

OILSEEDS

Rapeseed – Mustard
(*Brassica campestris* & *Brassica juncea*)

Varieties:

Varieties	Year of release	#Agroclimatic zone	Duration (days)	Yield (q/ha)	Oil content (%)
Rapeseed: (<i>Toria</i>)					
TS-36	-	All zones	90-95	10-12	41-43
TS-38	-	All zones	90-95	10-12	41-44
M-27	1978	All zones	90-95	10-12	44.6
Mustard:					
TM-2	1993	U,C,L,H	105-115	12-16	36-40

Refer to page C for full forms of the agro-climatic zones

Newly recommended rapeseed or *toria* varieties

Varieties	Year of release	Duration (days)	Seed yield (q/ha)	Adaptation	Recommended for	Disease & pest reaction	Oil content (%)	Remarks
JT 90-1 (Jeuti)	2020	89	6.97	<i>Rabi</i> ; delayed sowing in rice fallow	All zones except Hills Zone & BVZ	Moderately Susceptible to <i>Alternaria</i> blight (leaves and pods show symptoms); moderately susceptible in case of incidence of aphids and sawfly	43	Suitable for late sowing
TS 46	-	94	9.06	<i>Rabi</i>	All zones except Hills Zone & BVZ	-	-	Suitable for late sowing
TS 67	-	90	7.01	<i>Rabi</i>	All zones except Hills Zone & BVZ	-	42	Suitable for late sowing

Indian mustard varieties newly recommended

Varieties	Ywear of release	Duration (days)	Seed yield (q/ha)	Adaptation	Recommended for	Oil content (%)	Disease and pest reaction
PM 26	2011	107	12-14	Rabi	All zones except BVZ and Hills Zone	40.32	-
PM 27	2011	107	13.44	Rabi	All zones except BVZ & Hills Zone	43.03	-
NRCHB-101 (Notified)	2009	108	13-15	Rabi	LBVZ, CBVZ, NBPZ, UBVZ, HZ	34.6-42.1	Moderately resistant to <i>Alternaria blight</i> and tolerant to aphids

Soil Type:

Rapeseed – mustard generally do well in sandy soils. However, other light soils are also equally good.

Field Preparation:

A fine seedbed is essential for rapeseed – mustard. The field should be ploughed 4-6 times followed by laddering in order to obtain a fine tilth.

Fertilizer Management:

Application of FYM or compost @ 2-3 t/ha is beneficial for the crop.

Nutrient	Requirement (kg/ha)	Form	Fertilizer requirement	
			kg/ha	kg/bigha
For Rapeseed				
(a) Plains:				
Rainfed condition				
N	40	Urea	87	12
P ₂ O ₅	35	SSP	220	30
K ₂ O	15	MOP	25	3
Irrigated condition				
N	60	Urea	130	18
P ₂ O ₅	40	SSP	250	33
K ₂ O	40	MOP	66	9

(b) Hills				
Rainfed condition				
N	65	Urea	140	20
P ₂ O ₅	35	SSP	220	30
K ₂ O	0	MOP	0	0
Central Brahmaputra Valley Zone				
Rainfed condition				
N	60	Urea	130	18
P ₂ O ₅	30	SSP	190	27
K ₂ O	30	MOP	50	6
Mustard (for All zones)				
N	80	Urea	174	23
P ₂ O ₅	40	SSP	250	33
K ₂ O	30	MOP	50	7
B	-	Borax	7.5	1

Apply 75% N and P when seeds are inoculated with *Azotobacter* @ 40 g/kg seed and PSB @ 40 g/kg seed.

If SSP is not used as source of P, sulphur @ 20 kg/ha in the form of gypsum (133 kg/ha) should be used.

NPK may be supplied in the form of mixed fertilizers. Nutrient requirements are to be adjusted according to contents in fertilizers. Rapeseed-mustard have been found to respond well to the application of borax in some agro-climatic zones of Assam. For higher yield of rapeseed and mustard in the North Bank Plains Zone, a fertilizer dose of 60:40:40 kg NPK/ha is recommended. However, the earlier doses of 40:35:15 and 40:20:20kg NPK/ha have also been recommended for those farmers who cannot afford a higher dose. Apply Boron as basal @ 1.5 kg/ha (15 kg borax/ha or 2 kg borax/bigha) with recommended dose of NPK for all zones of Assam

The crop booster 'Green Harvest' is recommended @ 25 g/10 lit of water at 30 days after planting.

FERTILIZER RECOMMENDATIONS AS PER FERTILIZER PRESCRIPTION EQUATIONS (FPE)

Fertilizer prescription equations can be used to find out the amount of NPK fertilizers required to obtain a certain yield target of the crop based on soil test values for NPK. The FPEs can be used under cultivation practices where only chemical fertilizers are used and where chemical fertilizers + FYM/Vermicompost/Enriched compost etc. are applied. The FPEs are valid for different varieties of the same crop having not more than 15% variations in yield. The amount of NPK fertilizers will vary according to yield target and soil test values. Yield target must not cross the potential yield of a particular crop.

