

Native undervine plants show promising results

Research has identified three species of native plant that are likely to be effective for undervine planting in Waipara and other areas. Bidibid (*Acaena inermis purpurea*), shore cotula (*Leptinella dioica*) and creeping pohuehue (*Muehlenbeckia axillaris*) have all demonstrated good survival and growth rates.

After two years of research, the three most successful plants

- Formed a dense and spreading cover beneath the vines; eventually this will reduce the need for herbicide applications
- Increased the diversity and abundance of beneficial insects and spiders
- Were unlikely to enhance pest leafroller populations in vineyards
- Enhanced the lifespan of key parasitic wasps which kill leafrollers: bidibid and creeping pohuehue were the best in this respect
- Increased soil moisture levels
- Reduced runoff and improved soil aggregation and porosity



Jean Tompkins

Conclusions and considerations

Establishing native groundcovers within a vineyard can provide a multitude of ecological and economic benefits. However, it requires a significant investment of time and capital. Native plants can be costly and effective weed control is essential in the first couple of years – a commercially-available seed supply would make a big difference.

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Omihi Primary School students plant stage one of their new biodiversity trail on the school grounds.

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Weblinks:

www.bioprotection.org.nz/greening-waipara

<http://ecovalue.uvm.edu/newzealand/>

http://www.waiparawine.co.nz/research/greening_waipara

www.lincoln.ac.nz/story13772.html

www.lincoln.ac.nz/story_images/1028_NewsUpdate

GREENING WAIPARA

Building biodiversity back into the wine experience

The project

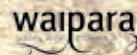
The Waipara Valley in North Canterbury is New Zealand's fastest-growing wine region, with around 80 vineyards covering 1500 hectares. Greening Waipara is a world-leading, research driven project that aims to restore functional biodiversity to agricultural ecosystems by way of "ecological engineering" – making them more sustainable, profitable and marketable. The project is based at the Bio-Protection Research Centre, Lincoln University and since it began in September 2005, 52 Waipara Valley properties have joined the project and over 25,000 native trees, shrubs and groundcovers have been planted.



The native Hells Bells (*Anaphalioides bellidioides*) growing beneath the vines at The Mud House vineyard, Waipara.

The need for change

Agriculture, including viticulture, damages biodiversity and has caused major declines in New Zealand's native plant and animal populations. By conserving our remaining undisturbed habitats and introducing additional biodiversity in the form of both native and non-native species, the services that nature provides for free to the arable, pastoral and horticultural sectors can be enhanced. Nature's services include biological control of pests, pollination, improved soil quality, conservation and eco-tourism. These services add value to vineyards and farms while reducing reliance on herbicides and pesticides.



Ecological makeover of vineyards on public display

Vineyard biodiversity trails have been established at four Waipara vineyards and wineries: Pegasus Bay Winery, Torlesse Wines, The Mud House Winery and Café and Waipara Springs. A fifth trail is now under way in a very different setting – Omihi Primary School, ten minutes north of Waipara on State Highway One.



Torlesse Wines biodiversity trail.



The trails offer visitors a chance to see Greening Waipara in action, exposing visitors to a range of plant and animal species that were once common in the Waipara Valley landscape. The trails cover wetlands, dryland scrub forests with weta motels, lowland forests complete with lizard lounges and pine discs harbouring native snails, slugs and beetles.

Each winery trail has its own unique quiz for children (and adults!) to complete as they walk the trail, with prizes for those who complete them correctly.

Left: A Māori pou whenua stands at the start of the Pegasus Bay trail. Pou whenua are carved posts placed on the land to acknowledge the link between tangata (people) and the whenua (land).



North Canterbury high school students on the Torlesse Wines biodiversity trail.

Enhancing native butterfly populations in the Waipara Valley

Butterflies are a sensitive bio-indicator of environmental health and their iconic image is often used for marketing purposes. Mark Gillespie, a PhD student working within the Greening Waipara project is examining the factors influencing the remaining butterfly populations in the Waipara Valley and is attempting to develop grower-friendly ways of enhancing their numbers. Mark has already been approached by Paul Donaldson from Pegasus Bay Winery for practical advice on how to increase the numbers of these attractive insects.



Mark Gillespie

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Mark has produced a booklet on his work to date. You can download this from <http://bioprotection.org.nz/greening-waipara>, or for a paper copy, contact Annie Barnes: anna-marie.barnes@lincoln.ac.nz, 03 321 8452.



*Yellow admiral butterfly (*Bassaris itea*) feeding on a kanuka (*Kunzea ericoides*).*

Undervine mulches improve vineyard biodiversity and sustainability

Organic mulches such as pea straw, linseed straw and grass clippings applied beneath vines can reduce botrytis diseases and the need for irrigation and fertiliser, improving plant health and thus enhancing sustainability and potentially market acceptance for the wines produced.



Dave Malcolm

Research carried out by Royal Society of New Zealand Teacher Fellow Dave Malcolm and visiting Spanish PhD student Lorena Pumariño has found that mulching increased water retention, water infiltration and biological activity and reduced temperature fluctuations when compared to the bare ground control. Vine leaves were also analysed and those from mulch treatments showed increased nitrate and potassium levels. Further testing will be done after the 2010 harvest to measure the effect of the mulches on grape yield, brix and the incidence of botrytis.

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Where do vineyard pests come from?

Bio-Protection Research Centre PhD student Mariska Anderson's research aims to explore the spatial dynamics of pest and beneficial insects in Waipara Valley vineyards. This large-scale study will examine the role that landscape features and habitat management strategies play in pest and natural enemy population dynamics in vineyards.

The pest species being studied are the endemic New Zealand grass grub beetle *Costelytra zealandica* and the introduced light brown apple moth (LBAM) *Epiphyas postvittana* which is native to Australia, along with their respective natural enemies.

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