

## Insect Pest Problems of Pigeonpea in Guangxi and Hainan Provinces of China

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Pigeonpea (*Cajanus cajan*) crop in China is relatively new in the extensive diversified system. After the introduction of pigeonpea materials from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India into China in 1985, several trials were organized in the country to prove its potential as soil conservation agent, food, fodder, and fuel. Although the crop attracted the attention of the farming community for several years, in recent years its importance increased rapidly due to its fodder value in Guangxi province and as soil conservation agent in Yunnan province. Intensive work on this crop gained momentum during 1997 after the introduction of advanced breeding material of different maturity groups from ICRISAT and by 2000 the pigeonpea area extended to about 3000 ha in Yunnan, Guangxi, and Jiangxi provinces (Zong Xuxiao et al. 2001). Among various constraints of pigeonpea production, insect pests were recognized as the prime factor by various researchers (Yang Shiyong et al. 2001). During October 2001, detailed crop monitoring was undertaken by a team of ICRISAT and Chinese researchers to quantify the importance of insect pests in Nanning, Tiandeng, Dahua, Fengcheng, and Longan counties in Guangxi and Hainan provinces.

### Insect Pest Observations

During the visit, the team had the opportunity to inspect pigeonpea crops ranging from vegetative to maturity stages at different places. In Longan county it was preferred for livestock fodder particularly for goats fed in stalls.

The crop adapted well for ratooning and the health of the goats improved after feeding with pigeonpea fodder at flowering stage, 2–3 times a day. Fodder is of immense value in this area and continuous cutting of the crop for feeding goats has resulted in the shortage of seed for further plantings. The plants are attacked by *Maruca vitrata*, podfly, and the webber *Lamprosema* sp. As the

reduction in fodder quantity through insect attacks is not significant, one need not worry about any plant protection measures; however, one must plan to protect the seed for future sowings.

At the Guangxi Academy of Agricultural Sciences (GAAS) research station, in the trials in which the crops were in the vegetative phase, plants were severely attacked by *M. vitrata* (10–12 webs plant<sup>-1</sup>). It was severe particularly in determinate types. Though podfly and aphids were noticed in early-maturing types, they were of secondary importance.

At Tiandeng pigeonpeas (ICP 7035 and ICPL 87091) sown on hill slopes (about 200 m above village) were at peak reproductive phase and were loaded with pod borers (*M. vitrata* and *Helicoverpa armigera*) (*Maruca*: mean of 10 larvae plant<sup>-1</sup>; and *Helicoverpa*: 3–4 larvae plant<sup>-1</sup> with overlapping stages). Other insects such as blister beetles (*Mylabris* spp), *Euproctis* sp, and *Lamprosema* sp were of minor importance. Farmers applied one spray of contact insecticide for controlling pod borers but it was ineffective due to rains in the preceding week.

In Taipin village of Wuming county, the ratoon crop was excellent in growth with more than 500 pods plant<sup>-1</sup>. Though insects like mealy bugs and podfly were seen they were of no economic importance (<5% damage). A new homopteran pest was found feeding on the tender branches and the reproductive parts of pigeonpea. Adults of this pest were collected and preserved for further identification. Since the crop was close to harvest this new sucking pest was not of much economic importance. The farmer applied two insecticidal sprays in the first crop but did not apply any spray in the ratoon crop and he was happy with the bumper ratoon yields without any inputs on pest management.

At Manjiang village pigeonpea was mainly cultivated as intercrop with maize (*Zea mays*) for fodder. During our visit, pigeonpea (after maize harvest) was in podding phase. Since the crop was meant for fodder and was about to be cut, the presence of insects such as *Maruca*, semilooper, plume moth (*Exelastis atomosa*), *Helicoverpa*, and sap-sucking bugs (*Clavigralla* sp) were of less economic importance.

