



Mechanized Picking: The Key to Profitable Cotton Farming



R. Raja
S. Manickam
G. Tamil Amutham
A.H. Prakash
V.N. Waghmare

ICAR - CENTRAL INSTITUTE FOR COTTON RESEARCH
Regional Station, Coimbatore - 641003, Tamil Nadu

Introduction

- Cotton cultivation in India requires full mechanization from sowing to harvesting to address rising labour costs and shortage of timely labour, especially during peak harvest season.
- While sowing, spraying, and intercultural operations are partially mechanized, manual cotton harvesting remains a major cost and labour-intensive activity.



- Mechanical cotton picking is essential for improving efficiency, reducing delays, lowering production costs, and maintaining fibre quality.
- The ICAR-Central Institute for Cotton Research (CICR) has developed and demonstrated a complete mechanization package using High Density Planting System (HDPS) suitable for machine picking.
- At CICR Coimbatore, cotton variety Suraksha was grown under HDPS (90 x 10 cm spacing) over one hectare and all the operations were carried out using machines viz., land preparation, precision planting with pneumatic planter, drip irrigation, spraying with boom sprayer and drone sprayer for agrochemical application and tractor based intercultural operations.
- The seed cotton was harvested using two row spindle type machine picker.

Plate 1. Precision sowing through pneumatic planter



Plate 2. Mechanized intercultural operations



Plate 3. Cotton crop canopy management through spraying of Mepiquat Chloride



Preparing the crop for machine picking

- To prepare the crop for machine harvesting, defoliant developed by ICAR-CICR was sprayed when the crop was 140 days old and desired level of boll opening and defoliation was achieved.

Plate 4. Spraying of ICAR-CICR defoliant



Plate 5. HDPS cotton crop three days after defoliant spraying (leaf shedding and boll opening)



Plate 6. HDPS cotton crop five days after defoliant spraying



Plate 7. HDPS cotton crop ready for machine picking



Harvesting

- Spindle type two row picker (Shaktiman Cotton Master 1437) was used for harvesting the prepared crop.
- The picker can complete picking of cotton in one acre field within 45 minutes. It can harvest about 12-15 acres per day.

Plate 8. Shaktiman Cotton Master 1437 two row spindle picker





Trash content analysis

- The machine picked seed cotton samples were analyzed for trash content at Ginning Training Centre, ICAR-CIRCOT, Nagpur.
- The total trash content in the harvested kapas ranged from 8.96 to 12.44% on seed cotton basis. The details of the trash content are presented in Table 1.

Conclusion

- Mechanized picking of cotton is no longer a luxury but a necessity for ensuring the economic viability of cotton farming in India.
- It addresses labour constraints, reduces harvesting costs, and improves fibre quality—critical for enhancing competitiveness in both domestic and international markets.
- With a focused approach toward breeding, machinery development, capacity building, and institutional support, India can bridge the current gaps and transition toward a more modern, efficient, and sustainable cotton production system.

Table 1. Trash content of machine picked cotton samples

Sample details	Seed cotton (g)	Lint (g)	Cotton seed (g)	Trash by manual separation				Trash by Trash Analyzer			Total Trash
				Bracts / burrs	Sticks	Leaves (green/dry)	Total trash	Wt. of trash	Cotton + trash	Total Trash	
Raw Cotton basis R1	300	103.5	174.5	6.27	1.61	10.67	18.55	6.93	1.26	8.19	26.74
				(%)	0.54	3.6	6.23	2.31	0.42	2.73	8.96
R1 - Lint basis (103.5g)				6.05	1.55	10.30	17.9	6.7	1.2	7.91	25.81
				(%)	1.80	17.41	28.88	6.43	1.4	7.8	36.68
Raw Cotton basis R2	300	100.2	167.7	9.67	0.6	5.8	9.62	2.14	0.45	2.6	12.22
				(%)	1.79	17.34	28.76	6.41	1.4	7.8	36.56
R2 - Lint Basis (100.2 g)				9.65	2.34	16.93	29.53	6.08	1.34	7.42	36.95
				(%)	0.78	5.64	9.84	2.02	0.45	1.6	12.44
Raw Cotton basis R3	300	99.8	168.0	3.42	2.3	16.9	29.48	6.1	1.34	7.43	36.91
				(%)	10.3	2.3	29.48	6.1	1.34	7.43	36.91
R3 - Lint Basis (99.8 g)				10.3	2.3	16.9	29.48	6.1	1.34	7.43	36.91
				(%)	2.3	16.9	29.48	6.1	1.34	7.43	36.91



Contact Us

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Regional Station, Coimbatore - 641003, Tamil Nadu

 +91 422 243 0045  cicrcbe@gmail.com  www.cicr.org.in