

GREEN GRAM (MUNG BEAN or MOONG)

Botanical name: *Vigna radiata* L. Wildzek.
Family: Leguminosae
Origin: India and Central Asia

Area and Distribution

Green gram is cultivated in the countries of India, Burma, Srilanka, Pakistan, China, Fiji, Queens land and Africa.

India is the major producer of green gram in the world and grown in almost all the States. It is grown in about 36 lakh hectares with the total production of about 17 lakh tonnes of grain with a productivity of about 500 kg/ha. The important green gram growing States in the country are Orissa, Maharashtra, Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan and Bihar.

In Gujarat, it is cultivated in an area of about 1.73 lakh hectares with the production of 0.72 lakh tonnes with an average yield of 414 kg/ha (Average of 2004-05). It is mainly cultivated in the districts of Kutch, Banaskantha, Sabarkantha, Mehsana, Surendranagar and Ahmedabad, however, almost all districts are growing green gram in the State.

Economic importance

Greengram is an excellent source of high quality protein (25%) having high digestibility. It is consumed as whole grains as well as "Dal" in a variety of ways in our food. Sprouted green gram is used in the preparation of curry or a savory dish (South India). It is supposed to be easily digestible and hence the patients prefer it. It is also a good source of Riboflavin, Thiamine and Vitamin C (Ascorbic acid). When green gram is sprouted, seeds synthesized remarkable quantity of ascorbic acid (Vitamin C). Green gram is also used as green manure crop. It being a leguminous crop has capacity to fix the atmospheric nitrogen (30-40 kg N/ha). It also helps in preventing soil erosion. Being a short duration crop, it fits well in many intensive crop rotations. Green gram can be used as feed for cattle. After harvesting the pods, green plants are uprooted or cut from the ground level and chopped into small pieces and fed to the cattle. The husk of the seed can be soaked in water and used as cattle feed. It is self-pollinated crop. In North India, it is cultivated in both *kharif* and summer seasons and in South. India, it is cultivated in *rabi* season.

Climatic requirement

Green gram is best suited to areas having an annual rainfall of 60 to 75 cm. It requires a hot and warm climate. Greengram is considered to be hardiest among all pulse crops and can tolerate drought to a great extent. Hence, it is successfully grown in any adverse conditions and particularly in drought prone areas during *kharif* season. However,

water logging and cloudy weather are harmful for the crop. It is grown in all the three seasons in the country.

Soil

Green gram can be grown on a variety of soils ranging from sandy loam to black cotton soils having good drainage capacity. Saline and alkaline soils are not suitable for green gram cultivation. Green gram is very sensitive to water logging conditions.

Field preparation

Field is prepared by one or two ploughing followed by two or three cross harrowing and planking. The field should be well leveled and free from weeds and stubbles.

For summer season crop, pre-sowing irrigation should be given immediately after harvesting of the previous crop. Field is prepared at Vapsa conditions by giving two or three ploughing by local plough or harrow. Each ploughing/harrowing should be followed by planking to make the field levelled and to minimize the loss of moisture by evaporation from the soil. Planking operation is important in summer season to prevent the losses of moisture from the soil.

Time of sowing

Sowing is done on onset of the monsoon in *kharif* season and during second fortnight of February to first fortnight of March in summer season.

Method of sowing

Sowing should be done behind the local plough or with the help of seed drill.

Seed treatment

Before sowing, seeds should be treated with Thiram or Captan @ 2 to 3 g/kg of seeds. It is also desirable to treat seeds with suitable rhizobium strain if crop is taken in the field first time.

Spacing:

45 cm x 10 cm (*kharif*)

30 cm x 10 cm (*rabi* and summer)

Seed rate:

12 to 16 kg/ha (*kharif* season)

20-25 kg/ha (*rabi* and summer seasons)

Seeds should be sown at a depth of 5-7 cm.

Manures and fertilizers

10 to 15 CL/ha well decomposed FYM should be incorporated into soil at the time of preparation of the land.

N kg/ha	P ₂ O ₅ kg/ha	K ₂ O kg/ha	Remarks
20	40	0	As basal application

In clayey soils of South Gujarat, a doze of 10 kg N/ha is sufficient when seeds are treated with rhizobium culture and also apply 40 kg P₂O₅/ha.

Application of sulphur @ 20 kg/ha is found beneficial if the soils are deficient in sulphur.

Irrigation

For rainfed crop, irrigation is not needed but drainage is very important because this crop is very much sensitive to water logging.

For summer season crop, five to six irrigations may be given. First irrigation should be given at 20-25 DAS and subsequent irrigations should be given at an interval of 12-15 days. Irrigation should not be given at full bloom stage of the crop. Late flowering and early pod filling stages are critical stages for irrigation.

Weeding and Interculturing

One or two interculturing and one to two weeding should be carried out at 20 and 45 days after sowing. Fluchloralin or Pendimethalin @ 0.5 kg/ha or oxadiazon @ 0.25 kg/ha as pre-emergence should be applied when hand weeding is not possible due to continuous rains during *kharif* season under middle Gujarat conditions. In wheat-moong cropping sequence, apply Fluchloralin @ 0.9 kg/ha as pre-emergence and carry out hand weeding at 30-35 days under South Saurashtra zone in summer green gram. In South Gujarat conditions, keep the crop weed free up to 30 days during summer season.

Cropping system

Early maturing varieties mature in 60-70 days and they can be fitted between *kharif* and *rabi* season crops. Green gram is taken with cotton V 797 as inter crop in Saurashtra region during *kharif* season. It is also grown as mixed crop with pearl millet, sorghum, maize and cotton.

Green gram is taken in a crop sequence of sorghum-wheat-green gram, sorghum-potato-green gram or pearl millet-wheat-green gram.

Plant protection

Pests: Aphids, Jassids, White flies and Pod borer

Diseases

Yellow mosaic, Mosaic mottle, Leaf crinkle, Leaf curl, Seed and Seedling rot, Cercospora leaf spot. Mosaic is transmitted by whiteflies (Vector) and hence, it should be controlled by spraying of systemic insecticides.

Harvesting

When pods are turned into black colour, two to three pickings are done. Pickings should be carried out only during morning hours. Threshing should be done in threshing yard and seeds are separated and cleaned.

Varieties

Variety	Maturity days	Recommended area for sowing
Gujarat moong-1	70 – 80	More suitable for <i>kharif</i> only for North Gujarat
Gujarat moong-2	60 – 70	Entire State for summer cultivation also.
Gujarat moong-3	70 – 75	" , Yield 1200-1300 kg/ha, only for summer season
Gujarat moong-4	60-65	Yield 1200 –1300 kg/ha. Kharif and summer seasons. Resistant against micophomina blight. Synchronous maturity.
K-851	65-70	Entire state for summer cultivation also and pods are matured at the same time having synchronous maturity and hence field can be harvested at the same time. Yield 1000-1200 kg/ha. Kharif and summer seasons.
Sabarmati	70-75	<i>Kharif</i> and summer cultivation
Pusa baisakhi	60-70	Early type variety for summer cultivation
Mohini & Jawahar-45	-	Medium to mid-late
C.O.4		Rabi variety

Research Stations: 1) Main Pulses Research Station - SardarKrushinagar
2) Sub Stations - Vadodara, Anand, Derol and Junagadh.

Yield : 600 - 700 kg/ha - *Kharif* season; 1100 - 1300 kg/ha - Summer season