



Promotion of Improved Chickpea Varieties in Rice-Based Cropping Systems of Smallholder Farmers of Odisha

Cultural Management Practices of Chickpea

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Cultural Management Practices of Chickpea

Cultural management practices are measures undertaken by humans which refers to that broad set of management techniques or options which may be manipulated by agricultural producers to achieve their crop production goals (Kennedy et al. 1975).

Field Operation and Management

- Field selection
- Land Preparation
- Fertilizer application
- Sowing
- Irrigation
- Thinning and weeding
- Rouging
- Insect and disease management
- Post-harvest practices

a. Field Selection

- Well Drained
- Deep loams or silty clay loams or fine-textured deep black soils
- pH = 6.0 to 8.0
- Free from salinity
- Free from waterlogging



b. Land Preparation



Harrowing



Leveling (precision)



Fertilizer application and Bed shaping



Ridge & furrow (45 cm to 60 cm between rows) or Broad beds (1.2 m 4 rows)

c. Fertilizer application

Total quantities of N, P and K should be given as a basal dose. Generally recommended doses are: 20–30 kg nitrogen (N) and 40–60 kg phosphorus (P) per ha. If soils are low in Potassium (K), an application of 17 to 25 kg K per ha is recommended. The important micronutrients for chickpea include sulphur (S), zinc (Zn), iron (Fe), boron (B) and molybdenum (Mo).

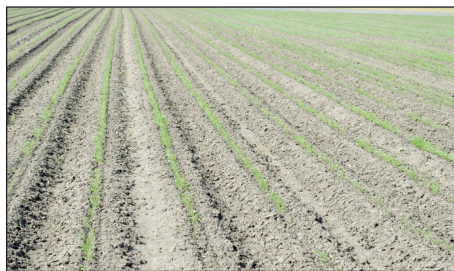
The dose of fertilizer requirements vary from field to field and should be determined based on the results of soil analysis.

d. Sowing

Sowing is usually done on conserved soil moisture. A pre-sowing irrigation may be needed, if the available soil moisture is not adequate for germination. Kabuli chickpea should not be irrigated immediately after sowing, particularly in deep black soils



Line sowing (30 cm x 20 cm)



Sowing of 1 seed per hill

e. Seed Rate and Seed Treatment

Seed rate differs from variety to variety, depending on seed size. The following guidelines may be used for seed rate:

Seed size (100-seed eight)	Seed rate (kg/ha)
Small (<20 g); e.g. JG 315	50 - 60
Medium (20 - 30 g); e.g. JG 11, JAKI 9218	60 - 90
Large (30 - 40 g); e.g. KAK 2, Vihar, LBeG 7	90 - 120
Extra-large (>40 g); e.g. MNK-1	120 - 150

The seeds should be treated with fungicides (2 g thiram + 1 g carbendazim/kg seed) before sowing.

f. Weeding

Keep the crop free from weed competition. Use pre-emergence e.g. Pendimethalin (1 to 1.5 kg/ha) and Fluchloralin (1 kg/ha).



g. Roguing

Rouging of off-types can be done throughout the cropping period based on the visual differences observed in flowering time, growth habit and maturity time. All the disease infected plants should be removed.

h. Irrigation

One or two need-based irrigation (preferably one at branching and another at pod filling stage). Do not give excessive irrigation.



Unwarranted vegetative growth due to excessive irrigation

i. Pests Management

Pod borer is the most important pest of chickpea and it damages almost all the pods in case of severe damage.

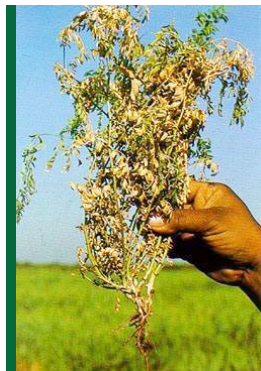
Even though the pod borer resistant varieties are not available, this pest can be controlled effectively through application of an integrated pest management strategy (IPM). Some IPM practices are given below.

- Monitoring of insect population through pheromone traps
- Regular visual observations on the larval population. The action threshold is 1-2 larvae/meter row.
- Intercropping with a crop (such as coriander) that attracts parasitoids.
- Bird perches (10-15/ha) to attract predatory birds.
- Application of bio-pesticides such as NPV @ 250 LE per ha, or 5% neem fruit powder extract or Bt formulations @ 1 kg/ha
- If the insect population is not controlled by non-chemical methods, then application of chemical sprays (indoxacarb @ 70 ml a.i. per ha or spinosad @ 45 ml a.i. per ha) can be used as and when needed.



j. Root Disease Management

- Use wilt resistant varieties.
- Seed treatment with fungicides can reduce incidence of collar rot.
- Seed treatment with *Trichoderma viride* @ 4 g per kg seed has been found effective in reducing incidence of wilt.
- Deep ploughing during summer and removal of undecomposed debris from the field.
- Follow crop rotation. Exclude chickpea from the crop rotations of infested fields for at least 3 years.



k. Harvesting and Threshing

Harvest when leaves start to senesce, pods turn yellow, plants are dry, and seed feels hard and rattles within the pod. Harvesting and threshing both can be done by commercially available combine harvesters.



Manual harvesting



Threshing by combine after manual harvesting



Combine harvesting



Loading of trolley with clean seed after harvesting and threshing by combine

l. Seed Processing

The dried seeds should be graded and free from plant parts, soil particles, stones, weed seed, other crop seed, shriveled, broken, or damaged seed. The cleaning and grading is achieved by winnowing and mechanical sieving.

m. Seed storage

Seed moisture level is 10 - 12% for short-term storage (up to 8 months). After drying, the seed should be stored in polythene-lined gunny bags or in safe

storage structures (metal bins or earthen containers) in air tight containers. Fumigate the seed bins or the seed store periodically with commercially available fumigants (e.g. ethylene dibromide and phosphine).



Isolation distance for seed production: An isolation distance of 10 m for foundation seed and 5 m for certified seed is required.



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