



Pesticide, Fertilizer, and Genetic Modification Use in Conventional Cotton in the U.S. and Globally

THE CASE FOR ORGANIC



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Cotton is one of the most widely grown crops in the world— produced for apparel, textiles, home and hygiene products, and even foods made with cottonseed oil. Since conventionally grown cotton is also one of the most chemically intensive crops to produce, organic cotton production can make a big difference in protecting the environment and preventing exposure to toxic chemicals.

This report offers a detailed roundup of science and data that highlights the amount of, and concerns around, chemicals used in conventional cotton production globally and in the United States (U.S.). It builds on The Organic Center's 2020 report "*Organic Cotton: One of the most important choices you can make for the environment,*" which dives deep into the benefits of organic cotton production.

Cotton is grown in more than 50 countries around the world, with the U.S. being the third largest producer. Much of the cotton in today's textiles is dependent on the extensive use of synthetic pesticides and fertilizers and genetically modified seeds.

For those interested in what cotton's chemical landscape looks like around the world—and in the U.S., in particular—this report offers important insights and makes a case for change, providing information on which brands can base decisions regarding how to make their supply chains more sustainable. The authors of this report provide a case study of U.S. production given that to our knowledge it is the only country with readily available, detailed, and public data on pesticide use on cotton crops. We acknowledge different practices exist in different countries and hope this case study can serve to form the basis of studies elsewhere.

Cotton is one of the most widely grown crops in the world— produced for apparel, textiles, home and hygiene products, and even foods made with cottonseed oil.



The Case for Change

Cotton is the most widely produced natural fiber, found in everything from T-shirts to personal care products and mattresses. It is the second most widely produced fiber by volume, behind only polyester.

Cotton is also widely used for food and animal feed. In fact, for each 100 pounds of fiber produced by the cotton plant, it also produces about 160 pounds of cottonseed used for oil and meal in food products and feed.

The majority of conventionally grown cotton is genetically modified (GM) and produced with billions of pounds of synthetic pesticides and fertilizers applied to the crop around the world each year, including in the U.S.

Recently, overviews of global pesticide use during the years 2018–2022 have been made publicly available by the International

Cotton Advisory Committee (ICAC). While information-rich, the data in these and related reports are offered by the chemical manufacturers themselves, omitting the names and quantities of the different pesticides. So, too, is limited data on synthetic fertilizer use provided. Despite the known widespread use of chemical inputs and their potential risks, detailed industry information about chemical use largely remains behind prohibitive paywalls, when collected at all.

As far as we know, the U.S. is the only country to survey and report the use of pesticides and fertilizers in cotton production, listing the actual inputs and providing the information to the public at no cost. The U.S. Department of Agriculture (USDA) undertook the survey on cotton every two years from 2015 to 2021, but the next survey won't be undertaken until 2025 and published in 2026.



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For each 100 pounds of fiber produced by the cotton plant, it also produces about 160 pounds of cottonseed used for oil and meal in food products and feed.

While every sustainability initiative is a step in the right direction, in this report we focus on **the importance of organic production**. We identify concerns with conventional production that support the case for making extensive change from the beginning of the supply chain—**the farm**.



This report contains the most recent data for both global and U.S. use of pesticides and fertilizers in cotton, but without greater data collection and transparency, it is still inadequate to paint a complete picture.

Today there are several programs aimed at reducing cotton production inputs both globally and in the U.S. While every initiative is a step in the right direction, in this report

we focus on the importance of organic production and identify concerns with conventional production that support the case for making extensive change from the beginning of the supply chain—the farm. For starters, knowledge of the names and quantities of inputs is vital for companies wishing to make their product lines more sustainable and to avoid making claims that could be considered “greenwashing.”

What is Organic Cotton?

Organic is the only agricultural program that is regulated and enforced in many countries. In the U.S. all cotton sold as organic must meet the strict federal law (the Organic Foods Production Act) and regulations covering how the cotton is grown.

USDA organic standards require that organic cotton is grown using methods and materials that have a low impact on the environment, replenish and maintain soil fertility, reduce or eliminate the use of toxic and persistent pesticides and fertilizers, and build biologically diverse agriculture. Third-party certification organizations verify that organic producers use only methods and materials allowed in organic production.

