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Course name :

**Crop Production Technology-II
(ASAG 2204)**

Course credit :

(2-1-0)

Lecture 6

Topic: Chickpea



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6.1 BENGALGRAM/CHICK PEA

Cicer arietinum

Family-Leguminaceae

It is also known as Gram (or Chana).

Origin: Western Asia (Turkey)

6.2 Economic importance:

Chick pea contains 21% protein, 2.2% fat, 62% carbohydrates.

It also contain calcium of about 190 mg/100g; Iron 90.5 mg/100g; Phosphorus

280 mg/100g.

Among the pulses, chick pea has **relatively lower protein content but of** higher biological value and protein digestibility.



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- Germinated seeds can cure is scurvy”
- An acid liquid from the granular hairs of leaves and pods contains two acids.
- They are i) Malic Acid (90-96%)
ii) Oxalic Acid (4-10%)
- Which are used in the preparation of drugs, and are prescribed for the intestinal dis-orders and blood purification.
- Soaked seed and husk are fed to cattle.



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6.3 Area, Production, productivity:

- On the basis of the cultivated area, chick pea is the 19th most crop grown in the world. 77% of total area and production in world is from India.
- Important countries growing chick pea are Pakistan, India, Turkey, Mexico, Burma, Ethiopia.

In India – Madhya Pradesh ranks first in Area (2.6 m.ha), production (2.4 m.t) with a productivity of 930 kg/ha followed by Rajasthan. The three states Madhya Pradesh, Rajasthan, Uttar Pradesh accounts for 84% of Area, 86% production in the country.



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6.4 CLIMATE

It is a rabi pulse crop and requires cool humid weather and mainly suitable to North India.

It is suited for moderate rainfall areas of 400-700mm.

Water-logging results into wilt diseases (when grown with Redgram) Optimum temperature regime for chick pea is 24-30°C.

Chick pea is a long day plant and requires sufficient bright sunshine.

The period of cool temperature decides the duration of the crop, because of which in North India, it comes to harvest in 160-170 days.

Where as the winter is warm in South India then the duration is shorter of about 90-110 days.



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6.5 SOILS:

It can grow on wide range of soils from medium to heavy black soils.

It does well on Black cotton soils and sandy loams.

- Optimum pH required for crop growth is 6.0 to 7.5 (>8.5pH not suitable)
- It does not withstand water -logging, saline and alkaline conditions



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6.6 Types and Varieties in Chickpea:

There are 2 important varietal types available in India They are:Kabuli type and Desi type. Mostly cultivated type of chick pea is Desi type.

CHARACTERS	DESI TYPE	KABULI TYPE
	More area	Less Area
Colour of the seed	Yellow to dark brown	White (or) Pale cream
Size of the seed	Small	Large ,bold and attractive
Shape of the seed	Irregular and wrinkled	Smooth
Plant structure	Small and bushy	Taller and erect.
Percentage of production	85%	15%
Yield potential	High yielders	Low yielders
Adaptation	Mostly to winter climates	Mostly to spring
Test weight	17-26 gm /100seed	>26 gm /100 seeds



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Other varieties: Radhay, Gwalior, Vikas, Chabba

Wilt tolerant variety: Vishal, Vijay, Avarodhi

Popular varieties grown in A.P: Annegiri, Kiranthi,
Jyothi, Swetha

6.7 VARIETIES :

Desi type

Avrodhi, pant G- 186, gaurav, uday, Radhey, pusa -
256, pusa-362, harayana chana -1, Gora hiasri.

Kabuli type :

C-104, L-550, L-144, Pusa-1003, sadabahar.



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6.8 Field preparation:

- Rough seed bed is required for chickpea.
- In case chick pea crop is taken after *kharif* fallow, deep ploughing is desirable.

6.9 Seeds & sowing:

Seed rate:

- Desi Type 65-70 kg/ha
- Kabuli type 80-90 kg/ha
- Early sowing of chickpea results in excessive vegetative growth and poor setting of pods.
- The early sown crop suffers more from wilt .
- Seed treatment with thiram or carbendazim 0.25 % before sowing should be done.



