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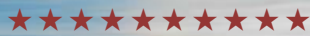
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# PAKISTAN BIOTECHNOLOGY INFORMATION CENTER



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## PABIC ACTIVITIES

**Dr. Muhammad Iqbal Choudhary Bestowed with Top  
Muslim World Science Award**



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### **Dr. Muhammad Iqbal Choudhary Honoured with Top Muslim World Science Award**



**PABIC Coordinator Dr. Muhammad Iqbal Choudhary has been named a 2021 Mustafa Prize Laureate for his services in the field of bio-organic chemistry, it emerged on Wednesday**

Director PABIC and the ICCBS Professor Dr. Muhammad Iqbal Choudhary has been named a 2021 Mustafa Prize Laureate for his services in the field of bio-organic chemistry, it emerged on Wednesday.

The Mustafa Prize, a top science and technology award, is granted biennially to the top researchers and scientists from the Islamic world in four categories: Life and Medical Science and Technology, Nanoscience and Nanotechnology, Information and Communication Science and Technology, and all areas of science and technology.

The prize was established in 2012 as a symbol of scientific excellence at the

international level, and is regarded as the Nobel Prize of the Muslim world, a news release said.

Five scientists from Pakistan, Iran, Bangladesh, Lebanon and Morocco have been awarded the 2021 Mustafa Prize in their respective fields of study.



Prof Dr. Iqbal Choudhary, is a world-renowned medicinal chemist. He has published 1,175 research papers in the fields of organic and bio-organic chemistry in international journals, 76 books and 40 chapters in books published by major US and European press. He has secured 40 US patents so far.

Dr Iqbal's work has been cited by researchers from around the world — 27,407 times in total — and his h-index is 70. As many as 94 local and international scholars have completed their PhD degrees under his supervision so far.

Dr Iqbal, who holds DSc, PhD, and CChem degrees, has been awarded by Pakistani governments with the Hilal-e-Imtiaz, Sitara-e-Imtiaz and Tamgha-e-Imtiaz.

He has been elected a fellow by renowned academies including the Academy of Sciences for the Developing World, Islamic World Academy of Sciences, Pakistan Academy of Sciences, Royal Society of Chemistry, and Chemical Society of Pakistan.

Prof Iqbal has previously been honoured by the president of Iran with the Khwarizmi International Award; president of Azerbaijan with the ECO Award in Education; and the prime minister of Pakistan with COMSTECH Award in Chemistry.

He was given the prestigious title of distinguished national professor by the Higher Education Commission in 2004 and meritorious professor by the University of Karachi in 2013.



## NATIONAL NEWS

### **Cotton: Poor Farm Practices Led to Bollworm Attack in Punjab, Say Experts**

Even as the Punjab government, following the pink bollworm attacks, has ordered a probe to find whether farmers were supplied spurious BT cotton seeds, agriculture experts attribute the crop infestation in the state's Malwa region to poor farm practices.

“There is not much merit in claims on seed quality,” said Vijay Kumar, principal entomologist at Punjab Agriculture University (PAU), Ludhiana, while pointing to varied incidence of infestation in different districts.

“Our assessment suggests a bumper crop this time and a good yield may overcome the loss incurred by farmers due to bollworm infestation,” he said.

“Even as area affected by pink bollworm (PBW) In Bathinda district, where the

infestation was first reported on a small patch in 2018, has been increasing over the years and extended to the adjoining areas of Mansa district as well, field surveillance has found that pest severity is limited to three blocks: Bathinda, Sangat and Talwandi,” said Kumar.

Rakesh Rathi, director, Indian Cotton Association Limited, said in spite of the pest attack, the industry is hopeful of Punjab reaching last year's production of 50 lakh quintals.

Meanwhile, Fazilka has not reported any case, and in Muktsar it was found at only three to four spots, said Kumar, who has been engaged in containing bollworm attacks for the past five years.

<https://www.hindustantimes.com/cities/chandigarh-news/cotton-poor-farm-practices-led-to-bollworm-attack-in-punjab-say-experts-101633112864074.html>

### **Imam Stresses to Enhance Agri-Sector**

ISLAMABAD, Oct 06 (APP): Federal Minister for National Food Security and Research Syed Fakhar Imam Wednesday stressed the need to upgrade the agriculture sector using modern technology and applying different methodologies on smaller areas that could be replicated on a larger scale upon success to multiply its benefits.

