Organic Cotton: A Healthy way of Life
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Organic production can be defined in many ways but 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.

Cotton is an important cash crop and lifeline of textile industry. It is the most widely used natural fibre cloth in clothing today and accounts for almost 50% of the textile market worldwide. At present it is used to make a number of textile products. These include bath towels and robes, denim, shirts, socks, underwear, T-shirts, bed-sheets, etc.

Natural fibres have their problems, too. Cotton uses more pesticide per cotton plant than almost any other crop in the world. This has serious impacts, causing illness and even death amongst cotton farmers who are exposed to dangerous pesticides every day. These pesticides also affect local eco-systems, killing certain plants and animals and causing an imbalance. The chemicals used to grow cotton remain in the fabric and are released during the lifetime of the garments so they affect people wearing clothes too.

Certain dyes are thought to cause cancer. In many parts of the world, garments are dyed or bleached using toxic chemicals without proper precautions; the chemicals used can then affect workers and flow into sewers and rivers, damaging local ecosystems.

Cotton is grown on an estimated 3% of the total cultivated area in the world, but uses about 25% of all insecticides consumed in agriculture. Pests are such a serious threat to cotton production that economic yields are almost impossible to achieve without monitoring pests and adopting chemical controls. Organic production can be defined in many ways but 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.

Different varieties of cotton comprising fibres like Bt cotton (DCH32), organic cotton (MCU 5) and coloured cotton fibres (brown) were obtained from nearby fields and mills. The details of these fibres are given in table-1.

Globally, nearly 90 million acres of cotton are grown in more that 70 countries. The amount of organic cotton farmers grew worldwide in 2007-08 increased 152%. According to the Organic Cotton Farm and Fiber Report 2008, organic cotton production increased to 145,872 tonnes (668,581 bales) grown on 161,000 hectares in 22 countries worldwide from 57,932 tonnes (265,517 bales) produced in 2006-07.

Organic cotton is grown and processed without toxic chemicals that can be absorbed easily when in contact with the user’s skin. Pesticides, fertilisers and chemicals used to grow and process conventional cotton fabrics may go directly to the user’s blood stream, which consequently affects the body’s organs and tissues.

Cotton producers in all nineteen countries mentioned adapted current varieties to organic production practices. Commercially grown varieties have been tested and developed for high input conditions. Under such conditions, any genotype not performing well will automatically be discarded. Varieties performing well under optimum conditions may not be able to maintain their yield level without synthetic fertilizers and insecticides. Breeding material for organic cotton production has to be screened under organic conditions.

What is Organic Farming?

Growing cotton without synthetic fertilizers and other chemicals has been termed green, environment friendly, biodynamic, etc., but organic production is the most popular name used in the cotton industry. There is no accepted single definition for organic cotton, and there is not only one reason for going into organic production. Organic cotton production is a system of growing cotton without synthetic chemical fertilizers, herbicides, conventional synthetic insecticides, growth regulators, growth stimulators, boil openers or defoliants. It is a system that contributes to healthy soils and/or people.

Table-1: Different varieties of Cotton

<table>
<thead>
<tr>
<th>Fibre</th>
<th>Fineness (m/x)</th>
<th>Length (mm)</th>
<th>Strength (gf/tex)</th>
<th>Elongation (%)</th>
<th>Moisture content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bt cotton</td>
<td>132</td>
<td>136.45</td>
<td>35.8</td>
<td>7.00</td>
<td>6.20</td>
</tr>
<tr>
<td>Coloured cotton</td>
<td>113</td>
<td>26.34</td>
<td>26.6</td>
<td>9.10</td>
<td>6.10</td>
</tr>
<tr>
<td>Organic cotton</td>
<td>137</td>
<td>32.26</td>
<td>36.6</td>
<td>7.20</td>
<td>5.80</td>
</tr>
</tbody>
</table>
The organic system promotes enhanced biological activity, encourages sustainability and commands proactive management of production systems.

Conventional cotton is one of the most chemically-dependent crops, sucking up 10% of all agricultural chemicals and 25% of insecticides on 3% of our arable land; that’s more than any other crop per unit. That adds up to 1/3 of a pound of chemicals to produce enough cotton for a T-shirt, and 3/4 of a pound for a pair of jeans. And that’s just not bad for the planet; 20,000 deaths occur each year from pesticide poisoning in developing countries, many of these from cotton farming, according to the World Health Organization (WHO).

