Field Corn Mechanization Tests

low moisture corn harvested with high efficiency in Antelope Valley tests with mechanical pickers

Lloyd Peterson

No correlation between moisture content of corn and field losses was evidenced in Antelope Valley field trials—under the conditions of the study—with mechanical harvesters in 1953.

Excessive losses were caused by picker adjustment and operation.

High field losses occurred in both wet and dry corn when the snapping rollers on the harvesters were set too far apart, when the harvester was traveling too fast, and when the picker snouts were too high.

Late season harvesting was troublesome because moisture content went down rapidly, and the dry stalks made careful adjustments and operation even more important.

When the snapping rollers were too far apart, ears of corn were caught between them, and shelling action rather than snapping action took place.

Improper adjustment of the rollers caused excessive loss in corn with high moisture content as well as in corn with low moisture content.

Two fields—each with a gross yield of 5,600 pounds per acre and a grain moisture content of 22%—were harvested with all factors the same except the position of the snapping rollers. In one field the rollers were fully open, but in the second field they were moved to a closed position. In both fields the picker snouts were on the ground. The corn was erect and approximately nine feet tall.

Ten locations in each field were checked by tossing a 40" x 40" frame and then counting the kernels. In this area an average count of 20 kernels represents 56 pounds per acre. The difference between the two fields in estimated loss was 448 pounds of shelled corn per acre.

Two row conventional harvester mounted on tractor.

In the Antelope Valley tests, the most efficient jobs of harvesting were done when the picker speeds were kept at 2.5 miles an hour—or less—and the snouts occasionally struck the ground. In corn that was down, or with low hanging ears, it was necessary to slow the speed—even to one mile an hour—and to keep the snouts as low as possible.

Where the picker snouts were operated as high as 6" above ground and at speeds over three miles per hour, low hanging ears were left on the stalk.

Slick Rollers

Late in the season the stalks became very dry and—in a few cases—the snapping rollers became so highly polished by use they failed to reject stalks fast enough. This caused stalks to break above the snapping rollers. In the picker-sheller type of harvester, the broken stalks clogged the sheller throat. A tar-like compound made specifically for the purpose was dressed on the snapping rollers, which were enabled again to reject the stalks, and breakage was reduced. Because of the bulk of material passing between the snapping rollers, an application of the compound was made every hour. High temperatures may have contributed to the rapid removal of the compound.

Deep and irregular irrigation furrows—because they made it difficult to keep the harvester on the row and the picker snouts low—hindered the efficiency of the pickers in these tests on mechanical harvesting of low moisture corn.

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Low Moisture Corn Harvested in Imperial Valley with Mechanical Pickers.

A	B	C	D	E	F	G	H	I
Field number	Gross yield, lbs. per acre	Field loss* in lbs. per acre	Percentage loss of gross yield	Percentage of moisture in grain at harvest	Postion of snapping rollers	Ground speed in M.P.H.	Height of picker snouts above ground	Crop characteristics
1	3,900	633	16.2%	12	Open	3+	6"	6', erect
2	5,000	487	9.7%	15	Open	3+	6"	6', erect
3	4,400	426	9.7%	12	Semiclosed	3+	6"	9', erect
4	5,600	644	11.5%	22	Open	2+	on ground	9', erect
5	5,600	196	3.5%	22	Closed	2+	on ground	9', erect
6	5,770	308	5.3%	14	Closed	1.5	on ground	9', erect
7	4,400	207	4.7%	10.5	Semiclosed	2	on ground	5', erect
8	4,080	162	4.0%	11	Closed	2+	on ground	5', erect
9	4,200	245	5.8%	12	Closed	2+	on ground	9', erect
10	5,600	129	2.3%	14	Closed	2.5	on ground	10', erect

* Estimates made by tossing a 40" × 40" frame ten times and averaging the kernel count. Twenty kernels = 56 pounds per acre (Iowa State College). Estimated preharvest losses did not exceed 100 pounds of ear corn per acre.