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NATIONAL NEWS:

PARC Organizes Training Workshop For Rice Growers:

ISLAMABAD-The Agricultural Engineering Institute (AEI) of Pakistan Agricultural Research Council (PARC) organised a seminar and training programme for rice growers at Daska, Sialkot for enhancing rice yields through education and training on the advantages of utilizing specialized machinery for rice cultivation and harvesting. The seminar was also aimed to highlight the drawbacks of traditional methods, said a press release issued here. Prominent participants comprised of Dr Asif Ali Mirani, DG, AED, PARC, Dr Hafiz Sultan Mehmood, Director, AEI, NARC along with experts, researchers, engineers, program leaders and representatives from agricultural organizations. Dr Ghulam Muhammad Ali, Chairman PARC, emphasized the significance of rice as Pakistan's second major cash crop, following wheat and highlighted the need of using modern farming equipment and high-yielding varieties to enhance productivity and combat the impacts of climate change on the agricultural sector. Rice cultivation primarily takes place in fertile regions of Sindh, Punjab and Balochistan, providing a livelihood for a significant number of farmers, he said, adding that as compared to wheat, rice mechanization in Pakistan was relatively low, leading to delays in sowing and reduced yields due to manual labor. Moreover, labor shortages caused by urbanization and industrialization pose a significant challenge for farmers, he added. Dr Ali suggested that adopting mechanization and utilizing head-feeding combine harvesters could provide viable solutions to tackle these issues. During the fiscal year 2021-22, he said rice cultivation encompasses a land area of 3,537 thousand hectares, yielding a total of 9.323 million tons.

original link: https://www.nation.com.pk/19-Jun-2023/parc-organises-training-workshop-for-rice-growers

INTERNATIONAL NEWS:

PARC Okays 14high-Yeid Rice Varieties:

ISLAMABAD: The Rice Evaluation Committee of Pakistan Agricultural Research Council on Monday recommended 14 high-yield rice hybrids from private seed companies for cultivation in Pakistan.
In addition, the National Institute of Genomics and Biotechnology (NIGAB) of PARC has introduced four fine rice varieties that have demonstrated significantly higher grain yield compared to the currently grown varieties.
These fine rice varieties were also endorsed by the Variety Evaluation Committee (VEC) for cultivation in Pakistan, with the aim of enhancing farmers' productivity and profitability.
In addition to the above recommendations, the VEC also suggested the cultivation of Sona Super Basmati, a long-grain variety measuring 9.5mm, and Vital Super Basmati developed by the Rice Research Institute at Kala Shah Kaku. Vital Super Basmati is notable for its high levels of zinc and iron enrichment.
The committee members were given a comprehensive overview of fifty-one proposals for rice hybrids and varieties by National Coordinator Rice of PARC, Dr Muhammad Yousuf.
During a meeting with rice scientists, PARC Chairman, Dr Ghulam Muhammad Ali expressed his confidence in the positive impact that the introduction of these high-yielding rice varieties would have on productivity and the profitability.

original link: https://www.dawn.com/news/1760758

Big Relief For Agriculture In Budget 2023-24:

ISLAMABAD – In a major relief for agriculture, the federal government has further expanded the loan volume for the farmers from Rs1800 to Rs2250 billion.
Finance Minister Ishaq Dar, while revealing the budget, said the government earmarked Rs50 billion for shifting the 50,000 tube wells on solar panels. The country's finance czar announced that all taxes and customs duties on saplings customs duty have been revoked.
The federal government has abolished all duties and taxes on the combined harvest. He also announced to allocation Rs10 billion for the loans of smaller growers.

Unveiling proposed allocation at the National Assembly after getting formal approval from the federal cabinet, Dar said that it was the best possible budget in the tough economic conditions being faced by the country in the aftermath of global recession and worst floods.
Out of Rs2709b development outlay, Rs950b has been allocated for PSDP and Rs200b for public-private partnership while provinces would carry out development with Rs1559b.

original link: https://pakobserver.net/big-relief-for-agriculture-in-budget-2023-24/

Canada Approves RNAi Biopesticide Technology Field Study:

Canada's Pest Management Research Agency (PMRA) approved the field study application of RNA interference (RNAi) biopesticide delivery technology. It is a sustainable and eco-friendly way to eliminate crop pests using biotechnology.
Renaissance Bioscience Corp. developed RNAi to provide an environmentally safe and sustainable way to protect crops from insects that cause substantial damage. It has the potential to reduce or replace the usage of traditional chemical pesticides that cause damage to the environment, as well as animal and human health, when used excessively.
The RNAi's mechanism of action targets and turns off a particular gene/s that is unique to the identified pest, which stops its invasion of the crop. This reduces or may eliminate the effect on other plants and animals.

