



Pakistan Biotechnology  
Information Center  
(PABIC)

PAKISTAN BIOTECHNOLOGY INFORMATION CENTER



ISAAA  
International Service  
for the Acquisition  
of Agri-biotech  
Applications

PAKISTAN BIOTECHNOLOGY INFORMATION CENTER

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## PABIC ACTIVITIES

### **A Certificate Course on “How to Establish Halal Products Testing Laboratory?”**

This program is Organized by COMSTECH in collaboration with International Center for Chemical and Biological Sciences (ICCBS) Karachi and Pakistan National Accreditation Council (PNAC) on June 8 – 10’ 2021 at COMSTECH Secretariat, Islamabad.

By Our Conviction, Islam Is A Way Of Life. Islam Sets Food Standards For Humanity. Corruption Is Not Halal, Halal Means Doing Things In Lawful Manner, said Mr. Shibli Faraz, Minister for Science and Technology while addressing 3-day COMSTECH training course on “How to establish Halal testing laboratory”, here on Tuesday, at COMSTECH Auditorium.



He said rather focusing on going international, focus on ensuring healthy food quality. Labs should have capacity to determine Halal and Haram with the focus on complete food value chain. The Minister encouraged all Halal industry related institutions to develop mechanism for increasing capacities and advised that universities should be part of this as well.

Mr. Faraz highlighted the way forward for research by mentioning that there is a huge gap between research done in the past in Pakistan and its application. He emphasized that research should bring benefit to the people of Pakistan and the entire humanity. He said that research should yield to patent and then be commercialized.

Prof. Dr. Iqbal Choudhary, Coordinator General COMTECH said that Halal accreditation and certification is a niche in which we can achieve excellence. He said that Halal business is growing over 20% and there are no major Halal certification bodies in Muslim countries. Dr. Choudhary said that we at COMSTECH are focused on science based commercialization and developing capacity in OIC member states focusing on the application of science research output. He said that the theme of today’s event is relevant to industrial development of Pakistan and OIC.

Secretary General, The Standards and Metrology Institute for Islamic Countries (SMIIC), Turkey, Mr. İhsan ÖVÜT, said that we need to develop common standards with the commitment to practice them to compete internationally.

The inaugural session was addressed by Ms. Ismat Gul Khattak, Director General, Pakistan National Accreditation Council, Mr. Akhtar A. Bughio, Director General, Pakistan Halal Authority, and Prof. Dr. Syed Ghulam Musharraf, Professor, Dr. Panjwani Center for Molecular Medicine and Drug Research, ICCBS, Karachi. The inaugural session was attended by 800 participants online and 80 people

participated in-person. This 3-day event will

end on Thursday, June 10.

## Webinar on Covid-19 An Opportunity to Reform the Agricultural System of Pakistan

LAHORE: The federal government should play a leading role in ensuring food security and control on prices. The government should introduce special industrial zones in farm districts and they should have the facilities of cold storages, food-processing units, connection with retail chains and export industries. These views were expressed by experts in a webinar titled “COVID-19, an Opportunity to Reform the Agricultural System of Pakistan,” jointly organised by the Pakistan Biotechnology Information Centre (PABIC) Lahore Chapter, CropLife Pakistan and Forman Christian College, Lahore.

strategic planning is needed in streamlining the biotechnology products in the country.

“Improving water management is key as the four major crops, i.e. rice, wheat, sugar cane and cotton, consume 80 per cent of water but contribute only 5 per cent to GDP. Improving the nexus of agriculture, education, training and research and technology is the need of the hour,” Dr Kauser explained. COMSTECH Coordinator General Prof Dr Iqbal Choudhary said that during pandemic period the science had demonstrated the true spirit of researchers to find solutions under limited national capacity.

The poster features a dark green background with white and yellow text. At the top, it displays the logos of Forman Christian College and the Pakistan Biotechnology Information Centre (PABIC) Lahore Chapter. The main title is 'COVID-19 An Opportunity to Reform the Agriculture System of Pakistan'. Below the title, it specifies the date and time: 'May 24th, 2021 - 2:00 - 3:30 pm' and provides a Zoom link: 'Webinar Link: <https://bit.ly/3v8JKoG>'. A row of six headshots of speakers is shown, each with their name and title below it. At the bottom left, a Zoom link is provided: 'Zoom link: <https://zoom.us/j/92738074569?pwd=anFSU09pQkZUT0Q0UxQenYdFgrZz09>'.

Name	Title
Dr. Siang Hee Tan	Executive Director, CropLife Asia
Dr. Iqbal Choudhary	Coordinate General, COMSTECH
Dr. Iqbal A. Khan	Former VC UAF, FSD
Dr. Yusuf Zafar	Ex. Chairman PARC
Mr. Murtaza Qudusi	Regulatory Affairs Manager BASF Pakistan Private Limited
Mr. Atif N. Mughal	Assistant Professor, FCCU Certified Supply Chain Professional

CropLife Asia Executive Director Dr Sianghee Tan said the global pandemic played havoc on food supply systems in Pakistan and across Asia. The existing issues across the food value chain have been exposed and exacerbated by COVID-19, while new ones have been created as well. “Our responsibility as stakeholders is to ensure that the men and women who drive food security across the region are supported to do just that. “This includes providing policies that enable and empower our farmers to produce more safe and nutritious food on less land and with fewer impacts on the world around us”, he commented PARC former Chairman Dr Yusuf Zafar give a wake-up call to modernise the grain storage and reporting systems in Pakistan and said that the way forward was revisiting the procurement policies, incentivising the private sector for grain storage and involving foreign investment to develop modern storage and handling system. He said strong coordination between API, PBS,

The webinar was attended by scientists, policymakers, and representatives from leading biotech institutes, academia, crop science industry, farmers and other stakeholders. FCC postgraduate studies Dean and PABIC Director Lahore Dr Kauser Malik highlighted that crop biotechnology had all the ways to make the agricultural sector of Pakistan flourish. The government needs to focus on supporting small and marginalised farmers and promote small-scale innovative technologies to promote growth in this sector. A lot of

SUPRCO and provincial CRS departments was crucial for the success of this sector.

Representative of Crop Life Pakistan, Murtaza Quddusi briefed the participants on various disruptions to the agriculture supply chain due to COVID lockdowns across the country and rest of the world. He

highlighted the potential of digital technologies for farmer outreach and knowledge dissemination activities, and shared the success of Crop Life member companies in overcoming physical restrictions to serve the farmers through such innovative methods.

## **Webinar on "Contributions of Agricultural Biotechnology Adoption in Vietnam"**

Biotech maize adoption in Vietnam shows positive impacts of higher productivity, increased farmer income, and environmental improvement, according to the speakers of the webinar Contributions of Agricultural Biotechnology Adoption in Vietnam held in a hybrid event today hosted in Hanoi, Vietnam.

Vietnam Seed Trade Association (VSTA), together with the Vietnam Farmers' Union (VFU), and ISAAA co-organized the webinar attended by representatives of state management agencies, scientists, representatives of the provincial departments of agriculture, international experts, and domestic and foreign seed companies. The objective of the webinar was to share information on the global status of agricultural biotechnology adoption as well as in Vietnam, particularly the socio-economic impacts of biotech corn after five years of being approved for farming in Vietnam.

ISAAA SEAsiaCenter Director, Dr. Rhodora Romero-Aldemita, presented the global status of GM crop adoption. "In 2019, the cultivation of 190.4 million hectares of biotech crops significantly contributed to food security, sustainability, climate change mitigation, and improving the lives of more

than 17 million biotech farmers and their families worldwide. Vietnam is one of three countries with a double-digit biotech acreage growth rate, along with the Philippines and Colombia," said Dr. Romero-Aldemita.

Graham Brookes from PG Economics UK presented the results of their latest study on the socio-economic impact of GM crops. "In 2018, the total extra income for farmers cultivating biotech crops was 19 billion - for each extra US dollar invested in biotech crop seeds, farmers could make an extra profit of USD 4.42. In addition, had biotech crops not been grown in 2018, an additional 23 billion kilograms of carbon dioxide would have been emitted into the atmosphere, which is the equivalent of adding 15.3 million cars to the roads," Brookes stressed.

Dr. Tran Xuan Dinh, General Secretary of Vietnam Seed Trade Association, and Mr. Nguyen Xuan Dinh, Vice Chairman of Vietnams Farmers' Union, shared about Vietnam's experiences and perspectives on agri-biotech. Dr. Le Huy Ham, Chairman of the National GM Food Feed Committee, served as the moderator of the discussions.

## **Webinar on Science and Opportunities for Biotech (GE and GEd) Poultry in Food and Agriculture**

ISAAA launched the first webinar of the series of the Asia Oceania Regional Animal

Biotech Webinar with a focus on gene editing in poultry. The webinar

featured CRISPR applications to develop chickens with special traits that may eventually improve poultry production for meat and eggs, and generate biologicals for medicine.

The webinar was streamed on May 13, 2021, and featured Dr. Tim Doran, Senior Principal Research Scientist for the Health and Biosecurity Unit of Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO). Doran gave a presentation about the GEd chickens developed by CSIRO using in vivo transfection of primordial germ cells (PGCs), a direct-injection technique that they specifically developed. The technology involved injecting CRISPR components intravenously into chicken embryos that are 2.5 days old resulting in about 1-10% efficiency of germ-line integration. Using the technique, CSIRO was able to come up with several studies such as developing chickens with improved resilience against Avian influenza (ANP32A), Avian leucosis virus subgroup J, and Marek's Disease Virus. CSIRO also used it to produce allergen-free eggs, by knocking out ovomucoid, the most allergenic white protein, using a well-established poultry genome engineering capability that is safe in cooked egg products. This will be beneficial to consumers with egg allergy which is a food safety issue and has implications for vaccine production that uses eggs.

Lastly, CSIRO used their technique to develop the next generation of vaccine eggs. They used CRISPR to delete a segment of the IFNAR1 gene, a protein-coding gene commonly associated with devastating viral diseases. The CRISPR plasmid was injected into eggs which were later on hatched into chicks that were raised to sexual maturity. After two generations and characterization

tests, the development of the GEd chickens was found to be successful. CSIRO found that their technique may provide new opportunities for genome editing in chicken and other avian species that lack PGC culture.

