National Academy of Agricultural Sciences

Prof. Panjab Singh
President and
Former Secretary (DARE) & DG, ICAR

The Hon’ble Prime Minister,

We the Fellows of the National Academy of Agricultural Sciences (NAAS) compliment the Genetic Engineering Appraisal Committee (GEAC) of the Ministry of Environment, Forest and Climate Change (MOEF&CC), for having cleared transgenic parental events and hybrid DMH-11 of mustard for environmental release. We greatly appreciate that this decision is based on comprehensive deliberations and stringent appraisal of scientific data on biosafety. We request that the Central Government should accept these recommendations at the earliest and allow the environmental release of the two transgenic events and hybrid DMH-11 to enable scientific and technological interventions to benefit farmers, consumers, national economy, and the environment.

We reiterate that science-led agricultural revolution, especially the Green Revolution, during the past 50 years, had transformed India from a ship-to-mouth situation to a Right-to-Food status. Yet, the country is home to one-fourth of the world’s undernourished, hungry, and poor. Paradoxically, majority of the hungry and deprived people are the smallholder farmers, comprising almost 50% of India’s population - over 600 million real people. Average income of a farmer is one-fifth of that of a non-farmer, rendering the country highly unequal. These challenges are further exacerbated by the emerging and re-emerging biotic and abiotic stresses, climate volatilities, and dwindling natural resources – arable land, water, and biodiversity. Obviously, new technologies and unusual developmental pathways are called for meeting the imbalances and complex challenges.

Sir, you have very strongly set a target for doubling the farmers’ income by 2022 consistent with the eco-environmental security and the Sustainable Development Goals. The much needed low input – high output agriculture cannot be developed without the use of new technologies such as genetic engineering. The NAAS, the agricultural think tank of the nation, is of the firm view that appropriate genetic engineering (GE) technologies will have to be used for meeting the challenging crop productivity objectives for ushering Evergreen Revolution leading to sustainable higher yields, improved nutritional quality, and resilience to climate change for achieving the above goals.

In the last two decades, the global area under GE crops has increased over 110 fold, from 1.7 to 185.1 million hectares, benefitting hundreds of millions of farmers, especially small and resource-poor farmers in developing countries. In 2016, of the 26 countries planting GE crops, 19 were developing countries, accounting for 54% of global area under the GE crops providing enormous

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environmental and economic benefits. A global meta-analysis has shown that “on average, GE technology adoption has reduced chemical pesticide use by 37%, increased crop yields by 22%, and increased farmer profits by 68%”. Between 1996 and 2014, GE crops have helped, among other major gains, in conserving biodiversity by saving 152 million hectares of land, and in alleviating poverty for ~16.5 million smallholder farmer families covering ~ 65 million people.

India herself has greatly benefited from the GE technology, becoming world leader in cotton production and export. Released for commercial cultivation in 2002, Bt-cotton area in India increased to 11.6 million ha in 2015, comprising nearly 95% of the total cotton area cultivated by about 7.7 million smallholder farmers. Since the adoption of Bt-cotton, chemical pesticide use in cotton has declined from 33% to 11% of the total pesticide used and the productivity and production have doubled, making India largest producer and second largest exporter of cotton in the world, adding US$ 1.6 billion to the cotton economy annually (please see the attached NAAS Policy Brief 1).

The cotton story must be repeated in other crops based on critically assessed technological gaps on case-by-case basis. Regarding oilseeds, the following points are noteworthy: (i) India meets 60% of its demand for edible oils through imports, costing nearly Rs. 80,000 crore annually, let alone the opportunity lost for the farmers to enhance their agricultural productivity and income, (ii) Bulk of the imported oil is extracted from transgenic soybean and canola (mustard) extensively cultivated in USA and Canada, and (iii) National average yield of oilseed crops is low and sluggish. With this backdrop, biotechnological intervention in oilseed crops assumes high priority.

