WANTED ALIVE: Beneficials

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Beneficial insects will play a key role in keeping pest populations in check this spring; but who are they?

A lacewing larvae feeding ferociously on an aphid (Source: cesar)
Many groups of beneficial insects can be prevalent during spring and play a key role in pest control when low to moderate numbers of crop pests such as aphids and caterpillars are present. Beneficial insects can be encouraged by reducing insecticide applications (particularly broad-spectrums), as well as providing alternate food sources and refuge habitats on farms. Some beneficial insects likely to be encountered this spring include:

**Ladybird beetles**

There are numerous types, but three species commonly found are the white collared ladybird, the common spotted ladybird and the transverse ladybird. Adults are round to oval shaped, with black spots on red, orange or yellow shells. Larvae have grey/black elongated bodies with orange markings and may be covered in spines or white fluffy wax material. Egg to adult stage takes 3-4 weeks, while adults can live for several months.

Ladybird adults and larvae are predatory, feeding on aphids, leafhoppers, thrips, mites, moth eggs and small caterpillars.

**Brown & green lacewing**

Adult brown lacewings are mottled brown in colour and 6-10 mm long, while adult green lacewings are 15-20mm long and pale to bright green in colour. Both have prominent eyes and long antennae. Their clear membranous wings are typically folded in an upside-down v-shape and are large with numerous veins giving a lacy appearance. Larvae lack wings, have protruding sickle-shaped mouthparts and a body that is long and varies from thin to stout in shape.

Lacewings attack aphids, thrips, mites, caterpillars and moth eggs. Brown lacewings adults and larvae are both predatory, while only green lacewing larvae are predatory.
Parasitic wasps

Adults vary in size (1-20 mm long) and colour ranging from bright orange to completely shiny black. They have two sets of wings that are clear or dark coloured. Female wasps often lay their eggs into host larvae or eggs. The developing wasp larva feeds inside the host, usually aphids or pest caterpillars. Aphid ‘mummies’ (bronze-coloured, bloated/enlarged aphids) indicate the activity of aphid parasitic wasps that are small, usually dark in colour and difficult to detect.
**Hoverfly**

Adult hoverflies are 4-7 mm long, have dark-coloured flattened bodies with black and yellow markings, and have only one set of wings (typical of flies). As the name suggests they ‘hover’ over objects and look similar to bees or wasps. Larvae are legless, green in colour, 8-10 mm long and appear grub-like. They are often mistaken for pest caterpillars such as diamondback moth but lack the typical head capsule of caterpillars.

Hoverfly larvae attack a range of soft-bodied insects, but prefer aphids. They are common in flowering crops such as canola, pasture paddocks and on some roadside flowering weeds.

Hover fly adult (left) and larvae (right) (Source: cesar)

**Damsel bugs**

Adults are 8-12 mm long and move quickly when disturbed. They have a slender light-brown body with long antennae and large protruding eyes. Juveniles are similar but smaller in size. They have a long curved ‘snout’ that is carried under the body when not feeding.

Damsel bugs feed on a range of soft-bodied prey items including small caterpillars, moth eggs, aphids, and mites.

Damsel bug (Source: cesar)
Predatory shield bug

There are several species that vary in size and shape. Adults are 10-15mm long and have shiny, shield-shaped bodies, often with patterns and spikes. Juveniles are dark red and brown with the early instars being bright red. There are multiple generations per year and adults usually live for several months.

Shield bug adults and larvae are predators of soft-body insects, particularly caterpillars, moth eggs and aphids.

Our advice

So how many beneficials is enough (to keep pest numbers below damage thresholds)? Sadly, there is no simple answer. There are currently no predator:prey ratios that would guide management decisions. However, there are some guiding principles to assist:

- Most beneficial species are highly mobile and will move from crop to crop if left unsprayed.
- There is often a ‘lag’ time between the growth of pest populations, and increases in abundance of beneficials. This is particularly so in southern cropping systems in spring.
- Monitor crops regularly enough so you can measure whether the relative rate of increase in beneficial insects (per sweep, per m, etc.) is faster (or slower) than that of pest populations. In the former case, the beneficials are winning!
- Beneficials are more likely to suppress caterpillar pests in the egg and younger stages than the larger instars. This said, the larger caterpillars are still prone to parasitic wasps, predatory bugs and ground beetles.
- Aphid parasitic wasps: it takes around 10 days from the time the wasp ‘stings’ an aphid until the aphid turns into a mummy. Recording the relative number of mummies and live aphids provides an indication of the impact wasps are having on the aphid infestation.
- Some ladybird beetles species consume >2000 aphids in their lifetime. Consider delaying a chemical application and monitor again in 7 days time. It is amazing how quickly pest populations can crash when beneficials are left alone.

For further information and images of beneficial invertebrates see the GRDC Beneficial Insects – The Back Pocket Guide, and cesar’s insect gallery.
Native budworms – we’re watching!

A network of traps across eastern Australia is poised to track the arrival of budworm moths; just as well since reports from the inland Australia suggest we could experience a large migration this year.

