



## Seed Connect

The monthly newsletter of Federation of Seed Industry of India

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A high rice and wheat production this year has contributed to total food grains output of 283.4 million tonnes in the country. Though lower than the projected amount, these yields need to be appreciated considering the monsoon deficit experienced by the farmers. Similar increased yields have been observed for sugarcane and soybean, though coarse cereal and pulses yield are expected to decline by approximately 9%. Cotton production is also expected to be lower by 16% due to Fall armyworm infestation in many parts of the country. Despite higher productivity in most crops, as per the National Statistical Office (NSO) report for 2018-19, the Gross value added (GVA) at basic prices for agriculture has decreased to -0.1% for the fourth quarter. Indian agri-GDP has previously grown at more than 3%, therefore, to address the current slump in agri-GDP and retain agricultural competitiveness in the global markets, India needs to enhance research and development (R&D) investment to enable rapid advancement of technology from labs to farms.

China on the other hand has grown its agri-GDP at 4.5% over the last 40 years and their farmers income have increased by 15% per annum. This has been achieved by liberated price control and rapid adoption of technology. India spends roughly 0.7% of agri-GDP on R&D, which needs to be doubled in the next 5 years, so that we may attain our dream of doubling farmer income by 2022.

Accessibility to high quality seed is critical for sustained yield improvement, this is especially true for crops that grow hybrid seeds. Hybrid technology has been providing solutions for the issues of declining soils, water scarcity and high cost of labour. Plateauing crop yields and higher consumer demands can be addressed by a focussed investment in new technology to develop better hybrids, varieties of food crops. Hybrids have benefitted farmers in case of crops like rice, maize, sorghum, pearl millet, sugar cane, cotton and wheat as they are high yielding requiring lower inputs. Despite the obvious gains, the market penetration of hybrid needs to be increased. Besides staples and grains, hybrids developed for different agro-climates in the country can augment vegetable yields too.

The seed value chain has both public and private sector players that are involved in distribution, marketing as well as development of new hybrids. A keen collaboration amongst the various players and information sharing with the farmers can improve the adoption of hybrids, so that farmers may reap the benefits of the technology.

**-Shivendra Bajaj**  
**Executive Director**  
**Federation of Seed Industry of India**

## **Seed News in India**

### **PepsiCo case, and needs of seed research**

#### **[Hindu BusinessLine]**

Seed varieties cannot be patented in India. So no one, Indian or foreign, can patent seeds and control our food supply. The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act allows protection of plant varieties for some years if they are found to be distinct, uniform and stable. India is the only country which has provided for the farmers to use, multiply, share informally or sell formally any protected variety, as long as they do not brand it and sell it. This is a huge facility given to the Indian farmer who can access new varieties coming from the research programmes of any company and grow them without any restriction. This is the second reason why no one can control our food supply. But if farmers brand and sell seeds that are under PPV&FR protection then it is an offence.

### **EPCO to develop 20 villages as Climate Smart Villages**

#### **[The Pioneer]**

Twenty villages each of Rajgarh, Satna and Sehore districts are being developed as Climate Smart Villages by the Environment Planning and Coordination Organization (EPCO). Through this scheme, farmers are being given an innovative initiative to help in farming as per climate change. This is the first plan of its kind in the country.

### **Farmers in Maharashtra to Protest Against Ban on Genetically Modified Crops; Sow Bt Brinjal and Bt Cotton Today**

#### **[Krishi Jagran]**

Farmers' body 'Shetkari Sanghatana' has announced that it will sow genetically modified also known as GM seeds of brinjal & cotton in Maharashtra today, (10<sup>th</sup> June 2019), even though the varieties are prohibited in the state. As many as 5,000 farmers, under the aegis of Shetkari Sanghatana, are likely to assemble in Akola to sow the transgenic varieties as a sign of protest against the government's ban.

### **Govt Report on rabi, kharif crops: As Maharashtra reels under drought, sugarcane production increases**

#### **[Indian Express]**

In drought-hit Maharashtra, where 24,000 villages are reeling under water scarcity the production of sugarcane, a water-intensive crop, has increased by 10 per cent in 2018-19 compared to 2017-18. In the same period, the area under sugarcane crop has also increased by 22 per cent. According to the state government's annual report for rabi and kharif crops for 2018-19, "area under sugarcane plantation has increased from 9.02 lakh hectares (2017-18) to 11.63 lakh hectares (2018-19). Sugarcane production has increased from 83,138 lakh metric tonnes (2017-18) to 91,704 lakh metric tonnes (2018-19).

