow, hailstorms, volcanic eruptions or pest and disease infestations – we've started an initiative to track crop loss in an online map and database.

In this issue, we are sharing highlights from the past year focusing on three regions: Oceania (Australia & New Zealand); South Asia and Southeast Asia. In the next issue, we'll focus on East, Central and West Asia.

Mapping events in 2016, 2017 and 2018 is only the start, however. Since weather is concerned with short term patterns, and climate the long term, it will thus require continuous tracking to confidently discern between freak anomalies, and emerging long-term patterns. But as the legendary quote by Lao Tzu goes, "A journey of a thousand miles [sic] begins with a single step". Come, join the journey with *Asian Seed*.

### CROP LOSS KEY

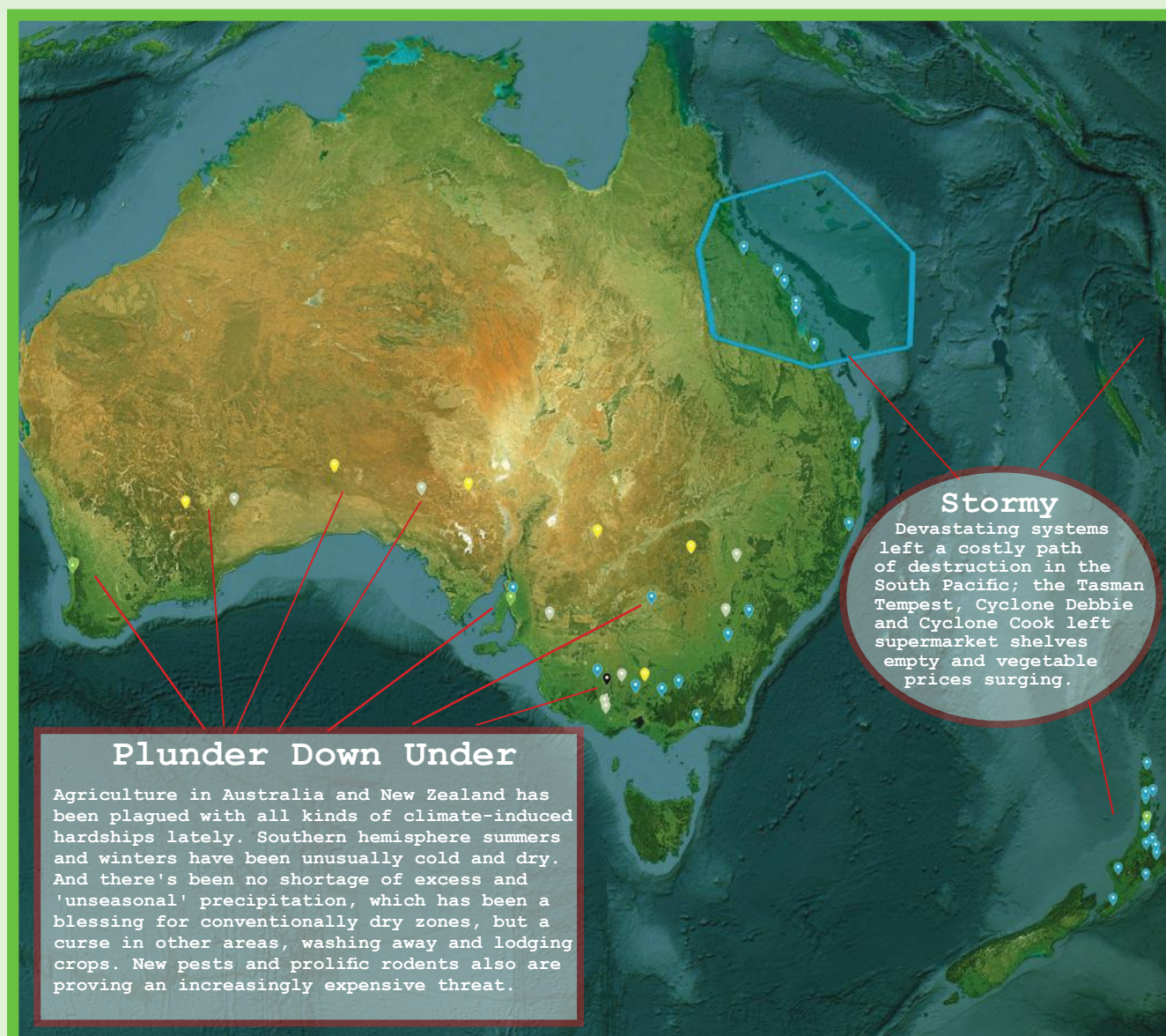
-  Flood, Storm, Deluge, Cyclone
-  Drought, Moisture Stress
-  Pest, Disease Infestation
-  Volcanic, Hail, Geomagnetic
-  Frost, Snow, Blizzard
-  Heat wave, stress

## Access Country Crop Loss Data Online

The full mapping data will be embedded onto APSA's website, complete with summaries, damage assessments and references for pinpointed climate-induced crop loss events. We've embedded the data using Google MyMaps, which can be exported into an interactive KMZ file for viewing with applications such as Google Earth. Good Standing APSA members who wish to access, or contribute to this map and data set, please email [Steven@apsaseed.org](mailto:Steven@apsaseed.org). Members in mainland China can obtain the data by emailing [Xiaofeng\\_APSA@163.com](mailto:Xiaofeng_APSA@163.com).



# Australia, New Zealand



Australia			
Period	Location	Climate-Weather Event	Affected Crop(s)
Jan-Dec 2017	nationwide	Storms, muddy fields	asparagus, celery, eggplant, parsnips, snow peas, silver-beet, squash, sweet corn, zucchini, mushrooms, potatoes, sweet potatoes, broccoli, cauliflower, Sweet truss tomatoes, Avocados, lettuce, basil and shallots
2017 Jan	Mid North, Bendigo, Wimmera	heavy rains	pulses, peas, wheat
2017 February	Perth, Belmont, Mount Hawthorn, Palmyra	pest infestation: tomato potato psyllid	tomato, potato, eggplant, capsicum, chilli, tomatillo, sweet potato
2017 Mar-June	Prosperpine, Mackay, Plane Creek, Bowen, Townsville, Rock Hampton	Cyclone Debbie	cane, horticulture crops, tomato, capsicum and eggplant
2017 May	Bute South Australia	mice infestation	wheat, canola
2017 June	Western SA and WA; northern NSW	Dry weather	Wheat
2017 June	NSW, WA, SA and Victoria	Dry, cold winter	Cereal Crops & Pulses
2017-Aug	NSW	sustained rains	macademia
2017 November	Victoria, Euroa, Gippsland, Wangaratta	excessive rain, floods	cherries
2017 November	Victoria, Ararat, Westmere, Maroona	frost	wheat
2017 Nov-Dec	Western Victoria, Ararat, Banyena	frost, hail, torrential rain & floods	lentils, chickpeas, wheat, canola and cherries damaged
2017 Dec	NSW: Orange and Young	excessive rain	cherries
2017 Dec	South Australia, Riverland	frost	peas
New Zealand			
2017 Mar-May	North Island	Storms & Cyclones	Whole milk powder
2107 April	Pukekohe	Cyclone Debbie	onions, to lettuces, squash and broccoli
2017 April	Bay of Plenty	Cyclone Cook, flooding	forage, maize, dairy, kiwifruit
2017 April	Vanuatu: Epi island	Cyclone Cook, flooding	root crops, banana and papaya
2017 April	Pukekohe and Levin	Tasman Tempest, Cyclones Debbie and Cook	broccoli, cauliflower, spinach and lettuce
2017 Apr-May	Whangarei, Pukekohe, Bay of Plenty, Hawkes Bay, Katikati	Tasman Tempest, Cyclones Debbie and Cook	lettuces, spinach and some other green vegetables
2017 Apr-May	Auckland	Tasman Tempest, Cyclones Debbie and Cook	Leafy Vegetables
2017 Dec	Dargaville, Ruawai and Taranaki	Storms	Kumara, tomato and capsicum
2017 Dec	Paengaroa & Houhora	prolonged heavy rains, heavy winds affecting harvest	avacadoes, kiwis

