

ADVANCING sustainable pest control

River Bioscience introduces TrichoMax™ for effective tortricid management in orchards. By Rob Elfick



Rob Elfick

River Bioscience is proud to bring *Trichogrammatoidea cryptophlebiae* to the market this season. Our registration for TrichoMax™ (L11627) was granted in mid-2024. Since then, we have been supplying growers with this beneficial wasp to enhance their biological pest control methods and promote sustainable agricultural practices.

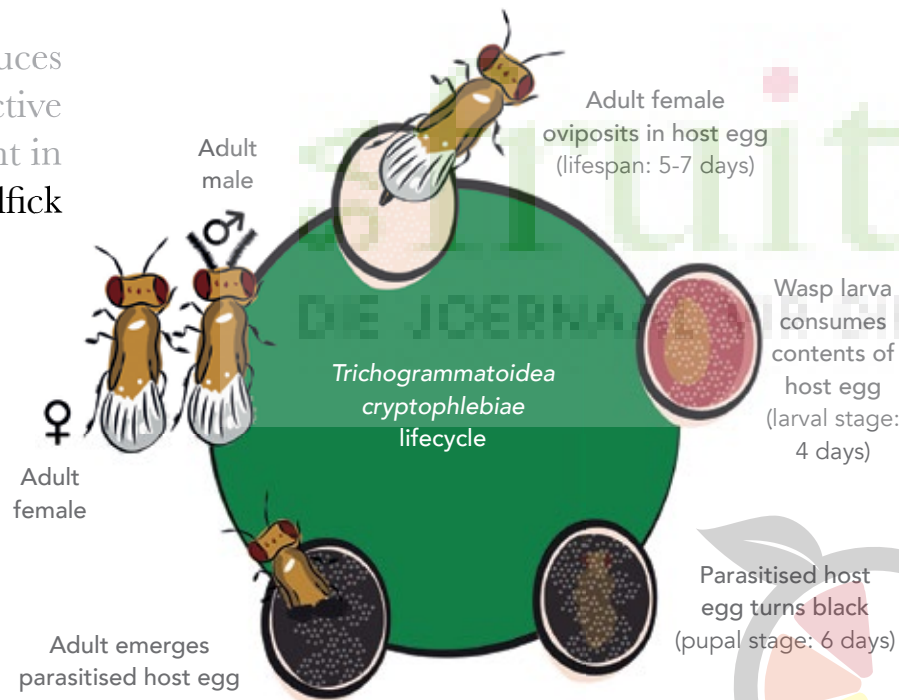
Trichogrammatoidea cryptophlebiae are tiny parasitic wasps that can significantly reduce FCM (false codling moth) populations in citrus orchards by parasitising moth eggs. This biological control agent can be incorporated into integrated pest management (IPM) programmes to help suppress infestations. By incorporating TrichoMax™ into IPM programmes, growers can decrease pest incidence and crop loss with minimal reliance on synthetic chemicals, thereby maximising crop production and financial gains.

The life cycle of *Trichogramma* begins when an adult female with a lifespan of five to seven days, lays her eggs inside a host egg. The wasp larva consumes the contents of the host egg over approximately four days. The parasitised egg then turns black, entering a pupal stage that lasts six days, after which an adult wasp emerges.

To maintain effective pest control, we recommend applying 25 000 wasps per hectare per application for four to five applications within a season. Applications should ideally begin before pest pressure rises to a significant level. Repeated releases at the recommended rate provide optimal coverage for suppressing pest populations. Rigorous quality control (QC) processes are crucial to ensure each batch meets high standards for parasitism, emergence, and sex ratios, maximising the efficacy and sustainability of this biological solution.

Each batch of TrichoMax™ undergoes detailed QC sampling and analysis to guarantee wasp health and performance. A

standard number of QC samples per batch are selected from egg sheets of varying densities to accurately represent the entire batch. Samples are monitored from day one when eggs are harvested, to track metrics like parasitism, emergence, and sex ratios. By day four to five, our QC team counts the parasitised (black) eggs under a microscope to determine parasitism rates, ensuring that growers receive the recommended 25 000 wasps per hectare. On day 10, wasp emergence and sex ratios are evaluated. Emergence is measured by counting the holes in blackened eggs, while sex ratios (targeting two females to one male) are confirmed microscopically. All QC data is



recorded on a live, online dashboard and in hard copy to maintain TrichoMax™ quality for effective field applications.

Good stewardship is essential for maximising the effectiveness of biological control agents like TrichoMax™. While thorough QC ensures that each batch meets high standards, the success of these agents ultimately depends on proper handling and application. Incorrect transport, storage and application reduces the wasps' ability to control pests in the field. Other pest management practices should also be taken into consideration when applying TrichoMax™, as well as other parasitoids or predators. These organisms are often sensitive to broad-spectrum chemical sprays. Rather implement integrated pest management approaches, using reduced-risk chemicals or environmentally friendly solutions that are compatible with beneficial natural enemies. Proper stewardship safeguards the integrity of these biological agents, ensuring they perform as intended and deliver sustainable pest control for growers. Growers and other industry stakeholders are urged to use the product wisely – according to the label recommendations – and to follow biological control best practices.

MSc study enhances *Trichogrammatoidea cryptophlebiae* for South African pest control

Emma Thompson, River Bioscience research technician and field representative, is conducting MSc research focused on the biology of *Trichogrammatoidea cryptophlebiae* to improve its mass-rearing and effectiveness in South African agriculture. As an egg parasitoid native to SA, *T. cryptophlebiae* holds the promise of managing various pest species across multiple crops. However, gaps in knowledge about its biology – particularly regarding its fitness, fertility, and efficacy – need to be addressed to enhance its effectiveness as a biological control agent.

The primary goal of Emma's research is to develop best practices for rearing *T. cryptophlebiae*, ensuring the production of fit, fertile parasitoids capable of effectively targeting pest species in the field. Her study also evaluates the parasitoid's impact on several economically important tortricid pests, including:

- litchi moth (*Cryptophlebia peltastica*)
- codling moth (*Cydia pomonella*)
- macadamia nut borer (*Thaumatotibia batrachopa*)
- *Lobesia vanillana*
- false codling moth (*Thaumatotibia leucotreta*).

Preliminary results indicate that *T. cryptophlebiae* successfully parasitises the eggs of these species, demonstrating its potential as a versatile biological control agent.



Top: Parasitised egg on macadamia nut Above: Trichogramma wasps

Additionally, Emma's research provides insights into the parasitoid's interactions with overlapping pest populations, which could guide its application in regions where these pests coexist.

This MSc research is advancing our understanding of *T. cryptophlebiae* and its role in pest management while establishing protocols for more sustainable agricultural practices. By optimising rearing techniques and evaluating the parasitoid's efficacy across multiple pests, Emma's work is contributing to integrated pest management strategies that may reduce reliance on chemical pesticides, supporting a more ecologically sustainable future for South African agriculture. ■

River Bioscience is committed to advancing sustainable agriculture through innovative biological solutions like *T. cryptophlebiae*. By integrating TrichoMax™ into IPM programmes, River Bioscience offers growers a powerful tool to manage pest populations while reducing chemical use, supporting healthier ecosystems, and promoting resilient farming practices. Our rigorous QC measures, coupled with a focus on good stewardship, ensure that each batch of TrichoMax™ meets the highest standards, enabling growers to achieve effective pest suppression. Together, we are enhancing crop protection, promoting sustainability, and contributing to the long-term success of agriculture in our communities.