Organic cotton production is not simply an elimination of fertilisers and insecticides but it is a complete production system, which requires equally sound knowledge of cotton production practices. With respect to insect control in particular, a thorough knowledge of non-chemical means of insect control is a pre-requisite for organic production. Difference between organic cotton and conventional cotton is given in Table-2.

There are many reasons why organic cotton production has not extended to other countries. Nineteen countries tried to produce organic cotton during the 1990s, but many of them have already stopped, not for lack of desire or demand for such cotton due to economic reasons. Insecticides need to be eliminated from the cotton production system because they are dangerous to apply, have long-term consequences on the pest complex, and deleterious effects on the environment. Also, heavy reliance on pesticide use has pushed many countries out of cotton production.

Organic cotton production is also a consumer driven initiative. There are many harmful chemicals that people do not know about. Twelve of these chemicals are known as persistent organic pollutants or POPs, which are the most hazardous of all man-made products or wastes that cause deaths, birth defects and diseases among humans and animals. They are so dangerous that 120 nations agreed at a United Nations Environment Programme Conference to outlaw them. Of the 151 signatories to the convention 98 states have ratified it; sadly the United States and Russia have not yet done so. There are three of those chemicals used in cotton manufacturing. Bed-sheet, napkins and diapers are the main factors responsible for organic cotton production.

Organic fashion

Organic fashion means clothes which have been made with a minimum use of chemicals and with minimum damage to the environment. This includes chemicals used during every step in the process, from growing cotton, to the dying and finishing of the fabric.

The fashion industry has an enormous impact on the environment. Many of the clothes we wear today are made from synthetic materials that are made from petrochemicals, which are very polluting to the environment.

Many of the clothes we wear today are made from synthetic materials such as nylon and polyester. Nylon and polyester are made from petrochemicals, which are very polluting to the environment, causing global warming. They are also non-biodegradable, which means they don’t break down easily and so are difficult to dispose of. In order to manufacture nylon, nitrous oxide is released as part of the process. Nitrous oxide is a greenhouse gas that is 310 times stronger than carbon dioxide and causes global warming.

In 1998, Nike, one of the largest sports clothing lines in the world, decided to incorporate organic practices. Most of their products contain 3%-5% organic fibres and they also offer a 100% organic line. Nike alone uses nearly three-million pounds of organic cotton per year and other large companies such as Patagonia, Timberland, and Orvis also incorporate organic fibre into their clothing lines; without public support these companies would not be successful.

Apparel companies are developing programs that either use 100% organically grown cotton, or blend small percentages of organic cotton with conventional cotton in their products. There are a number of companies driving the expanded use of domestic and international organic cotton.

A wide variety of products made from organically grown cotton is now available: shirts and pants, socks, underwear, skirts and blouses, sheets and pillowcases, towels and bathrobes. The range of styles can be somewhat limited, but new styles are being developed to keep pace with the growing demand for organic cotton clothing.

Need for Organic cotton in Pakistan

In Pakistan cotton accounts for 8.2% of the value-added in the agriculture sector and about two per cent to GDP, adds over $2.8 billion to the national economy. Millions of farmers are directly associated with cultivation and harvesting of cotton crop and sale of lint. Many others are indirectly linked with cotton value chain, thus, livelihood of millions of farmers and of those employed along the entire cotton value chain is dependent on this single crop.
Biotechnology application in agriculture has emerged as a major technical innovation that promises to increase yields and improve quality. In Pakistan, Bt cotton was introduced through informal sector in 2002 as a means to reduce crop damage due to bollworms and consequently improve yields. This was a major step forward, but a number of factors have kept it from realizing its full potential.

There exists a need for science based analysis of issues concerning cultivation of Bt cotton and suggesting ways and means of its sustained use in the years to come. In particular, an in-depth examination is warranted of the ways and means for Pakistan to move from the current position of lagging far behind other agricultural economies in the introduction of Bt technology to a position at par with rest of the world wherein it becomes possible for most cutting edge Bt technology to be introduced in Pakistan at the same time as it is done in the leading agricultural economies.