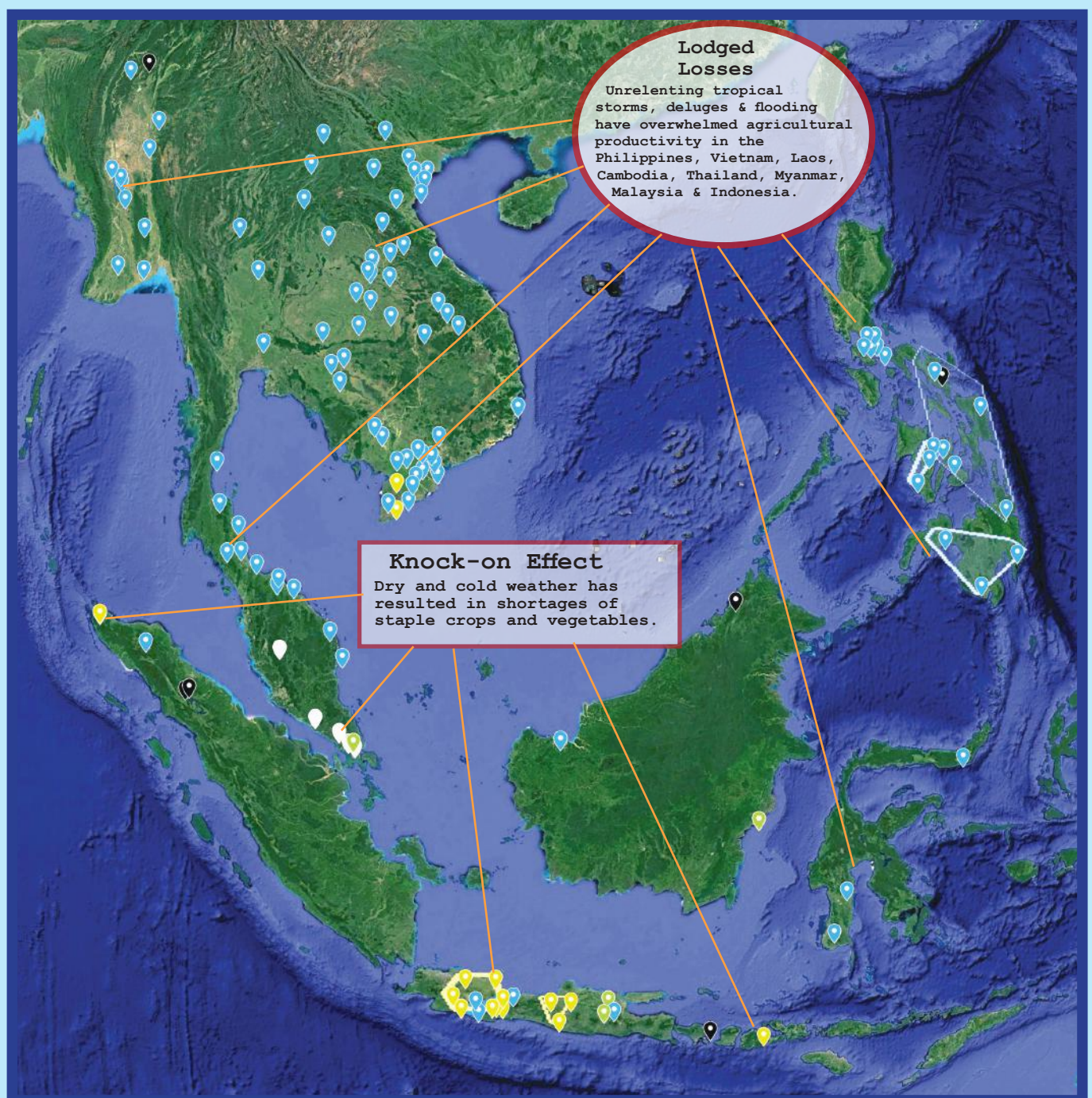


# Southeast Asia

No country in Southeast Asia has been spared from climate-induced crop calamities in recent years. Dramatic fluctuations in conventional rain patterns and monsoonal systems continue to inflict great hardship on farmers throughout the agriculture-dependent Indochina peninsula.

Though drought and salt-water intrusion events dominated headlines in Thailand, Vietnam, Indonesia and the Philippines through to the peak of the Modern Solar Minima in 2015, we've been logging an increasing number of reports of crop

failure linked to extreme rainfall, tropical storms, cyclones and hailstorms. Even the rice crop, which is among the flood-friendliest of all staple crops, has been washed away en masse. Though the world's most consumed grain can withstand waterlogged conditions for longer than most other field crops, it can succumb to mold, fungus and rot if left submerged for more than a few days. With cloudier skies in the forecast, another climate trend on our radar is cooler weather, which, when combined with dry conditions, can prove devastating.