Food security threat has always existed; however, the dimensions of this threat have changed due to other factors particularly

climate change, he said adding that Pakistan is the 10th largest country to produce agriculture commodities, at the same time, we are the 6th largest country by population. Ashfaq Ahmed Gondal, former Federal Secretary of Information and Broadcasting and Vice President (Federal Region), Center for Global & Strategic Studies (CGSS), said that food security was directly related to agriculture and agriculture is the backbone of Pakistan. Imam addressed a conference on “Food Security vis-à-vis Sustainable

Agriculture in Pakistan: Policy Outcomes and Prospects”, which was jointly organized by the Center for Global & Strategic Studies, Hanns Seidel Foundation Pakistan, and MNS University of Agriculture, Multan on Wednesday. Speaking on the occasion, Syed Hussain Jahania Gardezi, Provincial Minister of Punjab for Agriculture, Punjab

said that as far as food security was concerned, it has always remained a threat to mankind. Steffen Kudella, Resident Representative, Hanns Seidel Foundation Pakistan, Speaking on the occasion said that food security means everyone has access to sufficient and safe food even in times of crisis.

<https://www.app.com.pk/national/imam-stresses-to-upgrade-agri-sector/>

## **Pakistan Launches Digital Initiative to Empower Farmers**

Islamabad: A digital initiative has been launched in Pakistan’s fertile Punjab province to empower farmers with digital agriculture solutions and to create smart villages. This is the first of its kind digital agriculture community network project in Pakistan.

Digital Dera aims to contribute as agriculture and food security innovation lab where AgriTech startups and investors from around the country can visit and test their products and innovations in an actual agricultural space, Hayat said.

**NEW DIGITAL INITIATIVE TO EMPOWER FARMERS**

<https://gulfnews.com/world/asia/pakistan/pakistan-launches-digital-initiative-to-empower-farmers-1.82770221>

•Digital Dera is equipped with high-speed Internet and will help build the capacity of small farmers latest with awareness sessions in the local language.

•It aims to empower local farmers through the power of Internet connectivity and access to the digital knowledge economy.

A ‘Digital Dera’ (technology-enabled community) has been set up at Chak 26-SP in the Pakpattan region of Punjab, offering more than 1,500 farmers from across the rural belt complimentary Internet access to help them find solutions to farming challenges by learning about the latest agriculture technology and services.

## **Pakistan Needs to Upgrade Agri Sector**

ISLAMABAD: Pakistan needs to upgrade the agriculture sector through the use of modern technology, said Federal Minister for National Food Security and Research Syed Fakhar Imam.

Chairing a conference on “Food Security vis-a-vis Sustainable Agriculture in Pakistan: Policy Outcomes and Prospects” on Wednesday, he said “We can apply different methodologies to smaller areas that can be replicated on a larger scale upon

success to multiply their benefits for the people.” The minister said that around 38% of the population was employed in the agriculture sector, “which increases the significance of this sector”.

“Traditional and non-traditional threats are interconnected.

Elaborating on the food security issue, Hanns Seidel Foundation Pakistan Resident Representative Steffen Kudella said “food security means everyone has access to sufficient and safe food even in times of

crisis.” Citing a recent study, he said that food security was a serious challenge globally, “because many households suffer from food insecurity”.

The conference was jointly organised by the Centre for Global and Strategic Studies, Hanns Seidel Foundation Pakistan and MNS University of Agriculture.

“The road to progress in terms of food security has been bumpy but improvements have been tremendous,” he said.

<https://tribune.com.pk/story/2323617/pakistan-needs-to-upgrade-agri-sector>

## **INTERNATIONAL NEWS**

### **Karnataka: Farmers Oppose Field Trials of BT Cotton and BT Maize**

Nearly 11 years after the Union government enforced an indefinite moratorium on the field trials of the BT brinjal — the first genetically modified crop for mass production in India— farmers and activists from Karnataka have now opposed the proposal for confined field trials on BT cotton and BT maize. According to the activists, the proposal raises several questions as the objections are invited by the environment department instead of the agriculture and horticulture departments which are the real stakeholders of the farming activities in the state.

According to a notification issued by the forest, ecology, and environment department, comments and objections have been invited to issue NoC for conducting confined field trials of BT cotton and BT maize.

Krishnaprasad, director of Mysuru-based Sahaja Samrudha, which promotes organic farming, warned that if BT cotton or BT maize are allowed, it will have a devastating impact on the desi seeds, crop diversity and public health at large. When contacted BC Patil, the state agriculture minister said he is not aware of any such proposal. K Ramakrishnappa, former director of the state horticulture department said he is surprised by the entire process.

