



Etiella moth (lucerne seed web moth)

Etiella moth (*Etiella behrii* Zeller (*Lepidoptera:Pyralidae*)) is a seed eating moth native to Australia where it is widespread in all states except Tasmania. In SA it is a pest of seed lucerne crops, field peas, lupins and vetch. Severity of etiella attack varies between years and crops. On field peas and seed lucerne it occurs in damaging numbers every several years. It appears to be a pest of vetch and lupins in most years.

Description

Eggs are oval-shaped, 0.6 mm long, colourless when first laid but soon turning pale yellow or orange when ready to hatch, the black head of the unhatched larva can be seen through the egg.

The mature larvae has a pale golden-brown head with dark-brown mouthparts but in young larvae the head is black. Behind the head is a black shield, but the rest of the body is green with a pinkish tinge which becomes more pronounced with age. There are several golden-brown stripes along the body which are more prominent in younger larvae.

The adult is a greyish moth, 10 to 15 mm long. The head is snout-like. The leading edge of the forewing has a white stripe along its full length and at the base of the forewing there is a transverse orange band. At rest, the moths have an 'alert' appearance, with the front end of the body raised.

Larvae of the moth have been found on a wide range of native and introduced legume plants. Cultivated hosts include medics, clovers, lucerne, field peas (especially blue boilers), lupins, vetch, lentils and soybeans.

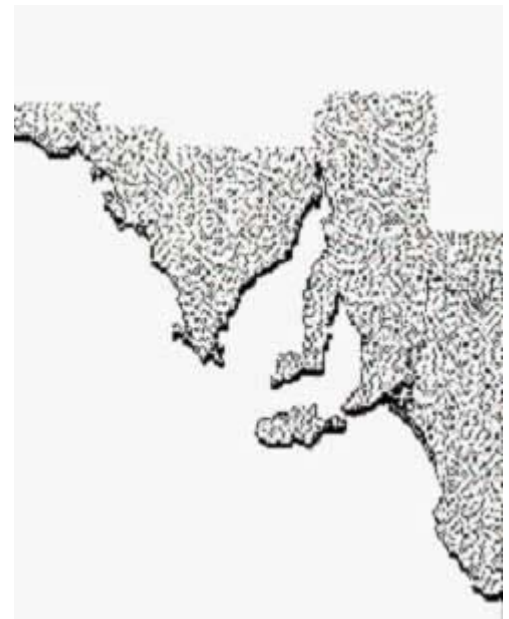


Fig 1: Occurrence of pest in areas where crops are grown in South Australia.

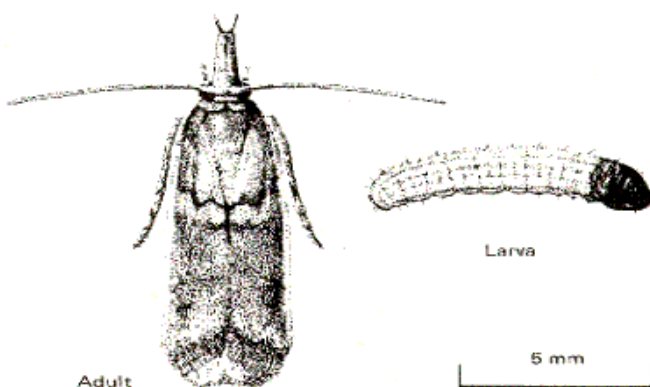


Fig 2: Adult and larva of Etiella moth.



Fig 3: Adult laying eggs on a raceme of lucerne pods.

Damage

In seed lucerne crops *etiella* larvae eat the seeds in the seed pods. A single larvae may enter a number of lucerne pods. During the early stages of an attack, there are few signs of damage. Often, the pods must be pulled apart before evidence of damage can be seen. Unless the lucerne crop is carefully monitored at regular intervals, considerable damage may occur.

There are no reliable estimates of damage caused to seed lucerne crops. In most seasons, *etiella* seems to cause little damage of seed lucerne. In the years when *etiella* numbers are high, significant yield losses have been reported.

Fig 4: Mature larva searching for a new feeding site on lucerne pods.



