

Anastatus wasps

Egg parasitoids of fruitspotting bugs and other bug pests

Reduce bug pressure in your crop

Reduce the need to spray

Get nature working for you

About Anastatus

Anastatus are native egg parasitoids of a number of major horticultural pests including **fruitspotting bug (FSB and BSB)**, **spined citrus bug** and **bronze orange bug**. Anastatus females use the bug egg to rear their own young. It takes about three weeks to develop to an adult wasp inside a bug egg. A wasp then emerges from the egg instead of a bug!

The female Anastatus wasp is **about 4 mm long** and could be mistaken for an ant. Females hold their wings close to their body and constantly walk across leaves but unlike ants they hop and fly. It flies more readily at temperatures over 23 degrees. Females may live for over a month but do most of their parasitising in the first two weeks and they may travel hundred of meters in that time. The males are much smaller and more wasp like. Males and females feed on nectars, plant sugars and insect honey dews.

The release strategy

Spotting bugs breed on many trees and shrubs found adjacent to farms. Anastatus releases increase local wasp numbers and subsequently reduce locally breeding bug populations that migrate into your crops.

- In Northern Australia bugs are active all year round so releases are best done throughout the year.
- South of Bundaberg we start release early spring to reduce summer bug activity through to late autumn early-winter to reduce numbers of overwintering bugs.

Regular releases of Anastatus make a very useful contribution to **reducing bug numbers and damage**. For spotting bugs, we suggest releases every 2 to 3 weeks. It's not necessarily a stand alone control for spotting bugs but many farms have had big reductions in bug damage and many more have a moderate reduction enabling them to reduce spraying. We are now releasing Anastatus on over 160 farms.

After release

The release rate and frequency of releases is the key factor. As the wasps only attack the bug eggs, it can take 6-8 weeks before a notable drop in bugs in the crop and it may take a couple of seasons to get the full benefit as overwintering bugs in your area are gradually reduced. On some farms it will work better and faster than others depending on the size of the crop and bug breeding areas nearby.

We therefore suggest that you continue your normal practices for controlling bugs and do not reduce your spraying until bug numbers in your crop are low enough to do so. To get the most from Anastatus and to enable **reductions in spraying** we recommend checking the crop for active bugs or fresh bug damage **before** spraying.

The first step with the strategy is to reduce the migration of bugs into the crop then to reduce spraying and in turn you will get more help from other local natural enemies like spiders and **get nature working for you**.

The release cards

Anastatus release cards contain unviable silkworm eggs that have been parasitised. The wasps may start to emerge in transit or soon after you receive the parcel and will continue to emerge for another week or so. Typically expect around 50% of the eggs on the cards to yield wasps, that is, escape holes evident after two weeks.

You will get from 3 to 6 cards per 1,000 wasps ordered depending on the parasitism and emergence rates.



Female Anastatus inspecting an FSB egg.



Female Anastatus on the right is larger than the male.



Parasitised FSB eggs (2mm) are hard to see in the crop.



By reducing spraying you will benefit more from other natural enemies like spiders. Here immobilising a BSB nymph.

Upon arrival, open the plastic bag and puff in some fresh air and reseal. Keep the bag in a warm place but out of direct sunlight. Its desirable to wait until some (say 50) of the wasps have emerged in the bag before placing the cards in the field. If you keep emerged wasps in the bag for more than a day or so they will need some food. You can streak a little honey on the inside of the bag.

Placing *Anastatus* cards in the field

The perforated cards are about 100mm x 380 mm long and can be torn in half or into groups of 3 or 6 strips.

- Hook on a twig or staple under a leaf or around a small branch with the eggs on the inside. This gives some protection from direct sun and rain.
- In very wet areas, hang them from a wire in an upside down container as wasps will continue to emerge for a couple of weeks.
- In hot weather, do not place the cards so that eggs will be in the direct sun.
- In cool weather, < 20°C max, place cards where they get warmth during the day so some direct sun is okay.
- Place cards as close as practical to areas where bugs are likely to be breeding - along boundaries & around the farm. See the list of bug hosts and if you can identify any nearby and when they have fruit present.
- If you are not anticipating spraying in the near future, then place some cards in the crop if bugs are present in the crop as well as in adjacent properties with permission.



Anastatus release cards are hung in the trees. Note the wasp escape holes in the eggs.



