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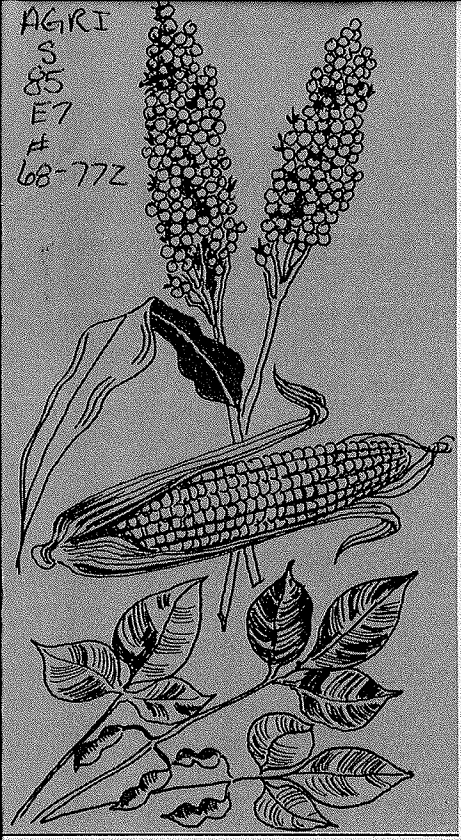

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DETERMINING HARVESTING LOSSES FOR ROW CROPS

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DETERMINING HARVESTING LOSSES FOR ROW CROPS

By

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Introduction

Field losses occur in all crops. They vary with variety grown, with incidence of insects and disease and with date of maturity and harvest. Losses can vary from year to year and from location to location. To hold losses to a minimum, harvest as soon after maturity of the crop as conditions permit.

No machine is 100% efficient. If field or crop conditions are poor at harvest, machine losses are large and a high percentage of the crop may be left in the field.

Estimating Shelled Grain Loss

You can estimate the amount of grain left in the field. The following method will give you a reasonable estimate of the amount of field loss behind harvesting machines, based on the average number of kernels per pound of grain and on small areas.

1. Lay of areas L_1 and L_2 (see Fig. 1). L_1 should correspond to the row width and be in the discharged material, L_2 should be in the harvested area but not in the discharged material. For corn in 30" rows, L_1 and L_2 are 31" long (see Table 1).

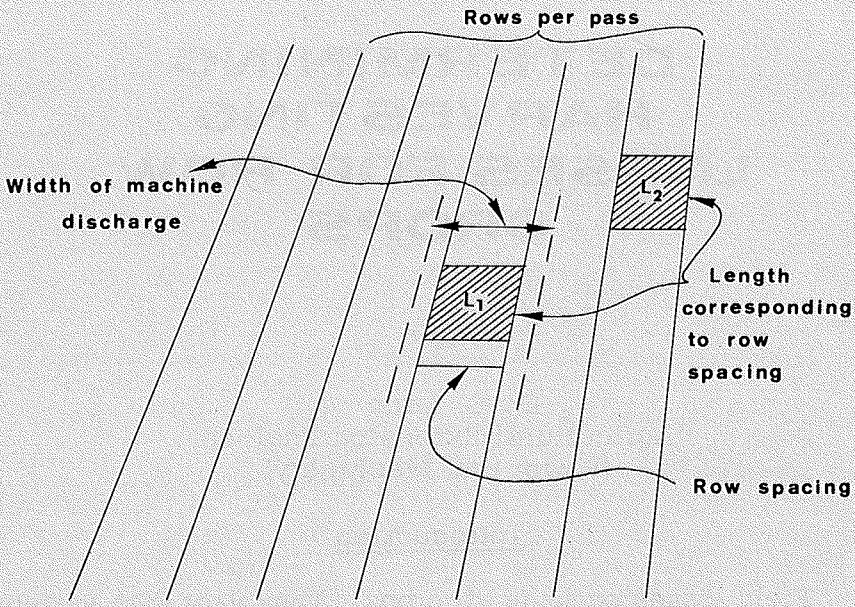

Fig 1.

2. Count the seeds in areas L_1 and L_2.

Example: 80 seeds were counted in L_1 and 20 seeds were counted in L_2.

