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CORN PICKER OPERATION

to Save Corn and Hands

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CONTENTS

	Page
HOW MUCH CORN IS USUALLY LOST?	3
Shelled corn and ear corn losses are about equal.	4
Method of planting has little effect on losses.	4
How to estimate shelled and ear corn losses.	4
CARE AND ADJUSTMENT FOR EFFICIENT OPERATION.	5
Slow speed + careful driving = low corn loss.	5
Keep the snouts close to the ground.	6
Pick early to save corn.	6
Run the snapping rolls as close as possible.	8
Keep snapping rolls in good condition.	8
Your snapping rolls may have an adjustment for speed.	9
Check timing of gathering chains.	9
Is the husking bed doing its job?	9
ACCIDENTS DO NOT HAPPEN — THEY ARE CAUSED.	10
Good adjustment means fewer accidents.	10
It pays to follow safety rules.	11

CORN PICKER OPERATION

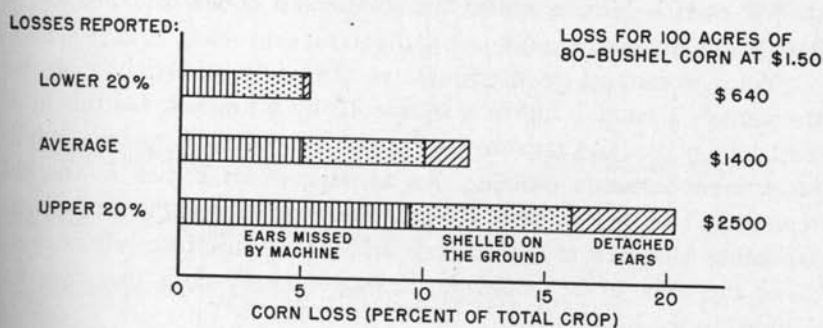
... to Save Corn and Hands

By H. P. BATEMAN, G. E. PICKARD, and WENDELL BOWERS,
Department of Agricultural Engineering

THE MECHANICAL CORN PICKER is one of the greatest boons to agriculture that has been developed during the past half century, but its outstanding contributions have sometimes blinded us to its shortcomings. On most farms it is leaving too much corn in the field, and it is by far the most dangerous farm machine to operate. The purpose of this circular is to give you information that will help you operate your picker more efficiently and safely.

HOW MUCH CORN IS USUALLY LOST?

Corn lost by the picker averages about 10 percent of the yield. This is 8 bushels an acre for an 80-bushel crop. With corn at \$1.50 a bushel, a farmer with 100 acres of corn and no livestock to recover some of the lost corn would lose \$1,200. There goes a nice share of the income! A 10-percent loss is average; two of out ten operators lose only half this much corn, but two others almost double this loss, for one reason or another. The data below are based on losses reported in a number of experiments and contests.



The question is often asked, "Which make of corn picker will lose the least corn?" The answer is that a good job of picking can be done with all the machines made by reputable companies. How well the job is done depends largely on the adjustment and care in operation.

Shelled corn and ear corn losses are about equal

The over-all average shows that losses are about equally divided between ears and shelled corn. When picking is late, however, ear-corn losses usually go up. This is because the shank becomes brittle and the stalks lodge. When corn-borer damage is serious, ear-corn loss is high throughout the picking season, but particularly high late in the fall. Shelled-corn loss stays about the same.

Where shanks are strong and the corn stands well, shelled loss sometimes increases toward the end of the season as the kernels and cobs dry out, while the ear-corn loss remains low.

Method of planting has little effect on losses

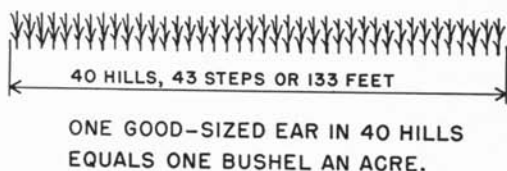
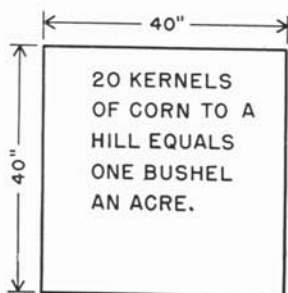
Picker losses are about the same whether the corn is drilled, hill-dropped, or checkplanted. This has been brought out by tests at Illinois and tests at the Nebraska Station (see Nebraska Bulletin 394). However, with heavy stalks and the corn checked at four plants to the hill, there will be more tendency for the snapping rolls to clog, and this condition requires a wider roll setting which will tend to give heavier losses of shelled corn.

