

How to Grow Sunflower

Sunflowers work well as a full season crop in rotation with corn, soybeans and/or sorghum. As a double crop after wheat, sunflowers are an equally good choice with soybeans. Regardless of whether they are grown as a single crop or double crop, sunflowers should not be planted in the same field more than once every three to four years. Sunflowers, like soybeans, do not leave very much residue; so on erosive fields consider seeding a fall cover crop after sunflowers. Sunflowers generally grow best on well drained soils, are tolerant of clay loam or silty clay loam soils and perform comparatively well on sandy loam soils. They should not be grown on wet soils, but may be a good choice for bottom ground that doesn't dry out until early summer, since the sunflowers can be planted relatively late.

Variety Selection

Most major seed companies have several varieties of sunflower available. Almost all commercial varieties of sunflowers are hybrids, so new seed should be purchased each year. Companies have been actively developing new hybrids of sunflowers with better disease resistance and higher yields. For the birdseed market, oil percentage does not matter, but selecting a variety with high oil content may be worthwhile for a vegetable oil market.

Planting

Sunflowers should be planted 1 to 1 1/2 inches deep. Row spacing studies have shown that sunflowers do not yield better in narrow rows, whereas wide rows are preferable to allow cultivating for weeds or use a row crop header. Sunflowers are not particularly sensitive to seeding rate, since head size (and seed number) per plant will increase in a thinner stand. Seeding rates can be from 15,000 to 25,000 plants per acre. Sunflower seeds vary in size, so seeding rate based on weight must take into account seed size, but will be roughly 3 to 4 pounds per acre. Number 2 sunflower seeds are largest, while number 5 are smallest. Most sunflower seed available is sized as a 3 or 4. Size of the seed can affect what type of planter modifications are necessary, such as buying new seed plates or finger pickups. Planting sunflower can begin anytime after soils have warmed to 50 degrees F. (April) through mid-July. It's not a bad idea to plant sunflower on a couple of different dates to reduce risk and spread out labor load. Planting early can allow sunflower to be harvested before corn and soybeans, and will likely avoid any bird damage. Planting late can allow planting after other crops are done, and is less likely to have damage from sunflower moth. Double crop planting after wheat works well with sunflower.

Fertility

Sunflower has modest fertility needs, but does respond to nitrogen. When following soybeans in the rotation, roughly 50 to 70 lbs. N/acre is appropriate.

Following a non-legume, about 80 to 100 lbs. N/acre is suitable. Animal manure or a legume cover crop can reduce or eliminate need for N fertilizer. One option is to spring plant a legume cover, such as Austrian winter peas in early April, let the legume grow for 2 months, then incorporate the legume and plant the sunflower in early June. This approach can eliminate the need for N fertilizer if good legume growth occurs. For sunflower planted double crop after wheat, apply about 60 lbs. N/acre if the wheat stubble is tillage incorporated, or about 80 lbs. N/acre if the sunflower is grown no-till in the residue. P and K should be applied based on soil test recommendation; for double cropping, extra P and K for the sunflower can be applied to the wheat the previous fall. On sandy soils, sunflower is often responsive to extra potassium fertilizer. Sunflower appears tolerant of soils with a pH down to 5.5, but consider liming if the pH is below 6.0, to improve nutrient availability in the soil. Starter fertilizer for sunflower will usually be beneficial only in cool soils of early spring, and should not be placed in direct contact with the seed.

Weed Control

One of the real advantages of sunflower is that its vigorous growth and robust size make it very competitive with most weeds. However, weeds must not be allowed to get a head start on sunflower. Weeds can be controlled either through herbicides or tillage, but most sunflower producers in Missouri make use of both, applying a pre plant herbicide and then row cultivating at least once after the sunflower seedlings are established. Some of the pre emergence herbicides* available for sunflower are Treflan, Prowl, Sonalan, and Eptam, all of which are primarily grass herbicides with control of some broadleaves. For 2002, a broadleaf herbicide called Spartan was given a temporary Section 18 registration for conservation or minimum tillage use in Missouri. A section 18 application has been submitted for Spartan for use on sunflowers again in 2003. For grass control after sunflowers have emerged, Poast and Select are available. Prior to planting, Roundup or paraquat can be used as a burn-down, and in the rare situation where a harvest aide (dessicant) is needed, paraquat or sodium chlorate can be used. Instead of herbicides, two alternative methods of weed control are to use cover crops (such as rye or winter annual legumes), or to use a stale seedbed technique (till the soil 7-10 days prior to planting to stimulate weed seed germination, then till again just before planting to kill those weed seeds).

