

# COTTON PICKER MANAGEMENT AND HARVESTING EFFICIENCY

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With good crop and machinery management, favorable weather conditions, and good ginning practices, most cotton from the first picking should grade very good—strict low middling or better. Under these favorable conditions, a spindle-type cotton picker should put 95 percent or more of the open cotton into the basket in good condition. However, this is not always the case.

Total value of the crop can be affected by picker management. The difference between expert and average-to-poor picker management can mean as much as \$900 per day for a two-row machine.

Through proper cotton picker management and efficient harvesting practices, cotton producers can consistently keep their field losses below 5 percent. Often, losses as high as 20 percent are tolerated, and 10 percent losses are considered normal. There is no better way to increase net profits at harvest time than to reduce these harvest losses.

The condition of the cotton in the field greatly affects harvesting efficiency and the grade of the crop. Good defoliation is essential for efficient harvesting and top-graded cotton. Field preparation is also important.

## **Field Conditions**

Turnrows should be 30 feet wide. They should be firm, smooth, and free of tall grass. Grassy turnrows can cause grassy samples even if the field is clean. Field losses increase when turnrows are not wide enough to allow the machine to be lined up and operated at the correct speed as it enters the row.

It is usually better to mow turnrows than disk them. Disking makes turnrows soft after a rain

and leaves a furrow that will cause the picker drum to bobble as it enters the row.

## **Picker Condition**

A successful harvest requires a cotton picker that is in good condition. Even an old picker will do a good job if it is in good mechanical condition.

Before the harvest season begins, pickers should be checked for damaged or worn spindles, moistener pads, doffers, bearings, and bushings. If they are damaged or worn excessively, they should be replaced. The cam track should be checked for excessive wear. A worn cam track may lead to premature failure of other picker parts. Replacing the cam track is a major operation and, unless you have a specially equipped shop, should be done by your dealer or by a picker specialty shop. Keeping the machine properly lubricated and adjusted will go a long way in extending picker life and improved harvesting efficiency. Read the owner's manual for information on lubrication and adjustments you can make.

## **Adjustments**

The alignment and adjustments of spindles to moistener pads and doffers can make the difference between a poor job and a good one. Study the operator's manual carefully before making adjustments or repairs.

The moistener pad should wipe the spindle thoroughly with each turn of the picker drum, Figure 1. Each spindle should ripple the pad slightly through its entire length but should not dig into it. A wetted spindle prevents the buildup of plant juices.

Precise adjustment of the spindle to the doffer is necessary to remove cotton from the spindle with each turn. Each doffer lug should run as close as possible to the spindle without touching, Figure 2. For field use, a dollar bill has been the standard gauge for measuring the spindle-doffer clearance for years. The main purpose for maintaining the clearance is to prevent contamination of the lint with minute doffer particles and to minimize wear of the doffer pads.

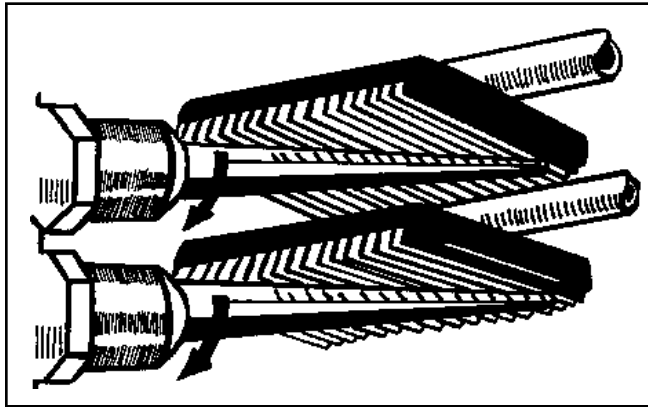


Figure 1. Moistener pad should wipe spindle thoroughly.

The vertical adjustment of each spindle bar should be checked. One bar out of adjustment can do serious damage to the doffer and cause the picker to do a poor job of harvesting. Check the clearance between the spindles and the doffer assembly for each picker bar to ensure that each bar is working in the same plane.

### Spindle Bars

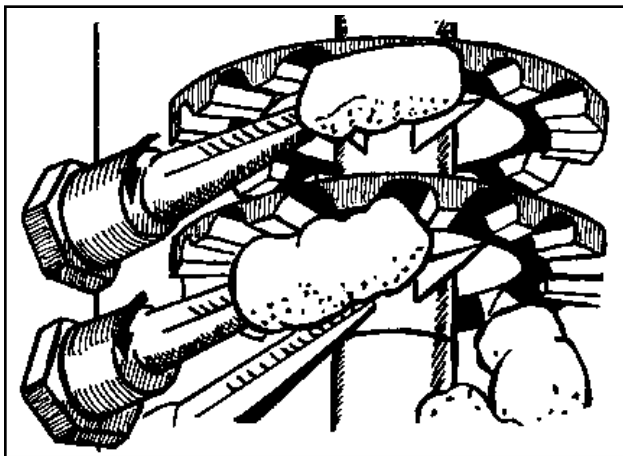


Figure 2. Each doffer lug should run as close as possible to the spindle without touching.

