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of Agri-biotech
Applications

PAKISTAN BIOTECHNOLOGY INFORMATION CENTER

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COVID-19 NEWS

Study Reveals Most Countries Fail to Protect Nature in COVID-19 Recovery Plans

A Rutgers University-led research reveals that most countries are failing to invest in nature-related economic reforms and investments as the COVID-19 pandemic provides an opportunity to reset the global economy and reverse decades of ecosystem and species losses.

The research team led by Pamela McElwee, associate professor in the Department of Human Ecology at Rutgers University–New Brunswick was composed of economists, anthropologists, and environmental scientists at many institutions on three continents. It explores the changes in global

economic systems – including incentives, regulations, fiscal policy, and employment programs – that are necessary to shift away from activities that damage biodiversity and move toward that supporting ecosystem resilience.

The paper spells out the actions that governments should be taking to prioritize nature, provide immediate employment benefits, and lead to longer-term transformations in the global economy.

For more details, read the article in Rutgers Today.

International Team of Scientists Identify Common Vulnerabilities in COVID-19 and Other Lethal Coronaviruses

Scientists from the University of Sheffield working with almost 200 researchers from across the globe have identified common vulnerabilities in COVID-19 and other lethal coronaviruses. The result of this important research is an important breakthrough in the identification of successful COVID-19 treatment.

The researchers analyzed the medical records of approximately 740,000 patients with COVID-19 to examine drugs that are

already approved for use and successful in treating other medical conditions and could be deployed rapidly to help the clinical outcomes of these patients.

Dr. Andrew Peden from the University of Sheffield's Department of Biomedical Science is one of the lead authors of the study.

For more details about this research, read the article at the University of Sheffield News.

Digital CRISPR-Cas-Assisted Assay for Rapid SARS-CoV-2 Detection

Johns Hopkins University researchers developed the first digital CRISPR-Cas-

assisted assay called digitization-enhanced CRISPR/Cas-assisted one-pot virus

detection (deCOViD) which is designed for SARS-CoV-2, the virus causing COVID-19.

With the COVID-19 pandemic, there has been an unprecedented demand for rapid diagnostics. With the uniformly elevated digital concentrations, deCOViD could

complete qualitative detection in less than 15 minutes and quantitative detection in 30 minutes, which makes it one of the fastest and most sensitive CRISPR-Cas-assisted SARS-CoV-2 detection to date.

Read more from Advanced Science.

WHO Calls for Actions to Encourage Acceptance and Uptake of COVID-19 Vaccines

As vaccines for COVID-19 reach high efficacy rates and with Britain's approval of Pfizer-BioNTech vaccine for emergency use, the World Health Organization (WHO) pinpoints the next challenge: public acceptance of the vaccine.

After the vaccine approval, a system for mass production for sufficient supply, efficient rollout, and equitable access would be laid out. When these factors are properly addressed, communities would be encouraged to accept and take up vaccination.

The recommendations of the report include the following:

- The vaccination must be easy, quick, and affordable.

- Vaccines must be available in safe, familiar, and convenient locations such as "drop-in" clinics where people usually go. Rollout plans should be combined with a targeted, credible, and clear information drive on the importance and benefits of vaccination explained by trusted sources.

WHO stressed that communicating consistently, transparently, empathetically, and proactively about uncertainty, risks, and vaccine availability is necessary to build public trust.

Get more information from WHO.

NATIONAL NEWS

Khyber Pakhtunkhwa First-Ever Food Policy Basis on Agriculture, Job Creation

To ensure implementation of the policy Chief Minister Mahmood Khan, devised the short term, medium term and long term plans. The short term plan would be of two to three years duration that will require around Rs56 billion and medium term plan would be of four to seven years with an estimated cost of Rs109 billion whereas the long term plan would be of eight to 10 years to be implemented with an estimated cost Rs 70 billion.

Similarly, 24 different measures including construction of small dams, raising of the existing dams, development of maximum command areas of these dams and others have been proposed under the medium term plan whereas nine different measures including construction of big dams, cultivation of olive plants at vast scale and others have been proposed under the long term plan of the policy.

Stressing the need for implementing the policy in letter and spirit, the chief minister directed the planning department to arrange

the required funding for the implementation of the action plan.

