UDC 687

CRITERIA AND BENEFITS OF PRODUCING ORGANIC COTTON

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In light of the ongoing COVID-19 pandemic, there has been a noticeable shift in consumer behavior towards prioritizing health and safety measures. This has led to an increased emphasis on transparency and the promotion of eco-friendly and sustainable textiles. As people become more health-conscious, they are also becoming more aware of the benefits of organic and recycled textiles, which is further fueling the growth of these markets [1-3]. It is essential that we continue to prioritize health and safety measures while also working towards a more sustainable future. By doing so, we can contribute to a healthier world and a more sustainable future for generations to come.

Organic production, as outlined in Council Regulation (EC) No834/2007, embodies a holistic system of farm management and production [4]. This system integrates optimal environmental practices, emphasizes biodiversity, conserves natural resources, upholds high animal welfare standards, and aligns with consumer preferences for products made using natural substances and processes. Organic production caters to a specific market demand for organic products and contributes to environmental protection, animal welfare, and rural development.

Focusing on the cultivation of organic cotton is an excellent way to support agricultural practices that are restorative and regenerative in nature. By doing so, we can reduce the risks associated with agronomy, environmental factors, and health concerns. It is important to keep in mind, however, that there are certain limitations associated with this approach, such as the high amount of manual labor required and increased production costs. Despite these challenges, it is critical that we prioritize the rebuilding of soil health, improving water cycles, and safeguarding biodiversity both above and below the surface of the earth on our "working lands" for the betterment of our future. This approach is an essential component of the nature-based solutions that account for more than 30 percent of the solutions to climate change [2, 5].

The cultivation of organic cotton is characterized by a farming approach that rigorously abstains from employing chemical fertilizers, pesticides, and pharmaceuticals. This farming methodology adheres steadfastly to stringent standards encompassing environmental, social, and economic sustainability, as clearly depicted in Fig. 1. Fundamentally, organic cotton production revolves around the fundamental principle of refraining from utilizing genetically modified organism (GMO) seeds, synthetic fertilizers, herbicides, pesticides, and chemicals for defoliation. Equally significant is the meticulous avoidance of any treatment involving fungicides or insecticides on seeds during the production phase, a crucial aspect depicted in Fig. 1. Organic cotton is a pivotal component of the ongoing journey towards a more transformative and responsible future [6, 7].

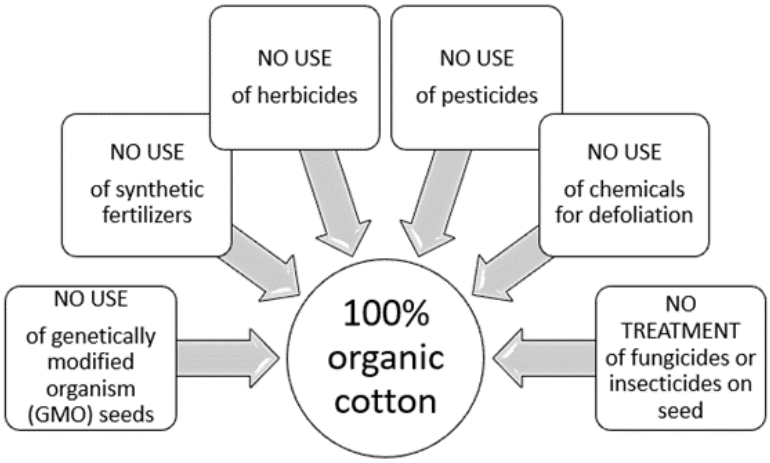

Fig. 1. The main criteria for the cultivation of organic cotton

The production of organic cotton is subject to rigorous guidelines, which results in lower yields and higher prices when compared to conventional cotton production that employs chemical pesticides. Despite facing these challenges, there has been a noticeable global increase in organic cotton production. However, it is disheartening to observe that organic cotton contributes only a meager 1.4% of the worldwide cotton harvest, according to the 2020/21 Preferred Fiber & Materials Market Report 2022 by Textile Exchange, which has a 24% share [8]. This percentage falls short of what was expected.

The cultivation and production of cotton entail significant resource utilization and can have detrimental impacts on both the environment and public health. The process necessitates the use of water, energy, and chemicals, which can result in pollution of local wastewater systems. The final phase of cotton processing, in particular, poses a significant environmental threat due to the high levels of solids, elevated temperatures, and substantial quantities of pollutants involved.