How to estimate shelled and ear corn losses

It is hard to estimate how much corn is being lost just by walking behind a picker. Some of the ears are still in their husks, and the shelled corn is hidden under the leaves and stalks or lying in the base of the husks.

You can make a good estimate of *shelled-corn losses* by counting the kernels around a hill in a square 40 by 40 inches. Do this in at least four places and take an average of the counts. Count more hills for a more accurate estimate. An average of 20 kernels to the hill represents 1 bushel an acre. If you find an average of 80 kernels, you are losing 4 bushels of shelled corn an acre. Be sure to carefully clean away the area to be counted, shaking out any corn that may be trapped in the husks.

For *ear-corn loss*, mark off along the row a length of 133 feet, approximately 43 paces, or take 40 hills in 40-inch checked-row corn. Each good-sized ear ($\frac{3}{4}$ pound) in this distance represents a loss of 1 bushel an acre. Again, average at least 4 places, and kick the husks and stalks around to be sure you do not miss any ears.

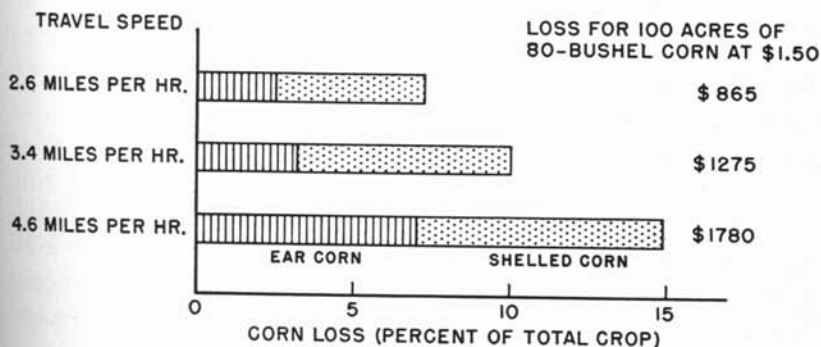


When you start picking corn, use these methods to keep track of your losses. If you are losing more than 5 percent (5 bushels an acre in a 100-bushel crop, 4 bushels in 80-bushel corn, and 2½ bushels in 50-bushel corn), then check yourself on the items which follow. You should then be able to find the cause of your trouble.

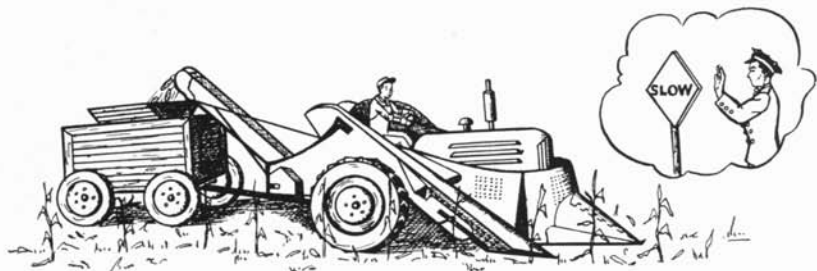
CARE AND ADJUSTMENT FOR EFFICIENT OPERATION

Slow speed + careful driving = low corn loss

You lose about \$4.00 more corn an acre when you change from first to second gear of your tractor, as shown by the tests reported below. In these tests the snouts of the picker were kept well down and great care was used in driving to keep on the row. Losses would have been higher if these precautions had not been taken. (These figures assume 100 acres of 80-bushel corn at \$1.50 a bushel.)



Only 65 percent of the time in the field is spent in picking, so when you increase tractor speed by 30 percent, you are reducing total time by only 15 percent. You may lose all this saving in time from increased clogging. Besides, there is greater danger of accident. At high speeds it is also difficult to keep the picker on the row and the stalks are whipped around much more violently, resulting in greater loss of ears.



The fine for speeding in a 100-acre field of 80-bushel corn is \$300 to \$500. The fine may be even more where there is lodged corn or when the stalks are brittle and the shanks tough.

Steer the tractor carefully to keep the corn row midway between the gathering chains. Otherwise the corn is shaken roughly as it enters the rolls and ears will be thrown off and lost. This is particularly likely to happen when the picker is operating at too high a speed. Good careful driving will do more than any other one thing to cut down on losses.