<https://www.dawn.com/news/1597463>

Pakistan Agriculture Research Council Working on Food Security in Thar

ISLAMABAD: The Pakistan Agriculture Research Council (PARC) is working to ensure food security in Thar desert said by PARC Chairman Dr Muhammad Azeem. He added that PARC has cultivated various kinds of fruits, vegetables and fodder crops to promote agriculture sector and create livelihood opportunities for the locals of Thar. PARC is also working on preservation of local species and preserved about 50 local species including trees, medicinal plants and cultivated moringa.

Muhammad Azeem said the council is engaged to strengthen government's efforts to eliminate malnutrition and hunger by intervening through agriculture and livestock development.

Whereas PARC North Zone Director Dr Attaullah said, that 14 varieties of guava, matching the local ecology, were also developed and distributed among the farmers of Thar to develop fruit orchards.

<https://www.dawn.com/news/1598608/parc-working-to-ensure-food-security-in-thar>

Talking to Associated Press of Pakistan (APP) on Tuesday, PARC Chairman Dr

Pakistan's Agriculture Industry Remains Open for Biotech Opportunities

Economist Graham Brookes, latest episode was hosted by Pakistan, with Federal Minister Syed-Fakhar Imam of the Ministry of Food Security and Research in attendance.

the same benefits as the farmers from 20 years ago who planted GM cotton. He also mentioned that myths about the GM technology that are not backed by science also affected the confidence of the farmers towards GM crops.

Dr. Zafar Hayat, a medical doctor and the president of the Farmers Bureau of Pakistan, presented from a stakeholder's point of view. He reported that while GM cotton performed very well when it was introduced in the 1990s, it is now time for new and better technologies to be introduced in Pakistan so that farmers of today can have

Mahaletchumy Arujan, the Global Coordinator of ISAAA, closed the webinar with another appeal to GM critics to speak to the farmers first before speaking for them.

The full episode can be viewed on the [ISAAA YouTube channel](#).

Pakistan to Produce Two Million Disease-Resistant Potato

Pakistan Agricultural Research Council (PARC) to Produce Two Million Disease-Resistant Potato Tubers Using Tissue Culture Technology. Tissue culture technology is being broadly used for large-scale plant multiplication and gives a science-based solution for plant propagation,

disease elimination and plant improvement, said Pakistan Agricultural Research Council (PARC) Chairman Dr Muhammad Azeem Khan during an agreement signing ceremony between PARC and United Arab Emirates-based Green System Pakistan Pvt Limited.

Briefing on the agreement, Dr Amjad said this accord is another chapter of cooperation between PARC-PATCO and Green System Pakistan, as the parties will work together to develop screen houses at NARC for expansion to up to two million potato tubers,

which would help to reduce import of potato seeds.

<https://www.potatopro.com/news/2020/pakistan-produce-two-million-disease-resistant-potato-tubers-using-tissue-culture>

INTERNATIONAL NEWS

Nearly 4,000 Hybrid Rice Varieties grown in China

Agronomists have planted about 4,000 rice varieties in a hybrid experimental rice base in southwest to acquire the ideal seeds for large-scale plantation.

the one-hectare experimental field, said Kuang Yinglong, breeding department manager of the Chengdu branch of the China National Hybrid Rice R&D Center.

The hybrid rice science park 9,087 square meters for the first phase of construction, along with 133.33 hectares of outdoor farmland.

http://www.xinhuanet.com/english/2020-09/22/c_139388143.htm

This year, nearly 4,000 rice varieties, each with 50 to 100 stems, have been grown in

Biotech Cotton Key to Eradicate Devastating Pest from US and Mexico

The proteins in Bt cotton kill pink bollworm and other caterpillar pests but are harmless to people and most beneficial insects.

the pest's arrival, eradication seemed within grasp.

Although Bt cotton kills essentially 100% of susceptible pink bollworm caterpillars, the pest rapidly evolved resistance to Bt proteins in laboratory experiments at the University of Arizona and in Bt cotton fields in India. To delay pest resistance, Uarizona scientists worked with farmers to develop and implement a strategy of planting non-Bt cotton refuges to allow survival of susceptible insects. For the first time since

In addition to traditional pest control tactics, such as plowing cotton fields after harvest to reduce the pest's overwintering survival, a novel strategy largely replacing refuges of non-Bt cotton with mass releases of sterile pink bollworm moths was initiated in Arizona in 2006. The sterile moths were released from airplanes by the billions to overwhelm field populations of the pest.