Bt cotton presently occupies around 90% and 60% of cotton area in Sindh and Punjab respectively. In absence of any regulatory oversight, the level of toxin expression in many Bt varieties may be less than optimal. This may expedite the development of resistance in cotton bollworm against Cry toxins. Also, there is no concept of maintaining the 20% refugee as part of the resistance management strategy. Local experts, however, have discounted such fears on two grounds: 1) landholdings are fragmented and many different crops are planted side by side; and 2) double-gene products will be available in the market before resistance has developed. How serious is the threat of resistance build up and how valid are the arguments of local experts needs to be carefully examined. To be specific what are the chances of significant resistance build up happening before the minimum four to five years required for the availability of `real' Bt technology, or can the current concept of Bt varieties disintegrate in that interim period?

Allahdin Group of Companies has introduced a new variety of cotton, "Bt-A One." He said that the main drawback in all the existing Bt cotton varieties is that they drop their bolls during the severe heat whereas the process to drop its bolls in this variety is almost zero.

This variety can be cultivated any time between March and May. Bt-A One is also an ideal variety for the ginner and textile sector. He further said that this variety was cultivated in more than dozen places and the yield of this variety is recorded between 40 to 50 maunds per acre.

Cotton yields are stagnant for the last several years. Factors responsible for the stagnant cotton production include: excessive rain at the time of sowing, high temperature at flowering stage, late wheat harvesting resulting in decline of area under the crop, leaf curl virus incidence, soil system, weather adversities, pest attack and improper production technology in major cotton growing areas of Punjab and Sindh. There are many social as well as economic problems facing cotton production including, illiterate farming community, high cost of inputs, small landholdings, less adoptability of innovations by the farmers, lack of guidance to farmers, high cost of production and insecurity in the market, the cost of production being the most significant among them.

In recent past two major factors had a significant impact on the economics of cotton production. They are extensive use of agrochemicals and yield stagnation. Among all agrochemicals, fertilisers and insecticides are of utmost importance. There are no efficient alternatives to synthetic fertilisers and cotton production has to bear the use of nutrient supplements in the form of inorganic fertilisers. Among pesticides, insecticides are group of agrochemicals which is extensively used on cotton.

Insects, being living organisms, have adjusted with the injurious chemicals and learned to survive with insecticides. Consequently, insecticide use kept increasing causing a serious impact on the economics of cotton production. Currently, there is a greater need for new developments in production research but more and more researchers are confronted with maintaining the current status of yields in their countries. The cost of production has increased to unacceptable levels in many countries that threaten the economics of cotton production. The concern for a life devoid of the use of extremely harmful toxic chemicals, the need for an eco-friendly industrial and agricultural culture and an increasing awareness of depleting natural resources and the consequences therein; these are factors which are shaping the lifestyles of people worldwide. It is in this context that the relevance of organic cotton becomes important.

**Conclusion**

Organic cotton production means not only the absence of inorganic synthetic fertilizers, pesticides and the elimination of growth regulators and defoliants, but it involves very careful planning of the whole farming system. Though presently commercially grown varieties are used in organic cultivation, there is a need to develop varieties which could better tolerate heavy pest pressure in the absence of insecticide use. Such varieties should be developed and tested under organic conditions. Similarly, there is a need to perfect the agronomic requirements of a crop to be grown without synthetic fertilizers and pesticides. There is also a need to identify suitable crop rotations so that the fertility level of the soil can be maintained for the lowest reduction in yield under organic conditions.

Organic cotton is not only better for our bodies but better for our environment. It makes a world of difference in the health and comfort of our people, especially those with allergies, asthma, or multiple chemical sensitivities. Especially infants can enjoy the purest softness, comfort and strength of cotton while diminishing the harm to our environment because what is toxic to you is 15 times more toxic to a baby. Not only do these synthetic pesticides pollute our air, water and soil, but they jeopardise our future.

**References**


2. Chaudhry, Rafiq M. 1993. Suitable varieties for organic cotton production. Presented at the International Conference on Organic Cotton held in Cairo, Egypt from September 23-25, 1993. (The conference was held under the auspices of the International Federation of Organic Agriculture Movements, Germany)