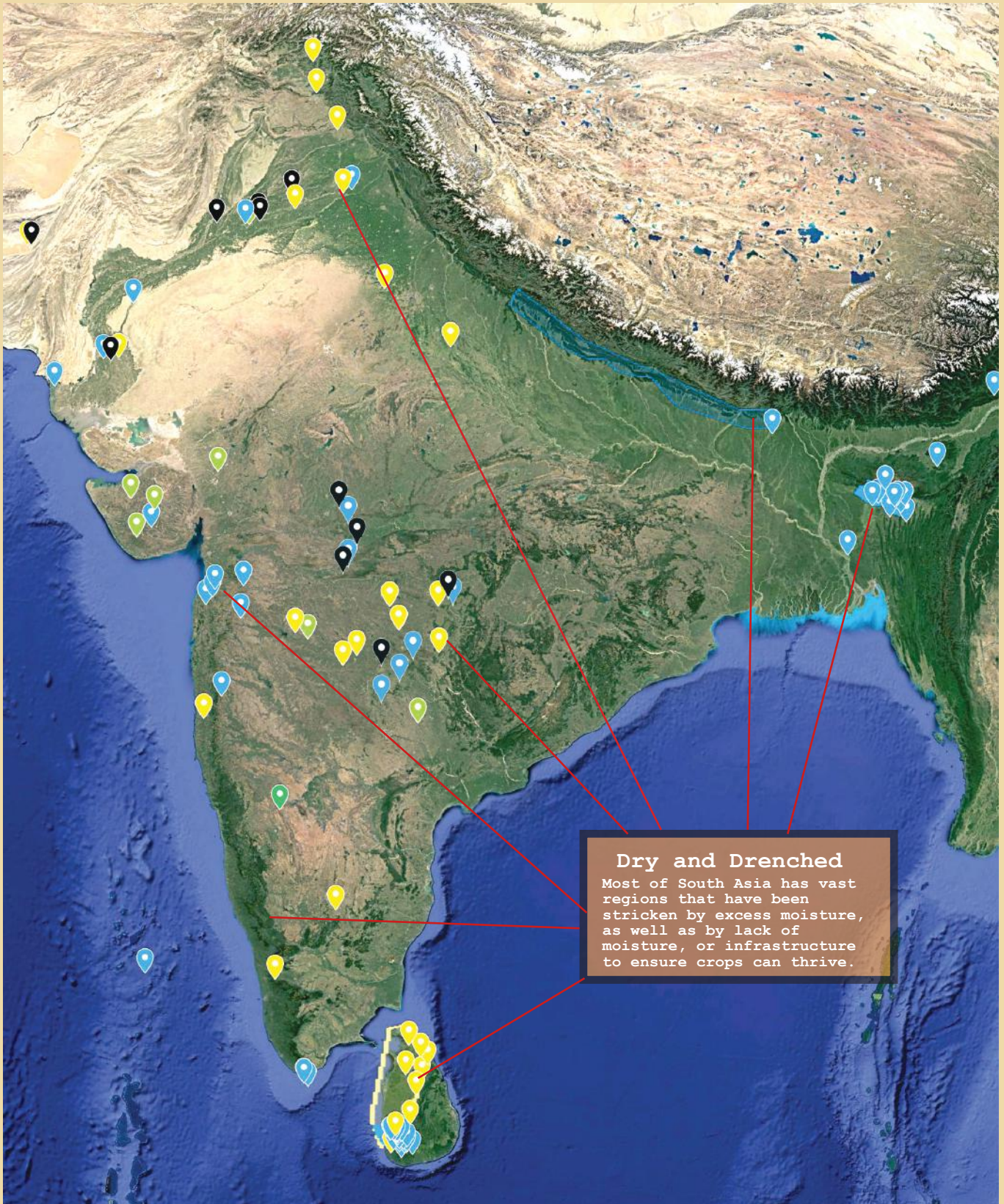


Period	Location	Climate-Weather Event	Affected Crop(s)
<b>Indonesia</b>			
2017 Jan-August	Indonesia: Jakarta	extreme drought damaging paddy crop	paddy
2017 Jan	Indonesia: MAROS	heavy rain, pest attacks	red chilli
2017 Feb 21	Indonesia: Brebes Regency	floods	Shallot
2017 Feb 27	Indonesia: Garut	floods	paddy, vegetables, palawija plant, eggplant and chilli
2017 June-July	Indonesia: Aceh Besar District, Aceh Province	drought, insufficient reserves supply, over planting by 11%	paddy
2017 July 10	Indonesia: Nganjuk East Java	pest outbreak, inadequate pest management	shallot
2017 July 12	Indonesia: Simbatan Village, Kanor District	high humidity raising the fungi growth and affecting productivity	red chili
2017 August	Indonesia: North Sulawesi, South Sulawesi, East Java and West Java	"bad weather", rain, thunderstorms	cloves
2017 Aug-Oct	Indonesia: West Java, Yogyakarta and West Nusa Tenggara	drought	paddy
2017 Sept 11	Indonesia: Balikpapan City	pest and virus infestation, market/harvest timing flux factors	dragon fruit
2017 Sept	Indonesia: Ciamis Regency, Cianjur Regency, Indramayu Regency, Karawang Regency, Kuningan Regency, Sukabumi Regency, Banjar City, and Tasikmalaya City.	drought	not clarified
2017 Dec	Indonesia: northern Gayo highlands	unexpected rain, drought and pests	coffee
2017 Dec	Indonesia: Sumatra, Karo	volcano eruption: Mount Sinabung	Tomato, potato, chilli and citrus
<b>Vietnam</b>			
2015-2016	Vietnam: Mekong Delta: Kien Giang and Ca Mau	saltwater intrusion and drought	rice, sugarcane, fruit trees, vegetables
2018 Jan	Vietnam: Mekong Delta	heavy rains, flooding	rice and other winter-spring crops
2017 Feb	Vietnam: Tien Giang, Vinh Long, Ben Tre, Hau Giang, Can Tho	heavy rains	fruits: mango, rambutan and durian
2017 Feb	Vietnam: Bac Lieu	heavy rains	salt farms
2017 Feb	Vietnam: Khanh Binh Tay Commune	heavy rains	green beans
2017 Feb	Vietnam: Hau Giang Province: Chau Thanh A and Vi Thuy districts; Can Tho City; Phuoc Long District in Bac Lieu Province; Ca Mau Province	heavy rains	paddy
2017 July	Vietnam: Nghe An Province	crop damages due to Tropical Storm Talas	paddy
2017 August	Vietnam: Binh Duong	heavy rains, flooding, rising tide	agricultural acreage
2017 August	Vietnam: Tinh Gia, Hau Loc, Thanh Hoa and Khanh Hoa	lean harvest, unusual and continuous rains	Salt
2017 Aug	Vietnam: Long An Province's Tan Hung District, An Giang Province; Moc Hoa district. Vinh Hung district	heavy rains, flooding	rice
2017 Oct	Vietnam: Hoa Binh	rain, floods	paddy, livestock
Oct-Nov 2017	Vietnam: NINH BINH	typhoon, floods	peach blossom trees
2017 Oct	Vietnam: Yen Bai province	rain, flooding, depression	crops
2018 Jan	Vietnam: northern provinces	heavy rains, flooding	peanut, soya, maize, sweet potato
<b>Philippines</b>			
2018 January	Philippines: Negros province, Bago City, Cadiz City, Escalante City, Manapla & Sipalay City	typhoon Agaton: heavy rainfall, flooding	rice, cash crops & fisheries
2017 Sept 15	Philippines: Laguna province	rain from Tropical Depression Maring	cash crops
2017 Sept 15	Philippines: Lucena City	rain from Tropical Depression Maring	paddy, fisheries, cash crops
2017 Sept 15	Philippines: Quezon province	rain from Tropical Depression Maring	fisheries
2017 Dec	Philippines: Bicol Region, Eastern and Central Visayas, and Caraga	Tropical Depression Urduja	rice, vegetables, corn,
2017 Dec & 2018 January	Philippines: Regions 9, 11, 12 & 13	typhoon Vinta (Tembin)	paddy, corn, banana, rubber, peachay, livestock
<b>Thailand, Laos &amp; Cambodia</b>			
2017, May	Thailand: Buriram, Nong Ki	extreme torrential rainfall, overflowing waterways	sugar cane, paddy
2017 August 30	Thailand: Lampang	extreme torrential rainfall, reservoirs overflowing due to Tropical Storm Sonca	agriculture Sector
2017 January	Thailand: Patthalung, Naritwat, Yala, Songkhla, Pattani, Trang, Nakhon Sri Thammarat, Suratthani, Chumphon	floods, rain in dry season	para rubber, fisheries, palm
2016 July-Sept	Thailand: Phitsanulok 8 districts	floods	paddy
2017 July 5-August 19	Thailand: Roi Et, Nakhon Phanom	extreme torrential rainfall, reservoirs overflowing due to Tropical Storm Sonca	paddy, fisheries
2017 May 30	Thailand: Sikhoraphum district, Surin	extreme torrential rainfall, overflowing waterways	paddy, Hom Mali
July-August	Thailand: That Noi District, Ubon Ratchathani	extreme torrential rainfall, reservoirs overflowing due to Tropical Storm Sonca	paddy
2017 July 5-29	Thailand: Sakhon Nakhon Province, Muang District	extreme torrential rainfall, reservoirs overflowing due to Tropical Storm Talas	paddy, Sugarcane, cassava, corn, fisheries, livestock
2017 July 26	Thailand: Kalasin Province, Nakhon District	extreme torrential rainfall, reservoirs overflowing due to Tropical Storm Sonca	paddy
2017 July-August	Laos: Oudomxay, Vientiane, Borikhamxay, Champassak, Khammuan, Savannakhet, Saravan, Xekong, Phongsaly, Huaphan, Attapeu and Xayaboury	Tropical Storm Sonca, flooding, landslides	rice, cassava, livestock, chili
2017 October	Cambodia: Battambang, Phnom Srok, Kong Pisei, Banteay Meanchey, Kampong Speu	heavy rain and isolated droughts	rice
<b>Malaysia &amp; Singapore</b>			
2017 January	Malaysia: Kampung Lubok Periuk (Kuala Berang)	floods	honey lemon crops
2017 Nov	Malaysia: Kuching	monsoon season	cabbages, carrots, tomatoes, long beans and brinjals
2018 Jan	Malaysia: Taman Fikri, Chukai	heavy rains, storm	crops and livestock
2018 Jan	Malaysia: Cameron Highlands, Pahang state; Johor (Tangkak, Johor Baru, Simpang Renggam and Pulau)	prolonged cold, wet weather	vegetables: leafy greens, bok choy, chai sim as well as spinach
2018 Jan	Singapore	rainy weather, overcast skies.	vegetables: tomatoes, Japanese cucumber, iceberg lettuce, lemongrass
<b>Myanmar</b>			
2017 April	Myanmar: Magwe, Minhla and Aunglan	early rains forced early planting	sesame
2017 April	Myanmar: Sagaing region	hailstorm	chickens, cow
2017 April	Myanmar: Mandalay, Sagaing and Magway	heavy rain	Onions
2017 July	Myanmar: Sagaing region	floods	paddy, summer pulses, watermelon and sesame
2017 August	Myanmar: Bago, Ayeeyarwady, Magwe and Yangon	floods	paddy
2017 Oct	Myanmar: Mandalay, Madaya	heavy rain, overflowing Sedawgyi Dam	banana, betel, beans and other crops



# Asian Subcontinent

Agriculture in South Asia has been cursed with both precipitative extremes: Record rainfall and subsequent flooding have dampened output throughout the Himalayas' floodplains, with major river systems across Bangladesh, Nepal, Northwest India and Southeast Pakistan regularly reaching new highs; meanwhile drought and moisture stress continues to hamper production in many other parts of the Subcontinent. Sri Lanka, in particular, has been hit by both extremes, which has seriously jeopardized the country's short term food security.





Period	Location	Climate-Weather Event	Affected Crop(s)
<b>India</b>			
2017 Mar-Nov	India: Nagercoil, Kanyakumari	strong wind and vagaries of weather, erratic monsoon	cloves
2017 June-July	India: Marathwada (Parbhani, Chandrapur, Aurangabad, Hingoli, Amravati, Yavatmal) and Vidharbha	drought: moisture stress	cotton, soybean, maize
2017 July	India: Gujarat: Saurashtra	excessive rain	cotton
2017 July-August	India: Gujarat, Saurashtra	flooding	cotton, groundnut, cereals, pulses, soybean, guarseed
2017 August, October	India: Andhra Pradesh, Maharashtra, Telangana and Karnataka. Gujarat: Rajkot, Jamnagar, Junagadh and Mehsana	infestation: Pink bollworm	cotton
2017 August	India: Maharashtra, western Madhya Pradesh, Bundelkhand, Kerala, and northern and southern interior Karnataka and Haryana, western Uttar Pradesh and Punjab	drought: moisture stress	unspecified agricultural acreage
2017 Sept 5	India: Bengaluru	water scarcity	paddy
2017 Oct	India: Nashik	unseasonal rains	rice, ragi, varai, bajra, udid, groundnut, niger seeds, soyabeen, corn
2017 Nov & Dec	India: Surat city & south Gujarat	cloudy and chilly weather	vegetables and banana
2017 Nov 29-30	India: Tamil Nadu: Kanyakumari	Cyclone Ockhi, rains, floods	rubber, banana, coconut
2017 Dec	India: Mahabaleshwar	unseasonal showers, fungal diseases	strawberries
2018-Feb	India: Marathwada and Vidarbha	unseasonal rain, hailstorms	wheat, chana, jowar, bajra, tur, gramand, mangoes, grapes, oranges, bananas and mangoes, citrus fruits,
2018-Feb	India: Telangana: Nirmal, Adilabad and Nizamabad districts	unseasonal rain, hailstorms	Bengal gram and sesamum crops, paddy, maize and Jowar
2018 Feb	India: Madhya Pradesh: Dewas, Khandwa and Burhanpur districts	Unseasonal Rain, hailstorms	wheat and chana
<b>Bangladesh</b>			
2017 March	Bangladesh: Sylhet region: Dharmapasha, Tahirpur, Jagannathpur, Chhatak, Companiganj, Gowainghat, Hakaluki Haor	heavy rains and flooding	rice
2017 July-August	Bangladesh, NE India	flooding from excessive rain	Aus rice, Aman rice, Aman rice seedbed, seedling, jute and vegetables
2017 Sept 7	Bangladesh	"worst flood in 100 years"	agricultural acreage
<b>Nepal</b>			
2017 July-August	Nepal: Kantipur, Hetauda, Chitwan, Banke, Jhapa, southern Tarai plains	heavy rainfall, flooding	paddy, vegetables, pulses, maize, fisheries, turmeric, rubber
<b>Pakistan</b>			
2017, March	Pakistan: Punjab, Sindh, Balochistan and Khyber-Pakhtunkhwa	water scarcity	rice, maize, moong, cotton and sugarcane
2017 April	Pakistan: Multan, Kabirwala and Khanewal.	dust storm and rain	mango
2017 April	Pakistan: Dera Ghazi Khan	hailstorm	wheat
2017 July-August	Pakistan: Punjab, Sindh and Balochistan	extensive salinity in the soil	crops
2017 August-September	Pakistan: Sindh	monsoon rains	cotton, onion
2017 Sept	Pakistan: Punjab	pest: Plnk Bollworm, whitefly thrips	cotton
2017 October	Pakistan: North Nazimabad, Lahore, Sindh	heavy rains and increased demand during festivals + lack of rains according to some	onion, garlic, lemon and tomatoes
2017 Nov	Pakistan: Sindh, Punjab and Wapda	insufficient rainy season water storage capacity leads to 36% water shortage for winter-spring crops	Rabi: wheat, gram, lentil, tobacco, rapeseed, barley and mustard
2017 Dec	Pakistan: Mangla and Tarbela dams	insufficient water storage capacity, escaped outflows and not filling dams in time	rabi (wheat) and early khariff crops
2017 Dec	Pakistan: Khaipur district	breaches in two canals	wheat and vegetables
<b>Sri Lanka</b>			
2017 March	Sri Lanka: Western Province: (Gampaha, Kalutara); Northern Province (Jaffna, Mulaitivu, Killinochichi, Vavuniya, Mannar)	drought	undisclosed
2017 May	Sri Lanka: Ratnapura, Elapatha, Pelmadulla, Kuruwita, Kiriella, Ayagama, Ingiriya, Bulathsinhala, Palinda-Nuwara, Millaniya, Padukka, Kolonnawa, Biyagama, Kelaniya, Kaduwela, Dompe, Hanwellla, Padukka, Avissawella.	floods	undisclosed
2017, June	Sri Lanka: nationwide	floods in southwest, insufficient rains in NW	paddy

# TO BE CONTINUED in next issue: East, West & Central Asia.

In the mean time, Good Standing APSA members are invited to access the data and maps online by emailing [Steven@apsaseed.org](mailto:Steven@apsaseed.org)

# Report: Asia veg share spikes

## APSA countries dominate global production, Int'l trade flows

Five of the top six fresh vegetable-producing countries last year were Asian, a report published by Rabobank Research in January highlights.

