

Modern Agriculture Biotechnology

Modern biotechnology is perhaps the single most important innovation that's helping our farmers be the most productive and efficient producers in the world. It enables them to grow more crop using fewer costly inputs, while significantly improving agriculture's impact on the environment and helping cope with the biggest challenges we face from nature and from a growing world population .

What is agriculture biotechnology?

Modern agriculture biotechnology refers to genetic modification using recombinant DNA (rDNA) methods to bring together genetic material from multiple sources.

Genetic modification is not new in agriculture. Modern biotechnology is just the latest in a long progression aimed at improving plants and animals for the benefit of mankind, starting with domestication of crops and livestock and including selective breeding and more recent gene modification techniques. Today's biotechnology is actually more precise and better understood than other cruder yet less regulated methods from the past. Modern biotechnology simply expands the possible improvements that can be made and increases the efficiency and precision of those improvements.

The primary commercial biotech crops grown today are corn, soybeans and cotton, as well as other crops such as alfalfa, sugarbeets, canola, papaya, squash and sweet corn. ***In the U.S. over 50% of cropland and 90% of major export commodities are grown with seeds improved through modern biotechnology.***

How does the U.S. regulate biotech crops?

Agriculture products derived from modern biotechnology are the most thoroughly reviewed and strictly regulated in history. Since 1986, the U.S. has regulated plants improved through biotechnology under the Coordinated Framework for the Regulation of Biotechnology. Three federal agencies share regulatory responsibilities:

- The **U.S. Department of Agriculture** oversees the interstate movement and field-testing of biotech crops as “regulated articles” to protect the environment. Before any biotech crop is approved for commercial cultivation, a petition must be granted by USDA after a thorough Plant Pest Risk Assessment and Environmental Assessment.
- The **Environmental Protection Agency** is responsible for ensuring that insect-resistant biotech varieties do not pose any environmental risk and are safe to grow and consume.
- The **Food and Drug Administration** uses the same regulatory safeguards for food developed using biotech products as it does for all products in the marketplace.

The regulatory framework in the U.S. is grounded in science and ensures human and animal health and environmental safety are maintained through rigorous scientific risk analysis. An emphasis on safety and science preserves consumer confidence and maintains predictability in order to promote investment in research and development of new beneficial innovations.

One of the key principles of sound regulation of any technology is that the degree of regulation should be proportional to risk. In this respect, modern biotechnology is actually over-regulated relative to the environmental safety and health risks the technology pose.

State-by-state regulation of biotechnology could have serious economic consequences by dramatically reducing predictability and incentives for innovation, making farmers and businesses vulnerable to special interest, and putting the local agriculture economy at a serious competitive disadvantage.

Is agriculture biotechnology safe?

Yes!

The overwhelming scientific consensus on the safety of modern biotechnology is unequivocal. The U.S. government, the World Health Organization, the American Medical Association, and the National Academy of Science all agree that food derived from biotechnology is just as safe as, and in some cases safer than, any other food.

After reviewing decades of research spanning hundreds of studies, food safety authorities in the EU recently concluded that biotech foods are as safe. While Europe still applies a costly and unpredictable “precautionary principle” to the regulation of agriculture biotechnology, the region is moving toward more cultivation and consumption of biotech crops. The “precautionary principle” applied broadly would prevent farmers producing many beneficial agriculture products and prevent consumers from enjoying common products like yogurt and beer.

Biotech crops have been grown for nearly two decades without any—zero—evidence of health risks. Farmers and ranchers have been feeding literally billions of livestock biotech corn and soybeans without any health consequences. Studies that have purported to identify health or safety concerns have been widely discredited.

How does agriculture biotechnology improve the environment?

Farmers have adopted biotechnology primarily because new traits help them produce more per acre. However, *adoption of biotechnology has also enabled a shift in agronomic practices that is significantly reducing environmental impact and leading to improved soil, water and air quality.*

The use of herbicide tolerant crops has enabled a significant reduction in tillage requirements to control weeds and prepare soil for planting. *Conservation tillage methods help improve soil and water quality* by reducing erosion and compaction.

Insect resistant (Bt) crops have dramatically *improved pest management and reduced the use of insecticides*. Biotechnology has also enabled a shift to more targeted and effective use of relatively environmentally benign herbicides that are also less toxic.

By reducing the need for tillage and chemical applications, biotechnology is *reducing fuel consumption and associated greenhouse gas emissions*. Limiting soil disturbance also keeps greenhouse gases trapped in soil and organic matter

Simply put, *biotechnology allows farmers to grow more food on less land*. This reduces the demand on cropland and limits the environmental footprint needed to provide food, fiber, and energy for a growing population. Increasing agriculture productivity helps to leave the most environmentally sensitive land undisturbed.

