

- Spraying should be done after mixing the pesticide in 700 liters of water. A prophylactic spray one month after sowing is beneficial.

Major Pests and their integrated management:

- Deep summer ploughing should be done and sowing should be done by 25th October.
- Balanced fertilizers should be used because excessive amount of nitrogen increases the chances of damage from aphids (Chenpa, Mahu).
- Irrigation in the fourth week after sowing of the crop reduces the incidence of sucking pest.
- The larvae of sawfly should be collected and killed in the morning.
- The caterpillars of hairy caterpillar, cabbage butterfly etc. eating in herd should be caught and killed.
- In the beginning, break the aphid affected branches and bury them in the ground.

If any of the above pests reach the level of economic damage in the inspection, sprinkle any one of the following insecticides at the rate of per hectare or dissolved in 700 liters of water in the evening:

- **Sawfly, painted moth and cabbage butterfly**
- Malathion 50 EC 1.5 liters or *Imidacloprid* 600 F.S. 1 liter or *Thiamethoxam* 35 F.S. 1 liter
- **Sucking insect and Aphid (Mahu):**
- *Imidacloprid* 600 FS 1 liter or *Dimethoate* 30 E.C. 1.0 liters or *Methyl demeton* 25 E.C. 1.0 liters or *Chlorpyrifos* 20 EC 1.25 liters

1. Sawfly



2. Painted Moth



3. Cabbage Butterfly



4. Aphid



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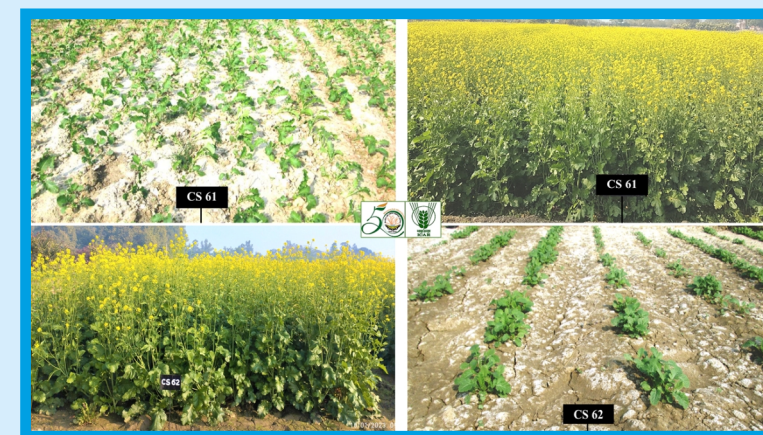
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Harvesting: When 75 percent of the pods turn golden in color, the crop should be cut, dried and threshed to separate the seeds. There is a possibility of falling of seeds on over ripening. The seeds should be dried thoroughly (at 8 percent moisture) and stored.

Therefore, farmers should sow only salt tolerant varieties of mustard in salt affected soil and water for higher yield and economic benefit.

CS 61 and CS 62: Salt tolerant varieties of Mustard and their production technology for salt affected land and poor-quality water



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CS 61 and CS 62: Salt tolerant varieties of Mustard and their production technology for salt affected land and poor-quality water

Mustard/Raya has a prominent place in *Rabi* oilseed crops. Even after several efforts, there is no significant increase in the mustard productivity (12 quintals/ha) of country compared to the global productivity (21.5 quintals/ha). Further, about 30% area (31 lakh ha.) out of the total mustard growing land (87 lakh ha.) is affected by salt stress in the country. Hence, prime reason for this lower productivity is the non-availability of improved high yielding varieties for the salt-affected land and poor-quality water regions where the mustard is being grown. Common varieties of mustard either do not germinate in salt affected soil and water or their production is very less, due to which, the farmers have to suffer a lot. But by sowing salt tolerant varieties of mustard, farmers get more yield and economic benefits per hectare. Therefore, farmers should sow only salt-tolerant varieties of mustard for higher yield in salt-affected soil and water.

