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Delinting and Treating Seed of Cotton: A Preventive Measure for Insect and Diseases - Part I

EXPERT'S Column



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Shri. Satpal Singh is working as Technical Assistant (T-3) at ICAR-CICR, Sirsa (Haryana) and currently attached to the Principal Scientist (Entomology). He has experience in laboratory rearing, identification as well as observations of various insect pest and damage symptoms in cotton crop.

In the North Zone of India (Haryana, Punjab and Rajasthan), cotton is the main cash Kharif crop. Cotton was sown in an estimated 16.39 lakh hectares in the North Zone during 2022-2023 and total estimated production was 42.34 lakh bales (170 kg in one bale). In the North Zone, mainly two species of cotton are planted namely *Gossypium hirsutum* (Narma) and *Gossypium arboreum* (desi cotton). The majority of area under cotton is occupied by *hirsutum* genotypes in the North Zone where BG-II hybrids, already treated are cultivated. As indigenous/Desi or *arboreum* cotton is comparatively tolerant to sucking pests and has not been reported with Cotton Leaf Curl Virus Disease (CLCuD) so far. In the last few years, seed cotton of *arboreum* cotton has fetched higher market price as compared to American/*hirsutum* cotton. Additionally, numbers of irrigations required are less in *arboreum* cotton than in American cotton. So these factors are pushing farmers towards *arboreum* cotton. Seed of conventional *hirsutum* genotypes (Non-Bt) and *arboreum* cotton are not available in the market so easily and farmers have to put in extra efforts to procure these seeds. The farmers can produce and process the seeds of both *arboreum* and *hirsutum* cotton for their domestic as well as commercial use.

That's why complete knowledge of seed production technology, cleaning, de-linting and seed treatment should be with farmers. Seed processing requires two steps of production (I) de-linting (II) seed treatment. Traditional seed delinting has been taken over by acid delinting. Acid de-linting of seed and seed treatment both facilitate better germination vis-a-vis plant stand and protection against insect-pest, but definitely requires skillful handling.

(I): Seed Delinting :

(i) Traditional method of seed de-linting: In this method, farmers can separate the lint from the seed by mixing fuzzy cotton seeds in moist soil, ash, or cow dung and slowly rubbing and crushing the seed to detach the fuzz. Through this method, the lint is not properly removed from the seed. However, some portion of the fuzz is removed for further use.

(ii) Acid delinting: Properly managed acid delinting can improve the overall germination and proper crop establishment, but it requires precision to avoid compromising seed quality

and viability. Acid delinting involves treating the seeds with strong acids, typically sulfuric acid, which can lead to the degradation of the seed coat that can result in physical damage to the seeds, making them more vulnerable to pathogens and reducing their overall quality. Another significant concern with acid delinting is its potential negative impact on seed germination. Prolonged exposure to acid or improper acid concentration may harm the embryo within the seed, affecting its ability to sprout and grow into a healthy plant; and can lead to overall reduced seed longevity and vigour. Seeds that have been severely damaged may not germinate at all, leading to a loss in seed quality and potential crop yield. The detailed acid delinting process is described below.

(1) Delinting of Fuzzy Seeds

Materials required for delinting of seeds:

1. Fuzzy or fibrous seeds (quantity to be processed), 2. Sulphuric acid, 3. Plastic gloves, 4. Plastic buckets, 5. Sodium bicarbonate, 6. Wooden sticks, 7. Plastic sieve

(A) Methodology of Acid Delinting

To obtain good germination of seeds of *arboreum* or *hirsutum* cotton and to protect them from seed-borne diseases as well as early stage insect-pests, it is highly essential to delint the seeds. Add 1 kg of fuzzy seeds in a plastic container and mix with 100 grams of sulphuric acid and stir vigorously for 2-3 minutes with a wooden stick. As soon as cotton lint starts turning brown and fuzz separates from the seeds, add 10 litres of water to it and stir it well and pour the seeds in the plastic sieve to separate seeds from the water. During this process wash the seeds 2-3 times with water frequently, to get rid of acid residue on the seeds. After washing with water and to neutralise the acidic effects, seeds should be washed with sodium bicarbonate solution (dissolve 12.5 g sodium bicarbonate in 2.5 litres of water) for 1 minute.

