Harvesting

Spindle Pickers and Cotton Quality

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Quality cotton starts when you select your variety and continues to require attention into textile manufacturing. Every step must be done right, but management becomes critical during defoliation, harvesting, and ginning.

Harvesting losses as high as 20 percent occur regularly, while some growers consistently keep their losses around 5 percent. The difference between expert and average-to-poor harvest management can mean as much as $1,000 per day for each two-row picker because of improved quality and harvesting efficiency. Can you afford anything less than an expert job?

Getting Pickers Ready For The Field

To do a good job, pickers must be in top condition before they go to the field. Spindle pickers are complex, close-tolerance machines, requiring sophisticated shop equipment for repairs, especially to the picking units. Most producers depend on their dealer or a specialty shop to do major picking-unit repairs.

Your best source of information is your operator's manual. Study it before you begin, and keep it handy for detailed instructions.

Safety

Read the safety section of the operator's manual before doing any maintenance or operating a picker. Go over safety procedures with operators at the beginning of the harvest season and periodically during the season.

Wear close-fitting clothing and stay alert any time that you are working around a cotton picker. Disengage the power and shut off the engine before you put any part of your body where it could contact moving parts.

Put blocks under the picking units on old pickers or engage the mechanical safety stops on the cylinder rods on newer models before you work under a picking unit.

Drive the picker slowly on rough ground, particularly when turning with a full basket. Never move the picker with the basket raised. Do not dump on a sloping area or near electrical wires.

Keep the engine area and picking units free of trash or cotton which could catch fire. If you discover a fire in the basket, dump the cotton on the ground immediately. Do not attempt to put out a fire in the picker basket. Always carry a fire extinguisher.

Pre-Season Maintenance

Begin preseason maintenance by cleaning the units with a high-pressure washer for easy inspection and servicing. Make sure the drive belts and universal joints in the drive train to the heads are in good condition.

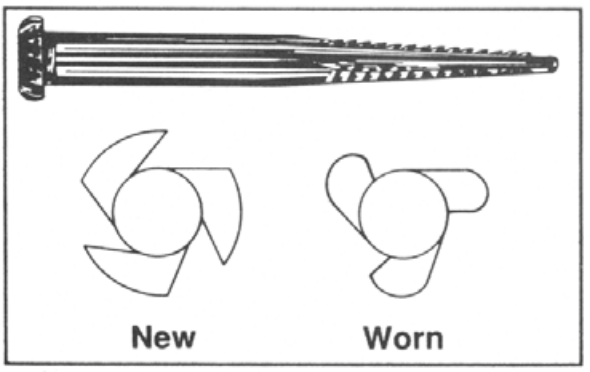

Figure 1. Cotton picker spindles

Check the spindles to make sure they are sharp and free of rust, especially the lower rows. Replace any that are worn or damaged (see figure 1). Make sure all the spindles turn when the unit is operating.

The alignment and adjustment of spindles to moistener pads and doffers can make a lot of difference. The moistener pad should wipe each spindle thoroughly (Figure 2). As the unit operates, spindles should ripple the pads slightly but should not dig into them.

Check the flow of moistening fluid to each pad. If a pad is not getting moisture, check the nozzle and the corresponding supply line. Your operator's manual will show how to regulate the flow and check for specific problems.

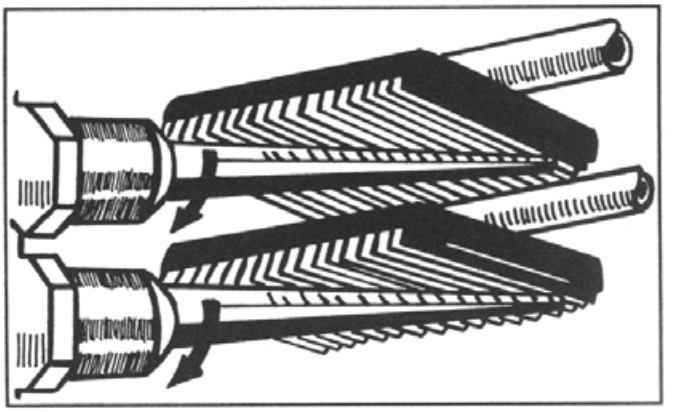

Figure 2. Moistener pad should wipe spindles thoroughly.

Doffers unwind the cotton from the spindle so it can be picked up and transported to the basket in an air stream (Figure 3). Each doffer lug should run as close as possible to the spindle without touching it. Improper adjustment allows some of the cotton to remain on the spindle, causing spindle twist and lowering both quality and harvesting efficiency. If this adjustment is too tight and spindles contact the doffer, small particles will be ground off the doffer, creating a contamination problem.

