

Cultivating Garden pea in Punjab

Pea (*Pisum sativum*) is a rich source of digestible proteins, vitamins and minerals like iron, magnesium, phosphorus and zinc. Its green beans are very common in Indian cuisine. Pea has a global value as food source for millions of people and is extensively cultivated as pulse and vegetable crop. Being leguminous crop, it fixes the atmospheric nitrogen through a symbiotic relation with root nodule bacteria. In India, during 2019-2020, garden pea is grown over an area of 5,63,000 ha with the annual production of 57,03,000 metric tonnes. However, in Punjab, pea is cultivated in about 43,860 ha area with the production of 4,60,450 tonnes mainly in Amritsar, Hoshiarpur and Nawanshahr districts. Besides Punjab, Karnataka, Madhya Pradesh, Rajasthan, West Bengal, Haryana, Himachal Pradesh and Bihar are major pea growing states. We can also preserve the green pods/tender seeds for a long time by drying, canning or freezing in order to fetch higher prices during the offseason. Pea is easy to grow, but have a very limited growing season. Therefore, its cultivation as per recommendation of Punjab Agricultural University is of utmost importance.

PEA, being a cool season crop, requires frost-free weather especially at flowering and pod formation stage though vegetative growth is not affected by the frost. The optimum temperature for its germination is about 20-25°C. Though, its seeds can germinate at 4-5 °C but under severe frost condition, its flowers and young pods may be damaged. High temperature reduces the pod quality as sugars in the seeds changes to hemicellulose and starch. A temperature above 27°C shortens its growing period but adversely affects pollination process.

Sowing time and seed rate play crucial role not only in crop production but also in escape of several insect-pests and diseases. Likewise, a healthy pea crop can be possible only if sown between mid-October to mid-November (for rabi season crop). Avoid early sowing of crop in September to get rid of pea wilt to some extent. The optimum seed rate is 45 kg/acre for early maturing varieties, while 30 kg/acre for main season varieties. The sowing should be done in line, with the spacing of 30 cm × 7.5 cm and 30 cm × 10 cm (row × plant) for early and main season varieties, respectively. Farmers may also make use of seed-cum-fertilizer pea drill having a sowing capacity of one acre in an hour. Seed treatment prior to sowing with *Rhizobium leguminosarum* culture is the simplest way to increase pea production and quality as it helps in quick nodulation on the roots which in turn fix atmospheric nitrogen. Farmers can get this culture from the Department of Microbiology, Punjab Agricultural University, Ludhiana. Culture should be mixed thoroughly in half litre of water and the suspension is rubbed gently on all the four sides of the seeds. Let the

treated seed shade dry well before sowing. One packet of culture is sufficient for one acre seed.

Nutrients application, irrigation and their timing are the major prerequisite for growing healthy crop. Go for refined annual soil testing to know the nutrient status of the field and based on soil test report follow proper manuring and fertilization of the crop. Farmyard manure @ 8 tonnes should be properly incorporated at the time of land preparation. Generally, pea crop has low nitrogen



Irrigation of the crop

Plant protection

Major insects infesting pea crop and their management

Insect	Symptoms
Leaf miner (<i>Chromatomyia horticola</i>)	The greenish larvae make serpentine tunnel in the leaves and feed on it. The infested leaves wither and dry. Flowering and pod formation are drastically affected.
Pea thrip (<i>Thrips indicus</i>)	Nymphs and adults of thrip cause severe damage to the young crop by sucking the cell sap from leaves and flowers.
Pea-stem fly (<i>Ophiomyia phaseoli</i>)	The maggots of fly bore inside the stem leading to withering and ultimate drying of the affected shoots. The adults also cause damage by puncturing the leaves, and the injured parts turn yellow. The damage is more severe on seedlings than on the grown up plants
Management a) At the time of sowing, apply 10 kg Furadan 3G (carbofuran) granules per acre. b) Sow the crop in the second fortnight of October to escape the damage of this pest.	

Major disease of pea and their management

Disease	Symptoms	Management
Powdery mildew (<i>Erysiphe pisi</i>)	First symptoms appear on the upper surface of the leaves as very small and discoloured spots which soon give rise to enlarge white powdery areas on leaves, stem and pod. Multiple infections may cover the whole plant.	Sulfex @ 600 g in 200 litres of water per acre should be sprayed on the appearance of symptoms. 2 - 3 sprays may be given at 10 days interval.
Wilt, root rot and collar rot (<i>Fusarium oxysporum</i> and <i>Rhizoctonia solani</i>)	Wilt attacks young plants. The affected plants show yellow-orange internal discolouration in the lower internodes. Diseased plants appear unthrifty, variously dwarfed depending upon the severity of infection, and may wilt and die.	Seed treatment with Talc based formulation of <i>Pseudomonas fluorescens</i> @ 15 g per kg seed before sowing is effective. Avoid early sowing in infested areas.
Rust (<i>Uromyces viciae fabae</i>)	During December-January, yellow and reddish brown coloured raised pustules appeared on the ventral leaf surface. Rust is more serious in the late sown crop.	Remove and destroy weed host plants of this disease (especially Rewari). For controlling powdery mildew and rust together, Sulfex @ 200 g can be sprayed in combination with Indofil M-45 @ 400 g per acre
White rot (<i>Sclerotinia sclerotiorum</i>)	Irregular water soaked spots on leaves, stem and pods appear. Symptoms are more frequent on pods which turn papery brown in colour in the later stage. White mycelial growth appears on the infected portion under wet and cool weather. Black hard sclerotial bodies embedded in mycelium are formed within the pods. The disease is high at flowering and pod formation stage.	Avoid pea crop sowing in fields where susceptible crops like brinjal, cauliflower, carrot are sown. Go for crop rotation with non-host crops like tomato and chilli. This will help in reducing the disease spread. All left over crop debris should be collected and burnt.

requirement. Therefore, full dose of nitrogen 20 kg (45 kg urea), phosphorus 25 kg (155 kg superphosphate) per acre should be applied before sowing. A pre-sowing irrigation is essential for proper seed germination. For the production of peas, first irrigation should be done after 15 days of sowing. Irrigations at flowering and pod formation stage are necessary. This crop can also be grown under rainfed conditions provided with sufficient moisture at the time of sowing. A total of 3-4 irrigations are required depending upon soil type and weather conditions. Two hoeings are necessary after 4th and 8th week of germination to keep the field free from weeds. Hoeing helps in weed removal and pulverizes the soil for proper aeration. However, it is difficult to control the weeds manually, if the crop is sown in rows in closed spacing.

Well developed and green pods (with tender seeds) should be harvested always. Number of pickings depends upon the maturity group of peas. Picking should be done either early in the morning or late in the afternoon. Picking during mid day deteriorates the quality of pea pod due to heat stress.

Improved varieties

Varieties on the basis of period of maturity :

Early maturing varieties: AP-3, Matar Ageta-7, Matar Ageta-6 and Arkel.

Main season varieties: Punjab-89 and Mithi Phali

Important precautions

- Avoid spraying the crop with hazardous insecticides/ fungicides at least 20 days before the picking of pods.
- Avoid direct contact with chemicals while treating the seeds with insecticide/ fungicide.
- Always use rubber gloves for application of granules/ insecticides.
- Keep the insecticides / fungicides in a store far from living area.

For further interaction, please write to:

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