3. Subtract L_2 from L_1. The answer equals L_3.

Example: $L_3 = L_1 - L_2 = 80 - 20 = 60$ seeds.

4. Make a fraction, f, of row spacing over width of machine discharge, d (Fig. 1).

Example: width of machine discharge = 40"
row spacing = 30"
then f = 30 ÷ 40 or .75

5. Multiply the number of rows taken per pass of the machine by f, the answer equals f_1.

Example: 6-row 30" corn head
then $f_1 = 6 \times .75 = 4.5$

6. Divide L_3 by f_1. The answer equals M_1, machine loss, seeds per row.

Example: $M_1 = L_3 \div f_1 = 60 \div 4.5 = 13.33$ seeds per row.

7. Find the total number of seeds from L_2 and from M_1. Divide the total by the crop factor, Table 2. The result equals the shelled corn loss in bushels per acre.

Example: shelled loss $= (L_2 + M_1 \div 10$
$= (20 + 13.33) \div 10$
$= 3.33$ bu/ac

Estimating Ear Corn, Milo Head or Bean Pod Losses

The preceding method cannot be used when harvesting machines use spreaders on the discharge. For machines with spreaders, take a count in one area and divide by the crop factor to get a loss estimate in bushels per acre.

Ear corn, milo head or bean pod losses can be estimated by picking up material between the rows for a distance corresponding to the row spacing (Table 3).

Weigh the material picked up. The weight in lbs. at market moisture 15.5% (No. 2 corn) equals grain moisture at harvest time times crop correction factor, Table 4. Result equals the loss in bushels per acre.

Example:
30" row corn
10 ears picked up in 249 feet of row (Table 3.)
5 pounds, weight of material picked up
20% moisture at harvest (Table 4.)
correction to 15.5% moisture
$X = 5 \times 0.95$
$X = 4.75$ pounds of corn at 15.5%
4.75 lbs. = 4.75 bu/ac, ear loss

Total Loss Estimate

Total loss of grain and ear corn, milo heads, or bean pods is the total of Step 7 and the row loss.

Example: 3.3 + 4.75 = 8.05 bu/ac total loss

When making loss estimates, procedures should be repeated in several places in the field.

Table 1. Distance required in field loss estimates.

Row Spacing (inches)	Length 1/ (inches)		
	Beans	Corn	Milo
20	21	47	15
28	15	33	11
30	14	31	10
32	13	29	9+
34	12+	27	9-
36	12-	26	8+
38	11	25	9-
40	10	23	7+

1/ Length = $\frac{144\ SA}{R_1\ A2\ W1}$

$A_1 = ft^2/ac$

$W_1 = lb/bu$

$A_2 = seeds/lb$

$144 = in^2\ ft^2$

R = row width, in.

$S_1 = \frac{seeds/area}{bu/ac}$

Table 2. Crop factor 1/ for determining loss estimates.

Crop	Factor
Corn	10
Beans	
Medium	10
Large	4
Milo	40

1/ These factors correspond to areas shown in Table 1 and cannot be used with other sized areas.

Table 3. Distance 1/ used to estimate ear, head, or pod loss.

Row Spacing (inches)	Distance to count (feet)		
	Beans	Corn	Milo
20	415	373	443
28	296	267	316
30	277	249	295
32	259	233	277
34	244	220	261
36	230	207	246
38	218	197	233
40	207	187	221

1/ Distance $= \frac{A1}{WR}$

A1 - ft 2/ac
W - lb/bu.
R - row width, ft

Table 4. Moisture correction factors, corrected to % moisture.

Grain Moisture %	15.5[1]	14[2]	13[3]
	Multiply by		
30	0.83		
29	0.84		
28	0.85		
27	0.86		
26	0.88		
25	0.89	0.87	
24	0.90	0.88	
23	0.91	0.90	
22	0.92	0.91	
21	0.93	0.92	
20	0.95	0.93	0.92
19	0.96	0.94	0.93
18	0.97	0.95	0.94
17	0.98	0.96	0.95
16	0.99	0.98	0.97
15.5	1.00	0	
15		0.99	0.98
14		1.00	0.99
13			1.00

1/ No. 2 corn, market grade
2/ No. 2 milo, market grade
3/ No. 1 soybeans, market grade