China, India, Vietnam, Turkey and Iran ranked 1, 2, 4, 5 and 6 in share of total volume of global production, which was just over one billion tonnes of vegetables, not counting potatoes, preserved and frozen vegetables, or melons.

The United States was the third top producer, while Russia, Egypt, Mexico and Spain ranked 7, 8, 9 and 10, respectively.

These 10 countries constituted 83% of global production, with the five aforementioned Asian countries representing more than 74% of global production, dominated by China, who churned out 53% of the total volume, up from 49% a decade ago.

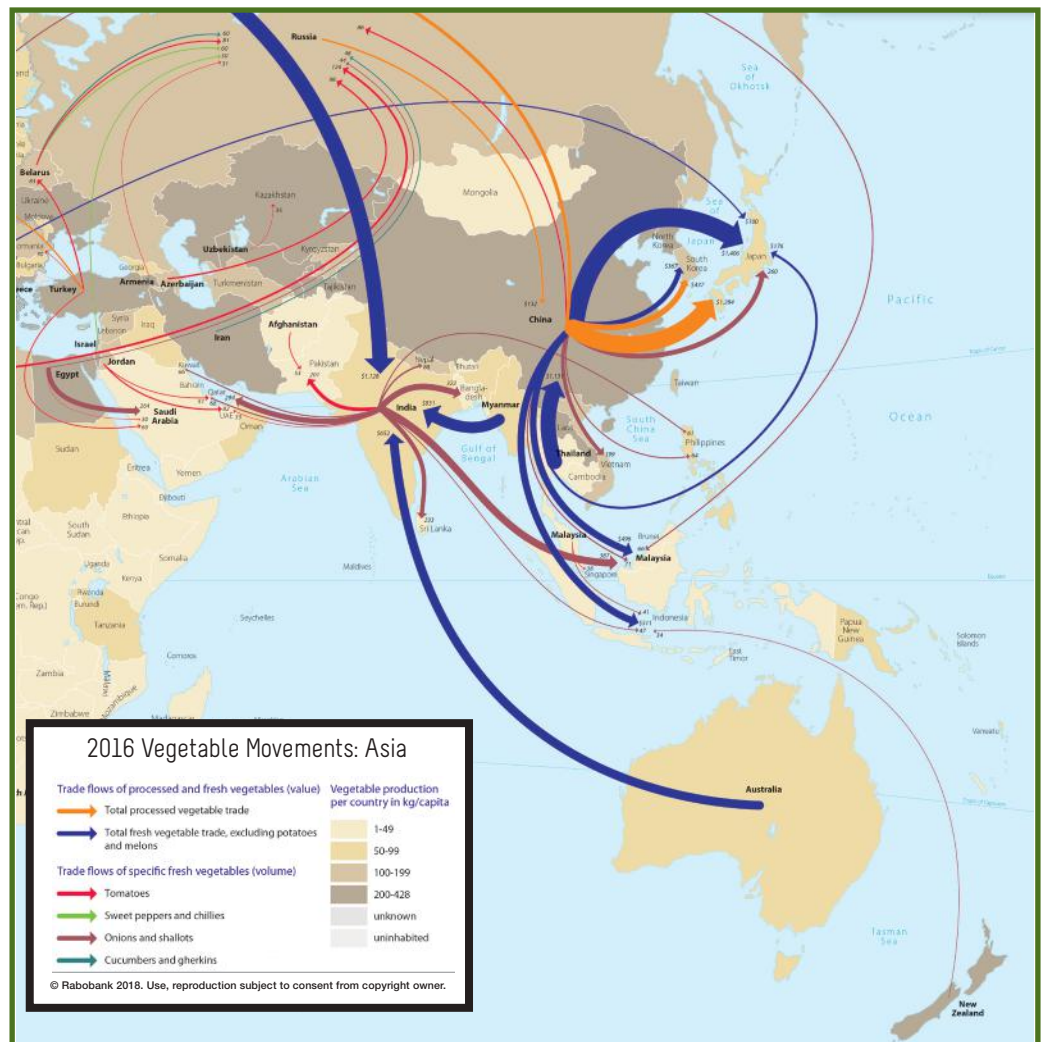
India's share of production was 14.5%, up from nearly 11%; Vietnam's share rose significantly, from less than 1% to nearly 3%; Turkey's share remained flat at 2% while Iran had a slight decrease, accounting for about 1% of global production.

The report notes that while only 5% of vegetables grown are traded internationally, this share is increasing due to a number of factors, including improved market access, climate, water availability, production costs, exchange rates, and trade agreements.

Several APSA territory countries prevailed as top importers and exporters of vegetables in 2016.

Most notably, China excelled as the world's top supplier, with its exports in 2016 exceeding \$9 billion – 37% more than world number 2, Mexico.

Australia, which was the world's seventh top exporter, supplied other countries (mostly India and China) with some \$1.63 billion worth of veggies – six times



**VEG VALUE CHAIN:** The map from Rabobank Research highlights a number of interesting trends about the movement of fresh and processed vegetables to, from and within Asia and the Pacific.

more than it had a decade prior (\$280mn).

Vegetable exports from Myanmar, Thailand and India also saw significant growth over 10 years to secure these countries as the world's 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> top exporters, respectively.

Leading vegetable importers in Asia in 2016 were India (\$4 billion), China (\$1.8bn), Japan (\$1.6bn), the UAE (\$1.1bn) and Malaysia (\$900 million), whose demand all grew significantly from 2006, especially India's and China's.

*Asian Seed* reached out to Rabobank Research for insight on vegetable trade trends in Asia, particularly with respect to seed.

Cindy van Rijswijk (Analyst - Fruit, Vegetables, Floriculture) noted that the vegetable sector in emerging markets, which includes most countries in APSA territory, is still fairly "informal".

"Many small growers sell locally on wet markets and spend limited money on seeds and other farm inputs that could raise production and quality," she said.

"This could change once they become part of a more professional supply chain supplying organized retail or food-service chains. In certain parts of Asia the professional vegetable sector is developing fairly rapidly.

"The main vegetable seed players do see sales in Asia

rising fast. Our Dutch clients that are active in supplying technology for greenhouses and storage facilities, for example, also see more and more requests coming from Asia," she concluded.

Based in the Netherlands, Rabobank provides financial services and intel on market trends, especially with respect to agriculture.

The original Rabobank report cited in this article also highlights many other interesting trade, production and consumer trends, covering processed and organic vegetables, as well as a budding market for greenhouse and environment-controlled vertical farming.

*For full map, report, and data, please visit [rabobank.com](http://rabobank.com)*





**CUTTING EDGE:** From Left: Mr. Andre Cariou (Deputy CEO, HM.Clause); Mr. Rémi Bastien (CEO, HM.Clause); Dr. Somsak Jungtrakul (Khon Kaen Governor); Mr. Franck Berger (CEO Limagrain Vegetable Seeds); and Gilles Gay (VP Global Research and Development HM.Clause).

## New Khon Kaen Station a Boon

LEADING VEGETABLE SEED COMPANY, HM.Clause – a Limagroup Company – recently inaugurated its new tropical vegetable seed Research & Development Station at Nong Rua district, in the northeastern Thai province of Khon Kaen.

The inaugural ceremony, which took place on 9 January, was attended by some 100 guests – including representatives from the local community and schools; members of the press; local and provincial government officials; local and international employees of HM.Clause, as well as executives from several other leading seed companies.

The event was presided over by the governor of Khon Kaen province, Dr. Somsak Jungtrakul, who joined several members of the leading French-American seed firm's executive board to give remarks and conduct the ribbon-cutting ceremony.

In his congratulatory remarks, Dr. Somsak said that the new R&D facility strengthens Khon Kaen's prospects as a strategic regional hub, not only for development and production of key agricultural commodities, but for complementary and dependent logistical services.

"We are honored to have a global leading firm like HM.Clause invest in Khon Kaen, which the Thai government is positioning

as an agriculture and transport logistics hub of ASEAN, which will complement economic growth fueled by [China's] One Belt, One Road Initiative," Dr. Somsak said. Keynote speeches were also given by Mr. Berger, Mr. Bastien, Dr. Gay, and Mr. Gleeson, who underlined their firm's background, strengths and strategies.

In his speech, Daniel Gleeson also echoed the regional hub theme: "Just as key investments enabled the Silicon Valley in California, US to become a hub for IT and innovation, we too envision Khon Kaen with the same potential to become a hub in vegetable breeding innovation," he said.

The morning concluded with a ribbon cutting rite, followed by a field tour for media and seed executives, including reps from APSA, Chia Tai, Sakata, Nongwoo Bio, East-West Seed and AG Universal, among others.

Located about 50km to the west of Khon Kaen city center, the new R&D Station spans 15 hectares of sandy, slightly-acidic soil. Of this area, nine ha are designated as open fields for breeding lines and adaptation trials, while five hectares will be utilized for breeding and cross pollination activities.

Moreover, the station has three hectares designated for isolated (netted)

plots that will be used primarily for disease screening, while naturally ventilated poly houses covering 2,000m<sup>2</sup> will be utilized as nurseries. The site, which will employ about 65 local employees initially, has irrigation and wastewater ponds, pathology, seed processing and storage units and an office.

The station will be used mainly to support breeding for hot and humid crop markets across the world – especially in South and Southeast Asia. Strategic crops to be focused on include tomato, hot pepper, cucumber, watermelon, melon and tropical sweet corn.

The development is one of a number of noteworthy ventures seen as a boon for the local economy. One of Thailand's most developed and populous northeastern provinces, Khon Kaen is being positioned by the Thai government as a strategic center in the ASEAN region for MICE, agriculture, logistics and transport.

