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THE HINDU

Uncovering the genetic secrets of purple rice



The mysterious ways of genes influencing the character of crop plants through long periods of domestication, selection and modern breeding continues to perplex genomics specialists, as found out by the genome researchers working on coloured rice, Purpleputtu recently. Even the whole Genome Sequencing (WGS) of the Purpleputtu rice variety has not fully opened the windows to the genetic secrets to the researchers.

Researchers at the SciGenom Research Foundation, Chennai, said the genome sequencing of Purpleputtu revealed around 65,000 unique genetic mutations compared with the reference sequence, of which about 50 are in the genes of the colour pathway. The question of how specific genes and gene networks control the expression of its uniqueness, the purple colour, still remains an unanswered mystery, say researchers.

In most cultivated white grain rice varieties, a regulatory gene, Rc is missing 14 base pairs, which is believed to have changed the phenotype of seeds from coloured to white. The presence of the 14 base pairs is believed to help regulate the anthocyanin pathway

enzymes to produce coloured seeds, and its absence is accounted for the grains remaining more or less white. The sequencing revealed that the 14 base pairs of Rc gene were absent in Purpleputtu variety. Yet, its seeds remained true to the nomenclature and were found retaining the colour, explained George Thomas, Director, SGRF, and Arjula R. Reddy, advisor to the Foundation. This leads to the conclusion that there are alternative regulatory pathways operating in Purpleputtu, they explained.

The Foundation decided to focus on the purple rice variety as many traditional lines or their wild cousins have not yet been fully sequenced. This traditional variety, while being grown as a bio-barrier and as a marker line between test plots in rice fields to prevent cross-pollination, remained genetically uncorrupted and retained its unique characters over the years. The seed shattering gene and a few other domestication-related genes were found intact in a highly conserved area of about 4.5 million base pairs of Purpleputtu rice genome.

The whole genome sequence has been released in the public domain to serve as a reference point for indica rices, particularly coloured ones, they said.

The focus has now shifted to “understanding the molecular regulation of colour development, domestication and responses to stresses like drought, salt, extreme temperatures and photoperiodic insensitivity of this rice in order to improve it for better performance and its possible utility in breeding for these traits” they explained.

Periyakottai brinjal, pride of farmers



There were many types of brinjal grown in different parts of the State but those grown in Periyakottai and nearby villages in Sakkottai block of this district stand out for their unique features and taste.

Farmers in this region grow three different species – pale green, pale green with blue stripes and violet with stripes and these varieties were not grown anywhere else in the district. The salient feature of the variety was that the fruits would grow big in size but still tender and tasty, say farmers.

“We have been growing the variety for more than three generations,” says C Viswalingam, a farmer of Periyakottai. Every farmer cultivate this variety in at least 10 cents of land even if they cultivate paddy or pulses as main crop, he says.

“Its our pride and identity,” say the farmers who collect and preserve seeds on their own. They do not part with the seeds or seedlings with other farmers in the district. “It’s very difficult to get seeds from the local farmers and even if they give, they will dip them in hot water and give so that they will not germinate,” a progressive farmer in nearby Mithravayal said.

After cutting brinjals, oxidative browning takes place immediately in majority of other varieties but not in case of Periyakottai brinjal, the farmer said. The calyx of the fruits in this variety tastes good and that was the special feature of this variety, he added.

The produce was sold out in Karaikudi market and farmers get even Rs. 100 per kg, G Alagumalai, Assistant Director of Horticulture, Tirupattur block, who is in-charge of Sakkottai, said.

As the farmers preferred to collect and preserve seeds on their own, the department helps them with shade nets for nurseries, J Rajendran, Deputy Director of Horticulture, said.

The Dryland Agricultural Research Station (DARS) at Chettinad took up a study on the variety in a bid to secure Geographical Indication (GI) tag for the variety but gave it up later.

“We may take up a study on this variety along with native species grown in Paramakudi and Pudukottai,” Myrtle Grace, Professor and Head of the Research Station, said. Securing GI tag was a long process and the Research Station could help the farmers with grafting technology to fight diseases, she said.

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Meeting discusses support price for tapioca

The district administration conducted a tripartite meeting of tapioca cultivators, representatives of farmer's associations and sago manufacturers here recently under directions of the State Government for arriving at a uniform support price. The consultation was convened by District Revenue Officer R. Satheesh.

Farmers in the rain-fed hilly parts of the district have been increasingly switching over from ragi to tapioca cultivation. At present, tapioca is cultivated in about 6000 hectares, P. Tamilselvi, Deputy Director of Horticulture, said. While farmers expect returns of Rs. 10,000 to Rs. 12,000 per tonne, officials said the price will be determined based on starch realisation and market conditions.

Government promoting horticulture in a big way

The State government has pegged the Gross Value Addition (GVA) target for the horticulture sector for 2016-17 at Rs.49,845 crore. It is part of the government's endeavour to take the contribution of horticulture to GVA to 25 per cent.