Finally, wash the seeds once again and separate the half-matured, damaged broken seeds floating on water. Spread the cleaned seed in the shade to dry and retain optimum moisture. Store dried seed in proper packing at optimum temperature, air, light and moisture or use directly for sowing after essential seed treatment for insects and pests.

(to be continued...)

MB.PA Chairman and Japanese Team Visit CAI

Mr. Rajiv Jalota, Chairman, Mumbai Port Authority (Mb. PA) accompanied by Mr. Kaneko Toshihiro, Chief Counsel General of Japan in India, Mr. Hajime Kito, Director, Mitsubishi Corporation India Pvt. Ltd., Mr. Yasushi Funatsumaru, Director Head, Mumbai, Sojitz India Pvt. Ltd., Mr. Mehool N. Bhuvra, President, the Indo Japanese Association and Mb. PA team visited Cotton Association of India (CAI) on Tuesday, the 28th November 2023 and met Mr. Atul S. Ganatra and other board members.

The purpose of the meeting was to discuss the possibility of the Japanese team developing the entire strip opposite Cotton Exchange building on the northern side and the area in possession of Air Force into a Japanese garden. The possibility to develop the dilapidated building of Japan Cotton Co. Ltd. into a museum to showcase the nexus between Japanese cotton merchants with this area, Japanese art and culture was also discussed.

It was proposed to constitute a Joint Management Team consisting of Mb. PA officials, CAI and Japanese representatives. Mr. Rathod an officer from Mb. PA, has been assigned to coordinate in this matter with all concerned.

Mr. Kaneko Toshihiro traced the history of Japanese cotton merchants trading at Cotton Green and showed interest in associating with the beautification drive. The Japanese team also indicated that several Japanese companies located in India might be interested in contributing for this project provided their contributions are treated as CSR contributions.



Sr. No.	Parameters	Grade				Staple				Micronaire	
		Premium		Discounts		Premium		Discounts		Micronaire	Discount
		Grade	Premium Amount	Grade	Discount Amount	Staple	Premium Amount	Staple	Discount Amount		
8	P/H/R (U)	Superfine	+1000	Fully Good	-1000			26	-1000	3.0 - 3.2	-800
	ICS-105										
	(Staple length 27mm)										
	Micronaire 3.5 - 4.9	Extra S. Fine	N.A.	Good	-1300					3.3 - 3.4	-400
	(Grade : Fine) Trash - 4% Strength/GPT 26				(1.99)						(0.61)
9	M/M(P) /SA/TL/G ICS-105	Superfine	N.A.	Fully Good	-500	28	+1200			2.7 - 2.9	-500
	(Staple length 27mm)										
	Micronaire 3.0 - 3.4				(0.76)		(1.84)				(0.76)
	(Grade: Fine)	Extra S. Fine	N.A.	Good	-700						
	Trash - 4% Strength/GPT 25				(1.07)						
10	M/M(P)/SA/TL	Superfine	+500	Fully Good	-600						
	ICS-105										
	(Staple length 27mm)										
	Micronaire 3.5 - 4.9	Extra S. Fine	N.A.	Good	-800						
	(Grade:Fine) Trash - 3.5% Strength/GPT 26				(1.22)						
11	P/H/R (U)	Superfine	+1000	Fully Good	-1000	29	N.A.			3.0 - 3.2	-800
	ICS-105										
	(Staple length 28mm)										(1.22)
	Micronaire 3.5 - 4.9	Extra S. Fine	N.A.	Good	-1300					3.3 - 3.4	-400
	(Grade:Fine)				(1.99)						(0.61)
	Trash - 4% Strength/GPT 27										
12	M/M(P)	Superfine	+700	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 28mm)										(1.84)
	Micronaire 3.7 - 4.5	Extra S. Fine	N.A.	Good	-1000 (1.53)					3.3 - 3.4	-800 (1.22)
	(Grade:Fine) Trash - 3.5% Strength/GPT 27								3.5 - 3.6	-400 (0.61)	
13	SA/TL/K	Superfine	+700	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 28mm)										(1.84)
	Micronaire 3.7 - 4.5	Extra S. Fine	N.A.	Good	-1000 (1.53)					3.3 - 3.4	-800 (1.22)
	(Grade:Fine) Trash - 3.5% Strength/GPT 27								3.5 - 3.6	-400 (0.61)	
14	GUJ	Superfine	+700	Fully Good	-700			27	-1200	3.0 - 3.2	-1200
	ICS-105										
	(Staple length 28mm)										(1.84)
	Micronaire 3.7 - 4.5	Extra S. Fine	N.A.	Good	-1000 (1.53)					3.3 - 3.4	-800 (1.22)
	(Grade:Fine)										
	Trash - 3% Strength/GPT 27								3.5 - 3.6	-400 (0.61)	
15	R (L)	Superfine	+1000	Fully Good	-1100			28	-1000	3.0 - 3.2	-1200
	ICS-105										
	(Staple length 29mm)										(1.84)
	Micronaire 3.7 - 4.5	Extra S. Fine	N.A.	Good	-1300					3.3 - 3.4	-800 (1.22)
	(Grade:Fine)										
	Trash - 3.5% Strength/GPT 28				(1.99)				3.5 - 3.6	-400 (0.61)	