Doran and fellow CSIRO scientist Dr. Mark Tizard gave further insights not just about their work in the laboratories but also how CSIRO complies with Australia's biosafety regulations in developing the GEd chickens. They talked about how the consumers' needs and acceptance, as well as regulations, are both considered during product development, and that CSIRO encourages public participation in the process by conducting public perception studies. They expressed that although the GEd chicken is anticipated to gain public acceptance, it may take two to three more years before it is commercialized.

The Asia Oceania Regional Animal Biotech Webinar Series is made possible by ISAAA BICs Network and the United States Department of Agriculture. Head over to CSIRO's research publications repository to find out more about the GEd chicken that they are developing. To get updates about the webinars, subscribe to the Crop Biotech Update and follow [isaaa.org](http://isaaa.org) on Facebook, Twitter, and Instagram.



## COVID-19 NEWS

### **Analysis of COVID-19 Crisis-driven Growth Opportunities in GMO Crops and Seeds Market**

The global GMO crops and seeds market is treading a growth path for the dire need to expand crop production globally. Due to the exploding global population, crop production via conventional agriculture is insufficient to fulfill the food needs. This has necessitated alternate means of crop production that are viable and sustainable. To that end, GMO seeds have served to not only magnify crop yield but develop robust crop varieties.

In recent years, breakthrough developments in biotechnology have aided the growth of the agricultural sector. With extensive R&D, researchers have been successful to modify genes in laboratory environments. Unlike the traditional methods of the natural process of modifying genes over generations of cross-fertilization, GMO crops and seeds are developed by modifying genes by directly inserting them into the DNA of the seed. Demand for use as Insecticide accounts for Corn to lead other Crop types.

Original Link:<https://www.flanewsonline.com/analysis-of-covid-19-crisis-driven-growth-opportunities-in-gmo-crops-and-seeds-market/>

### **Coronavirus: 50% of Third Wave Cases Due to UK Variant, 25% Because of South African Variant**

Professor Dr. Iqbal Choudhary shared on Thursday that a study conducted by the National Institute of Virology (NIV) showed that close to 50% of COVID-19 cases in Pakistan's were due to the UK variant, while 25% were because of the South African variant, reported *The News* on Friday.

The global GMO crops and seeds market is divided on the basis of crop type, sales channel, trait, and region. In terms of crop type, the GMO crops and seeds market is divided into corn, cotton, sugar beets, papaya, apple, soybean, alfalfa, sugar beets, zucchini, and potato. Among all, corn is predicted to display maximum growth in the GMO crops and seeds market over the forecast period. This is because GMO corn is widely used as an insecticide owing to its efficacy as an insect repellent. In 2017, corn held a whopping 37.8% of the overall market.

By trait, the key segments into which the GMO crops and seeds market is divided are herbicide tolerance and insect tolerance. By sales channel, the global GMO crops and seeds market is divided into modern trade, direct sales, convenience store, and e-retailers.

The details about the impact of the South African and UK variant were reported by Dr. Panjwani Centre for Molecular Medicine & Drug Research (PCMD) at the University of Karachi's International Centre for Chemical & Biological Sciences (ICCBS) which was reviewing the COVID-related research projects undertaken by the National Institute of

Virology (NIV) and the Jamil-ur-Rahman Centre for Genome Research of the PCMD.

PCMD said that the third wave of coronavirus is becoming more serious due to the sharp increase of the highly contagious UK and South African variants in Pakistan. Prof Choudhary, who is the director of ICCBS, warned that the situation may slip out of control if

immediate measures are not taken to address the looming disaster.

“In the backdrop of massive violations of coronavirus-related standard operating procedures across the country, these variants have the potential to sweep a major chunk of the population within a short period,” said Dr. Choudhary. The positivity rate of coronavirus stands at 8.31% as of today (Friday).

Original Link: <https://www.geo.tv/latest/345621-coronavirus-50-of-third-wave-cases-due-to-uk-variant-25-because-of-south-african-variant>

## Media’s COVID Hypocrisy; Mandatory Vaccines; Biodegradable Plastic from GM Plants

- *How The Media’s Hypocrisy Undermines Critical Thinking In The Age Of COVID:* The same media outlets that tell you to get a COVID vaccine and reject coronavirus conspiracies will also promote organic food as a safer choice, though there is no evidence behind such a recommendation, and spread myths about the dangers of so-called “industrial farming.” How do these double standards impact the public’s trust in scientists?

- *‘Public health can supersede individual rights’:* Government-mandated vaccinations are not violations of personal liberty, courts determined a century ago. Does the government have the authority to require Americans to be vaccinated? Is it possible

that this heavy-handed approach will backfire, actually decreasing vaccine uptake, or are Americans just hyper-skeptical of their government?

- *Biodegradable plastic from plants: How GE camelina could advance industrial sustainability:*

Plastic pollution caused by single-use items like food containers and consumer products remains a serious environmental problem globally. As farfetched as it sounds, the best solution may be growing eco-friendly plastic in genetically engineered plants. Produced naturally by bacteria, they’re completely biodegradable and thus could serve as renewable sources of plastic, as well as animal feed and biodiesel.

Original Link: <https://geneticliteracyproject.org/2021/04/21/podcast-medias-covid-hypocrisy-mandatory-vaccines-biodegradable-plastic-from-gm-plants/>

## World Bank Report Highlights Risks Posed by COVID to Pakistan’s Economy

ISLAMABAD: A new World Bank report released on Wednesday termed new waves of infection, the emergence of vaccine-resistant strains coupled with setbacks in mass vaccinations as major risks to the

economic outlook of Pakistan. Output growth is expected to recover gradually over the medium-term, averaging 2.2 percent over fiscal years 2021-2023, mostly due to contributions from private consumption, the

report said. However, sectors that employ the poorest, such as agriculture, are expected to remain weak, and therefore poverty is likely to remain high.

Though fiscal consolidation efforts are expected to resume, the deficit is projected to remain elevated at 8.3pc of GDP in the fiscal year 2021, partly due to the settlement of arrears in the power sector, the report underlines.

Original Link: <https://www.dawn.com/news/1615724>

## NATIONAL NEWS

### **CPEC Significantly Improved Pakistan's Infrastructure, Power Sector**

The China-Pakistan Economic Corridor (CPEC) has showed maturity and stability of already deep high level friendship between Pakistan and China and since its launch, the flagship project has significantly improved Pakistan's infrastructure and power sector. “Along with these developments, human interaction between Pakistanis and Chinese has also increased, which is proving to be very helpful for people to understand each other from many angles beyond traditional ways,” Haroon Sharif, former Chairman BOI told China Economic Net in an interview. CPEC is also appealing to foreign investors as the government of Prime Minister Imran Khan has been briefing what is happening at Gwadar port, the progress of various projects.

Original Link: <https://www.urdupoint.com/en/miscellaneous/cpec-significantly-improved-pakistans-infras-1245472.html>

### **Farmers Should Prefer BT Cotton for Agriculture**

Agriculture experts here advised the growers to prefer the cultivation of BT Cotton varieties along with a 10 percent area of

It goes on to add the containment measures adopted in response to the Covid-19 led to a collapse in economic activity during the final quarter of the fiscal year 2020, and as a result, GDP is estimated to have contracted by 1.5pc in the fiscal year 2020. Over the first half of the fiscal year 2020-21, there have been signs of a fragile recovery.

Foreign investors from Saudi Arabia and Qatar were watching CPEC closely, he added. For better facilitating investors, he said these Special Economic Zones under CPEC should look like a ship or a vessel in which an investor could get all the things needed. “It must do partnerships, teach them how to do business and make it part of a value chain of China and Pakistan.” Haroon Sharif said China's model of development was very fascinating and he thought that the reason why China has developed so fast lied in its reform and opening-up policy.

Besides the opening-up, China made many reforms which Pakistan also needed to learn from it, he added.

non-BT cotton crops to save them from pest attacks.

On Saturday, a spokesman of the agriculture extension department said, that the government had set a target of cultivating 200,000 acres with cotton this year and for this purpose, the agriculture department was also providing a subsidy of Rs.1000/- per bag of approved and certified cottonseed and the farmers can purchase cotton seed of approved BT Cotton varieties including

IUB-13, MNH-886, BS-15, NIAB-878 and FH-142 along with non-BT varieties for Punjab seed corporation. The farmers must ensure a number of plants range from 15,000 to 17,500 on one acre if the cotton was cultivated from 1st April to 20th April and plant number should be 17,500 to 20,000 if the crop was cultivated from April 21 to May 10.

Original Link: <https://www.urdupoint.com/en/agriculture/farmers-should-prefer-bt-cotton-for-cultivati-1212632.html>

### **Farmers Told to Complete Sowing of Cotton by 31st**

MULTAN - Agriculture experts have advised farmers to complete cotton sowing by May 31 and use only registered seed varieties to get good production results.

Spokesman, however, added that farmers should select varieties out of the registered varieties available in accordance with local weather and soil conditions.

Fur-free seed with germination strength of 75 per cent should be applied at the rate of

six kilogram per acre, however, the quantity should increase to eight kilogram per acre in case of seed having fur on it.

Plant population should be 15000-17500 per acre for cotton sown till Apr 20, however, the range should increase to 17500-20000 in case of sowing from Apr 21 to May 10.

Original Link: <https://nation.com.pk/16-May-2021/farmers-told-to-complete-sowing-of-cotton-by-31st>

### **Government Bringing New Age Agriculture Technologies to Enhance Farming Quality**

Special Assistant to the Prime Minister on food Security Jamshed Iqbal Cheema Monday said that government was introducing new age technologies to improve farming quality and bringing the agriculture products at par with the international standard to increase the exports of the country. “We are educating farmers to use the modern technology which will save precious time and increase per-acre yield

with low labour cost”, he added. “The government's direction is right and intentions are good therefore we will achieve the set targets set in the next budget,” he added.

