

Why India needs genetically modified mustard

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Indian farmers suffer from minimal yields in mustard, as low as 1,000 kg/hectare — one third of that in Canada, China and Australia.

Around 60 lakh farmers grow mustard over 65-70 lakh hectares during the rabi (winter) season in Rajasthan, Haryana, Punjab and Madhya Pradesh.

Ironically, mustard production and yields have remained stagnant for the past 20 years. The scientific community attributes two reasons for this: first, a narrow variability in Indian mustard germplasm and second biotic and abiotic stresses.

Farmers continue to suffer from low yields, meagre farm income and loss of opportunity cost due to denial of farm technologies.

Heavy import dependence

India is a major importer of GM canola (Canadian mustard) oil and GM soyabean oil. India has been consuming genetically-engineered cotton oil produced domestically by our cotton farmers for the past 14 years. We consume approximately 50 lakh tonnes of GE edible oil every year.

GM Indian mustard oil is no different from imported GM canola and GM soyabean oils. Globally, a quarter of mustard/canola area, equivalent to 85 lakh hectares of the total 360 lakh hectares, was under genetically engineered varieties in 2015. GM canola is commercially cultivated over an area equivalent to one and a half



times the area under mustard in India. Farmers in Australia, Canada and the US have been benefiting from GM canola since 1996. Multiple GM technologies such as hybridisation and herbicide tolerance in canola helped their farmers produce more canola grain, oil and animal feed. India, China and EU are the major destinations for GM canola products.

GM mustard developed by Delhi University, South Campus, is India's first farm innovation that will allow Indian mustard farmers to produce more crop per unit area.

The development of GM mustard is a classic example of indigenous scientific capability to harness the science of biotechnology and farm innovation in agriculture. More so, India faces a huge deficit in edible oil production and annually imports approximately 14.5 million tonnes of edible oil including oil extracted from GM soyabean and GM canola.

Yields need to increase

Imported edible oil accounts for over 70 per cent of total edible oil

consumption, pegged at 20 million tonnes.

India's annual cooking oil import bill stands at around ₹78,000 crore and is the third largest Indian import after petroleum and gold.

The edible oil deficit will continue to widen with the increase in the population, dietary changes and per capita income.

To address this challenge, India needs to critically look into ways and means to increase productivity of oilseed crops, including mustard, soyabean and other important edible oil crops.

GM mustard hybrid DMH-11 (Dhara Mustard Hybrid-11) is one of the promising technologies to improve mustard yields in India.

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The truth is that India has a robust, multi-tier and multi-disciplinary regulatory system involving more than 100 external experts drawn mainly from Indian public sector institutions, through statutory regulatory committees.

Access to GM mustard hybrid technology will allow our mustard breeding research groups at DU, Indian Agricultural Research Institute, Punjab Agricultural University, Haryana Agricultural University and Directorate of Rapeseed-Mustard Research to use barnase-barstar technology to develop superior mustard hybrids for our farming community.

The writers are from South Asia Biotechnology Centre, New Delhi. Views are personal.