



# A Better Way of Doing Things

## Alternatives to Genetically Engineered Crops

Are there alternatives to genetically engineered crops? When it comes to protecting crops from pests—such as insects and weeds—farmers have many alternatives to the genetically engineered crops being grown today. But these alternatives are not products that farmers buy. Instead, they are alternative ways of growing our food and fiber, methods that together are often called sustainable agriculture.

Today's genetically engineered crops weren't designed to help small family farmers in the U.S. or the developing world. These crops belong to a system of agriculture that views the farm as a factory and farmers as contract labor, where the only goals are to increase yields and decrease costs of production—regardless of the costs to human health and the environment.

By contrast, sustainable agriculture is a system of farming that can produce high yields without destroying the environment and threatening our health. Farmers who use these methods rely on knowledge and experience to work in harmony with the environment, rather than relying on hazardous pesticides, synthetic fertilizers and genetically engineered crops. Sustainable agriculture looks at a farm as an “agroecosystem,” not as a factory.

### • Industrial agriculture and monocultures

Industrial agriculture is based on a system of monocultures—cultivation of one crop at a time in vast fields. While monocultures result in economies of scale that reduce production costs and prices in the market place, they also lead to increased vulnerability to insect pests and weeds and heavy reliance on synthetic fertilizers and pesticides. Genetically engineered crops were developed to fit into this system—to allow conventional farmers to continue growing monocultures and to allow pesticide companies (the corporations that are developing genetically engineered crops) to increase their profits.

### • Alternative agriculture and diversification

Farmers who use alternative methods rely on knowledge and techniques based on local conditions. They take advantage of natural processes and naturally occurring biological relationships, such as those between pests and predators. Perhaps most importantly, their farms are diversified. Instead of continuously planting corn or a corn-soybean rotation, for example, these farmers may grow corn, soybeans, wheat, oats, red clover, hay and adzuki beans—plus raise beef and/or milk cows.

Diversified farms tend to be more stable and resilient. Financial risk is reduced and, in general, they provide more protection from drought, pest infestations and other natural factors that might affect production.

### • The sustainable approach

Alternative farming practices are a range of technological and management options to reduce costs and enhance biological interactions and natural processes. Descriptions of some of these methods follow.

**Crop rotation:** Growing different crops in succession in the same field is one of the most common and successful techniques used in sustainable agriculture. Rotation can play an important role in pest management since growing different crops interrupts insects' life cycles and can help keep their numbers in check. Planting the same crop year after year provides insect pests with a steady food supply to support a growing population.

**Cover crops:** Farmers plant cover crops such as clover, alfalfa or vetch between cropping periods. These crops can prevent soil erosion, retain moisture, improve soil texture, suppress weeds and provide nitrogen (an important nutrient) for future crops. As a result, farmers using the right crops can reduce or eliminate the need for chemical fertilizers and hazardous pesticides.

**Increasing soil fertility:** In industrialized agriculture, soil is often “sterilized” to kill pests and pathogens, but beneficial microorganisms that play an important part in building and maintaining healthy soil are also killed in the process. Maintaining and improving soil quality is one of the most important factors to ensure the long-term sustainability of agriculture. Farmers need good soil to grow healthy plants that are less vulnerable to pests and that produce high yields. This can be accomplished in many ways including using animal manure, living plants (such as cover crops) or compost (plant debris) to build up the soil.

**Alternative weed control:** Rotary hoeing, increasing the density of the crop plants to crowd out weeds, intercropping, timing of planting to give crops a competitive advantage and transplanting seedling crop plants to give them a head start on weeds are some of the alternative methods used to control weeds.

**Natural pest predators:** Many birds, insects and spiders are natural predators of agricultural pests. Farmers can manage their farms so that they provide an attractive environment for these predators who can then play an important role in keeping pest populations in check.

• **What about yields?**

Many critics of organic and sustainable farming maintain that these methods would dramatically reduce the amount of food produced by U.S. farmers, resulting in higher prices and shortages. But research has found that even though only a small percentage of agriculture research dollars are spent on sustainable practices, yields can be comparable to those grown conventionally.

- **Corn** — A study comparing conventional and organic corn over 69 seasons found that yields on organic farms were 94% of conventional farms.
- **Soybeans** — Data from five states with 55 growing seasons of data showed that organic yields were 94% of conventional yields.
- **Wheat** — Research over 16 years showed that organic wheat produced 97% of the conventional yields.
- **Tomatoes** — At the University of California, researchers found no difference in yields between organic and conventional tomatoes after 14 years.

Sustainable agriculture offers a viable model of a locally based, socially just, environmentally and economically sustainable food system, without the use of hazardous pesticides and synthetic fertilizers. Of course, it's up to us to challenge the biotechnology and agriculture industries to realize this vision!

**Sources**

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*Regenerating Agriculture: Policies and Practice for Sustainability and Self-Reliance*, Jules N. Pretty, Earthscan, 1995.

*Techniques for Reducing Pesticide Use: Economic and Environmental Benefits*, David Pimentel, ed., Wiley, 1998.

“Get the Facts Straight: Organic Agriculture Yields Are Good,” *Organic Farming Research Foundation Information Bulletin*, Summer 2001.

**For more information:**

Pesticide Action Network North America Web site:  
<http://www.panna.org>

Organic Farming Research Foundation Web site:  
<http://www.ofrf.org>

Union of Concerned Scientists Web site: <http://www.ucsusa.org>

**Sustainable agriculture and organic farming**

Organic farming is a type of sustainable agriculture. Organic farms do not use toxic chemical pesticides or fertilizers or genetically engineered crops, and organic foods are minimally processed to maintain the integrity of the food without artificial ingredients, preservatives or irradiation.

Certified organic refers to crops that have been grown and processed according to strict standards and verified annually by independent state or private organizations. Certification includes inspecting and evaluating long term soil management, buffering between organic farms and neighboring conventional farms, product labeling and record keeping.

When you buy organic, you are not only supporting organic farmers, you're also buying food made without genetically engineered ingredients.



This fact sheet was prepared by Pesticide Action Network North America, September 2001.

Pesticide Action Network North America (PAN North America) advocates adoption of ecologically sound practices in place of hazardous pesticides and genetically engineered crops. PAN North America has over 100 affiliated groups in Canada, Mexico and the U.S., providing technical support and participating in joint projects with partner non-governmental organizations in Africa, Asia and the Americas. For more information visit <http://www.panna.org>.

PAN North America is one of the founding members of the **Genetically Engineered Food Alert Campaign**. Genetically Engineered Food Alert is a coalition of organizations concerned with the protection of consumers rights, public health and the environment. In an effort to better educate the public, Genetically Engineered Food Alert has launched a nationwide campaign about the risks associated with genetically engineered foods. For more information visit <http://www.gefoodalert.org>.

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