Rape seed and Mustard

Scientific name: Brassica spp.
Family: Cruciferae

Importance and uses

Rape seed and mustard are the major oilseed crops of Nepal. Total area under oilseed crop is 188455 ha and production is 132331 tons (2001), Among this rapeseed occupy about 80% area. Seeds are known by different names in different places e.g. Tori, sarson, raya. The oil content varies from 37-49 percent. The seed and oil are used as condiment in preparation of pickles and flavouring curries and vegetables. The oil is utilized for human consumption throughout Nepal in cooking and frying purposes. The oil cake is used as a cattle feed and manure. The leaves of young plants are used as green vegetables as they supply enough sulphur and minerals in the diet. The per capita consumption of oil is about 4 liters in Nepal but the FAO has recommended 6-7 liters oil per capita per annum.

Origin and History

The origin and early culture of rape seed and mustard is obscure. The earliest written records of rapeseed and mustard are found in ancient Sanskrit writing from 2000 to 1500B.C. With the multiplicity of farms that are grown, it is quite probable that there were several separate areas of origin. According to Vavilov (1926) the place of origin of rapeseed (Brassica compestris) is eastern Afganistan and adjoining parts of India and Pakistan. Singh (1958) considered the Brassica compestris var sarson to be the oldest of the various rapes and mustard grown in India.

Area and Distribution

The important rapeseed and mustard growing countries of the world are India, Canada, China, Pakistan, Poland, Bangladesh and Swedan. India ranks first in the world in respect of acerage accounting for 31.8% of the world total and second in production next to Canada.

The hecterage under oilseed crop in Nepal is 188455 ha and it is estimated that about 80% area is under toria (Brassica compestris var. toria) which is grown from terai to high hills. Sarson (Brassica compestris var. sarson) and rai (Brassica juncea) are cultivated in terai as mixed crop with wheat.

Climatic Requirements

Rape seed and mustard are crops of tropical as well as temperate zones and require some what cool and dry weather for satisfactory growth. Cool temperature, clear dry weather with plentiful of bright sunshine accompanied with adequate soil

moisture increase the oil yield. In Nepal, they are grown in winter season from September – October to February - March. Tori is more liable to suffer from frost and cold and is therefore usually sown earlier and harvested before the onset of frost. Rapeseed and mustard are long day in periodic response. These crops are not drought tolerant. They require an annual precipitation of 350-450 mm. The crops also do not tolerate water logging. The optimum temperature should be 29^{o}C at the time of sowing of tori.

Soil

Rape seed and mustard are capable of growing under a wide range of soil conditions varying from sandy loam to clay soil but they thrives beat on light loam soil. They neither tolerate water logging conditions nor do well on heavy soils. Neutral pH is ideal for their proper growth and development.

Varieties

A) Toria (*Brassica compestris* var. toria)

S.N	Varieties	Days to maturity	Yield ton/ha	Recommended area
1	Type-9	100	0.8	Terai and inner terai
2	Bikas	85-90	1.0	”
3	Lumle tori-1	89-153	0.9	Mid and high hills
4	Pragati	99	1.0	Terai and inner terai and eastern mid hill

B) Rai (*Brassica compestris* var. toria)

S.N	Varieties	Days to maturity	Yield ton/ha	Recommended area
1	Krishna	115	1.1	Terai and inner terai
2	Pusa bold	110-115	0.9	”

C) **Sarson (*Brassica compestris* var. sarson)**

S.N	Varieties	These varieties have been selected for recommendation
1	S-4	
2	I.C.S. 9108	

Crop rotation and mixed cropping

Rapeseed and mustard are grown in rotation with other crops like maize, cotton, bajara, pulses etc. Tori being a catch crop maturing in 90-100 days can be adjusted in the following rotations:

1. Maize – tori – wheat
2. Maize – tori – sugarcane
3. Maize – tori – sugarcane – ratoon
4. Maize – tori – cotton

In regions where irrigation facilities are available, following crop rotations may be followed.

