

BACKGROUND INFO-- Page Menu --From the field to Your Closet -- Cotton and the Environment -- Pesticides  
 Pesticides and Human Health -- Pesticides and the environment--Genetically Engineered Cotton -- Bt Cotton --  
 Herbicide Tolerant Cotton  
 Cotton is Food -- Sustainable & Organic Cotton Production--Organic Cotton Farmers -- Sweatshops & Clothing  
 Production

#### Introduction

Cotton, which is **native to Southern Africa and South America, is grown on over 90 million acres in more than 80** countries worldwide. The millions of tons of cotton produced each year account for 50% of the world's fiber needs (wool, silk and flax together account for 10%) and is **widely used as livestock feed and in food products such** as salad dressing and crackers. **The United States is the second largest cotton producer in the world after China.** In 1997, approximately 19 million bales (**enough to make 9 billion T-shirts**) were grown in 18 states.

#### From the field to Your Closet

Cotton grows on seeds that develop from the flowers of cotton plants. **The Cotton fiber and seed grow in a capsule called a boll**, which opens when the cotton plant is mature. After cotton is harvested, the seed cotton is then taken to a gin, where the fiber is removed from seed. **The fiber is then packaged into bales weighing almost 500lbs and the seed is used in processed foods and fed to livestock.** A sample of cotton fiber from each bale is tested for strength, length and color. Cotton spinning mills buy the cotton bales based on these qualities, and then process the fiber into spun yarn. Then a textile mill will process the yarn into woven or knitted fabric. Finally the fabric will be cut and sewn into the final garment. Cotton may be dyed at the fiber stage, the yarn stage, the fabric stage, or the final garment stage.

Despite cotton's image as being a natural and pure fiber, conventional cotton farming takes an enormous toll on the air, water, soil and people who live in cotton growing areas. **In the United States, 1/3 Pound of agricultural chemicals are typically used in the production of a single cotton T-shirt.**

The growth of Industrial agriculture and consolidation in the seed industry has replaced hundreds of cotton varieties with only a handful. **The practice of planting thousands of acres all of the same variety is known as monoculture and has left the crop extremely vulnerable to pests and diseases and forced cotton farmers onto what is known as the "chemical treadmill."**

**Just 2.4% of the world's arable land is planted with cotton yet it accounts for 24% of the world's insecticide market and 11% of sale of global pesticides, making it the most pesticide-intensive crop grown on the planet. \$2.6 Billion worth of pesticides are used on cotton worldwide each year.** The pesticides used by farmers not only kill cotton pests but also decimate populations of beneficial insects such as ladybugs and parasitic wasps. Because their natural enemies have been eradicated, these target insects, which were once only minor nuisances for farmers, become greater problems and ever-increasing quantities of toxic chemicals must be sprayed to keep them in check. Farmers then become stuck on what is known as the 'pesticide treadmill'.

Pesticides not only disrupt the balance of nature in the field, but also harm people who come in contact with them.  
 Pesticides and Human Health

\* **In California, five of the top nine pesticides used on cotton are cancer-causing chemicals (cyanazine, dicofol, naled, propargite and trifluralin).**

\* In Egypt, more than 50% of cotton workers in the 1990s suffered symptoms of chronic pesticide poisoning, including neurological and vision disorders.

\* In India, 91% of male cotton workers exposed to pesticides eight hours or more per day experienced some type of health disorder, including chromosomal aberrations, cell death and cell cycle delay.

\* **In the US, a 1987 National Cancer Institute Study found a nearly seven-fold higher risk of leukemia for children whose parents used pesticides in their homes or gardens.**

\* The World Health Organization estimates that at least three million people are poisoned by pesticides every year and 20-40,000 more are killed.

\* **Over 1 million Americans will learn they have some form of cancer and 10,400 people in the U.S. die each year from cancer related to pesticides:**

Pesticides and the environment

The pesticides and synthetic fertilizers used on cotton routinely contaminate groundwater, surface water and pollute the water we drink. Fish, birds and other wildlife are also affected by the movement of these chemicals through the ecosystem.

