Agriculture and Weed Resistance

Weeds are the second most significant agricultural problem, second only to soil erosion. The fact is growers must control weeds or they will suffer crop loss.

Growers can control weeds by using clean equipment and clean seeds, mulching with cover crops, mowing, tilling, cultivating, rotating crops, and applying herbicides. Whenever farmers use the same weed control methods repeatedly, some pests may develop resistance.

The environmental challenges of weed resistance are the same for biotech crops and conventional crops if farmers do not use herbicides as directed. Because U.S. growers have been using herbicides for almost 60 years, they have been dealing with the challenge of weed resistance to herbicides for almost 50 years – long before the development of biotech crop varieties.

**Best Practices Are Key to Controlling Resistance**

Good stewardship practices provide guidance for farmers to help them manage, delay or prevent the spread of weed resistance.

Diversified weed management programs are necessary, and over-reliance on a single herbicide as the sole means of weed control should be avoided. Growers should use multiple herbicides to manage weeds within a crop and/or across a crop rotation.

With biotechnology, genes for resistance to different types of herbicides can be inserted into one crop variety. Not only does this capability increase the number of weed control options available to farmers, it also can delay the development of resistance to a single herbicide, and gives growers more flexibility.

In addition, cultural practices such as pre-plant tillage, in-crop tillage, cover crops or other methods may be used.

**Biotech Crops Lessen the Need for Herbicide Use**

Biotechnology has helped dramatically reduce farmers’ reliance on pesticide applications.

Biotech crop varieties allow growers to control weeds with single, broad spectrum compounds that are more benign and have a lessened impact on the environment.


- One of the key environmental benefits of biotech crops is the reduction in insecticide applications and herbicide applications with these crops. In countries where biotech crops have been planted, pesticide use on four biotech crops – soybeans, corn, cotton, and canola – has fallen by 791 million pounds (8.8 percent). This has resulted in a 17.2 percent reduction in the associated environmental impact.

- Biotechnology has made possible pest control measures that more precisely target specific problem pests while dramatically reducing impacts on non-target species.
No-Till Agriculture
The new herbicide tolerant biotech crops have facilitated the use of no- and reduced tillage systems, which saves billions of tons of topsoil, improves water quality, and conserves fuel.

Farmer Benefits From Biotechnology
The modern farmer is a savvy business person, and adoption rates for biotech seed varieties continue to climb domestically and internationally.

- A National Research Council report acknowledges the environmental, economic, and potential social benefits of Genetically Engineered (GE) crops to U.S. agriculture. The report notes that: “GE crop technology has produced substantial net environmental and economic benefits to U.S. farmers growing soybeans, corn and cotton over using non-GE varieties in conventional production systems.”

- American farmers have adopted genetically engineered (GE) crops widely since their introduction in 1996, especially corn, cotton and soybean varieties. As of July 1, 2010:
  - Adoption of GE soybeans is **93 percent**.
  - Adoption of all GE cotton climbed to **93 percent**.
  - Adoption of all biotech corn is at **86 percent**.

- A record 14 million farmers in 25 countries are using biotech crops today, and this trend continues to grow. Ninety percent (13 million) of these are resource-poor farmers in developing countries.
  (*International Service for the Acquisition of Agri-biotech Applications*)

FOR MORE INFORMATION:
- Healing, Fueling, Feeding: How Biotechnology is Enriching Your Life ([www.valueofbiotech.com](http://www.valueofbiotech.com))
- PG Economics Ltd., UK.
- *International Service for the Acquisition of Agri-biotech Applications*
- *Bayer CropScience launches weed resistance initiative*, July 15, 2010
- Information on Monsanto’s comprehensive resistance management stewardship, including specific recommendations for growers: [http://www.weedresistancemanagement.com/stewardship.html](http://www.weedresistancemanagement.com/stewardship.html)
- Crop Life America: *Benefits of Pesticides and Crop Protection Chemicals*
- International Survey of Herbicide-Resistant Weeds: [www.weedscience.com](http://www.weedscience.com)
- Weed Science Society of America: [www.wssa.net](http://www.wssa.net)
- Helpful resources for farmers: [http://www.weedresistancemanagement.com](http://www.weedresistancemanagement.com) and [http://weedtool.com](http://weedtool.com).