Can biotech crops coexist with conventional and organic agriculture?

There is a long history of successful coexistence among farmers, particularly in seed production. The introduction of biotech crops does not present any new or novel risks.

The agriculture industry has developed a whole arsenal of *culture practices and stewardship measures that have proven effective and are easily adaptable to biotech crops*. Common stewardship practices that promote coexistence include: farmer to farmer communication; field selection and mapping; isolation distances; buffer rows; temporal isolation by staging planting times; removal of off-types and weeds; field inspections, including by third parties; rotational cropping; and, careful seed and grain handling practices.

For example, one of the world's largest canola producers and processors grows biotech canola on the same farm as organic canola. Within just 1-2 years, they virtually eliminated any risk of crosspollination or commingling by instituting simple stewardship measures and are able to export to biotech-sensitive markets.

Within production agriculture, it has long been a principle that the grower who derives value from a premium, differentiated crop accepts responsibility to implement the production practices necessary to preserve the integrity and value of that crop. *Undermining that principle threatens the dynamism of the industry and the future ability of farmers to choose diverse cropping systems and respond to consumer demand for high-value specialty crops*. For example, proposals for indemnity funds, mandatory stewardship measures, and cultivation bans can have the unintended consequence of eroding price premiums and profitability for farmers, threatening property rights, and eliminating market choice and opportunity.

USDA is currently implementing recommendations by the Advisory Committee on Biotechnology and 21st Century Agriculture to promote coexistence throughout the U.S. agriculture industry.

How are organic farmers protected from risk?

The National Organic Standards were carefully crafted as process-based standards to protect farmers. *The unintentional presence of biotech material through commingling or crosspollination does not cause a farmer to lose organic certification* if they are following their stewardship plan. In fact, USDA has confirmed that:

While the National Organic Program Regulation (7 CFR Part 205 et seq.) excludes the use of products resulting from genetic modifications, USDA-AMS does not consider inadvertent trace presence in itself to be a violation. NOP regulations do not require withdrawal of crops or land in the case of inadvertent GE contamination, but some producers have reportedly done so voluntarily.

There is also no significant evidence that growers are losing economic value or are unable to market their crops due to unintentional presence of biotechnology. When farmers do lose value it is because of private contracts they have signed to grow a crop using stewardship and testing requirements that go beyond the Organic Standard in exchange for a premium price.

There have been no cases of biotech companies suing growers for crosspollination or unintentional presence of biotech material in their crop. Lawsuits have only involved intentional, known violations of patent restrictions.

What are the labeling requirements for biotechnology?

FDA's longstanding policy on biotech food labeling states:

“FDA has no basis for concluding that bioengineered foods differ from other foods in any meaningful or uniform way, or that, as a class, foods developed by the new techniques present any or greater safety concern than foods developed by traditional plant breeding.”

Mandatory labels would mislead consumers about the safety of biotechnology, erode the credibility of FDA and discourage consumer acceptance of new, beneficial technologies. Similarly, state-by-state labeling requirements would further confuse consumers and create a labyrinth of costly requirements for food manufacturers.

There is no end to examples of information about production practices that could be labeled. As a result, many private, voluntary labeling initiatives have emerged to meet consumer demand. However, the federal government should reserve its authority to require labeling only when there is valid information about the composition of a product and science-based evidence on the safety or nutritional content of food.

Farmers and food manufacturers already have the ability to provide process-based information on food labels (for example: “GMO-free” and the National Organic Standard) when they determine it to be in their own marketing interest. ***Mandatory process-based labeling for biotech food eliminates this opportunity for innovative private marketing efforts to voluntarily label.***

Are there risks in animal biotechnology?

The same principles of science and safety apply to animal biotechnology. However, there are no animals improved through modern biotechnology that have been approved for commercial production or consumption.

Ongoing delays in the regulatory process and threats of state-by-state regulation could set a dangerous precedent by preventing commercialization of first generation of safe, beneficial products, such as salmon. Any efforts to undermine the federal regulatory framework for animal biotechnology can have serious and costly economic consequences by reducing future research and development in beneficial products that have the potential dramatically improve consumer health and safety.

Concerns about the commercialization of biotech-enhanced salmon should focus on actual environmental risks, not speculation. Many of the concerns about species risk, such as disease in salmon, is actually reduced within biotech varieties. In addition, the developers of biotech-enhanced salmon have proposed multiple safeguards to eliminate any risk of environmental release.