Sr. No.	Parameters	Grade				Staple				Micronaire	
		Premium		Discounts		Premium		Discounts		Micronaire	Discount
		Grade	Premium Amount	Grade	Discount Amount	Staple	Premium Amount	Staple	Discount Amount		
16	M/M(P)	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 29mm)										
	Micronaire 3.7 - 4.5										
	(Grade:Fine)	Extra S. Fine	+800	Good	-1000					3.3 - 3.4	-800 (1.22)
Trash-3.5%Strength/GPT28		(1.22)		(1.53)					3.5 - 3.6	-400 (0.61)	
17	SA/TL/K	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 29mm)										
	Micronaire 3.7 - 4.5	Extra S. Fine	+800 (1.22)	Good	-1000 (1.53)					3.3 - 3.4	-800 (1.22)
	(Grade:Fine)										
Trash - 3% Strength/GPT 28									3.5 - 3.6	-400 (0.61)	
18	GUJ	Superfine	+500	Fully Good	-700	30	+700			3.0 - 3.2	-1200
	ICS-105										
	(Staple length 29mm)										
	Micronaire 3.7 - 4.5										
	(Grade:Fine)	Extra S. Fine	+800 (1.22)	Good	-1000 (1.53)					3.3 - 3.4	-800 (1.22)
Trash - 3% Strength/GPT 28									3.5 - 3.6	-400 (0.61)	
19	M/M(P)	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 30mm)										
	Micronaire 3.7 - 4.5	Extra S. Fine	+800	Good	-1000					3.3 - 3.4	-800 (1.22)
	(Grade:Fine)										
Trash-3.5%Strength/GPT29		(1.22)		(1.53)					3.5 - 3.6	-400 (0.61)	
20	SA/TL/K/O	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 30mm)										
	Micronaire 3.7 - 4.5										
	(Grade:Fine)	Extra S. Fine	+800	Good	-1000					3.3 - 3.4	-800 (1.22)
Trash - 3% Strength/GPT 29		(1.22)		(1.53)					3.5 - 3.6	-400 (0.61)	
21	M/M(P)	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 31mm)										
	Micronaire 3.7 - 4.5	Extra S. Fine	+800	Good	-1000					3.3 - 3.4	-800 (1.22)
	(Grade : Fine) Trash - 3% Strength/GPT 30										
		(1.22)		(1.53)					3.5 - 3.6	-400 (0.61)	
22	SA/TL/K/IN/O	Superfine	+500	Fully Good	-700					3.0 - 3.2	-1200
	ICS-105										
	(Staple length 31mm)										
	Micronaire 3.7 - 4.5	Extra S. Fine	+800	Good	-1000					3.3 - 3.4	-800 (1.22)
	(Grade : Fine) Trash - 3% Strength/GPT 30										
		(1.22)		(1.53)					3.5 - 3.6	-400 (0.61)	