## Field Operation

Adjust the stalk lifter fingers on the cotton picker so that low bolls are lifted into the picking zone. Bolls should enter the unit higher than the second row of spindles. Tilt the drum so the back is 1 inch higher than the front. This will increase the exposure of the spindle to cotton and reduce dirt buildup inside the unit.

The drum speed and the ground speed should be synchronized so that the only motion between the spindle and the cotton boll is spindle rotation, Figure 3.

As the picker approaches a cotton stalk, the plant lifter should raise the bolls on the lower limbs into the picking zone. The pressure plates

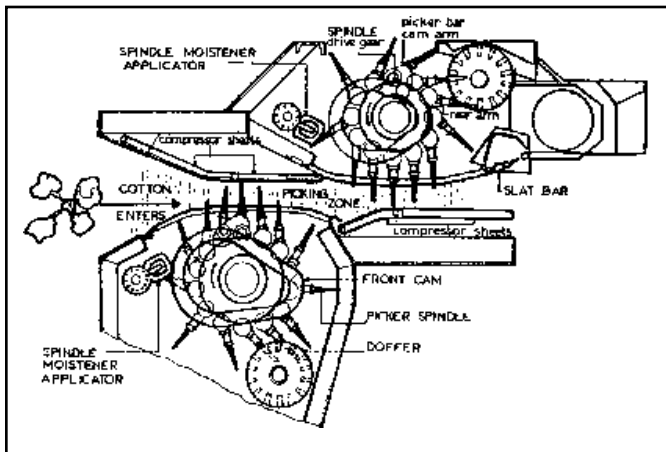


Figure 3. Top view of tapered spindle picker.

force the plant into the picking zone and hold the bolls so that the spindles can come in contact with the lint. When there are green bolls, tension should be light to medium with additional clearance to keep from stripping off the bolls. For last picking, the

tension on the pressure plates should be increased to remove all the lint from the stalk.

The spindles should be regularly checked for wear, especially the ones near the ground. Worn spindles should be replaced, Figure 4. You can easily check for excessive wear by sliding the blade of a pocket knife, perpendicular to the centerline, along the machined kerf of spindle,

Figure 5. If the blade catches on the barbs, the spindle is okay. However, if the blade does not catch on the barbs, the spindle should be replaced. The doffer assembly, stalk guides, grid bars, and pressure plates should also be checked.

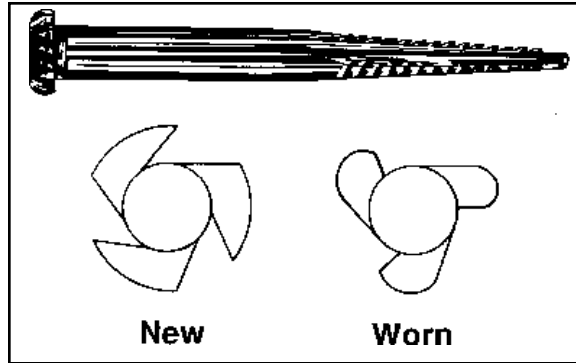


Figure 4. Cotton picker spindles.

Spindles should be kept clean to prevent plant juices from collecting on them and causing incomplete doffing and spindle twist. The first picking is most critical since plants are green-er. Spindles can gum up enough in 1 hour to lower harvesting efficiency by as much as 5 percent. This also creates severe problems with spindle twists.

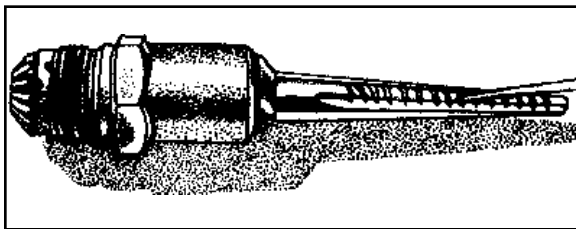


Figure 5. Use a pocket knife to check spindles for wear.

At each dump of the basket, the spindles should be checked and any twisted cotton removed. The picker head and cleaning grates should be cleaned.