The city of Khon Kaen is about an-hour-long flight away from Bangkok; by train, it takes six hours to reach from the Thai capital and one hour from the Lao capital, Vientiane. Upon completion by 2020-2022 of a China-backed high-speed rail project, the rail commute from Bangkok is expected to be reduced down to only two hours. 🌱

## East-West Seed Appoints New Chairman

East-West Seed has appointed Mr Ard Groot as its new Chairman of the Supervisory Board (SB), effective since 1 January 2018. Ard succeeds his father and company founder, Mr Simon Groot, who will continue to serve the Board as Honorary Chairman and Founder. Prior to this, Ard served the leading vegetable seed company as Vice Chairman of the Board since 2012. Filling in this role now is long-time seed industry professional Douwe Zijp. In his role Ard will continue to closely collaborate with the Board of Management, consisting of CEO Bert van der Feltz, Vice President Simon Jan de Hoop, and Vice President Michel Devarrewaere, who are charged with executive management of the company.



Ard succeeds his father, Simon.





# CHIA TAI SEEDS CO.,LTD.



## Head:

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Where Quality Food Begins.



# 1<sup>st</sup> China National Seed Congress Set for March

Registration for the first China Seed Congress is underway. APSA members planning to attend should register in advance. Organized by the China National Seed Association (CNSA), the event is scheduled for 25-27 March at the China National Convention Center in Beijing.

Online registration from 11 March is RMB2,800 or about US\$430 per delegate. On-site registration is RMB3,000 or about US\$465. Fees cover the whole event, including lunch.

The congress theme is, "a new era, new missions, new seed industry and a new journey."

This is the first such official national seed industry meeting in China and complements three other regionally-focused events organized annually: the Guangdong Seed Expo, the Shouguang Seed Expo, and the Beijing Seed Expo.

Activities at the inaugural congress will center on meetings, forums, training, exchanges, negotiations, and exhibitions.

On 26 March, the director general of the Chinese Ministry of Agriculture (MoA) will review developments



Order; Species Registration; and Green Passage and Breed Combination Testing.

2) The Rice Seed Innovation Forum

**中国种子大会**  
**CNSC**

covers: Rice Breeding Technology and Development; Rice Molecular Design Breeding; Rice Gene Editing Technology and Application; and Construction of Commercial Rice Breeding Systems.

3) The Maize Seed Innovation Forum will report on: Maize Hybrid Heterosis Utilization and Germplasm Improvement Technology; Maize Haploid Breeding Technology; Gene Editing Technology and Maize Breeding Application; and Establishment and Operation of Commercial Corn Breeding Systems.

4) The Economic Crop Seed Innovation Forum covers: Status and Development Trends in the Chinese Vegetable Industry; Potato Breeding and Seed Reproduction Technology; Molecular Vegetable Breeding Technology; and Vegetable Gene

Engineering and Breeding. 5) Topics during the Seed Industry Service Forum include: Status and Development Proposals for Mechanization of the Chinese Seed Industry; Development Trends in the Seed Coating Industry; and Digital Construction in the Seed Industry.

6) The International Cooperation Forum is probably the most interesting for APSA members. Topics include: introduction to national seed laws and regulations; intellectual property protection policies; quarantine policies; talks on the seed industry development investment environment by representatives from Asian and Pacific countries; introduction to policies and regulations on seed certification, patent protection, etc. from European and US representatives; and a report on the development of China's seed industry. Simultaneous interpretation is supplied.

APSA members wishing to join only the International Cooperation Forum can register at half price. CNSA will issue invitation letters to registrants for use in securing visas (which are delegates' personal responsibility).

For more information, please contact APSA's China Liaison Officer, Xiaofeng Li (Xiaofeng\_Li@APSA@163.com)

and forecasts in China's seed industry. At a high-level training session the same day, topics will include Problems and Countermeasures in Implementation of the Seed Law; Analysis of 2018 Planting Industry; Science and Technology Innovation and Development in the Seed Industry; and Mergers and Acquisitions in the Seed Industry.

Principal sponsors will address the delegates, too.

On 27 March six special topic forums will be held simultaneously:

1) The Seed Industry Policies and Regulations Forum feature reports on: Protection of Intellectual Property; Seed Market

## 16<sup>th</sup> Guangdong Seed Expo Draws 26,000 Visitors

MORE THAN 20,000 NEW SEED varieties, crop cultivars, agriculture products and technologies were exhibited at the 16th Guangdong Seed Expo, held last December in Guangzhou City.

Attended by more than 26,000 visitors, this year's expo was divided into three exhibition areas, managed by the event's main organizers: the Government of Guangzhou City, the Guangzhou Seed Trade Association and Nanfang Rural Newspaper.

An indoor exhibition – held at the Tianhong Hotel in Tianhe district – was

fully booked out by 386 hotel room exhibitors. Field demonstrations and exhibitions were held at two different locations; namely, at the Seed and Breeding Industry Town in Nansha District, and at the Kemulang Exhibition area of the Guangdong Agricultural Technology Extension Station, in Tianhe District.

Held annually since 2002, the Guangdong Seed Expo has become one of China's top seed trade and research events, where tens of thousands of excellent new varieties and supporting technologies have been showcased.



From left, APSA EC Member, Dr. Dehua Ma; APSA Director Heidi Gallant; Zhang Guanjie of Beijing Jewelry and APSA China Liaison Officer, Xiaofeng Li.

# Calling All Veg Breeders

## APSA–WorldVeg Consortium accepting new members

**A**PSA members with an interest in plant breeding for the development of improved vegetable varieties can now tap the knowledge and expertise of an internationally renowned leader in crop research by joining the APSA-WorldVeg Vegetable Breeding Consortium.

### Why a consortium?

As advances in biotechnology and genomics accelerate the pace of vegetable cultivar development, seed companies of all sizes must have a robust understanding of the latest vegetable breeding research, the practical skills to apply new breeding methods, and access to a diverse collection of vegetable germplasm to remain competitive in turbulent markets.

Through the APSA-WorldVeg Vegetable Breeding Consortium, participating companies and WorldVeg researchers will have multiple opportunities to discuss and evaluate breeding approaches and discover new avenues to share data and progress, creating a win-win situation. The Consortium will initially focus on tomato, pepper and cucurbits, but could broaden its scope to

other crops later. Following are some of the benefits:

### Annual Workshop

At the Annual Workshop, an event held exclusively for consortium companies, WorldVeg researchers will demonstrate new outputs of the Center's vegetable improvement program and discuss results obtained by consortium members who test WorldVeg breeding lines at their field sites using experimental protocols.

During the workshop, consortium members can:

- Actively participate in scientific presentations about ongoing WorldVeg research
- Review selected field trials of improved breeding material, subject to weather and field conditions

Each workshop will last two consecutive days and be held at WorldVeg headquarters in Tainan. Dates and format of workshops will be decided annually by WorldVeg in consultation with consortium members. Participants will have the opportunity to hold discussions in groups or individually by appointment with WorldVeg scientists during,

the day before, or the day after workshops.

WorldVeg will offer **free workshop participation** to one representative from each consortium company (includes lodging, meals, workshop materials, coffee breaks, and transportation to/from Kaohsiung International Airport, Kaohsiung, or Tainan High Speed Rail Station). All workshop participants must cover their transportation costs to reach the workshop vicinity.

### Early Access

Consortium Companies will be granted approximately a 12-month lead access to newly-developed lines shown at the annual workshop. These lines will be immediately available after the workshop.

In addition, Consortium members will be able to view preliminary yield trials ("PYT"), an advanced testing stage from which WorldVeg selects entries for its "online seed catalog", or similar demonstration trials.

Consortium members may have early access to screening protocols or other kinds of scientific information developed at WorldVeg, provided the sharing of such

information does not conflict with existing agreements or policies of WorldVeg.

### WorldVeg Updates

Consortium members will receive a newsletter highlighting the latest developments of WorldVeg breeding efforts once a year, approximately six months after the workshop. Other news and information of potential interest to members will be sent throughout the year.

Expect exposure to new relevant literature about germplasm screening, breeding methods, and WorldVeg breeding lines. Members will also receive a copy of the Center's *Annual Report*.

### Seed

Consortium companies can request ten free seed acquisitions per year from WorldVeg, subject to seed availability and phytosanitary clearance of requested accessions/lines.

### Training

Staff from consortium companies receive preferential access and a 20% discount on tuition for WorldVeg-offered training. This benefit extends to all employees of a consortium company.

## It's a Partnership

APSA and WorldVeg greatly value key information from Consortium companies to make its breeding programs more relevant to growers. Consortium members are expected to provide:

- Regular feedback from evaluation trials of improved breeding lines. WorldVeg scientists will specify the traits to be monitored and provide experimental protocols.
- Feedback on trait development that consortium companies would like WorldVeg breeding programs to pursue.
- Data on annual seed sales (in metric tons per variety per year) and information on which traits from WorldVeg were used for each variety. These data will be kept strictly confidential and only selected WorldVeg scientists will have access to it. The aggregated results from analyzing these data will be used in WorldVeg's efforts to raise funds from donors.

### Join the Consortium

Ready to take your company to the next level? Join the APSA-WorldVeg Vegetable Breeding Consortium and discover how exposure to the latest research and closer contact with international breeders and scientists will change the way you do breeding and business.

#### Fees

- Large companies (more than 100 employees): US\$6900 per annum
- Small companies (less than 100 employees): US\$2900 per annum

Fees are non-refundable. The term is January 1 to December 31.

Membership is open to all APSA members in good standing, and **registration deadline is 30 April, 2018**

For more details, please contact APSA Membership Programs Officer, Kunaporn Phuntunil: [E:kuna@apsaseed.org](mailto:E:kuna@apsaseed.org)





## Vegetable Breeding Consortium ANNUAL WORKSHOP

16-17 May 2018

World Vegetable Center Headquarters, Taiwan

The APSA/WorldVeg Vegetable Breeding Consortium Annual Workshop will change the way you do breeding and business:

- Learn about the latest developments in breeding research from the WorldVeg team of internationally renowned plant breeders
- Scout field trials of improved breeding material to enhance your cultivar catalog
- Meet breeders, pathologists, entomologists, a genebank manager and other researchers to strengthen your knowledge network\*

\*Available for individual meetings on 18 May by appointment



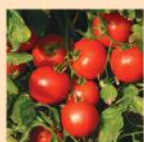
### Who should attend?

