SESAME (Sesamum indicum)

CROP IMPROVEMENT

I. SEASON AND VARIETIES

DISTRICT/SEASON	VARIETIES
A) Rainfed	
1. Adipattam (Jun - Jul)	
All districts	CO 1, TMV 3
2. Karthigaipattam (Oct - Nov)	
All districts	CO 1, TMV 3, TMV 5, SVPR 1, VRI(SV) 2
B) Irrigated - Masipattam (Feb - Mar)	
Coimbatore, Erode, Tiruchirapalli, Perambalur,	TMV 3, TMV 4, TMV 6, CO 1, VRI(SV) 1,
Karur, Madurai, Dindigul, Theni, Thanjavur,	SVPR 1, VRI(SV) 2
Tiruvarur,Nagapattinam	
C) Rice fallows	
Coastal situations	VRI(SV)1

II. PARTICULARS OF SESAME VARIETIES

Particulars	CO 1	TMV 3	TMV 4	TMV 5
Parentage	(TMV3 x SI 1878) x	South Arcot local x	Pureline from	Pureline from
	SI 1878	Malabar	Sattur local variety	Srivaikuntam variety
Duration (Days)	85 - 90	80 - 85	85 - 90	80 - 85
Oil content(%)	51	51	50	51
Yield kg/ha				
Irrigated	750 - 790	625 - 750	700 - 850	
Rainfed	450 - 650	400 - 650		450 - 650
Habit	Erect with branching and	Bushy with	Bushy with	Erect with
	short internodes on the main stem	profuse branching	profuse branching	moderate branching
Capsules	4 loculed	4 loculed	4 loculed	4 loculed
Seeds	Intense dark brown almost black	Darkbrown	Brown	Brown

Particulars	TMV 6	SVPR 1	VRI (SV)1
Parentage	Pureline selection from	Selection from Western	Pureline seletion from
	Andhra Pradesh variety	Ghat White	Tirukattupalli local
Duration (Days)	85 - 90	75 - 80	70 - 75
Yield kg/ha			
Irrigated	700 - 950	800	650 - 900
Rainfed		600	450 - 650
Oil content(%)	54	53.8	51
Habit	Erect with moderate	Erect and moderate	Moderate branching
	branching	branching	
Capsules	4 loculed	4 loculed	4 loculed
Seeds	Brown	White	Brown

CROP MANAGEMENT

1. FIELD PREPARATION

- a) Plough the field with tractor twice or with mould board plough thrice or five times with a country plough.
- b) Break the clods in between ploughings and bring the soil to a fine tilth to facilitate quick germination as the seeds are small.
- c) Chiselling for soils with hard pan: Chisel the soils having hard pan formation at shallow depth with chisel plough first at 0.5 m interval in one direction and then in the direction perpendicular to the previous one once in three years. Apply 12.5t FYM/composted coir pith besides chiselling.
- d) For irrigated gingelly, form beds of size 10 m² or 20 m² depending upon the availability, inflow of water and slope of the land. Level the beds perfectly without any depressions to prevent water stagnation, which will affect the germination adversely.
- e) In rice fallows, field is ploughed once with optimum moisture, seeds are sown immediately and covered with one more ploughing.

2. APPLICATION OF FERTILIZERS

- i) Spread FYM or composted coir pith or compost @ 12.5 t/ha evenly on the unploughed field and plough it in.
- ii) If the manure is not applied before commencement of ploughing, spread 12.5 t/ha of FYM or compost evenly on the field before the last ploughing and incorporate in the soil.
- iii) Apply NPK fertilizers as per soil test recommendation. If soil tests are not available, follow the blanket recommendations. Rainfed: Apply 23:13:13 kg NPK/ha or 17:13:13 kg NPK/ ha + 3 packets of Azospirillum (600 g/ha) and 3 packets (600 g/ha) of Phosphobacteria or 6 packets of Azophos(1200 g/ha). Irrigated: Apply 35:23:23 kg NPK/ha or 21:23:23 kg NPK/ha + 3 packets of Azospirillum (600 g/ha) and 3 packets(600 g/ha) of Phosphobacteria or 6 packets of Azospirillum (600 g/ha) and 3 packets(600 g/ha) of Phosphobacteria or 6 packets of Azospirillum (600 g/ha) and 3 packets(600 g/ha) of Phosphobacteria or 6 packets of Azospirillum (600 g/ha) and 3 packets(600 g/ha) of Phosphobacteria or 6 packets of Azospirillum (600 g/ha) and 3 packets(600 g/ha) of Phosphobacteria or 6 packets of Azophos(1200 g/ha)
- iv) Apply full dose of N, P and K basally. Add 5 kg of Manganese sulphate per hectare. Apply 50% of the recommended P₂O₅and K₂O with full recommended dose of N to irrigated gingelly raised after groundnut fertilized with 100% of recommended NPK.
- v) Open furrows to a depth of 5 cm and 30 cm apart and place the fertilizer mixture along the furrows and cover to a depth of 3 cm with soil before sowing.
- vi) If furrow application is not done, broadcast the fertilizer mixture evenly on the beds before sowing.

