

Cultivating Okra in Punjab

Okra locally known as *Bhindi* is cultivated widely as a food crop in the tropical and subtropical regions across the globe. The pods of okra play an important role in human diet as they are rich in dietary fibre, proteins, amino acids especially lysine and tryptophan, carbohydrates, minerals, vitamins and antioxidants. Mucilage and fibre content present in okra helps in lowering down the glucose level and are good for diabetic patients. Okra is gaining importance with regards to its nutritional, medicinal, and industrial value. Apart from nutritional and health importance, okra plays an important role in income generation and subsistence among rural farmers in developing countries like India.

OKRA, an annual shrub, represents a popular garden crop, which is well known for its palatability worldwide. The juvenile green pods of okra are commonly consumed as vegetable, whereas the extract from the pods also serves as a thickening agent in many recipes for soups and sauces to enhance their viscosity. The crop is commercially cultivated in many countries, viz. Japan, Turkey, Iran, Western Africa, Yugoslavia, Bangladesh, Afghanistan, Pakistan, Myanmar, Malaysia, Thailand, India, Brazil, Ethiopia, Cyprus and in the Southern United States. India topped the world in okra vegetable production with 509,000 ha of area and 6095,000 tonnes of production. Under Punjab conditions, okra is grown commercially in about 4.57 thousand hectares of land with the annual production of 47.65 thousand metric tonnes. In Punjab, farmers take two harvests of okra, one as spring summer crop and the other as rainy season crop. The cultivation of okra crop requires a long, hot and humid growing season. In comparison to spring summer, crop development is more rapid during the rainy season. Okra seeds do not germinate below 20°C, while the ideal temperature for seed germination is 29°C. Okra can be cultivated on a variety of soils, but it has to be friable. However, it grows best in light soils ranging from sandy loam to loam. Okra can withstand a somewhat acidic soil reaction (*p.H* 6.8 to 6.0). For its successful cultivation in Punjab, farmers should follow the practices recommended by Punjab Agricultural University (PAU), Ludhiana.

Improved varieties recommended by PAU, Ludhiana

Punjab Suhawani: Plants of this cultivar are medium in height, with deeply lobed leaves that are dark green in colour and have serrated margins. Pods are dark green in colour with five ridges and medium length. It has tolerance to Yellow Vein Mosaic Virus (YVMV) disease. It gives an average yield of 122.5 q/ha.

Punjab-8: The plants of this cultivar are medium in

height, with splashes of purple pigmentation on the stem. Fruits are long, slender, dark green and have five ridges. It has resistance to Yellow Vein Mosaic Virus (YVMV) disease and tolerant to jassid and borer. It is suitable for processing. It gives an average marketable yield of 137.5 q/ha. It is suitable for both February-March and June-July sowings.

Punjab-7: The plants of this cultivar are medium in height and have purple colouring on the stem. Fruits are medium in length, green tender and five ridged. Fruit tip is slightly furrowed and blunt. It has resistance to YVMV. Average marketable yield is 112.5 q/ha. It can be sown in February-March as well as in June-July.

Punjab Padmini: Plants with purple tinge on the stem and petiole, fruits quick-growing, dark-green, thin, long, five ridged and remain tender for a longer period. It has field tolerance to Yellow Vein Mosaic Virus. It is ready to pick in 60 days. It produces an average yield of 112.5 q/ha. It is suitable for sowing in spring and rainy season.

Farmers can obtain the seed of PAU recommended varieties of okra from Punjab Agricultural University, Ludhiana.

Agronomic practices

Sowing time, seed rate and spacing: Under north Indian plains scenario, the spring crop of Okra may be sown in between February-March, whereas the rainy season crop can be sown during June-July months across India. However, for the cultivation of seed crop, the best sowing time is around the middle of June. Fifteen to eighteen kg of seed per acre is required for sowing up to 15th February, 8-10 kg for sowing in March and 4-6 kg for sowing in June-July. Before planting, the seed should be soaked in water for 24 hours. Sowing should be done on ridges in February-March and on flat beds during June-July months. The sowing should be done by following row to row spacing of 45 cm and plant to plant space of 15 cm.

Nutrient management: During the land preparation, apply 15-20 tonnes of well rotten farmyard manure and 36 kg of N (80 kg of Urea) per acre into the soil. Care should be taken while applying the nitrogenous fertilizers that always apply half of the N at sowing and the rest as top-dressing after first picking of fruits.

Irrigation: Seed should be sown in proper soil moisture conditions. First irrigation should be given after 4-5 days of sowing. Further irrigations should be given after 10-12 days, whereas, during the rainy season, less irrigation is required. Total 10-12 irrigations during the cropping season are required. In light textured soils, use saline-sodic groundwater alternatively with good quality canal water along with incorporation of 24 q/acre rice straw mulch.