Insects

Sunflower is similar to corn in that a lot of insects like to eat it. Some are occasionally a problem, and a few are worth scouting for, possibly needing treatment once in awhile. At the seedling stage, there is rarely a problem unless a heavy infestation of cutworms are present. As the plant grows, many insects feed on sunflower foliage, including grasshoppers and caterpillars, but seldom do they cause economic damage. The real stage to be scouting for insect pests is once the flower bud has begun to develop. Head clipper insects which attack the stem right below the head can cause the whole head to fall off, but are not too

common. The main threat to sunflower is sunflower moth or banded sunflower moth. Ideally, the adult moths should be identified through scouting, and if present in sufficient numbers, should be sprayed before larvae become established. Once the eggs have hatched and larvae have moved inside the head and seeds, insecticide control is very difficult. Later planting (June or July) can help avoid sunflower moth in most years. A number of broad spectrum insecticides are labeled* for sunflower, including Asana, Baythroid, Furadan, Endosulfan, Lorsban, Parathion, Permethrin, Stryker, and Warrior. Certain organic insecticides may also be used, including Bt products and pyrethrin. It is best to avoid spraying an insecticide when honey bee pollinators are present.

Diseases

In cool wet soils, seeds or seedlings may be attacked by fungi, so seeds are typically treated with fungicide. Various leaf and foliar diseases will cause surface spots or yellow patches, but do not impact yield. Probably the greatest disease threat to sunflower is sclerotinia (white mold), which is also found in soybeans, canola, and certain other broadleaf plants. Using good rotation practices, including not planting sunflower in a field more than every three to four years, can reduce likelihood of disease.

*Pesticide products are mentioned in this guide only as a starting reference point for product use, and are not a guarantee that a label for the product is applicable to your particular location. For latest information on use of a pesticide, consult the product label or a company representative.

Harvest

Sunflower seeds are generally physiologically mature when the back of the flower head is yellow. When the head turns brown on the back, seeds are usually ready for harvest. In some cases, harvesting at high moisture may be useful to avoid bird damage or reduce loss from lodging or seed shatter. Platform (wheat), row-crop, and corn heads have all been used successfully with sunflower. Row-crop heads are perhaps the best choice because they can be used without modification. Corn heads need to be modified with a stationary cutting knife before use with sunflower. Platform heads can be used without modification, but often have a higher amount of seed and head loss than a row head. Adding pans to the front of the platform, and/or modifying the reel can improve efficiency.

Combine settings must be adjusted for sunflower versus other crops. Airspeed should be lower, due to the lighter weight of sunflowers. The concave should generally be run wide open (on a rotary combine, a rotor-to-concave setting of 3/4 to 1 inch is appropriate). A bottom screen of 3/8 inch, and a top screen of 1/2 to 5/8 inch is typical. Cylinder speed should usually be in the range of 250 to 400 rpm. The overall goal of the threshing process should be passing the head through nearly intact through the combine, or in a few large pieces, with all

developed seed removed from the head. If the head is being ground up into small pieces, there will be excessive trash in the grain.

Storage

During colder periods, sunflower can be safely stored at 10% moisture or less, but during warmer months the storage moisture should be at 8% or less. When taking a moisture reading on sunflower seeds that are being dried in a bin, keep in mind that the hull dries faster than the kernel. Thus, a moisture reading taken on sunflower being dried may be artificially low; to get a more accurate reading, place some seed in an airtight jar overnight and take moisture reading the next day, after the hull and kernel moisture have equalized.

Bins with perforated floors work better for drying sunflower than those with ducts. If aeration is not available, sunflower should be rotated between bins to avoid hot spots developing in the stored grain. When excessive trash is present in the harvested grain, cleaning before storage can greatly reduce incidence of storage problems. Ambient air can be used to cool and dry sunflower. If heated air is used, generally a 10 degree F. increase in temperature over ambient is sufficient to increase rate of drying. Be aware that sunflower dries more rapidly than corn or soybeans, and should be monitored to avoid overdrying.

Sunflower drying has a higher risk of fire hazard than some crops. The primary problem is that small fibers rub off the sunflower hulls and float in the air, and these fibers readily burn. A few tiny fibers burning will not necessarily start a fire, but if combined with overdried grain, may lead to a bin fire. Avoiding use of propane heat with an open flame will eliminate this risk, but if heat must be used certain precautions can be taken. The air intake for the dryer blower can be turned into the wind, allowing clean air to pass over the burner rather than air with sunflower fibers. Monitoring the bin during hot air drying, and avoiding overdrying, can greatly reduce the risk of a bin fire.

Other key steps in storage include cleaning the bin and grain handling equipment before storage, and monitoring the bin for insects. Avoid creating a peak or cone of grain at the top of the bin, since moisture, and possibly insects, will tend to congregate in that spot. Sunflower grown for the snack food (confectionery) market must be handled with extra care, cleaned well, and be free of insect damage to meet food grade standards.

Test weight (pounds of seed per bushel) of sunflower will vary because of different seed sizes, but typical test weights for oilseed sunflowers are 28-32 lbs./bu. (U.S. grade standard is only 25 lbs./bu.). Due to the low test weight, high sided semi-trailers are often used when sunflower is hauled long distance in order to carry more grain and reduce transportation cost.