

Cultivation of Bt cotton in Pakistan

by

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According to the Pakistan Plant Quarantine Rules 1976 no person shall import any plant or material which may be a source or medium of infection and pests destructive to agriculture except under a valid import permit issued by the Department of Plant Protection, Government of Pakistan.

According to Section 11, of Pakistan Seed Act 1976, no person shall sell, offer for sale, or advertise or hold stock for sale, or barter or otherwise supply any seed of any notified variety or species unless such seed is identifiable as to its variety or species, such seed confirms limit of germination and purity standards as laid down under Section 10.

Again, according to the National Bio-safety Committee (NBC), the Ministry of Environment, individuals who wish to import viable micro-organisms, plants or animals, genetically modified or constructed must proceed in accordance with the relevant guidelines of the NBC and are strongly encouraged to consult with the Institutional Bio-safety Committee (IBC) regarding the specifics of their intent.

But the irony is that despite all such legal barriers, cultivation of Bt cotton was undertaken illegally over an area of about 70 acres in districts Khaipur and Sukkur of Upper Sindh during the current cotton season (Kharif 2002). Since the American multinational Monsanto, which has developed this controversial genetically engineered variety of cotton, has not been given bio-safety clearance by the government, it is quite likely that Bt cotton cultivation in Upper Sindh has been taken with the seeds smuggled from any foreign soil probably neighbouring country-India.

Regarding Bt cotton it would be proper to mention that this variety contains a foreign gene obtained from a soil bacteria called *Bacillus thuringiensis*. This bacterial gene, introduced genetically into the cotton seeds, is supposed to protect the plant from boll worms. Supporters of Bt cotton and American multinational Monsanto claim that growing Bt cotton would help farmers save money they currently spend on chemicals.

However, on the contrary its critics claim that Bt cotton will become vulnerable to pest attack in the long run. They also allege that the Bt genes escaping from pollen grains might harm other crops in the neighbourhood and the environment.

In Thailand, farmers groups have been concerned about the potential danger to health, local crops, farming, livelihood and the natural environment caused by the GM crops.

Farmers groups are also concerned the GM crops will require intensive use of specific pesticides particularly "Round Up" produced by Monsanto.

Reportedly Nanjing Institute of Environmental Science, a Chinese agency and a cotton research institute under the Chinese Academy of Agricultural Science, has concluded that Bt cotton caused serious ecological disturbances and as a

consequence the claims to productivity efficiencies are fraught with high uncertainty.

What a pity? Despite these apprehensions about Bt cotton the government agencies responsible for monitoring the spread of illegal GM crops, both at provincial and federal levels, remained silent and unmoved and did not bother even to investigate the legal violation of rules and regulations of their respective departments.

During July this year (2002) following a report that some growers in districts Khairpur and Sukkur of Upper Sindh have undertaken cultivation of a cotton variety which is high yielding and did not require any pesticidal spray for boll control, this scribe visited the areas where cultivation of this new variety of cotton had been undertaken.

A survey indicated that the seed of this new variety had been sold by a ginning factory at Salehpat in District Sukkur. However, one grower reported that he had received seeds from a fellow grower of Shahdadpur (Lower Sindh).

Among growers, this cotton variety is known as Australian cotton but also "Beeta Cotton". To evaluate the performance as well as behaviour of this so-called Bt cotton (this is because sample was not tested by Chain Reaction (PCR) technique that detects for the DNA finger prints for Bt gene), all the standing crop' under Bt cotton located in Taluka Nara and Salehpat in districts Khairpur and Sukkur respectively were taken under regular surveillance by the writer.

Total acreage of this cotton variety was about 70 acres belonging to four growers at different locations within the taluka. Based on 3 months (July-September) observations and pest scouting some findings about Bt cotton under climatic conditions of Upper Sindh are as follows:

1. Bt cotton fields having trees or wind breaker in the vicinity sustained medium to severe leaf curl virus (LCV) attack.
2. Bt cotton was found resistant to boll worm but highly susceptible to Jassid (*Empoasca devastans*), requiring three to four sprays during the season. Repeated sprays led to mite resurgence in two fields sprayed with methamedophos.
3. Out of four plots two plots were found with about 60% Niab-78 variety of cotton indicating seed sold to the growers in the name of Bt cotton was mixture of Niab-78 and Bt cotton.
4. In spite of the fact that Bt cotton was found free from boll worm infestation apparently but microscopic study indicated 23% infestation spot on squares inflicted by newly hatched larvae of spotted boll worm contrary to about 5-10% infestation on non-Bt cotton in the adjoining fields. Dissection of squares (buds), however, revealed no live or dead larvae of boll worm inside

of squares or bolls but newly hatched dead larvae were certainly found on the surface of squares.

5. It would be pertinent to mention here that in Bt cotton, the insecticide is produced within the plant and when boll worm larvae hatch, they inject Bt protein along with plant tissue.

The protein becomes active and kills the larvae. However, the most haunting aspects of Bt cotton cultivation under the Upper Sindh climatic condition, as observed during three months surveillance of the standing crop, was its high susceptibility to spotted boll worm which may prove disastrous in the long run because of potential vulnerability of Bt crop to eventual adaptation by the insect pests.

Moreover, one immediate adverse impact of high spotted boll worm susceptibility of Bt cotton could be gauged from the fact that Niab-78 variety of cotton sown with Bt cotton, because of mixing of seeds of two varieties, sustained bolls damage up to 30% in one plot where spray for the boll worm control was not given following the impression that Bt cotton requires no spray for the boll worm.

However, in two plots, where CLCV attack was at low ebb during the entire season yield between 35 to 40 mounds is expected, based on the result of first picking. Accordingly, it is quite likely that illegal cultivation of Bt cotton may gain strength in the next cotton season.

Suggestion:

In view of susceptibility of cotton leaf curl virus (CLCV) as well as Jassid (sucking pest) and lack of awareness and mass illiteracy among farmers thus incapable to take care of the prerequisites vital for the cultivation of cotton it is imperative that an immediate halt is imposed on any plans, whether through official or private channels, of introducing Bt cotton cultivation in the country, especially in Sindh which faces less pressure from the pests that Bt cotton variety claims to control.

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