

Theme 7: Precision based cotton farming with mechanical harvesting

7.1 Project Name: Evaluation and refinement of spindle type header prototype and development of a cotton picker

Er. G. Majumdar (PI); Co-PIs- Ramakrishna G.I, Jayant Meshram, Blaise Desouza CSIR-CMERI, Durgapur, WB. Mr. E.Chandrasekar, Mr. Sanjay Hansdah

Importance of the study: Manual picking accounts for 30% of cost of cultivation in India. While, in most of the western countries, machine harvest is followed. Limitations exist for the commercialization of cotton pickers available in western markets, due to their massive size and power requirements. Additionally, operation of cotton harvester needs trained workforce, and repair and maintenance facilities at the village level. Hence, there is an urgent need

to develop a small-scale cotton harvester to cater the needs of small farms in India.

Salient findings

A spindle type cotton picking head earlier developed under a DST funded project in collaboration with ICAR-CICR and CSIR-CMERI-MERADO is now being modified in collaboration with CSIR-CMERI, Durgapur. Preliminary trials of the header were taken up at CICR, Nagpur with BGII hybrid (Ankur 3028) and BG cultivar (PKV-081Bt). The cotton was planted at 90×60cm and the tractor was operated in reverse direction. In general, the trash content of machine-picked cotton was significantly higher than manually picked cotton. Ankur 3028 BGII and PKV-081 Bt had trash content of 17% and 27% (seed cotton basis), respectively, as compared to 1% in the manually picked cotton. High trash in PKV-081Bt was due to non-defoliation of the crop and a high percentage of non-separable lint with trash constituents found in machine-harvested cotton (Table 7.1.1).



Spindle head trial at ICAR-CICR

Table 7.1.1: Trash constituents of machine picked cotton

| | Hybrid | Bracts (%) | Leaves (%) | Sticks (%) | Inseparable Lint from trash (%) | Fine Trash (%) | Total Trash (%) |
|-----------------------|------------|------------|------------|------------|---------------------------------|----------------|-----------------|
| Machine Picked | PKV 081 Bt | 3.07 | 1.88 | 1.37 | 20.67 | 0.37 | 27.36 |
| | Ankur 3028 | 5.45 | 0.97 | 1.0 | 9.08 | 0.84 | 17.37 |
| Manual | Ankur 3028 | - | 0.17 | 0.01 | 0.67 | - | 0.85 |