



Research funding helps solve grape growing challenges

Mealybugs, sour rot, frosts and humidity are problems for grape growers that may be closer to solutions thanks to funding from the 2009 Skeltons Viticulture Development Grant.

Over \$12,000 has been provided this year by Grant sponsors Skeltons, Plant & Food Research, Ballance Agri-Nutrients and Bayer CropScience New Zealand. The recipients are a variety of scientists, consultants, inventors and vineyard managers.

"We're now into our sixth year and the grant has become a credible funding source for the viticulture industry's bright ideas," says Skeltons General Manager, Ian Gold. "We've had a number of last year's successful applicants applying to continue and expand their research, and we see huge benefits in helping fledgling ideas grow and take off."

This year the grant was expanded from Hawke's Bay and offered to industry participants in Wairarapa and Gisborne as a result of Skeltons extending its technical advisory service into those areas as a result of becoming part of Farmlands.

Gibberellic acid for sour rot control

One of the successful applicants is Gisborne consultancy Lewis Wright Valuation and Consultancy Ltd with a proposal to research the use of gibberellic acid for sour rot control with a view to improving wine quality, and grower and winery returns.

Current vineyard management practices appear ineffective in controlling splitting and sour rots and growers must cut sour rot out prior to harvest. Lewis Wright estimates the loss to grower income based on 2008 returns is \$4.2M, with an additional \$1M in labour costs for bunch removal.

This research project will examine the effect of different application rates and timings of gibberellic acid in trials on commercial pinot gris vineyards in Gisborne and Hawke's Bay.

Challenging humidity levels under vines

Another new research proposal this year challenges the commonly held belief that humidity is higher under vines in the space above plant cover than where there is bare soil. Vineyard managers Rob Beard and Mark Dixon contest this and will be running trials to record specific in-field measurements of temperature and humidity in both scenarios. Monitoring will take place throughout the growing season, from bud-break to harvest.

Sensor recorders will be placed at ground level and bunch line to register temperature and humidity. Each test area will have rows with undervine cultivation of companion plants and rows of conventional weed sprayed bare strips.

"Being able to understand a changing climate is integral to sustaining and strengthening the wine industry," says the duo. "The possibility of modifying the micro-climate in the canopy and bunch line in particular has the potential to improve disease management, vine stress and overall harvested grape / wine quality," says Mark Dixon of Keltern Vineyard, Maraekakaho.

"It would also have the potential to reduce the amount of herbicide applied which has other positive sustainability implications," says Rob Beard of Stirling Vineyard, Meeanee.

The two projects to receive funding for the second year are those to extend research into mealybug control, and to develop a new frost protection system.



Mealybug control study continues

David Reid, a PhD student with Lincoln University is gaining a solid reputation for his work to remove mealybug host-plant species from vineyard ground cover with his 2008 work showing this approach has had significantly positive results. (See separate story on 2008 results).

The 2009 focus will be to trial and evaluate indigenous and exotic grass species for suitability as sustainable replacement cover crop species. "Removing mealybug host-plant species can substantially reduce the mealybug population but for this approach to be sustainable, we need to find non-host plants species to replace them," explains Mr Reid.

The trials to be conducted in CJ Pask vineyards will identify appropriate species and evaluate their performance in the vineyard with emphasis given to establishment, growth characteristics, ease of maintenance, mealybug host-plant suppression, and mealybug numbers in the trial blocks.

New frost protection system proving positive

In the fourth project, inventors Eduard Rust and Torbjorn Gustavsson of MinusSix Ltd will be aiming to stop frosts of -6 C from creating havoc with grape crops. Work in 2008 has resulted in patented technology that uses light bulbs as a heating source to deliver warm air from a series of pipes underneath vines. To date two prototypes have been designed, built and tested with results documented. Over the coming year, further field trials will be completed with 80 improved units tested with the focus on power distribution and consumption.

"If this system proves successful, it will remove the necessity for water use and therefore alleviate the pressure on growers from councils to restrict water rakes and apply for water consents," says Eduard Rust. "It will also be more efficient than using frost fans or helicopters.

"We are also expecting to prove that the system is reliable from one season to the next, and are easy to check and maintain."



