


Problem Solving

The Pros and Cons of Gene Modification

Farmers use many different chemicals to kill insects and weeds that threaten their crops. Chemicals are a concern to many consumers because they can contaminate soil and water. Some have been found to cause cancer. Some experts claim that the disadvantages of pesticides are overemphasized. Still, scientists search for ways to avoid chemical pesticides.

Biotechnology

One alternative to using pesticides is biotechnology. Biotechnology is a collection of scientific techniques used to create or improve plants, animals, and microorganisms.

In Colorado, the potato beetle had plagued potato crops for years. The beetles would eat an entire field of crops, leaving nothing but stems. Rather than using chemical pesticides, researchers invented a “smarter” potato. They inserted a gene that changed the DNA of the potato. It worked as an organic pesticide. Now the potato plant contains a biopesticide that is deadly to the beetle.

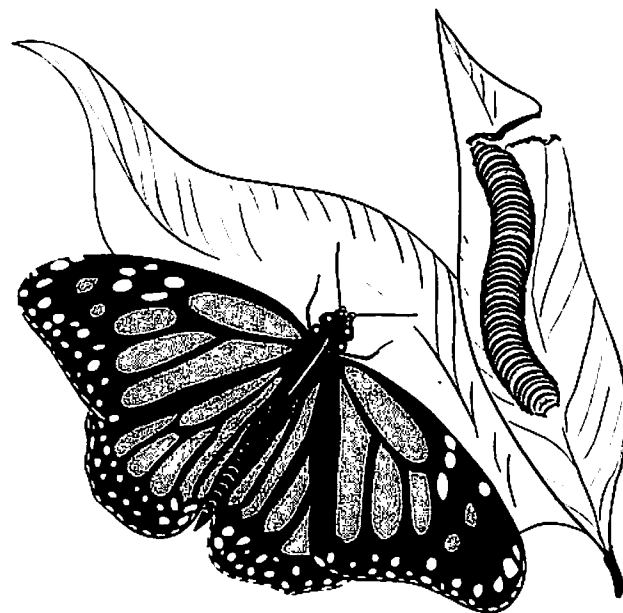
Altering the DNA of a plant is called genetic modification. Approximately 18 million hectares of American farmland are planted with genetically modified (GM) crops. This technology is being studied for use in areas of Asia, Latin America, and Africa where hunger and malnutrition are epidemic.

Researchers have developed a new rice that contains iron and vitamin A and a genetically altered sweet potato that resists a harvest-destroying virus. There is hope that these and other crops can be planted to help prevent malnutrition and starvation.

Untested Waters

Despite the promise of GM plants, some people fear the results. One concern is that genes of GM plants might cross-fertilize with wild plants and create “super weeds.” These super weeds could become resistant to certain herbicides. Some fear that mutant bugs might result if pests become resistant to the toxic effects of GM crops.

Other concerns are for human safety. Opponents call GM crops “Frankenfood.” They fear that illnesses could result from eating these plants. The greatest human health concern is allergies that might result from GM plants. Testing can be performed for known allergens, but new allergens might be created when genes in plants are altered.



A scientific study found that pollen from one variety of GM corn might kill the caterpillar *Danaus plexippus*, which becomes the monarch butterfly.

Applying Problem Solving Skills

1. What are the major problems connected with chemical pesticides?
2. Why do some people anticipate problems with genetic modification?
3. Which type of pesticides—chemical or genetically modified—would you prefer to have used on foods you eat? Why?
4. Do you think the government should regulate genetic modification? Explain.