

Cowpea Production Technology



सत्यमेव जयते

Government of India

Ministry of Agriculture & Farmers Welfare

Department of Agriculture Cooperation & Farmers Welfare

Directorate of Pulses Development, Bhopal (M.P.)



एक कदम स्वच्छता की ओर



Per Drop, More Crop

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COWPEA

Botanical Name - *Vigna unguiculata* (L.)

Synonym - Lobia, Barbati, Black eyed pea

Origin - Africa & Asia



Importance

This crop is known as drought hardy nature, its wide and droopy leaves keeps soils and soil moisture conserved due to shading effect. It is also known as black-eyed pea or southern pea etc. and has multiple uses like food, feed, forage, fodder, green manuring and vegetable. Cowpea seed is a nutritious component in the human diet, and cheap livestock feed as well. Both the green and dried seeds are suitable for canning and boiling as well.

Nutritive Value

Protein - 22-24% Carbohydrate - 55-66 %

Iron - 0.005% Calcium - 0.08–0.11 %

Essential amino acids (lysine, leucine and phenylalanine)

Crop Status

In Indian context, it is a minor pulse cultivated mainly in arid and semi arid tracts of grown in pockets of Punjab, Haryana, Delhi, and West UP along with considerable area in Rajasthan, Karnataka, Kerala, Tamilnadu, Maharashtra and Gujarat.

State-wise recommended varieties

State	Recommended Varieties
M.P.	Gujarat cowpea-3, V-240, Gujrat cowpea-4, UPC-622
M.H.	Phule Vithai
Gujarat	Pant lobia - 4, Pant lobia - 3
T.N.	Vamban -1, Co-6, UPC-628
Karnataka	KBC-2, IT-38956-1, PKB-4, PKB-6
Rajasthan	RC-101, RCP-27 (FTC-27), Pant lobia-4 Pant lobia-3
Punjab	CL-367, UPC-622, VRCP-4 (Kashichand)
C.G.	Khallechwari
U.P.	UPC-622, Swarna harita (IC285143), Kashi chandan, UPC -628, Pant lobia-1
Jharkhand	UPC-628
Haryana	Hisar cowpea 46 (HC 98-46)
U.P.	Pant lobia-1, UPC-628
Uttarakhand	Pant lobia-5, Pant lobia-4, Pant lobia-3, Pant lobia-2

Source: Seednet GOI, Min. of Agri. & FW, & ICAR-IIPR, Kanpur

Varieties – (a) Grain: C-152, Pusa Phalguni, Amba (V-16) (M), Ramba (V240)(M), Swarna (V- 38) (M), GC-3, Pusa Sampada (V-585), Shreshtha (V-37) (M)

(b) Fodder : GFC 1, GFC 2, GFC 3, -Kharif season, GFC-4 Summer (25-35 tonnes/ha), Bundel Lobia-1, UPC-287 and UPC-5286, Russian Giant, K-395, IGFRI-5450 (Kohinoor), C-88(20-35 tonnes/ha in Punjab), UPC 5287, UPC-4200 (NE India), UPC 618, UPC 62, UPC 622, UPC 625 UPC 628.

Climatic Requirements

Cowpea is warm weather and semi arid crop, where temperature ranging from 20°C to 30°C. Minimum temperature for seed establishment is 20°C and above 32°C temperatures development of root is cease. For maximum production day temperature 27°C and night temperature 22°C required. It is sensitive to cold and below 15°C temperature yield adversely affected. It can grow under shade of tree but can not tolerate cold or frost.

Soil Type & Field Preparation

Well drained loam or slightly heavy soil are best suited. In colder climate somewhat sandy soil preferred as crop mature earlier in them. It can grow successfully in acidic soil but not in saline/alkaline soil. In hard soil, one deep ploughing followed by two or three harrowing and planking are sufficient. In normal soil only two harrowing & planking is enough. For summer season crop give a irrigation immediately after harvesting of Rabi crop.

Sowing Time

Kharif- With onset of monsoon ranging from early June to end of July, *Rabi*- October-November (southern India), *Summer* - 2nd to 4th week of March (grain), February (Fodder), Hills: April-May, Green manuring- Mid June to 1st week of July

Seed Rate

For pure crop: 20-25 kg ha (grain), for fodder and Green Manure-30-35

kg/ha. During summer 30 kg/ha for grain and 4- kg/ha for fodder and green manuring.

