

Pests of Pepper

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Twenty species of insect pests are known to be associated with black pepper in India. The most important ones among them are the 'pollu' beetle, the top shoot borer, the marginal gall forming thrips and the scale insects and mealy bugs. Recently, two species of stem borers also have been recorded as new pests of black pepper.

The 'pollu' beetle, *Longitarsus nigripennis* Mots. (Coleoptera: Chrysomelidae), commonly known as 'flea beetle', is small, shining brownish black and is capable of jumping long distances. The adult beetle lays eggs in small shallow depressions made on the rind of tender pepper berries. The eggs hatch out into pale yellowish grubs which in their turn bore into and feed on the contents of tender berries making them hollow. The external indication of infestation is the presence of dark drying berries possessing characteristic circular holes in the midst of green healthy berries. A single grub destroys three or four berries. Fully fed grubs drop to the soil, construct oval earthen cocoons and pupate inside them. The total life cycle of the pest takes 40-50 days. It completes four generations between July and January. Egg laying stops by December when the pepper berries mature (Nair, 1971). The extent of damage caused by 'pollu' beetle goes up to 40%

of berries in certain endemic areas. Observations on seasonal abundance of this pest reveal that the beetle is active in the field from July to February. But the maximum pest population has been noticed in November. No alternate host or natural enemy of the pest has been hitherto recorded.

Studies on the intensity of incidence of 'pollu' beetle on different cultivars of pepper available in the germplasm assemblage maintained at the Pepper Research Station, Panniyur during three crop seasons from 1972 to 1974 have shown that high yielding cultivars like Karivally, Karimunda and Panniyur I suffered very heavy incidence of the pest ranging from 40 to 57% spike infestation whereas Kalluvally Type II, a popular north Kerala cultivar, recorded only 0.2 to 1.8% spike infestation. Though cultivars like Uthirankotta I and II, TMB V and Shimoga were practically free from pollu beetle infestation, the total number of spikes and berries on the vines were very small.

Cultural operations like raking the soil and regulation of shade of standards are reported to be beneficial in reducing pollu beetle infestation. Soil application of insecticides can also be effective in controlling the grubs falling to the ground for

pupation. However, chemical control trials carried out with granular insecticides like phorate, thiodemeton, carbaryl, carbaryl + lindane, lindane, carbofuran, mephospholan and trichlorphos did not bring about any significant reduction of pest incidence. Rahiman and Nambiar (1967) recommended spraying of pepper vines with 0.2% DDT twice in July and October for the control of pollu beetle infestation. In view of its high retentive toxicity, DDT spray is not being recommended in recent years. Pillai and Abraham (1974) recommended two sprayings with 0.1% dimethoate or 0.1% quinalphos in late July and early October. These insecticides were more effective than 0.2% DDT.

Where 'pollu' disease caused by the fungus *Colletotrichum necator* is also responsible for crop losses, a spray schedule involving a combination of both fungicide and insecticide would be more economical.

The top shoot borer *Cydia (Laspeyresia) hemidoxa* Meyr. (Lepidoptera: Eucosmidae) is another major pest of pepper. The caterpillars of this tiny crimson and yellow coloured moth, damage the terminal shoots of pepper vines by boring into them. The intensity of incidence of this pest will be more during the period from August to December, when succulent shoots will be available on pepper vines. As the caterpillar bores into the terminal shoot the growing point is damaged and this results in drying of the terminal portions of the vines. The pest takes about a month to complete its life cycle. The intensity of top shoot borer incidence on different age groups of Panniyur I vines (planted in 1970, 1971 and 1972) recorded in 1972 was 23.8%, 26% and 6.4% respectively. The maximum intensity of incidence of upto 48% shoot damage was noticed in a newly raised one-year old plantation in south Kerala. Three species of hymenopteran

parasites, viz., *Apanteles* sp. (Braconidae), *Eduderus* sp. (Eulophidae) and *Goniozus* sp. (Bethylidae), have been reported as natural enemies of pepper top shoot borer. The former two species parasitise late stage caterpillars and the latter early stage caterpillars of the pest (Visalakshy and Joseph, 1965). Spraying the vines with dimethoate or phosphamidon at 0.05% concentration has been found to be effective in controlling top shoot borer infestation.

The marginal gall forming thrips *Liothrips (Gynaikothrips) karnyi* Bagnall (Thysanoptera: Thripidae) is a persistent pest problem in almost all the pepper growing tracts of India. The thrips make marginal galls on the leaves within which they live in colonies. Due to the rasping and feeding activity of the adults and immature stages of thrips, the leaf tissues become thick and in severe cases of infestation the whole leaf presents a crinkled or malformed appearance. As a result of thrips infestation, hyperplasia or proliferation of parenchymatous cells sets in, and finally the leaves become brittle. An anthocorid bug and a species of mite have been recorded as predaceous on this thrips. They are found within the marginal galls feeding on the immature stages of thrips only and not on adults (Visalakshy and Joseph, 1967). Spraying the vines with 0.1% malathion or 0.05% dimethoate or quinalphos was efficacious in controlling thrips infestation.

The scales and mealy bugs also often cause considerable damage to pepper. The scales *Lepidosaphes piperis* Green (Coccidae) appear as small dark grey boat shaped encrustations on the stem and leaves of pepper vines. These suck plant sap and the badly infested vines dry up gradually. Other coccids like the mussel scale *Lecanium marsupiale* Green, the hard scales *Aspidiotus destructor* Sign., *Pinnaspis aspidistrae* Sign., *P. marchalis*

Cockll. and *Chionaspis varicosa* Green, and the mealy bug *Ferrisia virgatus* Ckll. also infest pepper vines and spikes. Spraying 0.1% malathion or 0.05% dimethoate will be effective in controlling coccid infestations.

The maggot of the gall midge *Cecidomyia malabarensis* Felt. (Diptera: Cecidomyiidae) is embedded in the pulp of berries and at the attachment of berry to the spike. The full grown maggot falls to the ground and pupates in the soil. Eggs are laid on the spikes. Infested berries increase in size in the beginning but appear stunted later. Swelling may be caused on the tender stalks and shoots also.

The flea beetles, *Pagria constatipennis* J. and *Neculla pollinaria* B., feeding on leaves and the weevil *Eugnathus curvus* Fst. damaging tender foliage have been

reported (Nair, 1975) Severe infestation of pepper foliage by the weevils *Myloccerus* sp. has been observed by the author.

Recently, *Pterolophia annulata* Chev. and *Diboma procera* Pasc. (Coleoptera: Cerambycidae: Lamiinae) have been recorded as new stem borer pests of pepper vines. The grubs of these longicorn beetles tunnel into and feed on the central core of the stem. The tunnels will be tightly packed with frass as the grub progresses forward. The grubs are often found in older and dead vines. They are also noticed tunnelling into the live vines at the collar region or slightly above. However, the grubs prefer dead and dried tissues (Dubey *et al.*, 1976). Biology and seasonal abundance of these pests are still under study. No natural enemies of these pests have been recorded. Chemical control schedules against them are yet to be worked out.

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