

Sunflower Production in Michigan

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THE SUNFLOWER (*Helianthus annuus*) is native to North America and was grown by Indians as a food source. Russia, Argentina and the United States are the leading producers of sunflowers. North Dakota and Minnesota lead all the states in sunflower production. Approximately 20,000 acres of sunflowers were grown in Michigan in 1980. In past years, growers raised a large seed type sunflower which was utilized for bird food, but in recent years, there has been a major increase in the production of oilseed sunflower used to produce a premium edible oil. At the time of this writing, there are two major export markets for oil-type sunflowers grown in Michigan, one being the Maple Leaf Monarch crushing mill in Windsor, Ontario and the other in Duluth, Minnesota.

Soil and Climate

Sunflowers can be grown on a wide range of soil types. However, poorly drained clay soils which do not dry out until late spring should be avoided. Medium- to fine-textured soils such as loams, silt loams or clay loams possess the highest yield potential for sunflower. Sunflowers have also performed well on muck soils in southern Michigan.

Sunflowers are a long season crop requiring about 115 to 130 days to mature, depending on the variety grown and growing season. The young plant is fairly resistant to frost damage. At the 6 to 8 leaf growth stage it becomes much more sensitive to frost.

A killing frost in late September is advantageous if the plant is mature as this will aid in dry down of the sunflower seeds.

Selecting the Variety

Non-oil sunflower seed is large-seeded, striped, with relatively thick hulls which separate easily from the kernel. Oilseed varieties are usually black-seeded with thin hulls which adhere to the kernel. Oilseed varieties contain from 38% to 50% oil and about 20% protein. Seeds of non-oil varieties are usually larger than oilseed types and have a lower oil content and test weight.

Most of the sunflower acreage is planted with hybrid seed. A limited number of oilseed hybrids were tested in 1979-80 in Michigan to determine the yield (Table 1). Average yields of all hybrids tested were 2,080 pounds per acre. Much of the oilseed acreage in Minnesota and North Dakota is planted with one of the hybrids tested in Michigan, USDA 894, which indicates its wide adaptation. Since there are only limited yield trials in Michigan, it is suggested that current data on hybrid testing be obtained from the University of Minnesota, St. Paul and North Dakota State University, Fargo.

Land Preparation

The soil should be prepared with a minimum amount of tillage to leave a firm, moist seedbed with a slightly rough surface. A firm seedbed allows

rapid and even emergence of seeds even if planted shallow. Excessive tillage can cause soil compaction by breaking down the soil structure. This should be avoided because soil compaction can lead to increased diseases in sunflower and reduced yields.

Planting Management

Seed should be placed from 1 to 2 inches deep depending upon soil moisture and temperature.

Sunflowers can be planted according to the same schedule as corn, with early planting in late April or early May usually resulting in higher yields.

The plant population for non-oil varieties should be between 12,000 to 18,000 plants per acre, depending upon the soil type. Coarse-textured soils should be planted at the lower populations and medium- to fine-textured soils at higher population because of their greater water-holding capacity. Oilseed varieties should be planted at a higher population than non-oil varieties. Plant population for oilseed varieties should be between 15,000 to 24,000 with adjustments made for soil type as with non-oil varieties.

Sunflower yields have been reported to be better with widths

Table 1. Michigan Sunflower Variety Trials — 1979-1980

Variety & Originator	East Lansing	Chatham		
	1979	1979	1980	2 yr. Avg.
894, USDA	2132	2928	2632	2330
M1, Midland Coop.	1995	2386	1824	2105
M2, Midland Coop.	2320	1891	2140	2015
M3, Midland Coop.	—	—	2197	—
449, Sigco	1866	—	—	—
894A, Sigco	2071	—	—	—
942, Sigco	2490	—	—	—

¹Each value represents the average of 4 replications.

from 20 and 30 inches between rows, than with widths of 36 and 40 inches. However, good yields have been produced on a wide variety of row widths. Even though row width may vary, the plant population per acre should remain the same. Use corn planting tables to determine seed spacing for recommended populations at the row width used.

Soil Testing and Fertilizer Needs

Plant nutrient requirements of the sunflower crop depend upon the per acre yield of the crop. Before making a fertilizer recommendation, one must determine a realistic yield goal for the sunflower crop being considered. Yield goals will depend upon soil type, average rainfall and management practices such as weed or insect control and timeliness of field operations. Once a realistic yield goal is determined, use a soil test to obtain the proper rate of fertilizer for the crop. A soil test recommendation will take into account past cropping practices and soil type.

Sunflowers respond well to applied plant nutrients, especially nitrogen, when good management practices are followed. Fertilizer should not be placed in contact with sunflower seed because of possible salt injury from the fertilizer, but should be placed in a band 2 inches to the side and 2 inches below the seed.

A 2,000 pound yield of sunflower seed will remove up to 100 pounds of nitrogen per acre.

Weed Control

Weeds in sunflowers can be controlled effectively by herbicides and timely cultivation. Currently, Treflan or Tolban are used as preplant incorporated (PPI) herbicides and give annual grass and some broadleaf control. Amiben is also used as a pre-emergent application after planting

and before plant emergence to further extend the spectrum of weed control of certain broadleaves. Even with herbicides, a cultivation program should be used to eliminate any weeds which may have escaped the herbicides.

Volunteer sunflower plants will often infest a crop following the sunflower crop. There are several herbicides which can be used to control volunteer sunflowers in small grains, corn and soybeans.

For more information on weed control, refer to MSU Extension Bulletin E-434, "Weed Control Guide for Field Crops."

Insect Control

A number of insects may feed on sunflowers. Insects which are specific to the crop are the sunflower midge, sunflower moth, banded sunflower moth, the Suleima moth and the sunflower weevil.

With the absence of insect resistant hybrids, management such as fall plowing or the timely use of insecticides is used to minimize insect damage to plants.

Birds may cause severe losses to the sunflower crop. Blackbirds cause the most damage. Damage by birds can be minimized by the use of a bird repellent such as Avitrol, by early harvest, or by avoiding planting the crop near bird roosting areas.

Disease Control

There are many known diseases of sunflowers. However, fungicidal protection against diseases in sunflowers is usually not economical. Using resistant varieties and growing sunflowers in a 3-year rotation with corn or small grains will aid in disease prevention. Sunflowers should not be grown in a potato rotation as verticillium wilt is a disease of both sunflowers and potatoes.

Harvesting and Storage

The sunflower crop is mature when the back of the head has turned from green to yellow. At this time the heads are still fleshy and aren't dry enough for combining. A killing frost at this time will aid in dry down. The use of paraquat as a desiccant will also speed up drying and aid in harvesting. Many growers prefer to harvest sunflowers at high moisture levels and then dry to reduce shatter loss and bird damage.

Sunflowers are harvested by conventional combines modified with a header attachment which consists of long seed gathering pans extending ahead of the cutter bar to salvage shattered seed. Commercial models are available from implement dealers. Many growers have built their own attachments and have used them successfully.

Sunflower seed should be dried to below 9½ percent moisture for long term storage. When drying sunflowers limit air temperature to 140°F (100°F seed temperature). Fire hazards exist in high temperature driers because of fine hair or fuzz rubbed loose from the seed during harvest. **Never leave the drying equipment unattended!** In-storage drying for sunflowers up to 29 percent moisture should have an air flow of 1 to 2 cfm per bushel. Sunflower depth in the bin should be ¾ that of corn to get the same air flow.

Additional References

1. Carter, J. F. 1978. Sunflower science and technology. ASA, CSSA and SSSA, Madison, Wis. No. 19 - Agronomy.
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