

Okra Cultivation

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Introduction

Bhendi (*Abelmoschus esculentus*) is a popular Indian vegetable. Ladies Finger, Okra, Bhindi (Hindi), Dhenras (Bengali), Vendai (Tamil), bhindo (Gujarati), Bendekayi(Kannada), Ventaykka (Malayalam), Asra-patraka (Sanskrit), and others are some of the more frequent names. It's a hairy annual erect herb that grows to be 0.9 to 2.1 metres tall with 3 to 5 lobed palmately cordate leaves. The plants produce pyramidal pods that range in size from 12.5 to 30 cm. It is mostly a tropical and subtropical crop. The crop is grown for its young sensitive fruits, which are cooked and used in curry and soups. It's high in vitamins A and B, as well as protein and minerals. It's also a good source of iodine, which can help with goitre treatment. Fruit is often dried or frozen for usage when it is not in season. Paper, card board, and fibres are made from dry fruit skins and fibres. Clearing cane juice for jaggery production requires the use of the root and stem.

The major bhendi (okra) producing states are Uttar Pradesh, Bihar, West Bengal, Odisha, Assam, Andhra Pradesh and Karnataka. During its growing season, Bhendi requires a long, warm growing season. In warm, humid conditions, it produces a good yield. It grows in a temperature range of 24°C to 27°C. Even in areas with considerable rainfall, it can be grown well during the rainy season. Frost injury is a serious problem for Bhendi. Seeds do not germinate at temperatures below 20 degrees Celsius.

Soil

Bhendi grows well in a wide range of soils. It, on the other hand, grows on loose, friable, well-drained sandy loam soils that are high in organic matter. In heavy soils with good drainage, it also produces a good yield. A pH range of 6.0-6.8 is thought to be ideal. Soils that are alkaline, saline, or have poor drainage are not suitable for this crop.

Season



The best time to sow seeds varies a lot based on the climate, the variety, and the temperature required for growth. The crop is typically planted between January- March and June -August. The precise month for sowing is determined on the region.

Varieties

- Released by **IARI** : Pusa Makhmali, Pusa Paushja, Pusa A-4, Pusa Sawani, Sel 2-2
- Released by **IIHR** : Sel-10 (A. Anamika), Sel-4 (A. Abhay) Released by **PAU** : P-7, Punjab Padmini, Punjab no. 13, Punjab 8
- Released by **IIVR** : DVR 1, 2, 3, 4, VRO 3, 4, 6, 5, 22, 25, Kashi Lalima
- Others : Parbhani Kranti, Kiran, Salkeerthi, Co 1, Aruna, MDU 1, Varsha Uphar, Azad Kranthi Hybrids : CO 2, 3, COBhH 1

Seed rate and seed treatment:

During the summer, Bhendi requires 18-20 kg seeds per hectare, whereas the rainy season crop requires 10-12 kg seeds per hectare. The seed rate is affected by the percentage of seeds that germinate, the space between them, and the season. Seeds are steeped in a Bavistin (0.2 percent) solution for 6 hours prior to sowing. After that, the seeds are sun-dried.

Land preparation: -

With 2-3 ploughings, the field should be well prepared. At the time of land preparation, well decomposed FYM (25 t/ha) is incorporated. Bhendi is planted on ridges or level ground. Sowing should be done on ridges if the soil is heavy. The use of organic manures such as neem cake and poultry manures boosts plant development and productivity in this crop. Using neem cake and poultry manures can help you save money on fertiliser.

Sowing

The hybrid varieties are planted at a spacing of 75 x 30 cm or 60 x 45 cm. A pre- soaking irrigation 3-4 days before sowing is beneficial. The seeds germinate in about 4-5 days.