Surviving the tough times

With world markets and the economy in turmoil, the New Zealand wine industry faces challenging times ahead. Growers during the 2008 / 2009 season may have had supply contracts terminated or found it difficult to find a home for their crops. Like other horticulture and agriculture sectors, the wine industry has its 'ups and downs' and it is important to focus on continuing to market a quality product so we can bounce back.

To survive the tough times, affected growers need to either maintain their vineyard or use the time to replant or graft to a more sought-after variety to be ready for when the world's economic situation improves. Grafting is a cost effective option, and can have a quicker turnaround as far as production goes.

Mechanical pruning is one option of reducing pruning costs, especially if a vineyard is set up as sylvoz or spur pruned. With the sylvoz system, there is a choice of tying down new droppers and following up with a mechanical pruner to prune the spurs, or alternatively, spur the old droppers and use a mechanical pruner to prune the spurs on the cordon.

Some vineyard owners and contractors also use a machine called the Langlois Vine Stripper. Pruning cuts are made first and the machine follows up afterwards, pulling out unwanted canes and throwing them into the row, leaving replacement canes standing. The objective of this approach is to reduce the 'pulling out' costs of pruning.

As tempting as it may be to drop fungicides to save money, it is still important to continue a solid cover spray programme. Sulphurs and DMI's are still relatively cheap and it's easier to keep powdery mildew away rather than eradicate it!

To save time and labour costs, try mowing and trimming in one pass. Some vineyard operators who have hydraulics on the front of their tractors, mow and cover spray in one pass.

Leaf plucking can be a cost effective tool when managing botrytis. Instead of hand plucking, some vineyard operators are now only using mechanical pluckers or even sheep to do the job. Sheep (older ewes are commonly used because they are more settled) do a good job in most training systems, except sylvoz because the fruit is lower to the ground.

Sheep tend to be introduced just after Christmas when the bunches are fully formed, and need to be out of the vineyard when the bunches start changing colour as the animals get a taste for the fruit as the sugars start accumulating.

Ultimately, each grower has to decide which strategy will work best for the situation they are in. Skeltons technical advisors are available to talk through these options with you.

Managing costs of wind machines

Operational decisions and management of costs is at forefront of all growers' minds. One production cost that has risen in the past few years is frost protection. If a wind machine is your form of frost protection, consider whether you are operating it efficiently. Likewise, if you are considering the purchase of a wind machine, do you know what it really costs?

Cost management decisions to consider for an existing wind machine:

- **Fuel consumption:** Operating and leaving your machine set in Auto Start/Stop will avoid any unnecessary running. Make sure the thermometer sensor is checked and calibrated each season.
- **Diesel return stack heaters:** These burn approx 1.1 to 2.3 ltrs/hr for back-up heat. The larger damper settings are for the light-up period only. After the heater is started, the damper should be turned down to a one-hole setting. The amount of protection needed for each site can be determined only by the grower, based on their years of experience with frosts, so have a light-up plan in place, particularly if the dew point is below critical. Burning efficiency and the life of the burner can be lengthened by ensuring heaters are maintained and stored properly at the end of each season.
- **Use Smart Lites:** An easy to see green or red flashing light can save a lot of costly running around, stress, and time. Placed within the frost fighting area, the Smart Lite will also tell you if more back-up heat is required.
- **Warrant of Fitness and annual service:** Ask for a written quote that has a comprehensive itemised service check list before servicing commences to avoid unwelcome extra charges.
- **Fuel supply:** Are you paying a competitive price and how good is your fuel supply?

Cost management decisions to consider when purchasing a new wind machine:

- **Check what's new:** Changes and improvements take time and money, money you could save not just now but also long-term. Find out what's available in regards to noise requirements and frost fighting area per wind machine.
- **Price:** Does the quoted price include everything and have you fully compared the brand parts, specifications, WOF and 24 hour emergency back-up service and support.
- **Fuel consumption:** All wind machine blades are designed differently and the amount of power required to drive the blades, and the frost-fought area, varies. Motor manufacturers must comply with New Zealand emission standards. Have you considered Carbon Zero emissions? More burnt fuel also means more frequent fuel delivery and larger storage facilities.