Participation in the workshop is open **only** to registered APSA/WorldVeg Vegetable Breeding Consortium companies. Consortium membership includes **free workshop participation** for one representative from each consortium company (includes lodging, meals, workshop materials, coffee breaks, and transportation to/from Kaohsiung Airport or Tainan High Speed Rail Station).

Attendance fee for each additional participant: US\$600.

## Featured crops

### TOMATOES



- 10-15 newly developed and previously released elite fresh market and dual-purpose tomato lines with TYLCD, bacterial wilt, and fusarium wilt resistances\*
- 5-8 entries of new TYLCD, bacterial wilt, and late blight resistant fresh market tomato lines under evaluation in a preliminary yield trial (PYT)

### CUCURBITS



- 8 newly developed bitter melon lines with cucurbit powdery mildew (*Podosphaera xanthii*) resistance and possessing good fruit quality\*
- 4 previously released elite bitter melon lines possessing traits of high yield, good fruit quality and resistance to cucurbit powdery mildew\*

### PEPPERS



- 8 newly developed lines of hot pepper and sweet pepper (4 each) with multiple disease resistance (Potato virus Y, *Phytophthora capsici*, chili veinal mosaic virus, tomato mosaic virus and bacterial wilt)\*
- 24 previously released elite lines of hot and sweet pepper (12 of each)\*
- 48 entries of hot and sweet pepper yield trials lines with multiple disease resistance

\*Seeds of all these lines are available for immediate distribution to Consortium members!

## Register today!

**APSA/WorldVeg Vegetable Breeding Consortium  
Annual Workshop**

**Asia & Pacific Seed Association**  
P.O. Box 1030 Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: +66-2-940-5464  
Fax: +66-2-940-5467  
Email: [apsa@apsaseed.org](mailto:apsa@apsaseed.org)

[www.apsaseed.org](http://www.apsaseed.org)

# Thai-bred Hybrid

**Manas Chiaravanond, 61, is a founding member of APSA and served as the association's fourth president from 1997–1998.**

Following the untimely passing of his brother, Manu, Manas on 15 January, 2018 became the Chief Executive Officer of Chia Tai Co., Ltd - Thailand's first and the only multinational vegetable seed firm. **Asian Seed** recently sat down with the cheerful and seasoned executive to learn about him, the history of Chia Tai, hybrid vegetable seeds in Asia and the early days of APSA.

By the time Manas was born in Bangkok in 1956, the family business had been operating for 35 years and was already the main player in Thailand's budding vegetable seed market.

But it wasn't until Manas took the family company's reins, in the mid-1980s, that Chia Tai would begin to truly make its mark on the regional and international seed scene, playing a central role in the development and diffusion of hybrid vegetable seeds in Thailand, Southeast Asia and beyond.

To better understand the success of Chia Tai today, we queried Manas about his interesting family history and the century-old legacy it was founded upon.

Many know that Chia Tai is a part of the CP Group, which also includes CP Foods (the largest agribusiness firm in Asia), CP All (the franchisee of 7-11s in Thailand and Japan) along with cable and internet giant, True Corporation.

But to be clear, Chia Tai is the original "seed" from which CP branched off, and expanded.

## LASTING LEGACY

Founded in 1921 by two legendary Chinese immigrants – Manas' father, Chia Siew Whooy (Choncharoen) and uncle, Chia Ek Chor – Chia Tai began as a small, humble seed shop in Bangkok's China Town.

The firm's strong reputation and success did not come overnight, but were gradually built upon a foundation of hard work, passion,

dedication and entrepreneurial spirit.

"In the early days, the business was entirely OP (Open Pollinated) seeds. My uncle regularly traveled back to China, where he selected varieties for trial in Thailand. These were mostly Chinese leaf and root vegetables such as Chinese cabbage, Pak Choy, Leaf Mustard, Chinese radish and so

and Ek Chor's family on the third.

After dinner every evening, the whole family would assemble in the office, on the ground floor, clearing space to form an impromptu seed packing line.

Everyone had an important role. The paper cutter earned one baht for every 1,000 packs cut. The seed packer earned 2.50 satang for every 1,000 packets packed.

Members of the family firm could earn 8 baht a night, which was a decent allowance in those days, when a bowl of noodles cost just 50 satang.

In addition to learning the value of money and teamwork, members of the Chiaravanond clan learned early on to take pride in their work, a value upheld by every employee, right up to the top.



**SINO-THAI LEGACY:** Chia Ek Chor (left) and Chia Siew Whooy

on," Manas relays.

"When my dad wasn't looking after the shop and family in Bangkok, he was traveling upcountry, meeting farmers and selecting the best local varieties for the business."

Sold under an airplane trademark, which symbolized advanced innovation and aspiration, the seeds of Chia Tai were selected and packed entirely by hand, mostly by those of the Chiaravanond family, whose members – young and old – all had an important role in the production line.

Long before mechanized fancy packaging and enforcement of stringent quality control regulations, Chia Tai was setting its own high commercial standards. It was the first seed company to voluntarily print expiration dates on its packets, offering customers an exchange guarantee for seeds that failed to germinate.

Before being packed, seeds were dried on the 4<sup>th</sup> floor rooftop of the family office building in the Songsawad area of old town Bangkok, which is still the company's headquarters today.

In the early days, Choncharoen's family resided on the second floor

## SUPERIOR SELECTION

Manas explained that most local varieties were selected and multiplied at the family farm in Om Noi, just west of Bangkok, where the company's main Seed Operation Center is still located.

"My father traveled all over Thailand to visit farms and select varieties. He and my uncle decided to open the Om Noi farm in the early 1950s. Om Noi is a famous place for vegetable production, and it's not too far from Bangkok. The soil there is fertile and most local varieties grow well."

Ek Chor and Choncharoen each fathered 12 children. Manas was the 11<sup>th</sup> of his father's dozen. Like his brothers and sisters, Manas was sent abroad to pursue his secondary and post-secondary studies.

"My father sent most of us to study in English-speaking countries," Manas said.

Listening to the advice of a British associate named Alexandar Campbell, Chia Tai's first and longest-serving international staff member, Manas' father understood that business in the coming generation would be conducted in English.





Manas at Chia Tai's Choncharoen Farm

## HYBRID REVOLUTION

By the time Manas returned from his studies abroad, arriving back to Thailand in 1979, local commercial hybrid vegetables still did not exist in Southeast Asia.

In 1984, he was appointed as Seed Business Unit Head. The timing was crucial. The seed industry was about to undergo a major transformation – a revolution.

Around that time, a new Dutch company named East-West Seed had begun trials in the Philippines and Thailand with hybrid vegetable breeding, driven by the leadership of a sixth-generation seedsman named Simon Groot (see Seed For Thought, Volume 23, Issue 6).

Like Simon, Manas was among a few visionaries ahead of their time, who knew hybridization was the future for tropical vegetable breeding in Southeast Asia.

Manas admits, however, that he didn't fully appreciate the potential of the seed business at first. It wasn't until a business trip to Japan in 1984, where his passion for seed really began to germinate.

"I met Toshiya Takii, the president of Takii seeds at the time, during my first international trip as head of seed for Chia Tai. I'll never forget what he told me, which resonates with truth to this day.

"He said 'when the economy is good, the seed business is good. When the economy is bad, the seed business is still good.'"

With his renewed passion for seed, and flare for international business opportunities, Manas was just the right person to kick start the coming revolution.

In 1985, he set up Thailand's first private vegetable research and development station in Chiang Mai, and a year later, another in Kanchanaburi. Meanwhile, Chia Tai began to aggressively recruit and contract breeders for the new age of F1 vegetable breeding.

By the end of the 1980s, after much trial and error, Chia Tai's breeding program was gaining ground. Success was near, and by 1990, the company released its first commercial F1 in the Thai market.

When word got out that Chia Tai's "Model" cucumber variety was returning double the yields of OP varieties on the market at the time – or up to six tonnes per rai (1,600m<sup>2</sup>), farmers quickly jumped on board and competitors took notice.

Knowing that the hybrid vegetable market potential was not limited to Thailand, Manas established breeding and trialling in neighboring countries.

In 1991, Chia Tai released the "Mummy" variety in Vietnam, which quickly became the most popular cucumber in that market. The firm tapped into the Indonesian market by 1994 with the release of "Action 434" melon variety, which continues to enjoy majority market share in that country today.

Under Manas' leadership, news of Chia Tai's

high-yielding, good-tasting, disease-resistant, weather-tolerant F1 Hybrid seeds spread like wild fire, with breakthroughs realized in a number of strategic crops; namely in cabbage, pumpkin, cucumber, tomato, pepper, melon, watermelon and sweet corn. The rest is history.

## FATEFUL CALL

Around 1990, just as Chia Tai was in the process of launching its first hybrids in Thailand, Manas received a phone call. The man on the other end of the line was a Danish seedsman who said he was working on a regional seed project.

"Mogens Lemonious had been contacting key players in the regional seed industry, and invited me to join a meeting in Bangkok with some other key seed executives, mostly from India," he recalled.

Manas has never looked back since. Following a series of meetings with other APSA legends, including Simon Groot and Dr. Kuldip Chopra, history was made at APSA's Foundation Meeting in Chiang Mai in 1994.

Of the ten or so founding APSA members that are still active today, Manas is probably the only one who can say without hesitation that he's been to every single Asian Seed Congress –

all 24 of them.

During his tenure as the association's fourth president (1997–1998), he is credited with helping APSA stand on its own feet financially.