“We are focusing on the use of certified seed for enhancing agriculture productivity due to better profitability and international recognition,” he added.

Original Link: <https://www.urdupoint.com/en/pakistan/govt-bringing-new-age-agriculture-technologie-1270917.html>

## **Government Committed to Develop Agriculture for Food Security**

Punjab Finance Minister Makhdoom Hashim Jawan Bakht has said that a progressive approach is being promoted to enhance agricultural productivity which is vital for food security in the country. The provincial minister said this while addressing a seminar on development, poverty rate, and food security, organized by Government College University, Lahore, on Thursday. He said the present government made the provincial budget with a different philosophy and inclusive growth instead of the past governments who established infrastructure without considering the judicious use of

it. The minister said that in the budget, the government has allocated Rs86 billion on civil works in the 16 most backward tehsils of the province. The minister said that the success of the government was not only the provision of funds but also their efficient use which is the first priority of the present government.

The government is trying to lift 5 million families across the poverty line through a comprehensive plan to provide services from birth to education and from education to employment throughout their life cycle.

Original Link: <https://dailytimes.com.pk/774736/govt-committed-to-modernise-agriculture-for-food-security-hashim/>

## **Government Plans to Incentivize Cotton Growers to Improve Production**

The sowing of cotton has registered a significant increase this year in South Punjab compared to last year due to the incentives of the Punjab government, said an official of the Punjab Agriculture Department. Talking to APP, he said it was heartening to note that the farmers were taking a keen interest in sowing cotton this year compared to last year. "Reports of cotton crop sowing were pouring in from the Southern Punjab, right from the first week of April, which was according to the expectation of the government, the official said. Mahar Mahboob, a farmer from Layyah, told APP that he has preferred to sow cotton in fields this year rather than other crops adding that the present government was taking initiatives for the farmers.

Replying to a question, he said that cotton was a cash crop as the government was

giving different initiatives to the farmers. He said that farmers were taking more interest in sowing the cotton than last years in southern Punjab. Punjab is to sow the crop on 1.6m hectares of land to produce 6.07m bales. The Bt cotton varieties recommended by the department include IUB-13, MNH-886, BS-15, Niab-878, and FH-142. Growers have been asked to consult local experts if they plan to sow other registered Bt cotton varieties keeping in view the environment of their district to get better production. It may be recalled here that cotton, a major cash crop and industrial raw material for the textile sector, was on a downwards trajectory due to various issues, but thanks to the present regime, which has realized and was making all efforts not only to facilitate the farmers but also achieve better yields.

Original Link: <https://dailytimes.com.pk/768221/govt-plans-incentives-for-farmers-to-increase-cotton-growth/>

## **Growers Encourage to Cultivate BT Cotton**

Agriculture experts had advised growers to prefer the cultivation of BT cotton varieties along with 10 percent area of non-BT cotton crops to save it from pest attacks. A spokesperson for the Agriculture Extension Department said on Tuesday that the government had set a target of 200,000 acres for bringing it under cotton cultivation this year.

For this purpose, the department was also providing a subsidy of Rs1,000 per bag of

approved and certified cotton seed. The farmers could purchase cotton seed from Punjab Seed Corporation at subsidized rates.

He further said that the experts had recommended 17,500 to 20,000 plants of cotton in one acre if the crop was cultivated from April 20 to May 10. Therefore, the farmers should choose fertile land for cotton cultivation and ensure the presence of 17,500 to 20,000 cotton saplings in a field to get their bumper yield.

Original Link: <https://tribune.com.pk/story/2295887/growers-urged-to-cultivate-bt-cotton>

## **Minister Suggests Reforms to Improve Farm Yield**

Food Security Minister Syed Fakhar Imam has suggested a raft of interventions such as seed sector reform, digital subsidiary management, water efficiency, farmers' access to credit and restructuring research institutions to improve productivity and bridge the yield gap. Imam gave a detailed presentation on agriculture to the Economic Advisory Council meeting chaired by Finance Minister Shaukat Tarin.

He expressed his joy that the agriculture sector, which had been neglected by successive previous governments, had come under the focus. "There is nothing better than self-sufficiency in food security," the minister told the meeting.

"Agriculture has been off the table for 22 years, but I'm so happy that agriculture is

back in focus because of the agriculture transformation plan," he added. During the four-hour-long session, four sub-groups on agriculture, China-Pakistan economic corridor, social protection and information technology, gave detailed presentations.

Presenting the subgroup presentation on agriculture Imam dilated on the current functioning of the agriculture and food security sector and ways forward for future. During the second session of the second meeting of EAC, which continued for four hours, four sub-group on Food Security, Agriculture, China Pakistan Economic Corridor, Social Protection and Information Technology & Digitalization – gave their detailed presentation.

Original Link: <https://tribune.com.pk/story/2303804/minister-suggests-reforms-to-boost-farm-yield>

## Opportunities Exist to Uplift Agriculture Sector

FAISALABAD: There are ample opportunities for University of Agriculture Faisalabad scientists to uplift country's agriculture and livestock sector, thanks to highly qualified faculty and existing research facilities, said Vice Chancellor Prof Dr. Asif Tanveer. He was talking as chief guest at a function organized by the VC Secretariat in connection with the successful completion of his service journey.

Prof Dr. Asif Tanveer said that there is no substitute for hard work. Benevolent students are creating surprises under the guidance of the Prof Dr. Asif Tanveer.

Registrar Tariq Mahmood Gill said that Dr. Asif Tanveer has always been sympathetic towards the betterment of the employees, students, farming community and other stakeholders.

Original Link: <https://www.brecorder.com/news/40091259>

## PAEC Grows Soybean Lines for Spring, Autumn Cultivation

In a statement, PAEC spokesperson Shahid Riaz Khan said we have developed soybean lines that can be grown both in spring and autumn. Currently, only 2-5 soybean cultivars are available in the country for general cultivation, which produce economical yield only under short-day conditions.

The PAEC Spokesperson, Shahid Riaz Khan, said that PAEC scientists have successfully identified, high-yielding soybean lines suitable for autumn cultivation in different agroecological regions of Pakistan, high-yielding soybean lines suitable for spring cultivation in different agroecological regions of Pakistan. These

varieties are highly virus resistant soybean genotypes against multiple viruses. Pakistan has been growing high delta crops such as rice, sugarcane and maize. The water level is fast decreasing and, therefore, a low delta crop such as soybean is very much required to reverse the trend.

As soybean is a legume crop, therefore, its cultivation will enhance soil fertility by its natural nitrogen fixation characteristics and addition of organic matter, which will be very helpful for follow-up crop. Soybean is a source of quality vegetable oil, proteins, essential amino acids, and essential fatty acids.

Original Link: <https://www.thenews.com.pk/print/845789-paec-develops-soybean-lines-for-spring-autumn-cultivation>

## Pakistan's First-Ever Research Center of Intercropping Officially Approved

ISLAMABAD: The establishment of the Pakistan National Research Centre of Intercropping (NRCI) at The Islamia University of Bahawalpur (IUB) was officially approved, according to a report published by China Economic Net (CEN) on Sunday.

This will be the first-ever national research center regarding intercropping technologies in Pakistan.

“Before this, there was no national research center dedicated to intercropping in Pakistan. The center firstly will be affiliated

with the key laboratory of China's Ministry of Agriculture undertaken by Sichuan Agricultural University (SAU), which is well-known throughout the world for intercropping research, especially in maize and soybean.

Pakistan wants to increase its soybean production desperately," Muhammad Ali

Original Link: <https://www.thenews.com.pk/print/826296-pakistan-s-first-ever-research-centre-of-intercropping-officially-approved>

### **Pakistan's Silent Rice Revolution**

Basmati rice now constitutes half of total 8 million national rice productions. Moreover, increased net domestic availability of basmati (more production + less exports) coupled with deregulated prices for rice should have led to domestic prices finding parity with falling global prices. Export of "other rice varieties" charged ahead from 2.7 million tons a decade ago to 3.4 million tons by last fiscal, ensuring that overall volume exported stayed put at 4 million tons per annum.

Although Pakistan's trade figures do not provide variety-wise breakdown for exports

Original Link: <https://www.brecorder.com/news/amp/40087902>

### **PM Imran Khan Says Government Fully Focused on Agriculture Sector**

The Prime Minister Imran Khan on Thursday speaking at an event in Lahore, spoke about the various sectors of Pakistan, including agriculture and tourism, that had been ignored by previous governments. "First we were stabilising the economy but now, our entire focus is on agriculture," he said. "I am leading it myself and I will prove to you by bringing about a major revolution

Original Link: <https://www.thenews.com.pk/latest/831379-pm-imran-khan-says-govt-fully-focused-on-agriculture-sector>

Raza, post-doc from Sichuan Agricultural University told CEN.

It's learned that 25 acres of land have been allocated to the center. "Chinese scientists are well experienced in intercropping technology.

(other than for premium basmati), it appears that rice processors have managed to replace coarse IRRI grains with hybrid varieties in the export mix as well.

For one, China – where hybrid varieties originated - has become the biggest buyer of Pakistan's non-basmati rice varieties (HS code 1006-3090), from virtually zero exports a decade ago. If true, higher share of hybrid rice grains in export volume (instead of coarse or basmati) would mean that Pakistan is no longer indulging in virtual export of water, a common refrain among environmentalists.

## **PM's Agriculture Emergency Programmed to Revolutionize Agri, Livestock Sectors**

“Realizing the potential of agriculture and taking cognizance of the challenges related to agriculture, the present government has introduced.”

Prime Minister Agriculture Emergency Programme “worth Rs 277 billion to revolutionize the agriculture and livestock sectors” he said while addressing UKAID and SDPI meeting on ensuring food security through use of technology. In addition, the programme also includes establishing new agriculture markets which will protect farmers from the exploitation of middlemen. He said that the programme’s vision is “food secure Pakistan, based on modern and efficient food production and distribution systems, can best contribute towards global stability and

peace”. The Government’s focus on adoption of new and emerging technology in agriculture sector is expected to improve the agriculture production and sustainability which ultimately help in achieving food security.