Spotting bug hosts This table summarises common major FSB and BSB hosts, exotic (X) and native (n) species. FSB is found in northern NSW while both FSB and BSB are found in Qld. FSB feeds on fruits and BSB feeds on fruits and shoots or new growth of many plants. F&B stands for - feeds & breeds. Not listed here is a wider range of plants that FSB and BSB feed on but may not breed on. This list is sorted by common name.

This table has been based on the one published by Waite et al* in 2000. HAL Final Report HG97010 Ecology and Behaviour of fruitspotting bugs

Family	Scientific name	Common name	Origin	FSB	BSB
LAURACEAE	<i>Persea americana</i>	avocado	x	F&B	F&B
MUSACEAE	<i>Musa paradisiaca</i>	banana	x		F&B
CAESALPINDACEAE	<i>Bauhinia sp.</i>	bauhinia	x	F&B	F&B
OXALIDACEAE	<i>Averrhoa carambola</i>	carambola	x	F&B	F&B
ANACARDIACEAE	<i>Anacardium occidentale</i>	cashew nut	x		F&B
EUPHORBIACEAE	<i>Ricinis communis</i>	castor bean	x		F&B
EUPHORBIACEAE	<i>Glochindion ferdinandi</i>	cheese tree	n		F&B
CUCURBITACEAE	<i>Sechium edule</i>	choko	x		F&B
MORACEAE	<i>Ficus carica</i>	common fig	x	F&B	
FABACEAE	<i>Erythrina crista-galli</i>	coral tree	x		F&B
PASSIFLORACEAE	<i>Passiflora suberosa</i>	corky passion flower	x	F&B	F&B
MALVACEAE	<i>Hibiscus tiliaceus</i>	cotton tree	n		F&B
ANNONACEAE	<i>Annona reticulata</i>	custard apple	x	F&B	F&B
VITIACEAE	<i>Vitis vinifera</i>	grape	x	F&B	F&B
MYRTACEA	<i>Psidium guajava</i>	guava	x	F&B	F&B
ROSACEAE	<i>Raphiolepis indica</i>	Indian hawthorn	x	F&B	
MYRTACEA	<i>Myrciaria cauliflora</i>	jaboticaba	x	F&B	
MYRTACEA	<i>Syzigium sp.</i>	lillypilly	n	F&B	F&B
SAPINDACEAE	<i>Dimocarpus longan</i>	longan	x	F&B	F&B
ROSACEAE	<i>Eriobotrya japonica</i>	loquat	x	F&B	F&B
SAPINDACEAE	<i>Litchi chinensis</i>	lychee	x	F&B	F&B
PROTEACEAE	<i>Macadamia integrifolia</i>	macadamia nut	n	F&B	F&B
PROTEACEAE	<i>Macadamia tetraphylla</i>	macadamia nut	n	F&B	F&B
ANACARDIACEAE	<i>Magifera indica</i>	mango	x	F&B	F&B
RUTACEAE	<i>Citrus mayeri</i>	Meyer lemon	x		F&B
RUTACEAE	<i>Murraya paniculata</i>	mock orange	x	F&B	F&B
MORACEAE	<i>Morus nigra</i>	mulberry	x	F&B	F&B
CARICACEAE	<i>Carica papaya</i>	papaw	x	F&B	F&B
PASSIFLORACEAE	<i>Passiflora edulis</i>	passion fruit	x	F&B	F&B
PUNICACEAE	<i>Punica granatum</i>	pomegranate	x		F&B
ANACARDIACEAE	<i>Euroschinus falcatus</i>	ribbonwood	n	F&B	F&B
MORACEAE	<i>Ficus racemosa</i>	rough-leafed fig	n	F&B	F&B
ELAEOCARPEACEAE	<i>Elaeocarpus grandis</i>	silver quandong	n	F&B	
FABACEAE	<i>Phaseolus atropurpureus</i>	Siratro	x	F&B	F&B
RHAMNACEAE	<i>Alphitonia petrei</i>	soap bush	n	F&B	F&B
SAPINDACEAE	<i>Cupaniopsis anacardioides</i>	tuckeroo	n	F&B	F&B
MELIACEAE	<i>Melia azedarach</i>	white cedar	x	F&B	F&B
RUTACEAE	<i>Casimiroa edullis</i>	white sapote	x	F&B	F&B

Contact us to discuss your specific crop situation

BioResources Pty Ltd - www.bioreources.com.au - youtube.com/@bioreourcesau

ph: 0492 247 176 email: office@bioreources.com.au