Supporting Hawke's Bay Wine awards

Skeltons, as Farmlands horticulture specialists, has taken over the former Farmlands sponsorship of the Syrah Category in the HB A & P Mercedes Benz Wine Awards. We were delighted to present to last year's winner, the Villa Maria Cellar Selection Syrah 2006 which was also selected as the Champion Wine of the Show. We look forward to supporting this prestigious event on the Hawke's Bay wine event calendar.

Investigating biological control of mealybugs

David Reid, Bio-Protection Research Centre, Lincoln University

A Skeltons' Viticulture Development Grant 2008 and 2009 recipient, David Reid, a PhD student at Lincoln University, conducted investigations into biological control of mealybugs by modifying insect habitats.

Results showed that where ground cover host plants had been removed, mealybugs either died or moved into adjacent rows that had attracting ground cover. Trials with non-host cover crops are planned for the 2009-10 season and this research is to be supported by further funding from the 2009 Grant.

"Mealybug numbers can be reduced in a vineyard block if you remove their favourite host plants. If you do this in a thorough and progressive way, you can significantly reduce the mealybug population in the vineyard," says David.

Background

In many established Hawke's Bay vineyards, significant numbers of vines are infected with leafroll viruses. Growers need to replace large numbers of vines or entire vineyard blocks to maintain premium wine quality. Mealybugs are the primary virus vectors, and are difficult to eradicate. Most are protected from chemical sprays and predators because they live underground, on the roots of host-plants such as white clover. Some move into the canopy around veraison and colonise grape bunches.

Host plants

In the CJ Pask Gimblett Road vineyard, mealybugs live predominantly on the roots of broadleaf plants (e.g. hawksbeard, white and subterranean clovers, dovesfoot, and willow-herb) (Fig. 1) on the vineyard floor. It is difficult to remove clover species and willow-herb from the vineyard as underground stems survive herbicide control with glyphosate.



Figure 1. Mealybugs on hawksbeard taproot.

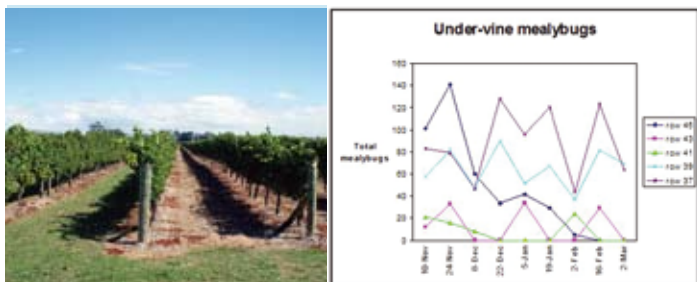


Figure 2. Mealybug host-plants were removed from part of the block by herbicide spray. Rows 41, 43, and 45 are inside the herbicide strip.

Last season, mealybug numbers were significantly reduced in a 10-row strip by multiple herbicide sprays with glyphosate and Buster (glufosinate-ammonium) that killed host plants (Fig. 2).

Mealybug numbers in the marginal row or outside the herbicide zone remained high. Inside the herbicide zone, mealybug numbers decreased, yet mealybugs did not move into the vine canopy. They appear either to have died, or moved to preferred host plants outside the herbicide zone.

Herbicide control is not sustainable, and it will be necessary to plant non-host cover crops and maintain them to ensure that they are free of host weeds. Cover crop trials are planned for next season.

Ants

Mealybugs produce honeydew, which attracts ants (Fig. 3). Ants "farm" mealybugs, and will defend them from attack by natural enemies.



Figure 3. *Iridomyrmex anceps* and *Ochetellus glaber*: canopy ants.

Last season, canopy ants were controlled in 55 bays by placing bait stations containing boric acid bait, in the canopy. Mealybugs were not found in any bunches in these bays. In the previous season (without bait stations), 12.4 percent of bunches from these bays were infested with mealybugs. A further trial is planned to verify this result.

Biological control of canopy ants may be difficult as they have few natural enemies and several food sources. Under-vine compost mulch reduced canopy ant numbers in this vineyard, but this mechanism is not understood.

Wasps

Natural enemies of mealybugs in this vineyard include three very small wasps (Fig. 4). They are capable of parasitising significant numbers of mealybugs, but are vulnerable to damage by organophosphate insecticides and to ant attack.



Figure 4. *Tetracnemoidea brevicornis*, *Coccophagus gurneyi* and *Anagyrus fusciventris*; mealybug parasitoids.

