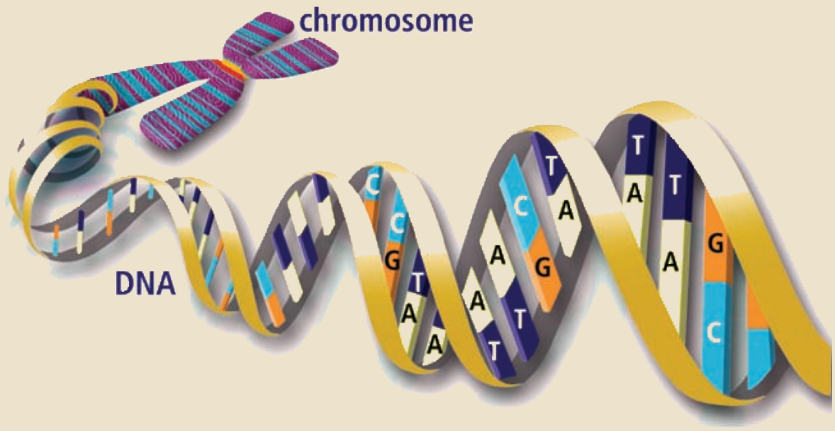
Biotech Soybeans

Exploring the soybean genome to discover what's possible.



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Modifying the soybean genome is not easy but is the surest way to improve resistance to diseases and pests.

Producers familiar with the way biotechnology has enabled the stabilization of corn yield wonder aloud why soybean yield continues to vary greatly. Why has the soybean industry not had further advancements similar to the development of Roundup Ready™ technology? What can farmers anticipate from biotechnology and why is it important?

"Biotechnology is the best way to seriously improve and stabilize soybean yield, but it is not easily done," says David Wright, Iowa Soybean Association (ISA) director of contract research. "Soybeans are not as easy to transform genetically as corn is, but that hasn't stopped researchers from working on behalf of soybean producers."

Soybeans with resistance to herbicides other than glyphosate (the active ingredient in Roundup herbicide) are currently being developed. In the future, soybean producers will have a choice between Roundup Ready™ soybeans, Liberty Link™ soybeans and those with resistance to Roundup and dicamba. This will provide two modes of action and can stop the development of weeds resistant to glyphosate, as well as provide an alternative where resistance has already developed.

Crop biotechnology has been the most rapidly adopted agricultural technology in history. In the United States, 90 percent of the soybean crop, 85 percent of cotton and 50 percent of field corn are now bio-engineered, known as genetically modified organisms (GMOs). Worldwide, 60 percent of soybeans and 28 percent of cotton are GMO varieties. Across the globe, experts expect to see a marked increase in corn and canola GMO varieties in the next few years, which currently make up 14 and 18 percent of those crops, respectively.

Developing nations, including China, India and Mexico, are now using GMO varieties in nearly 40 percent of their acreage. With further dramatic growth of GMO use predicted in these countries, the use of GMOs worldwide is projected to grow at a much faster rate in the next five to 10 years than in the United States. In China, for instance, hundreds of new biotech companies have recently emerged.

According to Walt Fehr, a professor at Iowa State University, scientists are hard at work using biotech tools to discover resistance to major yield-robbing pests such as bean leaf beetles, soybean aphids, soybean cyst nematodes, soybean viruses, Phytophthora root and stem rot and Asian soybean rust. "As new problems develop in soybean production, biotechnology is being asked to provide solutions," he says.

"Gene mapping using molecular markers to identify genes that will improve the plants resistance to disease and insects will likely be the most widely used technology in soybeans," says Tom Clemente, a researcher at the University of Nebraska. "Impacting yield directly will be difficult, even with biotechnology."

As producers see advancements in the development of GMO soybean varieties, they will also have more opportunities to market them. In October of 2007, in some softening of its stance, the European Union allowed several GMO products into its countries, though at this point they can only be grown for export and for livestock feed. Also, as biodiesel and ethanol plants have sprouted up in the United States, farmers are seeing increased opportunities to enjoy the benefits of biotech traits approved for use in the United States, but not approved for export.

As soybean growers take advantage of new biotechnology traits, channeling of grain to approved locations will need to become part of every producer's risk-management plan. Biotechnology is too important to the profitability of the soybean producer to slow down on research and development of new traits.

"Soybean producers need the security and yield stability that biotechnology can produce," says Delbert Christensen, ISA director and soybean producer from Audubon, Iowa. "Without new biotechnology-based insect and weed control traits, producer profitability from growing soybeans will be at risk."