Media Release

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More of the good drop - productivity in vineyards can be increased with the help of insects

Controlling pests is an essential part of food production, and can be done using chemicals and the natural enemies of pests - biological control. Researchers at the University of Melbourne have shown that by minimizing chemical use, populations of the pest's natural enemies can be maintained which increases biodiversity and vineyard productivity.

Biological control of pests is widely accepted as desirable but there has been insufficient information about vineyard dynamics to help elevate it from a good idea to a key strategy for controlling pests and diseases of grapevines. Management of pests and diseases remains a key issue for agricultural profitability and environmental health.

Dr Linda Thomson and colleagues at the Centre for Environmental Stress and Adaptation Research (CESAR) have demonstrated links between maintaining insect biodiversity and productivity in vineyards. The maintenance of biodiversity increases the capacity to control insect pests while minimizing insecticide usage.

"Moves towards sustainability require a reduction in chemical toxicity loadings and conservation of natural enemies to maintain pest control", said Dr Thomson.

"While there is a lot of information from laboratory tests regarding the effects of chemicals on beneficial predators and parasitoids there are very few translations of these effects into field impacts particularly under commercial conditions."

Trials carried out in vineyards by a CESAR team lead by Dr Thomson have demonstrated that chemical use is related to natural enemy abundance.

Dr Thomson and Prof Ary Hoffmann developed a method to predict the likely effect of a season-long chemical spray regime on a full range of potential natural enemies in a crop. The guide potentially provides a more meaningful way of evaluating sustainable chemical use, by combining available toxicity information with other considerations like reinvasion of farmed areas from adjacent vegetation following chemical applications.

Season-long chemical applications are used to calculate a relative score for a vineyard based on published toxicity rankings as well as knowledge of chemical

impacts on local fauna based on field assessments. This method enables growers to maximize the abundance and diversity of natural enemies which contribute to pest control in the vineyard.

Dr Thomson collaborated with Fosters Wine Estates, which through its Footprint project aims to measure and compare factors linked to sustainability. The aim of the project is to provide growers with a more informative measure and record of chemical effects than the traditional spray diary.

Incorporation of a 'softness score' (the effect of the chemical on the pest's natural enemies) in relation to beneficial biodiversity, will give a clearer indication of likely economic and environmental impacts. Fosters has incorporated both the 'softness' of agricultural chemicals applied and biodiversity in the vineyard and surrounding environment as sustainability indicators across their vineyards in Australia, New Zealand and the United States.

"Combining information on the effects of chemicals and the impact of adjacent vegetation on the natural enemies will contribute to preservation and maintenance of natural enemies in vineyard ecosystems, with associated benefits of reducing the need for chemical applications with their environmental and financial cost," said Dr Thomson.

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