Tap water is usually used in the spindle moistener system and is sufficient to keep the spindles clean. Wetting agents may be beneficial if you

have hard water or are picking with green leaves present. In some situations, spindle oils will do a better job and improve overall efficiency.

## **Lubrication**

When lubricating your picker, carefully follow the instructions in the operator's manual. Cotton can be contaminated with grease or oil if care is not taken during lubrication. The lines that carry grease from the central lubricating points to individual bearings sometimes break, causing large accumulations of grease that can get mixed with the seed cotton.

## **When To Begin Picking**

To determine when to first begin picking, consider the amount of open cotton and green leaves on the stalks. Green leaves add much moisture to the seed cotton. They also cause lint stain and gummed-up spindles. Leaves and trash can lower picker efficiency and make drying and cleaning necessary at the gin. However, if harvest is delayed, color is lost and field losses are increased.

Research shows that maximum yield and maximum value per acre can be achieved when the first picking is delayed until cotton is between 85 and 90 percent open. Total yield may be reduced greatly if picking is begun before 70 percent is open. However, there are many other factors that should be considered in each individual case.

Each morning, you must decide what time to begin picking. Harvesting cotton when it is too wet or adding too much water through the picker's moistening system can reduce the efficiency of the picker by as much as 5 percent and can cause a full grade reduction.

Regardless of how dry the weather, cotton is rarely dry enough to be harvested at night or before late in the morning, Figure 5. In the fall, humidity is usually above 90 percent in the early

morning hours. On good picking days, humidity drops to a low of 30 to 40 percent during mid-day, then begins to rise again in mid-afternoon, and usually tops 90 percent during the night.

Harvesting should be delayed until the dew has dried and relative humidity has dropped below 60 percent. At this time, lint moisture should be about 8 percent. Lint moisture above 10 percent (70 percent relative humidity) can cause serious damage to the quality of the lint.

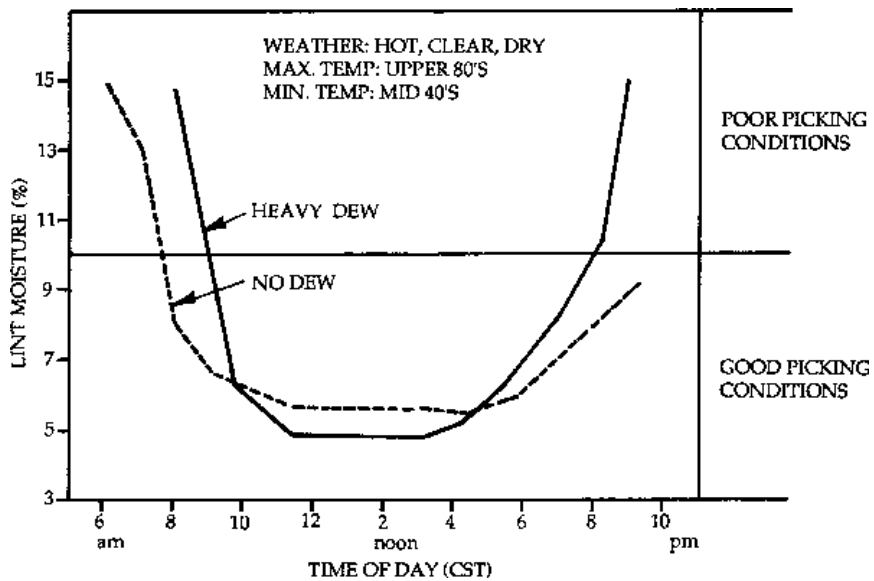


Figure 6. Lint moisture in cotton on two typical picking days.

Cotton that is picked wet is often a full grade lower than cotton picked dry. The grade difference is due to color loss during storage. Since delays during the rush season can last for days, it is important to pick cotton when it is dry. Cotton that is to be stored in modules must be dry when it is harvested.

### Moisture Problems in Storing and Ginning

Excess moisture also causes problems in storage and ginning. A wide variation in moisture

causes ginner to overdry some cotton, thereby reducing the quality. High-moisture cotton will cause gin machinery to choke up and break down, and wet cotton may cause rough lint preparation and very low grades.

Harvest dry cotton and then handle it so that it requires a minimum of drying and cleaning. If cotton must be harvested wet, keep it separated from dry cotton and tell the ginner so the temperature in the dryer can be increased. It is nearly impossible to dry and gin cotton properly if the moisture content varies widely in the same module or trailer. Good producer-ginner cooperation will conserve the natural quality of your cotton.

Adapted by Gerald Christenbury, Extension Agricultural Engineer, from Circular ANR-475, Auburn University.

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