\* In 1995, pesticide-contaminated runoff from cotton fields in Alabama killed 240,000 fish.

\* **It is estimated that pesticides unintentionally kill 67 million birds each year.**

\* **14 million people in the U.S. are routinely drinking water contaminated with carcinogenic herbicides and 90 percent of municipal water treatment facilities lack equipment to remove these chemicals.**

Genetically Engineered Frankencotton

In the year 2000, over 13 million acres of GE cotton were grown in the United States and a handful of other countries around the world. **Two types of GE cotton are currently on the market: Bt cotton which produces its own pest killing toxin and herbicide tolerant cotton which has been engineered to survive being sprayed by herbicides. Some plants have also been engineered to have both of these traits.**

Bt Cotton

**Bacillus Thuringiensis (Bt) is a naturally occurring soil bacterium, which has been used safely for decades by both conventional and organic farmers. When certain insects consume Bt they stop feeding and will perish within a few days. Farmers have always used Bt sparingly and usually as a last resort knowing that frequent use would lead to insect resistance and the loss of an important pest control tool. Monsanto's Bt cotton has been engineered to produce the Bt toxin in every cell of the plant including the roots.** In GE cotton fields insects are continually exposed to Bt and scientists predict that within a few years they will become resistant to Bt. When this happens conventional farmers will return to using highly toxic herbicides. Furthermore, many scientists are also concerned that Bt crops could transfer the Bt gene to wild relatives of cotton. Ecologists have no way to predict the problems that such a transfer could cause for these ecosystems.

\* **In 1999 researchers at Cornell University found that pollen from Bt corn was poisonous to monarch butterflies.** Studies have also shown similar effects on other beneficial insects such as lacewings and ladybugs.

\* **In the Indian state of Karnataka, thousands of farmers have uprooted and burned illegally planted genetically engineered cotton as part of a campaign known as 'Operation Cremate Monsanto'**

**Herbicide Tolerant Cotton** >> [A second type of genetically altered cotton]

Herbicide tolerant cotton has been genetically engineered to withstand a toxic weed killer, which would kill a normal cotton plant. Two types of herbicide tolerant cotton are currently on the market: **BXN cotton** (tolerant to the herbicide bromoxynil, also known as **Buctril, manufactured by Aventis**) and **Roundup Ready** (tolerant to **glyphosate manufactured by Monsanto**). **Although the biotech industry claims that these crops reduce chemical use, numerous studies have shown that they result in even greater quantities of toxic herbicides being sprayed on crops.** The US Environmental Protection Agency (EPA) has concluded that bromoxynil is a possible human carcinogen and has classified it as a developmental toxicant. **Roundup (glyphosate) is acutely toxic to animals and humans and is the third most commonly cause of pesticide illness among agricultural workers in California.**

\* In 1997, farmers growing Roundup Ready cotton noticed that some of the cotton bolls began to fall off the plants three quarters of the way through the growing season. Monsanto has offered to reimburse farmers in Mississippi, Arkansas, Tennessee and Louisiana as a result of the crop failures.

\* **A study by agricultural economist Charles Benbrook has shown that herbicide tolerant crops have led to an extra 20 million pounds of herbicide use per year in the US.**

### **Cotton is Food!!!**

Cotton is comprised of **40% fiber and 60% seed** by weight. Once separated in the gin, the fibers go to textile mills, while the seed and various ginning by-products are used for **animal feed and human food. The pesticide residues from these cottonseeds concentrate in the fatty tissues of these animals, and end up in meat and dairy products.** Cottonseed, which is rich in oil and high in protein, is also a common ingredient in cookies, potato chips, salad dressings, baked goods, and other processed foods. Herbicide-resistant or Bt-spliced genetically engineered cotton plants—and their oil and seed derivatives—**also contain foreign proteins, bacteria, viral promoters, and antibiotic resistant genes; food ingredients which humans have never eaten before.**

\* **Milk and beef cattle eat about 6 to 8 pounds of cottonseed per day.**

\* In 1994, Australian beef was contaminated with the insecticide chlorfluazaron as a result of cows being fed contaminated straw. **The following year scientists discovered that newborn calves also have high levels of the insecticide, which had been passed on from their mother's milk.**

\* In California, it is illegal to feed the leaves, stems and short fibers of cotton plants known as "gin trash" to livestock because levels of pesticide residues are so high.