The focus has since been laid on replacing the less remunerative field crops with the likes of mango, sweet orange, acid lime, banana, papaya, pomegranate, guava, oil palm, cocoa, apple berry, Thai guava, and dragon fruit.

This has been accomplished in 14,310 hectares of the targeted 32,513 hectares, according to an official release. Besides, rejuvenation and canopy management are being taken up in crops like mango, sweet orange, acid lime, and cashew for improving productivity.

As far as water is concerned, the government is concentrating on promotion of farm ponds to save plants at critical stages of growth during drought and has been encouraging the cultivation of vegetables.

The Horticulture Department has provided hybrid vegetable seeds for 3,813 hectares at 50 per cent subsidy. It is also extending technical support in identification of beneficiaries and selection of crops. It has asked farmers to switch over to micro-irrigation to conserve water and bring additional areas under cultivation. The farmers are being motivated to adopt organic farming, and certification is being promoted in Visakhapatnam, East Godavari, Prakasam, Kurnool, Anantapur, Chittoor, and Krishna districts for mango, cashew, and vegetables. A total of 181 food processing organisations have been identified.

Eleven companies have entered into MoU with the government for value chain development of agriculture and allied commodities at Anantapur.

Krishi Mela to focus on cultivation of less water-intensive crops

In the wake of the drought prevailing in the region for the second consecutive year, the University of Agricultural and Horticulture Sciences (UAHS), Shivamogga, has planned to spread awareness among farmers about the cultivation of less water-intensive crops during the annual Krishi Mela. The mela will be held on campus from October 21 to 24, said Vice-Chancellor C. Vasudevappa. He was speaking at a press conference recently.

Pulses such as green gram, black gram, pigeonpea, cowpea and chickpea, that can be grown in arid and semi-arid conditions, are cultivated on the university campus. Paddy is cultivated under the System of Rice Intensification (SRI) method that requires less water. Those farmers who attend Krishi Mela will be taken to these plots.

Technical sessions

In addition to this, technical sessions on the role of pulses in maintaining the food security of the nation and soil health, the advantages of growing paddy under SRI and other methods without the flooding of fields will be conducted at the event, he said. The experts will provide the farmers with technical knowledge on cultivating pulses as intercrops in maize and paddy fields. Demonstrations on mechanised transplantation and sowing of paddy and training for members of women self-help groups on terrace gardening will also be held.

Mr. Vasudevappa said more than 400 stalls would be set up. Scientists from premier research institutions including Indian Institute of Agricultural Research, Central Plantation Crops Research Institute, Directorate of Cashew and Cocoa Development, firms engaged in production of agricultural inputs and implements will take part. Exhibitions on pisciculture and livestock will be conducted.

Minister for Agriculture Krishna Byre Gowda will inaugurate the event.

Giving thrust to sustainable farming

The United Planters' Association of Southern India and China Tea Marketing Association signed a memorandum of understanding recently to co-operate for sustainable development of the tea sector. Solidaridad Network, a global civil society organisation, will provide technical support in implementing the project.

Nico Roozen, executive director of Solidaridad Network, spoke to *The Hindu* and sent his responses to an email questionnaire on the need for promoting sustainable practices in agriculture.

Solidaridad works with different sectors in India, including textiles, sugar, and aquaculture.

According to Mr. Roozen, the agriculture sector in India faces three major challenges - size of the landholdings is small and, without scale, consistent quality is not possible to be part of high value markets; the extension support and quality of inputs available to the small farmers are not adequate; and with climate change impact, farmers need to use more inputs such as fertilisers and this leads to higher cost of production and low returns.

With a growing mid-income population, Indian farmers need to increase production of food and dairy products, cotton, etc.

Food businesses and traders are increasingly aligned with NGOs to invest in sustainable and profitable farming.

Awareness among consumers is on the rise and they ask details of how the products are sourced.

All the stakeholders, which includes the governments and the industry, need to understand that markets are key in driving change. Unsustainable ways threaten food security and businesses. There is a need to produce more with less and ensure that it is done in a way that sustains people and environment.

Solidaridad, which aims to develop and deliver commodity-specific and region-specific adaptation solutions and is working in India with the private sector on technologies to reclaim degraded land, co-invests with some of the progressive private sector companies approximately 15 million Euros a year. The funds are used to support farmers across communities to increase yield and use less land and water and Solidaridad also supports the Clean Ganga project by working with tanneries in Kanpur.

On the tea sector, Mr. Roozen says that tea production has to be financially sustainable for social and environmental improvements.

Tea price on nominal rates has fluctuated. But according to FAO data, the prices in real terms have gone down continuously from 1957. India and China are the biggest tea producing and consuming countries.

Solidaridad will facilitate a “pre-competitive platform” of the stakeholders in the two countries. It would be a co-operation platform for tea producing and importing countries to strengthen the global tea sector, and promote its sustainable expansion in a market-based environment.

This forum would conduct consultations, research, and share information. The small holders in India are not earning a remunerative return. The co-operation will help them learn and acquire latest technologies to produce and sell higher quality tea in a sustainable way, he says.