A collaborative trapping program for native budworm moths across eastern Australia is continuing in 2016 and is aimed at focusing monitoring efforts in pulse and canola crops this spring.

Trapping network

Native budworm (*Helicoverpa punctigera*) is a serious pest of pulses and sometimes canola. Budworm moths are capable of migrating hundreds if not thousands of kilometres in winter and spring. Typically, moths migrate into the cropping zone from the north or north-west, often originating from arid, inland regions that have previously benefited from episodic rainfall events in autumn and winter.

*cesar* is collaborating with colleagues from SARDI, QDAF, the University of New England and agronomists and growers in Victoria, New South Wales, Queensland and South Australia to provide this advanced warning system for native budworm infestations in the eastern cropping zone. In some areas, traps for the cotton bollworm (*H. armigera*) are also in place.

Native budworm moths invade the cropping zone from late winter each year (Source: *cesar*).

A sparsely distributed network of pheromone traps has now been established throughout the cropping regions of eastern Australia. The traps are baited with a synthetic sex pheromone that specifically attracts native budworm moths, and provides an indication of current female egg-laying activity. From this network, we can provide an overview of moth activity for the southern New South Wales and Victorian regions. Previous research has shown that moth catch peaks can be directly related to egg-laying peaks, although surges in egg-laying do occasionally occur in the absence of peak moth catches.

Worrying news from the inland

Drs. Peter Greg and Alice del Socorro, researchers from the University of New England, have been undertaking field surveys for native budworm in the north of SA and southwest Qld over late winter. Using sweep nets to sample from native ephemeral plants, they have found very large numbers of native budworm, and its less important cousin, the lesser armyworm (*H. punctifera*), throughout the entire inland region. Peter has not observed such large numbers in many years, and believes that breeding will continue given the enduring inland rain.
Assuming typical spring winds to relocate moths, this suggests that the southern cropping zone is likely to experience a big year for native budworm.

Moth catch data

*MothTrapVis* is a new interactive graphic tool that we have developed through the National Pest Information Service (NPIS) to present the relative size of moth catches at each trap location. The tool is available to explore the changing distribution of moth catches over time. Locations of trapping network for native budworm and cotton bollworm traps are marked with an x.

Native budworm catches since early August (see the legend for size of moth catch). The graph shows total catches across the network since early winter. Click on the map to go to a live link.

Native budworm catches for the week ending 2nd Sep 2016. Click on the map to go to a live link.
The first substantial moth catches of the season in Victoria were recorded in the Victorian Mallee and to a lesser extent the Wimmera, following strong winds on 18th August. Moderate catches have persisted in the Mallee, and are probably being driven by SA populations of moths. Egg-laying will be in full swing in Mallee crops. As yet, there are no records of moth catches in southern NSW.

For more information on native budworm including its biology and management visit our PestNote.

Acknowledgements

We thank the following for providing various forms of support to this forecast service:

Institutional Support

Drs. Peter Gregg and Alice del Socorro – School of Environmental & Rural Science, University of New England (Armidale)

Bill Kimber – SARDI (South Australia)

Trap operators

Brad Bennett – Consultant, AGRIvision (Victorian Mallee)

Jim Cronin – Agronomist, Landmark (NSW Central West Slopes and Plains)

Bill Gardner – Agronomist and Grower, (Victorian Wimmera)

Shayn Healey – Agronomist, Crop-Rite Pty Ltd (Victorian Mallee)

George Hepburn – Agronomist, Tylers Hardware & Rural Supplies (Victorian Wimmera)

Damian Jones – Agronomic Results, (Victorian Mallee)

Jake Leith – Agronomist, AGRIvision (Victorian Wimmera)

David White – Agronomist, Delta Agribusiness (NSW Riverina)

Diamondback moth caterpillars: early signs are ominous

*Early DBM moth catches are a reminder that it’s not too early to monitor. In SA, indicators suggest that this is a moderate to high risk season*

Diamondback moth larvae feeding on canola (Source: cesar).
Where have they been reported?

Traps baited with pheromones of diamondback moth (DBM - *Plutella xylostella*) in the Ouyen area of the Victorian Mallee have revealed an initial surge in moth catches. This provides an early reminder of the need to monitor brassica crops for this pest.

SARDI researcher, Kym Perry, has reported that there is an above average risk this year for DBM heading into early spring. This assessment is based on the relatively early arrival of DBM in SA canola crops this season. Kym has been undertaking research on DBM for the past three years.

**Kym believes that the outlook for DBM is similar to that of 2014. In that year, there were extensive spring outbreaks in areas of SA, northern Victoria and NSW.**

As in 2014, March rainfall in many regions this year created an abundance of brassica weeds in autumn prior to sowing and during early crop establishment. Follow up surveys in SA revealed a widespread DBM presence. Subsequent monitoring of sentinel canola fields in SA has shown that at a high proportion of crops have been colonised by DBM during May and June. Moderate moth activity, localised larval infestations and some damage have been observed in some areas of SA, in the Victorian Mallee and in North East Victoria.

