A new method to assess genetic purity of hybrid rice seeds

New Delhi, Nov 19: The purity of hybrid seed has to be maintained for all crops as prescribed by Indian Seed act 1965. The purity of CMS lines used in hybrid seed production of rice need to be very high (99%) in order to produce 98% pure hybrid rice. This is tested either by checking for morphological features during flowering in a field which is called grow-out test (GOT) or by using molecular markers. In the first, the process is expensive and one full season is required before using the CMS lines in the hybrid seed production program. The second test is faster. However, it has to be done on at least 200 independent seeds and it is tedious.

A team of researchers at DBT-Centre for DNA Fingerprinting and Diagnostics (DBT-CDFD) have now developed an alternative method, where the analysis is based on bulked-seed using mitochondrial markers. Maintainer line seed powder, which is usual admixture in the CMS line, is mixed in various proportion with CMS line seed powder and genotyped using capillary electrophoresis. Statistical analysis of the results obtained suggest that this method is accurate and cost-effective and thus better than the two conventional testing techniques.

The scientists have found that as many as 20 samples can be analysed at a time in 3 days using this method while analysing even one sample takes more than 3 days in the conventional method using molecular markers.

The new method will help the seed industry and farmers by enabling faster, accurate, and cost-effective assessment of genetic purity of CMS lines. It can be extended to other crops also where the mitochondrial sequence information is available.

Ref. Anupama K, Pranathi K, Sundaram RM 2020 Assessment of genetic purity of bulked-seed of rice CMS lines using capillary electrophoresis. Electrophoresis 41:1749-1751

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