It was noted that the world has been facing a paradox of widespread food insecurity and malnutrition amid net food surpluses. Increased food supplies do not automatically enhance access to food especially by the poorer groups of society. Food Minister said that according to the Constitution of the Islamic Republic of Pakistan the right to food as one of the Fundamental Rights and Principles of Policy. Despite strong agricultural base, the country fares poorly with respect to indicators of food security.

Original Link: <https://pakobserver.net/pms-agriculture-emergency-programme-to-revolutionize-agri-livestock-sectors/>

## **Soorty Inaugurate Organic Cotton Initiative in Pakistan**

Soorty, a Pakistan-based vertical denim manufacturing company announced the launch of Soorty Organic Cotton Initiative, in partnership with WWF-Pakistan, and the Department of Agriculture Extension, Balochistan, based on a program that brings organic farming practices and a better way of life to farmers in the Balochistan region of Pakistan.

“SOCI goes beyond just cultivating organic cotton,” said Asad Soorty, Director Soorty. “SOCI is about uplifting the farming families of this deprived region through higher income, better schooling and access

to professional health services. This is our first foray into farming, and we’re excited by the possibilities in front of us.” The project’s first mission centers on the Nall region of Balochistan’s Khuzdar district, situated south of the provincial capital of Quetta City.

Currently, Pakistan makes up just 0.17 percent of the world’s organic cotton. Organic farming initiatives in the Balochistan region are also a point of focus for Artistic Milliners, which launched its own Milliner Cotton Initiative in the Rahim Yar Khan district last year.

Original Link: <https://sourcingjournal.com/denim/denim-mills/soorty-organic-cotton-initiative-balochistan-pakistan-farming-272736/>

## **Pakistan's Government Committed to Develop Agriculture for Food Security**

Punjab Finance Minister Makhdoom Hashim Jawan Bakht has said that a progressive approach is being promoted to enhance agricultural productivity which is vital for food security in the country. The provincial minister said this while addressing a seminar on development, poverty rate, and food security, organized by Government College University, Lahore, [Pakistan](#) on June 17, 2021.

The minister stressed that the present government made the provincial budget with a different philosophy and inclusive growth instead of the past governments who established infrastructure without considering the judicious use of it. The minister added that in the budget, the government has allocated Rs86 billion on civil works in the 16 most backward tehsils of the province. The District Development Programme has been selected keeping in view the labor consumption.

Read more from [Pakistan Biotechnology Information Center](#).

### **Pakistan Seeks Cooperation with China to Develop Agricultural Sector, Enhance Food Security**

Pakistan can seek help in improving production technology and product quality and expanding the sales market to increase exports to various countries, including China, one of the major destinations for the country's exports.

"With the formation of prudent trade policies and high value-added products in the agricultural sector, the country can develop a huge consumer market in China," said Muhammad Ansar, chairman of the agronomy department at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi.

Pakistani Prime Minister Imran Khan said recently that the government has been

seeking support from China to boost the country's agricultural sector to ensure sustainable development and prosperity.

"Pakistan and China have a long history of agricultural cooperation, and the country (Pakistan) has excelled in many areas due to enhanced bilateral agricultural research and development activities," Imran said, adding that China has not only established its agricultural sector on modern lines but also extended its help to countries including Pakistan under the Belt and Road Initiative of which the CPEC is a flagship project, to boost agricultural development.

Read more from [Pakistan Biotechnology Information Center](#).

## **INTERNATIONAL NEWS**

### **After Eradicating Pink Bollworm, Arizona Farmers Hope to use GMO Cotton to Target Other Pests**

Cotton farmers in Arizona started planting genetically modified cotton in 1996 in an effort to eradicate an invasive species of

moth from Asia or Australia known as the pink bollworm.

Pink bollworm caterpillars eat the seeds of cotton plants and damage cotton fibers, and in the 1990s and early 2000s, they were a big problem in Arizona. Then farmers tried a new method to combat the insects: planting genetically modified cotton, called Bt cotton, that is toxic to pink bollworms.

His study shows that eliminating the pink bollworm saved cotton farmers in the United States \$192 million from 2014 to 2019 and helped reduce pesticide use in Arizona cotton fields by 82%. Though it's been years since a pink bollworm has been spotted in the state, many Arizona farmers like Ollerton continue to use genetically modified cotton, and are turning their eyes toward other types of cotton pests.

Original Link: <https://amp.azcentral.com/amp/6836112002>

## **Enabling Strategies for Developing Pakistan's Agriculture**

A recent report, jointly prepared by experts from Victoria University in Australia and leading government officials in Pakistan, takes such a strategic view. It identifies smallholder agriculture as a pivotal sector for Pakistan, arguing the comprehensive initiatives to assist smallholders could have major flow-on economic and social impacts. The starting point is that while the global economy experienced a major economic transformation between 1990 and 2015, Pakistan's economy remained basically isolated from this transformation. Pakistan's economy still relies heavily on agriculture, which accounts for 19% of the country's GDP. Around 64% of Pakistan's population lives in rural areas, most of who are employed directly or indirectly in agriculture. Small farms dominate Pakistan's agriculture.

There is an urgent need for enhancing the policy focus on smallholders in general and

To combat this problem, Arizona farmers were required to plant non-genetically modified cotton as at least 4% of their overall cotton crop so that some non-resistant bollworms would survive and mate with the resistant bollworms. Ollerton said he hasn't noticed much of a difference between regular cotton and genetically modified cotton in the U.S., except that in some genetically modified cotton varieties, it was harder to open up the cotton bolls for picking. He has continued to use the genetically modified cotton even after getting rid of pink bollworms because they are useful against other types of pests as well, such as the native cotton bollworm, also known as a corn earworm.

on horticulture and livestock and dairy farming in particular, because of the dominance of small farmers in these segments of agriculture. Given the federal structure of Pakistan's public sector, this transformation will need to be supported by both national and provincial level governments. In conclusion, smallholder agriculture in Pakistan is facing a multitude of challenges that are collectively holding down its performance far below its potential. Because small farmers are lacking in education and training in supplying to modern food markets, their productivity and household incomes remain low.

By following the recommendations of this report, central and provincial governments can help small farmers to overcome these challenges, integrate with modern food supply chains and become much more efficient and prosperous.

Original Link: <https://tribune.com.pk/story/2303856/enabling-policies-for-developing-pakistans-agriculture>

## **Food Safety Essential to Tap Global Market**

Pakistan has immense potential in the food business and can capture the world market by adopting safety requirements and meeting global standards.

These views were expressed by speakers at a virtual event on Monday to mark World Food Safety Day.

Experts, on the occasion, said that safe food contributes to a healthy life, a healthy economy, a healthy planet, and a healthy future. They stressed the need for local

actions based on equitable novel solutions and strengthened multi-sectoral collaboration, which was essential to meet the Sustainable Development Goals.

Meanwhile, Ministry of National Food Security and Research Additional Secretary Syed Anwarul Haq emphasized building a better food system, which would not only improve health but also impact increasing food and agricultural products exports and achieve a high place in the global market.

Original Link: <https://tribune.com.pk/story/2304019/food-safety-vital-to-tap-global-market>

## **Pakistan-China Cooperation in Sugar Industry to Bring ‘Sweet Revolution’**

Pakistan and China can produce high-grade sugar in abundance and export it across the world, said Dr Gu Wenliang, Agricultural Commissioner of the Chinese Embassy in Pakistan, according to China Economic Net (CEN). “Sugarcane cooperation between China and Pakistan will bring sweet revolution, and will literally turn the friendship between the two nations ‘sweeter than honey’,” he remarked.

Dr. Gu Wenliang was speaking at "China-Pakistan Sugarcane Industry Cooperation and Exchange Forum" where experts from both China and Pakistan participated and exchanged views. "Chinese Academy of Tropical Agriculture Science has been giving training to the scientists across the globe.

Dr Zhang Shuzhen, Researcher from Institute of Tropical Bioscience and Biotechnology of CATAS strongly rejected using conventional seeds. "As CPEC inches near to completion in Pakistan, we are offering our latest agricultural technology to Pakistan."Pakistan is a traditional agricultural country, but there is still a lot more to do to modernize its agriculture sector to enable it to meet international. We are here to help Pakistan achieve goals.

"We established the Pakistan-China Agricultural Cooperation and Exchange Center in the first place in 2019 and now the Information Platform, in a wish to vitalize cooperation between the enterprises and research institutions of the two sides and promote Pakistan’s development in agriculture," Dai Bao said.

Original Link: <https://dailytimes.com.pk/769131/pakistan-china-cooperation-in-sugar-industry-to-bring-sweet-revolution/>

## PARC Conducts Seminar for Rice Farmers

ISLAMABAD: PARC organized a rice field seminar on 27th March 2021 at Zaidi Farms, Kakar Gill, Shaikupura.

Dr. M Azeem Khan, Chairman, PARC viewed seminars as an important part of farmer's support system. While addressing the participants Dr. Sarfraz Ahmad said PARC is identifying site-specific potential researchable issues with a multi-disciplinary

team in different rice growing ecologies of Pakistan, highlighting the research gap in developing improved machinery for permanent raised beds and strengthening the coordination among the various sub-components of rice PSDP project for sustainable agriculture. Rice CEWRI-NARC, Dr. Ghani Akbar as an event organizer for facilitating farmers.

Original Link: <https://www.brecorder.com/news/40079892/parc-conducts-seminar-for-rice-farmers>

## Kenya's Agricultural Reforms Set to Bolster Bt Cotton Commercialization

The Government shall be mandated to promote and market fibre crops and products locally and internationally, a development that will invigorate Bt cotton production.

