

How to Estimate Yield

— System Designed for Oil-Type 'Flowers —

Can you eyeball a late-summer/early fall sunflower field from the road and project its actual harvested yield within 100 pounds? If so, you don't need to read this article. If not, however, you will find the yield estimating system described here to be a nice complement to your own seasoned talents of observation.

Developed by now-retired USDA-ARS sunflower geneticist Jerry Miller, this approximate estimation system is designed

for oil-type sunflower specifically. It accounts for five key yield elements: (1) plant population, (2) head diameter, (3) seed size category, (4) good seedset and (5) center seedset. Here's a brief explanation of how each of these elements is measured:

• **Plant Population** — To determine a field's plant population, step off a representative 10-foot section of row at least 50

feet from the end rows. Then use the accompanying Table 1 to calculate the overall field population. (Note: Any diseased, lodged or otherwise unharvestable plant within that 10-foot section must be subtracted before calculating your field total.) (Con't. on Page 14)






Table 1: Plant Population

Step off a 10-foot section at least 50 feet from end rows.

— Plants Per 10 Feet of Row —							
Population	12"	18"	22"	28"	30"	36"	Multiplier
14,000	3.2	4.8	5.9	7.5	8.0	9.5	0.70
15,000	3.4	5.2	6.3	8.0	8.5	10.25	0.75
16,000	3.7	5.5	6.7	8.5	9.25	11.0	0.80
17,000	3.9	5.9	7.1	9.0	9.75	11.75	0.85
18,000	4.1	6.2	7.6	9.5	10.5	12.5	0.90
19,000	4.4	6.5	8.0	10.0	11.0	13.0	0.95
20,000	4.6	6.9	8.4	10.75	11.5	13.75	1.00
21,000	4.8	7.2	8.8	11.25	12.0	14.5	1.05
22,000	5.1	7.6	9.2	11.75	12.5	15.25	1.10
23,000	5.3	7.9	9.6	12.25	13.25	15.75	1.15
24,000	5.5	8.3	10.1	13.0	13.75	16.5	1.20
25,000	5.7	8.6	10.5	13.5	14.25	17.25	1.25
26,000	6.0	9.0	10.9	14.0	15.0	18.0	1.30

Figure 1: Seed Size

Remove a seed two inches from edge of plant head and compare to seed outlines below.

	Multiplier
Light (L) — 	0.8
Medium Light (ML) — 	0.9
Medium (M) — 	1.0
Medium Heavy (MH) — 	1.1
Heavy (H) — 	1.2

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Head Diameter — Using a ruler or tape measure, measure the average head diameter. What's "average?" You should measure at least 10 consecutive heads that appear to be, in your estimation, of average size for that field. Once you've come up with an average diameter, multiply it by the corresponding multiplier figure in Table 2. (If the field is not very uniform, measure head size in more than one location and then average the results.)

Seed Size — Figure 1 displays approximate outlines for five categories of oil-type sunflower seed size — from light to heavy. It also includes the multiplier to be used for each category. When picking a

"typical" seed from a plant head, you should remove one that is about two (2) inches from the outside of the head and then compare it to the Figure 1 outlines in order to come up with a representative seed size category. Multiply that by the appropriate number.

Percentage Good Seedset — Count one diagonal (arc) row of seed in the head. The multiplier will be the percentage of good seeds within that arc.

Center Seedset — If there are no seeds in the center two inches of the head, multiply by 0.95. If there is a hole in the center of the head, multiply by 0.90.

Seed Weevil Damage — This is diffi-

cult to accurately estimate. Any judgments as to the effect on potential yield should be calculated into the percentage of good seed. (Typically, the red seed weevil will consume about 30% of each kernel damaged. The gray seed weevil, whose damage shows up as raised seeds on the head, consumes 100% of the kernel.)

To arrive at an estimated yield for the field, one should multiply 2,450 times the appropriate multipliers in the accompanying tables and figure.

For example: An oil sunflower field with a stand of 19,000 plants per acre, an average head diameter of 7.5 inches, typical seed size of "light medium," a good-seed count of 85% and no seed in the center two inches of the head would be calculated as follows:

$$2,450 \times 0.95 \times 0.91 \times 0.9 \times 0.85 \times 0.95 \\ = 1,539.3 \text{ lbs/ac}$$

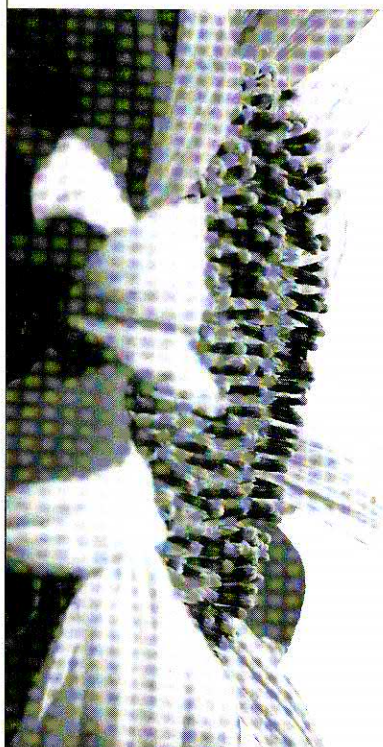
Multipliers used in this example are:

$$2,450 \times \text{plant population} \times \text{head size} \\ \times \text{seed size} \times \text{center seedset} = \text{yield}$$

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Table 2: Head Diameter

Measure 10 consecutive heads (in each sampling location) to determine an average diameter.

Head Diameter (Inches)	Multiplier
4.5	0.37
5.0	0.46
5.5	0.55
6.0	0.64
6.5	0.73
7.0	0.82
7.5	0.91
8.0	1.00
8.5	1.09
9.0	1.18
9.5	1.27
10.0	1.36