Etiella has been recorded as damaging up to 20 percent of pea seeds from field pea crops, but it is rarely recognised as a pest of peas because its damage is usually misidentified as being that of native budworm (*Helicoverpa punctiger*). Both insects chew pea seeds, leaving a jagged edge around their feeding site. Webbing in the pod is an indication of *etiella* feeding.

Etiella may damage lupin crops in some seasons. It is not known whether *etiella* affects yields of medic or clover seed crops.



Fig 5: Mature larva feeding inside a pea pod.



Fig 6: Damage caused by larva inside a lupin pod (Note the entrance hole on the right).

Life cycle

There are probably three to four generations each year in spring, summer and autumn. After December, the generations tend to overlap, and all stages may be present in a crop. Adults are first seen in late September with a second peak in late November - early December. A third peak often occurs in late December to early January. The main larval attack on lucerne seed crops occurs in mid January.

In autumn, mature larvae drop to the ground and spin cocoons in the soil and do not develop into pupae until spring.

Adults females may lay about 200 eggs which may hatch within 24 hours in hot weather, but may take up to two weeks to hatch in cool weather; four to seven days is the normal hatching time during summer.

On lucerne plants eggs are mostly laid on the fully formed pods while they are still green and succulent. Eggs are rarely laid on immature pods and have not been recorded from other parts of the plant. On the mature pods, eggs may be found between the pod and calyx, or between the coils of the pod.

The egg hatches into a small larvae which constructs a small funnel-like silk tube around itself, with one end attached to the surface of the pod. The larvae then chews into the pod and feeds on the seed, and usually does not leave until most seeds have been eaten. The silk tube and the entry hole quickly disappear.

After eating its first pod, the larvae enters further pods, often leaving some seed uneaten. The fourth and fifth larval stages are too large to enter pods. Instead, the larvae meshes several pods together in a silk tent, which protects it and allows it to eat into the surrounding pods. Etiella is often detected in lucerne crops at this stage, but which time some damage has already occurred.

During summer larvae take between two and four weeks to develop into pupae. The pupal stage lasts two to three weeks. Adults may live from one to three weeks so that the life cycle egg to egg, is complete in about five to six weeks.

Cultural control

The main strategy for etiella control in seed lucerne is to ensure that the final cut or grazing period occurs in mid December, rather than earlier in December. In this way the main period of seed set occurs after the moth flights in late December to early February.

Although etiella may live on native legumes, its numbers on these plants are very low. The source of most etiella in crops is probably nearby legume crops or volunteer plants, especially lucerne plants on roadsides or irrigation banks which are not cut or grazed.

Removal of volunteer plants near susceptible crops may help control etiella, although it is not know if this practise is effective.

Natural enemies

Six species of insects (five wasps and only fly) parasitise up to 10 per cent of large larvae when they emerge from the pods and build their webbed retreats.

Disease has been recorded as killing up to 40 per cent of larvae.

Chemical control

Moth flights may be detected around lights at night, and during the day in fields where the moths, when disturbed, move in short flights between plants and alight on the undersides of leaves.

Monitoring in seed lucerne crops should aim at detecting the presence of eggs or young larvae in the pods. This can be done by examination of mature seed pods especially when moths are abundant, and in any case, during mid January. Examine 50 to 100 racemes of pods, and if about 5 per cent of pods contain small larvae, a spray should be applied. Detection of webbing by mature larvae is too late to prevent damage.

Monitoring damage levels in early legume crops such as lupins and field peas may give some estimate of damage that could occur in lucerne later in the season.

The aim of spraying is to kill adults before they lay eggs. Chemical control of the damaging stages of *etiella* is difficult because they are protected by the pod or webbing. Insecticides with fumigant action may kill some larvae but control may not always be satisfactory. It is likely that sprays applied against other pests of seed lucerne crops may coincidentally control adult *etiella* moths in the crop.

For current chemical control recommendations refer to:

AgriVet Information CD available from:

Farm Chemicals Program
Primary Industries & Resources SA
GPO Box 1671
ADELADIE SA 5001
Ph: 08 8226 0405

Further reading:

Austin, A D, T C R White, D A Lawlzer and D G Taylor (1993) Biology of *Etiella behirii* Zeller (Lepidoptera: Pyralidae): a pest of seed lucerne in South Australia. Transactions of the Royal Society of South Australia 117: 67-76.

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