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Green Pea Sustainable Management through Eco-Friendly Approaches

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Abstract

Peas (*Pisum sativum*) are a widely grown crop and have commercial value as a food source. They are consumed fresh and processed, e.g. as canned or frozen peas. Peas are the rich source of the various nutrients like protein, carbohydrate, phosphorus, fiber, iron, potassium and vitamin K. Among these, the insect–pests and diseases play can cause very high losses of yield and quality of produce.

Introduction

Pea is an herbaceous annual plant from the Fabaceae family that is grown worldwide for its edible seeds. Peas are commonly available fresh, canned, or frozen, with dried peas often used in soups. The crop is short duration and mature early and can easily fit in different crop rotations. In Punjab, peas are cultivated in approximately 43,860 hectares, with a production of 4,60,450 tonnes primarily in Amritsar, Hoshiarpur, and Nawanshahr districts. Various biotic and abiotic factors, along with constraints, influence pea cultivation. Several factors i.e. poor source of seed, improper selection of varieties, excessive use of fertilizers, untimely check of weeds, severe incidence of insect-pests and diseases are involved for lower productivity. Over use of pesticides increases the cost of production and leads to environmental pollution and health hazards. Therefore, it is very important to follow integrated pest strategies, which are more reliable and eco-friendlier.

Insect-Pests

Pea weevils: Adult pea weevils come out in the spring and deposit their eggs inside pea seeds. When the eggs hatch, the larvae consume the seeds, causing damage by creating holes. Insecticides are ineffective against the larvae, so the focus is on eliminating the adult weevils. The pea leaf weevil is another pest that targets both the roots and leaves of the plant. The larvae of this weevil feed on the nitrogen-producing nodules of the plant. The adult pea leaf weevil is identifiable by its gray-brown appearance with three stripes on its back, and plants affected by this pest will display notches in their foliage.

Pea Stem Fly

The adult flies are metallic black. The maggots bore into the stem thereby causing withering and ultimate drying of the affected shoots, thus reducing the bearing capacity of the host plants. 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. For management avoid early sowing of the crop than mid-October, remove and destroy all the affected branches during the initial stages of attack. Also apply 10 kg carbofuran 3 G per acre in furrows at the time of sowing.

Pea leaf miner: The adults are two-winged flies having greyish black mesonotum and yellowish frons, active from December to April or May(ASFHS,2024). The large number of tunnels made by the larvae between the lower and upper epidermis interferes with photosynthesis and proper growth of the plants, making them look unattractive. Maintain good plant health with judicious use of fertilizers to reduce pest incidence.

Pea-aphid

Adult aphids are soft bodied, long legged, pear-shaped, green yellow or pink in colour with long conspicuous cornicles. Both nymphs and adults suck the sap from young shoots, ventral surface of tender leaves, inflorescence and even on stems. Curling and distortion of leaves, stunting and malformation shoots occur. The infected leaves turn pale and dry. To reduce aphid incidence, eradicate weeds growing on field bunds, waste lands, road side and irrigation channels/canals as they serve as reservoir for aphids and also use fertilizers judiciously, as the higher application of nitrogenous fertilizers increase the aphid populations.

Pea thrips: These are small, slender, agile insects. They are commonly found in flowers of but will also feed on leaves. Their presence in flowers at early bloom may result in poor pod formation due to pollination interference by thrips feeding. For management remove weeds growing in and around the field and avoid excessive use of nitrogenous fertilizers.

Photo No.	Insect pest/ Disease	Typical symptoms
1	Pea Weevil	
2	Leaf minor	
3	Shoot fly	
4	Wilt and root rot	
5	Powdery mildew	
6	Rust	
7	White rot	

Diseases

Wilt and root rot

It is fungal disease and more severe in early sowing crop. The disease emerge base of plant reddish brown cankers may appear in the collar region of plant and later on the roots become rotten. Root rotting and yellowing of lower leaves, followed by wilting. The favorable temperature for the disease is 27-30^0 C and fungal spore survive in soil for long time Ananymous 1 2021(a). For management avoid sowing in the disease-affected field and early sowing. Treat the seed with 15 gm of *Pseudomonas fluorescens* Bacteria per kg/seed.

Powdery mildew: The powdery mildew is widespread disease that is often most prevalent on late maturing filed pea varieties. Symptoms appear on plants white floury patches covering large areas, stem, branches, leaves and pods. In severe infestations, brown, pitted spots may occur on pods and the seed may be visibly affected. Premature ripening may result in shrunken seed. Generally, the disease appears at the end month of January. Mild temperatures ranging from 15^0 to 25^0 Celsius with high humidity provide favorable conditions for the growth and spread of the fungus. Extended periods of leaf wetness due to dew or rainfall can also contribute to powdery mildew development. The pathogen can survive on crop waste for a very long time in the field.

Management: Farmers should be destroying the crop debris after harvesting the crop. Spray the fungicide, 600 gm Sulfex in 200 liters of water per acre. Three sprays may be given at 10 days interval.

Rust: Generally, the disease first manifests itself in the month of December. Favorable climatic conditions make the disease more dangerous for early planting crops, which cause extensive yield loss. The primary disease signs are yellowish, reddish brown, spherical, elevated powdery pustules appear on the lower side of the leaves, which eventually spread to all parts of the plant. Anonymous 1 (b)2021. The pustules may develop to be larger, atypical-looking lesions that are dark or black in colour. Rust pustule growth can cause infected leaves to appear twisted or curled. The severe infections might result that stunted growth, premature defoliation of the leaves and shrieked grain. The pathogen become survives on weeds (Riwari) and collateral hosts (Chatri Matri). Cool and moist weather conditions are favorable for disease development.

Management: Keep the field free from Rewari weed which serves as a source of inoculums. To manage the powdery mildew and rust together spray the fungicide 200gm Sulfex in combination with 400g Indofil M-45 in 200 liter of water per acre.

White rot*:* The disease caused by fungal pathogen Sclerotinia sclerotiorum which affects various crops including field pea. The disease is mainly attack at flowering and pod formation stage. The initial symptoms of white rot as small, irregular shaped water-soaked lesions on leaves, stem and pods; however, the disease is most frequently observed 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 and its live in soil many years. These

black sclerotia cause infection in next crop. Cool and moist weather conditions are favorable for disease development.

Management

The following tips should follow by the farmers to manage the disease: plant waste should collect and burned. Pea should not be planted after susceptible crops such as brinjal, cauliflower, carrots, and pea; alternatively, tomatoes and peppers can be cultivated. This will help in stopping the spread of primary inoculums in the field.

References

Anonymous (a) 2021 package of practices for cultivation of vegetables, Punjab agriculture university, pea management.81

Anonymous (b) 2021 package of practices for cultivation of vegetables, Punjab agriculture university, pea management.82

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