Organic farmers have a limited number of materials in their toolbox to manage pests such as insects and weeds. These include natural (or “non-synthetic”) materials derived from mineral, plant, or animal matter like insecticidal soaps, pheromones,

Organic cotton production prohibits the use of:

- ✓ Toxic synthetic pesticides
- ✓ Synthetic fertilizers
- ✓ Genetic modification
- ✓ Sewage sludge



and biological pesticides such as *Bacillus thuringiensis (Bt)*. Organic farmers have restricted access to approximately 27 synthetic active pest control products—in contrast to the over 900 registered for use in conventional farming. These materials must be on the USDA National List of Allowed and Prohibited Substances and may only be used when mechanical, cultural, and biological controls are insufficient to control pests, weeds, and disease.



While organic cotton was grown in 21 countries during the 2021/2022 growing season, approximately **97% of global organic cotton was produced in eight countries:**



1. INDIA
2. TURKEY
3. CHINA
4. KYRGYZSTAN
5. TANZANIA
6. KAZAKHSTAN
7. TAJIKISTAN
8. UNITED STATES

(Ranked in descending order by volume.)

Benefits of Organic Cotton Production

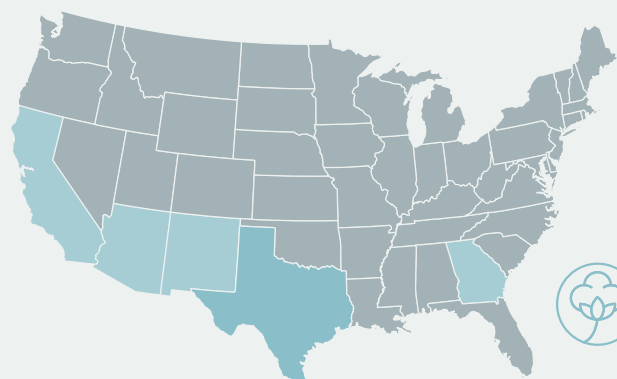
Many management practices used by organic agriculture—such as minimum tillage, returning crop residues to the soil, and the use of cover crops and rotations, increase biodiversity, improve carbon sequestration, and reduce the use of toxic chemicals.

Instead of using harmful synthetic pesticides and fertilizers, organic cotton farmers use cover crops like clover, rye and other crops as rotational crops to manage soil nutrition,

soilborne diseases, and pests. Organic practices help increase the function of natural pest and disease management, while increasing the return of carbon to the soil, raising productivity and helping sequester carbon.

Organic producers use natural methods such as reducing water availability or waiting for frost to help defoliate the plants, eliminating the use of toxic synthetic defoliants allowed in conventional production.

In the U.S., **Texas** led organic cotton plantings and production in 2023, with additional acreage in **Arizona, California, Georgia, and New Mexico.**



Pesticide Use in Cotton Production

What are Pesticides?

Pesticides are inherently toxic—the Latin root “cide” literally means “to kill.” There are many types of pesticide ingredients including herbicides, insecticides, and defoliants. These chemicals can affect the nervous system, irritate the skin or eyes, cause cancer, affect the body’s hormone or endocrine systems, and more. According to the United Nations, pesticides can persist in the environment for decades and pose a global threat to the entire ecological system upon which food and agriculture production depends.

A pesticide consists of both “active” and “inert” ingredients. The active ingredients kill the pests (weeds, insects, fungi) and the inert ingredients make it easier to apply the product, coat the target plant, and extend the effectiveness of

the product. Despite their name, some inert ingredients are recognized as active ingredients in other pesticides and are potentially, or are verified to be, toxic. The identity of inert ingredients, which typically account for most of the volume of a pesticide, is considered “confidential business information,” and not measured in the U.S. Department of Agriculture’s publicly available reports for cotton and other crops.

Here, we refer to active ingredients as “pesticides” unless referring to specific types of pesticides such as herbicides, insecticides, fungicides, defoliants, and the like. We also recognize that the amount—volume or weight—of an input does not necessarily reflect toxicity, but for now, weight forms the benchmark for measurement and is what is most widely reported.