### **Hyderabad scientists develop new groundnut varieties**

#### **[Times of India]**

Groundnut has just turned healthier. Two new varieties of groundnut with more healthy oil content and nutrition are ready for release in the market. According to ICRISAT scientists, the new varieties contain a high content of oleic acid, which is a monounsaturated fatty acid that gives health benefits to consumers including reduced risk of developing cardiovascular disease.

### **AP govt announces new farmer-support scheme**

#### **[Hindu BusinessLine]**

The Andhra Pradesh government has announced a new farmer support scheme, christened YSR Rythu Bharosa, to be implemented from October 15 in the State. It will offer investment support of Rs. 12,500 per annum per farmer.

### [Agri Ministry projects record rice, wheat output for 2018-19](#)

**[Hindu BusinessLine]**

Rice and wheat production in the country scaled new heights taking total foodgrain output in 2018-19 to 283.37 million tonnes (mt), a tad lower than the 285 mt foodgrains produced in the previous year, according to the third advance foodgrain estimates released by the Agriculture Ministry.

### [Higher output cools North tea prices](#)

**[Hindu BusinessLine]**

Tea producers in North India are a worried lot. Higher production of the crop in February, March and April has sent prices down. The industry is expecting prices to firm up for the second flush crop backed by better quality and good demand. The second flush, which starts coming into the market by June, usually is the most premium quality and commands a better price.

### [Maharashtra government starts awareness campaign for farmers](#)

**[Times of India]**

In a bid to make farmers aware about its various schemes and get them benefitted, the state agriculture department has started an awareness programme- Unnat Sheti Abhiyan (progressing farming campaign) from May 25 to June 8, 2019.

### [Agricultural scientists grow apples in warm Haridwar](#)

**[Times of India]**

Scientists at Haridwar-based Krishi Vigyan Kendra (KVK) of G B Pant University of Agriculture and Technology, Pantnagar have managed to grow apples in plains of Haridwar district, where mercury rises upto 40-degree Celsius in summer. Apple cultivation requires cold climate with average summer temperatures of around 21-24 degrees Celsius during active growth period.

### [Now, a green paint from Litchi peel and seed](#)

**[Hindu BusinessLine]**

A professor at Lovely Professional University (LPU) at Phagwara in Punjab has come up with an eco-friendly paint by developing the formulation using plant waste material.

### [Horticulture award for TNAU V-C](#)

**[Hindu BusinessLine]**

N Kumar, Vice-Chancellor, Tamil Nadu Agricultural University, has been conferred the lifetime recognition award by the Confederation of Horticulture Association of India. The award has been conferred for his outstanding contribution in the field of horticulture and academic leadership focussed on human resource development in agriculture.

### [What Modi needs to do to spur agri-trade](#)

**[Financial Express]**

Today, India spends roughly 0.7% of agri-GDP on agri-R&D and extension together. This needs to double in the next 5 years. The returns are enormous. What is needed is to raise productivity in a manner that can cut down unit costs and make Indian agriculture more competitive, enabling higher exports. There is ample evidence that much of Indian agriculture is globally competitive. But it is our restrictive policies that restrain private sector from building direct supply chains from farms to ports, bypassing the mandi system. This leads to weak infrastructure for agri-exports. The net result of all this is that Indian farmers do not get full advantage of global markets. Further, an obsessive focus on inflation targeting by suppressing food prices through myriad controls is basically an anti-farmer policy.

## Seed News Around the World



### Vegetable Breeder Simon Groot is the 2019 World Food Prize Laureate

#### **[Crop Biotech Update]**

Simon N. Groot, vegetable breeder from the Netherlands and founder of East-West Seed is the 2019 World Food Prize Laureate. The announcement was made at a ceremony at the U.S. Department of Agriculture on June 10, 2019. Mr. Groot won the award for empowering millions of smallholder farmers in more than 60 countries to earn greater incomes through enhanced vegetable production, benefitting hundreds of millions of consumers with greater access to nutritious vegetables for healthy diets.