The Bill, technically referred to as Fibre Crops Development Authority Bill, seeks to provide for the development, regulation, and promotion of cotton and sisal industries. This is expected to introduce focus and clarity in the management of the cotton value-chain as the Government banks on Bt cotton to revitalize the textile and apparel industry by increasing the crop production from the current 20,000 bales to 200,000 bales by 2022. Speaking during a virtual consultative meeting on Bt cotton with Kenya's cotton value chain players, Solomon Odera, the Head of the country's Fibre Crops Directorate, exuded confidence that once the Bill becomes law, cotton farmers will enjoy protection from exploitation through price fluctuation.

"The Bill will establish a development levy which will be used in financing various activities within the value chain of both

cotton and sisal," said Odera. Approximately 1.5 million tons of cottonseed oil is produced annually, making cottonseed oil the number one vegetable oil produced from secondary sources. Cottonseed oil is trans-fat free, contains no cholesterol, and can play a role in reducing saturated fat intake," he said. He also revealed that cottonseed is a major source of protein, as its by-product, the oil cake, contains a high-quality protein (23%) – a necessary ingredient for animal feed. This makes cotton de-oiled cake or meals the preferred feed for cattle and buffaloes in the country.

Kenya is currently rolling out commercial farming of Bt cotton with farmers in cotton-growing counties in eastern and western Kenya having already planted the GM crop. During the 2020's October-November season, farmers in ten cotton-growing counties in the eastern region planted 16.3 metric tons of Bt cotton on 10,000 acres (4,047 hectares). Cultivation of Bt cotton was launched in the country in March 2020 starting with the planting of on-farm demonstration plots around the country.

For more information about biotechnology in Africa, send a message to [mkarembu@isaaa.org](mailto:mkarembu@isaaa.org).

## Experts Encourage Farmers in Pakistan to Plant Bt Cotton

Agriculture experts in Pakistan advised growers to plant Bt cotton varieties along with a 10 percent area of non-Bt cotton crops to save them from pest attacks.

Agriculture extension department spokesperson said that the government had set a target of cultivating 200,000 acres with cotton this year and for this purpose, the agriculture department was also providing a subsidy of Rs.1000/- per bag of approved and certified cottonseed and the farmers can

purchase cotton seed of approved Bt cotton varieties including IUB-13, MNH-886, BS-15, NIAB-878, and FH-142 along with non-BT varieties for Punjab seed corporation. The farmers must ensure a number of plants range from 15,000 to 17,500 on one acre if the cotton was cultivated from April 1-20, and plant number should be 17,500 to 20,000 if the crop was cultivated from April 21 to May 10.

Read the story from [Pakistan Biotechnology Information Center](#).

## Japanese Researchers Use Menthol-Like Compound to Stimulate Plant Immune Mechanisms

Researchers from Tokyo University of Science developed a structurally similar compound to menthol which boosts the plant's immune system against herbivore pests.

Terpenoids are natural chemicals released by plants that can serve as airborne signals to activate defense-related genes in nearby plants of the same species. The researchers chemically modified the terpenoid compound menthol by attaching amino acids to produce six derivatives. They wanted to see if these modified compounds are more effective than unmodified menthol in activating plant defense mechanisms. The researchers then applied these modified compounds in soybean leaves and found that

only valine methyl ester (ment-Val) outperforms menthol.

Further experiments showed that ment-Val solution boosted the expression of defense-related genes of soybeans for three days, and the second spraying on the fourth day boosted the expression of these genes again. The researchers also found that men-Val could also increase the gene expressions of defense-related genes on other crops such as maize, tobacco, and peas.

The study showed that ment-Val is a good alternative to chemical pesticides that farmers use. It is more eco-friendly and has good shelf life making it useful in the fields of agriculture and horticulture.

For more details, read the news release in [Tokyo University of Science](#) and the journal article in [Plant Molecular Biology](#).

## Research Confirms GM Grass Cleanses Soil of Toxic Pollutants Left by Military Explosives

A study conducted at the University of York has confirmed that genetically

modified (GM) switchgrass detoxifies residues of the military explosive RDX, left

behind on live-fire training ranges, munitions dumps, and minefields. RDX has been used on munitions since WW2 and its use has now resulted in widespread groundwater pollution.

The researchers generated the GM switchgrass by inserting two genes from bacteria able to break down RDX. The plants were then grown in RDX

contaminated soil on a US military site. The study has confirmed that the plants removed and degraded RDX at a rate of 27kg RDX per hectare. RDX is designated as a priority pollutant by the US Environmental Protection Agency and is of significant and increasing public concern. In the US, over 10 million hectares of military land are contaminated with munitions components, of which, RDX is a major component.

For more details, read the article on the [University of York website](#).

### **First GM Mosquitoes Deployed in the United States**

A field test in Florida released the first genetically modified (GM) mosquitoes to assess a method in controlling the spread of diseases that *Aedes aegypti* mosquitoes may carry such as Dengue, Zika, Chikungunya, and Yellow Fever.

GM *A. aegypti* mosquito eggs were placed in a box at six locations in the Florida Keys. About 12,000 male mosquitoes are expected to be released in the boxes each week starting in the second week of May for 12 weeks. These male mosquitoes don't bite, so they cannot pass on diseases to humans. It

carries a gene encoding tetracycline-repressible transcription activator (tTA) which is passed on to their offsprings and kills female progeny in their early larval stage.

The study aims to create an alternative way in managing the population of *A. aegypti* mosquitoes because insecticide resistance is rampant among insect pests in the US. Previous field tests in Brazil, Panama, the Cayman Islands, and Malaysia have shown promising results.

To learn more about the study, read the article in [Nature](#).

### **Scientists Encouraged to Invest Time for Science Communication**

Time devoted to science communication is a valuable investment that can have a tremendous societal impact, according to the University of Illinois at Urbana-Champaign Assistant Professor Esther Ngumbi. The statement was discussed in *A Comprehensive Guide on Science Communication* edited by Fani Kelesidou and Eclodie Chabrol and published by Hindawi.

The guide includes practical tips and examples of how to best convey science to facilitate engagement; do's and don'ts when communicating research to the general public, and insightful interviews with individuals who were involved in public engagement and science communication campaigns. The guide is available for download, as Hindawi follows open access publishing model to help facilitate better communication of science and effectively transform people's lives.

Download a copy from [Hindawi](#).

## **GM White Maize Contributes to Food Security in South Africa**

In South Africa, white maize is the only staple food crop produced using genetically modified (GM) cultivars. From 2001 to 2018, GM white maize has brought welfare benefits amounting to ~US\$695 million, according to a study conducted by experts from the University of Arkansas and published in the *Global Food Security* journal.

GM white maize is produced on a widespread commercial basis for direct human consumption in South Africa. To

Read more findings in [Global Food Security](#).

estimate the total welfare benefits of this GM crop in the country, the researchers computed the economic and environmental impact from 2001 to 2018.

Results showed that GM white maize has contributed to food security by an average of 4.6 million additional rations per year. Furthermore, GM maize has reduced environmental damage by US\$0.34 per hectare or US\$291,721 annually, compared to conventional hybrid white maize.

## **AGRI BIOTECH NEWS**

### **CPEC to Help Increase Dates Cultivation in Pakistan**

The CPEC is poised to usher in a new era of trade and growth, Pakistani date growers pin their hopes on its different projects to help bring revolution in date farming. The newly built motorways under CPEC are making the dates' market accessible to farmers and helping them bring the latest machines and modern farming tools to their farms in remote parts of the country. Dates are the third largest horticulture crop in Pakistan, which is found in all four provinces of the country. Dried, Shareefa, Muzawati, Kupro, Hillavi, Aseel and Rabbi Etc. As the name Dhakki shows, these dates with exotic taste are cultivated in the Dhakki area of D. I Khan District in Khyber Pakhtunkhwa .

Muhammad Shah, another farmer said, "Dhakki is suitable for dates' nurseries

and our saplings have demands in markets but we could not send them to distant cities due to poor conditions of roads and long journeys," he said and he added, "We would also bring the latest machinery to use them in our farming". The farmers of Dhakki are expecting dates processing units in their area in the near future.

The farmers of the southern parts of KP expect to have industries and processing units in the special economic zones. "Our dates and its products would be exported directly to foreign countries through the special economic zone," Zahid Bittani, a farmer from Tank district told Gwadar Pro. "Connectivity will help us increase dates farming and its yields," Nan Lal, who deals in dates, told Gwadar Pro via phone from Sukkar, the report added.

Original Link: <https://dailytimes.com.pk/750923/cpec-to-help-increase-dates-cultivation-in-pakistan/amp/>

## **Olive Cultivation to make Pakistan Self-Sufficient in Edible Oil**

Dr. Muhammad Naeem, Assistant Professor Economics, University of Swabi said that olive cultivation was a profitable business in world and about \$3.6 billion, which normally Pakistan spends on import of olive oil every year, could be saved by promoting olive farming.

To capitalize on the good work of the project, Federal Government had launched “Promotion of Olive Trees Cultivation on

Commercial Scale” Project worth Rs 2.3 billion in 2015 to increase production of edible oil. He said that new orchards on about 13,264 acres were raised and wild olive grafting in over 470,000 plants achieved besides grafting in about 500,000 wild olive and raising of orchards on 12,000 acres. Eight certification laboratories would be established while a Pak Olive Company to be raised to ensure stability in its business, he added.

Original Link: <https://nation.com.pk/26-Apr-2021/olive-cultivation-to-make-pakistan-self-sufficient-in-edible-oil?version=amp>

## **BIOTECH NEWS**

### **Breeders Developing Extra Resistant Brinjal Varieties**

Bt brinjal, a genetically modified eggplant variety, was developed to fight fruit and shoot borer that used to cause colossal crop loss in Bangladesh’s brinjal fields but not anymore.

Dr Md Jahangir Hossain, who coordinates biotech brinjal and late blight-resistant potato project in Bangladesh, told this correspondent that in 2020-21 crop year as many as 65,000 farmers in Bangladesh are growing Bt brinjal in 12,500 acres of land.

Earlier, five years after introducing country’s first genetically modified crop – Bt brinjal – government undertook an impact assessment study in 2018. It stated

that the farmers got benefitted financially by cultivating Bt brinjal and they are now less prone to health hazards caused by pesticide sprays.