Excessive use and misuse of pesticides can contaminate surrounding soil and water sources, causing biodiversity loss and destroying beneficial insect populations that act as natural enemies of pests.



Conventional cotton ranks as the most pesticide-intensive crop per land unit (4.1 pounds/acre or 4.6 kg/ha) of the nine field crops surveyed by the USDA over the last five years from 2019–2023, including corn, soybeans, and wheat.

U.S. Use of Pesticides in Conventional Cotton

To the best of our knowledge, the U.S. is the only country gathering and publicly offering data on the use of pesticides and fertilizers on cotton—including the names and quantities of the inputs. The USDA’s National Agricultural Statistics Service (NASS) most

recent survey on the crop covered the nine states making up 92% of the 11.1 million acres of cotton planted in 2021.

In addition to identifying the inputs, the survey results demonstrate that approximately 42 million pounds / 19,086 tonnes of pesticides were used on 10.3 million acres / 4,174,504 hectares of cotton. This ranks conventional cotton as the crop with the most intensive pesticide use per land unit (4.1 pounds per acre / 4.6 kilogram per hectare or kg/ha) of the nine field crops surveyed by the USDA over the last five years from 2019–2023, including corn, soybeans, and wheat.

Exposure to glyphosate has been linked to Non-Hodgkin Lymphoma and endocrine disruption as well as many important human health concerns such as development of cancers, impaired neurodevelopment, and endocrine disruption, particularly related to sex hormones. Childhood exposure to glyphosate is associated with metabolic and liver disorders in adulthood. It is found at high levels in the breast milk of US women and ubiquitously in the urine of U.S. adults and children alike.

Pesticides applied to conventional cotton included roughly 60% herbicides (26 million pounds / 11,752 tonnes), 30% “other” pesticides such as defoliants and plant growth regulators (12 million pounds / 5,485 tonnes), 10% insecticides (3.8 million pounds / 1,686 tonnes), and 1% fungicides (358,000 pounds / 162 tonnes).

At least 98 pesticides (not including different salts of active ingredients such

as 2,4-D, dicamba, and glyphosate) were reportedly used on cotton in 2021. (Note: USDA withheld quantities of almost half of the pesticides to avoid disclosing data for individual operations, so the actual quantities could be substantially larger.)

Just 10 pesticides made up 86% of all pesticides reported as used on cotton that year with the herbicide glyphosate alone (~13 million pounds / 5,782 tonnes) making up 30% of all pesticides used on cotton.



Organic production protects human health and the environment because the majority of Top 10 pesticides used in cotton are considered Highly Hazardous Pesticides.

The **top 10** pesticides pose a number of health concerns. For example:

- **SEVEN** (acephate, acetochlor, glufosinate-ammonium, glyphosate, paraquat, tribufos, and trifluralin) meet the United Nations Highly Hazardous Pesticides criteria, amounting to ~22 million pounds / 10,032 tonnes applied—or 53% of the total.
- **SIX** (acephate, acetochlor, glufosinate-ammonium, glyphosate, tribufos, and trifluralin) are considered known, probable, likely, possible, or suggestive carcinogens.
- **FOUR** (acephate, glyphosate, metolachlor, and trifluralin) are considered endocrine disruptors.
- **THREE** (acephate, dicamba, and glufosinate-ammonium) are considered level II moderately acutely toxic pesticides.

Outside of significant health concerns, there are considerable environmental concerns posed by the use of some of the top ten conventional cotton pesticides. For instance, dicamba use on cotton was prohibited in 2024 due to its off-target movement and damage to non-target crops and other plants. It is also known to cause adverse effects to birds, mammals, bees (larvae), aquatic plants, and non-target terrestrial plants. Acephate (which includes its degradate methamidophos) is highly toxic to honeybees and beneficial predatory insects on an acute contact basis. Acute and chronic risks to birds and chronic risk to mammals are also high. Methamidophos, an active ingredient in its own right and

Highly Hazardous Pesticides (HHPs)

Not all pesticides are equal, with some being more hazardous than others. The United Nations considers these “[Highly Hazardous Pesticides](#),” (HHPs) and defines them as:

- ✓ Present particularly high levels of acute or chronic hazards to health or environment
- ✓ Appearing to cause severe or irreversible harm to health or the environment under conditions of use in a country.