### Cotton growers find savior in corn on yield fall

#### **[The News]**

Cotton growers in Pakistan-Punjab are gradually switching to corn and coriander crops as the silver fibre's yields continue to wilt on unsuitable use of seeds, heavy rain fall and inclement weather. The country's cotton production is expected to fall to 12 million bales of cotton.

### Mexico Doesn't Back Up Trump's Twitter Claims of Big Farm Deal

#### **[Bloomberg]**

resident Donald Trump hinted at additional measures between the U.S. and Mexico, a day after he vowed that Mexico would soon make "large" agricultural purchases from the U.S. as part of a deal on border security and illegal immigration that allowed Mexico to avoid U.S. tariffs. Three Mexican officials said Saturday they were not aware of any side accord in the works, and that agricultural trade hadn't been discussed during three days of negotiations in Washington.

### Turning legume cover crops into forage applications

#### **[AGDaily]**

Whether producers are wanting to grow more homegrown feedstuff without increasing acreage, improve soil structure, add organic matter into the ground, increase soil fertility, or all the above cover crops are an effective and quick way to achieve their goals. Depending on the species and quality of variety used, forage producers can significantly increase yields and quality by taking advantage of the soil structure improvement, added biomass and even free Nitrogen fixation traits some cover crops provide. To avoid a cover crop monoculture, different crops are planted year to year, including cereal rye, clover, forage oats, winter peas, sorghum-sudangrass and tillage radish.

## [From Big Six to Big Four](#)

### **[Seed World]**

Over the past three decades, a series of mergers and acquisitions created the “Big Six”: Monsanto, Bayer, BASF, Syngenta, Dow and DuPont. These firms were all active in crop protection chemicals and, with the exception of BASF, also had strong positions in seed and biotechnology. This combination of activities was not a coincidence, but illustrates the complementarities between these activities. Consolidation in global seed markets is not a new phenomenon. The merger of Dow and DuPont, the acquisition of Syngenta by ChemChina, and the merger of Bayer and Monsanto have recently reshaped the global seed industry. A recent study by the Organisation for Economic Co-operation and Development (OECD) sheds some light on these questions. The report, “Concentration in Seed Markets: Potential Effects and Policy Responses,” was published in December 2018 and presents new, detailed evidence on the degree of market concentration in seed and GM technology across a broad range of crops and countries.

## [Limagrain and Rijk Zwaan Announce Licensing Deal on Traits in Vegetables](#)

### **[Seed World]**

Limagrain, through its listed company Vilmorin & Cie, and Rijk Zwaan have signed an agreement for the exchange of non-exclusive licenses for patented traits in vegetables. This exchange will enable the two vegetable breeding companies to strengthen their innovative capacities and introduce improved varieties more quickly.

## [Using Varieties and Genetics to Combat Wheat Production Challenges](#)

### **[Seed World]**

Wheat production challenges are found across the globe, and plant breeders are creating solutions to those problems with varieties and genetics. Heat stress, drought and weather fluctuations at planting time affect a wheat crop’s yield and quality. Research shows productivity begins decreasing when temperatures exceed 25 degrees Celsius. Countries with reduced rainfall are experiencing a shortage of irrigation water. This means wheat might be grown in more marginal areas, requiring varieties that can cope with drought.

## [Effects of climate change likely already being felt in global food production](#)

### **[AGDaily]**

The world’s top 10 crops — barley, cassava, maize, oil palm, rapeseed, rice, sorghum, soybean, sugarcane, and wheat — supply a combined 83 percent of all calories produced on cropland. Yields had long been projected to decrease in future climate conditions. However, new research shows climate change has already affected production of these key energy sources — and some regions and countries are faring far worse than others.

## [New research explores the origins of the apple](#)

### **[AGDaily]**

Several recent genetic studies have demonstrated that the modern apple is a hybrid of at least four wild apple populations, and researchers have hypothesized that the Silk Road trade routes were responsible for bringing these fruits together and causing their hybridization. Archaeological remains of apples in the form of preserved seeds have been recovered from sites across Eurasia, and these discoveries support the idea that fruit and nut trees were among the commodities that moved on these early trade routes.

