

Influence of spindle material and surface texture on time taken for picking cotton under variable conditions

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■ **ABSTRACT** : Cotton harvesting is done by hand picking in India. Manual picking is not only tedious and labour consuming but also costlier than other agricultural operations. The use of machines for picking is, therefore, considered to be viable in minimizing the drudgery involved in hand picking and reducing the cost of cotton picking. By keeping these factors in mind, the present investigation was undertaken to study the mechanism involved in picking of cotton by the rotating spindles. The spindles were fabricated with the materials selected for the study and they were evaluated for their performance in picking cotton from bolls under laboratory conditions. The spindles were evaluated with the help of the test rig developed for the purpose and the different parameters were recorded. The time taken for picking cotton from the boll varied from 0.48 to 4.53 seconds under variable conditions for selected varieties. The time taken was minimum at the speed of 3000 rpm and maximum at 1000 rpm. The time taken for picking decreased with increase in speed for all the varieties. The time taken for picking also decreased with decrease in the level of moisture content of cotton. The minimum time was taken by the tapered spindle with grooves and knurl whereas the time taken was maximum for tapered plain spindles. The laboratory trials of the spindles revealed that, the hylum spindle of tapered shape with grooves and knurl gave better performance as the time taken for picking was minimum.

■ **KEY WORDS** : Cotton picking, Picking spindles, Picking time, Spindle speed

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India ranks third in the world in production of cotton crop. Cotton is being cultivated in three distinct agro-climatic zones namely; North Zone comprising of Punjab, Haryana and Rajasthan, Central Zone comprising of Maharashtra, Gujarat and Madhya Pradesh and South Zone comprising of Tamil Nadu, Karnataka and Andhra Pradesh.

In India harvesting of cotton is done manually by hand picking. Manual picking is not only tedious and labour consuming but also costlier than other agricultural operations. In recent years it has been observed that labour availability is scarce during peak periods of cotton harvesting. The use of mechanical picking by machine is, therefore, considered to be a viable option in minimizing the drudgery involved in hand picking.

As per the available reports, the research on mechanical picking or cotton pickers are very meagre or no information is available in India. Consequently this area of research and development needs immediate attention of researchers for

development of suitable mechanical pickers. As the biological scientists are gearing up to develop suitable cotton varieties which are amenable to mechanical picking, it is necessary to develop/ identify a mechanical picker suitable for cotton crop cultivated in Indian conditions.

The cotton harvesters available at present are of two types, *i.e.*, pickers and strippers. Mechanical pickers are selective in picking and in this system the seed cotton is removed/picked from the open bolls, where as green and unopen bolls are left on the plant itself to mature for later pickings, while strippers on the other hand are once-over machines. All bolls whether open or closed are removed from the plant in a single pass. Chemical defoliant and desiccants are usually applied to facilitate harvesting.

By Keeping these factors in view, an attempt has been made to identify crop machine and operational variables which influence on the picking mechanism of the cotton pickers and to develop the picking spindles and to conduct exhaustive