3. APPLICATION OF AZOSPIRILLUM

25% of the N can be substituted by 3 packets of Azospirillum (600 g/ha) and 3 packets (600 g/ha) of Phosphobacteria or 6 packets of Azophos (1200 g/ha) by seed treatment and 10 packets of Azospirillum (2000 g/ha) and 10 packets (2000 g/ha) of Phosphobacteria or 20 packets of Azophos(4000 g/ha)as soil application.

4. NUTRITIONAL DISORDERS

- a) **Manganese deficiency** : Leaves develop interveinal chlorosis, chlorotic tissue, later develop light brown or husk coloured necrotic lesions.
- b) **Zinc deficiency**: Middle leaves develop chlorosis in the interveinal areas and necrosis along the apical leaf margins. Mix 5 kg/ha of Zinc sulphate with 45 kg of soil and broadcast evenly in the beds after sowing.

Note: Do not incorporate the micronutrient in the soil.

5. SEED RATE

Adopt a seed rate of 5 kg/ha.

6. SPACING

a) Give a spacing of 30 cm between rows and 30 cm between plants. b) For rice fallows, seeds are broadcasted and thinned to maintain 11 plants/ m_{a} .

7. QUALITY OF SEEDS

Select mature, good quality seeds free from pest and fungal damage.

8. SEED TREATMENT

Treat the seed with *Trichoderma*@ 4g/kg. This can be done just before sowing. SUCH SEEDS SHOULD NOT BE TREATED WITH FUNGICIDES or treat the seed with Thiram 4 g or Carbendazim at 2 g/kg of seeds before sowing.

9. SOWING

- a) Sow the seeds preferably in lines.
- b) Mix the seeds with four times its volume of dry sand and drop the mixture evenly along the furrows in which fertilizers are applied.
- c) Sow the seeds to a depth of 3 cm and cover with soil.
- d) The optimum time of sowing for VRI (SV) 1 sesame is second fortnight of February to first fortnight of March under summer irrigated conditions.

10. WATER MANAGEMENT

- i) Irrigate at sowing and give life irrigation 7 days after sowing depending on the soil and climatic condition and allow excess water to percolate.
- ii) Give one pre-flowering irrigation (25 days): One at flowering and one or two at pod setting. An irrigation at flowering period is critical.
- NOTE: The critical stage for moisture requirement is the flowering phase i.e, between 35th to 45th days of sowing. During the maturity phase, moisture status should be low. If more water is given during this phase, maturity of seeds is affected and filling up of the capsules will be poor. Therefore, stop irrigation after 65 days of sowing.

11. THINNING

Thin out the seedlings to a spacing of 15 cm between the plants on the 15th day of sowing and 30 cm on 30th day of sowing. This operation is very important for the crop in order to induce basal branches.

12. WEED MANAGEMENT

Weed and hoe on 15th and 35th day of sowing. Apply Alachlor @ 20 kg/ha on 20th day after sowing and irrigate the crop immediately.

13. HARVESTING

a) Decide when to harvest

- i. Observe the crop, considering the average duration of the crop.
- ii. Twenty five per cent of the leaves from the bottom are shed and the top leaves loose their colour and turn yellow at maturity.
- iii. The colour of the stem turns yellow.
- iv. The colour of the capsules turn yellow upto the middle.
- v. Harvest before the bottom capsules turn brown.
- vi. Examine the 10th capsule from the bottom by opening. If the seeds attained the full color of the variety harvest may be taken up.
 - vii. If harvest is delayed/ the capsules will dehisce resulting in yield reduction.

b) Harvest

- i. Pull out the plants from the bottom.
- ii. Stack in the open, one over the other in a circle with the stems pointing out and the top portion pointing inside.
- iii. Cover the top with straw, so that humidity and temperature increases.
- iv. Cure like this for 3 days, shake the plants. About 75 per cent of the seeds will fall off.
- v. Dry the plants for one more day and again shake the plants. All the mature seeds will fall off.
- vi. Winnow the seeds and dry in the sun for 3 days. Stir once in 3 hours to give uniform drying.
- vii. Collect the seeds and store in gunnies.

