



Helianthus annuus

Family name: *Asteraceae*Common name: *Asteraceae*

Local name: (زهرة الشمس) Zehrat Al Shams



Cultivated



Role in Biodiversity

- Sunflowers are adapted to grow in a wide range of climates and habitats. They often escape from cultivation and very rapidly establishes new populations and colonizes disturbed sites, dry thickets, open areas, grasslands, roadsides, irrigated fields and agricultural lands. Once established, they grow as a weeds, forming dense and large stands that successfully outcompete native plant species.
- The flowering period of sunflowers may increase bird and insect abundance and diversity. Sunflower germination also produces important secondary compounds with potentially important roles in ecology, as well as the physiology, biosynthesis, and biodegradation of organisms.
- Sunflowers have the ability to absorb and accumulate heavy metals so they can be used to remove cadmium and lead from soils. Large scale plantations of sunflower have been established around Chernobyl to absorb radionuclides.
- Sunflower plants hydroponically grown in contaminated ponds were able to remove cesium, strontium and uranium radionuclides.



Environment and Growing

Sunflowers can generally grow in moderate to well-drained soil types, such as clay loam or silty clay loam soils, and they thrive best in sandy loam soil conditions. The crop needs at least six hours of direct sunlight per day and the flower heads are heliotropic (they rotate to follow the sun). Sunflower seeds require a sufficiently fine and moist soil around them at sowing depths of 2-3 cm.

Growth requirements:

- Temperatures for germination range 15-35°C.
- pH range 6-7.5.
- Water requirements range 600–1000 mm.



Reproduction and Communication

- Sunflowers are a cross-pollinated crop. Flowers are distinguishable by their strong sunny colour that invites pollinators. They produce a large amount of nectar and pollen to attract bees and other polinators.
- Pollination boosts sunflower crop yields both qualitatively and quantitatively.
- Seeds are the best way to propagate the plant. It can be grown in containers and transplanted to a site if done carefully.



Life span

After sunflowers bloom, their seeds begin to mature, which takes about a month. The sunflower seeds are ready for harvest when their shells are hard and the sunflower head starts to droop and turn brown. This stage usually occur about 125 days after the seeds are sown.



Size

sunflower size range is 1 to 3.5 metres high.



Parts



Stems are green, erect, rough, and covered with coarse hairs.

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Leaves are broad with serrated margins, and are alternately arranged on the stem.

Fruits are single-seeded achenes.



Sunflowers have a strong taproot with secondary order roots reaching down to 3 metres.

Flowers are in attractive heads which are 30 cm or more across. The disk flowers are brown, yellow, or purple while the petal-like ray flowers are yellow.

Seeds are 10-15 mm long and 4 mm broad, cylindrical or drop-shaped, and consist of a hard hull (pericarp) and a kernel.

INTRODUCTION

Herb

Helianthus annuus, the sunflower, is an annual herb native to the south-west USA–Mexico area. It is now cultivated worldwide in temperate, subtropical and tropical climates under a wide range of agro-environments as the world's fourth largest oil-seed crop. Sunflowers are characterized by producing many individual flowers in very large flowerheads, which mature into seeds on a receptacle base.

In Sudan, sunflowers are established mainly in rainfed areas of the country and to a lesser extent in irrigated areas. It is cultivated in Al Damazin, Al Gedaref, Khartoum, Al Rahad, and in White Nile and Sinnar states. Sunflower oil is used for cooking and the green plant is a good source of fodder for animals and seed remains are used as animals and poultry feed.

LIVELIHOODS / CULTURE

Cultivation

Sunflowers are planted in all lands except those with high salinity. Planting usually begins in mid-June to mid-July. Light, early-maturing varieties are planted in areas with less rain fall.

Soil preparation: For the plowing process to be completed, the moisture content in the land must be appropriate after 100 mm of rain falls, which is usually sufficient to close the cracks and thus enable the plowing process. In areas of mechanized rain-fed agriculture, land preparation depends on the wide level disc plow to stir the land and remove weeds at the beginning of the fall season. This process can be repeated before planting. Summer plowing after the sesame harvest or after early-ripening crops using the wide disc or disc harrow, help with the early start of agriculture in some impermeable lands. It requires the use of disc harrow plows or digging plows to break the impermeable layer to a depth of 25-30 cm.

Seeds sowing: Sowing is usually done by scattering seeds by hand or machine in the rain-fed sector. In traditional agricultural practice, farmers use the Selowka which requires experience and knowledge to control the distances between the holes and between the rows and to control the placement of the appropriate number of seeds. In large scale agriculture, planting is done by placing seeds on flat land in parallel rows at equal distances with the help of machine that has the ability to plant, hoe and distribute seeds well in one operation. Cultivation can be done at three levels of distances between rows: 60, 80 and 100 cm in the irrigated and rain-fed sectors, with the distance between plants being determined at 30 cm in the case of the irrigated sector and 45 cm in the case of the rain-fed sector. Seed rate is 5 kg per acre in the case of manual cultivation and 3 kg in the case of machine cultivation.

Watering: This crop needs regular irrigation, without drowning or thirst. The crop needs 6-7 irrigations at a rate of once every 10-14 days.

Weeding: In traditional agriculture practice, farmers remove weeds manually approximately 3-4 weeks after planting. The weeding process is repeated after 6-8 weeks depending on the type and density of weeds present. In the case of mechanical control, the weeding machine is used after adjusting the weeding units to remove weeds between the rows. This process requires planting the crop at specific distances that enable the weeding machine carried on the tractor to carry out the weeding operations without affecting the crop. This process may require manual intervention to get rid of the weeds present on the rows, depending on the density and type of weeds.

Harvesting: Sunflower harvesting time comes when the stems and leaves turn yellow, the lower leaves dry up and start to fall off, the back of the disc turns yellow-brown and bends down, the bracts turn brown, the ray flowers wither and dry up, a large percentage of the disc flowers fall off, and the seeds become ready to fall too. Early harvesting, i.e. before maturity, leads to a decrease in productivity and oil content, and delaying harvesting leads to the fall of the plant, which also leads to a decrease in productivity and oil content. Delayed harvesting leads to the fall of some of the seeds and the other part being picked up by birds. Harvesting can be done by machine or manually by cutting the discs and collecting them, then pounding them to separate the seeds and cleaning them with sieves.

Storing and distribution: Sunflower seeds are stored in dry, well-ventilated conditions.

Cultural Value

Seeds of sunflower are used as a source of oil for humans or as a poultry feed. Sunflower cakes, which are raw material for the oil industry, are also used as animal feed.

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Cultural Expressions

Information not available.

THREATS

In Sudan, sunflower crops are threatened by various biotic and abiotic stresses, including drought stress (frequent dry spells) and erratic distribution of rainfall, and diseases caused by fungi. Sunflower cultivation can result in Nitrogen depletion in the soil.

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