Read the news release of Renaissance BioScience for more information.

AGRI BIOTECH NEWS:

Case Studies Reveal Keys To Sustainable Seed Access In Eastern Africa:

Michigan State University researchers and partners reviewed the sustainable access to quality seeds of genetically engineered Bt cotton in Eastern Africa and recommended improved public-private partnerships. Their review article is published in the journal *GM Crops and Food*.
Genetically engineered Bt cotton varieties contribute solutions to challenges in crop losses and productivity. In Eastern Africa, Bt cotton has been commercially approved in Sudan (2012), Ethiopia (2018), and Kenya (2019), and the region has the potential to grow over 5 million hectares of cotton. The seeds planted were sourced from India, but due to the COVID-19 pandemic, supply chain disruptions impeded farmers' access to these seeds. Thus, stakeholders are looking for local sources of seeds to ensure sustainable access and affordable cost.
Case studies highlighted that capacity building in local seed production and extension advisory services is crucial. They also concluded that enhanced public-private partnerships are necessary for sustainable seed access in the region.

Read the open-access article in *GM Crops and Food*.

Experts Decode Genome of Destructive Asian Soybean Rust Fungus:

Decoding a genome provides information about how an organism functions. In the case of the Asian soybean rust fungus (*Phakopsora pachyrhizi)*, the scientists understood why it is highly variable and how this severe soybean disease can be managed to prevent production losses to farmers worldwide.
Members of the International Asian Soybean Rust Genome Consortium were able to sequence and assemble the genome of three samples of the fungus *P. pachyrhizi* that causes Asian soybean rust disease. The fungus has been hard to handle due to its ability to adapt to control measures – it either loses its sensitivity to fungicides or breaks the genetic resistance present in soybean cultivars.
Researchers found that it was composed of about 93% repetitive DNA transposons that can change places in the genome, contributing to its high variability trait. They also identified the fungus' full set of effectors that led to understanding how the pathogen's attack strategies work, which is crucial in developing control strategies against it.

Read the full article by Embrapa to learn more.

Targeted Mutagenesis by CRISPR Improves Grain Quality and Heat Resilience in Rice:

Researchers at the University of Arkansas System Division of Agriculture (UADA) showed that by suppressing the activity of a grain-specific vacuolar H+ translocating pyrophosphatase (VPP5), chalk content of the grain could be reduced.

Grain chalk is an undesirable trait that impacts milling yield and cooking quality. Heat stress, specifically high nighttime temperature, is a major inducer of chalk, leading to yield losses and market value of rice. Based on the information that higher VPP5 activity leads to higher chalk content, Vibha Srivastava and her group at UADA used CRISPR-Cas9 to target promoter elements and suppress VPP5 activity during grain filling stages in rice. The resulting rice (vpp5 lines) showed 7 to 15-fold lower chalk content and improved grain weight. Most importantly, much lower chalk was induced by high nighttime temperature in vpp5 lines. Biochemical and gene expression analysis indicated improved starch biosynthesis and compact packing of starch granules as part of the mechanism.

HEALTH BIOTECH NEWS:

Native Tobacco Plants As Sustainable 'Biofactories' For Oral Medicines:

Researchers at Australia's University of Queensland (UQ) reveal that Australian tobacco plants could be used as 'biofactories' for large-scale manufacturing of medicines. Professor David Craik and Dr. Mark Jackson from UQ's Institute for Molecular Bioscience showed that native wild tobacco, *Nicotiana benthamiana*, can potentially produce large quantities of drugs in a cheaper and more sustainable method.
According to Professor Craik, they will use the natural ability of plants to produce cyclotides, the strings of amino acids in a circular shape, making them stable and suitable as oral drugs. The research team will use modern molecular biology techniques to effectively instruct the plant cell to produce the molecule of interest. The research team grew the drug T20K, which is currently in phase 1 clinical trials to treat multiple sclerosis, a devastating autoimmune disease affecting the central nervous system. Professor Craik said T20K is the first cyclotide drug to reach clinical trials, and he is hopeful that more will follow and reach the market.

