



Factsheet

USDA Coexistence Fact Sheets Cotton

Growing Cotton in the United States

In 2013, about 10.4 million acres of cotton were planted, down from nearly 15 million acres of cotton planted in 2011. Cotton farmers in the United States have the choice of growing biotech, conventional or organic seeds, depending on their production systems or direct end-use markets they have access to. Of those 10.4 million acres planted, 90 percent (or more than 9.3 million acres) of the seeds were biotech. In 2011, 12,030 acres of organic cotton were planted, comprising 0.08 percent of the cotton crop that year.

In 2014, the cotton industry had more biotech seeds planted than any other crop, with 96 percent of the acres planted as biotech.

The Global Markets for Cotton

Annually, cotton farmers harvest about 15 million bales of cotton, or about 7.3 billion pounds. Most of the crop – about 75 percent – is used for apparel, while 18 percent is used for home furnishings and 7 percent is used for industrial products.

Aside from the cotton fibers produced from the cotton plants, cottonseed is also a useful product of the crop. More than 6 billion pounds of cottonseed and cottonseed meal are used in livestock feed, and more than 90 million gallons of cottonseed oil are used for human food products, such as salad dressing or margarine.

The export market is significant for the cotton industry, with more than 12 million bales of cotton exported, as well as 3.5 million bale equivalents of cotton textile products annually.

Consumer demand is driving the market for organic cotton higher. In fact, the organic fiber market grew by 17.1 percent in 2011, reaching a value of \$708 million. Farmers growing organic cotton are receiving premium prices for their product.

Challenges for Cotton Farmers

Cotton is a natural host for a variety of insects, including moths, stink bugs and aphids. Annually, these pests can cause severe damage to cotton crops. With the introduction of biotech cotton, certain varieties of cotton are genetically engineered to resist some of the moth pests. This is accomplished by inserting a naturally occurring gene from *Bacillus thuringiensis* (Bt) into the genetic code of cotton seeds. Bt cotton produces a protein that is poisonous to cotton moths, and helps farmers reduce their dependence on pesticides. Organic cotton farmers also control moths by spraying Bt onto organic fields.

While Bt is an effective tool to minimize damage from cotton moths, it must be managed properly to reduce the development of Bt resistant pests. Planting refuge, or a block or strip of plants that do not contain the Bt gene, provides a safe haven for Bt-sensitive insects, reducing the likelihood of developing resistant insects. This helps ensure that Bt varieties and Bt spray will be effective for biotech and organic farmers, respectively.

For organic or conventional cotton farmers, standards and/or contract requirements do not allow the use of biotech seeds. Therefore, these cotton farmers must rely on other pest control systems, such as:

- *Crop rotation.* Rotating crops annually establishes a natural balance that minimizes large pest infestations that can grow each year.
- *Natural enemies.* Pests that infest cotton fields have natural predators, such as birds, ladybugs, beetles or spiders. They may not rid the fields of pests, but they will help keep pests at a tolerable level.
- *Trap crops.* Some cotton pests prefer other crops, like corn, sunflower, sorghum or okra. Growing these crops along with cotton can help spare the cotton fields as the pests infest the trap crops.
- *Natural pesticides.* If pest populations reach intolerable levels, organic and conventional cotton farmers may choose to use natural pesticides that are allowed by their program standards and/or contracts. These pesticides may include Bt sprays, neem spray, pyrethrum, or a combination of extracts from plants like castor, thorn apple, ginger, marigold, and others.
- *Synthetic Pesticides.* Unless disallowed by contract, growers of conventional crops may control cottons pest using a variety of chemical pesticides on the market and labeled for use in cotton.

Cotton farmers closely manage weeds in their cotton fields. While cotton farmers may benefit from choosing herbicide resistant varieties, thereby allowing them to spray herbicides on their fields to control weeds, organic cotton farmers must use non-synthetic herbicides, or resort to alternative practices like hand-weeding and flame-weeding.

Cotton crops grow stronger and result in better yields with proper nutrition, making soil fertility a key priority for all cotton farmers. Biotech and conventional cotton farmers often rely on fertilizers, applying a mix of needed nutrients to their fields. These can be in the form of dry, granular fertilizers applied directly to the soil or liquid fertilizers that are sprayed onto the field. Organic cotton farmers, however, most often use natural materials to increase the soil fertility. They focus on the organic matter in the soil, or plant and animal residue, which helps keep the soil moist and retain essential nutrients that are naturally occurring in the soil. The most important source of organic material for organic and conventional cotton farmers is the residue of the crops grown on the field itself, like leaves, stalks and remaining roots. Compost and manure can also be applied to help increase the organic matter in the soil.

Organic and conventional cotton farmers must also manage the risk of commingling of their crop by biotech seed. Biotech commingling can occur from impure seed, mixing of seed, pollen drift,

volunteer plants, equipment or transport vehicle residue. To manage the risk effectively and ensure coexistence among cotton farmers, all farmers should follow best practices.

Best Practices for Coexistence Among Cotton Farmers

Biotech farmers can support and assist neighboring farmers who are growing organic and/or conventional cotton by following these guidelines:

- Follow refuge regulations if planting Bt cotton varieties. Bt is an effective tool to minimize damage from pests, but must be managed properly to reduce the development of Bt resistant pests. If those resistant pests begin to emerge, the Bt varieties will be less effective, as will the Bt spray organic farmers use to control these pests. Refuge is a block or strip of crops that do not contain the Bt gene, making those plants a safe haven for insects lacking Bt resistance and reducing the likelihood that resistant insects will be selected by Bt use.
- Establish good communication with neighboring farmers, and know where organic or conventional crops are planted in your area
- Coordinate planting dates with neighbors to minimize pollen drift at critical times
- Spray pesticides, herbicides and fertilizers in correct weather conditions to avoid drift
- Clean equipment regularly
- Keep good records to ensure correct best management practices were taken

Organic and conventional farmers can follow the guidelines below to minimize the risk of commingling by biotech seeds:

- Verify seeds are non-biotech from supplier(s)
- Establish good communication with neighboring farmers
- Know which neighbors are planting biotech cotton, and in which fields and consider discussing with neighbors in advance challenges that may arise and ways these could be addressed
- Post fields as organic or conventional (identity preserved or specialty)
- Set up physical barriers by isolating fields with wind breaks or by distance
- Coordinate planting with biotech neighbors to offset pollen drift
- Keep harvesting and hauling vehicles clean, or segregate to keep commingling risk low
- Keep equipment, storage facilities and transportation units clean, or segregate
- Keep good records
- Save samples of seed, harvest crop and delivered crop
- Know biotech tolerances, if any, written into contracts