Badagalapura Nagendra, president of the Karnataka Rajya Raitha Sangha said the organisation will not allow the field trial to happen in the state. When we have rich biodiversity, native seeds and varieties, I don’t understand the logic behind allowing these kinds of trials,” he said. Earlier, the Union and state governments imposed a moratorium on such trials citing public

health and other reasons. We will oppose this proposal jointly with all the like-minded

organizations,” he said.

<https://timesofindia.indiatimes.com/city/mysuru/karnataka-farmers-oppose-field-trials-of-bt-cotton-and-bt-maize/articleshow/87223626.cms>

## **Nigeria Approves Genetically Modified TELA Maize for Open Cultivation**

The Federal Government of Nigeria has granted environmental approval for evaluation and open cultivation of TELA Maize, a new maize variety genetically modified to tolerate moderate drought and resist the fall armyworm and stem borer.

TELA maize has the potential to transform Nigeria’s farming communities with higher yields, better grain quality and higher farm income.

It was issued by the National Biosafety Management Agency (NBMA), the federal government agency mandated to regulate genetically modified products in the country.

NBMA/CM/003, allows the commercial release of TELA Maize effective from October 8, 2021 to October 5, 2024.

The approval was contained in a Certificate issued to the country’s Institute for Agricultural Research (IAR) whose researchers developed the variety.

The TELA Maize Project was launched in 2018 and is a part of an international Consortium coordinated by AATF, involving Bayer, International Maize and Wheat Improvement Center (CIMMYT), and the National Agricultural Research Systems of seven countries including Ethiopia, Kenya, Mozambique, Nigeria, South Africa, Tanzania, and Uganda.

<https://www.pabic.com.pk/nigeria-approves-genetically-modified-tela-maize-for-open-cultivation/>

## **Professor’s Biotechnology Consulting Bears Fruit in Africa**

An FGCU Professor’s expertise in propagating plants from tissue culture and his hands-on experience combating a highly infectious banana virus are helping farmers a world away revive a devastated fruit industry and cultivate business opportunities.

There was a fellow building a lab who wanted to do tissue culture bananas.” With

Griffis’ help on two trips abroad and online follow-ups, along with some Malawi government support, that farmer, Frank Washoni, was able to establish a lab and nursery and start growing and distributing tens of thousands of banana suckers that were free of the virus. It’s too soon to tell if Malawi’s banana industry will achieve a sustainable comeback, Griffis said, but small farmers have proven to be important players in increasing production of horticultural

crops when given the right support and integrated into cooperative networks and larger market chains.

His background in research and development for a major plant micropropagation company in south Florida also prepared Griffis to train others to produce bananas through tissue culture using a small cross-section of stem that fairly quickly sprouts new growth when stimulated by nutrients and plant hormones; the sprouts continue to grow in a nursery before being transplanted in a field.

Facilitated by the nonprofit Cultivating New Frontiers in Agriculture (CNFA) and federally funded, his work has included guiding the setup of biotechnology laboratories and training farmers and local volunteers in banana production, pest and

disease control, soil management and post-harvest handling of crops to minimize loss.

This past summer, Griffis worked remotely to help a host farmer on the ground in Malawi to train 16 men and women in various aspects of banana production and disease control. In the meantime, the farmer who established the first commercial lab in Lilongwe, Malawi to use biotechnology for micropropagation under Griffis' mentorship continues to expand his business with other fruit and vegetable crops grown through tissue culture. Griffis has grappled with the banana virus before, including during his time in the Tropical Plant & Soil Science Department at the University of Hawaii; the Aloha State is by far the largest U.S. banana producer and has agricultural restrictions due to bunchy top presence.

<https://fgcu360.com/2021/10/22/professors-biotechnology-consulting-bears-fruit-in-africa/>

## AGRIBIOTECH NEWS

### **Genetic Engineering and Beetroot Dye Tomatoes Purple**

Scientists at the Leibniz Institute for Plant Biochemistry (IPB) in Halle have used genetic engineering methods to produce purple tomatoes using dye from beetroot.

The scientists smuggled the genes for the biosynthesis of betanin into the plants and activated them in the ripening fruits. Betanin is not originally formed in tomatoes and comes from beetroot as a natural food coloring. Like many dyes, betanin has a strong antioxidant effect. The purple fruits produced could also serve as a source of

betanin for food coloring. First attempts to color yogurt and lemonade with tomato betanin were promising.

