

Evaluating competing claims about genetically modified crops

The arguments for and against GMOs began at the technology's inception, in the 1980s, and have changed little since. But during that period, over one and quarter billion acres of land have have been planted with genetically modified seeds, ample evidence with which to test the claims of both supporters and opponents, concludes an article in the most recent issue of the *Journal of Economic Perspectives*.

The authors write:

We argue that while a number of the environmental issues with genetically engineered seeds warrant scrutiny, the accumulated experience with the first wave of agricultural biotechnology has generated considerable benefits to consumers and the environment. While the next wave of genetic engineering has potential to improve crop response to climate change and boost the nutrient density of staple crops, attention must be paid to the unique risks each new trait may pose. Policy must also seek to ensure that innovation is not unnecessarily burdened and that those who stand to benefit most from the technology—the poor in developing countries—are not neglected. Agriculture is challenged at the outset of the 21st century to feed, clothe, and fuel a world population growing in size and wealth. The history of modern farming lends optimism that the challenge can be overcome, but with the sources of historic growth—mechanization, conventional plant breeding, agrochemicals, and irrigation—reaching diminishing returns, a commitment to new technologies like agricultural biotechnology is needed.

The authors consider the first generation of agricultural biotechnology, which introduced insect-resistant and herbicide-tolerant strains of four principle row crops—corn, soybeans, rapeseed, and sugar beets—and the environmental, economic, and human health impacts of these plants.

Below are some excerpts of their findings:

- In spite of environmental risks posed by agricultural biotechnology, theory and empirical evidence suggest genetically engineered crops deliver environmental benefits by saving land and agrochemicals and by maintaining rather than diminishing agricultural biodiversity.
- A number of studies using farm-level data in various countries have found that genetically engineered seeds increase crop yields.
- Crop consumers benefit from lower prices. But all else equal, lower prices hurt farmers.
- Given their monopoly status afforded by intellectual property rights, seed companies have incentive to manage resistance in order to preserve the efficacy of their seed technologies.
- The recombinant DNA process is not inherently less safe than conventional forms of plant breeding and that the content of crop plants and foods should drive their regulatory scrutiny, not the process by which they were bred.
- Even first-generation agricultural biotechnology likely delivers some health benefits that weigh against health risks.

As new GMOs are developed, the uncertain risks of “new transgenic crops” must be weighed against “benefits from increased food production, reduced insecticide use, and avoided health risks to food consumers and farm workers,” the authors conclude.

Finally, the authors write, current regulations were developed before GMOs were understood and investigated, which has lead to over regulation, inhibiting the introduction of new transgenic varieties and discourages application in developing-country, where benefits are likely greatest.

Read the full original article: [Agricultural Biotechnology: The Promise and Prospects of Genetically Modified Crops \(PDF\)](#)

Additional Resources:

- [GLP Infographic: 10 reasons we need crop biotechnology](#), Genetic Literacy Project
- [GLP Infographic: International science organizations on crop biotech safety](#), Genetic Literacy Project
- [Does the Seralini corn study fiasco mark a turning point in the debate over GM food?](#), Forbes
- [GMO ‘He Said/She Said’? Ethics debate intensifies over retraction of flawed Seralini rat study](#), Genetic Literacy Project