The names of the specific leading HHPs used on cotton globally remain confidential and because the UN did not develop a list to go with its definition there are different lists with different pesticides leading to different lists of HHPs. For example, glyphosate is not included as an HHP in [the study](#) referenced in ICAC’s analysis though it is included in the [Pesticide Action Network’s list](#) which draws from a wider set of databases.

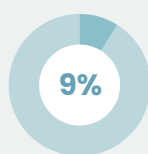
Top 10 pesticides in conventional cotton in the U.S. by weight in 2021



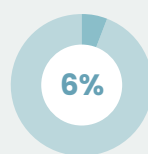
1
Glyphosate*
HERBICIDE



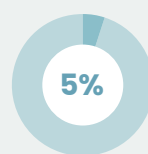
2
Ethephon
GROWTH
REGULATOR



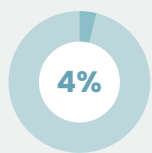
3
Dicamba
HERBICIDE



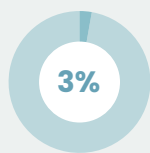
4
Acephate*
INSECTICIDE



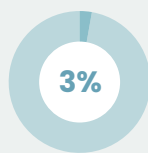
5
Tribufos*
DEFOLIANT



6
Paraquat*
HERBICIDE



7
S-metolachlor
HERBICIDES



8
**Glufosinate-
ammonium***
HERBICIDE



9
Acetochlor*
HERBICIDE

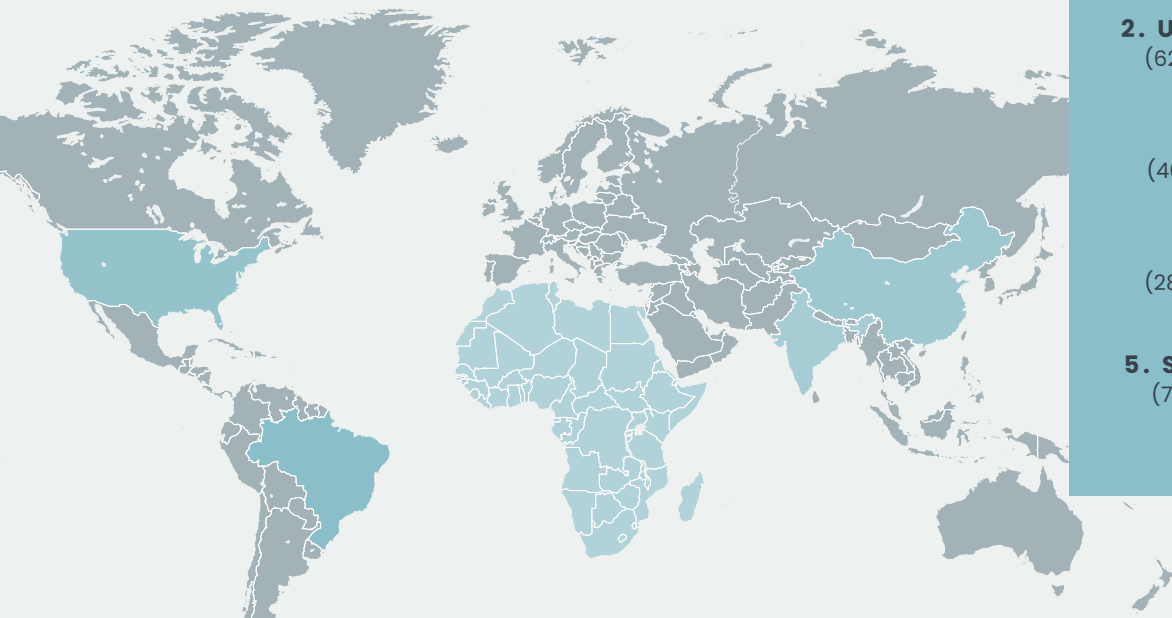


10
Trifluralin**
HERBICIDE

* indicates this pesticide is classified as a Highly Hazardous Pesticide

^ indicates this pesticide is classified as a “forever chemical”