FERTILIZER PRESCRIPTION EQUATIONS (FPE) FOR RAPESEED

A. For Normal Sowing:

Fertilizer Prescription Equations without IPNS (Fertilizer alone)

$$FN = 10.37 * T - 0.39 * STVN$$

$$FP = 1.86 * T - 1.07 * STVP$$

$$FK = 4.47 * T - 0.74 * STVK$$

Fertilizer Prescription Equations with IPNS (Fertilizer + FYM)

$$FN = 10.37 * T - 0.39 * STVN - 0.58 * M$$

$$FP = 1.86 * T - 1.07 * STVP - 0.10 * M$$

$$FK = 4.47 * T - 0.74 * STVK - 0.21 * M$$

where, FN,FP,FK-Fertilizer N,P₂O₅, K₂O; STVN, STVP, STVK-Soil test values for N, P₂O₅, K₂O, T-Targeted yield, M-IPNS component

B. For Late Sowing

Fertilizer Prescription Equations without IPNS (Fertilizer alone)

$$FN = 8.71 * T - 0.27 * STVN$$

$$FP = 5.90 * T - 3.13 * STVN$$

$$FK = 9.42 * T - 0.78 * STVN$$

Fertilizer Prescription Equations with IPNS (Fertilizer + FYM)

$$FN = 8.71 * T - 0.27 * STVN - 0.22 * M$$

$$FP = 5.90 * T - 3.13 * STVN - 0.08 * M$$

$$FK = 9.42 * T - 0.78 * STVN - 0.18 * M$$

where, FN,FP,FK-Fertilizer N,P₂O₅, K₂O; STVN, STVP, STVK-Soil test values for N, P₂O₅, K₂O, T-Targeted yield, M-IPNS component

Integrated sulphur management in Rapeseed (toria)-summer blackgram sequence

Apply sulphur @15 kg/ha as gypsum (100 kg /ha or 13 kg/bigha) to rapeseed only plus 25% recommended dose of NPK in form of urea, diammonium phosphate (DAP) andn muriate of potash (MOP) + biofertilizer (azotobacter and PSB for rapeseed and nrhizobium and PSB for blackgram@ 50 gm each /kg seed) +2ton FYM/ha (3q FYM/bigha) to each crop in rapeseed-blackgram sequence (Zones: All Zones).

Application of Lime:

CaCO₃ in the form of dolomitic lime @ 65.5 kg/bigha should be applied 15 days before seeding and incorporate in the soil in areas where multiple cropping is practised.

Seed Treatment:

Seed treatment with metalaxyl 35WS @ 6 g/kg of seed is recommended for eliminating downy mildew and White rust.

Seed Rate:

Seed rate of 10 kg/ha (1.3 kg/bigha) for *toria* has been found to be optimum.

For TM 2, TM 4 and Varuna, seed rate will be 8 kg/ha and plant population should be maintained at 3 to 3.5 lakh/ha. A seed proportion of 75:25 of toria + lentil mixed is recommended for Hills Zone only. As pure crop, a seed rate of 6-8 kg/ha is recommended for Hills Zone. After sowing, the land is lightly laddered.

Seed rate of rain fed late sown *toria* after *sali* paddy (rice-*toria* sequence) should be 13 kg/ha, i.e. 33% higher than normal recommended rate of 10kg/ha.

Time of Sowing:

The optimum time of sowing is middle of October to middle of November. Early sowing helps in escaping the attack of aphids.

In Barak Valley Zone, rapeseed and mustard can be sown as late as November 30 in upland condition and up to the third week of November in medium upland condition. However, the seed rate of rainfed late sown *toria* grown as succeeding crop in rice (*Sali*)-*Toria* sequence should be 33% higher than normal recommended rate, i.e. 13.0kg/ha.

Irrigation:

One Irrigation of 6 cm depth of water may be applied either at 50% flowering or at early siliqua formation stage. In case a rainfall of 20-25 mm is received during this period, no post sowing irrigation is essential. Pre-sowing irrigation is normally not required for timely sown crop. However, in dry areas one pre-sowing irrigation may be applied.

As moisture conservation tillage practice for rapeseed after *sali* rice, one cross ploughing by power tiller incorporating rice stubbles is recommended. The situation for this practice should be medium land with medium textured soil, field capacity 23-25%, soil moisture at the time of land preparation around 22.5%, and time of sowing 4th week of November to 1st week of December.

Foliar spray of urea :

Two foliar applications of 1% urea at flowering and pod filling stages along with basal application of recommended fertilizer dose, i.e. 60 kg N, 30 kg P₂O₅ and 30 kg K₂O/ha.

Interculture:

Normally no weeding is required. Whenever necessary, one weeding at 15- 20 days after sowing is sufficient to keep the field weed free.

A). Insect pests: Thiamethoxam 25 WG @ 12.5g a.i./ha or 0.3g/lit can be applied against aphids

Insecticide	Quantity (lit/ha)	Volume of water (lit/ha)	
		Hand sprayer	Power sprayer
Oxydemeton methyl 25EC	0.5	500-700	200-250

In *Orobanche* endemic areas continuous cropping of *toria*-mustard should be avoided. Crop rotation with cereals and legumes may be followed to reduce attack of the parasite.

B). Diseases:

i) Alternaria blight (*Alternaria brassicae*):

Organic management of Alternaria blight of Rapeseed: Seed treatment with Biogreen (AAU product) @ 5% + Soil treatment with Biogreen @ 2.5 kg/ha (incubate 1 part of Biogreen with 50 parts of FYM for 7 days) + Foliar Spray with Biogreen @ 5% at 45 DAS.

ii). Wet rot or white blight (*Sclerotinia sclerotiorum*):

For control of this disease the infected plants are to be collected along with the sclerotia and should be burnt. The following spray schedule should also be adopted:

Fungicide	Concentration	Quantity (kg/ha)	Volume of water (l/ha)
Hexaconazole 5 EC	0.2 %	1.2 - 1.4 l/ha	600 - 700

Bee pollination:

For enhancing yield through increased pollination, 5 honey bee colonies/ ha is recommended in rapeseed-mustard.

Harvesting:

The crop is ready for harvest when 75-80% siliquae turn yellow. The crop is harvested by pulling out whole plants or cutting by sickle.