

# **SUNFLOWER**

**Botanical Name:** *Helianthus annus L.*

**Family:** Compositae

**Origin:** Southern United States and Mexico

## **Economic Importance:**

- One of the important edible oilseeds cultivated in India.
- The oil content varies from 45-50% and it is premium oil with pale yellow in colour used for cooking and margarine.
- Sunflower is a rich source of linoleic acid (64%) which helps in reducing the cholesterol deposition in the coronary arteries of the heart and thus useful for heart patient.
- Sunflower oil has high oxidative stability and it is more useful as frying oil.
- Sunflower oil is used as industrial raw material for manufacturing cosmetics, soaps and pharmaceuticals.
- Oil cake contains 40-44% high quality protein and it is ideally suited for poultry and livestock.
- The bast fibre of the stem is source for making rough quality paper.
- Because of its short duration, photo insensitivity, wide adaptability and drought tolerance, it can be grown at any time of the year due to that it can serve as an ideal catch crop during the period when land is left fallow.

## **Area and Distribution:**

The major sunflower producing countries of the world are the Russian fed., USA, Argentina, Romania, Spain, Turkey and South America. Russia is producing about 66% of the world's Sunflower oil.

Karnataka, Maharashtra and Andhra Pradesh are the major sunflower producing states. It is also grown in Punjab, Haryana, Tamil Nadu, Uttar Pradesh, Bihar and west Bengal.

## **Classification:**

There are about 264 species in *Helianthus* genus. All the varieties grown in India and Russia are grouped in three main groups.

1. Large White seeded type: Having high oil content
2. Small black seeded type: Best for eating seeds.
3. Intermediate type with striped seeds: Good for both eating and oil purposes.

## **Climatic Requirement:**

Sun-flower is a photo-insensitive crop therefore, it can be grown in any season viz. Kharif, Rabi, and spring throughout India.

The crop require cool climate during germination and seedling growth. Seedlings tolerate frosts moderately up to four to six leaf stage of development. It requires warm weather from the seedling stage up to flowering stage and warm and sunny days during flowering to maturity. Optimum temp 27-28°C is best for good growth. High temp above 38°C during post anthesis period reduces seed yield and oil content.

### **Soil Requirement:**

Sun-flower can be grown in wide range of soils and tolerate a moderate pH range and some salinity. It thrives best on deep loam soils with good drainage and irrigation facilities. Optimum pH range 6.5 to 8.5.

### **Land Preparation:**

It requires well pulverized and weed free seed bed. Usually one ploughing with MB plough followed by two to three harrowing are sufficient, followed by planking is desirable.

Under irrigated conditions where sunflower is to be taken during Rabi, sowing should be done after pre irrigation. Sunflower seeds have thick hull and imbibe water at a slow rate. It is therefore necessary to ensure sufficient moisture content at time of sowing.

### **Seed and Sowing:**

1. **Season and sowing time:** Sunflower, unlike most other crops, is not affected with the season and day length. It is sown in **Kharif**- First fortnight of July. **Rabi**- Second fortnight of October & **Summer**- First fortnight of March.
2. **Seed Treatment:** Treat seeds with 3 gm. thiram or captain per Kg of seeds.
3. **Spacing:** 60 x 20-30 cm.
4. **Seed rate:** 8-10 kg ha<sup>-1</sup>.
5. **Sowing depth:** 3 to 4 cm.
6. **Sowing method:** Sowing is done either behind country plough or with deed drill or by dibbling 2-3 seeds per hill.

### **Manures and Fertilizers:**

Sunflower is a fast growing and heavy feeder of nutrients. Apply 8-10 tons/ha of FYM or compost before 15-20 days of sowing at the time of land preparation. Fertilizers are applied based on soil test values, if values are not available apply fertilizer dose of 60-80 Kg N, 60 Kg P<sub>2</sub>O<sub>5</sub> & 40 Kg K<sub>2</sub>O per ha. Apply whole dose of P &K and half dose of N at the time of sowing. Remaining quantity of Nitrogen should be top-dressed at the time of second irrigation (Flowering stage).

### **Water Management:**

Sunflower is a crop of medium water requirement. Usually no irrigation is needed for *Kharif* crop. Pre irrigation is necessary for *Rabi* and *Zaid* crops to get uniform germination and better stand. Rabi crop may be irrigated thrice at four to five leaf stage (40 DAS) Flowering (75 DAS) and grain filling stage (110 DAS).

Sunflower crop is highly sensitive to water stress between flowering and grain filling stage at least one irrigation should be provide at that time. Irrigation requirement of sunflower during *zaid* season is high generally 4 to 8 irrigations with an interval of 10-15 days.

**Weed management:**

Intercultural operations are essential to minimize the weed population. Weed free conditions up to 60 DAS resulting in better yield performance. Weeding at early growth is essential because slow initial growth makes them poor competitors with more vigorous weeds. First weeding should be done at 25-30 DAS & 2<sup>nd</sup> weeding at 55-60 DAS. Weeds can also be controlled effectively by the use of herbicides. Use of Alachlor or Pendamethalin @ 1.5 kg a. i. per ha applied as a pre-emergence spray.

**Supplemental Pollination:**

Sunflower is self-incompatible and dependent on bees for cross pollination and seed set. Whereas bee activity is low it supplemented with hand pollination. **Hand pollination should be carried out at early in morning between 8-11 am for about two weeks. Hand pollination can be done by covering the hands by muslin cloth and gently rubbing the heads with palm.** Maintaining 5 bee hives/ha provide optimum req. of pollination. Do not spray insecticide spray during flowering period as affects the visit the honey bee.

**Harvesting and Threshing:**

Harvest the crops when seed contains 20% of moisture, back of head turns yellow brown colour and bottom leaves start drying withering. All heads not ready for harvesting in one time therefore harvesting is done in two to three installments to avoid shattering.

Harvested heads should be dried in sun and then threshed by beating the center of head with small stick.

**Yield:**

If all improved package of practices are followed, it should be possible to obtain 20 qtls of seeds / ha

**Varieties:** Modern, Surya, CO-1, CO-2, PKVSF- 9, EC-69874, EC- 68414, BSH-1,

**Hybrid:** KBSH-1, LDMRSH-1, MSFH-17, KBSH-44, Phule Raviraj.