Manure and fertilizers

The amount of fertiliser applied is determined by the soil fertility and the amount of organic manure added to the crop. At the time of land preparation, about 20-25 t/ha of FYM is blended. In general, 100 kg N, 60 kg P₂O₅, and 50 kg K₂O are recommended for maximum yield. At the time of planting, a half-dosage of N is administered, as well as a full dose of P₂O₅ and K₂O. The remaining half of N should be provided 30 days after sowing, followed by an earthing-up procedure.

Fertilizer is applied by digging a deep narrow furrow on one side of each sowing ridge and filling it with fertiliser. This crop should typically be fertilised with nitrogen fertilisers such as urea, calcium ammonium nitrate (CAN), and ammonium sulphate.

Irrigation

Irrigation frequency in bhendi crop varies with the season and the soil type. Bhendi is grown without irrigation in rainy season in high rainfall area where distribution of rainfall is uniform throughout the growing season. A light irrigation is given soon after seed sowing to ensure good germination. The crop is irrigated at an interval of 4-5 days in summer. Moisture stress at fruit setting stage reduces the fruit quality and the yield. Normally the crop is irrigated by adopting the furrow method of irrigation.

Intercultural Operations

Weed control :- It is necessary to keep the crop weed free during the first 20-25 days of plant growth. A total of 3 to 4 weedings are needed. The first weeding is done when the seedlings are two weeks old and subsequent weedings are done at an interval of 25 days. Pre-emergence application of Basalin 48 EC (1.5kg a.i./ha) or Stomp 30 EC (0.75 kg. a.i./ha) followed by one hand weeding at 20-25 days after sowing effectively controls the weed growth.

Plant protection :-

- ✚ **Leaf hopper :-** Nymphs and adults of leaf hopper are pale green and move diagonally. The affected leaves turn yellowish and curl. In case of heavy infestation the leaves turn brick red and crumble.
- ✚ **Shoot and fruit borer :-** When the crop is young, larvae bore into tender shoots and tunnel downwards which wither, drop down and growing points are killed. In fruits, the larvae bore inside these and feed on inner tissues which become deformed in shape with no market value.
- ✚ **Red spider mite :-** Larvae & nymphs are greenish red while adults are oval, reddish brown in colour. Mites feed on the under surface of leaves and the affected leaves gradually start curling and get wrinkled and crumpled.
- ✚ **Yellow vein mosaic disease :-** Interwoven network of yellow veins encompassing with islands of green tissues on leaves. Later, entire leaves turn yellow. This disease, spread by white fly, is economically most important disease.
- ✚ **Root knot nematode :-** Microscopic, soil borne, vermiform pests. They feed vigorously on roots and cause galling of roots. Affected plants are weak, stunted with yellow leaves.

Integrated Pest Management Strategies:-

1. Sowing of YVMV resistant hybrids viz. Makhmali, Tulsi, Anupama-1 and Sun-40 etc. especially during kharif season of the crop.
2. Grow maize/sorghum on borders as a barrier/trap crop for the entry of shoot & fruit borer adults.
3. Set up yellow sticky and delta traps for white fly etc.
4. Erection of bird perches @ 10/acre in the field for facilitating bird predation.
5. Give two to three sprays of NSKE @ 5% alternating with sprays of pesticides, if needed, for leaf hopper, white fly, mites and aphids etc. Leaf hopper, if crosses ETL (5 hoppers/plant), spray imidacloprid 17.8 SL @ 150 ml/ha. This will be effective in controlling other sucking pests as well.

Harvesting and Yield

The fruits are ready for harvest in about 45-60 days after seed sowing depending upon variety and season. Size of the pod and stage at which it is harvested varies with variety/hybrid and market preference. Generally, medium sized (7-10 cm long) tender pods, which can be easily snapped from the plant, are harvested. As all the fruits do not mature at the same time, harvesting is carried out once in 3-4 days. Frequent picking promotes fruit development and prevents the pods from growing too large. Yield of the Bhendi varies greatly depending upon variety and season of cultivation. On an average bhendi yields 7.5-10 t/ha while the yield of hybrid varieties ranges from 15-22 t/ha.