Top five countries with the highest average use of pesticides by volume on cotton in 2018–2022:



1. BRAZIL
(80 million pounds /
36,449 tonnes)

2. UNITED STATES
(62 million pounds /
27,992 tonnes)

3. CHINA
(40 million pounds /
18,311 tonnes)

4. INDIA
(28 million pounds /
12,607 tonnes)

5. SOUTH AFRICA
(7 million pounds /
3,104 tonnes)

considered one of the most acutely toxic organophosphate pesticides, was canceled for use on cotton in the U.S. in 2009.

In addition to concerns with the top ten pesticides, ten of 64 pesticides containing per- and polyfluoroalkyl substances (PFAS)—known as “forever chemicals”—are among the 98 pesticides used on U.S. cotton in 2021. The ten PFAS pesticides used in cotton production are bifenthrin, fluometuron, fluridone, formesafen, novalunon, pyroxasulfone, saflufenasil, sulfoxaflor, tetraconazole and trifluralin. This amounted to 1.6 million pounds / 772 tonnes or approximately 4% of the pesticides applied to U.S. cotton that year. Thus, “the legacy impacts of PFAS addition into pesticide products could be widespread and have wide-ranging implications on agriculture and food and water contamination, as well as the presence of PFAS in rural environments.”

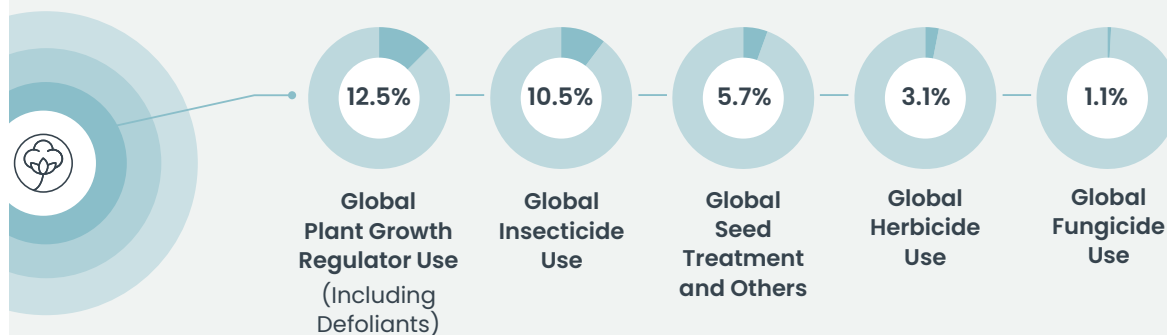
Global Use of Pesticides in Conventional Cotton

In 2021/2022, approximately 57 billion pounds / 26 million tonnes of cotton were grown on approximately 82 million acres / 33.2 million hectares or 2.3% of global arable land in roughly 54 countries.

The top five cotton-producing countries by harvested area (e.g. acre, hectare) in that year were: India, U.S., China, Pakistan and Brazil. However, by yield (amount of cotton produced), the list is very different with China, Brazil, Russian Federation, Turkey, and Israel as the leading countries (the U.S. ranked 15th).

Publicly available global pesticide use summaries do not provide the names and quantities of specific pesticides and fertilizers like the U.S. does (albeit in only periodic reports).

Cotton production accounted for 4% of total global pesticide use in 2018–2022. Broken down into different types of chemicals, this looks like:



Global Pesticide Use on Cotton: 2018–2022

An ICAC [analysis](#) of average pesticide use on cotton over a five-year span from 2018–2022 in the 41 countries making up the bulk of pesticide use on the crop revealed that:

Cotton has consistently ranked among the top crops for pesticide use in agriculture and accounted for 4% of total global pesticide use overall. There is a “significant” amount of pesticides applied to cotton crops, ranking cotton fifth among the top single crops (following soybeans, corn,

wheat, and rice) with an average annual pesticide usage of 256 million pounds / 116,083 tonnes.