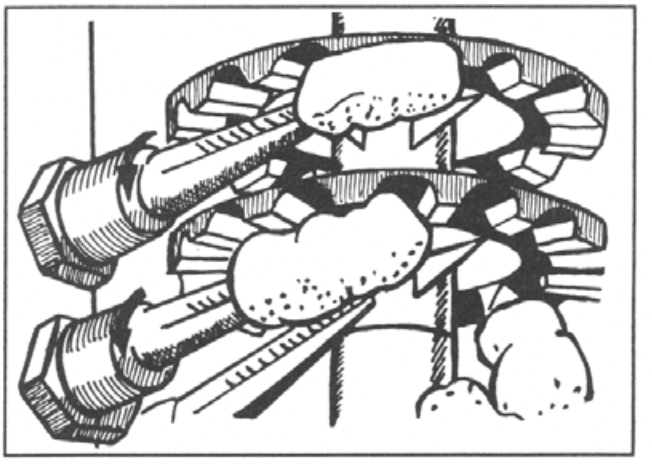

Figure 3. Each doffer lug should run as close as possible to the spindle without touching it.

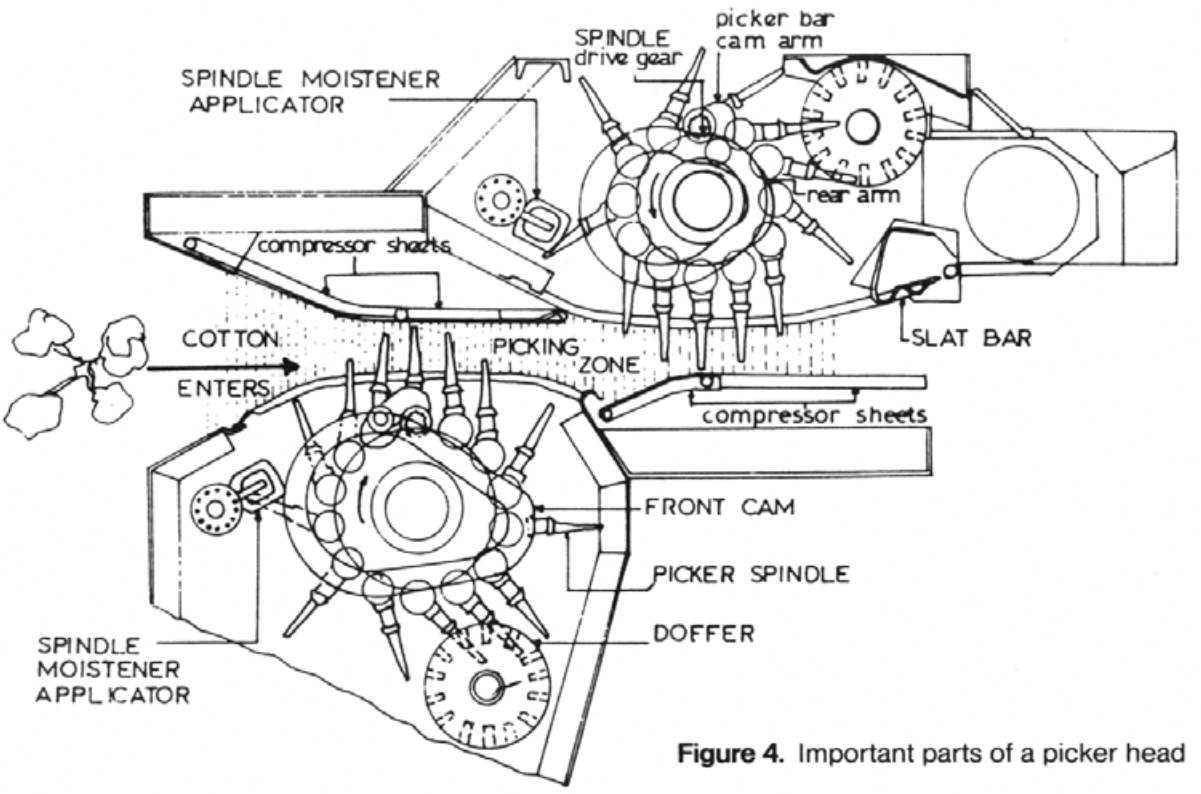

Figure 4. Important parts of a picker head

Do not use the spindles to grind the doffer lugs to match the lower spindle bars on freshly rebuilt picking units. This practice can cause poor doffing and serious lint contamination problems in the textile mill and should be avoided. Shim low spindle bars to correct height before running the picker.

Long Term Adjustments

When the picker is in good operating condition, some permanent adjustments — those that should not be required on a daily basis — need to be made.

For example, adjust the stalk-lifter fingers so that low bolls are lifted into the picking zone above the second row of spindles. Tilt the drum so the back is one inch higher than the front to increase the spindle's exposure to cotton and reduce dirt build-up inside the unit.

The compressor sheets (pressure plates) hold the bolls so the spindles can contact the lint (Figure 4). When there are green bolls, compressor-sheet tension should be light to medium with additional clearance to keep from stripping off the bolls. For last picking, the tension on the compressor sheets should be increased and the clearance reduced to remove as much of the lint from the stalk as possible.