CROP PROTECTION

A. Pest management

Economic threshold level for important pests

Pests	ETL
Shoot webber - Shoot damage	2 larvae /m ² or 10% plant damage
Leaf amage	10 larvae/m ² in the vegetative stage and 2 larvae/m ² during the reproductive stage

Pest management strategies

Pests	Management strategies	
Shoot and Leaf webber	 Two sprayings with neem formulation 0.03% 	
Antigastra catalaunalis	Apply any one of the following insecticides 25 kg/ha on the	
Pod borer	25 th , 35 th and 50 th day of sowing :	
Elasmolomus (= Aphanus)	Endosulfan 4 D	
sordidus	Phosalone 4 D	
Gall fly	Quinalphos 1.5 D	
Asphondylia ricini	Malathion 5 D	
	Spray any one of the following :	
	Phosalone 35 EC 1000 ml/ha	
	Quinalphos 25 EC 1000 ml/ha	
	Dichlorvos 6W SC 500 ml/ha	
	Monocrotophos 36 WSC 625 ml/ha	
	Endosulfan 35 EC 1000 ml/ha	
	Carbaryl 50 WP 1000 g/ha in 500 litre of water	
	Neem seed kernel extract (5%).	
	Neem oil 2% (two rounds)	
	 Use alternate insecticides each time and avoid the usage of same 	
	insecticide every time.	
Leaf webber		
Antigastra catalaunalis		
Storage pests	Dust any one of the following on gunny :	
Iribollum castaneum	Malathion 5 D	
Corcyra cephalonica	Phosalone 4 D	
	Carbaryl 10 D	
	 Mix one kg of activated clay with 100 kg of seeds after adequate drving of seeds 	
Asphondylia ricini Leaf webber Antigastra catalaunalis Storage pests Triboilum castaneum Corcyra cephalonica	 Malathion 5 D Spray any one of the following : Phosalone 35 EC 1000 ml/ha Quinalphos 25 EC 1000 ml/ha Dichlorvos 6W SC 500 ml/ha Monocrotophos 36 WSC 625 ml/ha Endosulfan 35 EC 1000 ml/ha Carbaryl 50 WP 1000 g/ha in 500 litre of water Neem seed kernel extract (5%). Neem oil 2% (two rounds) Use alternate insecticides each time and avoid the usage of sa insecticide every time. Dust any one of the following on gunny : Malathion 5 D Phosalone 4 D Carbaryl 10 D Mix one kg of activated clay with 100 kg of seeds after adeq drying of seeds 	

B. Disease management

Seed treatment	Treat the seeds with any one of the following
	P. fluorescens @ 10g/kg of seed
	T. viride @ 4g/kg of seed.
	 Thiram @ 4g/kg of seed
	 Carbendazim @ 2g/kg of seed.
Name of the Disease	Management
Powdery mildew	Apply any one of the following
Erysiphe cichoracearum	 Sulphur dust 25 kg/ha
	 Wettable sulphur 25 kg/ha
Alternaria blight	 Spray Mancozeb 1000g/ha
Alternaria sesami	
Cercospora leaf spot	 Spray Mancozeb 1000g/ha
Cercospora sesami	

Root rot Macrophomina phaseolina (Rhizoctonia bataticola)	 Biological control Soil application of <i>P. fluorescens</i> or <i>T. viride</i> – 2.5 Kg / ha + 50 Kg of well decomposed FYM or sand at 30 days after sowing. Chemical
	Spot drench Carbendazim – 1 gm/ litre
Phyllody Phytoplasma Vector: <i>Orosius albicinctus</i>	 Cultural Method Remove and destroy infected plants. Chemical To control vector, spray Monocrotophos 36 or Dimethoate 30 EC 500 ml/ha combined with Intercropping of Sesamum + Redgram (6 : 1)

SEED PRODUCTION

Variety Seed Production

Land requirement

Land should be free of volunteer plants.

Isolation

Adopt 50 m for certified seed production

Fertilizer

NPK @ 50:25:25 kg ha⁻¹ as basal

Apply manganese sulphate @ 5 kg ha⁻¹ as basal

Foliar application

Spray 1% DAP at the time of first flowering and again 10 days after first spray.

Harvest

Harvest when 75–80% of the pods start yellowing and bottom 1 or 2 pods have dehisced.

At this stage, the pod moisture content will be 50-60% and seed moisture content will be 25 - 30%.

Seeds would have attained chocolate brown colour.

Stack the plants in inverted position and allow them to dry for 3 - 4 days.

Threshing

Remove the staked plants and beat with pliable bamboo stick

Processing

Use 4/64" (1.6 mm) round perforated metal sieve for grading.

Drying

Dry the seeds to 7- 8% moisture content and treat the seeds with Carbendazim or Thiram @ 2 g kg⁻¹ of seed.

Storage

Use gunny or cloth bags for short term storage with seed moisture content of 8 - 9%

Use polylined gunny bag for medium term storage with seed moisture content of 7 - 8%

Use 700 gauge polythene bag for long term storage with seed moisture content of less than 5%.

Mid-storage correction

Soak the seeds for two hours in double the volume of Disodium phosphate solution (3.60 g/100 lit of water).

Remove the floaters

Dry back the seeds to original moisture content 6 - 7%.

Other management practices

As in crop management technique