Pesticide use consisted of a similar application of herbicides (110 million pounds / 50,019 tonnes) and insecticides (108 million pounds / 49,142 tonnes) among other chemical classes like defoliants, fungicides, and plant growth regulators. The total [average] pesticide use on cotton across all surveyed countries amounted to 3.4 pounds/acre/3.86 kg/ha.

“

“The widespread use of insecticides, especially the highly hazardous insecticides, raises concerns about potential adverse effects on non-target organisms, environmental contamination, and the development of insecticide resistance in pest populations.”

Similarly, the “use of herbicides raises concerns regarding environmental impact, including soil and water contamination, non-target plant damage, and the development of herbicide-resistant weed populations.”

—ICAC



Cotton ranked fourth for usage on surveyed single crops for all types of HHPs combined, second for highly hazardous insecticides, and third for highly hazardous herbicides.

While herbicide and insecticide use on cotton is roughly equivalent across all countries surveyed, use *per country* differed considerably. For example, U.S. conventional cotton production used 5 times more herbicides than insecticides (48 million pounds / 21,753 tonnes vs. 9 million pounds / 4,043 tonnes), while Brazil used half as many herbicides as insecticides (23 million pounds / 10,262 tonnes vs. 43 million pounds / 19,406 tonnes).

ICAC's analysis of the use of Highly Hazardous Pesticides (HHPs) on cotton versus other single crops over the five-year period of 2018–2022 in the 19 countries surveyed, found that cotton uses a “significant” proportion of HHPs, accounting for 13% of the crop's total pesticide use, second only to bananas among single crops. Specifically, cotton ranked fourth for usage (in tonnes) of all types of HHPs combined, second for highly hazardous insecticides (HHIs), and third for highly hazardous herbicides (HHHs).

Cotton had a total average annual HHP usage of 33 million pounds / 15,141 tonnes. This included 19 million pounds / 8,671 tonnes of HHIs, 5 million / 2,144 tonnes of HHHs, 3 million pounds / 1,475 tonnes of Highly Hazardous Fungicides (HHFs), and 6 million pounds / 2,851 tonnes from “other” categories including pesticides such as acaricides and molluscicides.

Almost all—95%—of HHP's in cotton were used in just four countries: China (14 million pounds / 6,240 tonnes), Brazil (8 million pounds / 3,827 tonnes), India (5 million pounds / 2,405 tonnes) and the U.S. (4 million pounds / 1,869 tonnes).

Breaking down the HHP use into the amount used per land area demonstrates a large difference in use of these higher hazard inputs between the countries; Brazil led in the use of HHPs at 2.3 pounds/acre or 2.58 kg/ha, followed by China at 1.7 pounds/acre or 1.94 kg/ha, then Israel at 1.4 pounds/acre or 1.57 kg/ha, Colombia at 0.5 pounds/acre or 0.57 kg/ha), and the U.S. with 0.4 pounds/acre or 0.48 kg/ha.

Fertilizer Use in Cotton Production

What are Fertilizers?

Fertilizers are substances (either organic or synthetic) that are added to land or soil to increase its productivity. Synthetic fertilizers are derived from mineral or fossil fuel extraction. The three primary nutrients needed for plant growth—nitrogen (N), phosphorus (P), and potassium (K)—form the basis of industrial agricultural fertilizers, also known as “NPK fertilizer.”

The production of synthetic fertilizers is energy intensive. In addition, fertilizers can be lost to the environment through volatilization into the air, leaching into ground water, emission from soil to air, and runoff into surface water, causing harmful nitrogen pollution.

Nitrogen-based synthetic fertilizers are considered a major contributor to increased nitrous oxide (N₂O) emissions, which are roughly 265 times more potent than carbon dioxide (CO₂) as a

greenhouse gas. Nitrous oxide is during in-field application of nitrogen fertilizers but is also generated as a byproduct of nitric acid production used to make synthetic commercial fertilizer.

Organic cotton production prohibits the use of synthetic fertilizers, reducing the emissions of nitrous oxide.