<https://www.sciencedaily.com/releases/2020/12/201221173140.htm>

AGRI BIOTECH NEWS

Researchers Sequence Genomes of 600 Green Millet Plants, Find Gene for Dispersal

Dr. Elizabeth Kellogg and her team at Donald Danforth Plant Science Center

(Danforth Center) has generated the genome sequences of nearly 600 green millet plants

and released a very high-quality reference *Setaria viridis* genome sequence. Their analysis also led to the identification of a gene related to seed dispersal in wild populations for the first time.

For years, Dr. Kellogg and other researchers at Danforth Center drove up and down the highways of the continental United States, occasionally pulling over to the side of the road to collect small weedy plants and bring them back to the lab. These weedy plants are green millet, a small model grass with a short lifecycle that uses the C4 pathway

Pinkglow™, Del Monte's Pink Pineapple Now Available

After more than 15 years, Pinkglow™ Pineapple, the pink pineapple from Fresh Del Monte is now commercially available. A product of bioengineering, Pinkglow™ Pineapples contain lycopene, a natural pigment that gives some produce its red color (e.g. tomatoes, watermelon), which makes this pineapple pink.

Pinkglow™ Pineapples are grown on a select farm in the South-Central region of

Costa Rica, which has the ideal soil and climate for growing pineapples. These pineapples are said to have a delicious and unique taste, with notes of candy pineapple aromatics, and are also less sour than a traditional pineapple, juicier and sweeter in taste.

Through association mapping, the team identified a gene called Less Shattering 1 (SvLes1) and gene editing studies confirmed that it was involved in shattering by turning it off.

The genome data also revealed that green millet was introduced into the United States multiple times from Eurasia.

For more details, read the news release from Danforth Center.

For more details, visit the [Pinkglow Pineapples website](#).

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

Research Team Discovers Strategy to Make Plants More Salt Tolerant

A research team from the Centre for Research in Agricultural Economics (CIRAD) has found that plants are more tolerant to soil salinity by regulating the TEMPRANILLO (TEM) genes.

Plants under high concentrations of salt flower later and produce almost no seeds, but the study found that mutant plants with TEM deficiency flower earlier, thus producing seeds, so their shorter life cycle

allowed them to escape the blockage of growth caused by salt.

"The results we present in this study provide new strategies to regulate plant growth in saline soils: who knows if in the near future we will be able to use TEM genes in rice breeding programs?" concludes Pelaz.

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

Chinese Scientists Develop Rice Variety Using Ion Beam Technology

A research team at the Hefei Institutes of Physical Science (HFIPS), Chinese Academy of Science led by Prof. Wu's team applied ion beam mutagenesis in crop

breeding to promote the development of molecular breeding. The rice variety is called Zhongkejing No. 5.

It will help to alleviate the shortage of good varieties of glutinous rice," said Dr. LIU Binmei, breeder of the rice variety. In China, more than 100 new varieties of rice, wheat, and corn have been bred through ion beams in 2020, making important contributions to

the advancement of agricultural science and technology.

For more details, read the article in the Chinese Academy of Sciences Newsroom.

Gene for Resistance to Devastating Tomato Virus Now Identified

The research team at Enza Zaden, an international vegetable-breeding company based in the Netherlands has identified a gene that provides high resistance to the devastating Tomato Brown Rugose Fruit Virus (ToBRFV), also called tobamo after its genus.

ToBRFV was first discovered in 2014 and has since spread to parts of Europe, America, Asia, and Africa. Plant

pathologists at Enza Zaden screened new resistance genes in its wild tomato germplasm and found one gene providing high resistance against ToBRFV.

With this High Resistant (HR) level, the tomato plants tested at Enza Zaden research stations did not show any ToBRFV symptoms.

For more details, read the press release from Enza Zaden.

OTHER THAN AGRI BIOTECH

Olive Cultivation to Boost Green Economy of Pakistan

Olive trees' plantation has been restarted at large-scale in Potohar region of Punjab, Khyber Pakhtunkhwa, erstwhile Fata, Balochistan, Azad Kashmir and Gilgit Baltistan after substantial decrease of coronavirus cases, he said. The country's political dispensation came to realize to reclaim vast unutilized land through the plantation of over three million olive trees in five years auguring well to overcome the looming threats of food security and poverty especially in rural areas, which are largely dependent on agriculture.

