How to identify and control mung bean pests

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Plate 1. Heliothis larvae.

Plate 2. Bean podborer larvae.

Many insect pests are found in mung bean crops in Queensland. The most serious are the larvae of heliothis, the larvae of the bean podborer and the sapsucking bugs (brown bean bug, green vegetable bug and pod sucking bug).

These insects reduce yield and quality by damaging flowers, pods and seeds, and control is necessary to produce high quality seed.

Heliothis larvae (*Helicoverpa* spp.) feed on leaves (plate 1) and terminal buds as well as developing seeds. During the first month of emergence, feeding on the terminal buds will cause the plant to branch from the axillary buds, but these will grow and yield normally if soil moisture levels are high and plants are able to make compensating growth. However, if the terminal buds are attacked after the first month, only small stunted branches will grow and the pods produced will lie too close to the ground to be harvested. Heliothis larvae will also eat flowers, effectively preventing pod set, or feed on the developing seeds. More importantly, holes chewed in the pods expose uneaten seeds to the weather. During rainy periods, germination may occur, or fungal and bacterial pathogens may infect damaged pods and destroy the remaining seeds.

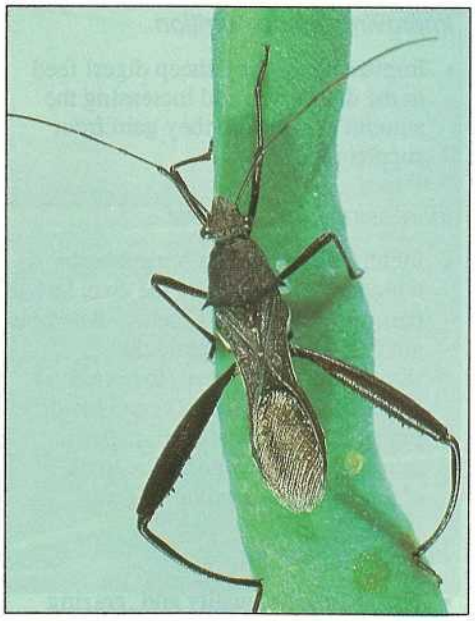

Plate 3. Pod sucking bug

Larvae of the bean podborer (*Maruca testularis* plate 2) bore into unopened flower buds, leaving a 'pin hole' in the petals as the only external evidence of infestation. They feed on the developing seed pod within the buds and require nourishment from several flower clusters for full development. As the larvae move between flowers and developing pods, they bind them together with frass-covered webbing.

Controlling both heliothis and bean podborer larvae in flowers is essential for pod set.

The adults and nymphs of pod sucking bugs, (*Riptortus serripes*, plate 3), brown bean bug (*Mirperus scutellaris*, plate 4), redbanded shield bug (*Piezodorus hybneri*) and green vegetable bug (*Nezara viridula*, plate 5), feed by piercing and sucking the developing bean seeds. This causes young seeds to abort and partly grown seeds to shrivel. Fully expanded seeds show discoloration surrounding the depressed puncture point.

As the value of mung bean seed depends on quality, especially its ability to sprout evenly with high percentage germination, bug control is important.

Plate 4. Brown bean bug.

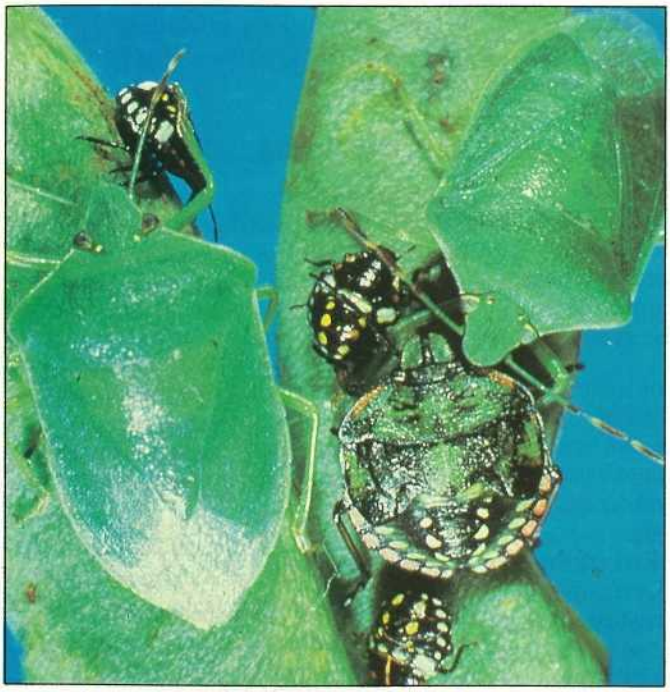

Plate 5 (top left). Green vegetable bug.