To maximise their longevity and fecundity, these parasitoids need food source plants in the vineyard. In an on-going trial, potential nectar source plants are being evaluated. The main difficulty encountered is weed competition. Vigorous species such as alyssum and oregano appear to be better suited in this vineyard than slower-growing native species (Fig. 5).



Figure 5. Clockwise from top left: creeping selliera, alyssum, oregano, pohuehue.

Harvesting

Grape harvesting machinery moves mealybugs. However in mealybug hotspots, some mealybugs are left attached to bunch rachii. Mealybugs remaining on the rachii are exposed, and move to find shelter, potentially from virus-infected

to uninfected vines. There is an opportunity, immediately post-harvest, to control these, with an oil spray for instance. The value of this type of intervention will be assessed next season.

This Grant is supported by Skeltons, Ballance Agri-Nutrients, Bayer Crop Science, and Plant & Food Research. Details can be found on www.skeltons.co.nz



Grapevine Intelligence

August 2009

Biofungicide practice and the 09 Vintage



The 09 Vintage had another quick flowering with no disease issues until the late February rains that had biofungicide manufacturers and suppliers exhausted of product. Registered biofungicides

Serenade Max, Sentinel and for the first season, FoliActive were all put to the test to control quick developing bunch rot as more small periods of rain followed. Another new bacillus subtilus product, Companion Gold was also given the test independently in trials for future use and efficacy.

As the rain continued so did the botrytis battle, with the use of Armour-Zen and a new registered product from Citrox called ProAlexin PNS. These products, like PMS (potassium metabisulphite), were tested post-infection to help combat botrytis bunch rot incidence and severity. For some growers it was a losing battle and for others it gave satisfactory results. Like all bio-controls, a grower's first-hand experience with these products in the field is critical to determine best timing and application.

New products introduced

FoliActive, a registered biofungicide for the control of botrytis and powdery mildew contains live strains of Bacillus subtilus. The establishment of living bacteria produces a protectant layer that displaces and occupies infection sites prior to any disease development or infection periods. FoliActive also contains fermentation extracts and nutrients that have a dual purpose, stimulating the natural plant defence mechanism. FoliActive at 6ltrs/ha is a post veraison (the three to four week period before harvest) biofungicide spray applied in enough water to ensure good coverage.

ProAlexin PNS is registered as a plant nutrient synergist that stimulates the plants defences and also has an anti-microbial sterilant effect on existing infections. Used in the food industry, it is a natural alternative created from certain fruit acids and unique extracts taken from bitter oranges. It has a broad spectrum use against many different pathogens, has no withholding period and comes with a BioGro certification as 'BioAlexin'. The full potential of ProAlexin is yet to be utilised when used in a whole season spray programme.

Electronic pruners

Skeltons currently stocks two brands of electric pruners (Felcotronic and Bahco). The advantage of these pruners is they reduce the risk of OOS (occupational overuse syndrome), especially when spur pruning. Another advantage is they reduce the number of cuts required by loppers due to their increased cutting power – thus increasing speed and efficiency when pruning.

Both brands have a similar belt / harness system to spread the weight of the battery, and the Bahco has an on / off switch on the harness shoulder strap for easy access. Both pruners have digital displays which show remaining power left in battery and each battery should enable at least a full day's work.

Also in stock are a full range of secateurs and loppers, including the Bahco Ergonomic Bypass secateurs. The adjusted angle of its cutting head allows your hand and forearm to prune in a more natural position, therefore reducing the likelihood of OOS occurring.

For any further information please contact your Skeltons Technical Advisor, or your Skeltons or Farmlands store.

Viticulture technical seminar

Skeltons will be offering a free seminar covering topics pertinent to effective grape growing. To be held in Hastings on 26 August, growers outside of Hawke's Bay should contact their local Skeltons Technical Advisors to coordinate transport.

Romeo Bragato – gold sponsorship

Skeltons and Farmlands are proud to be Gold Sponsors of this year's Romeo Bragato conference being held in Napier from 20 to 22 August. In addition, Skeltons will be involved in manning the competition stations at the national finals of the Young Viticulturalist Competition in Napier on August 22. We look forward to catching up with you at this event.

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