Early Needs Recovery Program to address pest challenges in blueberry

Saleh Adnan, Research Horticulturist Entomology, New South Wales Department of Primary Industries

The blueberry industry on the NSW north coast has been adversely impacted by the flooding in February 2022 and the prolonged wet conditions in the northern New South Wales region experienced over the past two years. In response to these events, NSW Department of Primary Industries has been working to assist industry, with one of the key activities to undertake pest and disease surveillance in blueberry farms.

As a part of this program, the NSW DPI northern horticulture entomology team has visited a cross section of commercial blueberry farms across the north coast and maintained continuous correspondence with the respective farm managers to gain insights into the pest issues that impact blueberry production. The following is a snapshot of some of the key pests encountered and the subsequent work that has been, or is being, undertaken to develop improved management strategies for these pests.

Leafroller moths

Leafroller moths (light brown apple moth (LBAM, *Epiphyas postvittana*), mango flower webworm (*Dudua aprobola*), orange fruit borer (*Isotenes miserana*) remain a priority issue.

The feeding activity by the caterpillars of these moths impairs vegetative growth, impacts new flush (Figure 1) and flowering, and finally reduces fruit setting. Growers have experienced high pressures of leaf rolling moth complex recently and, in most cases, it was considered to be caused by LBAM.

From samples collected, it has been found that the damage in recent years has been predominately due to mango flower webworm and orange fruit borer. While growers have a reliable monitoring tool as well as management strategies for light brown apple moth, the understanding of other leaf roller moths and their economic impacts on blueberry remains rudimentary.

Consequently, growers are applying non-selective chemicals to control these moths which is leading to secondary pest pressures.

To better address this situation, preliminary evaluation of biological, cultural, and chemical control options is being undertaken.

As part of this work, we plan to assess the potential of commercially marketed egg parasitoids (*Trichogramma* spp) in managing these tortricid moths.

Figure 1. Rolled blueberry leaves (L) and leaf rolling caterpillars on blueberry flush (R)
Photo credit: Saleh Adnan

Figure 2. Damage to blueberry flowers (L) and young flush (R) caused by swarm of adults *Monolepta australis*
Photo credit: Saleh Adnan

Red Shouldered Leaf Beetle

The red shouldered leaf beetle, *Monolepta australis* is a native pest of fruit tree crops including avocado, macadamia, mango, longan, lychee, and recently found to establish in blueberry. Over the past spring and summer, increased levels of damage have been observed across many crops and while little is known about this pest, the increased activity is believed to have some relationship to the weather events experienced over the past 12-24 months.

Swarms of adults feed on the growth flushes of y oung plants resulting in wilting and dieback of shoots, and significant growth impairment of young plants (Figure 2). Invasion of flowering plants causes reduced fruit-set and epidermal scarring of fruit rendering it largely unmarketable.

Generally, growers rely on seasonal scouting followed by spot application of insecticides where adults are feeding. However, growers are wanting to reduce the use of broad-spectrum insecticides for the control of this pest as these products have impacts upon the farm ecosystems, especially on natural enemies and pollinators.

Building on this overall context, we are undertaking laboratory rearing of this beetle to better understand its life cycle, particularly the breeding cycle. This work will allow us to look at strategies to target the breeding cycle and ultimately reduce the population of adults that can swarm.

Elephant Weevil Borer

The elephant weevil borer *orthorhinus cylindrirostris* is another endemic Australian beetle that has caused significant economic losses to blueberry crops in recent years. In addition to direct yield losses, larval feeding renders plants susceptible to breakage during harvest and shortens a plant's productive lifespan. There is also added cost of replacing the collapsed plants.

This pest appears sporadically and is often found in localised areas. Since the floods elephant weevil borer activity has been found in some locations but not all.

Growers are currently applying Bifenthrin and Indoxacarb (registered in Blueberries) for controlling elephant weevil borer, however these compounds are broad spectrum and impact significantly upon beneficials.

To assist in improving management of this pest and reduce the impact upon beneficials, laboratory assays have been carried out to assess the efficacy of biological and new generation chemistry insecticides as potential control options.

In the laboratory bioassay, the efficacy of both the microbial insecticides and the new generation insecticides was comparable to that of Bifenthrin, however field trials are needed to validate the laboratory results.

Figure 3. Laboratory rearing of *Monolepta australis*
Photo credit: Saleh Adnan

Figure 4. Laboratory assay to test the efficacy of biological and new generation insecticides against Elephant weevil borer
Photo credit: Saleh Adnan

Overall, the Early Needs Recovery Program supports the blueberry growers across NSW north coast regions to develop integrated pest management approaches to encounter ongoing as well as future pest challenges escalated by similar weather events (if any).
The entomology team will continue to undertake surveillance for any changes or new issues that emerge.

Should any growers spot something unusual or wish to discuss any findings from this report please contact Saleh Adnan at DPI :

saleh.adnan@dpi.nsw.gov.au

Acknowledgements

This work is part of the Early Needs Recovery Program (ENRP)under the $150 million Primary Industries Support Package (PISP) that is co funded 50-50 by the Australian and NSW governments under the Disaster Recovery Funding Arrangements (DRFA).