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Punjab government yet to provide machines to curb straw burning



Although paddy harvesting is on full swing in Punjab, the state government is yet to provide around 1100 subsidised farm implements proposed for this year to manage the straw from the harvest. This delay may result in farmers burning the straw thereby increasing air pollution in surrounding areas, including Delhi.

This year, Punjab was sanctioned Rs 10 crore for the machines that include 125 balers, 125 mould board plows and gyro rakes, 300 happy seeders, 445 choppers and shredders – all used to manage the paddy stubble. The state has almost 30 lakh hectares under paddy, which means a large number of machines will be required.

The Rs 10 crore is minuscule considering, according to the agriculture department, Rs 1600 crore will be required over the next five years to provide subsidised machines. “However, Punjab has not even received the Rs 10 crore yet. When it does come and we give farmers the machines, it would be time to sow wheat,” said a senior officer from the department.

PIL for immediate ban of 19 pesticides: Delhi HC seeks Centre's reply



A plea seeking an immediate ban on 19 pesticides as recommended by an expert panel on the ground that they are carcinogenic has been moved in Delhi High Court, which has sought the Centre's stand on the issue. A bench of Chief Justice G Rohini and Justice Sangita Dhingra Sehgal asked the Centre's lawyer to take instructions on the issues raised in the PIL which has claimed that the panel's recommendation to ban the 19 chemicals was accepted by the government but have not yet been implemented.

The petition has also alleged "conflict of interest" against the expert committee for having representatives from the pesticide industry who, it claimed, had vested commercial interest. It has contended that the panel had "heavily relied" upon the inputs of these members from the pesticide industry and alleged that this had led to 47 chemicals not being banned.

As per the petition, the expert panel was set up by the Agriculture Ministry to look into 66 pesticides which were banned in other countries but continued to be used in India. The petitioner, K V Biju, has sought directions to the Centre to reconstitute the panel by excluding members from the industry and include independent representatives from the government.

It also sought reconsideration of the continued usage of 47 pesticides as per the recommendations of the expert panel. Of the 19 pesticides, the committee had recommended immediate ban on production and import of 13 of them, prohibit their use by 2018 and phase out the remaining six by 2020. It had recommended continuation of

the remaining 47 pesticides, asking for a review of 28 of them in 2018. The matter is listed for hearing on December 7.

THE HINDU BusinessLine

Centre working on portal to get farm insurance data in real time

New Delhi, October 16:

Efforts are on to make the collection of data on insurance coverage for farmers under the Prime Minister's Fasal Bima Yojana (PMFBY) become more efficient and timely from the upcoming rabi season.

The Agriculture Ministry is working on a portal where banks can directly enter details on insurance sold to farmers during the two cropping seasons.

This will help the Centre in accessing information on insurance coverage on real time basis in various States and take timely corrective action wherever required. "We have already had several rounds of meetings with senior officials, including General Managers of all commercial banks, and also discussed various alternatives to make the portal user-friendly," an Agriculture Ministry official told *BusinessLine*.

Commercial banks are responsible for a large part of insurance sold to farmers as the PMFBY mandates that all banks have to mandatorily cover farmers who take loans from them in the period the insurance is sold. Since banks take their time to give details on the number of farmers they have provided insurance cover to, the Centre gets delayed information on the spread of the scheme.

"Once we start getting data on a real-time basis from banks, we will know exactly how the scheme is doing and if steps like more publicity or extending the deadline for issuing insurance need to be taken," the official said. The Agriculture Ministry hopes to have the portal in place by the time insurance for the rabi season starts being offered to farmers next month, he added.

The PMFBY, which replaced the older National Agricultural Insurance Scheme (NAIS) and the modified NAIS, seeks to provide comprehensive insurance to farmers against the vagaries of nature at very low premia of 2 per cent of the insured value for the kharif crop and 1.5 per cent for the rabi season.

Deadline extended

The deadline for the insurance scheme for the kharif season was extended from July 30 to August 10 this year for most States and from August 15 to August 31 for Bihar as several States were late in notifying the new scheme. According to Agriculture Ministry's rough estimates, this kharif season insurance coverage this year at 3.15 crore farmers have been insured this kharif season as opposed to 3.08 crore last year.

Indians eat less eggs

Hyderabad, October 16:

India is the largest producer of eggs in the world with around 83 billion per annum, but the per capita availability for consumption is a third of the recommended nutrition requirement.

Against the suggested intake of 180 eggs per year by the National Institute of Nutrition, Hyderabad, the national availability is just 63 eggs per person per year at present.

With one out of every four kids below the age of five suffering from malnutrition, eating egg is one of the best ways of combating it says nutrition specialists. The reason is that an egg is a good source of protein, Vitamin A, B6, B12, amino acid, iron and selenium and phosphorous.

The Union Agricultural Ministry, which observed World Egg Day on Friday said in order to increase egg production by three times many steps have been taken, so that childrens' health improves while poultry farmers get benefits.

Government has been promoting poultry farming through National Livestock Mission by providing financial assistance to the BPL families.

Contrary to popular notion, eggs do not increase blood cholesterol