

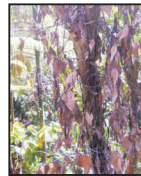


#### Management

- Removal of heavily infested plant parts will minimize the inoculum.
- Spray dimethoate 30 EC (2 ml/l)

#### 6. Nematode pests

Root-knot nematode, *Meloidogyne* sp. and burrowing nematode, *Radopholus similis* are the two important nematode species infesting rooted cuttings in the nursery. The damage caused by nematode infestation results in formation of galls, poor growth, foliar yellowing and sometimes interveinal chlorosis of leaves. The establishment of nematode infested cuttings will be poor when planted in the field and such cuttings develop slow decline symptoms at later stages. Nematode infestation predisposes plants to fungal and bacterial root pathogens.



#### Management

- Raise rooted cuttings in solarized nursery mixture
- Application of *Paecilomyces lilacinus* @ 10/l or neem cake @ 1 kg /vine is also recommended

#### 7. Gall midges

The gall midge pests infesting black pepper include *Trichoperrisia pipericola*, *Cecidomyia malabarensis* and *Zalepidota piperis*. The maggots make swellings in tender leaf stalks and shoots. The affected berries were recognised by their stunted shape. This pest is responsible for part of the loss connected with the "Polhu" disease.

#### Management

- The affected plant parts can be collected and burnt immediately.
- The larvae are parasitized by *Platygaster* sp. and braconids.
- Raking the soil and expose the pupae to sunlight followed by drenching with chlorpyrifos 50 EC @ 1.5 ml/l.
- Foliar application of thiamethoxam 25 WG @ 0.3 g/l will be effective

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## AICRP ON SPICES INDIAN COUNCIL OF AGRICULTURAL RESEARCH



## Black Pepper Integrated Pest Management



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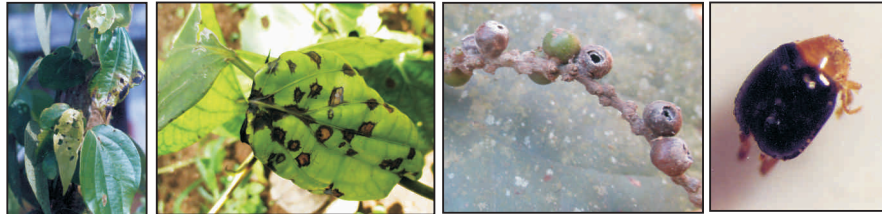
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Black pepper is the most important spice of the world and referred as "King of Spices". Several pests attack the crop at different stages of growth and they are considered as big challenge and menace for the farmers. Yield loss can be minimized by the proper management of these pests. Major pests of black pepper and their management measures are given below.

### 1. Pollu beetle, *Lanka ramakrishna* (= *Longitarsus nigripennis*)

*Pollu* beetle is the most destructive pest of black pepper and is more serious in plains. The pest infestation is more problematic in shaded areas and higher during September and October months. Both the grubs and adults feed on the growing tips, tender stems, leaf petioles, spikes and berries. Tunnelling of tender stem causes drying up of the shoot. As a result of boring, the berries turn yellow initially, dries up and turns dark in colour. They are hollow and crumble when pressed. Such hollow berries are called 'Pollu' berries. The adult beetles feed on tender leaves and due to feeding, irregular holes can be seen.



#### Management

- Regulation of shade in the plantation reduces the population of the pest
- Spray quinalphos 25 EC (2 ml/l) or dimethoate 30 EC (1.5 ml/l) during June/July and September/October

### 2. Top shoot borer, *Laspeyresia hemidoxa* (= *Cydia hemidoxa*)

The top shoot borer is a serious pest in almost all black pepper growing areas. The pest infestation is higher during July to October. Larvae bore into tender terminal shoots and feed on internal tissues resulting in blackening, decaying and drying of affected shoots.



#### Management

- Apply quinalphos 25 EC (2 ml/l) on tender terminal shoots, repeat the spraying at monthly intervals (during July - October) to protect emerging new shoots

### 3. Marginal gall thrips, *Liothrips karnyi*

The feeding of thrips on tender leaves causes the leaf margins to curl down and inwards resulting in the formation of marginal leaf galls. Later the infested leaves become thick, crinkled and malformed. In severe attack, the whole plant may become stunted, adversely affect the formation of spikes.

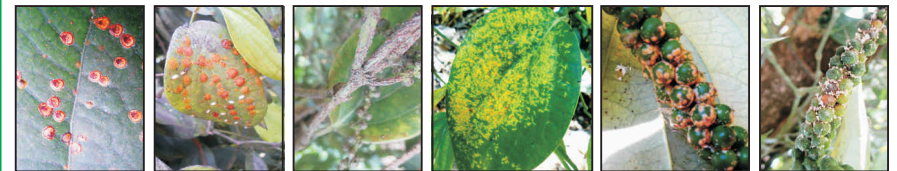


#### Management

- Spray dimethoate 30 EC (1.5 ml/l) during emergence of new flushes in the field and also in the nursery when the pest is noticed.

### 4. Scale insects

Among various scale insects recorded on black pepper, mussel scale (*Lepidosaphes piperis*) and coconut scale (*Aspidiotus destructor*) causes serious damage to vines. They suck the sap from stems, leaves and petioles resulting in yellowing and wilting. In severe cases of infestation, the affected portions of the vines dry up.



#### Management

- Remove the affected portion and spray neem oil 0.3% or neem gold 0.3%
- Spraying *Lecanicillium lecanii* @5-10 g/l is found to be effective in managing the pest
- If the infestation is severe, spray dimethoate 30 EC (1.5 ml/l).

### 5. Mealy bugs

The commonly found mealy bugs infesting black pepper are *Ferrisia virgata*, *Planococcus* sp., *Pseudococcus* sp., *Xenococcus annandalei* etc. They found in cluster on the terminal shoots, leaves, berries, roots and suck the sap resulting in yellowing, withering and drying of plants and shedding of berries. Many of the vines infested by root mealy bugs are also likely to be infected with *Phytophthora* and nematodes.