The study is aimed towards further development of genetic engineering methods, which can be analyzed with the production of a clearly visible dye. In the case of betanin, planning and readjustment was carried out for a long time in order to achieve the desired synthesis performance in tomatoes. The Halle-based scientists not only brought three biosynthesis genes required for betanin production into the

tomato plants but also several genetic switches with which the genes introduced could only be activated in the fruit and all of them at the same time, exactly at ripening time. However, betanin production in the fruits was initially low and the research team

had to introduce a fourth gene, that the biosynthesis of the dye could be sustainably increased. The result is deep purple tomatoes that contain even more betanin than beetroot.

For more details, read the news article on the [IPB website](#).

## **Nigeria Approves Genetically Modified TELA Maize for Open Cultivation**

The Federal Government of Nigeria has granted environmental approval for evaluation and open cultivation of TELA Maize, a new maize variety genetically modified to tolerate moderate drought and resist the fall armyworm and stem borer. This development now places Nigeria one step closer to commercializing the biotech maize and becoming the second African country after South Africa to do so.

The approval was contained in a Certificate issued to the country's [Institute for Agricultural Research \(IAR\)](#) whose researchers developed the variety. It was issued by the [National Biosafety Management Agency \(NBMA\)](#), the federal government agency mandated to regulate genetically modified products in the country. The Certificate, with permit code no. NBMA/CM/003, allows the commercial release of TELA Maize effective from October 8, 2021 to October 5, 2024.

A decision document accompanying the certificate from NBMA said that the decision to grant the permit after consideration of the advice of the National Biosafety Committee, National Biosafety Technical Sub-Committee and the risk

management report provided by the applicant.

“The Agency was convinced that there are no known adverse impacts to the conservation and sustainable use of biodiversity, taking into account risk to human health. The permit, pursuant to this decision, is without prejudice to other extant legal requirements,” stated the decision document signed by NBMA Director General/CEO Dr. Rufus Ebegba.

Reacting to the decision, Prof. Mohammed Ishiyaku, Executive Director of IAR, said it is inspiring to secure the approval for the commercial release of the drought tolerant and insect resistant maize. “The next step is to further evaluate the performance of this new variety by farmers on their fields in all the major maize growing belts in Nigeria. Thereafter, we shall seek another approval by the National variety release committee before making the seeds commercially available for farmers to plant in the 2023 cropping season,” Prof. Ishiyaku remarked.

On his part, Prof. Abdullahi Mustapha, the Director General/CEO of Nigeria's [National Biotechnology Development Agency \(NABDA\)](#), said that TELA maize will play a key role in ensuring the country

becomes food secure, exuding confidence that the challenge of drought and pest infestation on maize will be a thing of the past.

Perennial drought and infestation by the fall army worm and stem borer are major contributors to low maize production in Nigeria rendering the country food insecure owing to the crop's status as a food staple. Though maize is the most cultivated crop in the country, grown by almost 50% of the farming households, it is still unable to meet the domestic demand for the crop, estimated at 15-18 tons annually.

*For more information about the approval, read the [AATF press release](#) or contact NBMA Director General/CEO Dr. Rufus Ebegba at [rebegba@hotmail.com](mailto:rebegba@hotmail.com)*

## **Golden Rice Favored as It Tastes, Smells like Regular Rice, but More Nutritious**

In a ceremonial tasting held at the Department of Agriculture Philippine Rice Research Institute (DA-PhilRice) in Muñoz, Nueva Ecija, stakeholders including the country's Agriculture Secretary Dr. William Dar favored "Golden Rice" over ordinary white rice for its health benefits.

"It smells and tastes the same as ordinary rice, except it is colored yellow. But I will choose 'Golden Rice' over white rice, because it has more health benefits." said Secretary Dar during the rice-tasting event as part of the inauguration of the DA's Crops Biotechnology Center (DA-CBC).

Nueva Ecija Representative Micaela S. Violago, an ophthalmologist by profession, also favors Golden Rice, saying, "Golden

TELA maize has the potential to transform Nigeria's farming communities with higher yields, better grain quality and higher farm income. The [TELA Maize Project](#) was launched in 2018 and is a part of an international Consortium coordinated by AATF, involving Bayer, International Maize and Wheat Improvement Center (CIMMYT), and the National Agricultural Research Systems of seven countries including Ethiopia, Kenya, Mozambique, Nigeria, South Africa, Tanzania, and Uganda.

