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Genetically Engineered Crops Are Safe, Analysis Finds

By Andrew Pollack

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Genetically engineered crops appear to be safe to eat and do not harm the environment, according to a comprehensive new analysis by the advisory group the National Academies of Sciences, Engineering and Medicine.

However, it is somewhat unclear whether the technology has actually increased crop yields.

The report from the influential group, released on Tuesday, comes as the federal government is reviewing how it regulates biotech crops and as big packaged-food companies like Campbell Soup and General Mills are starting to label products as being made with genetically engineered ingredients to comply with a new Vermont law.

The report also says that new techniques, like a way to make small genetic changes in plants using genome-editing, are blurring the distinction between genetic engineering and conventional plant breeding, making the existing regulatory system untenable. It calls for a new system that pays more attention to the attributes of the crop, as opposed to the way in which it was created.

Despite its roughly 400 pages, however, the document is not expected to end the highly polarized dispute over biotech crops, which are often called G.M.O.s, for genetically modified organisms. Both sides on Tuesday pointed approvingly to findings that buttressed their viewpoint and criticized those that did not.

The Biotechnology Innovation Organization, which represents companies that sell genetically modified seeds, said it was “pleased” that the study found “that agricultural biotechnology has many demonstrated benefits to farmers, consumers and the environment.”

But Michael Hansen, senior scientist at Consumers Union, which is critical of the crops, pointed to the lack of a significant increase in yield.

“Despite industry claims, these crops are clearly not the answer to world hunger,” he said in a statement.

Perhaps because of the sensitivity and complexity of the issue, many of the document’s conclusions are hedged by caveats.

“We received impassioned requests to give the public a simple, general, authoritative answer about G.E. crops,” Fred Gould, a professor of entomology at North Carolina State University and chairman of the committee that compiled the report, wrote in the preface. “Given the complexity of G.E. issues, we did not see that as appropriate.”

This is the latest of several reports on genetically modified crops by the National Academies, which are private, nonprofit organizations set up by Congress to give advice on issues related to science, technology and medicine.

A previous report by the groups, released in 2010, found that genetic engineering had provided environmental and economic benefits to American farmers.

The new report was written by a committee of 20, almost all of them from academia. There was no one from crop biotechnology companies like Monsanto or DuPont on the committee, though some members have developed genetically engineered crops and might have been consultants to the companies.

The committee examined more than 1,000 studies, heard testimony from 80 witnesses in a series of public meetings and webinars, and analyzed 700 comments submitted by the public.

The committee concentrated its review on the genetically engineered crops that account for the vast bulk of such plants grown in the United States. These are corn and cotton containing bacterial genes that make the crops resistant to certain insects; and soybeans, corn and cotton that are resistant to herbicides, particularly glyphosate, the main ingredient in Roundup.

The report says that foods made from such crops do not appear to pose health risks, based on chemical analyses of the foods and on animal feeding studies, though it says many animal studies are too small to provide firm conclusions. Several other regulatory, scientific and health organizations have previously also concluded that the foods are safe.

The committee also looked at the incidence of certain diseases, in some cases comparing rates in North America, where genetically modified crops have been part of the diet since 1996, and Western Europe, where food from biotech crops is not eaten much. It said it found no evidence that the crops had contributed to an increase in the incidence of cancer, obesity, diabetes, kidney disease, autism, celiac disease or food allergies.

The document also says the regulatory system should be tiered, with potentially riskier products receiving greater scrutiny before they can be marketed, whether those products are made using genetic engineering or not. Other new products, regardless of how they are made, might need virtually no scrutiny. New techniques like DNA sequencing can be used to more closely analyze the molecular composition of food products, the authors write.

“Clearly the report makes a bold statement in favor of greater transparency and modernizing the review system to make sure the regulatory tools are keeping pace with the technology,” said Scott Faber, vice president for government affairs at the Environmental Working Group, which advocates labeling.

Regarding environmental effects, the report says there is “no conclusive evidence of a cause-and-effect relationship between G.E. crops and environmental problems. It says it has not been proved that the increased planting of such crops is indirectly responsible for the decline of the monarch butterfly.

The report says use of the insect-resistant crops has clearly led to a decrease in the spraying of chemical insecticides. Conversely, the use of herbicide-resistant crops might have led to an increase in the spraying of chemical weed killers in some cases. Overuse of glyphosate has spurred evolution of weeds resistant to that chemical, vexing farmers.

However, looking only at the pounds of chemicals sprayed per acre is misleading because different chemicals have different toxicities, it says.

The committee concludes that the use of crops has generally provided economic benefits for the farmers and can increase their output in certain cases, for instance, by protecting crops from insect damage. Nonetheless, it says that nationwide, the introduction of the crops does not appear to have accelerated the rate at which corn, soybean and cotton yields were already improving.

“There’s no change in the slope, at least no significant change in the slope,’’ Dr. Gould said in presenting the results Tuesday, saying the finding was somewhat puzzling. While the influence on yields could conceivably be greater in developing countries, the report questions how essential genetic engineering will be to feeding the world as the population grows.

The report does not reach firm conclusions on two controversies: whether foods made from the crops should be labeled and whether glyphosate can cause cancer. It says there is no safety reason to label such foods, though it may be justified for other reasons like consumers’ right to know.

Wayne Parrott, a professor of crop and soil sciences at the University of Georgia and a proponent of biotechnology, said in a statement distributed through the Genetic Expert News Service: “The inescapable conclusion, after reading the report, is the G.E. crops are pretty much just crops. They are not the panacea that some proponents claim, nor the dreaded monsters that others claim.”