



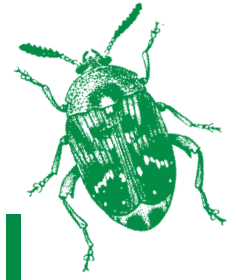
NSW DEPARTMENT OF
PRIMARY INDUSTRIES

4








3RD EDITION

Pulse Point

Managing Pea Weevil



Critical control points for management

-  Only sow seed free of live pea weevil
-  Monitor crops when flowering starts
-  Spray a border extending 40 m into the crop **before** pods are visible
-  Harvest on time and deliver grain early
-  Fumigate carry-over grain straight after harvest in a sealed storage
-  Graze paddocks to reduce shattered and spilt seed
-  Coordinate control efforts with neighbouring pea growers

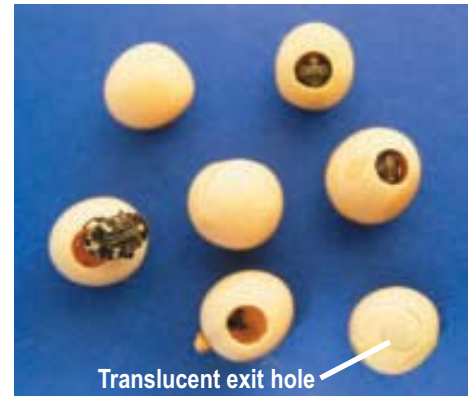


An adult beetle of pea weevil.

Description

Adult pea weevil are chunky, 5 mm long, brownish beetles flecked with black, grey and white patches (see above). The tip of the abdomen extends beyond the hard wing covers. The portion of the abdomen that is visible is white and marked with two black oval spots. Contrary to the name they are not true weevils so lack the typical snout that a weevil has.

Eggs are cigar shaped, shiny bright yellow and approximately 1.5 mm



Field pea seed infested with adult pea weevil showing the beetles exiting the seed and the exit hole not yet opened.

long. They are attached singly to developing pea pods, often with several eggs on each pod. Infested areas tend to be clustered, with eggs on several pods of the same plant or nearby plants.

The larvae burrow straight through the pods to feed on the seed, so are not readily found for identification until seed is mature (above) and it is too late for control.

Biology

Adult beetles hibernate during summer, autumn and winter in sheltered positions such as in or around silos and grain bins, under bark of trees and in cracks and crevices of fence posts. The adults emerge from hibernation in spring when temperatures reach 18°C and fly in search of field pea flowers. They can fly up to 5 km attracted by the scent of pea flowers, however most pea weevil come from closer infestations from previous seasons. Irrespective of how far the beetles fly to reach the crop, their movement within a flowering crop is generally restricted to the crop's edge.

The female beetles are sexually immature when they leave hibernation and first arrive in the pea crop. They require a feed of pollen and further time for ovarian development to take place.

Approximately 2 weeks after arrival in the pea crop the females lay eggs on the developing pods. This delay in egg laying should be taken into account when deciding on the optimal date to spray pea weevil, especially in early crops when beetle flights may occur over an extended period.

Eggs hatch in about 14–28 days and bore directly from the egg, through the pod wall and into the developing seed. For this reason the adult pea weevil must be controlled prior to egg laying as insecticides are ineffective against the larvae. After about 40 days of feeding inside the pea seed the larvae prepares a 2–3 mm exit hole by chewing partly through the seed coat. The larvae then pupates and after about 14 days develops into an adult beetle. By this time the seed has generally been harvested and some beetles will emerge from the seeds to find suitable hibernation sites. The remaining beetles will stay within the seed until next spring or until they are disturbed by seed movement or vibration.

Impact

Pea weevil can directly reduce yield by consuming the seed or by increasing the number of seeds split during threshing. Yield can be reduced by up to 15% in heavy infestations.

At the time of harvest (13% seed moisture content) the pea weevil larvae are generally still immature and have only completed 20 to 30% of their feeding. This means 70 to 80% of the seed damage has yet to be done. Fumigation at this time, straight after harvest, prevents further seed weight (yield) loss.

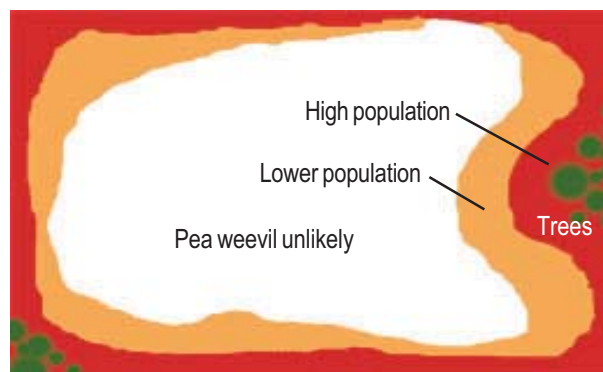
The human consumption pea market has a nil tolerance for live or dead pea weevil, while the

stockfeed market has nil tolerance for live pea weevil. The circular cavities in the damaged peas are visually unacceptable for human consumption and also effect sprouting percentages. Grain with damage will be downgraded to stock feed and can also can be non-viable or produce weak seedlings.