In Balochistan, over 500,000 plants are being grown over 9,391 acres with an expected economic oil income of

Rs1.160billion during the said period. Likewise, over 50,000 plants are being grown on 455 acres in Azad Kashmir and Islamabad, which are likely to generate a substantial revenue of Rs71 million after four years.

To cater people's growing demands, he said, the first olive promotional project funded by the Government of Italy was started on June 1, 2012 under which olive cultivation on 1,500 hectares were successfully achieved.

<https://www.technologytimes.pk/2020/10/12/olive-cultivation-to-boost-green-economy-of-pakistan/>

Farmer Survey Reveals Significant Economic, Environmental Benefits from GM Corn in Vietnam

A farmer survey conducted in Vietnam in 2018-2019 revealed that planting genetically modified (GM) corn significantly reduced production cost, increased farmers' income, and decreased pesticide use.

The objective of the survey was to assess the farm-level economic and environmental effects of the use of GM corn that is insect resistant and herbicide tolerant.

Among the economic impacts exhibited by the results of the study was that the GM corn varieties yielded +30.4% more than the conventional varieties. The survey also revealed that for every extra USD 1.00 spent by the farmers on the GM corn seed relative

to conventional corn seed, the farmers gained an extra income amounting between USD 6.84 to USD 12.55.

As for environmental benefits, the results of the survey pointed to the reduced insecticide and herbicide use when planting GM corn. Using the Environmental Impact Quotient (EIQ) indicator, it was recorded that the associated environmental impact of herbicide use in the GM corn was lowered by 36% as compared to the value applicable to the conventional corn

The full article is published by *GM Crops & Food*.

FAO Urges G20 to Support Farmers, Protect the Vulnerable and Invest in Innovation

Food and Agriculture Organization of the United Nations (FAO) Director-General, QU Dongyu, called on G20 members to address the impacts of COVID-19 on agri-food systems by boosting farmers' productivity, scaling up social protection mechanisms, and investing in digital innovation.

"It is essential for the G20 to keep working on preventing this health crisis from becoming a global food crisis," said Dongyu. "The G20 is a highly important impetus and emergency response on global

policy, coordination and leadership to develop an inclusive, resilient and sustainable world by leading responsible investment, enabling policies, innovation and capacity building," he added.

FAO is ready to continue to support the collective actions of G20 especially through the Agricultural Market Information System, Hand-in-Hand Initiative, COVID-19 Response Recovery Programme, and the Food Coalition.

To know more, read the article from FAO.

Plant-based Milk Bottles Launched in New Zealand

Milk in recyclable plant-based bottles is now available in New Zealand.

The milk bottles are made from sugarcane, which is natural, renewable, and sustainably sourced from Brazil. Brazil is one of the biggest producers of sugarcane. One good

characteristic of sugarcane is that it captures carbon dioxide from the atmosphere as it grows. Thus, the bottles have a lower carbon footprint. The plant-based milk bottles are initially sold in North Island, for further expansion in distribution depending on the consumer response.

Read more from [Fonterra](#).

WHO Refers to GM Mosquitoes as Beneficial Technology

The World Health Organization (WHO) released its official statement to clarify its stance on the evaluation and use of genetically modified (GM) mosquitoes and its use to control vector-borne diseases (VBD).

The organization takes the position that all potentially beneficial new technologies should be investigated to determine how useful they are in the continued fight against diseases of public health concern.

Evaluation should be done using established and internationally-recognized risk assessment tools and procedures, and the

decisions arising from these evaluations should account for the potential health benefits in consideration of disease control, and not be limited to potential environmental risk.

WHO recognizes that community engagement is essential in developing effective approaches to fight against VBDs when planning and conducting field trials prior to the introduction of any new public health intervention.

Read the full position statement by [WHO](#) to find out more.

UAE Passes Mandatory Biotech Labeling Law

The United Arab Emirates has passed a new law regulating the import, export, re-export, transit, trading, development, manufacture, production, and transfer of food and agricultural products containing 0.9 percent or more components derived from bioengineering.

