

Botanical Description

Botanical Name	–	<i>Cicer arietinum</i>
Synonym	–	Chickpea, Bengalgram, Chana
Origin	–	South West Asia – Afganisthan / Persia.



Introduction

Chickpea is the largest produced food legume in South Asia and the third largest globally, after common bean (*Phaseolus vulgaris* L.) and field pea (*Pisum sativum* L.). Bengal gram is widely appreciated as health food. It is a protein-rich supplement to cereal-based diets, especially to the poor in developing countries.

Nutritive value

Protein	- 18-22%	Calcium	- 280 mg/100 gm
Carbohydrate	- 61-62%	Iron	- 12.3 mg/100 gm
Fat	- 4.5 %	Phosphorus	- 301 mg/100 gm
Calorific value	- 396 Kcal/100 gm		

Crop Status

Globally, India ranked first in area and production, followed by Pakistan, Iran and Australia with respect to area and Australia, Myanmar with respect to production. The highest productivity of 3759 kg/ha is observed in China followed by Israel, Republic of Moldova and Bosnia & Herzegovina. India's productivity was 995 kg/ha (*FAO Stat.*, 2014).

During Twelfth Plan (2012-15) the area and production of gram has been 87.62 lakh hectares and 82.15 lakh tonnes. More than 90% gram production comes from 7 states of MP, Rajasthan, MS, Karnataka, AP, UP. & CG. MP ranked Ist in area (34.69%) and production (40.60%). Maharashtra rank at IInd in area (16.57%) & IIIrd in production (13.07%). Whereas, Rajasthan stands IInd position in production (14.09%) The highest yield was recorded in A.P. (1522 kg/ha) followed by Punjab (1216 kg/ha) and Gujarat (1193 kg/ha). The lowest yield was recorded in Tamilnadu (648 kg/ha) (*DES*, 2015-16).

Chickpea is classified in two categories i.e. desi and kabuli.

Desi: Grains of desi chickpea are small in size, light yellow to dark brown in colour and have a thick seed coat. Chromosome no. is $2n=14,16$

Kabuli: Grains of kabuli chickpea are bigger in size, whitish-cream colour, thin seed coat and contain high levels of carbohydrates and proteins. Chromosome no. is $2n= 16$.

Climate Requirement

It's a winter season crop. But Frost at the time of flowering results in the failure of the flowers to develop seeds. It is best suited to areas having moderate rainfall of 60-90 cm per annum.

Soil Type & Field Preparation

It can be grown in coarse-textured sandy to fine-textured deep black soils (vertisols). However, the best suited soils are well drained, deep loams or silty clay loams with a pH ranging from 6.0 to 8.0. The field should have loose tilth and good drainage. The stubble and debris from the previous crop should be removed as these can harbor the pathogens that cause root diseases, such as collar rot.

Field preparation for sowing chickpea is based on the soil type and cropping system. In case of a heavy soil, a rough seedbed is prepared to avoid packing of the cloddy surface due to winter rains and to facilitate soil aeration and easy seedling emergence.

Sowing Time

North India – Rainfed: Second fortnight of October, **Irrigated:** first fortnight of November.

Central & South India - First fortnight of October to first fortnight of November; **Late sowing** (December-January) should be avoided as the late-sown crop may experience moisture stress and high temperatures at the critical stage of pod-filling, leading to reduced yield and seed quality.

Method of sowing & Seed Rate

Adopt line sowing by double box seed drill or local plough. Also BBF and Ridge & Furrow method in low lying or shallow lands at 8-10 cm depth as the shallow crop is much prone to wilt.

Seed size (100-seed weight)	Seed rate (kg/ha)	Spacing
Small (less than 20 g)	60 kg	Timely Sown: 30 cm X 10 cm
Medium (20 – 30 g)	90 kg	Late Sown:- 25 cm X 10 cm
Large (30 – 40 g)	120 kg	Irrigated areas:-45 cm X 10 cm
Extra-large (more than 40 g)	150 kg	

Seed Treatment

Disease Control: Strictly follow FIR seed treatment with (fungicide, insecticide and rhizobium) Seed treated with 2 gm Thirum + 1 gm Carbendazim or Carboxin(vitavex) 2 g/ kg to control wilt & root rot; **Insect-Pest:** Thiamethoxam 70 WP @ 3 g/kg seed; **Culture & Micronutrient:** Rhizobium 5 g + PSB 5 g/kg of seed & after that apply Molybdenum 1 g/kg/ of seed.

*If the seed is to be treated with pesticides, always apply fungicides first, followed by insecticides, and finally *Rhizobium* culture/Phosphate Solubilizing Bacteria (PSB) or follow instructions on the packets.

Cropping system

Gram in rotation with cereal crops helps in controlling soil-borne diseases. The most common cropping system based on chickpea are as below:

- a) **Rotation:** (i) Kharif fallow – Gram (in barani areas), (ii) Paddy – Gram, (iii) Maize– Gram, (iv) Bajra – Gram, and (v) Jowar – Gram
- b) **Inter cropping:** (i) Chickpea + Mustard (2:1 to 4:1), (ii) Chickpea + Linseed (2:2), (iii) Chickpea + Wheat/Barley (2:2), (iv) Chickpea + Safflower (2:2), (v) Chickpea + Coriander (2:2)

Water Management

Chickpea is mostly sown as a rainfed crop. However, where irrigation facilities are available, give a pre-sowing irrigation. One irrigation at branching and one at pod formation stage. Excess of irrigation enhances vegetative growth and depresses yield.

Fertilizer and Manure

Fertilizer requirements depend on the nutrient status of the field, and thus, vary from field to field. Therefore, the doses of fertilizers should be determined based on the results of soil test. It is better if all the fertilizers are drilled in furrows at a depth of 2 cm and at the side of 5 cm from seed. The generally recommended doses for chickpea include 15- 20 kg nitrogen (N) and 50–60 kg phosphorus (P) per ha. If soils are low in potassium (K) an application of 17 to 20 kg/ ha K₂O is recommended. Total quantities of N, P and K should be given as a basal dose. Foliar spray of 2% urea at flowering has been found beneficial in rainfed crops.

Weed Control

Chickpea is a poor competitor with weeds at all stages of growth. Pre-emergence herbicides Pendimethalin @ 0.75 to 1 kg a.i./ha was found effective in controlling early flush of weeds (use within 48 hrs. after sowing). Mechanical and/or manual weeding can be done where wide row spacing is used. One hand weeding or inter-culture with hand hoe or wheel hoe at 25-30 days after sowing.

Plant Protection Measures

Disease

The important disease of Chickpea are Collar rot, Sclerotinia stem rot, Botrytis Grey Mold, wilt, Dry root rot.