

Cowpea as a Future Food Legume in Changing Climate

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Short-duration cowpea is a wonder crop which gives 2-3 crops a year between February and October and fits well in multiple systems. It can be sown singly between the time gap of two main crops or as an intercrop with other crops like wheat-rice and maize-sugarcane, etc. It is a drought hardy and dual-purpose crop whose pods can be used as vegetable and grain as *dal* or processed in different nutritious products which are rich in zinc, iron and some other nutrients. Cowpea also helps in improving fertility of soil as Rhizobium bacteria present in its root nodules fix nitrogen of the environment in the soil. As malnutrition is spreading day by day at the cost of declining per capita availability of proteins due to well adopted 'wheat-rice' and 'rice-rice' cropping systems and legumes remained as an option for marginal land holders only. Cowpea contains good amount of protein i.e. 22-24% and carbohydrate i.e. 54-56%, also called as poor man's meat. So, there is urgency and challenge to agricultural research in India to produce ample amount of legumes which is going to be a rich source of vegetarian's dietary proteins in near future. The only way to make the space of cowpea in the well adopted cropping systems is to develop short duration and high yielding cultivars of cowpea which can occupy the field from March to June i.e. after harvesting of wheat and before transplanting of rice.

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. A number of photo-insensitive and heat tolerant short duration cowpea varieties like Pant Lobia-1, 2, 3, 4 and 5 from GBPUA&T Pantnagar University, Arka Garima from IIHR, Bangalore, Pusa Su komal from IARI, New Delhi and Kashi Kanchan, Kashi unnati from IIVR, Varanasi has been developed. In fact, the challenge is not only to produce sufficient quantity and good quality of cowpea but also to

popularize short duration cultivars among the farmers as cowpea is a low input requiring crop as it can also be grown in zero tillage if proper moisture is maintained before sowing.

Land preparation

Well drained loamy or slightly heavy, acidic soils are best for cowpea cultivation. 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.

Sowing of Seed

The time of sowing varies according to type of crop.

- **Kharif crop:** 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)
- **Green Manuring** - Mid June to 1st week of July

Seed Rate

- During *Kharif* season 20 - 25 Kg/ha for grain purpose and 30 - 35 kg/ha for fodder and green manure is required.
- During *summer* 30 kg/ha for grain and 4 - kg/ha for fodder and green manuring is required.

Spacing

Row to row - 30 (Bush type) to 45 cm (spreading type)

Plant to Plant - 10 (Bush type) to 15 cm (spreading type)

Method of Sowing

Sowing of cowpea is done by broadcasting, line sowing and dibbling of seeds based on 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. Sowing depth of 3 - 5 cm should be maintained.

Seed treatment

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

Manuring

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 P₂O₅ and 50 - 60 kg. K₂O/ha . Phosphorus and Potassic fertilizer should be give according to soil test value.

Intercultural Operation

For higher yield, crop should be free from weed up to 25 to 30 days after sowing. It covers the land very soon. Application of Pendimethaline @ 0.75 - 1 kg.a.i./ha along with one hand weeding at 35 days after sowing is beneficial.

Irrigation

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. Light irrigation is required at flowering and pod filling stage.

Aphids and Jassids are the major threat to this crop. 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. To control this, spray of Oxydemeton Methyl 25 EC (Metasystox) @ 1 ml/ liter or Dimethoate 30 EC @ 1.7 ml/ liter of water is required.

Harvesting

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 and grains 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.

Apart from all the benefits of cowpea, a series of food products have been made by cowpea such as akara, bhujia, dahi bara, laddoo, biscuits, boondi, cake, curry, mathary, sev and papad. Various varieties of cowpea will be a boon for different regions of country and will definitely pave the way for growth and development of the country. So, the urgent need of this era is to develop new varieties of cowpea suiting different agro-climatic conditions of India.

Introducing cowpea as additional crop in various cropping system and thus, increasing the availability of much needed pulses will surely led to enhanced pulse production to cope with increasing malnutrition along with improved soil health status in different areas of the country.