U.S. Use of Fertilizer in Conventional Cotton

In the U.S., approximately 1.3 billion pounds / 584,409 tonnes of synthetic fertilizers were applied to cotton in 2021 including:

Nitrogen: 695 million pounds / 315,238 tonnes or 54% of the total.

Potash: 293 million pounds / 133,016 tonnes or 23% of the total.

Phosphate: 240 million pounds / 108,844 tonnes or 19% of the total.

Sulfur: 57 million pounds / 26,986 tonnes or 4% of the total.



Organic prohibits the use of synthetic nitrogen-based fertilizers which cause nitrous oxide greenhouse gas emissions that are **265 times more potent** than carbon dioxide.

Texas Organic Cotton Marketing Cooperative

In 2021,
**cotton ranked third
for the most intensive
fertilizer use per land unit**
(125 lbs/acre or 140 kg/ha)
among the nine field crops
USDA surveyed 2019–2023,
behind only corn and rice.



In 2021, cotton ranked third for the most intensive fertilizer use per land unit (125 lbs/acre or 140 kg/ha) among the nine field crops [USDA surveyed 2019–2023](#), behind only corn and rice.

Global Use of Fertilizer in Conventional Cotton

The total use of NPK in cotton production amounted to approximately 16.4 billion pounds / 7.5 million tonnes in 2020, according to a [2023 textile industry analysis](#) of fertilizer use on cotton in 38 countries.

Nitrogen (“N”) was the fertilizer most extensively used on cotton globally with approximately 9.4 million pounds / 4.3 million tonnes applied that year, representing approximately 58% of total NPK use on the fiber.

India (6.1 million pounds / 2.7 million tonnes), China (3.7 million pounds / 1.7 million tonnes), the U.S. (1.4 million pounds / 623,000 tonnes), Pakistan (1.3 million pounds / 608,000 tonnes), and Brazil (1.2 million pounds / 566,000 tonnes) were the top users of NPK fertilizer on cotton.

Application of fertilizer does not necessarily result in commensurately increased yields. For instance, while India was the largest user of each of the NPK fertilizer types individually, the country ranked 26th for cotton yields. Similarly, the U.S. was the third largest user of NPK fertilizer but ranked ninth for yields. Conversely, Australia had the highest yields per land unit but ranked seventh for NPK use.

Genetically Modified Cotton

What is Genetic Modification (GM)?

A genetically modified organism is a plant, animal, or microorganism that has had its genetic material (DNA) changed using technology that generally involves the specific modification of DNA, including the transfer of specific DNA from one organism to another. GM cotton is cotton that has been modified to tolerate pesticides such as herbicides and insecticides, among others.

Organic regulations strictly prohibit the use of GM in agriculture.

U.S. Use of Genetic Modification in Conventional Cotton

Genetically modified cotton was commercially introduced in the United States in 1995, with adoption rates increasing rapidly

in the years that followed. Genetically modified seeds have accounted for the majority of cotton acres since 2000. GM crops are broadly classified as herbicide-tolerant (HT), insect-resistant (*Bt*), or “stacked” varieties that combine HT and *Bt* traits. HT crops can tolerate one or more herbicides and provide farmers with a broad variety of options for weed control by targeting weeds without damaging crops. *Bt* crops contain genes from the soil bacterium *Bacillus thuringiensis* and provide control of insect pests, such as the tobacco budworm and pink bollworm.

According to a USDA analysis of upland cotton planted, 96% of planted acres used GM technology (either HT or *Bt*) in 2024. Stacked seed traits (seeds containing both HT and *Bt* traits) made up 87% of planted cotton



Organic regulations strictly prohibit the use of GM in agriculture.



The widespread use of pesticides on GM cotton crops has led to the development of herbicide-resistant “super weeds” and insecticide resistance, which can make *Bt*, a vital organic tool, ineffective.



acres. Growers have transitioned to stacked seeds for many reasons, including the wider availability of stacked products for growers.

The first stacked seed traits, introduced in the late 1990s, added *Bt* traits to existing HT seeds. Since then, weed management has become more complex with the emergence of herbicide-resistant weed species and *Bt*-resistant pests. Stacked seeds with multiple traits enable farmers to utilize many different options for pest management, such as resistance to multiple herbicides—including glyphosate, glufosinate, and dicamba.