The study outcome found that the farmers who cultivated the Bt brinjal gained by 55 percent higher income comparing to their peers growing the non-Bt brinjal.

The genetically modified Bt brinjal has been developed by inserting a crystal protein gene from the soil bacterium *Bacillus thuringiensis* into the genome of various brinjal cultivars thereby, protecting the crop from infestation of Fruit and Shoot Borer , the deadliest pest for brinjal.

Original Link: <https://www.dhakatribune.com/business/2021/04/06/breeders-developing-doubly-resistant-brinjal-varieties>

### **About all Cash Crops is Genetically Engineered Now**

More than 90 percent of all corn, cotton and soybeans planted in the U.S. are genetically

engineered, according to data from the Department of Agriculture.

The number of crops modified to be herbicide-tolerant and insect-resistant has increased dramatically since 2000.

That year, a quarter of corn planted was genetically engineered. Now, 20 years later, about 92 percent of corn planted is genetically modified. Soybeans and cotton have followed similar trends.

According to the non-profit organization, International Service for the Acquisition of Agri-biotech Applications, some of the benefits of biotech crops are increasing crop productivity, conserving biodiversity and reducing CO2 emissions.

Original Link: <https://thecounter.org/cash-crops-genetically-engineered-gmo-usda/>

### **Agriculture Department Cracks Down on Unapproved HTBt Cotton Seeds**

This season, the quality control team of the department has seized unapproved HTBt cotton seeds worth Rs 1.90 crore till June 9. However, Shetkari Sanghatana to continue with the 'disobedience movement' and facilitate the provision of HTBt cotton seeds to willing farmers

Even as the farmers are busy with Kharif season agricultural activities, Agriculture Department has started a crackdown against unapproved herbicide-tolerant (HT) Bt cotton seeds across Maharashtra. And, while the action is being taken against HTBt cotton seeds, Shetkari Sanghatana has announced that it will facilitate the provision of the seeds to farmers at their doorstep as part of its 'disobedience movement'. As per the official data, the Quality Control Squad of the State Agriculture Department has seized unapproved HTBt cotton seeds as well as Soyabean, Gram, and Tur grains being sold as seeds in an unauthorized manner, and registered a total of 19 police cases in this regard in various parts of Maharashtra. Of these 19 cases, 18 relate to unapproved HTBt cotton seeds.

The cases relating to cotton have been registered in Nagpur, Yavatmal,

Chandrapur, Gadchiroli, Washim, Amravati, Dhule, Jalgaon, and Nandurbar districts. 11 of these cases about unapproved HTBt seeds have been registered in the above-mentioned six districts of the Vidarbha region. Of these 11, three each are in Nagpur and Yavatmal districts, two each in Chandrapur and Gadchiroli districts, and one each in Amravati and Washim districts. Of the total stock of unapproved HTBt cotton seeds seized, the highest 11,110 packets were seized in Saoner tehsil of Nagpur district, followed by 2,270 packets in Aheri tehsil of Gadchiroli district, and 1,600 packets in Chandrapur city. The total estimated worth of the HTBt cotton seeds seized in the State up to June 9, is Rs 1,90,77,000/. Apart from the HTBt cotton seeds, the department's squad seized 6,191 quintals of Soyabean, Gram, and Tur grains being sold as seeds in an unauthorized manner at Darwha in Yavatmal district on June 5.

This seized stock has been estimated to be worth Rs 4.1992 crore. HTBt cotton seeds have been a matter of debate for the past some time.

Original Link: <https://www.thehitavada.com/Encyc/2021/6/14/Agriculture-Department-cracks-down-on-unapproved-HTBt-cotton-seeds.html>

## One Step Closer to Efficient Cannabis Production

Currently, the commercial cannabis industry relies on other propagation techniques, such as collecting seeds or taking carefully timed cuttings from stock “mother” plants. “Plants that come out of tissue culture also have the benefit of being disease-free, they frequently show enhanced vigor, and you can grow a lot more in less space,” says Lubell-Brand.

Plants in tissue culture depend on the grower to assume the role of nature to provide the

right balance of nutrients and growth hormones in the culture media, to regulate temperature and light -- everything. “Cannabis does not really want to be in tissue culture.”

One day, maybe not so far in the future, the majority of cannabis may be micropropagated using tissue culture, though Lubell-Brand says there are still improvements to be made.

Original Link: [https://www.eurekalert.org/pub\\_releases/2021-05/uoc-osc050421.php](https://www.eurekalert.org/pub_releases/2021-05/uoc-osc050421.php)

## Operation Ordered in Opposition to Sale of Substandard Fertilizers, Pesticides

RAWALPINDI - Additional Deputy Commissioner (ADC) General, Rawalpindi, Qasim Ijaz has directed the authorities concerned to launch a crackdown against sellers of substandard fertilizers and pesticides. The ADC asked the officers to make all-out efforts to ensure the quality of the fertilizers and pesticides and their availability at the rates fixed by the government. He said the Punjab government was taking solid steps for agricultural reforms and to ensure the availability of

agricultural commodities at prices fixed by the government. All the officers concerned will have to play a more active role to implement the policies being formulated by the government, he added. He underlined the need to use the drip irrigation technique which is a suitable irrigation system for the regions like Potohar.

There is a looming threat of water scarcity in the years to come and modern irrigation systems like drip irrigation would help save precious water, he added.

Original Link: <https://nation.com.pk/01-Apr-2021/operation-ordered-against-sale-of-substandard-fertilizers-pesticides>

## Canada Approves HB4 Drought Tolerant Soybeans

On June 1, 2021, Bioceres Crop Solutions has announced that it has successfully completed the regulatory review process and received approval for its HB4 drought and herbicide tolerant soybeans from the Canadian Health Agency and the Canadian Food Inspection Agency.

With approximately 2.5 million hectares farmed every year and yields often below three tons per hectare, Canada's soybean production regions are well suited for HB4 value generation. Ongoing breeding efforts for the Dakotas and Minnesota region in the United States will now expand to southern Canada, reaching a total of 10

million hectares targeted with the HB4 varieties under development.

Currently, HB4 soybean is approved for production in the United States, Brazil, Argentina, and Paraguay,

For more details, read the article on the [Bioceres Crop Solutions website](#)

## **Indian Farmers Lose Opportunity to Benefit from Bt Brinjal as GEAC Halts Field Trials**

The Genetic Engineering Appraisal Committee (GEAC) has ceased the field trials of Bt brinjal and other transgenic crops in India due to the unwillingness of some states to cooperate and with the pressure of some non-governmental organizations.

"We are disappointed by the Ministry of Environment, Forest and Climate Change's regressive decision to not go ahead with the Bt Brinjal field trials or any other GM crop trials without considering the recommendations from States and Union Territories. This further complicates the

collectively representing, together with Canada, 85% of the world's hectareage dedicated to the crop.

already cumbersome process of conducting field trials of transgenic crops in India," said Dr. Shivendra Bajaj, Executive Director of The Federation of Seed Industry of India (FSII). "If we do not use GM technology, we will lose opportunities to save water and reduce fertilizer and pesticide consumption. This is a huge setback for science and technology in agriculture. Most importantly, it puts the Indian farmers at the grave risk of becoming uncompetitive in the international markets," added Ram Kaundinya, Director General of FSII.

For more details, read the news releases in [The Genetic Literacy Project](#) and [Business Today](#).

## **HEALTH BIOTECH NEWS**

### **PARC Opens First Potato Tissue Culture Laboratory at Chilas**

PARC has been able to increase the production of disease free potato seeds through tissue culture technique as per capacity of its cold storage, after which for the first time in Gilgit-Baltistan and Chilas a potato tissue culture laboratory has been set up to provide disease free potato seeds to the farmers so that the farmers can become self-

sufficient and economically stable by getting maximum potato production in less time, this was said by Dr. Muhammad Azeem Khan, Chairman PARC, during the inauguration of potato tissue culture Laboratory and screen house at Chilas under the PSDP project of Potato tissue culture technology in Pakistan.

Original Link: <https://pakobserver.net/parc-opens-first-potato-tissue-culture-laboratory-at-chilas/>

### **Sugar-Free Mangoes Ideal for Diabetics Launched in Pakistan**

In Karachi, A Pakistani expert has introduced three varieties of sugar-free

mangoes ideal for diabetics with having 4 to 6 percent sugar level, ARY News reported.

Three new varieties of sugar-free mangoes have been introduced in Pakistani markets after a scientific modification by a mango expert at a private agriculture farm in Sindh's Tando Allahyar. The sugar-free mangoes were introduced by M H Panhwar Farms after the research and scientific modification that took a period of around five years. While talking to the ARY News program Bakhbar Savera, M H Panhwar's nephew and a mango expert Ghulam Sarwar told that his elder uncle, M H Panhwar was best known for his work on organic farming and he produced a wide range of research articles and manuals on fruits and others." "The Government of Pakistan had conferred Sitara-e-Imtiaz on Mr. Panhwar for his research related to fruits including mangoes and bananas. The prices of sugar-free

mangoes are equivalent to the normal varieties of mangoes available in Pakistan markets at the price of around Rs150 per kilogram. Ghulam Sarwar said that the said mangoes are included in late varieties and it will take one week for meeting the maturity criteria. Elaborating about the season of these varieties, Sarwar said that the sugar-free mangoes will reach the local markets after Sindhri and Chaunsa's season is completed and remained available till August.

According to the website, the agriculture farm was established by Muhammad Hussain Panhwar, also known as Panhwar, to promote horticulture fruits in Sindh and Pakistan to meet the national and international agriculture market.

Original Link: <https://arynews.tv/en/pakistan-sugar-free-mangoes-diabetics-varieties/>

### **Bangladesh Developing New Generation of Genetically Engineered Disease-Resistant Bt Eggplant to Fight Plant Diseases, Dramatically Cutting Insecticide Use**

Starting with only 20 farmers in 2014, the technology of Bt brinjal – a crop developed to drastically lower hazardous pesticide application – reached 65,000 eggplant growers this year, making it the fastest expanding biotech product in Bangladesh.

