Opinion: GE Crops Are Seen Through a Warped Lens

Risks that pertain to all manner of new crops are often misattributed to genetic engineering. This distorts the public's view of the technology.

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Public perception of genetically engineered (GE) crops is being manipulated by organizations that purport to represent the interests of consumers and the environment. These anti-GE groups publish stories discussing risks as if they are unique to GE crops, not acknowledging that similar risks are accepted in traditional agriculture. Meanwhile, environmental, health, and economic benefits of GE crops become lost in a sea of alleged dangers, such as triggering allergies in consumers or harming the environment. As a result, efforts to engineer crops with agronomic traits or improved nutrition face an uphill battle to gain acceptance.

Of course, there are potential risks involved with growing GE crops, which are assessed during regulatory reviews prior to cultivation, and these must be taken into consideration when assessing the potential benefits of such plants. But the same can be said for any food item entering the market. Conventional crop breeding has a long history of safety, but all novel crop varieties—both those bred by traditional means and those genetically tweaked in some way—have the potential, albeit remote, to manufacture toxic or allergenic proteins not previously produced in that crop. In addition, altered levels of enzymes, transcription factors, and small interfering RNA transgene products, which may be produced by plants naturally or introduced through genetic engineering, may affect the crop's safety or nutritional qualities.

Even though they apply generally to all crops, these and other potential risks are often misattributed to GE crops alone. For example, critics cite unintended effects as the result of imprecise molecular tools, but research has shown that genetic engineering is actually less likely than traditional breeding to cause unexpected changes in plant quality, food safety, or environmental impact (*J Agric Food Chem*, 61:11695–701, 2013). Although GE technology can be used to introduce traits from a wider array of species compared with traditional breeding methods, the knowledge of how GE traits work allows researchers to accurately evaluate risks.

Many existing generic agricultural drawbacks—from resistance evolution in pest populations to the socioeconomic and environmental impacts of industrial-scale, monoculture-dependent agriculture—

are often attributed solely to genetic engineering. To cite such risks as reasons GE crops should not be incorporated into modern agriculture is flawed logic. As the risks apply to both GE and non-GE crops, the focus should shift to the relative benefits the two approaches bring to crop improvement, environmental stewardship, and food safety.

Research from our group at Corteva Agriscience, the Agriculture Division of DowDuPont, and many others has documented numerous advantages of GE crops, both for the environments where they are grown and for the people who consume them. Increased yields allow more natural habitat to be spared, while reduced insecticide use and better pest control can improve the quality of the crops. Tolerance to herbicides has favored tillage practices that promote soil health and reduce erosion and runoff, and insect-resistant maize has reduced carcinogenic toxin contamination from fungi that grow in plant tissues damaged by pests. GE crops can also be enriched with nutrients deficient in the diets of some populations; beta-carotene–enriched golden rice is a prime example.

Crop improvement through genetic engineering is able to deliver these benefits at greater levels, with more precision, and more rapidly than conventional breeding techniques. To feed humanity for years to come, we must continue to advance our agricultural systems, so that we can grow more nutritiously enhanced food on less land, while minimizing the environmental impact. Misconceptions about GE crops threaten to obstruct that progress. Crop varieties developed using modern technologies must be held to the same standard as crops produced by more traditional means. The risk of not doing so is that we will not be able to feed the world of the future.

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