Spacing: Row to row-30(Bushing) to 45 cm (spreading), Plant to Plant-10 (Bushing) to 15 cm (spreading)

Method of Sowing

Sowing of cowpea is done by broadcasting, line sowing and dibbling of seeds based on the their purpose and season. Line sowing has been better over broadcasting method of sowing. However, for fodder and green manure crop broadcasting method considered better. In high rainfall area, formed 30 cm wide and 15 cm deep drainage channel at every 2 meter interval to drain excess rain water. Sowing of seed a depth of 3-5 cm.

Seed Treatment

Treat the seed with Thiram (2g) + Carbendazim (1g). It is also desirable to treat the seed with *Rhizobium* culture @10g/kg seed.

Crop Rotation

Grain/vegetable	Fodder
Cowpea-Wheat-Mung	Sorghum + cowpea-berseem-maize+cowpea
Cowpea-Potato-urd/bean	Maize-berseem/oat- maize+cowpea
Maize/Rice-Wheat-Cowpea	Sudan grass- berseem/oat- maize+cowpea
Maize-Toria-Wheat-Cowpea	Cowpea-berseem-maize+cowpea
Rice-Rice-Cowpea	
Rice-Cowpea	
Rice-Mustard-Cowpea	

Intercropping

Growing one or two rows of cowpea in widely spaced crops and incorporating the biomass after picking pods can increase soil fertility and yield of companion crop. The improvement in this system can further be made by pairing the rows of main crops and taking one or two rows of cowpea in between two paired rows of either of pigeonpea, maize and sorghum. Here, we can get 5-7 q/ha grain yield of cowpea without any adverse effect on main crop yield.

It can also be grown as floor crop in coconut garden and intercrop in tapioca in Kerala and as sole crop in single or double crop rice fallows in rabi or summer season respectively.

Manure & Fertilizer

Apply FYM/compost 5-10 t/ha as basal with last ploughing. 15-20 kg N/ ha as starter dose in poor soils (organic carbon<0.5%), 50-60 kg/ha P_2O_5 and 50-60 kg K_2O /ha. Phosphorus and potassic fertilizer should be give according to soil test value.

Micro Nutrients

1. **Zinc.** Quantity of Zinc requirement determined according to the soil type & it's availability or status in the soil. Therefore, the doses of zinc should be applied based on the soil type as follows:
 - **Red sandy and loamy soils** -2.5 kg Zn ha⁻¹ (12.5 kg zinc sulphate hepta hydrate/ 7.5 kg zinc sulphate mono hydrate) per hectare.
 - **Black soils** -1.5 to 2.0 kg Zn ha⁻¹ (7.5 to 10 kg zinc sulphate hepta hydrate/ 4.5 to 6.0 kg zinc sulphate mono hydrate) per hectare.
 - **Laterite ,medium and alluvial soils** -2.5 kg Zn ha⁻¹ (12.5 kg zinc sulphate hepta hydrate/ 7.5 kg zinc sulphate mono hydrate) as basal along with 200 kg of farm yard manure.
 - **Low organic carbon content and hilly sandy loam soil** - 2.5 kg Zn ha⁻¹ (12.5 kg zinc sulphate hepta hydrate/ 7.5 kg zinc sulphate mono hydrate) as basal in every alternate year.
2. **Molybdenum** - In clay loam soils, apply 0.25 kg Ammonium Molybdate ha⁻¹ as basal.

Water Management

For summer crop, irrigation is most critical among all inputs followed by weeding and fertilizer. Generally, crop required 5-6 irrigation depending on soil, prevailing weather conditions etc, at an interval of 10-15 days. The response to irrigation is in order of flowering> pod filling>vegetative. Crop can tolerate flooding upto 2 days at flowering and pod setting thereafter, a marked decrease in yield and its attribute.

Weed Control

For higher yield crop should be free from weed upto 25 to 30 day crop stage. Application of pendimethaline 30% EC @ 0.75 - 1 kg a.i./ha combined with one hand weeding at 35 days after sowing is beneficial.

