



Integrated pest management

Beneficial species and Serenade® Opti

Serenade Opti Biofungicide was introduced into Australian horticulture in 2018. The product is derived from Bayer's unique *Bacillus amyloliquefaciens* strain QST713 and is registered for control of botrytis in grapes and strawberries, plus suppression of bacterial spot in tomatoes, capsicums and chillies as well as anthracnose and stem end rot in mangoes, avocados and other tropical fruit crops.

Beneficial insects and other beneficial species such as mites play an important part in the management of many pest species in horticultural production. It is important to understand the potential impact of foliar applied sprays on the activity of beneficial insects and mites.



Serenade Opti assessments

With the launch of Serenade Opti, Bayer commissioned independent Australian assessments focusing on the safety of Serenade Opti against key beneficial species. Studies were undertaken by CESAR Pty Ltd, an independent laboratory with insects and mites supplied by Biological Services or Bug for Bugs. These studies compared Serenade Opti with an untreated control and commercially available conventional fungicides.

The studies investigated exposure to surface residues, simulating the arthropod walking across a treated leaf in the field and as an overall spray application with the insect directly sprayed with the fungicide. Mortality was assessed after 24, 48 and 96 hours exposure. The studies showed that Serenade Opti has minimal effect on most arthropods through either exposure methods. The table below shows the impact of Serenade Opti when classed by IOBC ratings*. In some cases, Serenade Opti recorded no impact on the beneficial insect or mite with survival at each time point equivalent to the untreated insect e.g. *Orius tantillus*.

Overall Serenade Opti has been shown to have a low impact on beneficial arthropods, when used as directed. This makes Serenade Opti ideal for inclusion in all farming systems.

BENEFICIAL SPECIES		BENEFICIAL FUNCTION	DATA SOURCE	
	<i>Chilocorus circumdatus</i>	Predatory ladybird beetle	Adults and larvae are predators on aphids, whiteflies, thrips, scale insects, some eggs and small larvae.	Laboratory trials
	<i>Cryptolaemus montrouzieri</i>	Predatory ladybird beetle	Adults and larvae are predators on aphids, whiteflies, thrips, scale insects, some eggs and small larvae.	Laboratory trials
	<i>Mallada signata</i>	Green lacewing	Predator of moth eggs, moth larvae, aphids, whitefly, thrips, mealybugs, mites.	Laboratory trials
	<i>Orius tantillus</i>	Predatory bug	Predator of various thrips, aphids, spider mites and caterpillar eggs.	Laboratory trials
	<i>Trichogramma pretiosum</i>	Parasitic wasp	Parasitoid of heliothis and other caterpillars.	Laboratory trials – slightly harmful from overall spray exposure
	<i>Typhlodromus occidentalis</i>	Predatory mite	Predator of spider mites, two-spotted mite, European red mite and apple rust mite.	Laboratory trials

International Organisation of Biological Control (IOBC) Scale

Classification: **1** = Harmless, **2** = Slightly harmful, **3** = Moderately harmful, **4** = Harmful



The toxicity ratings for individual chemicals are derived from laboratory and semi-field-based tests in accordance with the guidelines of the International Organization for Biological and Integrated Control (IOBC) Working Group on Pesticides and Beneficial Organisms. Toxicity ratings indicate the reduction in the ability of the beneficial species tested to provide pest control, and range from 1 to 4:

1. The chemical is 'harmless' and kills fewer than 25% of the beneficial species of interest.
2. The chemical is 'slightly harmful' and kills between 25% and 50% of the beneficial species of interest.
3. The chemical is 'moderately harmful' and kills between 50% and 75% of the beneficial species of interest.
4. The chemical is 'harmful' and kills more than 75% of the beneficial species of interest.

*Please refer to the Serenade Opti product label for the Restraints associated with the use of Serenade Opti. Serenade® is a Registered Trademark of the Bayer Group. Bayer CropScience Pty Ltd, ABN 87 000 226 022, Level 1, 8 Redfern Road, Hawthorn East, Victoria 3123. Technical Enquiries 1800 804 479. crop.bayer.com.au

While these studies indicate that Serenade Opti is not harmful to beneficial arthropods, caution should be taken when interpreting these results as laboratory studies may not translate to acute toxicity effects under field conditions. Furthermore, these bioassays do not consider potential sublethal impacts of fungicides, such as physiological and behavioural effects which can disrupt beneficial populations (Desneux et al. 2007). **References:** www.iobc-global.org www.cesaraustralia.com Desneux N, Decourtye A and Delpuech JM. 2007. The sublethal effects of pesticides on beneficial arthropods. Annual Review of Entomology 52: 81-106.

Always consult the product label for detailed information. The information and recommendations set out in this brochure are based on tests and data believed to be reliable at the time of publication. Results may vary, as the use and application of the products is beyond our control and may be subject to climatic, geographical or biological variables, and/or developed resistance. Any product referred to in this brochure must be used strictly as directed, and in accordance with all instructions appearing on the label for that product and in other applicable reference material. So far as it is lawfully able to do so, Bayer CropScience Pty Ltd accepts no liability or responsibility for loss or damage arising from failure to follow such directions and instructions.