The ICAR-Central Soil Salinity Research Institute (ICAR-CSSRI), Karnal has made a special contribution in developing advanced salt tolerant varieties of mustard for use in agriculture in salt affected land and low-quality water in different geographical conditions of the country. As a result of continuous breeding efforts of ICAR-CSSRI, it has been possible to develop and released salt tolerant and high yielding varieties of mustard, the details of which are as follows: -

Land reparation for cultivation: First ploughing of the field is done with soil turning plough and later 2-3 ploughing is done with

Salt tolerant improved varieties	Year of release	Maturity period (Days)	Production capacity (quintal/ha.)		Special traits
			Salt affected land	Normal land	
CS 62	2023	125-132	20-22	25-27	<ul style="list-style-type: none"> Recommended for irrigated Sodic condition of Uttar Pradesh About 40 percent oil content Sodicity tolerance (up to pH₂ 9.4) Resistant to Alternaria blight, White rust, Powdery and Downy mildew, Sclerotinia stem rot and also the least incidence of aphid (Chenpa).

Salt tolerant improved varieties	Year of release	Maturity period (Days)	Production capacity (quintal/ha.)		Special traits
			Salt affected land	Normal land	
CS 61	2023	130-136	21-22	25-28	<ul style="list-style-type: none"> Recommended for irrigated Sodic condition of Uttar Pradesh About 39 percent oil content Sodicity tolerance (up to pH₂ 9.3) Resistant to Alternaria blight, White rust, Powdery and Downy mildew, Sclerotinia stem rot and also the least incidence of aphid (Chenpa).

indigenous plough. After this, the field should be made pulverized. If there is less moisture in the field, then it should be irrigated. Good preparation is done in one go by tractor driven rotavator. Get the salt affected land tested in the laboratory. If the alkalinity (pH) of the land is 9.0 to 9.4, then apply 4 tons of gypsum/hectare in the fields at the time of first ploughing and keep the fields waterlogged for 15 days or if irrigation water is not available, mix gypsum by ploughing the fields during the rainy season.

Seed treatment: Seed should be treated before sowing with *Imidacloprid* 600 F.S. or Thiamethoxam 35 FS at the rate of 8 ml per kg. for protection from insects and with Thiram/Bavistin at the rate of 2.5 grams per kg for protection from seed borne diseases.

Sowing time, seed rate and method: The suitable time for mustard sowing is till 25 October. Seed should be used at the rate of 5 kg/ha in irrigated areas. Sowing is done by machine in shallow (4-5 cm deep) furrows at a distance of 30 cm. Delayed sowing increases the chances of aphid attack and other pests and diseases.

Fertilizer application: Fertilizers should be used on the basis of soil test recommendations. Using Urea 50 kg, and Single Super Phosphate (SSP) 75 kg at the rate of per hectare in irrigated areas gives good yield. Use of Single Super Phosphate is more beneficial as it also supplies sulphur. In irrigated areas, half dose of Urea (25 kg) and the entire quantity of Single Super Phosphate is applied at the time of sowing at the 2-3 cm bottom of seed in furrows. The Single Super Phosphate should be

applied one day advance before sowing. Apply remaining quantity of urea in top dressing after first irrigation (25-30 days after sowing).

Irrigation: Mustard is particularly sensitive to moisture deficiency during pre-flowering and seed filling stages. So, irrigate it to get good yield. To get maximum yield, apply two irrigations, first after 25-30 days of sowing (before flowering) and second after 65-70 days (before pod filling stage) in case of no rain.

Weeding and thinning: Within 20-25 days after sowing, the dense plants are removed and their mutual distance should be maintained at 15 cm apart. To destroy weeds, a weeding should be done after the first irrigation. For chemical weed control, *Fluchloralin* 45 E.C. @ 2.2 liters per 800 liters of water or *Pendimethalin* 30 EC @3.3 liters per 800 liters of water per hectare and sprinkled before sowing and mix it in the soil by harrowing well.

Crop Protection: Pests and diseases affecting mustard crop are as follows: -

Major diseases and their management:

- For the control of soil borne diseases, it is very important to do deep ploughing in the summer season, adopt crop rotation, burn the remains of diseased plants and destroy the weeds.
- Sowing up to 25th October, helps in preventing diseases like *Alternaria* leaf blight, white rust and powdery mildew.
- Healthy and certified seeds should be used. Seed treatment should be done for protection from seed borne diseases (stem rot) at the initial stage.
- For prevention of *Alternaria* blight, white rust, stem rot and leaf blight, apply Dithane M-45 or Bavistin or Mancozeb 75% at 2.0 kg. quantity or 1.0 kg of Metalexil+Mancozeb.