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6.10 Spacing:

- Desi type 30x10cm.
- Kabuli type 45x10cm.

6.11 Time of sowing:

Middle October to first fortnight of November.

6.12 Depth of sowing: 6-8 cm.

Seeding time	Seed rate (kg/ha)	Spacing (cm)	remarks
N-India : october 3 rd week	Rainfed traditional = 65-70	30 cm (desi)	Drilling or furrow sowing to a depth of 8-10 cm for rainfed and 5-7 cm for irrigated
Central and peninsular region : early october	Rainfed irrigated kabuli =80-90	45 cm (kabuli)	



6.13 Fertilizers and manures:

FYM – 10 t/ha applied

Situation	N (Kg/ha)	P(Kg/ha) basal	K (Kg/ha) basal
Rainfed	10	40	20
Irrigated	20	60	40

- Zn' deficiency can be corrected by 0.5% ZnSO₄. spray or soil application of 25kg /ha
- Zinc Sulphate which is effective in increasing the yields.
- Bio-fertilisers: Seed treatment with the Rhizobium strain namely cicer rhizobium will increase the Nitrogen fixing ability of the plant and thereby yield will be enhanced by 20-30%.



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6.14 IRRIGATION

- 55% area of chickpea is under Rainfed.
- Where under drought conditions, the crop requires 2 irrigations at critical stages .
 - 1) at Branching (45 DAS) and
 - 2) at pod formation (75 DAS)
- If water is adequate then four irrigations are recommended at:
 - 1) Sowing
 - 2) Branching
 - 3) Flowering
 - 4) Pod filling



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- Evaporative demand is high in South India, Irrigation at that time can double the yield.
- Evaporative demand is low in North India, Irrigation can cause excessive growth leading to lodging.

6.15 CRITICAL STAGES

- Branching – 45 DAS
- Pod formation – 75 DAS
- Depending on soil type water requirement range is **300-400mm**
- **Very sensitive to soil salinity.**



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6.16 WEED CONTROL

- Weeds become problematic in chickpea due to its short growing nature.
- Weeds are found more under rainfed condition.
- First 40 DAS are critical for weed competition.

Pre emergency herbicides are

- Bentazon (1.0-1.5 kg/ha)
- Pendimethalin (0.5-1.0 a.i kg/ha)
- Pendimethalin (0.5%) + Imazethpyr (50g)

Preplant incorporation of

- Fluchloralin (0.5 – 1.0 a.i kg/ha)
- Trifluralin (0.5-0.7%).
- 2 or 3 timely intercultivations for row sown crop.



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6.17 HARVESTING:

- In **North India** chickpea duration is **150-160 days**. In **South India** crop comes to harvesting with in **90-110 days**.
- Crop is harvested when leaf turns to reddish brown and starts leaf shedding.
- Harvesting is done during morning to avoid shattering of pods.
- Plants are pulled out or cut with a sickle and carried to threshing floor.



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6.18 THRESHING

- The harvested plants are dried in sun for about a week and then it is threshed under the feet of cattle (or) by beating with sticks.
- Then the grain is collected and it can be used directly (or) crushed.



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619.1 CROPPING SYSTEMS:

Rice – Chick pea

Cotton – chickpea

6.19.2 INTERCROPPING:

Chick pea + Mustard

Chick pea + Linseed

Chick pea + Sunflower

Chick pea + Coriander (for South zone)

6.20 YIELD: 20-25 q/ha.



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6.21 COLLECTION OF ACIDS FROM CHICK PEA CROP:

- The leaves and pods of Bengalgram on the growing crop are coated with thin film of **Malic acid (90-96%)**; **oxalic acid (4-9%)**.
- They are encrusted on leaves and pods and dissolved on dew and settles on plants during winter season due to this the plants give sour taste.
- These Acids are considered to have some medicinal properties and they may be collected and stored.
- About 4 – 4½ kg of acids may be obtained from 1 ha of crop.