While there is a general concern about the integration of pesticides into GM pesticide-resistant plants, GM cotton also poses threats to organic cotton growers specifically. The widespread use of pesticides on GM cotton crops has led to the development

of herbicide-resistant “super weeds,” which can make *Bt*, a vital organic tool, ineffective. The risk of contamination by GM seeds also threatens the organic sector’s ability to meet consumer demand and expectations for GM-free crops and products.

Global Use of Genetic Modification in Conventional Cotton

In 2019, the most recent year for which data is readily available, cotton was the third most widely adopted “biotech” (another term for GM) crop by the 29 countries that have adopted the technology. The top four GM crops were (ranked in descending order) soybeans, maize (corn), cotton, and canola. Based on the global crop area for individual crops, 79% of cotton, 74% of soybeans, 31% of maize, and 27% of canola were biotech crops in 2019.

Conclusion

Cotton is the most widely used natural fiber in the global apparel and textile sector. However, the extensive use of synthetic pesticides and fertilizers, as well as genetically modified seed, raises concerns about the environmental and public health impacts of the crop's production practices today.

Farmers and brands have been urged to change their cotton production practices to become more sustainable and meet global, national, and/or corporate sustainability goals. However, detailed information and data sharing on pesticide use in cotton production has only recently become available and is still limited for many parts of the world where cotton is produced, making it difficult for farmers and brands to make educated decisions on improving their practices.

This report presents the first time the U.S. production data on pesticide and fertilizer use in cotton has been analyzed in such an in-depth and public manner. Similarly, recent information from ICAC has provided some of the first—and helpful—use (vs. sales) data, particularly around the use of Highly Hazardous Pesticides. However, details on global cotton production inputs remain unidentified and data regarding the scope of GM practices and pesticide use have limited availability outside of industry access and those fortunate to have that information shared with them.

Several organizations in the U.S. and around the world are working to reduce



Texas Organic Cotton Marketing Cooperative

Farmers and brands have been urged to change their cotton production practices to **become more sustainable and meet global, national, and/or corporate sustainability goals.**



Naturepedic Organic Mattresses and Bedding

Brands can drive change

by significantly increasing their uptake of organic cotton while supporting and working closely with the farmers providing it.

the use of pesticides and fertilizers on cotton. This is both to increase profitability while improving the sector's environmental stewardship by reducing risks to people and the environment as well as the reliance on fossil fuel-based inputs, given their impact on climate change. Indeed, 29% of all cotton globally was estimated to be produced under a sustainability program or standard in 2022/2023.

To meet critical sustainability goals, improvements need to be made far more rapidly—and transparently. To best protect people and the environment, the conventional cotton sector can draw on the practices utilized by the organic sector that reduce or eliminate the use of hazardous inputs and practices while improving soil health and biodiversity.

Recommendations

- a. Given that governments authorize the use of pesticides, fertilizers, and cotton industry helps promote that use, government and the cotton industry should work together to track the use of those inputs and practices annually and make that information publicly available at no cost—including the identity and weight of the pesticides and fertilizers used. This would enable farmers and brands alike to make informed decisions.
- b. Governments and universities should provide increased research and education around the challenges that organic farmers and farmworkers face, developing and providing training around the use of non-toxic methods of pest management for insects and weeds in particular, as well as for defoliation.

To meet critical sustainability goals, improvements need to be made far more rapidly—and transparently.

Consumers can also play a big role by purchasing organic cotton products.



- c. Brands can drive change by significantly increasing their uptake of organic cotton while supporting and working closely with the farmers providing it.
- d. Farmers should convert to organic production to dramatically reduce or eliminate the use of hazardous synthetic crop inputs while improving soil health.
- e. Consumers can also play a big role by purchasing organic cotton products.

Certified organic is the only agricultural program to be governed by federal law and regulations in many countries, prohibits the use of hazardous inputs, and provides transparency from field to finished product.

Given the risks posed to humans and the environment from conventional cotton production, the time is now to make the change and transition to organic production methods.

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