### Sustainable and Organic Cotton Production

Working with rather than against nature is the guiding principle behind organic farming. Organic farmers use biologically-based rather than chemically dependent growing systems to raise crops. While many conventional farmers are reacting to the ecological disorder created by monocultures, organic farmers focus on preventing problems before they occur.

#### A cotton farmer in Cameroon

Conventional farmers using toxic chemicals have found themselves embroiled in an endless battle with crop pests. **Over 500 species of insects, 180 weeds and 150 fungi have developed resistance to the chemicals used to kill them off.** Agbiotech companies continually develop new products to keep up with this resistance and keep farmers on the 'chemical treadmill'. **By focusing on managing rather than completely eliminating troublesome weeds and insects, organic farmers are able to maintain ecological balance and protect the environment.** Organic cotton is now being grown in more than 18 countries worldwide. In the United States, approximately 10,000 acres of organic cotton were planted in 1998 in the Mid-South, Texas and California.

## How do they do it? -- Organic Cotton Farmers

The soil: Organic Farming starts with a healthy soil. **The soil is seen as a living system and not simply a growing medium for plants. Compost, efficient nutrient recycling, frequent crop rotations and cover crops replace synthetic fertilizers to keep the soil healthy and productive.**

**Weed Control:** Organic Farmers have **many options** to control weeds including: mechanical weeding implements, such as hoes and flame weeders, crop rotations, planting several crops together (intercropping), more efficient use of irrigation water, the use of mulches and by even adjusting the planting dates and densities of their crops.

Pest Control: By encouraging biological diversity, farmers create conditions, which reduce the likelihood of any insect, bird or mammal doing any major damage to their crop. To control pests organic farmers may use: beneficial predator insects, crop rotations, intercropping, and as a last resort biological pesticides like **Bt and neem oil**.

**\* In Peru, cotton farmers have saved over \$100 per acre in pesticide and fertilizer costs by switching over to organic production.**

**\* In Tanzania organic cotton farmers plant sunflowers to encourage beneficial ants that feed on the larvae of the bollworm, and fertilize the soil with manure from their cattle.**

**\* In India, organic farmers intercrop cotton with pigeon peas and make insecticidal sprays from garlic, chili and the neem tree.**

**\* In California, organic cotton farmers plant habitat strips of vegetation such as alfalfa near their fields as a refuge for beneficial insects.**

### Sweatshops and Clothing Production

Sweatshop apparel, clothing and shoes produced in the United States and the global South under sub-standard labor and environmental conditions, is so all-pervasive as to be almost invisible. The availability of cheap, almost throwaway clothes that change with each fashion season has become deeply embedded in our culture and yet there is a face behind the \$150 pair of Nike sneakers or the Kathie Lee blouse. Since it's now considered "too expensive" to pay a living wage and protect the environment, US, European, and Japanese textile and clothing manufacturers, have, for the most part, closed down production and moved to "outsource" their production overseas, preferably in the lowest-wage countries like Viet-Nam or China. Since women and children are the easiest to exploit, they are the preferred workers in these sweatshops. Rights of free speech, free association, and the right to form a trade union are routinely repressed. **Water pollution, air pollution, social dislocation, economic exploitation-- these are merely the "externalities" of the global marketplace.**

Maquiladora worker in El Salvador

**\* A United Nations study in 1997 found that in 80% of developing countries, manufacturing wages are now lower than they were in the 1970s and early 80s.**

**\* Hourly wages paid by clothing giants such as Wal-Mart, Ralph Lauren, Ann Taylor, Esprit, Liz Claiborne, Kmart, Nike, Adidas, J.C. Penney and others in China's "special economic zones," are as low as 13 cents an hour, well below the estimated 87 cents an hour minimum living wage for an assembly-line worker in China.**

**\* More than 200 American textile mills have closed since 1998.**