

Cotton Harvesting Technologies

**Rohit Nalawade¹,
Shital Sonawane^{2*},
Mohit Kumar³**

¹PhD Research Scholar, College of Technology and Engineering, Maharana Pratap University Agriculture and Technology, Udaipur (Raj).

², PhD Research Scholar, ICAR-Central Institute of Agricultural Engineering, Nabi Bagh Bhopal (MP).

³PhD Scholar Indian Agriculture Research Institute, ICAR-110012



*Corresponding Author
Shital Sonawane*

Article History

Received: 4. 06.2022

Revised: 8. 06.2022

Accepted: 14. 06.2022

This article is published under the terms of the [Creative Commons Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

Cotton has traditionally been one of India's most important crops, and it continues to play a significant role in the social and economic elements of the country till this day. India is the world's largest producer of cotton, as well as the second largest exporter and consumer of the crop. In India, farmers often pick two to five times before the crop is ready to be harvested. The first three pickings are predicted to yield 85 percent of the seed cotton, and subsequent pickings, even with manual labour, may not be cost-effective.

Cotton picking is time-consuming and expensive, costing ten times as much as watering and twice as much as weeding. Cotton picking is time-consuming and expensive, costing ten times as much as watering and twice as much as weeding. Picking costs account for 30 to 35 percent of the entire cultivation cost. Availability of cotton harvesting workers becomes even more rare during peak season.



Mechanical picking will also enhance the production of cleaner grade of seed cotton. Further, mechanical cotton-picking system will also be helpful in achieving timeliness of operation, for the next crop.

There are two type of mechanical harvesting equipment popularly known as:

1. Cotton Pickers
2. Cotton Strippers

Both these types of machines require the cotton variety with compact sympodial or semi-sympodial plants with synchronized ball opening.

Cotton Pickers

The cotton picker works similarly to a hand picker, removing only the seed cotton from the plant. Cotton pickers are classified in four

ways. They are categorized based on mounting methods, number of harvested rows, height of picking drums, and spindle type. A tractor-mounted machine or a self-propelled equipment with one or two rows can be used. The cotton seed is taken from open bolls with this machine, while the green and unopened bolls are left on the plant to grow for later harvest. A mechanical picker is made up of a device that guides cotton plants into the machine, a mechanism that removes cotton seed from open bolls, a transporting system for selected cotton, and a storage basket. These devices should be able to harvest mature cotton with minimal waste and without harming the fiber plant or unopened bolls. Cotton types with high yields, long fibers, and open bolls are defoliated before the first harvest.



Cotton strippers

Machines for stripping cotton are "once-over" machines. The stripper removes all bolls from the plant in one pass, whether they are open or closed. Plants are stripped by forcing them through a space that is too small for the bolls to pass through. While the snapped bolls are collected in the machine, the plants in the row stay in place. The plant is pushed upward and forward when the bolls are removed. Because the root system must counteract this force, the plants must be firmly anchored in the row. As a result, stripper harvesting is usually

postponed until the plants have shed their leaves. Chemical defoliant are sometimes used to speed up the stripping process. Semi-dwarf plants with relatively short fruiting, short-nodded branches, storm-resistant bolls borne singly but with sufficiently fluffy locks for good extraction (stripping), and medium-sized boll-stem are ideal for this sort of machine. Cotton recovery is limited and field losses are high when a variety that produces a broad plant with multiple vegetative and fruiting branches is stripped.



For stripping harvesting, a plant population of 75-125 thousand plants per hectare in 1.2 m rows is typically recommended. Brush-type and finger-type strippers are currently available. Cotton is transported from stripping units using three different methods: finger-beater rolls, augers, and air. With finger-type strippers, finger-beater rolls are employed. Brush-type strippers work well with auger-type conveyers. Especially if rotating beater conveyers are used, much dirt and garbage can be filtered out of the cotton through holes in the housing beneath the conveyers. With an upward-moving air stream, strippers can separate ripe cotton from the heavier, unopened green bolls. The harvested cotton is pneumatically transported to the harvester's storage basket. The green bolls fall from the air stream into a container, where they are thrown onto the turn row in the hopes of being salvaged later.

Performance of mechanical cotton strippers:

- There are many factors such as plant characteristics, cultural practices etc affects the performance of all types of mechanical cotton strippers.
- The desirable plant type for cotton stripper is one which has relatively short-node fruiting branches 20-25 cm in length, less in height and has a stormy-resistant boll.

- The locks of stormy-resistant-type cotton are usually not very fluffy and are held tightly in the soil.
- Fluffy and loosely attached locks are easily caught and held between limbs and thus are pulled through the stripping space and lost.
- Every effort should be made to keep the field free of weeds, grass and vines.
- Pieces of grass collected with cotton are difficult to remove and if present in excess reduce the quality of cotton lint.

CONCLUSION

Cotton is mostly picked manually in most of the developing countries. In advanced countries like USA, Australia, Brazil and Russia, cotton picking is carried out mechanically by cotton pickers (the most commonly used machines) or cotton strippers. In India the cotton harvesting is still done manually due to expensive and less efficient machinery. The majority of Indian farmers are small and marginal thus, the available machineries are not affordable for them. Further, the efficiencies of the available machineries are low due to lack of suitability to the Indian cotton varieties in terms of non-uniform maturity of cotton bolls.