## **New research**

### **Identification of genomic region(s) responsible for high iron and zinc content in rice**

#### **[Scientific Reports]**

Micronutrient especially iron and zinc-enriched rice hold immense promise for sustainable and cost-effective solutions to overcome malnutrition. In this context, mapping was done to localize genomic region(s)/QTL(s) for grain Fe (iron) and Zn (zinc) content together with yield and yield-related traits in rice. Genotyping of mapping population with 108 SSR markers resulted in a genetic map of 2317.5 cM with an average marker distance of 21.5 cM. Mean grain mineral content in the mapping population across the two seasons ranged from 10.5–17.5 ppm for Fe and 11.3–22.1 ppm for Zn. Based on the multi-season phenotypic data together with genotypic data, a total of two major QTLs for Fe and three for Zn were identified.

### **A deletion mutation in *TaHRC* confers *Fhb1* resistance to Fusarium head blight in wheat**

#### **[Nature genetics]**

Fusarium head blight (FHB), which is mainly caused by *Fusarium graminearum*, is a destructive wheat disease that threatens global wheat production. *Fhb1*, a quantitative trait locus discovered in Chinese germplasm, provides the most stable and the largest effect on FHB resistance in wheat. Here we show that *TaHRC*, a gene that encodes a putative histidine-rich calcium-binding protein, is the key determinant of *Fhb1*-mediated resistance to FHB.

### **Mutation of a histidine-rich calcium-binding-protein gene in wheat confers resistance to Fusarium head blight**

#### **[Nature Genetics]**

Head or ear blight, mainly caused by *Fusarium* species, can devastate almost all staple cereal crops (particularly wheat), resulting in great economic loss and imposing health threats on both human beings and livestock. However, achievement in breeding for highly resistant cultivars is still not satisfactory. Here, we isolated the major-effect wheat quantitative trait locus, *Qfhs.njau-3B*, which confers head blight resistance, and showed that it is the same as the previously designated *Fhb1*.

### **Mutation of *ZmDMP* enhances haploid induction in maize**

#### **[Nature Plants]**

Doubled haploid (DH) breeding based on in vivo haploid induction has led to a new approach for maize breeding. All modern haploid inducers used in DH breeding are derived from the haploid inducer line *Stock6*. Two key quantitative trait loci, *qhir1* and *qhir8*, lead to high-frequency haploid induction. Mutation of the gene *MTL/ZmPLA1/NLD* in *qhir1* could generate a ~2% haploid induction rate (HIR) nevertheless, this mutation is insufficient for modern haploid inducers whose average HIR is ~10%

### **Genetic mapping of powdery mildew resistance genes in soybean by high-throughput genome-wide sequencing**

#### **[TAG]**

Powdery mildew (PMD), caused by the fungus *Microsphaera diffusa* Cooke & Peck, leads to considerable yield losses in soybean [*Glycine max* (L.) Merr.] under favourable environmental conditions and can be controlled by identifying germplasm resources with resistance genes. In this study, resistance to *M. diffusa* among resistant varieties B3, Fudou234, and B13 is mapped as a single Mendelian locus using three mapping populations derived from crossing susceptible with resistant cultivars.

### **Genome-wide SNP discovery for development of high-density genetic map and QTL mapping of ascochyta blight resistance in chickpea (*Cicer arietinum*L.)**

#### **[TAG]**

Chickpea cultivation in temperate conditions is highly vulnerable to ascochyta blight infection. Cultivation of resistant cultivars in combination with fungicide application within an informed disease management package is the most effective method to control ascochyta blight in chickpeas. Identifying new sources of resistance is critical for continued improvement in ascochyta blight resistance in chickpea. The objective of this study was to identify genetic loci and candidate genes controlling the resistance to ascochyta blight in recombinant inbred lines derived from crossing cultivars Amit and ICCV 96029.

### [Identification and characterization of a new dwarf locus \*DS-4\* encoding an Aux/IAA7 protein in \*Brassica napus\*](#)

#### **[TAG]**

Dwarfism is an important agronomic trait affecting yield in many crop species. The molecular mechanisms underlying dwarfism in oilseed rape (*Brassica napus*) are poorly understood, restricting the progress of breeding dwarf varieties in this species. Here, we identified and characterized a new dwarf locus, *DS-4*, in *B. napus*. Next-generation sequencing-assisted genetic mapping and candidate gene analysis found that *DS-4* encodes a nucleus-targeted auxin/indole-3-acetic acid (Aux/IAA) protein. A substitution (P87L) was found in the highly conserved degron motif of the Aux/IAA7 protein in the *ds-4* mutant.