Sr. No.	Parameters	Grade				Staple				Micronaire	
		Premium		Discounts		Premium		Discounts		Micronaire	Discount
		Grade	Premium Amount	Grade	Discount Amount	Staple	Premium Amount	Staple	Discount Amount		
23	SA/TL/K/TN/O	Superfine	N.A.	Fully Good	N.A.			31	N.A.	3.0 - 3.2	N.A.
	ICS-106										
	(Staple length 32mm)										
	Micronaire 3.5 - 4.2	Extra S. Fine	N.A.	Good	N.A.					3.3 - 3.4	N.A.
	(Grade : Fine) Trash - 3% Strength/GPT 31										
24	M/M(P)	Superfine	+1200	Fully Good	-1000	35	+1000	33	-1500	2.5 - 2.7	-700
	ICS-107										
	(Staple length 34mm)		(1.84)		(1.53)		(1.53)		(2.29)		(1.07)
	Micronaire 2.8 - 3.7	Extra S. Fine	N.A.	Good	-1500	36	+2500				
	(Grade : Fine) Trash - 4% Strength/GPT 33				(2.29)	(3.82)					
25	K/TN	Superfine	+1200	Fully Good	-1000	35	+1000	33	-1500	2.5 - 2.7	-700
	ICS-107										
	(Staple length 34mm)		(1.84)		(1.53)		(1.53)		(2.29)		(1.07)
	Micronaire 2.8 - 3.7	Extra S. Fine	N.A.	Good	-1500	36	+2500				
	(Grade : Fine) Trash - 3.5% Strength/GPT 34				(2.29)	(3.82)					
26	M/M(P)	Superfine	+1200	Fully Good	-1000	36	+1500	34	-1000	2.5 - 2.7	-700
	ICS-107										
	(Staple length 35mm)		(1.84)		(1.53)		(2.29)		(1.53)		(1.07)
	Micronaire 2.8 - 3.7	Extra S. Fine	N.A.	Good	-1500						
	(Grade : Fine) Trash - 4% Strength/GPT 35				(2.29)						
27	K/TN	Superfine	+1200	Fully Good	-1000	36	+1500	34	-1000	2.5 - 2.7	-700
	ICS-107										
	(Staple length 35mm)		(1.84)		(1.53)		(2.29)		(1.53)		(1.07)
	Micronaire 2.8 - 3.7	Extra S. Fine	N.A.	Good	-1500						
	(Grade : Fine) Trash - 3.5% Strength/GPT 35				(2.29)						

Conversion factor – 653.62 based on the RBI closing exchange rate of 1 US \$ = Rs.83.37 prevailing on 24th November 2023

Figures in bracket denotes value difference in Cents per Lb.

Note :

- (1) These Value Differences are applicable to domestic trade.
- (2) The above differences are merely indicative in nature. Cotton Association of India gives no warranty as to the accuracy or completeness of information contained herein and accepts no legal responsibility howsoever arising in relation to such information.
- (3) Premium and Discount mentioned in Indian Rupees above will remain constant for one month whereas the same mentioned in Cents per Lb. will vary as per the exchange rate fixed by the Reserve Bank of India.

