

Sesame
Sesamum indicum

Importance

- It is regarded as *queen* of oilseeds
 - Because of its quality (fatty acid composition)
 - Its resistance to oxidation and rancidity
- India is considered as basic centre of origin
- Very ancient

cropEconomic Importance

- 38-54% high quality oil
 - Containing 1-15% protein
- 75% sesame is used for oil
- 20% for domestic including sweets, candies and condiments
- 2-3% for next sowing
- It is nourishing food, as flavoring agent and for medicinal purpose
- Manufacture of soaps, cosmetics, perfumes, insecticides & pharmaceuticals
- Sesame cake is good livestock feed
- Also an ingredient to poultry

feedDistribution

- A crop of tropics and sub-tropics
- But it is grown up to 40°N in China
- India is the major producer

**Sesame - World - Area, production and productivity
(Million hectares and million tonnes)**

Country	Area	Production	Productivity
India	2.13	0.50	0.24
Sudan	1.05	0.25	0.25
China	1.00	0.56	0.62
Burma	0.87	0.21	0.25
Nigeria	0.25	0.08	0.30
World	6.57	2.27	0.35

Sesame – Indian scenario (Million ha & million t)

State	Area	Production	kg/ha
Gujarat	0.30	0.09	0.29
Rajasthan	0.21	0.02	0.07
Tamil Nadu	0.17	0.09	0.54
MP	0.17	0.04	0.21

UP	0.16	0.03	0.19
Maharashtra	0.13	0.04	0.30
WB	0.01	0.09	0.85
India	2.13	0.50	0.24

The plant

- It is erect, branched annual
- Multi flowered, fruit is capsule with small oleaginous seeds
- Leaves are most variable in shape and size
- Lower leaves tend to be broad
- Upper leaves are more narrow and lanceolate
- Flowers arise in the axils of leaves & on the upper portion of the stem

Seed

- Small, ovate 3g/1000
- Testa color varies black, white, yellow, dark grey
- Dry matter content in the seed increases rapidly between 12-24 days in parallel with oil content
- A capsule may contain 50-100 seeds

Climate

- Requires fairly high temp
- 2700 heat units are normally required
- 27-33°C is found to be optimum
- < 10°C growth process stops
- > 40°C can affect fertilization
- A rainfall of 500-650mm
- Heavy rain at flowering affects yield
- Extremely susceptible to water logging
- It is drought resistant, can withstand drought
 - Except establishment period
 - A crop for SAT regions
- Susceptible to wind damage & hail
- Heavy storms can virtually strip off leaves

Soils

- From sandy to clay soils
- Thrives well under well drained moderately fertile soils of medium texture
- Soils with impervious sub-soil are not suitable
- Soils with neutral pH
- Sesame grows with a range of 5.5 to 8.0 soil pH
- Many soils where sesame cultivated are saline

Land preparation

- Fine tilth by deep ploughing
- Land should be leveled properly
- Beds and channels is more suitable
- In heavy rainfall areas broad bed furrows

- Ridges may be to drain the excess rainfall

Improved varieties

- CO 1
- TMV 3, TMV 4, TMV 5, TMV 6
- Paiyur 1
- SVPR 1 (white)
- VRI 1

Duration

- 80-85 days

Oil content

- 44-56% mostly 50%

- Season
 - North
 - Kharif - according to monsoon set
- In
 - Bihar, WB & Orissa:
 - Irrigated - March
 - Tamil Nadu
 - Seed rate & spacing
 - Seed rate - 5 kg /ha
 - Spacing
 - 30cm x 30cm (11 plants m⁻²)
 - Broadcasting and thinning to - 11
 - Spacing adapted in other states
 - 30x15 (AP, Assam, Karnataka, Orissa, WB)
 - 45 x 10 in Kharif and 45x15 in Rabi in Gujarat
 - Seed treatment & sowing
 - Treat the seeds with Trichoderma @ 4g/kg
 - 3 pockets of Azospirillum /ha
 - N
 - Mix the seeds with four times its volume of dry sand and mix
 - Drop / broadcast uniformly
 - Depth of sowing 3cm
 - Transplanting of gingelly
 - Transplanting is possible
 - In light textured soil
 - Nursery
 - Raised bed, 300 m⁻²
 - Seed rate : 1.0 to 2.0g seeds m⁻²
 - Seedlings of 15-20days old
 - Irrigate and transplant
 - Transplant at late afternoon
 - Optimum population with equidistance gives yield advantage
 - Manures & Fertilizers
 - FYM/composted coir pith 12.5t/ha
 - Blanket - N:P₂O₅ :K₂O kg /ha
 - Tamil Nadu
 - Rainfed - 23:13:13
 - Irrigated – 35:23:23
 - If Azospirillum applied, N may be reduced by 5-10 kg
 - Other states with higher recommendation
 - Gujarat – Irrigated: 50:25:25
 - WB – Irrigated: 50:25:25
 - Apply all basal
 - 5kg MnSO₄ in Mn deficient soils
 - 5kg ZnSO₄ for Zn deficient soils
 - Micronutrients should be broadcast with sand after sowing
 - Water management
 - Irrigate at sowing

- Light short interval is better than heavy
- Heavy irrigations reduce seed weight and oil content
 - Irrigation at flowering critical
 - Soil moisture should be low at maturity
- Irrigation at 25% ASM
- IW/CPE ratio of 0.4
- Total water requirement- 250-350mm

Weed management

- Thinning, hoeing and weeding are important cultural practices
- Hoeing & weeding twice at 15 & 30 DAS
- Herbicides
 - Pre-emergence application of Alachlor @ 1.25 kg/ha
 - Or Fluchloralin 1kg/ha
 - Herbicide application to be followed with hand weeding on 30th day

Maturity

- 25% of bottom leaves dropped
- Top leaves lose their green color – turn to pale yellow
- The colour of the stem turns yellow
- Capsules up to middle of the stem turn yellow
- Examine the 10th capsule for seed color
 - If the color is black then ready for harvest

Harvest

- May be cut to ground or uproot
 - Preferably in the morning
- Stack in the open one over other in circular heap
- Keep the top inside and roots out
- Cover top of the heap with straw and tie or add weight
 - Humidity and temp increases

g Yield

Heap for 3-5 days

- Open the heap and keep the stacks drying
 - Dry it for 2 or 3 days
 - Shake the plants after drying to separate the seeds
 - Dry the plant again and separate the seeds
- Vary very widely
 - Few 100 to 3000kg
- Rainfed in India
 - 375-500 kg
- Irrigated (rabi)
 - 500-575kg
- Transplanted gingelly may give higher yield of 2.0 tonnes

Cropping system

- As pure crop
 - Rice-gingelly
 - Sesame-wheat
 - Sesame-chickpea/ rapeseed/lentil/pearlmillet
- Mixed / inter crop
 - Yield is poor but area is more
 - Sesame +mungbean
 - Sesame +groundnut
 - Sesame +maize

Storage

- Clean and dry
- 5% moisture for storage
- Containers should be tight tipped