"Harnessing plants as 'biofactories' is more cost-effective as it uses fewer resources and is less wasteful, with a much simpler production process," Dr. Jackson said.

For more details, read the article in UQ News

Researchers to Develop Gene Editing Therapy for Blindness:

Researchers from the Wisconsin Institute for Discovery will develop gene editing therapeutics for two diseases that can cause blindness. The collaborative project is funded by the US National Institutes of Health.
The eye was chosen as the initial point of the study because it is self-contained and separated from other organs. It is also accessible, easy to monitor, and less likely to experience negative immunological reactions. The scientists will combine advanced genome CRISPR technology with new drug delivery systems to produce new treatments for untreatable hereditary diseases—Leber Congenital Amaurosis (LCA) and Best Disease (BD).
LCA is a rare and severe group that affects children's entire vision. Meanwhile, BD is a slow-onset disease that affects older individuals' central vision. By focusing on these diseases, the researchers can acquire a more comprehensive understanding of the efficacy of their gene editing treatments.

For more information, read the news release of the University of Wisconsin-Madison.

Experts Develop Vitamin D-enriched Tomatoes:

Researchers from Norwich Research Park and partners successfully engineered biofortified tomatoes using gene editing. Their findings are published in *Nature Plants*.

Poor vitamin D in diets is a health concern worldwide. Vitamin D insufficiency increases the risk of cancer, neurocognitive decline, and all-cause mortality. The majority of food sources lack or do not have vitamin D. This concern led the research team to use gene editing tools to build up the formation of provitamin D_3 in tomatoes.
The researchers modified a duplicated section of phytosterol biosynthesis in the tomato plants considering the possibility of supplement production from waste material. Confirmatory tests were conducted to ensure the efficacy of the biofortification strategy. They also found that the amount of vitamin D_3 in the ripe fruit can be boosted more through sun-drying.

Read the open-access article in *Nature Plants*.

OTHER THAN CROP BIOTECH NEWS:

CRISPR-Cas9 Reveals A Gene Necessary In Coral Skeleton Formation:

A team from Carnegie Science used CRISPR-Cas9 gene editing tools to identify a gene that is essential in the skeleton formation of stony corals. Their findings are published in the *Proceedings of the National Academy of Sciences.*
Stony corals are marine invertebrates that construct large skeletons, which constitute the backbone of reef ecosystems. These serve as a home to about a quarter of identified marine species in the oceans. However, due to carbon pollution, reef growth has been hindered. The excess carbon dioxide released into the air is absorbed by the ocean, which leads to ocean acidification. This change impacts calcification, a process for constructing the skeletons of stony corals.
With the help of CRISPR-Cas9, the scientists determined that the *SLC4γ* gene is necessary for the skeleton formation of young coral colonies. The gene encodes a protein that transports bicarbonate across cellular membranes. By understanding its biology, scientists can initiate successful conservation efforts for these marine communities.

For more information, read the article in Carnegie Science.

Cultivated Chicken from GOOD Meat and UPSIDE Foods Receive Full Approval from USDA:

The United States Department of Agriculture (USDA) has given the final approval to two companies, UPSIDE Foods and Good Meat to sell lab-grown meat in the country. With these approvals, the US becomes the second country after Singapore to allow the sales of cultivated meat. UPSIDE Foods' cultivated chicken is made from chicken cells grown in the lab. The company completed the pre-market regulatory review process for its cultivated chicken after receiving the Grant of Inspection (GOI) from USDA. With this approval, UPSIDE Foods can now start commercial production and sales of its cultivated chicken, with its first order from Bar Crenn in San Francisco through a partnership with three-Michelin-star chef Dominique Crenn. GOOD Meat, the cultivated meat division of food technology company Eat Just, Inc., also received USDA approval for its cultivated chicken made directly from animal cells four months after the company received its

"no questions" letter from the U.S. Food and Drug Administration (FDA). The production for the first batch of cultivated chicken has started, which will be sold to restaurateur and humanitarian Chef José Andrés, the owner of José Andrés Group, which operates more than 30 restaurants across the country.

For more details, read the news releases from UPSIDE Foods and GOOD Meat.