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AN ENZYMATIC PROCESS FOR REMOVAL OF STICKINESS OF HONEYDEW CONTAMINATED COTTONS

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Abstract

Stickiness of cotton caused by honeydew from insect secretions such as aphids and whiteflies is well known. The stickiness causes a lot of problems in the processing of cotton to yarn- especially in operations like high-speed carding- and leads to imperfections in the final yarn, apart from affecting machine productivity.

The Tempanil process, which has been developed in India, is based on the available technical data on the nature and problems associated with honeydew-contaminated cottons. The process employs a combination of chemicals, which are essentially:

I. Enzymes which selectively react with sugars present in honeydew
II. Powerful wetting-out agents with mild antiseptic properties

The chemicals are capable of selectively decomposing the chemicals responsible for the stickiness of the Honeydew affected cotton into harmless reaction products.

In selecting the various chemicals, care has been taken to see that they don't in any way affect the properties of the fiber or interfere with the subsequent wet processing operations.

Method of Use

For treating 1 ton of cotton, dissolve 1 kg of Tempanil-powder in 10 litres of soft water* and add this to 40 litres of soft water* containing 0.50kg of Tempanil Liquid.

Cover the sprayed cotton with a polythene sheet and allow to stand for 12-18 hours during which the honeydew would get converted to chemicals with no sticky characteristics. After this the treated cotton may be dried to the desired extent and processed as usual.

Tempanil powder and liquid are totally harmless to cotton cellulose when employed as recommended as above.

Tempanil chemicals are mainly intended to overcome the honeydew problem without the loss of frictional properties of cotton. Hence, if seeds are present in large quantities, it is suggested that they be removed as much as possible before the spinning operations.

The chemicals used in the process do not effectively remove the "stickiness" resulting from the crushed cotton seeds. Therefore, it is essential that the ginning process is carried out in such a way that the maximum quantity of seeds are extracted, so that seed crushing with oil oozing does not create its own stickiness.

The efficiency of the process is also dependent on the uniform spraying of the chemical solution using compressed air jet sprayers gives satisfactory results.

The Tempanil process has been used on a commercial scale by nearly 400 spinning units' spread all over India. A large majority of the mills that have regularly used the Chemical have reported very satisfactory results in overcoming the problems associated with honeydew-affected cottons.

Use of Tempanil Chemicals at Ginning Stage

Tempanil Chemicals can be used in ginning factories as per suggestions given earlier. The chemicals are to be sprayed after ginning and prior to bailing. The cottons so treated have been found to be free from stickiness due to honeydew contamination in the spinning operations.

Table 1. Properties of Tempanil Treated Cottons

Character	Untreated Cotton	Tempanil Treated Cotton
Actual Count	50.52	50.67
Count CV (%)	1.42	1.02
Breaking Load (gm)	276.00	282.00
CV of Elongation	9.37	8.47
Yarn Elongation	5.56	5.86
Yarn Uniformity	10.32	10.17
R K M	22.92	24.50
Thin Places (Uster)	5.00	3.00
Thick Places (Uster)	25.00	18.00
Neps Uster	55.00	47.00
Total	**85.00**	**68.00**
Disturbing Faults	0.94	0.80
Drafting Faults	68.40	55.13
H I Faults	3.20	2.30
Total Faults	**72.54**	**58.23**
Actual TPI	24.10	24.00
No. Breaks/100 Spindle Hour	2.10	1.60
No. Wrappings around back draught rollers	16	4