The Federal National Council (FNC) approved 15 draft laws on health, food, environment, and the economy, during 13 sessions in the first ordinary term of its 17th legislative chapter. The draft laws approved by the FNC in the first term of its 17th legislative chapter covered consumer protection, public health, the regulation of national strategic food reserves, the biosafety of genetically modified

organisms (GMOs) and their products, pesticides, and amendments to a Federal Law on regulating commercial agencies, as well as other draft laws.

The new law on labeling states that the importer, exporter, trader, developer, manufacturer, and producer of GMOs or their products shall place information label on each shipment and package indicating that they contain GMOs or their products, and any other data determined by the Implementing Regulation of the law.

For more details, download and read the Voluntary Report published in the [USDA FAS GAIN](#) and the announcement in the [Emirates News Agency](#).

Research Team Finds Hormones Control Root Length

A research team at the Technical University of Munich (TUM) led by Professor Caroline Gutjahr has found new communication channels for hormones that influence root

growth. The protein SMAX1 slows down the production of ethylene, the plant hormone that triggers or accelerates the ripening of numerous fruits and vegetables.

When less of the gaseous hormone is produced in the plant, this stimulates the plant to grow long roots and short root hairs. This turns on the production of ethylene, which means that the roots stay short and the root hairs grow longer.

According to Gutjahr, the mechanism has an enormous influence on the roots of the legume *Lotus japonicus*, the model plant for peas, beans, and lentils which was used in their study.

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

Researchers Map Plant Immune System

The research provides a roadmap to plant immunity, with a focus on cell-surface and intracellular immune receptors.

In a paper published in the *Journal of Biological Chemistry*, Professor Mark Banfield, leader of the BBSRC-funded Plant Health Institute Strategic Programme (ISP) at the John Innes Centre and corresponding author of the review said the overview explains concepts of the plant immune

system to readers from diverse research backgrounds, including biological chemists, structural biologists, and biophysicists.

In the paper, the research team describes how receptors perceive signatures of pathogens and pests and initiate immune pathways.

For more details, read the article on the [JIC website](#). The full, open-access paper is available here.

Giant Virus Genomes Found Riding on Algae Genomes

With the discovery of large viruses that can be seen with a standard microscope, another study shows that these humongous parasites inject a variety of their genes into their host's genome.

Common viruses are too small to be seen by a standard microscope and don't have enough genes to survive without a host. When they tried to look through the genomes representing all the sequenced DNA from Chlorophytes algae, they

discovered that an entire giant virus was genetically present in the DNA of a dozen Chlorophyte species.

They reported in *Nature* that the giant viruses added around 78 to 1,782 genes to the algae. Two algae even had the whole genomes of two giant viruses in their DNA, wherein one giant virus' genetic material was 10% of the total gene count of the algae.

Read more from [Science](#) and [Nature](#).

ISAAA Webinar: Global Status of Biotech Crops and the Philippine Adoption Experience

The Philippines is the first country to plant a biotech crop in Southeast Asia and has become a model for science-based biosafety regulation in the region. Global biotech crop adoption in 2019 and the Philippine experience on biotech crops will be

presented through a webinar on December 14, 2020, at 10 AM (GMT+8) via Zoom.

The webinar will cover the highlights of the ISAAA report on Global Status of

Commercialized Biotech/GM Crops in 2019 including the following:

- global area of biotech crops from 1996 to 2019;
- global adoption rates of principal crops;
- trends in approvals of GM events; and
- Filipino farmers' experience in biotech adoption.

The global report will be presented by Dr. Paul Teng, ISAAA Board Chair. Africa's experiences in biotech research and adoption will be discussed by Dr. Margaret Karembu, ISAAA AfriCenter Director. Dr. Richard

Torno will share his experiences in planting Bt corn. Gerald Mores, President of the University of the Philippines League of Agricultural Biotechnology Students, will tackle the youth's perspective on the future of biotech.

The webinar will be hosted by ISAAA SEAsiaCenter. Dr. Rhodora Romero-Aldemita, ISAAA SEAsiaCenter Director, will serve as the moderator of the discussions.

Registration to the webinar is open to all and free of charge. Sign up now at bit.ly/ISAAAwebinarPH.

ISAAA Shares 2019 Global Biotech Crop Adoption to Stakeholders in the Philippines and Arab Region

Another webinar was organized for Arab countries on December 9, 2020.

