

Organic Cotton

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[for ICAC Research Associates]

Organic Cotton

Cotton grown without the use of any synthetically compounded chemicals (ie, pesticides, fertilizers, defoliants, etc.) is considered 'organic' cotton.

Organic Production

Organic cotton production does **not** use synthetically compounded chemicals but can use 'natural' chemicals like sulfur dust and Bt and other biological control agents in pest management and organic acid-based foliar sprays (eg, citric acid) and nitrogen and zinc sulphate in harvest preparation.

[USA - USDA NOP; 7 CFR Sec. 205.601; list allowed]

What is Organic Agriculture?

"Organic agriculture" is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony."

[USA - USDA NOP]

Organic Cotton

• 'Organic' is a labeling term.

• For cotton to be sold as 'organic cotton', it must be certified by an independent organization that verifies that it meets or exceeds defined organic agricultural production standards.

• To produce 'organic cotton textiles', certified organic cotton should be manufactured according to organic fiber processing guidelines.

World Organic Cotton Production

2004/05: the world production of organic cotton was about 25,394 metric tons (116,600 US 480 lb bale equivalents)

~ 0.1% of world cotton production, which was about 25 million MT (120 million US 480 lb bales) – all of it would fit on a single average size cargo ship

Organic Cotton Production 2004/05

- Turkey 10460 MT
- India 6320 MT
- China 1870 MT
- USA 1968 MT
- Tanzania 1213 MT
- Uganda 900 MT
- Pakistan 600 MT

Why Organic Cotton?

Proponents claim: organic cotton is:

- A more 'sustainable' approach than conventional cotton,
- An environmentally preferable product (because conventional cotton overuses/misuses pesticides)
- Of added benefit to the environment, farmers, and consumers
- Conventionally grown cotton fiber/fabrics/apparel has chemical residues on the cotton that can cause cancer, skin irritation, and other health-related problems to consumers

Why Organic Cotton?

For most consumers, the word 'organic' is primarily a marker -- a word that symbolizes a lifestyle that they want to be part of.

Certification or regulation itself and the 'science' behind organic products is not what most consumers care about when buying organic products.

Key Points

- **Conventional and organic production can co-exist. Profitability will drive producer decisions.**
- **We must correctly define *sustainability*.**
Organic is NOT equivalent to sustainable.
Either organic or conventional cotton production practices may be sustainable

Sustainability

Sustainability has many definitions but the basic principles and concepts remain constant: balancing a growing economy, protection for the environment, and social responsibility, so they together lead to an improved quality of life for ourselves and future generations (US EPA, 2006).

Sustainable Agriculture

- Satisfy human food and fiber needs
- Enhance environmental quality and the natural resource base upon which the agricultural economy depends
- Maximize the efficient use of nonrenewable resources and on-farm resources and integrates, where appropriate:
 - Natural controls
 - Biological cycles
- Sustain the economic viability of farm operations
- Enhance the quality of life for farmers and society as a whole

Pesticides

(Includes: Herbicides, Insecticides, Fungicides)

MYTHS:

Cotton accounts for 25% of all pesticide use.

It takes 171g (6 oz) of pesticides to grow cotton for one T-Shirt.

Pesticides

(Includes: Herbicides, Insecticides, Fungicides)

FACTS:

• Cotton accounts for 8.5% of the world's use of pesticides.

• In the USA, approximately 0.45kg (1lb) insecticide and 1.05kg (2.3 lbs) of herbicide are used per acre.

• In the USA, where data are available, ~1g (0.038 oz) of pesticides are used to grow enough cotton for a T-shirt. [Off by a factor of >150X!]

Pesticide Registration -- USA

New crop protection products

- Subject to ~120 separate tests
- Costs US\$180-220 million
- 8-9 years to develop
- Tolerances are set at ~1000x < NOEL (depending on the risk factors)

Pesticide Residue on Raw Fiber ABSENT

The Bremen Cotton Exchange (Bremen, Germany) routinely conducts laboratory tests for pesticides (228 substances) on raw cotton from many growing regions of the world. *The results showed that all cottons, including U.S. cottons, satisfy the Eco-Label standard and easily pass the regulations for foodstuffs.* 'Thus, cotton under German law theoretically can be used as a foodstuff.'

Crop Production – organic vs conventional

- *All methods of cotton production have some practices that not necessarily environmentally friendly but are necessary to produce the crop (if lifecycle assessed.)*
- eg, conventional cotton 90-168kg/ha (80-150lbs/acre) using conservation tillage
- Organic cotton ~7-11MT/ha (3-5 t/acre) poultry manure, 20-30 MT/ha (9-15 t/a) cattle/dairy manure

Crop Production

Many of the environmentally friendly procedures that are used in some organic cotton production also are used in producing conventional cotton -- cover crops, trap crops, strip cropping, wind breaks, biological control of insects, including pheromone trapping and mating disruption, etc.

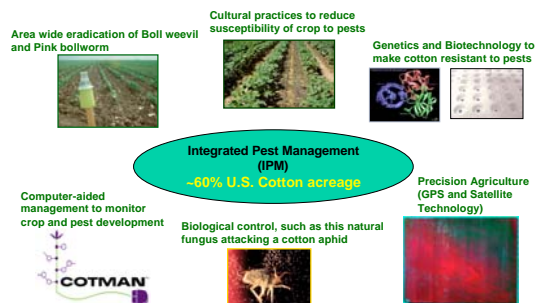
Crop Production

Organic cotton production uses some 'IPM systems', which have shown a high potential for success both ecologically and economically, but does not and can not consider all available IPM techniques –

conventional cotton production does [*biotech cotton & pesticides*]. ~60% of USA cotton acreage uses IPM.

(USDA-NASS, 2001)

Critical Integration of Modern Technologies into Integrated Pest Management (IPM)



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Cotton producers are in the forefront of adopting modern technology for IPM – cultural practices, computer-aided management systems, biological control, precision agriculture, biotechnology, and genetics. *Most of these are integrated and used before any synthetic pesticides are applied to cotton fields.* IPM is practiced in ~ 60% of USA cotton acreage.

Crop Production

- *Organic cotton* is more expensive to produce – results from a six-year study in the USA showed organic cotton production costs at about 50% higher than those of conventional cotton;
- Usually has lower yields, which requires more land to produce the same quantity of cotton; and
- Can have lower grades, which affects economics; and it requires significantly more labor to produce.

Soil, Air, and Water

- Cotton is a very drought- and heat-tolerant crop that does not require excessive amounts of water.
- Conservation tillage is difficult or impossible to implement in organic cotton production systems because of the heavy reliance on mechanical cultivation or use of extensive hand labor for weed control. This increases risk of soil erosion and use of fossil fuels for mechanical cultivation.
- *Conservation tillage has a significant impact on greenhouse gas (CO₂) emissions*

Summary

- *Organic cotton production is not any more environmentally friendly or sustainable than current conventional cotton production.*
- It can require more land to produce the same amount of cotton;
- It can require more labor; and
- It costs more to produce.
- *From a consumer residue standpoint, there is no difference between conventionally grown cotton and organically grown cotton.*

Summary

•Conventional and organic production can co-exist. Profitability will drive producer and consumer decisions.