RAPESEED-MUSTARD

In Orissa, both toria and mustard varieties are cultivated. The toria varieties are more promising than mustard ones because of short and mild winter and low irrigation facilities.

Variety

The toria and mustard varieties recommended for the state are as follows :

Variety	Duration (days)	Seed yield (q/ha)	Oil content (%)	Remarks
Toria				
Parbati	75	15.0	41.0	Suitable for rainfed & early sowing
Anuradha	75	14.0	44.0	Suitable for irrigated and late sown condition
PT 303	85	12.0	40.0	Suitable for irrigated condition
TS 29	80	9.0	39.0	Suitable for rainfed condition
M-27	75	7.0	40.0	Suitable for rainfed condition
Mustard				
Varuna	110-115	18.0	37.0	Suitable for irrigated and rainfed condition
Kranti	115-130	20.0	38.0	Suitable for irrigated condition
Pusa Bold	110-115	15.0	40.0	Suitable for irrigated condition
Pusa Bahar	105-120	22.0	40.0	Suitable for irrigated condition
Pusa Jaikisan (BIO 902)	90-95	15.0	40.0	Suitable for irrigated condition

It is often confused when we describe rapeseed, toria and mustard in the field. It may be mentioned here that rapeseed-mustard comprises a group of oilseed crops belonging to genera *Brassica, Eruca* and *Synapsis*. The different ecotypes of *Brassica campestris* are yellow sarson, brown sarson and toria, collectively called rapeseed. *Brassica juncea* is a distinct species which is called indian mustard or rai or raya. The genera *Eruca* (taramira) and *Synapsis* are not cultivated in our state. In trade, yellow sarson, brown sarson, toria and taramira are kwown as rapeseed and rai as mustard. Generally toria and mustard are cultivated in our state. The distinguishing features of toria and mustard varieties are presented below for ease of field identification.

	TORIA (*Brassica campestris*)
1.	It is popularly known as lahi or maghi lahi.
2.	Plants are dwarf (60-65 cm) with dichotomous branches.

	MUSTARD (*Brassica juncea*)
1.	It is popularly known as rai, raya or laha
2.	Plants are tall (90-180cm), erect, much branched.

3.	Branching starts from the base of the plants.
4.	Leaves are small and light green in colour. Leaves grasp the stem completely, more often serrated.
5.	Pollination behaviour is cross pollinated (self incompatible)
6.	Short growing period with low potential yield
7.	Seed are small, light brown in colour with thin seed coat and nonmucilagenous in nature.
8.	Oil content : 40-46%

3.	Branching starts from the axil of 4^{th} or 5^{th} leaf.
4.	Leaves are stalked, glabrous or hairy, dark green in colour, the leaf blades donot reach the stem, prominently serrated.
5.	Pollination behaviour is self pollinated (self compatible)
6.	Long growing period with high potential yield
7.	Seeds are bold, round, reddish brown in colour with thick seed coat and mucilagenous in nature.
8.	Oil content : 33-40%

Land preparation

Rapeseed-mustard require a fine seed bed. In rainfed crop, plough the land once or twice with country plough or cultivator each followed by planking to conserve soil moisture. In irrigated crop, give a first ploughing by MB plough followed by 2-3 ploughings with country plough to obtain a good tilth. Make the seed bed free from weeds and stubble of previous crop. Apply FYM or compost @ 7.5 t/ha during final land preparation and incorporate it in the soil. Divide the land length and breadth wise into sub-plots of convenient sizes by drawing furrows at a distance of 3 to 4 m apart for irrigation and drainage.

Seed rate

Line sowing : 7.5 kg/ha
Broadcasting : 10.0 kg/ha

Seed treatment

Treat the seeds with vitavax power 1.5 g or (carbendazim 1.0 g + thiram 1.5 g) per kg seed prior to sowing.

Sowing

Optimum sowing time : Toria: Last week of September to mid-October

Mustard: Mid October to end of October

Spacing : 30 cm x 10 cm

Sowing depth : 3-4 cm

Fertilizer application

The fertilizer dose recommended for toria and mustard are as follows.

Crop	Fertilizer dose (kg/ha)		
	N	P_2O_5	K_2O
Toria (rainfed)	40	20	20
Toria (irrigated)	50	25	25
Mustard (rainfed)	50	25	25
Mustard (irrigated)	80	40	40

Apply the entire fertilizer dose as basal 5.0-7.5 cm below the seed furrows in rainfed crop. In irrigated crop apply 50% N and entire dose of P_2O_5 and K_2O as basal and rest 50% N at 3 weeks stage.

The nitrogen should be applied preferably as ammonium sulphate and phosphorus as singe super phosphate otherwise apply gypsum @ 250 kg/ha as basal to meet the sulphur need of the crop as the crop responds to sulphur. In zinc and boron deficient soils, apply $ZnSO_4$ @ 25 kg/ha and borax @ 12.5 kg/ha, respectively to increase the seed yield and oil content.

Interculture

Thin out the excess plants within the rows to maintain plant to plant distance at 10 cm at 2 weeks stage. Perform hoeing, weeding and thinning (wherever necessary) at 3 weeks stage. Weeds can also be controlled by using fluchloralin @ 0.5 kg/ha as pre-plant incorporation one day before sowing.

Irrigation

The crop responds well to irrigation. Besides a pre-sowing/post sowing irrigation to facilitate uniform germination, the crop requires irrigation at an interval of 12-15 days depending on soil and weather conditions. Under limited supply of irrigation, if one irrigation is available apply it at 3 weeks stage and with two irrigation apply one at 3 weeks stage and second at seed filling stage.

Plant protection

Major insect pests are sawfly, aphid and hairy caterpillar and diseases are alternaria blight, downy mildew and white rust. For control of these pests and diseases refer **Annexure-II and III**.

Harvesting and threshing

Harvest the crop when the pods turn yellowish. Delay in harvesting causes shattering problems. Stack the harvested bundles in the threshing floor for 4-5 days for ripening of the upper siliqua. Dry the bundles for 2-3 days and thresh with sticks or bullocks/tractor in a sunny day. Clean the seeds and dry in the sun for 4-5 days or till the moisture content comes down to 8.0 per cent for safe storage.

INSECT PEST MANAGEMENT IN RAPE SEED- MUSTARD

<u>Aphids</u>

Occurrence and damage

Light, soft bodied insects appear from early growth stage and continue upto pod maturing stage. They desap plants causing heavy loss in yield. Heavy aphid incidence is observed from mid December to end of January.

Control measures

Spray the crop with methyl demeton or dimethoate @ 1000 ml or imidacloprid 125 ml/ha ensuring thorough coverage. Spraying must be done in the afternoon hours to save honeybees. Complete mustard sowing before 1st week of November to reduce aphid infestation. Non irrigated crop should be at short duration and sowing be done within the first fortnight of October, particularly in hilly districts. Release *Chrysoperla carnea* @ 50,000 first instar larvae 01-02 times at per need.

Saw fly

Occurrence and damage

Dark coloured larvae looking like caterpillars defoliate plants.

Control measures

Spray endosulfan @ 1000 ml or carbaryl 50 WP @ 2.0 kg/ha ensuring thorough coverage.

Larger cabbage moth

Occurrence and damage

Small pale green caterpillars feed on terminal shoots by webbing the leaves, bore into the green pods also.

Control measures

In Orissa aphid and leaf webber incidence is observed simultaneously. Hence, alternate application of acephate or quinalphos and methyl demeton or dimethoate can check both the pests satisfactorily. Acephate is to be applied at 500 g/ha. The rest of the insecticides are applied @ 1000 ml/ha.