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Course name :

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

Course credit :

(2-1-0)

Lecture 5

**Topic: Pulses – importance of
pulses in Indian agriculture**



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5.1 PULSES – IMPORTANCE OF PULSES IN INDIAN AGRICULTURE:

- Pulse crops called grain legumes are the most important food crops after cereals.
- They have been valued as food, fodder and feed and have remained as main stay of Indian agriculture.
- The term pulse is derived from the latin word “Puls” meaning “pottage” (thick soup)
- Pulse crops play an important role in agricultural economy of India .

They fix atmospheric nitrogen and their deep penetrating root system enable the plants to utilize limited available moisture more efficiently. Indian Institute of Pulse Research (IIPR) was established in 1993 at Kanpur.

Per capita requirement of Pulses: Acc. To ICMR – 150gm /day and Acc. To FAO – 140gm /day

At present, the per capita availability of pulses in India is only 47gm/day.



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5.2 AREA, PRODUCTION AND PRODUCTIVITY OF PULSES IN INDIA

- Pulses are grown over an area of 23 million ha with a production of 13 to 14 million tonnes with average productivity levels ranging from 500-600 Kg/ha.
- India accounts for 33% of total world area under pulses and 25% of total world production.
- Kharif pulses (Pigeon pea, black gram, green gram, horsegram, Mothbean, Cowpea) cover 45% of total area and 30% of total pulse production.
- Rabi pulses (Chick pea, pea, lentil, lathyrus) cover 55% of total area and 64% of production.
- Major pulse producing states are **Madhya Pradesh, Maharashtra, Orissa, Rajasthan and Uttar Pradesh.**



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- Highest production of pulses is from Madhya Pradesh followed by Rajasthan and Uttar Pradesh.

5.3 Importance of Pulses:

- They are rich source of **proteins**
- The average protein available in pulses is 20-30%. Pulses are rich in 'Ca' & Phosphorous.
- They are also good sources of **Vitamins**.
- Pulses provide a superior quality of fodder & feed to the cattle, as they are good forage crops with proteins and minerals content.
- They are considered as **good green manure crops** because of rich canopy development.



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- They improve the **soil fertility** by biological nitrogen fixation
- The nitrogen needs of pulses is low & minimizes the N requirement of succeeding crop by around $\frac{1}{4}$ of its total requirement.
- Pulses help in the **Soil and Water conservation.**
- They improve the physical condition of the soil like **soil aeration, water holding capacity by improving microbial population, breaking of hard pans and moisture retention.**
- Some crops act as **smothering crops** which control weeds & protects soil from erosion E.g.:- **Cowpea and Horse gram.** Pulses can also be used better intercrops.



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5.4 PULSES-REASONS FOR LOW YIELDS OF PULSES IN INDIA

I) AGRONOMIC CONSTRAINTS:

II) GENETICAL CONSTRAINTS:

III. PHYSIOLOGICAL CONSTRAINTS:



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5.4.1 AGRONOMIC CONSTRAINTS:

1. **Improper sowing time:**
2. **Low seed rate:** Farmers have been using a seed rate of 10-15 kg/ha as against the requirement of 20- 25 kg/ha in case of moong.
3. **Defective method of sowing:** Pulses are hardly sown in rows. This creates lot of problems in adopting agronomic practices such as weeding, hoeing, spraying, harvesting etc.,
4. **Inadequate interculture:**
5. **Insufficient irrigation:** Though pulse crops are drought tolerant, one or two protective or life saving irrigations are required, particularly in rabi pulses. For Kharif pulses also, protective irrigations are essential during the period of dry spell.



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6. Sowing under utera cultivation: Large area under pulses is sown as utera without cultivation and inputs. The yields of such crops is very poor.

7. Poor management conditions:

8. Weed infestation: Because of their inherent slow growth rate at the initial stage, pulse crops suffer due to infestation of weeds. Depending upon the duration of the crop, the critical period for weed competition in the pulses varies from 20-45 DAS. If weeds are not controlled during this period, marked crop losses ranging from 30-50% in chick pea, 50-70% in greengram and blackgram and as high as 90% in pigeonpea have been recorded.

10. Losses due to diseases and insects pests: The major diseases are wilt, blight and grey-mould in chickpea. Powdery mildew and leafspot diseases in greengram, blackgram and cowpea etc.



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5.4.2 GENETICAL CONSTRAINTS:

- Lower productivity.
- Non synchronous fruiting/ flowering.
- Non-responsiveness to good management.
- Complete or partial absence of genetic resistance to major diseases and pests(eg: Helicoverpa armigera under continuous rainfall, causes wilt and sterility mosaic in redgram etc.).
- Indeterminate growth habit of most of the pulses
Instability in performance.
- Non-availability of drought and waterlogging resistant varieties.



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5.4.3 PHYSIOLOGICAL CONSTRAINTS:

- Low harvest index.
- Flower drop is another physiological problem in pulse crops. This results in poor pod setting and consequently low yield.
- Non-responsiveness to fertilizers.
- Photo and thermosensitive phenomenon.
- Lack of short duration varieties i.e. long duration gives low per day production.



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Common name	Botanical name	Common indian name
Chickpea or bengalgram	<i>Cicer arietinum</i>	Chana
Pigeon pea or redgram	<i>Cajanus cajan</i>	Arhar
Greengram or mungbean	<i>Phaseolus aureus</i>	Mung
Blackgram or urdbean	<i>Phaseolus mung</i>	Urd
Cowpea	<i>Vigna unguiculata</i>	Lobia
Lentil	<i>Lens culinaris</i>	Masoor
Mothbean	<i>Vigna acontifolia</i>	Moth
Horsegram	<i>Dolichos biflorus</i>	Kulthi
Lab-lab	<i>Dolichos lab-lab</i>	Urahi
Beans	<i>Phaseolus vulgaris</i>	Rajmash
Garden pea or pea	<i>Pisum sativum</i>	mutter