UPCOUNTRY SPOT RATES								(Rs./Qtl)					
Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]								Spot Rate (Upcountry) 2022-23 Crop December 2023					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Gravimetric Trash	Strength /GPT	11th	12th	13th	14th	15th	16th
3	GUJ	ICS-102	Fine	22mm	4.0 – 6.0	13%	20	12795 (45500)	12654 (45000)	12513 (44500)	12457 (44300)	12401 (44100)	12373 (44000)
4	KAR	ICS-103	Fine	22mm	4.5 – 6.0	6%	21	14088 (50100)	14004 (49800)	13919 (49500)	13863 (49300)	13779 (49000)	13751 (48900)
								Spot Rate (Upcountry) 2023-24 Crop					
1	P/H/R	ICS-101	Fine	Below 22mm	5.0 – 7.0	4%	15	13554 (48200)	13498 (48000)	13498 (48000)	13498 (48000)	13385 (47600)	13329 (47400)
2	P/H/R (SG)	ICS-201	Fine	Below 22mm	5.0 – 7.0	4.5%	15	13694 (48700)	13638 (48500)	13638 (48500)	13638 (48500)	13526 (48100)	13469 (47900)
5	M/M (P)	ICS-104	Fine	23mm	4.5 – 7.0	4%	22	15072 (53600)	15044 (53500)	14988 (53300)	14988 (53300)	14932 (53100)	14904 (53000)
6	P/H/R(U) (SG)	ICS-202	Fine	27mm	3.5 – 4.9	4.5%	26	14229 (50600)	14201 (50500)	14201 (50500)	14201 (50500)	14257 (50700)	14229 (50600)
7	M/M(P)/SA/TL	ICS-105	Fine	26mm	3.0 – 3.4	4%	25	-	-	-	-	-	-
8	P/H/R(U)	ICS-105	Fine	27mm	3.5 – 4.9	4%	26	14369 (51100)	14341 (51000)	14341 (51000)	14341 (51000)	14397 (51200)	14369 (51100)
9	M/M(P)/SA/TL/G	ICS-105	Fine	27mm	3.0 – 3.4	4%	25	14341 (51000)	14341 (51000)	14341 (51000)	14341 (51000)	14341 (51000)	14313 (50900)
10	M/M(P)/SA/TL	ICS-105	Fine	27mm	3.5 – 4.9	3.5%	26	14904 (53000)	14847 (52800)	14763 (52500)	14763 (52500)	14679 (52200)	14650 (52100)
11	P/H/R(U)	ICS-105	Fine	28mm	3.5 – 4.9	4%	27	14538 (51700)	14510 (51600)	14510 (51600)	14510 (51600)	14566 (51800)	14538 (51700)
12	M/M(P)	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	15325 (54500)	15213 (54100)	15185 (54000)	15185 (54000)	15100 (53700)	15072 (53600)
13	SA/TL/K	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	15382 (54700)	15269 (54300)	15241 (54200)	15241 (54200)	15157 (53900)	15129 (53800)
14	GUJ	ICS-105	Fine	28mm	3.7 – 4.5	3%	27	15353 (54600)	15269 (54300)	15269 (54300)	15269 (54300)	15269 (54300)	15241 (54200)
15	R(L)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	15325 (54500)	15185 (54000)	15185 (54000)	15185 (54000)	15185 (54000)	15157 (53900)
16	M/M(P)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	15466 (55000)	15438 (54900)	15410 (54800)	15410 (54800)	15382 (54700)	15353 (54600)
17	SA/TL/K	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	15522 (55200)	15494 (55100)	15466 (55000)	15466 (55000)	15438 (54900)	15410 (54800)
18	GUJ	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	15550 (55300)	15466 (55000)	15466 (55000)	15466 (55000)	15466 (55000)	15438 (54900)
19	M/M(P)	ICS-105	Fine	30mm	3.7 – 4.5	3.5%	29	15635 (55600)	15607 (55500)	15578 (55400)	15578 (55400)	15522 (55200)	15494 (55100)
20	SA/TL/K/O	ICS-105	Fine	30mm	3.7 – 4.5	3%	29	15691 (55800)	15663 (55700)	15635 (55600)	15635 (55600)	15578 (55400)	15550 (55300)
21	M/M(P)	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	15832 (56300)	15803 (56200)	15775 (56100)	15775 (56100)	15747 (56000)	15719 (55900)
22	SA/TL/K/TN/O	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	15888 (56500)	15860 (56400)	15832 (56300)	15832 (56300)	15803 (56200)	15775 (56100)
23	SA/TL/K/TN/O	ICS-106	Fine	32mm	3.5 – 4.2	3%	31	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
24	M/M(P)	ICS-107	Fine	34mm	2.8 - 3.7	4%	33	20837 (74100)	20752 (73800)	20752 (73800)	20752 (73800)	20752 (73800)	20752 (73800)
25	K/TN	ICS-107	Fine	34mm	2.8 - 3.7	3.5%	34	21118 (75100)	21034 (74800)	21034 (74800)	21034 (74800)	21034 (74800)	21034 (74800)
26	M/M(P)	ICS-107	Fine	35mm	2.8 - 3.7	4%	35	21259 (75600)	21174 (75300)	21174 (75300)	21174 (75300)	21174 (75300)	21174 (75300)
27	K/TN	ICS-107	Fine	35mm	2.8 - 3.7	3.5%	35	21399 (76100)	21315 (75800)	21315 (75800)	21315 (75800)	21315 (75800)	21315 (75800)

(Note: Figures in bracket indicate prices in Rs./Candy)