realIPM

insect range

Control mealybug

Introducing **Real PermiFIX**



Coccidoxenoides perminutus (**Real PermiFIX**) is an extremely effective parasite of citrus and vine mealybugs and provides control of both low- and high-density infestations. It is important to determine the type of mealybug present before considering the use of **Real PermiFIX,** as it is very host specific.

Background

Mealybugs are sap sucking insects that feed on a wide range of plants. They can quickly increase in number, weakening the plant. They also produce large amounts of a sticky secretion called 'honeydew', which often promotes the growth of unsightly fungi, resulting in a black coating known as 'sooty mould'.

Mealybugs are also notoriously difficult to control chemically. The reasons for this include:

- The mealy secretion and waxy covering they produce protects them from being wetted by chemical sprays.
- Their habit of hiding in tight, confined spaces such as under the calyx or in the navel end of an orange makes it extremely difficult to get the required contact.
- Most pesticides that have any effect against mealybugs are extremely toxic and almost always cause greater harm to beneficial species leading to a resurgence of the pest in a very short time.
- Mealybugs are quick to develop resistance to synthetic pesticides.

Real PermiFIX serves as a supplement to naturally occurring enemies of mealybug, such as Lacewing, *Cryptolaemus*, *Anagyrus*, etc.



Image of mealybug

Real PermiFIX

Real PermiFIX are black in colour with noticeable translucent wings, long antennae and are approximately 2 mm in length. **Real PermiFIX** pose no threat to non-target insects. These little wasps contribute to resistance management as mealybugs are not able to develop resistance against parasite attack.

Real PermiFIX parasitise Citrus mealybug (*Planococcus citri*) and Vine mealybug (*Planococcus ficus*).

PACKAGING AND RELEASE

Available format – number of pupae per package:

1 000 | 1 500 | 3 000

To release:

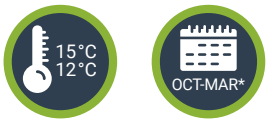
- Remove the sticker covering the exit hole.
- Hang the **Real PermiFIX** cardboard disposable carton on a branch.
- Make sure that the pupae are protected from the rain, dew and direct sunlight.
- If possible, position the container next to mealybug hot spots, after you are sure that ants are not present.
- **Real PermiFIX** adults will emerge and fly out to parasitise mealybug.

Real PermiFIX are best to introduce in spring/early summer, when the first mealybug eggs and crawlers are seen in the field. Preventative measures are far more effective than curative control of mealybug. The predatory wasp is most effective at temperatures between 17-32 °C. Pupae will begin to hatch on the hatching date (approximate) indicated on the packaging.

DOSAGE

Please consult your **realIPM** technical representative to discuss the effects of chemical active ingredients on your beneficial insects and how to develop an effective Integrated Pest Management (IPM) programme.

Pests	Infestation	Dosage (per season)
Vine mealybug (*Planococcus ficus*) Citrus mealybug (*Planococcus citri*)	Preventative	2 x 6 000 individuals/ha
	Light curative	2 x 8 000 individuals/ha
	Medium curative	3 x 15 000 individuals/ha
	Heavy curative	3 x 20 000 individuals/ha



** Plan according to historical infestations*

Augmentative releases

Real PermiFIX are best released in spring and early summer, before mealybug populations build up to high levels.

- Winter releases are not recommended due to low temperature and the consequent reduction in mealybug populations.
- Do not release **Real PermiFIX** too soon after applying toxic chemicals and avoid harsh chemical applications after insects are introduced.

***Real PermiFIX** can be combined with a number of other mealybug predators to clear mealybug hot spots. See life cycle below.*

STORAGE

- Store between temperatures of 12-15 °C • Store lying down • Store in a cool dry place, out of direct sunlight

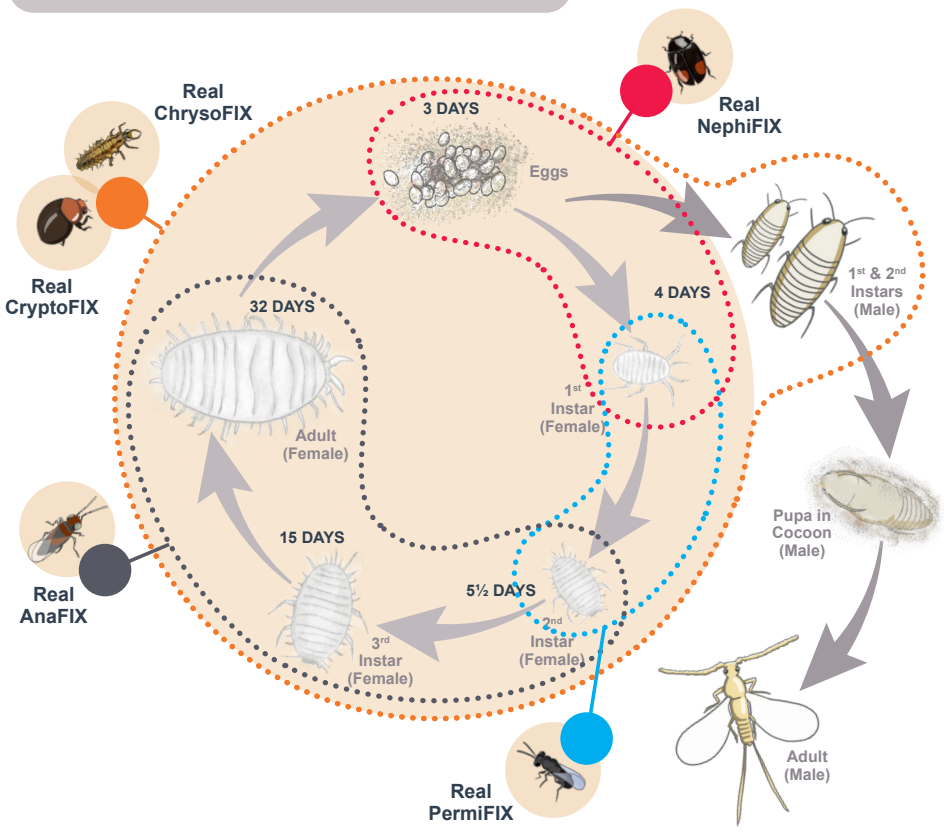
LIFE CYCLE AND OPTIMAL BENEFICIAL INSECT USE

Utilising beneficial insects to manage mealybug may require more than just one insect species. The mealybug life cycle is rapid in ideal climatic conditions and matching the right beneficial insect to life cycle stage is critical in ensuring efficacy in dealing with this pest.

There are five commercially available beneficial insects that can be used to target the various stages:

- **Real AnaFIX** are mobile and most effective against later mealybug stages, especially 3rd instar nymphs as well as 2nd instar nymphs and adult females.
- **Real CryptoFIX** are ideal to control medium-high and hot spot pest populations and feed on all mealybug developmental stages depending on beetle life stage.
- **Real PermiFIX** or **Real NephiFIX** are ideal for the early instars.
- **Real ChrysoFIX** larvae will feed on all mealybug life stages as well as other arthropod prey.

GENERAL LIFE CYCLE OF MEALYBUG



Life cycle adapted from:
https://www.researchgate.net/figure/Illustration-of-female-and-male-mealybug-lifecycles-adapted-and-altered-from-37-38_fig1_372404721

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