Plant Protection Measures

Diseases

Bacterial Blight

Symptoms : The germinating seedling turn brown-red and die. Irregular to round spots brown in colour with chlorotic halos, appear on leaves, and later spread to stem. Stem may break, pods are also infected leading to shrivelled seeds.



Control Measures

i) Grow resistant varieties; ii) Use healthy and disease free seeds; iii) In case of severe infection, crop may be sprayed with 0.2 % (2g/liter) copper oxychloride (Blitox).

Cowpea Mosaic

Symptoms

It is caused by a virus transmitted by aphids. The affected leaves become pale yellow and exhibit mosaic, vein banding symptoms. The affected leaves become reduced in size and show puckering. Pods are also reduced and become twisted.



Control Measures

i) Use healthy seed from healthy crop; ii) For controlling aphids spray Oxydemeton methyl 25 EC (Metasystox) @ 1 ml/liter or Imidacloprid 17.8 SL @ 0.2 ml/ liter of water and repeat the spray after 10 days of first spray.

Powdery Mildew

Symptoms

Powdery mildew are visible on all the aerial parts of the affected plants. Symptoms first start from leaves and then spread to stem, branches and pods. This white growth consists of the fungus and its spores. Affected leaves become twisted and smaller in size.



Control Measures

i) After harvest, collect the plants left in the field and burn them; ii) The disease can be controlled by spray of wettable sulphur @ 3g/liter or carbendazim @1 g/liter of water.

Insect-Pest Management

Cowpea Pod Borer

Nature of Damage

The caterpillar rolls the leaves and web these with the top shoot. Caterpillar bore into the pods and feed on the seeds, if flower and pods are not available larvae feed on foliage.



Control Measures

i) Collect and destroy the eggs and young larvae; ii) The young caterpillar can be killed by dusting 2% Methyl parathion @ 25-30 kg per hectare or spray of Quinalphos @2 ml/liter of water; iii) Fix 3 feet stick in the field @10/ha bird perches to attract predatory birds.

Hairy Caterpillar

Nature of damage : It is major insect of cowpea. It is cut juvenile plants and eat away all the green matter of the leaves.

Control Measures

i) Collect and burn the eggs and burn the eggs and larva of insect; ii) The young caterpillar can be control by spray of Chloropyrifos or Quinolphos @2ml/liter of water.

Aphids and Jassids

Nature of Damage

The adult and nymphs of these pests suck the juice from the leaves and the damage is more severe when the plants are young. As a result of sucking of sap, the leaves turn brown and crumbled and the plant look sick.



Control Measures

i) Spray of Oxydemeton Methyl 25 EC (Metasystox) @ 1 ml/ liter or

Dimethoate 30 EC @ 1.7 ml/ liter of water.

Bean Fly /Stem Fly

Nature of damage

Bean fly causes the characteristics swelling of stem at ground level where the maggots burrow onto the stem. The maggots puppets at the base of the plant and the stem grows it often cracks. The petiole often shows dark streaks where the maggots have move through and damage tissue.



Control Measures

i) Keeping the field clean from legume debris; ii) Application of Phorate (Thimet) 10 G @ 10 kg per hectare in furrows at the time of sowing is effective for avoiding infestation.

Harvesting, Threshing & Storage

Green pods for use as vegetable can be harvested 45-90 days after sowing depending on the variety. For grains, the crop can be harvested in about 90-125 days after sowing when pods are fully matured. The crop should be then dried and threshed, threshed grain should be dried in sun before storage.

For fodder, the cutting of the crop depends upon the need and the stage of growth of the component crop sown with it. Generally it should be done 40-45 days after sowing.

Yield

A good crop of cowpea yields about 12-15 q of grain and 50-60 q of straw per hectare. If the crop is raised for fodder purpose 250-350 q of green fodder is obtained per hectare.

Recommendation to achieved higher production

- i) Deep summer ploughing once in 3 years.
- ii) Seed treatment should be done before sowing.
- iii) Application of fertilizer should be based on soil test value.

- iv) Weed control should be done at right time.
- v) Adopt integrated approach for plant protection.
- For technical information of crop production please contact to district KVK/ nearest KVK.
- To avail benefit from Central and State Government running schemes for crop production (ploughing, fertilizers, micronutrient, pesticide, irrigation equipment), agricultural implements, storage infrastructure etc., please contact to your DDA/SADO office.

**- For more information also visit -
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