**About diamondback moth**

Diamondback moth caterpillars are typically most abundant during spring and summer where they can cause extensive damage to canola foliage and seed.

As temperatures warm from late August, the pace of larval development and population growth will increase considerably. Consider this: at 12°C the lifecycle takes more than 100 days whereas at 28°C the DBM lifecycle takes only 14 days. Accordingly, population growth of DBM in winter will be slow due to the cool to moderate temperatures, but will escalate in September. In many cases, DBM build-up will be limited by beneficial species, many of the same species that control aphids, along with *Zoopthora* fungal infections, particularly where wet weather conditions persist.

For detailed information about this pest, and for comprehensive advice on preventative management strategies, go to our diamondback moth PestNote.

**Our advice**

We recommend starting to monitor for DBM larvae in canola crops particularly those sown in the vicinity of volunteer canola and weed brassicas. Infested crops should be regularly monitored. This will be especially important once conditions become warm and/or dry.

Spraying at this time of the year for DBM is unlikely to be warranted. If early DBM control is necessary, *Bacillus thuringiensis* may be an option for growers that are practicing a more biologically-based form of IPM. Alternatively, Affirm® and Success Neo® are registered for DBM control in canola, and are reasonably effective and less disruptive to beneficial insects. Keep in mind that moderate to high levels of resistance is widespread in Australian populations.

**Aphids may also be present in canola crops. Given the DBM risk, any aphid sprays should aim to conserve DBM beneficials early in spring.**

Be careful not to confuse DBM caterpillars with other insects. In particular, the green larvae of the hoverfly can appear similar. Hover fly larvae are an important predator of aphids, and can best be distinguished by the absence of an obvious head capsule. In contrast DBM larvae have a small brown head capsule and wriggle frenetically when disturbed.
Sources of field reports of diamondback moth
Brad Bennett – Consultant, AGRIvision Consultants (Victorian Mallee)
Siobhan de Little – Researcher, cesar
Kym Perry – Researcher, SARDI (South Australia)

Lucerne flea revels in the rain

*It’s been a big year for lucerne flea, but spot spraying is often all that’s necessary*

Where have they been reported?

Reports of major feeding damage from lucerne flea (*Sminthurus viridis*) in new and established lucerne pastures have come in from the Wellington region of the NSW Central West Slopes and Plains. Similarly widespread crop damage has been reported in lucerne northeast of Albury in the NSW Riverina, and in grass/clover pastures southeast of Kerang in Victoria’s Northern Country. Wet conditions have not only provided an optimal environment for populations to thrive, in some cases they have hindered access to paddocks to control them.

About lucerne flea

Lucerne fleas move up plants from ground level, eating tissue from the underside of foliage. They feed through a rasping process, leaving behind a thin clear layer of leaf membrane that appears as transparent ‘windows’ through the leaf.

![Adult lucerne flea (left) and the typical ‘window’ feeding damage (right) (Source: cesar).](image)

Depending on temperatures and moisture availability, lucerne flea can have up to 6 generations per year between autumn and spring. The length of each generation varies from 3-5 weeks. The first generation often hatches from over-summering eggs in March-April after adequate autumn rainfall. In late spring lucerne fleas will typically die off from the onset of warmer weather leaving over-summering eggs on soil surface. The rate of growth of lucerne flea populations is very moisture dependent; they do well in moist conditions or under dense canopies of pasture.

Want to know more about lucerne flea? Visit our PestNote for further information.
Our advice

The complex of beneficial species should be assessed before deciding on control options. The pasture snout mite and spiny snout mite are effective predators, particularly in pastures where they can prevent pest outbreaks. Spiders and ground beetles also prey on lucerne flea.

Characteristically, lucerne fleas are often patchily distributed within crops, so spot spraying may be sufficient. Do not blanket spray unless the infestation warrants it.

Lucerne fleas have a high natural tolerance to synthetic pyrethroids and should not be treated with insecticides from this chemical class.

Sources of field reports of lucerne flea

Rebecca Bingley – Agronomist, Landmark (NSW Riverina)

Jack Edwards – Agronomist, D&J Rural Services (NSW Central West Slopes & Plains)

James Maino – Researcher, cesar

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**What is PestFacts?**

PestFacts is a free e-mail service designed to keep growers and farm advisers informed about invertebrate issues – and solutions – as they emerge during the winter growing season. The service has a focus on pests of broad-acre grain crops.

**We need your reports**

PestFacts is produced on an ‘as-needs’ basis and relies upon pest observations and field reports from our subscribers. If you have recently observed invertebrate pests (or beneficial species) in crops and pastures, please [report it here](mailto:pestfacts@cesaraustralia.com).

**PestFacts map**

PestFacts map is an interactive tool that allows users to search and view historical pest reports across Victoria and NSW. The map is updated with each issue of PestFacts to include new reports.

**How to acknowledge PestFacts?**

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**Contact us**

Contact us on +61 3 9349 4723 or email pestfacts@cesaraustralia.com

PestFacts is supported by