He explained that at the time, FAO was phasing out its financial support for the project as initially planned. Even with membership dues and limited advertising in the newsletter, APSA was struggling to break even and its future wasn't guaranteed.

"The first few Congresses were mostly technical-oriented. There wasn't any business aspect. Yet most of our members were businessmen. So we introduced trading tables and booths. This is exactly what was needed, and I am proud to see this aspect still popular today," he said.

Manas insists, APSA deserves credit for the success of the Asia-Pacific seed industry over the past two decades.

"APSA and the Asian Seed Congress made it possible to meet many of our partners and realize success beyond national borders. I am sincerely grateful to APSA for this." 🌱

# Meet the NOC of ASC 2018

The Philippine Seed Industry Association (PSIA) has elected eleven officers, whose tenures commenced 1 January, 2018 and will be effective through to 2020. Established in 1976, PSIA is the oldest seed association in Southeast Asia, and will serve as the National Organizing Committee (NOC) for the upcoming 25<sup>th</sup> Asian Seed Congress scheduled 12-15 November this year in Manila.



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# Kasetsart Uni Turns 75

AGRICULTURALISTS, educational leaders and diplomats from around the world on 2 February joined Kasetsart University in celebration of the premier Thai agricultural university's 75<sup>th</sup> Anniversary.

The occasion was marked by an educational leadership-focused "President's Forum", which coincided with Thailand's annual National Agriculture Fair, known popularly as the Kaset Fair.

Held at the Sutham Areekul Hall in the Golden Jubilee Administration and Information Center, on KU's Bangkok campus, the forum was attended by some 700 hundred distinguished guests.

Coinciding with the forum was the annual National Agricultural Fair, which was staged from



Some 700 guests attended the President's Forum on 2 Feb.

26 January to 3 February.

Co-organized annually by Kasetsart University and the Ministry of Agriculture and Cooperatives, the Kaset Fair was set up on the university's city campus main thoroughfares, where entrepreneurs from around the country displayed and pitched various wares and products, ranging from agricultural goods, equipment and machinery, to plants, livestock, pets, food and

other miscellaneous items.

Exhibitions also showcased works from all 22 departments under the Ministry of Agriculture and Cooperatives, covering developments and breakthroughs in farming innovation, technology, fisheries, livestock, irrigation, land reform, agricultural economics, agronomy, dairy, livestock, agricultural economics and weather modification (rainmaking). 🌱

## Thai Seed Center Capacity Building

The Thai Seed Trade Association (THASTA) will partner with the Dept of Agriculture to organize capacity building activities aimed at standardizing the country's seed sector. In a mid-January meeting, THASTA agreed to support workshops to train local stakeholders on compliance with production, storage, handling and inspection standards through the Dept's Agriculture Seed Center in Phitsanulok province. More details to be announced.



THASTA reps met with the DOA in mid-January.



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**HM.CLAUSE**  
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## Global Reach. Local Touch.

HM.CLAUSE, belonging to the farmers co-operative group Limagrain, is made up of a culturally diverse and collaborative team, working in over 30 countries, serving customers on every continent. Our worldwide network of professionals and state-of-the-art research facilities enable us to work side-by-side with growers to provide the most regionally adapted and reliable vegetable seeds available.

HM.CLAUSE proudly sells vegetable seeds throughout Asia under our 3 commercial brands:



Limagrain 

# Lots in Store for APSA Technical Groups in 2018

APSA's four Special Interest Groups (SIGs) and three Standing Committees (SCs) – and their respective Working Groups – have been productive these past few months. Every two months, we meet via teleconferencing platform to plan and discuss events, activities, programs for the benefit of our association's members. All groups have met at least once so far this year and future meeting dates are set. Following are some updates.

First and foremost, we are pleased to announce that we have scheduled an in-person meeting for all of our groups' active members. Though teleconferencing has proved convenient for many of our members, who maintain busy travel schedules as it is, it cannot be stressed that there is no substitute for a face-to-face meeting, which we usually only have once a year, during the annual Asian Seed Congress.

This upcoming meeting, which will effectively function as a "Mid Term" session for our technical groups, is scheduled for 24–25 April in Bangkok. If you are an active committee member and would like to attend, be sure to reach out to the chair or co-chair of the respective group for an invitation.

## SC Trade & Marketing

During our last meeting on 11 Jan, we reviewed a proposal for a study tour to be held in conjunction with the Guangdong Seed Expo this December. We also discussed the next steps for organizing another Expert Consultation on Phytosanitary Measures later this year

in Bangkok. The tentative plan is to implement a training aspect into the three-day program.

## SIG Veg & Orn

In our 4 Jan meeting, our discussion was focusing on developing protocol for a recently established Working Group of Integrated Vegetable & Ornamentals Seed Companies or WIC. The purpose of the WIC is to identify important concerns from key players in the seed industry through our members so as to devise effective action plans that can be implemented through other concerned APSA groups. We have already identified an initial batch of members for the group and started to identify key topics of focus, which include plant and seed health issues, regional phytosanitary requirements, research and plant breeding innovation, intellectual property and seed technology, to name a few. The WIC will discuss these priorities in person at our upcoming midterms.

## SC Seed Technology

In our 22 Jan meeting, we continued our discussions on organizing more useful webinar sessions this year. Key topics identified include seed priming, seed dormancy, seed coating and diseases and we are reviewing a number of expert presenters to lead webinars on these topics, with our first webinar expected to take place this March. Look for an announcement.

## SIG Field crops

In our 23 Jan meeting, we considered a proposal to organize a study tour to

the Philippines, in collaboration with the Philippine Seed Industry Association. This tour would focus on GM maize seed production, and could potentially take place in July. We also discussed the prospect of collaborating with the FAO to organize an Expert Consultation focused on "Future Smart Crops".

## SIG Hybrid Rice

In our 25 January meeting, we discussed plans for a Post-Congress Tour dedicated to hybrid rice production in the Philippines at IRRI and news about the 2018 National Rice Technology Forum, which will take place in the Philippines this March. APSA, through the SIG, will follow up with more details on the agenda of the aforementioned itineraries, with registration details to be updated to our website.

## SC IPR and Biodiversity

In our 5 Feb meeting, we discussed preliminary results from our IPR survey, which we disseminated online and in person at last year's Congress. The results are being analyzed in detail and will guide us on focus areas moving forward. The committee agreed to be more active in sharing and exchanging information and resources among APSA members, especially in respect to global plant protection initiatives, such as UPOV's PRISMA system (see [page 8 news](#)). The committee is also considering a proposal to organize a PVP Forum in collaboration with the China National Seed Trade Association (CNSTA), which could be organized after the Beijing Seed Congress. 🌱

## IMPORTANT REMINDERS

Minutes from our meetings, which include specific topics, agendas and plans, are updated and posted to each of our respective SIG and SC pages. All are indexed in the Members Only section of APSA's website.

To access these pages, first log in to our members section, using the log-in information supplied to your Voting Representative.

After logging in, from the drop-down menu, select "Activities" and navigate to the respective page, where you will find a list of downloads of the latest meetings' minutes and other relevant documents and dates.

These updates are exclusive to APSA members, so be sure to check-in regularly.

Also note that we are actively recruiting members to our SIGs, SCs and Working Groups. Members who would like to participate, or can recommend someone else in your company who would be ideal, we encourage you to get in touch by emailing our Membership Programs Officer, Kunaporn Phuntunil ([kuna@apsaseed.org](mailto:kuna@apsaseed.org)) or alternatively, our Deputy Director, Dr. Kanokwan (see interview and contact to the right)

We look forward to hearing from you soon.



# The New Deputy In Town

APSA is pleased to welcome Dr. Kanokwan “May” Chodchoey as the newest member of the Secretariat. Dr. Kanokwan joined as Deputy Director on 3 January. She has a PhD in Biotechnology from Mahidol University, and brings to APSA a wealth of valuable technical experience.

The new Deputy Director will be leading the development and execution of the Special Interest Group and Standing Committee activity for APSA.

In addition to working with governments in the region to strengthen their interaction with the seed industry, May will be forming closer relationships with our National Seed Association members, in the Asia Pacific region and beyond. May will also be managing APSA's member benefits for plant breeders by overseeing APSA research consortiums, including the World Vegetable Center-APSA consortium and other upcoming project-based endeavors.

*Asian Seed* sat down with May to get to know her better. Here is the transcript:

## **Tell us a little bit about yourself.**

I am from Cha-choeng-sao, a small provincial town just to the east of Bangkok. I have one sibling and four cousins, who are close to me (They are all strong ladies!). We grew up immersed in the sweet aroma of coffee as my mother had a small old-fashioned coffee shop in town, where my extended family spent a lot of quality time together. After obtaining my bachelor's degree in Biotechnology from King Mongkut's Institute of Technology Ladkrabang, I applied and was accepted to the PhD

program in Biotechnology at Mahidol University, graduating in 2011. After that I started my career, with Monsanto Thailand. I worked in Phitsanulok in the beginning of my career as a lab supervisor and here I was well groomed and equipped with practical agricultural knowledge, quality management systems, plant operations and quality testing processes for veg and corn seeds. During my six years with Monsanto, I got to explore many roles related to quality control. These include Quality Manager for Thailand and Vietnam; QC Manager for Asia Pacific and China; and QC Lead for Asia & Africa. My last role was Quality Lead for Asia Pacific. Aside from getting the opportunity to meet my husband, I gained a great deal from this experience, which helped me learn about myself and the direction I want to move in, which is using my skills and knowledge to benefit others through a non-profit organization like APSA.

## **What do you hope to gain from APSA, and what will you bring to the association?**

In my previous job, aside from working in labs and interacting with scientists another aspect I enjoyed was the opportunity to interact with farmers and customers who directly deal and trade in seed. I really like meeting new people and interacting with them, especially if



my work can benefit their livelihood. I believe APSA will allow me to do this more regularly, and in the context of a non-profit organization, the work has a lot of potential to make a difference in society. With APSA, I look forward to applying my knowledge and experience towards the association's novel missions, so as to support and develop seed organizations, with the hope that the resulting benefits will trickle back down to the farmers.

