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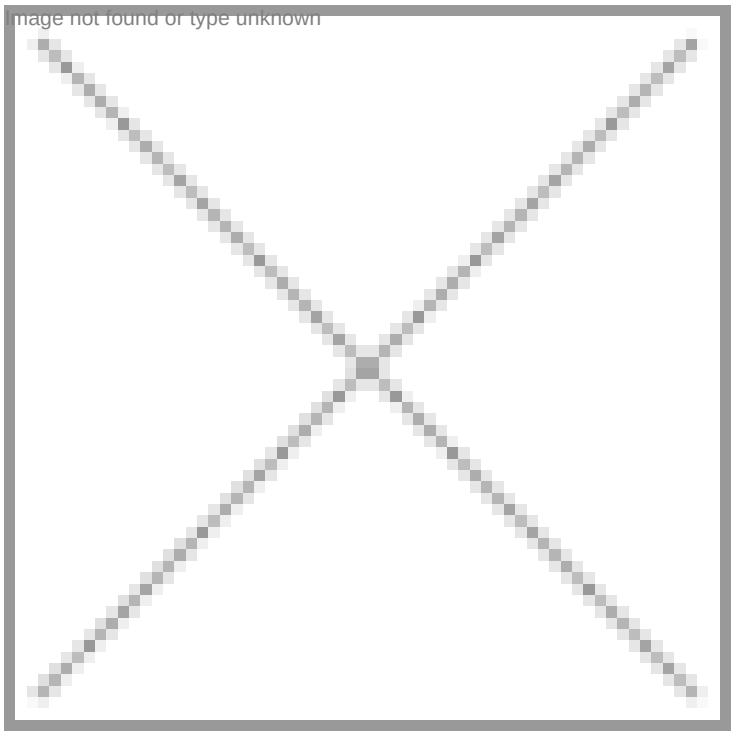
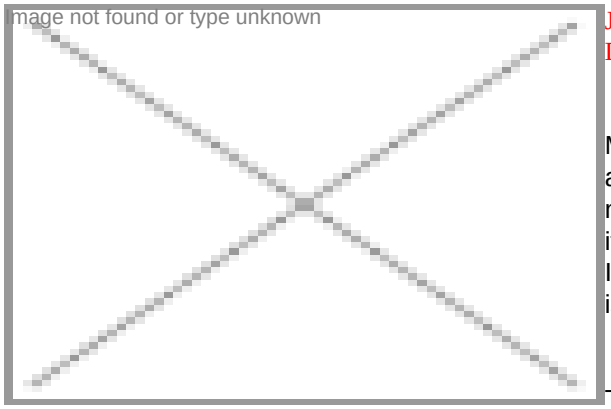
Nutritionally improved mustard hybrids

11 May 2012 | News





Jalgaon-based Nirmal Seeds and The Energy and Resources Institute of New Delhi are developing hybrid varieties of mustard by using marker assisted

Mustard oil is generally preferred due to its characteristic pungency, but at the same time the oil has high amounts of erucic acid which is anti-nutritional. The oil cake too has high level of glucosinolates which makes it unfit as the cattle feed. So far the genetic improvement programs in Indian mustard have targeted only the yield related traits. However, there is a need for developing quality mustard hybrids with nutritional value

Taking a step in this direction, in March 2011, Jalgaon-based Nirmal Seeds initiated a joint project with The Energy and Resources Institute (TERI), New Delhi, on nutritionally improved mustard using marker assisted selection (MAS) technology. The project is aimed to improve the quality of mustard oil and cake by reducing the erucic acid and glucosinolate content. With Brassica juncea being the most widely cultivated Brassica species in India, one of the major achievements of this project is expected to be able to develop double low traits in the plant species.

The project valued at nearly ₹10.34 lakh, received the Biotechnology Industry Innovation Partnership Programme (BIPP) funding to a tune of ₹8.57 lakh (₹4.29 lakh as aid and ₹4.28 lakh as loan) from the Department of Biotechnology (DBT).

TERI will be carrying out molecular validation of the double low traits of the Brassica progeny arising from the backcross breeding program at Nirmal Seeds. The research and development (R&D) team at Nirmal Seeds has been simultaneously

carrying out analytical validation of erucic acid and glucosinolate content at TERI by using gas chromatography (GC) and high performance gas chromatography (HPLC). The F1 progeny of the crosses has been raised and leaf DNA samples of raised F1 population were sent to TERI for validation of double low traits using molecular markers. Microspore culture laboratory has been set up at Nirmal Seeds for haploid plant production, which is one of the objectives required for fixation of homozygous characters at BC3 generation.

Highlighting the importance of public private partnership, RO Patil, managing director, Nirmal Seeds, says, â€œBoth the public and the private sector organizations have their own specialized skill sets and strengths. Public private partnership program brings this complimentary strength together and can play a crucial role in dealing with big agricultural challenges. While public sector provides expertise in plant science genomics and bioinformatics, the private organizations contribute to crop improvement through hybrids, delivery of the product, and services and marketing.â€?

Way forward

The anti-nutritional properties of the Indian mustard cultivars due to high erucic acid and glucosinolate content have resulted in its limited preference in southern and central India as well as in international market. This crop accounts for nearly one-third of the oil produced in India, making it India's key edible oilseed crop. Till date no double low varieties of B. juncea have been commercially released in India. Once the new hybrids are developed, they are expected to have wider acceptance and increased utility both as edible oil and cattle feed.

Rahul Koul in New Delhi