View of okra crop field

Table 1. Insect-pests and their management

Insect-pest	Symptoms	Control measures
Jassid (<i>Amrasca biguttula</i>)	The nymphs and adults of jassids cause damage by sucking the sap from the underside of leaves during May-September. Plants attacked by jassid show yellowing and curling along the margins, turn pale to bronze colour and finally premature defoliation occurs. A large number of greenish adults and nymphs are seen under the leaves.	Spray the crop with any of the following insecticides in 100-125 litres of water per acre: i) 80 ml Ecotin 5% (Neem based insecticide) ii) 2000 ml PAU Homemade Neem Extract iii) 40 ml Confidor 17.8 SL (imidacloprid) iv) 40 g Actara 25 WG (thiamethoxam) v) 560 ml Malathion 50 EC vi) 100 ml Sumicidin 20 EC (fenvalerate)
Whitefly (<i>Bemisia tabaci</i>)	This insect causes maximum damage during July-September. Its adults and nymphs suck sap from the underside of leaves and excrete honey dew on leaves which become sticky. Affected leaves turn black due to development of sooty mould.	Spray 80 ml Ecotin 5% (Neem based insecticide) or 2000 ml PAU Neem Extract.
Spotted bollworms (<i>Earias</i> sp.)	This insect damages crop during May-September. Shoots infected with borer droop downwards and dry up. Infested fruits have a varying number of holes.	Spray the crop with any of the following insecticides in 100-125 litres of water/acre: i) 50 ml Coragen 18.5 SC (chlorantraniliprole) ii) 200 ml Sumipleo 10EC (pyridalyl) iii) 70 g Proclaim 05 SG (emamectin benzoate) iv) 100 ml of Sumicidin 20 EC (fenvalerate)

Table 2. Major diseases and their management

Disease	Symptoms	Control measures
Yellow vein mosaic virus	The initial symptoms start as yellowing of veins and later on all the leaves show severe yellowing. Fruiting is reduced.	i) Sow resistant variety, Punjab Padmani, Punjab-7 and Punjab-8. ii) Control whitefly (the virus vector) by spraying 80 ml Ecotin 5% (Neem based insecticide) or 2000 ml PAU Neem Extract in 100-125 litres of water/acre.
Damping-off	Both pre and post emergence mortality of plants occurs.	Use disease free seed.

Table 3. Economics of cultivation of okra in Punjab

Particulars (per acre)	Rate (₹)	Quantity	Value (₹)
a. Variable costs			
Seed (kg)	300 per kg	10	3000
Manures and Fertilizers			
Urea(kg)	5.93 per kg	80	475
FYM (t)	500 per tonne	17.5	8750
Irrigation (No.)	100 per irrigation	11	1100
Hoeing (No.)	1472 per hoeing	4	5888

Particulars (per acre)	Rate (₹)	Quantity	Value (₹)
Plant Protection measures			
Ecotin 5% (Neem based insecticide) (ml) 2 sprays	1100 per 100 ml	160	1760
Sumicidin 20 EC (fenvalerate) (ml) 2 sprays	700 per litre	200	140
Labour cost for spraying	150 per acre	4	600
Labour (hrs)	46 per hr	300	13800
Tractors (hrs)	500 per hr	8	4000
Marketing and transportation charges			2500
Sub total			65013
Interest @ 9% for half the crop period			1462.8
Total variable costs			43475.8
b. Gross returns			
Main product (kg)	25 per kg (average)	4800	1,20,000
Returns over variable costs			76,524.2

Weed management: To keep weeds under control, give three to four hoeing's. The first hoeing may be given when the seedlings are two weeks old and then at fortnightly spans.

Harvesting: The crop will be ready for harvest in about 45-50 days after sowing, depending upon the prevailing climatic conditions and variety. Tender fruits (10 cm long) should be picked. Frequent pickings would be required during peak season and 10-12 pickings are done.

SUMMARY

Okra is one of the most important fruit vegetables for home consumption. Due to its high nutritive value and

long post-harvest life, it has captured a prominent position among the export-oriented vegetables. In India, okra is one of the major summer and rainy season vegetables, grown for its tender green pods. In order to increase the production and fetch higher returns from okra, farmers should follow scientific cultivation practices with selection of varieties recommended as per region.

For further interaction, please write to:

Dr Arti Verma (Assistant Professor), Krishi Vigyan Kendra, Langroya, Punjab 144 516. *Corresponding author email: artiverma@pau.edu

Attention Readers

The ICAR brings out a number of publications on Agriculture, Animal Husbandry, Horticulture, Fisheries and its allied subjects. To project its publications among students, research scholars, extension workers, scientists and faculty members, the Business Unit of the Directorate of Knowledge Management in Agriculture (DKMA) of the ICAR arranges Book Exhibitions in the campuses of the Agricultural Universities.

If you want to hold a Book Exhibition, you may send your request through your Department Head/Dean to the Business Manager of the ICAR, preferably 1 month in advance, so that a good Book Exhibition could be arranged in time. The students can avail a handsome discount on the ICAR publications including journals.

For further details, contact:

Business Manager

Directorate of Knowledge Management in Agriculture
Indian Council of Agricultural Research

Krishi Anusandhan Bhavan, Pusa, New Delhi 110 012.

Telefax: 011-2584 3657; E-mail: bmicar@gmail.com