As regards Brassica (mustard/canola) in particular, 8.5 million ha, a quarter of its global acreage, was under genetically modified varieties, and farmers in Australia, Canada and USA have been reaping socio-economic and environmental benefits from GM canola since 1996, rendering Canada as the foremost exporter to India. Having one of the largest mustard acreages in the world, India must benefit from the successful experiences of other important Brassica growing countries. Our scientists have toiled hard during the past 20 years to develop promising biotech mustard varieties. For developing mustard hybrid DMH-11, the barnase-barstar system was used to produce stable male sterile and fertility restorer lines for hybrid seed production. In field trials, **DMH-11 out-yielded the national and zonal checks by 20 to 30%**. Future breeding using these two transgenic events will provide mustard hybrids with canola quality and better yield. Thus, extensive diversity available in mustard in the country could be mustered to produce progressively higher yielding superior multi-trait hybrids.

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It may be clarified that the GE system using barnase-barstar genes is used in India only for developing stable male and female parental lines for cost effective quality hybrid seed production, and not for herbicide tolerance and weed control, as falsely propagated by the anti-GM activists. Another false propaganda is so called ‘contamination’ of the neighboring fields with the GM event. This is an imaginary issue, as India’s biosafety guidelines for using GE crops provide safeguards to prevent unintentional gene flow for maintaining the purity of seeds of any GE crop. Moreover, the country has developed a fail-proof system, including Gene Banks, for safe maintenance of the germplasm of crops like mustard.

Appreciating that regulatory approval is an essential requirement for commercialization of GE crops, India has developed a multi-tier regulatory system, which is one of the most robust regulatory systems in the world to address the biosafety and environmental concerns. The DMH-11 hybrid and its parental lines were rigorously tested for biosafety as per the guidelines and procedures. All the biosafety studies conducted were submitted to GEAC in September 2015, and clearance from GEAC has been accorded on May 11, 2017, after a thorough analysis by the expert committee. We have apprised ourselves of all the conducted studies and will like to unequivocally state that this technology is safe and will help the farmers and the country in improving its edible oils economy.

We are aware that there is massive negative propaganda on GM crops by the activists causing serious damage to the future of Indian agriculture. The points repeatedly raised by the opponents of GE technology include: (i) food safety of GE crops, (ii) loss of biodiversity, (iii) development of resistance in pests, and (iv) development of super weeds. The worldwide studies clearly show that the GE foods are safe, that there is no adverse effect of GE crops on biodiversity, that development of resistance in pests is no different from the normal natural phenomenon. Further, the opponents often falsely confuse the public of the barnase-barstar based male sterility system in mustard being a genetic use restriction technology (GURT) or terminator technology. The barnase-barstar system is the most effective and popular technology for producing rapeseed hybrids in some of the most advanced countries. Moreover, our regulatory bodies have cleared GE mustard of being free from terminator technology after thorough appraisal.

We wish to highlight that during the past two decades of use of GE crops for food and other purposes, no risks related to human health and environment have been encountered. This has also been supported by 107 Nobel Laureates in their letter to the Governments around the world, saying that the GE crops are “... as safe as, if not safer than those derived from any other method of production”. Extensive studies in the EU and US did not find any adverse effect of the GM crops on health and environment as compared to traditionally bred varieties.

The Academy strongly endorses the recommendations of the GEAC, as the GM-mustard is a safe technology and it has been in use in other countries for
boosting edible-oil economy. It is high time to deregulate and approve environmental release of the GE varieties which have been tested and found biosafe, to extend the benefits of growing these varieties to the farmers, consumers and the environment without further delay. Having fully met the regulatory biosafety and performance requirements, a biotech product must not be denied to the farmers, who should have options to make informed choices, and empowered to become globally competitive in the fast changing world.

Finally, we submit that it is time we put faith in the power of science and technology to improve our agricultural and food system productivity, profitability, and sustainability in perpetuity. We urge you to endorse the decision of the GEAC at the earliest. This will not only help the farmers in improving their income and help the country in reducing the burgeoning edible oil deficit, but will also ensure that science is not denied the opportunity to serve the society.

We will be happy to meet you to address any concerns you may still have.

With respectful regards,

Encl. As above

Yours faithfully,

(Panjab Singh)

Hon’ble Prime Minister of India
South Block
New Delhi -110001