

# Pest Fact Sheet:

## Codling Moth

(*Cydia pomonella*)

### Identification

Adult codling moths can be up to 1cm long with a wingspan of up to nearly 2 cm; the females are usually bigger than males. They have a grey-brown body with patterns of white lines on the wing. A bronzed area at the tip of the wing is characteristic of this species. Due to their colouration they are often hard to spot.

Codling moth eggs are oval-shaped, flat and about 1mm long. When first laid they are white, but develop a reddish ring with time. The larvae start out as a 2mm white grub with a black head, and then progress through different larval stages to become cream/pink with a brown head. Larvae can reach up to 15mm long when mature. Larvae remain dormant or pupate in a cocoon before emerging as adult moths.

### Damage

Damage caused by codling moth can be of two types. The first larvae to reach fruit often feed on the surface of the fruit before finding a site into which to tunnel. This initial feeding results in shallow excavated areas known as stings. Stings can also occur where young larvae penetrate a short distance and then are killed by insecticides or other means. Deep tunnels within the fruit are caused by the larvae tunnelling toward the core of the apple, where they feed on the seeds. Often the fruit flesh around these tunnels is broken down by bacteria and the tunnels are plugged by the insects using excreta (frass), which can be seen exuding from the entry hole. As the larvae leave the fruit they again tunnel through the flesh to reach the exterior. This internal injury can lead to premature ripening and fruit drop.



Adult codling moth (top), larvae and egg (above).



### \* Similar Damage

Damage resembling codling moth stings can be caused by heliothis (budworms) or loopers. Tunnels in fruit can also be caused by oriental fruit moth. It is important to make sure that the insect causing the damage is codling moth, as control measures may not be effective against other insects.

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### Life cycle

During winter, codling moth larvae enter diapause (a physiological state of dormancy) within thick silken cocoons. These cocoons are hidden under loose bark or in soil or debris around the base of the tree. Within the cocoons the larvae pupate to become adult moths and emerge, usually around the time of bloom. These moths are active for only a few hours before and after sunset. A female moth will lay up to to 70 tiny disc shaped eggs. Eggs are laid singly on leaves, fruit or spurs over a period of around a week. The time that these eggs take to develop and hatch into larvae is influenced by temperature. Upon hatching, young larvae immediately seek out a fruitlet. They may feed briefly on the surface of the fruitlet before tunnelling into the fruit to feed on its flesh and seeds . Within the fruit the larvae progress through further developmental stages ('instars'). The fifth-instar larva emerges from the apple and falls to the orchard floor. It then finds a sheltered position – often by crawling part-way up a tree and sheltering under loose bark – and pupates to later emerge as an adult moth. This cycle is repeated a number of times during a single season. The number of cycles (or generations) per season is largely dependent on the temperature. Warmer regions are more likely to have greater numbers of generations.

### Monitoring and Control

Monitoring is required to meet export protocols. This is undertaken in Tasmania by Biosecurity Tasmania for export to Korea or Japan – talk to Biosecurity Tasmania if this is your situation. Otherwise, it is recommended to monitor for codling moth by having at least one pheromone trap per registered block (up to 10 ha.) Pheromone traps are recommended more to determine the first flight of moths to develop an action plan, than to use as a control measure only. Maintaining good orchard hygiene (keeping weeds down and removing loose bark and pruning waste) will reduce the number of overwintering sites.

Chemical control should be timed to match hatching of eggs as once larvae enter fruit control is difficult. Using traps to find first flight will then give you a good indication of when eggs will hatch.

This can be calculated by degree days; optimum temperatures for codling moth activity are between 10 and 31°C, 111 GDD required for egg hatch. Talk to your local agent for further information, but it is anticipated that control will not be needed. Refer to the export manual spray guide for available chemical options.

In cherries, monitoring for the presence of codling moth should be all that is required, given the support available for cherry not being a host plant. Continued monitoring may establish evidence for non-host status in Australia. Studies have even shown that codling moth (when given only cherry fruit into which to lay eggs) could not complete a full life cycle in cherry fruit (Hansen & Lewis 2003). Trap counts are reported to be low in cherry orchards, even when adjacent to pome fruit (Johnson & Hansen 2008).

### All information is sourced from:

- APAL Integrated Pest Management for Australian Apples & Pears 02/10 – 7252.
- CGA Cherry Export Manual and Biosecurity Management Programme 2014/15 – Version 2.