ISAAA SEAsiaCenter hosted the Philippine webinar which focused on the 2019 biotech crop status data and the Philippines' GM adoption experience as well as the youth's perspective on agricultural biotechnology. Gerald Mores, an Agricultural Biotechnology student from the University of the Philippines Los Baños (UPLB) and President of the UP League of Agricultural Biotechnology Students, provided insights about the future with biotechnology from the youth's perspective and how the youth can help change the course of agriculture for the better.

ISAAA, in partnership with the Association of Arab Universities (AArU) and the Association of Agricultural Research Institutions in the Near East and North Africa, presented the global trends and impact of biotech crops. ISAAA SEAsiaCenter Director Dr. Rhodora Romero-Aldemita presented the 2019 global status and trends of GM/biotech crops, and ISAAA AfriCenter Dr. Margaret Karembu highlighted the impact of the benefits brought about by planting GM crops in Africa.

For more information, send an e-mail to knowledgecenter@isaaa.org.

RESEARCH HIGHLIGHTS

Researchers Pinpoint Peanut Genes Linked to Salt and Drought Tolerance

Shandong Peanut Research Institute found peanut genes involved in salt and drought tolerance. The details of the study are published in *BMC Plant Biology*.

Peanut is one of the most important oil crops globally. Transcription factors (TF), which are vital in switching on or off gene expression, control several biological processes. One plant-specific TF

family known as NAC has been found to regulate response to salt and drought stresses. However, there is a limited understanding of peanut NAC. Thus, the researchers conducted a comprehensive genome characterization of peanut NAC.

In total, 81 and 79 NAC genes were identified from wild peanut species *Arachis duranensis* and *A. ipaensis* genomes, respectively. The genes were further categorized based on phylogenetic analysis,

which led to 18 distinct subgroups. After comparing the RNA sequences, it was found that 43 NAC genes are up- or downregulated under salt stress and under drought stress. On the other hand, 17 genes in cultivated peanut (*A. hypogaea*) were up- or downregulated under both stresses. Consistent results were generated with quantitative reverse transcription PCR.

Read the findings in *BMC Plant Biology*.

Cisgenic Potatoes Do Not Disrupt Soil Microsystems

An international group of scientists from Europe and Asia investigated the environmental risks of genetically modified potatoes, particularly its effects on soil microorganisms and associated ecosystem services. The results found no tangible impact on soil microbial communities.

Using a cisgenic modified potato Desiree variety that is resistant to the late blight-causing fungus *Phytophthora infestans*, the scientists analyzed its impact on abundance and diversity of rhizosphere inhabiting microbial communities. Two separate field

trials set up were selected in Ireland and the Netherlands. For two years, the cisgenic Desiree was subjected to comparison against its non-engineered late blight-sensitive counterpart and a conventional bred late blight-resistant variety for the presence and absence of fungicides.

The researchers noted that the bacterial and fungal communities responded to field conditions, potato varieties, year of cultivation, and bacteria sporadically to fungicide treatments.

Read the open-access paper in [*Bioengineering and Biotechnology*](#).

UPCOMING BIOTECH EVENTS

Online Certificate course on “**BASIC PLANT TISSUE CULTURE TECHNIQUES**” will be held on **February 16-17, 2021** Organized by COMSTECH, Secretariat, Islamabad In collaboration with International Center for Chemical and Biological Sciences (ICCBS) and Pakistan Biotechnology Information Center.

Who Should Attend:

The workshop is designed to address the interest of scientists and research scholars working in various fields of plant

biotechnology including genetics, and molecular biology.

Course Content:

The course will be comprises of series of lectures and “online hands on training sessions” covering following contents:

- Overview of Plant Tissue Culture and its Applications
- Equipment and Media used
- Explant Selection
- Sterilization

- Initiation, Multiplication, Shooting and Rooting

Registered participants will receive e-certificates

Please register Before February 1, 2020

https://docs.google.com/forms/d/e/1FAIpQLSeovmmpAzzwPZnQj45KqmF_6UtN4d544QyPOFuuw0PvB0Ohkg/viewform

Contact person:

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E-mail: khazima@comstech.org

Original Link:

<https://www.comstech.org/basic-plant-tissue-culture-techniques/>