PRODUCTION TECHNOLOGY OF OKRA

By:
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GENERAL CHARACTERISTICS:
▪ Scientific name- *Abelmoschus esculentus*
▪ Family - Malvacea
▪ Chromosome number- 2n= 130 (Natural Amphidiploid)
▪ Centre of origin-Tropical Africa

NUTRIENT VALUE AND USES:
▪ Rich source of **iodine**- useful for treatment of goitre
▪ Also rich source of **Calcium, Potassium and Vitamin C**
▪ Mucilage present in okra fruits is due to polysaccharides i.e. **galacturonic and glucuronic acids**
▪ fruit used against urinary disorders, chronic dysentery
▪ dry fruit skin and fibres are used in manufacture of paper, card board and fibres.
▪ **Root and stem are also used clearing cane juice for preparation of jaggery.**
AREA AND DISTRIBUTION:
- In India- Uttar Pradesh, Bihar, Odisha, West Bengal, Andhra Pradesh, Karnataka and Assam
- In world- tropics and subtropics region mostly Africa
- India is the leading producer of okra in world.
- Andhra Pradesh is the leading producer in India followed by West Bengal

BOTANY:
- It is a often cross-pollinated crop.
- Fruit is called capsule.
- A. esculentus(2n=130) = A. ficulneus(2n=72) x A. tuberculatus(2n=58)
- Imp. 4 species are A. esculentus, A. manihot, A. caillei and A. moschatus
PRODUCTION TECHNOLOGY:

CLIMATE:
- prefers warm humid weather
- susceptible to drought and low night temperature
- Temperature for growth is 20-30°C
- seed germination- 25 and 35°C
- seeds fail to germinate below 17°C
- if temp. grows above 42°C it results flower buds drop.

SOIL:
- loose, well drained loamy soil
- pH 6-6.8
SEASON:
- In areas, where temperature is mild it can be grown throughout the year.
- As it cannot tolerate frost and low temperature, it is grown twice in plains.
- As kharif, seeds are sown during May to July and as spring summer crop, seeds are sown during February to March.

SEED RATE AND SPACING:
- During summer-seed rate is 18-20 kg/ha (vegetative growth is less and seeds are sown at closer spacing of 45 cm X 20 cm or even less)
- During kharif- seed rate is 8-10 kg/ha (plant grow vigorously with more branching and sown at a spacing of 60 cm x 30 cm)
- Seeds sown at a depth of 2.5 cm.
LAND PREPARATION AND SOWING:
▪ Field is ploughed thoroughly for 2-3 times for making soil to fine tilth.
▪ Ridge and furrow system is followed.
▪ Okra is a direct seeded crop.
▪ Seeds are soaked for 6-12 hrs before sowing to enhance germination during summer.

NUTRIENT MANAGEMENT:
▪ Well decomposed FYM-20-25t/ha
▪ NPK-125kg/ha: 75kg/ha: 63 kg /ha
▪ Basal- ½ N₂ + Full P and K (before sowing or at the time of sowing)
▪ Top dressing- Remaining ½ N₂ (after 35-40 days of seed sowing)
IRRIGATION:
- Immediately after seed sowing
- Subsequent irrigated at an interval of 5-6 days.

INTERCULTURE:
- Frequent hoeing, weeding and earthing up.
- Use of weedicide flucholralin (1.5 kg/ha)
- One hand weeding at 45 days after sowing.
CROPPING SYSTEM:
- Sequential cropping: potato-Carrot-okra, okra potato-tomato, cauliflower-tomato-okra
- Sequential intercropping: Okra + french bean, okra + radish

PLANT GROWTH REGULATORS:
- Seed treatment by $\text{GA}_3$ (400 ppm), NAA(20 ppm) enhanced germination.
HARVESTING:
▪ Crop duration-90 days
▪ Pods should be harvested when they are immature and green and have attained edible size.
▪ Harvested when pod length is 8-10 cm but for export 6-8 cm is preferred.
▪ Delay in harvesting causes fibrous and matured fruit of poor edible quality.

