

Table 5. Sunflower tissue analysis interpretation

Nutrient	CONTENT				
	Low	Marginal	Sufficient	High	Excess
Nitrogen % N	1.4	1.5-1.9	2.0-3.4	3.5-3.9	4.0
Phosphorus %P	0.14	0.15-0.24	0.25-0.49	0.5-0.79	0.8
Potassium %K	0.9	1.0-1.4	1.5-2.9	3.0-4.9	5.0
Sulphur %S	0.14	0.15-0.19	0.2-0.39	0.4-0.99	1.0
Calcium %Ca	0.19	0.2-0.29	0.3-1.9	2.0-2.4	2.5
Magnesium %Mg	0.09	0.1-0.19	0.2-1.4	1.5-1.9	2.0
Zinc ppm ZN	11	12-14	15-69	70-149	150
Copper ppm (Cu)	2	3-5	6-24	25-74	75
Iron ppm (FE)	14	15-19	20-249	250-499	500
Manganese ppm (Mn)	9	10-14	15-99	100-249	350
Boron	No provincial guidelines developed. Consult analytical companies				

Special Fertility Considerations

Sunflowers have deep tap roots that can obtain water and nutrients five to six feet (1.5 to 1.8 meters) deep in the soil. These reserves of water and nutrients are unavailable to most other annual crops, making sunflower a good rotational crop. Sunflowers have the ability to scavenge nitrogen that has leached below the rooting depth of other crops.

SEEDING

Planting dates

Sunflower seeding should usually begin anytime after May 1 and ideally be completed by June 1. Seedlings are relatively frost tolerant up to the four-leaf stage. Choose earlier maturing hybrids or oil type hybrids if planting is delayed into the first week of June or for replanting. Oil type hybrids are shorter maturing than confection varieties. Planting date can also affect susceptibility to pests. Consult the following chapters as to when to plant to avoid damage by the most prevalent pest in your area.

Plant Populations and Row Spacing

Seeding rate for sunflowers depends on sunflower type. Oil seed varieties are generally planted at higher populations than confectionary varieties. Oil-type sunflower populations range from 20,000 to 22,000 plants/acre (0.6 plants/ft²).

Plant Populations and Row Spacing (Continued)

Confection type sunflowers should not exceed 18,000 plants/acre (0.4 plants/ft²) to ensure large seed size. Seeding rates for both oil and confection-type sunflowers should be adjusted when germination is low. Refer to tables 6 and 7 for information on plant density and row spacing as well as seed size and weight.

No yield differences have been detected between sunflowers seeded in rows versus solid seeded when adequate weed control exists. Fields with a row spacing less than 20 inches are considered to be solid seeded. Recommended row spacing for solid seeding is 10 to 12 inches (25.4 to 30.5 centimeters) for both confection and oil-type sunflowers. Plant populations should remain the same as stated above regardless of row spacing. Equidistant placement of seeds within the row allows for maximum utilization of resources (e.g. water, nutrients, sunlight) and often results in consistent head size. Sunflower plants compensate for differences in plant populations by adjusting head and seed size. As plant populations increase, head and seed size decrease and vice versa.

Depth

Sunflowers need to be placed in moisture but not deeper than three inches (7.6 cm). The ideal seeding depth is 1 ½ to 2 inches (3.8 to 5 cm) deep. Planting equipment should firm the soil over the seed row to maintain a moist seed bed and ensure good seed to soil contact.

Table 6. Seed spacing required for various populations, assuming 90 percent germination and 10 percent stand loss

Plants/acre	ROW SPACING (inches)					
	12	16	18	22	30	36
----- Seed spacing within row (inches) -----						
14,000	30.2	22.6	20.2	16.5	12.1	10.1
16,000	26.5	19.8	17.6	14.4	10.6	8.8
17,000	24.9	18.6	16.6	13.6	10.0	8.3
18,000	23.5	17.6	15.7	12.8	9.4	7.8
19,000	22.3	16.7	14.9	12.2	8.9	7.4
20,000	21.2	15.9	14.1	11.5	8.5	7.1
21,000	20.2	15.1	13.4	11.0	8.1	6.7
22,000	19.2	14.4	12.8	10.5	7.7	6.4
23,000	18.4	13.8	12.3	10.0	7.4	6.1

Table 7. Sunflower seed size and associated seed weight

OIL-TYPE SUNFLOWER		CONFECTION SUNFLOWER	
Seed Size	Seeds/lb	Seed Size	Seeds/lb
No. 2	5,000 – 6,000	Medium	4,000 – 5,000
No. 3	6,000 – 7,000	Large	3,000 – 4,000
No. 4	7,000 – 9,000	Extra Large	2,000 – 3,000

FIELD SCOUTING

Sunflower are a host to a number of pests. Fields should be monitored regularly for potential problems, to determine pest species present and if populations are at economic threshold levels. Field scouting involves walking into the field and assessing the overall health of the crop. Sunflower pests tend not to be distributed evenly throughout a field, so fields should be checked in several locations. For example, some pests are more abundant near the field edges rather than in concentrated areas within the field. Determining the extent of a pest population on the basis of what is found in only one or two small areas of a field is impossible. Sampling sites should be at least 75 feet in from the field margin. To determine whether an entire field, or a portion of the field, requires treatment at least five sites per 40-acres should be monitored to collect adequate information on the nature and extent of a pest infestation. The path through the field should follow the Z or X pattern as shown in Figure 2.

Figure 2. The X and Z scouting patterns (NDSU)

