

Macadamia nut borer

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The macadamia nut borer (*Cryptophlebia ombrodelta*) lays its eggs on the husk and the larvae burrow through the nut shell to eat the kernel. Macadamia nut borer (MNB) will cause premature nut fall, particularly during the oil accumulation stage (around December to February in Northern NSW). MNB also attacks mangroves, so pressure can be greater on farms adjoining mangroves.

Risk period

Table 1. The peak risk period for macadamia nut borer is from pea size nut to harvest.

Pre-flowering	Early flowering	Peak flowering	Nut set	Pea size nut and spring flush	Shell hardening to harvest	Harvest to pre-flowering

Pest identification

The adult MNB is a moth. The female has a wingspan of up to 25 mm. They are reddish-brown with a distinctive black triangle marking on the hind margin of each forewing (Figure 1).

MNB eggs are scale-like and are laid singularly on the surfaces of green husks. Eggs can be found anywhere on the nut, but are often laid along the suture line. They are ivory white when first laid but turn red just before hatching (Figure 2). Eggs that have been parasitised by wasps will appear black after about five days (Figure 3).



Figure 1. Macadamia nut borer adult. Photo: Jeremy Bright.



Figure 2. Macadamia nut borer egg. Note, reddish colour indicating nearly ready to hatch. Photo: Chris Fuller.



Figure 3. Parasitised macadamia nut borer eggs appear black after about five days. Photo: Chris Fuller.

Larvae are legless grubs which appear pinkish (Figure 4) with dark green spots when mature. While the shell is soft the larvae will burrow into the kernel to feed. As the shell hardens, it becomes more difficult for the larvae to enter. This can be related to variety, as thinner shell and late season varieties will be more vulnerable than thicker shell varieties. The larvae will develop cocoons before pupating (Figure 5), which usually occurs within the nut. Pupae are light brown at first and darken with age. The whole life cycle takes around 5 weeks in summer.

Damage

Damage is easily identified as entry holes in the husk of nuts (Figure 6). These holes are usually close to the panicle and will have protruding frass (Figure 7). Infested nuts will drop prematurely. Greatest losses occur when the shell has not fully developed. Where thin-shelled varieties have been previously attacked and the shell compromised, MNB damage will be apparent.



Figure 4. Macadamia nut borer larvae.
Photo: Chris Fuller.



Figure 5. Macadamia nut borer larvae will develop cocoons before pupating. Photo: Craig Maddox.

Management

MNB is carried over from out of season or old nuts that have fallen and been left on the orchard floor. MNB can also be prevalent where trees have a high proportion of sticktight nuts. Regular monitoring is key to good control. Releasing beneficial insects is most useful after the last FSB spray has been applied, usually in January.

Cultural and physical

Where possible clean up old nuts to reduce the carry over populations between seasons. If you have sticktight varieties, identify ways to eliminate or reduce this. Monitoring is key and will involve setting up pheromone traps to estimate populations and movement.



Figure 6. A macadamia nut borer at an entry hole.
Photo: Chris Fuller.



Figure 7. A macadamia nut borer entry hole with protruding frass. Photo: Chris Fuller.

Employing a pest scout will ensure adequate control as they will be able to report on the problem using an area-wide approach.

Biological

Until recently, MNB was the number one enemy for the macadamia crop. It was not until the development and production of MacTriX (*Trichogrammatoidea cryptophlebiae*; Figure 8) that the pest became more manageable. MacTriX has been an excellent tool for controlling MNB with an area-wide approach. The effectiveness of MacTriX has meant that spraying after January specifically for MNB is no longer required. It should be noted the effectiveness of MacTriX may be compromised in temperatures over 35°C. Wasps work well as part of an area-wide approach.

Other biological control agents include parasitic wasps such as *Apanteles briareus*, *Nixon*, *Bracon* spp., *Gotra bimaculatus* and a parasitic fly.



Figure 8. A female *Trichogrammatoidea cryptophlebiae* investigating an egg.
Photo: R Llewellyn.

Chemical

The chemical control options for MNB are listed in the [Macadamia plant protection guide](#).

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