

What's the hurry for GM mustard?

Long-term ecological, environmental effects of herbicide-tolerant crops haven't been considered



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WE ARE writing to express concern regarding the recent recommendation for approval for the environmental release of genetically engineered (GE) mustard ("DMH-11 hybrid") in India. The recommendation was made by the Genetic Engineering Appraisal Committee (GEAC). Our concern rests on several aspects of the proposal for release. First, the potentially harmful long-term ecological and economic consequences of releasing DMH-11 have not received sufficient consideration. Second, details of the mandatory trials to ensure food and environmental safety, which is a prerequisite before environmental release, have not been made public. Finally, a detailed long-term assessment of the potential social and economic benefits of using DMH-11, vis-à-vis its potential drawbacks, remains to be made. Without minimising the importance of the last two aspects, the present note is restricted to highlighting the first aspect.

A central feature of DMH-11 is that it carries a gene for herbicide resistance (also termed herbicide tolerance or HT). This fact has not received appropriate consideration. The deployment of herbicide-resistant or HT crops has been accompanied by deleterious outcomes in several places including the US, Australia, and Canada (so-called developed countries) as well as Argentina (a developing country). The most well-established harmful consequence has been the spread of herbicide-resistant weeds across large tracts of agricultural land, which can spell disaster for the normal crop.

The developers of DMH-11 stated in their food and environmental safety assessment submission of 2016 that, "Although GE mustard hybrid DMH-11 contains the bar gene conferring resistance to the herbicide Basta (phosphinothricin)... Basta herbicide is required to be used only by seed producer for hybrid seed production ... (and) farmers are not required to spray Basta in the hybrid GE DMH-11 for weed control". The GEAC in its recommendation on October 18 for environmental release of DMH-11 has accepted this position and placed certain conditions for environmental release. One is that, "Usage of any formulation of herbicide is recommended only under controlled and specified conditions exclusively for hybrid seed production ...". Another is, "Usage of any formulation of herbicide is not permitted for cultivation in the farmer's field under any situation and such use would require the necessary permission as per procedures and protocols of safety assessment of insecticides/herbicides by CIB&RC (Central Insecticide Board and Registration Committee)." In other words, GEAC assumes that farmers will use DMH-11 without adding herbicide even though they know that it carries a gene for herbi-

cide resistance. It ignores the known fact that there have been numerous recent reports in the Indian media of the illegal use of unapproved herbicide-resistant crops, which has been brought to the notice of the government. There is every likelihood that DMH-11 will also be grown using herbicide if it makes weed control easier, as is expected to be the case. Further, GEAC has considered the possible use of herbicide with DMH-11 merely as a matter of herbicide usage and referred its approval to the CIB&RC, which registers usage of herbicides on a crop-wise basis. However, on multiple counts, HT technology is qualitatively different from the conventional use of herbicides. These include levels of herbicide used, which is much higher than in conventional use; its effect on the crop which is engineered to be resistant to the herbicide and so to tolerate much higher levels of herbicide; and its agro-ecological impact including on agricultural biodiversity and insect populations. The scope of issues connected to use of herbicide with a herbicide-resistant crop places it squarely within the purview of GM regulation (that is, GEAC). It is not enough for GEAC to merely refer it for chemical registration since the CIB&RC is not the competent body for recommending approval of GM crops.

Thus, notwithstanding the statement of the developers and its implicit acceptance by GEAC, DMH-11 does meet the definition of an HT crop. The answers to two questions show this. Is DMH-11 herbicide tolerant? Yes. Is it a crop? Yes. The intent of the developer on how it is meant to be used does not determine how it is actually likely to be used, especially if that usage appears to confer obvious advantages.

We reiterate that HT technology involves the use of a herbicide in far higher amounts than conventional herbicide treatments, high enough to kill all weeds in the field, leaving only the engineered crop to grow. Thereby, it replaces all other weed control measures. This may be effective for a few years. But basic evolutionary considerations, as well as experience in other countries, shows that it imposes strong selective pressure for resistant weeds to emerge. They invariably do so in the course of time and spread rapidly. Once that happens, still higher amounts of herbicide need to be used; the cycle continues progressively. HT offers short-term benefits at the cost of long-term sustainability.

We are aware and appreciate that a great deal of time, effort, and resources have gone into the development and testing of DMH-11 mustard. It is also possible that the safety issues connected with herbicide tolerance were not fully apparent at the time of its design and development. However, the extant investment should not deter us from seriously analysing the risk that HT technology poses. In our view, the risk outweighs any benefit that may accrue from its deployment.

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