YIELD:
▪ Spring summer crop-6 to 8t/ha
▪ Kharif crop- 10 to 12.5 t/ha

STORAGE:
▪ Fruits are stored at 7-9°C temp. and 70-75% RH for couple of days.
▪ These can be stored at room temp. for 2-3 days if water is sprinkled on fruits during day and once in night.
<table>
<thead>
<tr>
<th>Institute Name</th>
<th>Variety name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIHR Bangalore</td>
<td>Arka Anamika, Arka Abhay, Sel.4, Sel. 10</td>
</tr>
<tr>
<td>IARI New Delhi</td>
<td>Pusa Makhmali, Pusa Sawani, Pusa A4</td>
</tr>
<tr>
<td>IIVR Varanasi</td>
<td>VRO 3, VRO 4, Kashi Pragati, Kashi Vibhuti</td>
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<tr>
<td>PAU, Ludhiana</td>
<td>Punjab 7, Punjab Padmini, Punjab 8</td>
</tr>
<tr>
<td>MAU, Parbhani</td>
<td>Parbhani Kranti, Parbhani Tillu</td>
</tr>
<tr>
<td>CSAUA&amp;T, Kanpur</td>
<td>Azad Kranti, Azad Bhindi 1, Azad Bhindi 3</td>
</tr>
<tr>
<td>HAU, Hissar</td>
<td>Varsha Uphar, Hisar Unnat</td>
</tr>
<tr>
<td>TNAU</td>
<td>MDU1, CO1</td>
</tr>
<tr>
<td>YSPUH&amp;F, Solan</td>
<td>Harbhajan bhindi</td>
</tr>
<tr>
<td>Varieties resistant to YVMV</td>
<td>Arka Anamika, Arka Abhay, Parbhani Kranti, Punjab Padmini, Varsha Uphar, Hissar Unnat, Punjab 8</td>
</tr>
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<tr>
<td>Varieties tolerant to fruit borer</td>
<td>Pusa A4, Arka Abhay, Punjab 8</td>
</tr>
<tr>
<td>For export</td>
<td>Pusa Sawani, Pusa A4, Parbhani Kranti</td>
</tr>
<tr>
<td><strong>Spineless variety</strong></td>
<td><strong>Pusa Sawani</strong></td>
</tr>
<tr>
<td>Tolerant to jassids</td>
<td>Pusa A4</td>
</tr>
<tr>
<td>Sl No</td>
<td>Disease name &amp; Causal Organism</td>
</tr>
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</tr>
<tr>
<td>1.</td>
<td>Powdery mildew <em>(Erysiphe cichoracearum)</em></td>
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<td>2.</td>
<td>Fusarium wilt <em>(Fusarium oxysporum)</em></td>
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<td>3.</td>
<td>Bacterial leaf spot <em>(Xanthomonas campestris)</em></td>
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<td>SI No.</td>
<td>Disease name &amp; Causal Organism</td>
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<td>4.</td>
<td>Yellow Vein mosaic (caused by Yellow vein mosaic virus)</td>
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<tr>
<td>5.</td>
<td>Enation leaf curl (caused by Enation leaf curl virus)</td>
</tr>
</tbody>
</table>
POWDERY MILDEW

YVMV

ENATION LEAF CURL
<table>
<thead>
<tr>
<th>SI No.</th>
<th>Name of insect-pest</th>
<th>Damage</th>
<th>Remedy</th>
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</table>
| 1.     | Shoot and fruit borer (*Earias* spp.) | • Caterpillars bore into stem, Flower buds and fruits.  
• Infested fruits are deformed and smaller in size | Destruction of infested plant parts, Spray 0.05% Malathion or Endosulfan at 10 days interval |
| 2.     | Jassids/Leaf hopper (*Amrasca bigutella bigutella*) | • affected leaves turn yellowish and curl upward  
• In severe infestation, leaves look burnt and brittle | Spray Endosulfan (0.05%) at 10 days interval |
| 3.     | White fly | Enhances the YVMV | Spray Endosulfan (0.05%) at 10 days interval |
SHOOT AND FRUIT BORER DAMAGE

WHITE FLY IN OKRA

JASSIDS IN OKRA
PHYSIOLOGICAL DISORDERS

Poor seed germination

- Mostly occurs due to early spring summer
- Seed germinate poorly when soil temperature remains at or below $20^\circ C$.
- Control by soaking in water for 24 hrs, soaking seed in hot water at $45^\circ C$
THANK YOU