



Scientific Cultivation of Pigeon pea and its Management

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Pulses have special importance in India because they are not only a major source of protein but also improve soil fertility. Pigeonpea (tur/arhar/pigeon pea) is one of the major pulse crops, mainly cultivated in northern India. Uttar Pradesh, Bihar, and Madhya Pradesh are the major pigeonpea-producing states. Pigeonpea cultivation is important from several perspectives. First, it provides cash income to farmers. Second, it is an important source of nutrition for the rural population because pigeonpea dal contains approximately 22% protein. Third, its deep roots break compact soil layers, improve soil structure, and contribute to nitrogen fixation. For this reason, it is also called a “biological plough.” The area under pigeonpea cultivation in northern India is continuously increasing. According to government statistics, Uttar Pradesh is the largest producing state in the country, contributing approximately 35% of total production. The crop is sown during the kharif season and harvested in January–February.

Soil and Climate: Soil and climate selection is extremely important for scientific cultivation of pigeonpea. It is a major kharif pulse crop that can also grow well under rainfed conditions.

Soil Requirements: Sandy loam to loam soils are considered most suitable for pigeonpea cultivation. Such soils have good drainage and provide adequate aeration to plant roots. Soil pH should be between 7.0 and 8.5. Extremely acidic or alkaline soils adversely affect pigeonpea growth. In deep soils, pigeonpea roots can penetrate 1–2 metres, enabling them to break compact soil layers and improve soil structure.

Climatic Requirements: Pigeonpea is a tropical crop. A temperature of 26–30°C is considered ideal. Adequate rainfall is required at sowing, whereas dry and cool weather is suitable during maturity. In northern India, pigeonpea is generally sown during June–July and harvested during January–February.

Crop Duration: The crop duration of pigeonpea ranges from 150–270 days, depending on the variety. Early-maturing varieties are ready in 150–180 days, whereas late-maturing varieties mature in 240–270 days.

Importance of Soil and Climate: When soil and climatic conditions are suitable, pigeonpea productivity can increase by 20–25%. Therefore, scientific pigeonpea cultivation in northern India is based on appropriate soil selection and climatic analysis.

Seed and Varieties: Selection of seed and variety is extremely important in scientific pigeonpea cultivation. Selection of the right variety affects both farmers' income and productivity.

Seed Rate and Spacing: A seed rate of 12–25 kg per hectare is generally sufficient for pigeonpea sowing. A spacing of 25–30 cm between plants and 60–90 cm between rows is maintained. This provides adequate light and air to the plants.

Seed Treatment: Seed treatment with *Rhizobium* culture is recommended. It increases nitrogen-fixation capacity and helps maintain soil fertility. Thiram or carbendazim is used for seed treatment to reduce disease incidence.

Major Varieties

- Major pigeon pea varieties grown in northern India include:
- UPAS-120: An early-maturing variety, ready in 150–160 days.
- Bahar: A high-yielding variety.
- Narendra-1: Popular in Uttar Pradesh.
- Malviya: A disease-resistant variety.
- ICP-151: A high-yielding variety.

Nutrient and Fertilizer Management: Nutrient management is extremely important in scientific pigeonpea cultivation. Although the crop has the capacity to fix nitrogen, balanced nutrition is necessary for initial growth.

Importance of Organic Manures: Well-decomposed farmyard manure (FYM), compost and green manure are particularly beneficial in pigeonpea cultivation. They improve soil structure and increase the availability of micronutrients. Application of organic manures also increases the water-holding capacity of soil.

Chemical Fertilizers: Balanced application of nitrogen, phosphorus and potassium is necessary in pigeonpea cultivation. Generally, 20–25 kg nitrogen, 60–80 kg phosphorus and 20–30 kg potassium per hectare are applied. Phosphorus is particularly important because it supports root development and nitrogen fixation.

Micronutrients: Zinc and boron deficiencies are often observed in pigeonpea cultivation. Zinc sulphate and boron are used to correct these deficiencies.

Biofertilizers: *Rhizobium* culture and phosphate-solubilizing bacteria (*PSB*) help increase pigeonpea productivity. Seed treatment with *Rhizobium* culture increases nitrogen-fixation capacity.

Disease and Insect Management: Disease and insect management is essential in pigeonpea cultivation because they can significantly affect crop productivity.

Major Diseases

Wilt: This is one of the most serious diseases of pigeon pea; plants suddenly wilt and dry.

Leaf blight: Brown spots develop on the leaves, followed by leaf shedding.

Disease Control

Seed treatment with Thiram/carbendazim and the use of *Trichoderma* powder are helpful for disease management. Selection of disease-resistant varieties is also important.

Major Insect Pests: Pod borer- it damages pigeon pea pods.

Aphids: They suck plant sap and affect plant growth.

Insect Control: Integrated Pest Management (IPM) techniques should be adopted. These include biological control, pheromone traps, and neem-based insecticides. Chemical insecticides should be used only when necessary.

Irrigation Requirement

Pigeon pea has deep roots, which enable it to tolerate drought conditions. Nevertheless, if rainfall is inadequate, 2–3 irrigations may be required.

- First irrigation: 25–30 days after sowing, during early plant growth.
- Second irrigation: At flowering.
- Third irrigation: During pod development.

Weed Management: Weeds are a major problem in this long-duration crop. Weeds compete with plants for nutrients and moisture.

Weeding and interculture: The first weeding should be carried out 25–30 days after sowing and the second at 45–50 days.

Chemical control: Herbicides such as pendimethalin may be used after sowing.

Integrated control: A combination of biological and mechanical methods is most effective.

Economic Importance: Pigeon pea is the second most important pulse crop in northern India after chickpea, and its economic importance is multidimensional.

Nutritional Value and Food Security: Pigeon pea dal is an integral part of the Indian diet. It contains approximately 22% protein, 15% fibre, and micronutrients such as iron and iodine. It is a major source of protein for the rural population and therefore helps reduce malnutrition.

Conclusion

Pigeonpea is the second most important pulse crop in northern India. Scientific cultivation of pigeonpea is an effective means of increasing farmers' income, maintaining soil fertility and ensuring food security. Pigeonpea contains approximately 22% protein and is an important source of nutrition for the rural population. The crop fixes nitrogen and improves soil structure. It provides cash income to farmers and raw material to the pulse industry. It also generates employment and supports industrial development in the rural economy.