Keep the snouts close to the ground

For lowest losses keep the snouts on the ground to get under the down stalks and bring them to the gathering chains in the best possible position. This is hard to do if the ground is rough or gullied, but if you keep the speed low, you can get good results.

Pick early to save corn

Start picking as soon as the corn reaches 21 percent moisture in the kernels, which is the upper limit for safe cribbing in the ear except for corn to be artificially dried. Your losses may be trippled if you delay harvesting until very late in the season. The following data are



Getting off the row leads to lost ears of corn and can also lead to a bad accident if you are careless when the rolls clog up.

averages of tests run in Illinois, Indiana, Iowa, and Nebraska over several seasons:

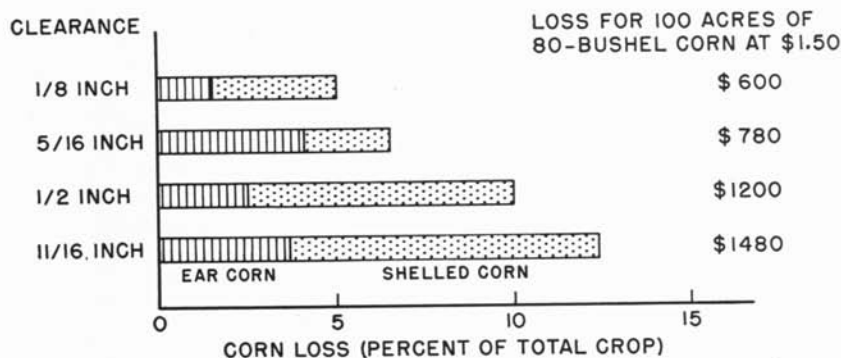
	Harvested October 26	Harvested November 20	Harvested December 7
Total loss.....	5.0%	8.4%	18.4%
Machine loss.....	4.6%	7.0%	11.8%
For 100 acres of 80-bushel corn at \$1.50, a loss of.....	\$600	\$1,008	\$2,208

These figures show that up to November 20 each week that the harvest is delayed costs about \$1.10 an acre, assuming \$1.50 corn, but after that date, watch out! As the stalks and shanks dry out, the ear loss becomes very high.

The weather sometimes prevents timely completion of the harvest. When this happens you need to be extra careful in operating the picker.

Run the snapping rolls as close as possible

You throw money away when you run your snapping rolls farther apart than the condition of your crop requires. Here is what Illinois tests showed for midseason harvest of corn averaging 75 to 95 bushels an acre (85 percent of the corn was standing) when the snapping rolls were set for different clearances:



Notice particularly that the loss of shelled corn went up rapidly as the snapping-roll clearance was increased to $\frac{1}{2}$ inch and to $\frac{11}{16}$ inch. These changes cost about \$2.00 an acre ($1\frac{1}{3}$ bushels) for each $\frac{1}{8}$ inch of adjustment. It is well to remember this point and to use discretion when you are considering opening the rolls to prevent clogging in heavy stalks and to avoid stalk breakage in down corn.

Keep snapping rolls in good condition

A corn picker does its best work when the snapping rolls are new and sharp. In this condition they catch the stalks and pull them down through with a positive action, and thereby snap the ears off cleanly. When spaced reasonably close ($\frac{1}{4}$ inch to $\frac{1}{2}$ inch, depending on the crop), they will shell very little corn and will seldom clog. When the lugs on the rolls wear smooth, roughen them by adding beads of metal with an arc welder. If you are being troubled with continuous clogging, perhaps you ought to put in new rolls. The cost will soon be made up in the time and corn you save.

If leaves and stalks are extremely dry and trash tends to linger on the snapping rolls, install snapping-roll set screws to increase aggres-

siveness. Accumulation of trash increases shelling of corn by keeping the ears in the snapping chamber longer than necessary.

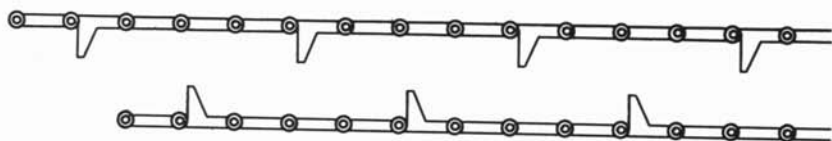
Your snapping rolls may have an adjustment for speed

Some pickers have a means of increasing the speed of the snapping rolls by about 75 r.p.m. You may find it an advantage to use this higher speed in extremely tall, extra leafy corn.