Daily In-Field Operation

In-field picker management can have a large effect on both your fiber quality and yield. Spindles must be kept clean to prevent plant juices from building up on them and causing incomplete doffing and spindle twist. In fields with green leaves, spindles can become coated with a gum-like plant residue in a few minutes, lowering harvesting efficiency and creating severe problems.

For Pima cotton and upland fields with green leaves, use spindle cleaner or a soluble oil in your moistening system. This way, you use less water and do a much better job of cleaning spindles than with soap or wetting agents.

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 will reduce the picking efficiency and can cause a significant quality loss during storage, even for a short period.

Cotton is rarely dry enough to be harvested at night or early in the morning (see figure 5). Harvesting should be delayed until the dew has dried and relative humidity has dropped below 70 percent. At that time, lint moisture should be about 8 percent.

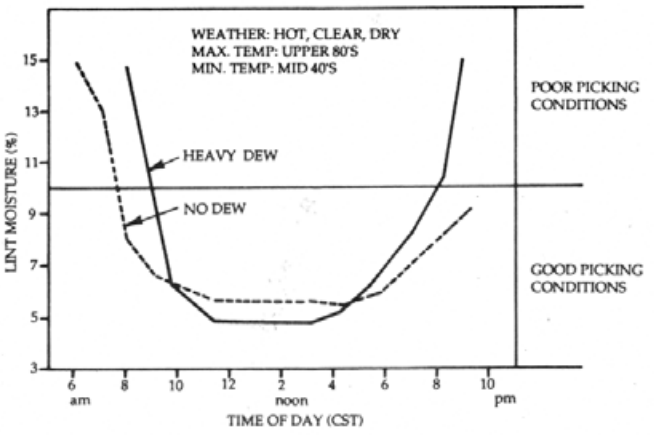

Figure 5. Cotton is rarely dry enough to harvest early in the morning or late in the evening

Use a meter to check the seed-cotton moisture. If you do not have a meter, bite the seed. If they crack, the moisture is probably low enough for harvesting to proceed.

If the moisture is 12 percent or lower, the cotton can be harvested and stored satisfactorily. Cotton harvested above 16 percent will likely suffer quality losses even if it is ginned immediately. Seedcotton at moistures between 12 and 16 percent will likely heat during storage and some quality losses would be expected. A publication dealing with storage and quality is available from the Cooperative Extension Service.

You should harvest only dry cotton and then handle it so that it requires minimal drying and cleaning at the gin. If you must harvest wet cotton, keep it separated from dry cotton and tell your ginner so he can give it special attention.

The picking units should be cleaned and inspected each time a basket is dumped. This will cause you to notice problems with spindle twist before they become serious and to discover trash accumulation before the unit chokes.

The basket grates should also be cleaned at each dump. Throw the accumulated trash and low-quality fiber on the ground — not in with the good cotton.

Each picker should have a fully charged fire extinguisher at all times. Fires can be started by friction from wrapped spindles, by a spark from the exhaust, by careless use of matches or flames, or from other sources. Fire damages doffer plates and moistener pads quickly. Be sure that no burning seedcotton is put in a trailer or module.

Remember that downtime is most expensive with higher-capacity pickers. Plan to do your maintenance and in-season repairs when conditions are not suitable for picking. Plan your harvesting and seed cotton storage/transportation to get the maximum capacity from your pickers. Refer to the brochure "Seedcotton Module Storage and Handling" for helpful suggestions.

Avoid Contamination

Set the correct clearances between spindles and doffer plates and between spindles and moistening pads. Particles of rubber are a serious and frequent contaminant.

When lubricating pickers, carefully follow the instructions in the operator's manual. Cotton can be contaminated by using careless lubrication procedures.

Contaminants such as plastic, wiping rags, clothing, or tarp ties can cause very expensive problems for textile manufacturers. In the gin, these materials will be chewed up into very small pieces which are not likely to be detected until they are woven into cloth or even sewn into a garment. Contaminants can often be traced back to the source and reduce your market. Caution your picking crew to be very careful not to allow even a small amount of any potential contaminant to get into your seed cotton.

Grass and weeds picked up by the heads on turnrows reduce the grades of the cotton and are just as much a contaminant as is an acrylic hat that goes into the gin. Avoiding contaminants means keeping stringy objects such as vines, grass, bark, clothing, and plastic from getting into your cotton — these contaminants are so similar to fiber that they cannot be removed by cleaning equipment.

Always try to deliver seed cotton to your ginner in the best possible condition. It is impossible for the ginner to properly dry and gin cotton if the moisture is excessive or if it varies widely in the same module or trailer. Good cooperation with your ginner will conserve the quality for which you worked all year. You will be proud of what you produced, your profits will show it, and your markets will be protected because your customer, the textile manufacturer, will be more efficient.

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