

EHC-D NEWSLETTER

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Organic Cotton... Friend or Foe?



Cotton... the soft, stable fiber which grows around the seeds of the cotton plant has been cultivated, spun, woven and dyed since prehistoric times. Cotton has clothed many of the world's cultures for more than 5,000 years and over the ages, it has been the economic backbone of exportation for India, the United States, Egypt and Peru and an import boon for Britain. Cotton's cultivation has been the impetus for invention and modernization and yet at one time it was the leading use of slave labor in the United States. Presently, cotton is still harvested by hand in Uzbekistan and other developing countries. Today's international cotton trade is a \$12 billion business. To insure the industry's continued success, cotton growing has become a pesticide-intensive business employing roughly 25% of the world's insecticide use. In fact, it is estimated that 20,000 deaths occur annually from pesticide poisoning as a direct result of cotton farming. Interestingly, however, the cotton plant has its own chemical called *gossypol* which naturally exists within the plant and has very strong insecticidal properties. Gossypol is a yellowish-tan pigment which forms in the stems, leaves and inside the seeds and hulls of the cotton plant. Gossypol is a polyphenolic aldehyde and is very toxic if consumed by insects and humans; it seems that only multi-chamber stomach or 'ruminant' animals such as cows, sheep, etc. can safely consume plant material containing gossypol.

Gossypol's potent and toxic qualities have been extensively investigated in China and Brazil for use as a potential male contraceptive pill. The World Health Organization has asked for a stop to this research due to the highly toxic nature of gossypol. Yet uses for gossypol as an anti-cancer, anti-malaria, anti-bacterial and anti-HIV agent are currently being extensively researched. The cotton seed itself contains much of the poisonous gossypol; however, the seeds have a 23% protein content and are a potential windfall as a human and animal food source. Researchers at Texas A&M University, among other institutions, have created a genetically modified cotton plant in which the gossypol develops only in the stems and leaves and no longer forms inside the seeds. This could free up an estimated 44 million tons of otherwise discarded cottonseed from the cotton fiber industry to be used as animal feed, ground into flour and made into consumable cottonseed oil.

In light of a movement toward global environmental awareness, efforts to reduce pesticide use are fostering a merging organic cotton industry. This industry uses crop rotation, natural defoliation and antagonistic organisms to replace the use of agrochemicals; however, the strict standards of organic farming disallow the use of genetically modified plants, thus organic cotton plants contain the pesticidal ingredient gossypol in the seeds and hulls. More refined organic cotton fabric has had the toxin-emitting seed hulls 'spun' out of the finished product and for this reason, and due to the use of no dye or natural dyes, some organic cotton fabrics are ideal for chemically sensitive and environmentally aware individuals. But the more raw, unrefined organic cotton in which the small flecks of remaining seed hulls can be seen, as is found in pillow and mattress fill and in blankets and some clothing, does contain amounts of the cotton's endogenous pesticidal agent. This phenolic pigment, gossypol, emitting its pesticidal toxin from fractions of the cotton seed hulls, is most likely the substance which many sensitive people find so intolerable about some organic cotton products.