



TMc MM 4.2: Commercial Technology Development on cotton plant by-produce and value addition

Introduction:

CICRCO has developed a method wherein the material is subjected to a cocktail of enzymes in a microbial in-situ system at room temperature. Laboratory conditions for the whole method have been standardized and scale up trials is under way. Commercial application of this technology along with economic feasibility will be studied in this project.

Objectives:

1. To standardize the preparation of absorbent cotton from non-spinnable cotton.
2. Value addition of cotton plant by-products.

Salient findings:

Preparation of Absorbent Cotton from Non-spinnable Cottons

A process has been standardized to prepare absorbent cotton from *Bengal Desi* cotton by replacing the conventional initial kiering process to a Biological process of microbial *in situ* system at room temperature. The work undertaken during 2007-

08 has established that this is an ecofriendly process and has a commercial value. A patent has been filed on the process of preparation and attempts are being made to transfer this technology.

Prevention of Aflatoxin Production during Storage of Cottonseeds

It is well known that any oilseeds during storage undergoes fungal infestation and the production of Aflatoxin by the fungus *Aspergillus flavus*. This is high when the moisture in the seeds go beyond 16%. Studies have been undertaken to prevent the growth of fungi by the application of fumigants and other chemicals. Spraying a yeast culture *Pichia guilliermondii* and propionic acid have been found to inhibit the growth of *A. flavus* and thereby the aflatoxin. With this background, scale-up trials were undertaken on 100kg cottonseed in five replications. The seeds were sprayed with 1% propionic acid to a total of 1% moisture pick up and incubated in a heap overnight, spread and dried in

shade and stored at room temperature. Seeds sprayed with only water to 1% moisture pick up served as control. Samples were withdrawn at monthly intervals and analysed for fungal count, protein and oil estimation.

The results indicated that there was a ten fold reduction in the fungal population even after 9 months of storage. CHCl_3 extracts of treated and untreated cottonseeds were subjects to HPTLC analysis. Extracts were spotted on precoated TLC plates, developed using acetone + CHCl_3 (1:9 ratio) followed by heating the plates in oven. Extracts from control seeds showed the presence of blue fluorescent bands indicating the presence of aflatoxin B1. Absence of fluorescent bands in treated lots indicated the arrest of fungal growth and the production of the toxin.

There was no significant change in the percentage of oil and protein in the treated and control lot during the period. The trials were scaled up to 1 tonne level.