




IPDM Monitoring Calendar




This calendar has been designed to help you monitor orchards more effectively. The shaded areas show you when to monitor, the comments section provides more information.

Key	
	Monitoring to indicate overwintering population
	Standard monitoring
	More detailed damage assessments

Pest Location	Pest	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July
FLOWERS	ADB (apple dimpling bug) ¹												
	Thrips ²												
LEAVES or LIMBS	Aphid Predators ³												
	Heliothis/ looper larvae ⁴												
	LBAM (lightbrown apple moth) larvae ⁵												
	Woolly Aphid ⁶												
	<i>A.mali</i> (woolly aphid parasitoid) ⁷												
	ERM European red mite ⁸												
	TSM (two-spotted mite) ⁹												
	Predatory mites ¹⁰												
	Mealybug ¹¹												
	Stethorus ¹²												
FRUIT	Scab ¹³												
	CM (codling moth) fruit damage ¹⁴												
	Heliothis/looper damage ¹⁵												
	LBAM (lightbrown apple moth) fruit damage ¹⁶												
TRAPS	CM (codling moth) ¹⁷												
	LBAM (lightbrown apple moth) ¹⁸												

Comments

1. An early indication of the local ADB population may be seen on flowering wattles and other plants between green tip and flowering of fruit trees. The main danger period for ADB is from early pink to petal fall, but damage can occur up to two weeks after petal fall. The Tasmanian dimple bug is a different species, found on *Macrocarpa* hedges before apple bloom.
2. Thrips may be seen from early pink to full bloom in late September to mid-October, but plagues of thrips may be seen as early as spurburst in mid to late September.
3. You may see adults or other stages of green lacewings, brown lacewings, lady bird beetles or syrphid flies on leaves throughout the season.
4. Heliothis moths lay their eggs on or near the flowers. Larvae feed on the developing fruit and generally bore clean holes deep into the fruit. The larvae range in colour from green to reddish brown and have a white stripe lengthways on each side of the body. Loopers range in colour from greyish white to yellowish-pale brown and may be mottled with brown and dark grey. Larvae can be difficult to see because they look like twigs. A second 'generation' might be seen in December. Leaf damage may be seen from flowering onwards. Fruit damage may not be seen until November, but by this time the larvae might be too big to control. Looper larvae move by "looping" their bodies something like this: 

5. Leaf damage by LBAM may be seen from late October through to late autumn if pest is uncontrolled. Some fruit damage may be seen in November but damage is generally noticed in Summer.
6. Woolly aphid may be seen on the tree all year round but will be sparse in winter with little woolly covering. Damage to new growth on trees may be seen from November through to Autumn.
7. *A. mali* parasitises woolly aphids on above-ground parts of the tree. Black, parasitised woolly aphids or aphid mummies, with exit holes where the parasites have emerged, may be seen.
8. Overwintering, or dormant, ERM eggs on tree limbs and twigs (usually in the roughened places of the bark) hatch in early spring. Adults, nymphs or eggs may be seen throughout the season, mainly on the upper surface of the leaves.
9. Female TSM overwinter on the ground and on/under the bark on the lower parts of trees. Throughout the growing season the life cycle ranges from 4-6 weeks or more depending upon the temperature. But in hot weather the life cycle can be as short as two weeks and you can find adults, nymphs and eggs at the one time. TSM will initially be seen on the lower leaves towards the centre of the tree and as they spread you will find them on higher leaves towards the outside of the tree.
10. *P. persimilis* move to the ground and surrounding plants and do not hibernate over winter. They may be seen earlier in the season than *Typhlodromus* spp. and are more active. The adult female is an orange-red, pear-shaped mite and is about one-and-a-half-times bigger than twospotted mite. They have long legs and move quickly. Eggs are about twice the size of twospotted mite eggs and are laid singly on the underside of leaves among twospotted mite colonies. *P. persimilis* populations can increase quickly. Mated female *Typhlodromus* spp. overwinter in the same sheltered sites as TSM. Adults are creamy-white in colour and pear shaped. They are about the same size as an adult twospotted mite. Eggs are oval, cloudy white and slightly larger than twospotted mite eggs. Throughout the growing season adults, nymphs or eggs may be found on the underside of leaves, particularly along the midrib. *Typhlodromus* spp. populations will fluctuate depending upon the amount of TSM available. The scientific name for the Genus *Typhlodromus* has now been changed to *Galendromus*.
11. The first generation of long-tailed mealybugs emerge from over-wintering sites under the bark of trees. Adult females shelter their young under flakes of bark and in the cracks on larger limbs. First instars stay under their mothers for 7-14 days then move up the limbs of the trees to look for food; at this time they may be found all over the tree. But they are easier to find on the backs of leaves in the centre of the tree. The second and third instars remain on the leaves. After a while the third instars move down the tree to sheltered sites on the main limbs where the males spin cocoons and pupate and the females continue to develop. Cardboard bands can be used to trap/monitor movement of 1st instars.
12. Adults normally overwinter. You may see small black beetles, sluggish larvae (feeding on TSM or aphids), pupae or eggs on leaves throughout the season.
13. Symptoms may be seen 2-3 weeks after periods of rain. Scab appears on the upper surface of the leaves as light green areas which turn brown then black. On the lower surface of the leaves scab appears as a diffuse discolouration, tending to extend along the veins, which turns black with age. Scab appears on fruit as small dark spots which increase in size and become brown and corky in the middle. Usually scab will be seen during spring and autumn, but when conditions are favourable it may be seen throughout the growing season.
14. Holes or 'stings' may be seen in fruit in early November right through to March if CM is uncontrolled. Dark brown sawdust-like material, or frass, may be seen sticking out from these holes. Depending on the instar a pinkish-white brown-headed caterpillar, up to 20 mm long, may be found inside the tunnel running to the core or in the seeds if the fruit is cut open. Fruit damage should be assessed three times: January, February and March. You will still have to monitor outside these periods as indicated by the darker shading on the calendar.
15. Heliothis will bore clean, deep holes in the fruit whereas looper will eat small holes in apples and graze the exposed surfaces of pears. Fruit damage should be assessed three times: January, February and March. You will still have to monitor outside these periods as indicated by the darker shading on the calendar.
16. LBAM larvae will graze shallow, irregular-shaped areas on fruit. You may see skeletonised leaves with a ragged appearance stuck to the fruit with webbing, especially between two or more fruits that are touching. Fruit damage should be assessed three times: January, February and March. You will still have to monitor outside these periods as indicated by the darker shading on the calendar.
17. Standard pheromone traps will catch male moths. Adult moths have a wing span of about 12 to 18 mm and are about 10 mm long when they are resting with the wings folded. Males are smaller than females. Both males and females will be caught in traps baited with pheromone plus one or more host-plant volatiles such as pear ester (also called DA). The forewings are brownish grey with several cross lines. Each forewing has an iridescent coppery-brown spot near the tip. The hindwings are pale grey with fringed borders.
18. Traps will catch male moths. Adults are about 10 mm long and are generally a yellow-brown colour with a darker brown area from halfway along the wings to the tips of the wings. Females are larger than males and have a black spot on the hind margin of the forewing.

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