The seed production plots organized in collaboration with Dawang Seed Company Ltd. at Pinguang of Fengcheng county were in excellent condition at preflowering phase but the pod borers such as *Maruca* and *Helicoverpa* started infesting the plants. In anticipation of the pest problem the organizers were cautioned to take up appropriate plant protection measures within a fortnight.

At Fushan village of Hainan province the germplasm evaluation plots were severely infected with yellow mosaic and sterility mosaic viral diseases. Though the



**Table 1. Insect pests on pigeonpea at different locations in China during October–November 2001.**

Location (County/Province)	Insect pests observed	Damage levels (%)
Guangxi Academy of Agricultural Sciences (GAAS) (Nanning, Guangxi)	<i>Maruca</i> , podfly, aphids	20
Longan (goat farm) (Longan, Guangxi)	<i>Maruca</i> , podfly, <i>Nezara</i> , <i>Lamprosema</i> , semiloopers	1–5
Tiandeng (Guangxi)	<i>Maruca</i> , <i>Euproctis</i> , <i>Helicoverpa</i> , <i>Mylabris</i> , <i>Lamprosema</i>	30
Taipin (Wuming, Guangxi)	Podfly, sucking pests (bugs), blue butterflies, hairy caterpillars	<5
Manjiang (Guangxi)	<i>Helicoverpa</i> , <i>Maruca</i> , plume moth, podsucking bugs, semiloopers	<5
Pinguang (Fengcheng, Guangxi) (vegetative phase)	<i>Maruca</i> , <i>Helicoverpa</i>	<1
Qi Bailong (Dahua, Guangxi)	Plume moth, podfly, <i>Maruca</i>	10
Fushan (Deugmai, Hainan)	<i>Maruca</i> , <i>Helicoverpa</i> , grasshoppers ( <i>Oxya</i> spp), termites	25

crop was sprayed twice against insect pests particularly grasshoppers (*Oxya* spp), *Maruca*, and *Helicoverpa*, the crop growth was not optimum. *Maruca* was more serious in determinate types of pigeonpea and also infested the neighboring winged bean (*Psophocarpus tetragonolobus*) crop. The farmers in this area recognize grasshoppers and *Maruca* as the prominent yield reducers in all legume crops. The details of location-wise pest occurrence and damage levels is presented in Table 1.

## Conclusions

The cultivation aspects of pigeonpea were well understood by the researchers and farmers in all counties. However, the utilization and plant protection measures needs to be better adopted for the successful establishment of the crop. In areas where the crop is used as fodder the seed supply need to be backed with appropriate insect management. The involvement of private seed sector which has better pest management skills than the farmers to meet the seed demand would be of immense value for the rapid establishment of the crop. Pigeonpea is prone to insect attack which has remained a severe threat for crop productivity in several countries. Hence, countries like China, where this legume has been newly introduced, need to be very cautious in promoting this crop.

## References

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## Efficacy of *Tephrosia vogelii* Crude Leaf Extract on Insects Feeding on Pigeonpea in Kenya

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Pigeonpea (*Cajanus cajan*) is an important source of dietary protein, and is consumed as green peas, whole grain, or split seeds. Yields of pigeonpea vary across locations, seasons, and cropping systems. In most areas, insect pests are an important constraint in pigeonpea. The most important flower- and pod-feeding Lepidoptera in eastern and southern Africa are *Helicoverpa armigera*, *Maruca vitrata* (= *testulalis*), *Etiella zinckenella*, and *Lampides* spp and they account for 5–35% loss in grain yield (Minja 2001). The pod-sucking Hemiptera [dominated by *Clavigralla* (= *Acanthomia*) spp] cause 30–70% loss in yield (Minja 2001). The common seed-feeding Diptera is *Melanagromyza chalcosoma*, which accounts for 4–45% yield loss in mid- to high-altitude elevations.

The majority of pigeonpea-growing farmers are poor rural women, who cannot afford the high costs for insect pest control using commercial insecticides. *Tephrosia*