#### **Upcoming Events**

##### **June 2019**

##### **ISF World Seed Congress 2019**

**Date:** June 3 –5, 2019

**Venue:** Nice, France

##### **International Conference on Agricultural and Biosystems Engineering (ICABE)**

**Date:** June 5 –6, 2019

**Venue:** Rome, Italy

##### **Agro Expo Uzbekistan**

**Date:** June 10 –13, 2019

**Venue:** Tashkent, Uzbekistan

##### **Symposium Plant Breeding and Biotechnology**

**Date:** June 11 –13, 2019

**Venue:** Wageningen, Netherlands

##### **12<sup>th</sup> World Congress on Plant Biotechnology & Agricultural**

**Date:** June 12 –13, 2019

**Venue:** Prague, Czech Republic

##### **International Rapeseed Congress (IRC)**

**Date:** June 16 –19, 2019

**Venue:** Berlin, Germany

##### **International Symposium on Soil and Plant Analysis (ISSPA)**

**Date:** June 17 –20, 2019

**Venue:** Wageningen, Netherlands

**International Scientific Conference Plant Genetics, Genomics, Bioinformatics and Biotechnology**

**Date:** June 24 –29, 2019

**Venue:** Novosibirsk, Russia

**International Seed Testing Association Congress (ISTA Congress) 32nd edition**

**Date:** June 26-July 3, 2019

**Venue:** Hyderabad, India

**PHOTOSYNTHESIS CONFERENCE 2019**

**Date:** June 30 – July 3, 2019

**Venue:** Brisbane, Australia

**ISHS International Symposium on Cucurbits**

**Date:** June 30- July 4, 2019

**Venue:** Ghent, Belgium

**July 2019**

**Plant Genome Editing & Genome Engineering**

**Date:** July 5-6, 2019

**Venue:** Vienna, Austria

**International Conference on Biodiversity and Ecosystems (ICBE)**

**Date:** July 6-7, 2019

**Venue:** New York, USA

**Southeast Asia Vegetable Symposium 2019, Melaka**

**Date:** July 9-11, 2019

**Venue:** Melaka, Malaysia

**International Conference on Agricultural and Biological Science (ICABS)**

**Date:** July 13-14, 2019

**Venue:** Brussels, Belgium

**International Conference on Agriculture, Forestry, Biotechnology and Food Science (ICAFBFS)**

**Date:** July 27, 2019

**Venue:** Jaipur, India

**International Conference on Recent Trends in Engineering, IT, BioTechnology & Agriculture Sciences (RTEIT)**

**Date:** July 27-28, 2019

**Venue:** Taipei, Taiwan

**August 2019**

**International Agriculture & Horti Expo**

**Date:** August 1-3, 2019

**Venue:** New Delhi, India

**Milan International Conference on Agricultural, Biological and Environmental Sciences (MABES)**

**Date:** August 5-7, 2019

**Venue:** Milan, Italy

**International Agriculture Innovation Conference (IAIC)**

**Date:** August 8, 2019

**Venue:** Oulu, Finland

**International Conference on Plant & Soil Science (ICPSS)**

**Date:** August 9, 2019

**Venue:** Taipei, Taiwan

**International Conference on Agricultural and Food Sciences (ICAFS)**

**Date:** August 12-13, 2019

**Venue:** Pattaya, Thailand

**International Congress and Expo on Agriculture & Horticulture**

**Date:** August 12-13, 2019

**Venue:** Prague, Czech Republic

**International Conference on Environment, Agriculture Biology and Natural Sciences (EABNS)**

**Date:** August 14-16, 2019

**Venue:** Bangkok, Thailand

**International Conference on Agriculture & Horticulture**

**Date:** August 15-16, 2019

**Venue:** Rome, Italy

**International Conference on Inventions and Innovations for Sustainable Agriculture (ICIISA)**

**Date:** August 15-17, 2019

**Venue:** Bangkok, Thailand