

TMC MM I.7 : Development of cotton picking machinery for small scale cotton production systems.

Lead Centre :	CICR, Nagpur
Cooperating centres	CIAE, Bhopal; PDKV, Akola; GTC, CIRCOT, Nagpur; PAU, Ludhiana

Introduction

At present, cotton in India, whether it is rainfed or irrigated, is entirely hand picked by humans. Manual picking is not only tedious hard work but also costlier than other agricultural operations. In recent years it has been observed that labour shortages appear during peak periods of cotton harvesting. The use of mechanical picking machine is, therefore, considered necessary in minimizing drudgery involved in hand picking as well as enhancing production of cleaner grade of seed cotton. The mechanical cotton picking system will also be helpful in achieving timeliness of operation for the next crop. Manual picking is not only tedious hardwork but also costlier than other agricultural operations. Manual picking of cotton requires around 465 labour-hours per hectare. Due to non-availability of labourers in time, cotton picking get delayed causing around 15 per cent field loss and affecting the overall quality of cotton lint. The change in weather forces the farmers to harvest cotton quickly and non-availability of labour and less available time makes it expensive & complex.

The cost of operation of the commercial spindle type cotton picker is estimated to be Rs.6000/ha leading to cost per kg of seed cotton to be Rs.6 against the cost of manual picking of Rs.5 per kg of seed cotton. However, considering the constraint of availability of labourers during peak season, the adoption of mechanical cotton picking is necessary. The use of mechanical picking machine is, therefore, considered necessary in minimizing drudgery involved in hand picking as well as enhancing production of cleaner grade of seed cotton.

Limitations of the commercial cotton pickers are their huge size and power requirement catering to very large farms. The cost of operation is high because of the large initial cost of these imported cotton pickers. Use of such sophisticated equipment also needs trained manpower coupled with repair and maintenance facilities at village level especially in case of available cotton harvesting systems. Often spares are not available within reach. Under these situations it is necessary that suitable pickers using alternative designs be developed to meet the Indian cotton challenges.

As the High Density Planting System (HDPS) is gaining popularity in India, due to its obvious advantages, a Cotton Stripper machine will be required for harvesting of crop, so closely spaced that available Spindle Type cotton pickers would not be able to operate within the rows.

Objectives

- To design and develop small scale cotton pickers to enhance the rate of cotton picking, suitable for small farm sizes and multiplicity of genotypes, and available power sources, under Indian conditions.
- To design and develop small scale cotton strippers for harvesting of cotton planted under High Density Planting System (HDPS).
- To work out a viable solution for on-board cleaning of the machine stripped trashy cotton.

Technical programme

S.No.	Activities	Cooperating centres
1.	Design and development and prototype fabrication of cotton stripper for high density planting system (HDPS) (or Ultra narrow row, UNR) in cotton	CICR, Nagpur CIAE, Bhopal PAU, Ludhiana
2.	Design and development of alternate ways of harvesting cotton	CICR, Nagpur CIAE, Bhopal
3.	Modification, Refinement and evaluation of Sensor based intelligent spindle type cotton picker	PDKV, Akola
4.	Design, development, evaluation and refinement of pre-cleaners for machine picked and stripped cotton	CIRCOT (GTC), Nagpur



Time frame

Sr. No.	Activity	Time frame									
		2012-13		2013-14		2014-15		2015-16		2016-17	
		I	II	I	II	I	II	I	II	I	II
1.	Design and development and prototype fabrication of cotton stripper for high density planting system (HDPS) (or Ultra narrow row, UNR) in cotton										
2.	Design and development of alternate ways of harvesting cotton										
3.	Modification, Refinement and evaluation of Sensor based intelligent spindle type cotton picker										
4.	Design, development, evaluation and refinement of pre-cleaners for machine picked and stripped cotton										

Output

- Cotton stripper machine for harvesting of ultra- narrow -row cotton and HDPS.
- Cotton harvesting machine using simple concepts suitable for Indian conditions
- Implements for cotton cultivation under narrow rows
- Identification of modification needs in the developed prototypes