Now, riding on the huge success of Bangladesh's fastest expanding biotech crop, breeders are working on developing two new eggplant varieties capable to withstand FSB and bacterial wilt.

The study outcome found that the farmers who cultivated the Bt brinjal gained by 55 percent higher income comparing to their peers growing the non-Bt brinjal. The genetically modified Bt brinjal has been developed inserting a crystal protein gene from the soil bacterium *Bacillus thuringiensis* into the genome of various brinjal cultivars.

Original Link: <https://geneticliteracyproject.org/2021/04/15/bangladesh-developing-new-generation-of-genetically-engineered-disease-resistant-bt-eggplant-to-fight-plant-diseases-dramatically-cutting-insecticide-use/>

### **Crops Steal Genes from Other Species to Stabilize Evolution**

Grass crops are able to bend the rules of evolution by borrowing genes from their

neighbors, giving them a competitive advantage, a new study has revealed.

Research, led by the University of Sheffield, is the first to show that grasses can incorporate DNA from other species into their genomes through a process known as lateral gene transfer. The stolen genetic secrets give them an evolutionary advantage by allowing them to grow faster, bigger or stronger and adapt to new environments quicker. By using genetic detective work to trace the origin of each gene, we found over 100 examples where the gene had a significantly different history to the species it was found in. Lateral gene transfer can move genetic information across wider evolutionary distances, which means it can potentially

have even bigger impacts. "Whilst only a relatively small proportion of genes are transferred between species, this process potentially allows grasses to cherry pick information from other species. With almost 29,000 of the brightest students from over 140 countries, learning alongside over 1,200 of the best academics from across the globe, the University of Sheffield is one of the world's leading universities. A member of the UK's prestigious Russell Group of leading research-led institutions, Sheffield offers world-class teaching and research excellence across a wide range of disciplines.

Original Link: [https://www.eurekalert.org/pub\\_releases/2021-04/uos-ngc042121.php](https://www.eurekalert.org/pub_releases/2021-04/uos-ngc042121.php)

## **First Potato Tissue Culture Lab in East and Central Africa Commissioned in Uganda**

Rebecca Kadaga, was Thursday commissioned the first-ever Irish Potato Tissue Culture Laboratory in East and Central Africa. Started 20 years ago, AGT was the first Ugandan tissue culture initiative to scale up and commercialize,

transforming into the biggest tissue culture laboratory in East and Central Africa. AGT has also set up 500 demonstration plots throughout Uganda in order to transfer best agronomic practices to farmers, free of charge.

Original Link: <https://chimpreports.com/first-potato-tissue-culture-lab-in-east-and-central-africa-commissioned-in-uganda/>

## **Innovative Collaboration Leads to New Insights into Tuberculosis Immune Response**

New research using human lung samples and three-dimensional bioengineering techniques to replicate the lung environment has revealed the important role of a subset of immune cells in the lung in fighting tuberculosis. The cells, called T Helper 17 cells or Th17, are important in animal models of TB but are rarely detected in humans' blood, so their importance in human disease has not been clear until now.

TB, a bacterial disease that mainly affects the lung, remains one of the leading causes of death in South Africa, and the World Health Organization estimates that in 2019 1.4 million people died from the disease globally. They found that the type of immune cells in TB-infected lung was significantly different than what is seen in the blood.

In particular, they found Th17 cells were highly enriched in the lung. They found that the presence of IL-17, the molecule that Th17 cells produce, reduces the growth of TB bacteria. This data confirms that Th17 cells are likely to have a protective role in humans and gives researchers a new focus for vaccine strategies.

“There is a strong case that the slow progress in TB control strategies could be, in part, because we have been studying TB in the ‘wrong place’.” Dr. Ogongo joined AHRI from the Institute of Primate Research

in Kenya and is now based at the University of California, San Francisco, in Prof Joel Ernst’s group where his work on the human TB immune response continues. “The cutting-edge tissue culture technologies developed by their group have been transferred to AHRI, meaning we can run these experiments here. In turn, due to the high burden of disease in South Africa and our dedicated clinical collaborators, led by Dr. Raj Madansein, we can access the lung tissue that makes these discoveries possible”.

Original Link: <https://www.miragenews.com/innovative-collaboration-leads-to-new-insights-561949/>

## **Growing Waling-Waling Using the Tissue Culture Method**

When growing ornamental plants, gardeners often take the natural route by growing plants from cuttings or seeds. All it takes is combining science with horticulture, and you’ve got the tissue culture method. Dominic Albis Galimba, a plant tissue culture expert, uses this method to grow the Philippine endemic orchid, waling-waling. “Through plant tissue culture, we can grow and conserve without taking the whole plant out of its natural habitat,” Galimba said. Galimba learned this method through his mentor, Raymundo Go Ong, an agricultural chemist who worked on the tissue culture of different orchids and ornamental plants for years.

“He told me that most plant tissue culture techniques cannot be read or obtained from research articles and books.”

### **Using the plant tissue culture method**

With the plant tissue culture method, the plant doesn’t have to be extracted from its natural habitat for propagation. According to Galimba, the first step is to self-pollinate the waling-waling flowers and successfully

gather their pods after four to four and a half months of harvesting time.

### **Caring for plant tissue culture grown waling-waling**

Growing waling-waling through the plant tissue culture takes about four years according to Galimba. Galimba notes that the plants need to be transferred to a different sterile container every 10 to 12 weeks, and the containers should be stored on a shelf with natural or artificial light.

### **The pros and cons of the plant tissue culture method**

As per Galimba, there are many benefits to using the plant tissue culture method. “Plant tissue culture is the best way to handle plants not only through conservation but also through new plant research,” Galimba said. It requires aseptic culture training or skills to avoid cross-contaminating the specimens, is labor-intensive because of the laboratory maintenance and subculturing of plants, and requires long-term investments since the plants take years to fully develop. Despite all these, Galimba is helping raise awareness about the tissue

culture method by providing cheaper alternatives to home gardeners.

Original Link: <https://mb.com.ph/2021/05/28/mixing-horticulture-with-science-growing-waling-waling-using-the-tissue-culture-method/>

## **Nanonutrients Protect Crops from Fungal Diseases**

A research team led by environmental toxicologist Jason White at the Connecticut Agricultural Experiment Station is fortifying crops with nutrients in nanosized packages to boost plant's immunity against pathogenic fungi in a more efficient manner than traditional methods. Their success is reported in *Plant Disease*.

Fungal diseases destroy a third of all harvests, posing a big threat to global food security. To combat fungal pathogens, farmers fumigate the soil with chemicals. However, excessive use of fungicides can be harmful to the environment, exposing even the beneficial microbes and leaving wastes on the land. In

Read more from [Science News](#).

the long run, pathogenic fungi could also evolve resistance against these synthetic chemicals. Thus, White and the team developed nanonutrient concoctions to boost the fungal resistance of soybeans, tomatoes, watermelons, and eggplants. The nutrients delivered to the plants trigger enzyme production to help them guard themselves against pathogenic attacks.

"People, in general, get nervous when you talk about nanotechnology and food," says White. He stressed that their team does not use any exotic materials, and instead "we're using nutrients the plants need [that] they just can't get enough of."

## **Genetics Allows Selection of Cattles that Produce Less Methane**

An Anglo-Danish biological insights group has identified a way to reduce emissions from cattle by selecting the ones that produce less methane using genetic tools.

Using genetics, scientists from Synomics identified a gene in cattle that causes excessive methane production.

The group claims that selective breeding will help farmers breed cattle with

For more details, read the article in [Food Navigator](#).

significantly lower methane output and reduce agricultural emissions.

The Synomics study used its proprietary combinatorial analytics and prediction engine to analyze phenotypic and metagenomic data and looked at more than 1,000 dairy cows from two breeds and five countries to identify targets for the association between host animal genome, its rumen microbiome, and its methane emission.

## Genome of Little Known Disease Offers Hope for Citrus Plants

Scientists at the University of California Riverside are hoping the RNA of an obscure infection can one day be used like a Trojan horse to deliver life-saving treatments to citrus trees. Citrus yellow vein disease, discovered 64 years ago in Riverside has finally been unraveled, a significant step toward harnessing its unique properties.

In the past decade, Huanglongbing, also known as citrus greening disease has caused a 72% decline in oranges used for juice and a 21% decrease in the American fresh citrus fruit market. Growers in other parts of the world are similarly affected, as the disease continues to spread unabated. In 1957, plant pathology professor Lewis Weathers found four limequat trees with beautiful, bright

veins on their leaves, almost fluorescent yellow that was recognized as a disease.

Experiments showed the disease is not carried by any animal or other microorganism. The researchers learned that the iRNA disguises itself with plant proteins that let it pass through cellular connective tissue. Kiran Gadhave, UCR microbiologist and lead researcher of the iRNA project explains that iRNA is amazing because it can manipulate plant cells to help it replicate, despite having only one functional gene. Though they believe the pathogen to be benign, the research team is doing additional testing to make sure it won't affect fruit quality or quantity, tree height, or any other markers of health.

For more details, read the article in [UC Riverside News](#).

## Scientists Discover Ancient Melon Key in Breeding Disease-Resistant Watermelons

Scientists from the University of Sheffield have discovered an ancient Egyptian melon as the closest relative and potential ancestor of watermelon that could possess the key in breeding disease-resistant watermelons and reduce the use of pesticides.

The scientists used DNA sequencing technologies, collection-based systematics, and Ancient Egyptian iconography to find the potential ancestor of the domesticated watermelon. They found that Sudanese

Kordofan melon has the closest genetic data to the watermelon. The analysis also showed that the Kordofan melon has more disease resistance genes and already tasted sweet during its early cultivation.

The findings provide substantial information that could help improve watermelon varieties. The disease resistance genes could help breeders produce better-yielding watermelons and reduce the use of insecticides and fungicides.

To learn more about the study, read the news article from the [University of Sheffield](#) and the journal article in [PNAS](#).