Rice is a welcome development, as its regular consumption would give children <sup>6</sup> more Vitamin A and therefore clearer eyesight." Also at the tasting event was US Agricultural Attaché Ryan Bedford who said he is a fan of Golden Rice and will feed it to his two daughters.

"Golden Rice" is like ordinary rice but enriched with beta carotene, which the body converts into vitamin A as needed. The increased consumption of "Golden Rice" by Filipino families would improve their dietary and nutritional requirements, said Dr. Marissa Romero, co-lead of the Healthier Rice Project. The beta-carotene enriched rice has been approved for commercial propagation by the DA Bureau of Plant Industry on July 21, 2021.

For more details, read the news releases from the [DA](#) and [PhilRice](#).

## **Study Identifies Proteins that Support Photosynthesis in Iron-Deficient Plants**

A study reveals that researchers have identified how iron-deficient plants optimize photosynthesis to protect themselves from absorbing too much light.

Iron is an essential micronutrient important to photosynthesis, and the research conducted by researchers at Dartmouth College focused on the activity in chloroplasts, where 90 percent of the iron in plant leaves is stored and where photosynthesis takes place. The research

team followed the cause of light-induced leaf bleaching observed in iron-deficient plants. They identified two regulatory proteins that protect plants from absorbing too much light during iron deficiency.

The images taken by the team show the way iron and other nutrients react to the absence of the regulatory proteins. The team hopes that understanding how plants adapt photosynthesis during iron deficiency may allow researchers to optimize plant growth in soils where iron is not naturally available.

For more details, read the article on the [Dartmouth College website](#).

## **RESEARCH HIGHLIGHTS**

### **GE Canola That Produces DHA Passes Food and Feed Safety Study**

Scientists from the United States and Australia recently published their work on the food and feed safety study of DHA canola, genetically engineered *Brassica napus*, which revealed its safety for use in human foods, nutraceuticals or animal feeds. This brings the DHA canola a step closer to being part of a solution to alleviate the high pressure in marine resources for the production of omega 3 fatty acids.

DHA canola is one of the first land-based production system for omega-3 long-chain polyunsaturated fatty acids that produce a high level of docosahexaenoic acid (DHA). The vector used to produce its desire oil profile contains the expression of cassettes

of seven genes in the DHA biosynthesis pathway and was designed to convert oleic<sup>3</sup> acid to DHA in its seed.

A full characterization of the DHA canola was done, which includes a detailed nutritional analysis of the seed, meal, and oil as part of the food and feed safety evaluation. The results showed that except for the fatty acid profile, none of the other compositional analytes showed differences when compared to their conventional counterpart. Fish feeding studies were also done to confirm the nutritional value and safety of the DHA canola. The scientists concluded that products derived from DHA canola are safe to use for human foods, nutraceuticals, or animal feeds.

For more details, see the full paper published by *Frontiers in Nutrition*.

## **Scientists Use Mix Methods To Cut Breeding Time by One Generation**

In a recent study, a group of scientists used a combination of techniques to move a plant breeding line forward while reducing the process by one backcross. Their method can help plant breeders cut the breeding process time by one generation.

The scientists showed the potential of genomic background selection by introducing Ethyl methanesulfonate (EMS)-induced alleles into oilseed rape lines leading to a fast reduction of background mutation load. They used two parameters to lessen the period of developing an improved elite line while reducing the mutation load. They first used a spring-type oilseed rape line as the recurrent parent which grows faster by three months compared to the winter-type oilseed rape. The single seed descent (SSD) method under highly-controlled growth conditions was used to grow the plant from seeds which were harvested immaturely. These methods were

previously known to have worked for other plants like wheat, barley and pigeon pea, and were done to illustrate the potential for further reducing the plant generation cycle by three to four weeks in oilseed rape under greenhouse conditions.

The scientists then applied marker-assisted selection to save repeated cycles of backcrossing by going through a foreground selection for the mutant allele, then going through the background selection for the recurrent parent genome. This resulted in the identification of the first generation backcross plant with a recurrent genome share of 85.7% - the average recipient genome share in a second backcross generation. This shows that one generation of backcrossing can be saved, leading to higher genetic gain. They concluded that using double hybrid populations for marker-assisted background selection is able to reduce the mutation load after random mutagenesis.

Read the full article in *Nature*.