The production of cotton is heavily reliant on the use of pesticides, which are highly toxic chemicals that include nerve agents and neurotoxins. In comparison to other crops, cotton production occupies a small percentage of the world's agricultural land, yet it consumes a significant amount of insecticides and herbicides worldwide. Specifically, insecticides account for 16% of the total usage, while herbicides make up 7% [9]. These chemicals pose a significant threat to human health, and they can remain present in the final textile product, posing potential harm to users. Moreover, the transportation stages involved in cotton production contribute to environmental damage, including energy, water, and chemical consumption. It is essential to consider these factors when evaluating the sustainability of the cotton industry.

Engaging in organic cotton cultivation represents a substantial opportunity to make a profoundly positive impact on the environment. A key factor in achieving this is the steadfast avoidance of synthetic chemicals at every stage of the production process. This deliberate omission of chemicals plays a pivotal role in significantly reducing the overall carbon footprint. Notably, the decision to steer clear of chemical usage can lead to a remarkable reduction in CO2 emissions,

achieving an impressive range of 46-50%. This compelling fact is supported by the insightful data presented in Fig. 2. Moreover, organic cotton farming has the potential to foster a healthier ecosystem for cotton cultivation. It also contributes to carbon sequestration by either absorbing or reducing CO2 from the atmosphere. These advantages underscore the value of organic cotton farming as a meaningful investment for individuals committed to environmental preservation. Importantly, the main characteristics that define the production of organic cotton are a 91% reduction in water consumption, a 62% decrease in energy demand, and a 26% reduction in soil erosion. These metrics further reinforce the environmentally sustainable attributes of organic cotton cultivation [5, 9].

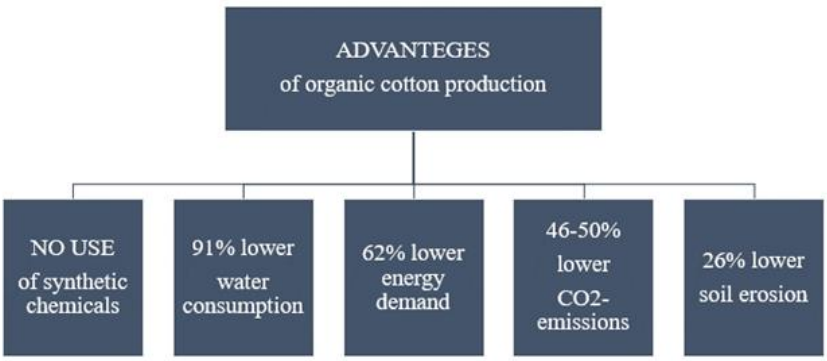

Fig. 2. The main advantages of organic cotton production

When it comes to cultivating cotton in dry regions, a substantial amount of water is required for irrigation purposes. However, conventional cotton farming practices tend to consume 64% more blue water compared to organic cotton. This disparity in water usage can lead to groundwater depletion and chemical pollution, which can have adverse effects on the environment and human health. In contrast, organic cotton is grown on small-scale farms that rely solely on rainwater for irrigation. This farming method promotes healthy soil, which can retain water more effectively, resulting in a remarkable decrease in water usage of up to 91%. This approach not only conserves water resources but also helps to maintain a sustainable environment for current and future generations [5, 9].

The practice of producing organic cotton has numerous benefits that promote environmental sustainability, social responsibility, and the well-being of individuals and communities. These benefits include:

1. Environmental sustainability: Organic cotton farming eliminates the use of synthetic pesticides and fertilizers, which reduces pollution and improves soil quality.

2. Reduced water consumption: By eliminating synthetic pesticides and fertilizers, organic cotton farming helps reduce pollution and improve soil quality, which in turn leads to reduced water consumption.

3. Biodiversity conservation: Organic farming practices support a healthier ecosystem by avoiding harmful chemicals that can adversely affect biodiversity and wildlife.

4. Improved health for farmers and communities: By avoiding exposure to toxic chemicals, farmers and their communities experience enhanced health and safety. Additionally, organic cotton products are safer for consumers, especially those with allergies or sensitive skin.

5. Climate change mitigation: Organic farming methods sequester more carbon in the soil, which helps mitigate climate change by reducing greenhouse gas emissions.

6. Increased consumer demand and market growth: As more consumers look for sustainable and eco-friendly products, the market for organic cotton products is growing.

7. Long-term sustainability and resilience: Organic farming fosters sustainable practices that ensure the long-term viability of farms, allowing them to thrive for future generations.

By following these criteria and benefits, the production of organic cotton supports a more sustainable and responsible approach to cotton cultivation and textile production.

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