1. Moong – brown or yellow sarson or rai
2. Black gram – sarson or rai
3. Maize – sarson or rai

Rape seed and mustard are generally grown mixed with winter crops like wheat, barley, gram, lentil and pea.

Field Preparation

The land should be well prepared first by ploughing deep with soil turning plough followed by two cross harrowings. Each ploughing should be followed by planting so that the soil is well pulverized and leveled. Care should be taken to see that weeds and stubbles are well removed from the field and the soil contains adequate moisture to ensure good germination.

Seed and sowing

Time of sowing: Planting time is the single most important variable affecting the seed yield of rape seed and mustard to a great extent. Sowing either too early or too late have been reported to be harmful. for getting good yields of rapeseed and mustard timely sowing is must. Tori should be sown from the mid to last week of September. If sowing of tori is delayed, there is great danger of attacks of aphids on this crop. Sowing of sarson and rai must be completed in the first fortnight of October.

Seed rate and Spacing

Generally tori is planted in rows 30cm apart while sarson and rai are sown in rows 45 cm apart. Thinning is done three weeks after sowing to maintain a plant to plant distance of 10-15cm. In case of mixed cropping they are generally sown in rows 1.8-2.4m apart in main crop. When sown mixed with some other crop 1.5-2 kg seed rate per ha is sufficient. Sowing could be done either behind the local plough or through the seed drill. Before sowing seed should be treated with thiram or captan at the rate of 2.5gm/kg of seed.

Manure and Fertilizers

If available apply 15-20 tons of FYM or compost at the time of field preparation. These crops show good response to chemical fertilizers. For good harvest apply 60-90 kg N, 60 kg P_2O_5 and 40 kg K_2O/ha.The quantity of phosphorus and potash should be based on soil test recommendation. Split application of N has been found very useful for rapeseed and mustard crop. If the crop is rainfed, use only half of the dose of recommended nutrients. Rapeseed and mustard have higher requirement for sulphur, therefore, N should preferably be applied through ammonium sulphate and phospohorus from single super phosphate. In rai foliar application of N is useful. Recommended dose of organic manure is 6 tons and N.P.K. 60:40:20 kg/ha respectively in Nepal.

Water Management

Rapeseed and Mustard are usually raised as rainfed on the conserved moisture from monsoon rains. Good yield can be achieved if the fields are bunded and leveled before the monsoon and ploughed two to three times during the monsoon season. Two irrigations at pre-bloom and pod filling stages are beneficial.

Weed control

Weeds in rapeseed and mustard crop cause approximately 20-30% reduction in yield. The most common weeds which grow in rapeseed and mustard crop are *Chenopodium album, Lathyrus spp, Melilotus indica, Cersium arvense, Fumaria parviflora and Cyperus rotundus*. One intercultural operation with hand hoe is very beneficial. Thinning operation should be accompanied by with interculture to provide the plants proper space within the rows.

Chemicals could also be used to control the weeds effectively. Apply isoproturon 1kg a.i. per ha in 800-1000 liters of water as pre-emergence spray.

Harvesting and Threshing

As soon as the pods turn yellowish-brown, harvest the crop. The crop is liable to shattering hence it should be harvested just before the pods open inorder to avoid losses. Sarson is less liable to shattering as compared to toria and rai (*Brassica juncea*). Crop is harvested with the help of sickles. The harvested crop should be stacked in threshing floor for five to six days before threshing. Threshing is very easy with the help of sticks. The pods easily shatter and give away seeds. Threshing could be done with bullocks or a tractor. The threshed grain is separated from the husk with the help of slow moving natural air current. Cleaned seeds must be dried in the sun for four to five days or till the moisture content comes down to 8%.

Yield

With the use of improved varieties, agronomical and plant protection techniques, the farmers may expect to harvest per ha 14- 20 quintals of seed of rape seed and 20-25 quintals of mustard (rai).