Plate 6 (top right). Soybean moth.

Plate 7 (centre). Soybean looper.

Plate 8. Cluster caterpillar

Plate 9. Green mirrid.

Other pests

Bean fly (*Ophiomyia phaseoli*) is usually a minor pest of mung beans. It is rarely seen in spring planted crops inland, but can appear in summer planted crops where successive plantings of susceptible crops have allowed large populations to build up in an area. Female bean flies lay very small eggs into the upper side of the leaf. The oviposition sites are marked by small, light-coloured punctures. A severe attack on young plants may cause them to wilt and die. After hatching, larvae tunnel down into the stem and, on older plants, the surface of the stem may split open near ground level. Yield and vigour of the plant is reduced and affected plants are susceptible to lodging (falling over) and mechanical damage, exaggerated by wind. This is rare and damage is usually restricted to scarring. Although this has been a minor pest in inland areas, it has been found to be a major pest overseas and may need to be controlled if mung beans are grown in the coastal areas of Queensland.

Bean blossom thrips (*Megalurothrips usitatis*) and jassids (*Austroasca viridigrisea*) attack seedlings. Both cause white stippling of the leaves. Thrips rasp the leaf surface and lap the exuding plant sap while jassids (or leafhoppers) pierce and suck sap. As seedlings grow, they become less susceptable to attack. Thrips also feed within flowers and can cause severe twisting of the pods and scarring of the pod surface. Such damage is of no economic concern.

The larvae of soybean moth (*Stomopteryx simplexella* plate 6), roll leaves to form a shelter from within which they feed on the leaf surfaces. Although this reduces the photosynthetic area of the plant, it is rare for populations to build up to levels that significantly affect plant growth.

Larvae of the soybean looper (*Diachrysia orichalcea*, plate 7) and cluster caterpillar (*Spodoptera litura*, plate 8) are occasionally found on foliage but it is unusual for populations to become large enough to cause economic damage.

A number of species of small bugs may be found in mung bean crops, the most common being Rutherglen bug (*Nysius vinitor*), green mirid (*Creontiades sp.*, plate 8 and apple dimpling bug (*Campylomma livida*,). The Rutherglen bug is a plant feeder but the others may be both plant feeders and predators of other pests. A research program is presently being conducted at Biloela Research Station to investigate the relationship between these bugs. The damsel bug (*Tropiconabis nigrolineatus*) and the bigeyed bug (*Geocoris lubra*) are both predatory on small insects and should be regarded as beneficial.

Ladybirds (*Micraspis frenata*), commonly called the stiped ladybird, can occur in large numbers are are usually seen feeding at the nectaries. They are predators of other insects such as aphids and do not cause damage to crops.

Control

Heliothis is a major pest of several field crops in Queensland and an insecticide strategy, designed to slow the development of insecticide resistance in heliothis populations, needs to be observed when control is being considered.

Table 1. Chemicals recommended.

Pest	Chemical control
heliothis	endosulfan, methomyl, thiodicarb, deltamethrin and synthetic pyrethroids, in accordance with the pyrethroid strategy. (Growers are referred to QDPI farm note *Summer crop insecticide management strategy* EN 8904002)
bean podborer	methomyl
soybean looper	endosulfan, deltamethrin
pod sucking bug	endosulfan
brown bean bug	endosulfan
redbanded shield bug	endosulfan
green vegetable bug	endosulfan
thrips	dimethoate

Crop monitoring

Sampling methods and economic injury levels have not been determined for mung beans. The following procedures, used for navy beans and soybeans, can be used as a guide.

Mung bean crops should be inspected weekly while in vegetative growth and twice weekly from flowering to completion of pod fill, so that informed judgement of whether to spray or not can be reached.

Vegetative stage

Seedlings should be inspected for heliothis or thrips damage to terminals. If most plants show leaf distortion from thrips damage and early crop growth is slow due to cool conditions, a spray will boost early growth. If more than 25% of terminals show heliothis damage, an insecticide should be applied.

Flowering and pod-fill stages

During the flowering and pod-fill stages, 5 m lengths of row at six locations, widely spaced throughout the crop, should be examined. Insecticide application should be made if heliothis numbers average more than 2/m, or bean pod borer larvae average more than 3/m.

Sapsucking bugs can be sampled by shaking plants onto a white sheet, such as an opened up fertiliser bag. Examine 5 m lengths of row at six widely spaced locations throughout the crop, at least twice weekly from early flowering until the completion of pod-fill. Many species of bugs move to the top of the canopy and bask in the sunlight between 7 and 9 a.m. and are more easily seen and dislodged at that time. If bug numbers average 1/5 m of row, spraying is warranted.