## Scientists Develop Gene-Edited Mosquito to Help Eliminate Malaria

Scientists from the Imperial College of London used CRISPR-Cas9 technology to develop gene-edited mosquitoes that could

possibly reduce their ability to spread Malaria. Though only a preliminary study has been done, the breakthrough could be

used for a gene drive that can provide a new way to reduce illnesses and deaths caused by Malaria.

The researchers used CRISPR-Cas9 technology to insert a gene that encodes an antimalarial protein among genes that are turned on after the mosquito (*Anopheles gambiae*) consumes a blood meal. This allows a whole section of the DNA to also serve as a gene drive that can be passed on to most mosquito offspring. Then they bred the mosquitoes to determine if these can successfully reproduce and remain healthy. Further investigation was also made to test how well the Malaria parasite developed into the mosquitoes' guts.

While the preliminary study is promising, the scientists must still provide further evidence that this approach is safe and effective before releasing gene-edited mosquitoes into the wild. The next step is for the gene-edited mosquito to undergo a stringent regulatory process to make sure that it is safe and effective in blocking the Malaria parasite without raising concerns regarding accidental spread into the environment. The results of the study will advance gene drives closer to being tested in the field as an effective Malaria elimination strategy.

Read the complete results in [eLife](#), with additional reports from the [American Association for the Advancement of Science](#).

## **OTHER THAN AGRI/CROP BIOTECH**

### **Revival of Agriculture Sector Putting Positive Impact on Economy**

Prime Minister Imran Khan said that owing to the measures taken by the present government for the revival of the agriculture sector, small farmers got due dividends of their produce which besides improving their livelihoods were also putting a positive

impact on the country's economy. He expressed satisfaction over the steps taken for the revival of the agriculture sector in the country and said that all resources were being utilized to develop the agriculture sector and further enhance productivity.

Original Link: <https://dunyanews.tv/en/Pakistan/606212-Revival-of-agriculture-sector-putting-positive-impact-on-economy-PM>

### **The Shift to Digitization in Cell Culture Monitoring**

Cell culture is a valuable tool with numerous applications. With the exception of visual inspections for contamination and phenol red changes indicating pH shifts, the majority of monitoring and data collection takes place outside of the cell culture incubator. Culture vessels are taken to microscopes and plate readers and cell and media samples are manually collected for other offline assays. These actionable data

insights truly illuminate the black boxes of current cell culture systems.

As biologic drugs, cell and gene therapy products, and personalized medicine come to the forefront of medicine, process control, reproducibility, cost reduction, time to market and high-quality products gain paramount importance as truly enabling technologies.

Original Link: <https://www.technologynetworks.com/cell-science/blog/the-shift-to-digitization-in-cell-culture-monitoring-350028>

## Scientists Control Fruit Fly Population Using CRISPR

More males than females of the Mediterranean fruit fly were produced after the scientists conducted endogenous CRISPR activities during spermatogenesis on the insect.

The study was conducted by the Imperial College London and the Hebrew University of Jerusalem. They focused on the Mediterranean fruit fly or medfly (*Ceratitis capitata*), a worldwide agricultural pest that causes up to U.S.\$ 298 million worth of crop damage. By using endogenous CRISPR-Cas9 and CRISPR-Cas12 during spermatogenesis, the scientists were able to conduct sex ratio distorter system to influence the reproductive sex ratio of the medfly population. They used a DNA-cutting enzyme to destroy the X chromosome during sperm production that resulted in a medfly population that was 80% males. This can result in having fewer

medflies with fewer mating opportunities, as well as having fewer female medflies who will deposit their eggs into crops' fruits that eventually cause crop damage and economic loss to farmers.

This is also the first time that a sex-distorting modification was done to a non-model organism or an organism that has not been extensively studied or used in many experiments. Genomes of non-model organisms are generally less well known. The results of the experiment suggest that the modification can be done in a wide range of agricultural pest species and human disease insect vectors. The scientists intend to improve their modification methodology and further optimize it to ensure that any eventual use will not have unintended effects and that the end product will be safe for release.

Read the full paper in *BMC Biology* and the news release from the [Imperial College London](#)

## Scientists Pinpoint Gene Involved in Embryo Development and Flavonoid Production in Rice

Mutations of *OsCOPI*, an ortholog of *Arabidopsis thaliana* *CONSTITUTIVE PHOTOMORPHOGENIC 1 (COPI)*, were found to cause yellowish pericarp in rice and embryonic death, indicating the vital role of *OsCOPI* in the production of flavonoids and in rice seed embryo formation. The study is published in *Theoretical and Applied Genetics*.

Successful production of viable seeds is vital in plant life cycles. However, the seed development process is complex and extremely controlled, impacting various

characteristics such as viability and color. To elucidate more about this process, researchers from Seoul National University and partners generated three yellowish-pericarp embryo lethal (*yel*) rice mutants. The mutant seeds exhibited yellowish pericarps and abnormal embryos, as well as reduced size and weight. Results of genetic analysis and mapping indicated that these characteristics were controlled by the *OsCOPI* gene. Using CRISPR-Cas9, *OsCOPI* was knocked out, and the transgenic seeds showed *yel* mutant characteristics. On the other hand,

overexpression of *OsCOPI* led to the restoration of normal pericarp color, as well as reduced flavonoid accumulation in the embryo and endosperm.

Based on the findings, *OsCOPI* is involved in flavonoid biosynthesis and embryogenesis of rice grains.

Read more details in [\*Theoretical and Applied Genetics\*](#).

## **Herbicide Tolerant GM Canola Gets Commercial Approval in Australia**

The Office of the Gene Technology Regulator (OGTR) in Australia has issued license DIR 175 to BASF Australia Ltd., authorizing the commercial release of MS11 canola genetically modified (GM) for herbicide tolerance and a hybrid breeding system.

The release is authorized throughout Australia, and products derived from this GM canola may enter general

commerce, including the use in human food and animal feed. The license decision was informed by a Risk Assessment and Risk Management Plan (RARMP) undertaken by the OGTR with inputs from stakeholders nationwide. This included consultations with the public, state and territory governments, local councils, Australian Government agencies, the Minister for the Environment, and the Gene Technology Technical Advisory Committee.

The RARMP concludes that this commercial release poses negligible risk to people and the environment. The finalized RARMP and its summary, the license, and Questions and Answers about this decision are available online from the [DIR 175 page](#) on the [OGTR website](#).

## **RESEARCH HIGHLIGHTS**

### **GE Potato Plant Responds to Stress by Glowing**

A group of scientists developed a potato that emits light at the earliest stages of stress. The breakthrough can help give warning and provide enough time for farmers to address the crop's problems before it is lost to abiotic stress.

The scientists chose to modify the Irish potato (*Solanum tuberosum*) by establishing a whole-plant redox imaging that makes the potato express the chloroplast-targeted redox-sensitive green fluorescence protein 2 (roGFP2). The gene expresses a fluorescent protein as a response to the presence of reactive oxygen chemical molecules that the plants produce to manage stress. Therefore, the more stress that the potato experiences, the more reactive oxygen species it produces

causing it to make more of the fluorescent protein. When put under a highly sensitive fluorescent camera, the stress-induced engineered potato gives a bright, fluorescent glow. According to the scientists, they were also able to document that the accumulation of the reactive oxygen species occurred in the early phase of the plant's response to stressful conditions like drought, extreme temperature, and high light.

Based on the findings, the team concluded that the whole-plant redox imaging can help researchers understand the crop's stress responses, which in turn can be applied to agricultural research specifically in improving phenotyping in breeding

programs and early detection of field stress responses.

Learn more in [Plant Physiology](#) and [New Atlas](#)

## Identified Fruit Protein Helps Control Tomato Ripening

The expression of a single protein located in the subcellular organelles of the tomato was found to help speed up or slow down its fruit ripening, providing a novel opportunity for crop improvement.

Scientists from the University of Oxford focused on the role of plastids, or the subcellular organelles in fruits, in the ripening process of the tomato because the plastids are responsible for giving color to the fruit. Based on the literature, fruit ripening is linked to the biogenesis of chromoplasts but little is known about how plastids participate in this process. In their study, the scientists

discovered the function of the SP1 plastids: its overexpression accelerated ripening shown by color changes, and knocking it down delayed tomato fruit ripening. They were able to demonstrate that SP1 can trigger broadening effects in fruit ripening by promoting chloroplast-to-chromoplast transition.

The results of their study revealed an important role of the plastids in the fruit ripening of the tomato and can provide a theoretical basis for the [crop engineering](#) of tomatoes.

Learn more from [Nature Plants](#) and the [University of Oxford](#).

## Studies Show How Microbiome Affects Breeding of Apples and Oil Pumpkins

Two independent studies conducted by researchers from Graz University (TU Graz) found that the composition of microbiome of apples and oil pumpkins depends on its geographical location which can affect its fruit quality, adaptability, storability, and food safety to human health.

The researchers used high-throughput amplicon sequencing to target the 16S rRNA and the TS1 [genes](#) to assess the bacterial and fungal microbiomes in oil pumpkins. They found that the plant passes on much of its microorganisms on the seed from up to 60 percent to the next generation similar to how humans get their microbiomes from their mothers. Fungal microbiome diversity, on the other hand, depends mostly on the fungi present on the soil. The results of the study could lead to a microbiome-controlled

breeding of oil pumpkins resulting in high yield and longer storage life.

TU Graz researchers collected apple fruit "Royal Gala" from similar climates, within the continent, and exhibited the highest degree of similarities in its composition. They found out that fungal diversity is more noticeable than the bacterial community in terms of composition and abundance. They identified six fungal genera (Aureobasidium, Cladosporium, Alternaria, Filobasidium, Vishniacozyma, and Sporobolomyces) and two bacterial genera (Sphingomonas and Methylobacterium) in the core microbiome of the apple. Studying the core microbiome could help the researchers learn more about the susceptibility of apple fruits to pre- and postharvest diseases, fruit safety, and shelf life.

To learn more about these studies, read the journal articles in [\*Frontiers in Plant Science\*](#) and [\*Environmental Microbiology\*](#)