Monitoring

The only effective way to determine if pea weevil is present is to monitor crop edges every 3–4 days from the start of flowering using a sweep-net. If temperatures have consistently been below 18°C pea weevil will not be present.

Take 25 sweeps along a 1–5 m band around the edges of the crop, concentrating adjacent to trees or other structures. Repeat this at six or more sites on different sides of the paddock. If pea weevil are found, also monitor around trees within the crop.



Pea weevil numbers will be highest around the edges of the paddock and around trees, and negligible in the centre.


Management program

A whole farm management program is the best approach. Use the *Life cycle and critical control points* diagram and the section below as a guide to best practice.

Farm hygiene

- **Sowing seed** should be free of live adult beetles. If using farmer kept seed fumigate straight after harvest. When purchasing seed, ensure it has been fumigated.
- **Harvest on time** to minimise yield loss, and ensure adults have not emerged and moved to hibernation sites.
- **Clean up spilled seed** in paddocks and around storage sites.

 Monitor crops when flowering starts

 Sow seed free of live pea weevil - use fumigated seed



Adults emerge in spring when temperatures reach 18°C. They fly up to 5 km in search of pea pollen to feed on - essential for their reproduction.



 Target spray for adult beetles here

After 7-15 days they lay eggs on developing pods. Once this has occurred it is too late to control pea weevil in the crop.



Pea Weevil *Bruchus pisorum* Life cycle and critical control points for management

Adults seek shelter over autumn and winter around trees, fences and buildings.



Adults emerge from within the seed



Larvae hatch and burrow through the pod and into the developing seed.



 Graze paddocks to reduce spilt seed



 Harvest early




Larvae feed on the cotyledons and remain protected in the seed until maturity.



 Fumigate all stored seed



 Send seed off farm straight from header. Fumigate if live pea weevil present.



- Be aware that **baled field pea stubble** provides an ideal site for pea weevil to hibernate. Pea weevil can remain in the seed within the bales, being a source of adult beetles for the following season.
- **Control volunteer** field peas to minimise the pea weevil's ability to survive, build up numbers and re-infest future crops.

In crop control

Crops can be monitored around the edges for pea weevil for the first 10 days of flowering using a sweep net. However, in most traditional pea growing areas, it can be safely assumed pea weevil is present and border spraying should be an integral part of crop management.

A border spray to 40 m is effective and cheap in most situations. Insecticides are only effective on adult pea weevil so spraying should occur only after adults first appear but before egg laying commences.

Target insecticide application on or before withering of the early flush of flowers, but before small pods are visible.

If heavy infestations are detected, or if seed infested with live weevils has been sown, it will be necessary to spray the whole paddock. Refer to Insect and Mite Control in Field Crops for registered pesticides for pea weevil control in NSW.

Fumigation of harvested seed

Once grain is harvested, fumigate in a sealed storage as soon as possible to minimise yield loss.

Beware: Pea weevil host itch mites

Pea weevil can host parasitic itch mite which can cause allergic skin reactions in humans. This is best prevented by controlling pea weevil in the first instance, both in the growing crop and in stored grain. Be wary when moving grain infested with pea weevil, particularly when conditions are warm. Use personal insect repellent (especially under arms and where clothes are tight, such as around the waist) before handling infested grain, and shower afterwards.



Michel Dignand

Field pea seed damaged by pea weevil (left) is often confused with the damage done by heliothis and lucerne seed web moth (right). Growers should consult an agronomist if unsure of what has caused seed damage.

© State of New South Wales—
NSW Department of Primary
Industries 2005
ISSN 1441-2233

DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of writing in January 2005. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Written by Eric Armstrong
NSW Department of Primary
Industries, Wagga Wagga, and
Peter Matthews, NSW
Department of Primary
Industries, Temora.

Pulse Points produced as part
of the GRDC project
DAN463, 'Evaluation and
management of pulses in
southern NSW'.

Further Information

Eric Armstrong, NSW Department of Primary
Industries, Wagga Wagga.
Phone 02 69381814

Peter Matthews, NSW Department of Primary
Industries, Temora.
Phone 02 69773333

Acknowledgment

Greg Baker, Senior Entomologist, SARDI,
Adelaide, SA.

