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Factsheet

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USDA Coexistence Factsheets
Biotech Farming

Coexistence, as defined by the AC21 report, is the concurrent cultivation of conventional, organic, identity preserved (IP), and genetically engineered crops consistent with underlying consumer preferences and farmer choices. In other words, it is the existence of different types of production at the same time and in the same area. Market demands on U.S.-grown crops are increasing, and it will take products from the organic, conventional and biotechnology sectors to meet those demands. Understanding the differences and challenges of each sector, recognizing opportunities for growth in each sector, and understanding how one sector impacts the other two, will be critical as the agriculture industry continues to expand.

Biotech Farming Defined
Farmers using seed that has been developed using the techniques of modern biotechnology are considered to be using biotech farming. These farmers (as well as those planting conventional seed) also use tools such as pesticides and fertilizers to maximize the potential of their seed variety. Biotech seeds are also referred to as genetically engineered (GE) seeds. As with other types of farming systems, farmers who plant biotech seeds are committed to promoting ecological balance and efficient use of resources to limit their impact on the environment.

The Science Behind Biotech
Biotech plants are developed through a process where a specific gene or section of genetic material of one organism – a specific characteristic that is desired – is placed into another plant. Desired characteristics range from genes that offer insect resistance or drought resistance to genes that can improve the ripening process.

Before biotechnology was introduced, farmers changed the genetic makeup of seeds through selective breeding and, as recent as the 1940s, mutagenesis (induction of genetic mutations, amplifying a process that occurs naturally). However, when biotechnology was introduced into plant breeding in the 1990s, scientists added a more precise and targeted technique for the introduction of desirable characteristics into crops. Biotechnology is an extremely precise scientific tool for plant breeding. It allows scientists to change one characteristic without changing the rest of a plant's genetic makeup. Today's biotechnology tools provide a faster way to develop new seed varieties with different desired characteristics.

As specified by the Plant Protection Act, USDA's role is to make sure new biotech crops do not pose a plant pest risk – such as causing disease, or damage – to crops, plant products, or other plants in the United States. As new biotech crops are developed, we regulate their field-testing through rigorous permit and notification procedures that protect the health of surrounding crops

and plants. Additionally, the Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) evaluate biotech crops for both consumer and environmental safety. Nearly 2,400 studies have been conducted on the safety of biotech crops, both by industry experts and independent organizations. The overwhelming conclusion from the numerous studies is that biotech crops do not pose any more risks than conventional crops.

The Markets for Biotech Crops

Biotech crops have been widely adopted by farmers since their introduction in 1996. In 2013, 96 percent of all cotton, 94 percent of all soybeans, and 93 percent of all corn planted in the United States was biotech. In addition, biotech alfalfa and sugar beet are also widely planted. Across all crops in the United States, more than 173 million acres were planted with biotech seeds in 2013. With precise gene characteristics targeted, manufacturers of biotech seeds have the ability to develop plants that are more resistant to pests, disease, herbicides, and severe environmental factors like drought. The introduction of biotech seeds has also contributed to a decrease in pesticides applied to crop fields around the country.

More than half of alfalfa, corn, and soybean crops are used for animal feed or fuel production, and portions of the cotton and sugar beet crops are as well. For instance, in 2013, 48 percent of the U.S. corn crop was used to create animal feed, and 30 percent was used in ethanol production. Meanwhile, just 4 percent of the U.S. corn crop was used for high-fructose corn syrup, 2 percent for sweeteners, and just 1.5 percent for cereal. Other major uses for biotech crops include production of sugar and sweeteners (from biotech sugar beets), canola oil (from biotech canola) and textiles (from biotech cotton).

Some biotech products are sold for very specific end markets, requiring farmers to preserve the identity of the seed from planting to end market. This type of system is called identity preservation (IP) and is a useful tool to ensure market requirements are met in the field. While a majority of IP products are conventionally derived from seed, some biotech products fall within this category.

Coexistence: What it Means for Biotech Farmers

The sheer number of acres planted in biotech crops can create a challenge for organic or conventional farmers, as well as a marketing opportunity. Their marketing contracts and prices often depend on the ability to keep foreign matter from commingling their harvests. Farmers growing biotech seed can refer to their commodity’s best production practice guidelines as a roadmap to limit the risk of commingling for neighboring farmers.

Additionally, coexistence is necessary to help all farmers make the right choices for their farms and markets when it comes to seed varieties and production practices. These choices are necessary to provide a wide range of products to a global marketplace.

The rapid adoption of biotechnology by both farmers and end-use markets has helped create a strong foundation for agricultural production. The use of biotech crops has also benefited organic and conventional farmers, particularly as it relates to insect resistance. If a biotech farmer plants an insect-resistant variety of seed, neighboring organic and conventional farms may see reduced number of insects as well, due to the limited availability of host plants in the area.

Future Opportunities for Biotech Farming

Biotechnology science affords the potential to genetically alter plants to increase yields. With the limited number of tillable acres available to farmers, increasing yields is critical to meeting growing global demands. As the global population boom continues, and more developing countries increase their demand for affordable protein, the livestock feed market will remain a strong market for biotech crops. Alternative fuel markets are also considered a bright future for biotech crops.

In terms of human food consumption, biotech crops will continue to provide an affordable source of safe and nutritious food to people everywhere. The science also offers the possibility of enabling people to consume certain foods they were unable to consume before. For example, using the tools of biotechnology, the protein in peanuts that cause allergic reactions in humans may be removed from the peanuts. Likewise, providing much-needed nutritional characteristics in commonly eaten foods, like Golden Rice, can help improve the health of the people in developing countries.