## **Speaking of farmers, what is your general view on seeds, crops and breeding?**

Seeds, vegetables and crops represent the fundamental basis of our life, extending to food for humans and feed for animals. Having good breeding processes is necessary for sustainable food security, and for good health likewise. Moreover, breeding is the key for society to overcome and mitigate changes in the environment and other stress factors, whether biotic or abiotic. Aside from applying my education and interest for the benefit of others in the association, I look forward

to continuing to learn more from others, as the learning process is reciprocal and never-ending.

## **Aside from seeds, do you have any other passions or ambitions for the future?**

I love exercising, especially running, dancing and attending Zumba classes, which help me to relieve stress, both physical and mental. I love doing anything that I can to help others to be better, whether through my work, charity, making merit at the temple, teaching Thai classical music (I play a stringed mallet instrument called a Khim or Thai Dulcimer). I also like YouTube-ing and baking bread free of additives in my spare time. In the long term, I'd like to go back home or stay in the countryside in the North-Eastern region of Thailand and spend more time with my family, surrounded by rice fields and herb gardens, where I can organize small workshops for others to exchange and share useful knowledge. 🌱

*Be sure to give her a warm APSA welcome: Her email is: [May@apsaseed.org](mailto:May@apsaseed.org)*

# Obituary: Dr. Manmohan Attavar

The Indian, Asian and global seed industries suffered a devastating loss in the passing of Dr Manmohan Attavar, who left this world on 12 December in Mangalore, India. He was 85 years old.

The Chairman of Indo-American Hybrid Seeds (India) Pvt Ltd, a vegetable seed major in Asia, Dr Attavar was an APSA member of long standing and is highly revered in the seed industry, not only in India, but across the region and world.

Born in Karnataka, India, on 12 July, 1932, Manmohan obtained his M.Sc. (Agri) in 1961 from the University of Agricultural Sciences in Dharwad (Karnataka), India before continuing his studies abroad. Dr. Attavar was one of a new generation of Indian agro-scientists to study extensively in the US, earning his Doctorate in Plant Breeding and Genetics at Montana State University in 1964.

He returned to India in 1965 just as the Indian seed industry and the introduction of hybrid seed techniques were taking off. He set up Indo-American Hybrid Seeds (IAHS) in Bangalore, which over the past fifty years has grown to become one of India's leading seed companies. Dr. Attavar pioneered the development of vegeta-

ble hybrids such as the first commercial hybrid tomato (Karnataka) and Capsicum (Bharath) in 1973. He was the first Indian seedsman to introduce environmentally-controlled greenhouses to India to facilitate year-round seed production. And within two years he was exporting the first Petunia hybrid seeds to the US. From that time onwards, Indo-American has produced a substantial volume of F1 hybrid flower and vegetable seeds for export.

Moreover, Dr Attavar was instrumental in introducing the concept and practice of the 'Lab-to-Land' nursery management program to India. He also introduced high quality ornamental plants, produced under controlled greenhouse conditions in the country. He truly placed India on the global horticulture market.

He is also credited with introducing hybrids in okra, brinjal, gourds, watermelon, muskmelon and onions, along with the first aromatic rice hybrid (Khusboo) and the high-yielding non-aromatic rice hybrids (Samrat) among Indian farmers. He has



also popularized IAHS hybrids in Bt. cotton, sunflower and corn.

His background as a scientist and his commitment to improving vegetable crops and ornamental plants with modern technology led him to establish the Genetic Engineering Laboratory & Commercial Tissue Culture Laboratory in 1987. The company's seed testing laboratory was the first laboratory of its kind in the private sector in Asia. IAHS Seeds Lab was the first ISTA-accredited lab from the Asian private sector.

He has been the recipient of numerous honors and awards by both the Indian Government and the international community. Among them are the Padma Shri, a prestigious civilian award from the Indian government, who in 1998 formally recognized Dr Attavar's contributions to the field of Horticulture.

He was a Life Member of the International Seed Federation (ISF) and has served on the ISF Board and its various committees. He was also the president of the Association of Seed Industry, India and along with the late Dr Barwale, was honored for his contributions to the Indian seed industry at the First Indian Seed Congress in 2010 by NSAI.

He has been a member of important policy making committees of the government of India and the state of Karnataka and has been felicitated for his contributions to horticulture development by National Horticulture Board (NHB), Agricultural and Processed Food Products Export Development Authority (APEDA), and several scientific societies.

*APSA deeply mourns the sad demise of Dr Attavar. In his death, the seed industry has lost a respected leader and guide.*

## New APSA Members

### SEMILLAS ALTUE

Associate Member  
Nueva Los Leones 07, Piso 13, Providencia, Santiago  
Providencia, Santiago  
Chile 7500000

### Pishgaman Sanat Va Bazr Co.Ltd

Seed Enterprise  
No180-Daneshkade Avenue-Karaj-Iran  
3 Karaj, Alborz  
Iran 3134983848

### Genetika Seeds

Seed Enterprise  
Yesilkaraman mah. Yesilkaraman Sok. No:14/2  
AKSU, Antalya  
Turkey 7119

### SANKRANTI SEEDS

Seed Enterprise  
Sy No. 35/2, Vajarahalli  
Bidadi Hobli, Ramanagaram  
Bangalore, Karnataka  
India 562109



# Access Asia & the Pacific

## Regional, Global Trade Trends

Imports, Exports, Demand & Consumption

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Latest breakthroughs, technologies, threats & opportunities

## Regulatory & Phytosanitary

Latest in legislation, regulation on movement of seed

## Exhibitions & Events

The Asian Seed Congress & other important meetings

## 2018 Advertising Rates

Magazine Formats & Rates (US\$)	A la Carte		Seedsman (six Issues +)			Executive (four Issues +)			Breeder (three Issues +)		
	No. 1-4 & 6	No. 5	Special Rate	Value	Save	Special Rate	Value	Save	Special Rate	Value	Save
Centerfold: 420x297mm (+5mm bleed)	3,400	3,900	18,810	24,840	6,030	14,100	17,990	3,890	10,700	14,490	3,790
Full Spread: 420x297mm (+5mm bleed)	2,900	3,400	16,110	21,290	5,180	12,100	16,963	4,863	9,200	12,440	3,240
Back Cover: 210x297mm (+5mm bleed)	2,900	3,400	16,110	21,290	5,180	12,100	16,963	4,863	9,200	12,440	3,240
Inside Front Cover: 210 x 297mm (+5mm bleed)	2,200	2,900	12,510	16,520	4,010	9,500	13,225	3,725	7,300	9,770	2,470
Inside Front Cover: 210 x 297mm (+5mm bleed)	2,200	2,900	12,510	16,520	4,010	9,500	13,225	3,725	7,300	9,770	2,470
Inside Back Cover: 210x297mm (+5mm bleed)	2,040	2,500	11,430	15,144	3,714	8,620	12,085	3,465	6,580	8,874	2,294
Full page -- right: 210x297mm (+5mm bleed)	1,800	2,125	10,013	13,305	3,293	7,525	10,600	3,075	5,725	7,755	2,030
Full page -- left: 210x297mm (+5mm bleed)	1,600	1,925	8,933	11,885	2,953	6,725	9,475	2,750	5,125	6,935	1,810
Half page -- right: 210x148mm (+5mm bleed)	1,020	1,188	5,659	7,610	1,951	4,248	6,056	1,808	3,228	4,400	1,172
Half page -- left: 210x148mm (+5mm bleed)	920	1,088	5,119	6,900	1,781	3,848	5,493	1,645	2,928	3,990	1,062
Quarter page -- bottom full width left: 210x74mm (+5mm bleed)	650	700	3,555	4,865	1,310	2,650	3,856	1,206	2,000	2,765	765
Quarter page -- bottom full width right: 210x74mm (+5mm bleed)	600	700	3,330	4,560	1,230	2,500	3,625	1,125	1,900	2,610	710
Quarter page -- bottom right: 105x148mm (+5mm bleed)	550	600	3,015	4,155	1,140	2,250	3,294	1,044	1,700	2,355	655
Quarter page -- bottom left: 105x148mm (+5mm bleed)	500	600	2,790	3,850	1,060	2,100	3,063	963	1,600	2,200	600
Value Addition Marketing			Package Extras								
Advertorial*	Above + 10%		Free x 1	*	550-4290	Free x 1	*	550-4290	Free x 1	*	525-4095
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Facebook Target Marketing Campaign Premium**	100		Free x 1	**	100	Free x 1	**	100			
APSA 2019 Calendar Promotion (For Package Bookings Only)											
APSA Calendar One Month: 200x190mm + 200x40mm***	1,500		1,000	1,500	500	1,200	1,500	300	1,350	1,500	150

\* Client supplies copy and photos with editorial support. Editor will advise specs, varying on advertorial size. Value of advertorial is advertisement rate plus 10% premium

\*\*Facebook Basic Campaign = 1 week; audience reach 5,000-15,000 depending on desired demographic parameters & type of content; Premium = 2 weeks; audience reach 10,000-50,000 depending on desired demographic parameters

\*\*\* Calendar is booked on first come, first service basis. The special rate quoted in card is in addition to cost of package.

\*\*\*\* Only Good Standing APSA Members are eligible for the above rates; Asian Seed & Planting Material reserves the right to accept or reject content.

**T**imes have changed and will continue to change with the rapid digitization of marketing and communications in 2018 and beyond. As the world changes, so too must the seed industry. Hence, we are stepping up our game to meet the evolving needs of the market.

This year, *Asian Seed & Planting Material* is pleased to offer a number of new digital and dynamic marketing tools that will help you get your message out to a wider and specifically-defined audience – more effectively and efficiently than ever before.

Several new marketing opportunities are available to Good Standing APSA members à la carte, or in one of our value-added packages. See table above, or inquire via email:

**Steven or Suchada @apsaseed.org**





# Asian Seed Congress 2018

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