Check timing of gathering chains

The flights of one chain should fall halfway between those of the mating chain to assure the most even feeding. If your chains are not correctly timed, you can adjust them by loosening one of the lower idlers enough to slip that chain around on the drive sprocket to the proper position.

The drawing below shows the two flights of the chains spaced as they should be for best operation.



Is the husking bed doing its job?

If the husking bed is shelling too much corn, you may need to:

Increase tension on husking-roll springs.

Increase clearance of the feed apron or ear retarder.

Reduce the speed of the husking rolls.

If the husking bed is choked with trash,

Add set screws or lugs to the snapping rolls.

If there is trash in the wagon,

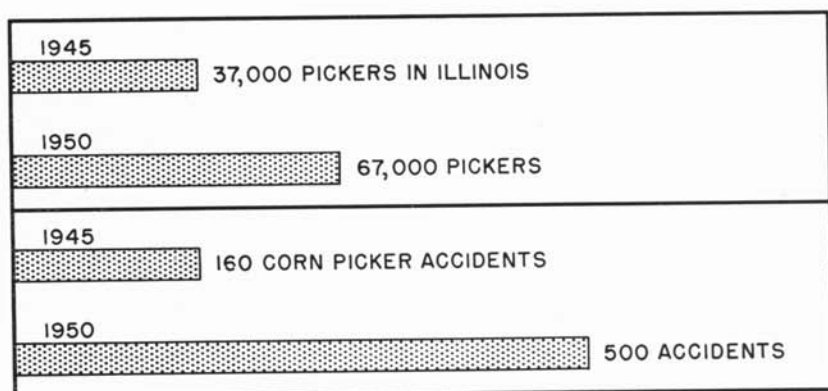
The ear retarder may be too close.

The fan may be faulty.

The tension springs for husking may need to be replaced or adjusted.

ACCIDENTS DO NOT HAPPEN — THEY ARE CAUSED

Accidents have increased faster than corn pickers. Since 1945 the number of corn pickers has not quite doubled, but the number of accidents has more than tripled. The terrifying rate of increase in number of accidents is shown in the following graph (number of accidents based on figures released by National Safety Council):



Part of the increase in the number of accidents can be blamed on the greater amount of corn per man to harvest and the short time that Illinois farmers have to harvest the crop. Each year farmers are more pressed for time during the corn-picking season, and consequently they increase their chances of getting hurt.

Good adjustment means fewer accidents

Most accidents are caused by the operator trying to unclog the picker while it is running. There will be less clogging if the picker is properly adjusted. So you get a double return for paying attention to adjustment: losses will be less, and you are less likely to get hurt.

Trying to pick when the weather is bad will cause clogging and increase the chances of getting injured. It is far better to forget about trying to get those extra two or three loads of corn in the crib each day than to lose an arm or leg in the snapping rolls while trying to pull out some wet cornstalks.

It pays to follow safety rules

Consider yourself a **safe** operator if you follow all safety rules regularly, especially the one that says, *Never attempt to unclog, oil, or adjust a machine while it is in motion.* If you can be classed as a safe operator, your chance of getting hurt on a corn picker in the next five years is only about *one in a million.*

But if you take occasional chances — such as trying to remove a loose cornstalk from the husking rolls while the picker is running — you are an **average** operator and, according to the National Safety Council, you stand *1 chance in 25* of getting hurt by a corn picker during the next five years.

The **careless** operator who ignores safety rules to the extent of trying to unclog snapping rolls while the picker is running has a *50-50 chance* of being seriously injured in the next five years.

Obedying the following safety rules will classify you as a safe, careful operator:

1. Keep your machine in good mechanical condition and properly adjusted.
2. Pick corn only when the weather is favorable. The few extra loads you pick on a rainy day are not worth the price of an arm or leg.
3. Always shut off the picker before you leave the tractor seat.
4. Carry a fire extinguisher with you on the picker.
5. Wear only clothes that fit snugly and that do not have loose pockets or sleeves.
6. Keep all safety shields in place.
7. Change off with another operator once or twice a day, if you can.
8. Use a metal sediment bulb on your tractor instead of a glass one.
9. Keep shucks cleaned away from the exhaust manifold.

Insist that these safety rules be followed on your farm, and use your influence to induce other operators to be careful.

