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December 2015 update #8

Heat Ranger Makes Quiet Progress

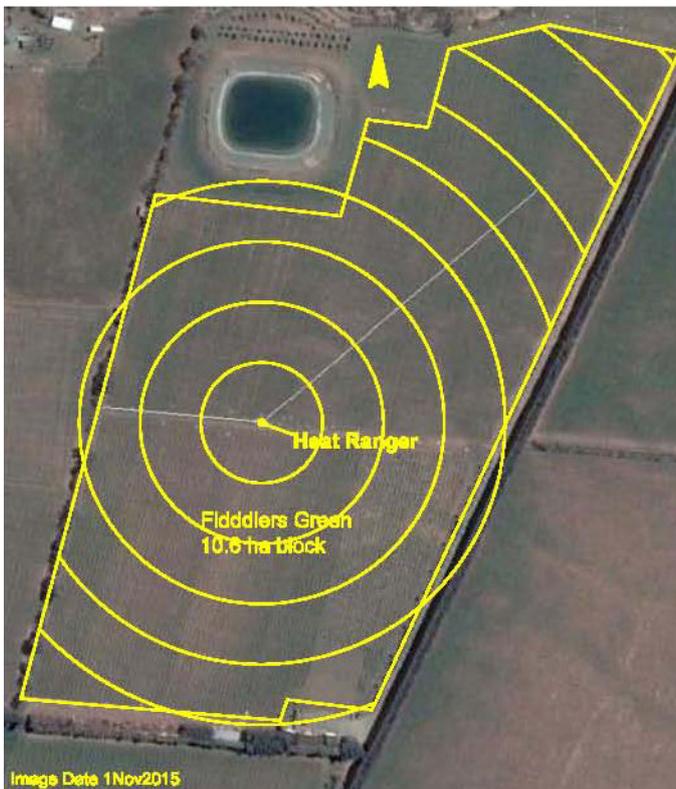
We would like to thank those who took the opportunity to check us out at Waipara and Cromwell last week and for the genuine interest expressed.

We Can Report

The machine at Waipara was operating in a 10 ha block of grapes that had been pretty much wiped out with frosts last season. Frosts that were not as severe as occurred this season. Ross Trowsdale was keen to see if Heat Ranger could turn that round. Ross has sprinkler frost protection on his nearby Dancing Water vineyard.

Well the short answer is yes. Heat Ranger operated during this season's frosts and while there was some minor damage Ross puts this down to being too late starting on the first event.

The achievement was significant



The block is quite irregular with Heat Ranger located within the existing headland. The circles on the Google map are at 40m centres. The total crop area is 10ha comprising Sauvignon Blanc, Pinot Noir, Chardonnay and Gewurztraminer.

We were measuring temperatures out to 240m but had not extended the equipment out to the 360m extremity of the block.

Heat Ranger protected the whole crop as the photographs taken on the 24th November show.

The key events occurred on the 9th October (4hours) and the 5th November (7hours) when temperatures at 1m above the ground got down to between -2 and -3 degrees. and we believe that this is quite an achievement. Certainly Ross is pretty pleased with the result.

Obviously in economic terms this has been very significant

Based on likely prices and yields the numbers look like this:

Variety	Area ha	Predicted Yield t/ha	Value/tonne	Total Value \$
Sauvignon Blanc	3.5	10	\$1750	\$61,250
Pinot Noir	3.5	6	\$2500	\$52,500
Chardonnay	2.0	10	\$2500	\$50,000
Gewurztraminer	1.0	5	\$2000	\$10,000
Total	10			\$173,750

Without the presence of Heat Ranger on the site this would have been another year without a crop and the long term future of the vines would have been put at risk. In the same district wind machines and helicopters were all working with varying degrees of success. Clearly the potential income has to pay the rest of the costs associated with husbanding the crop from here until post harvest, but there is no doubting the value of the protection effort. A level of protection in this case that extended to the far corner of the vineyard. The pictures tell the story.



These photos were taken two and a half weeks after the 5th November where control temperatures outside the area were at -3 degrees C at crop height.

Our measurements indicate that we are getting a sustained 2 to 3 degree lift in temperatures out to about 120m (4.5ha) and 2 degrees at 160m (8ha) and more than a degree at 200m plus (12ha). On the site we have had protection out to the north east corner which is 360m but will have been helped by the adjoining shelter belt.

We do not get many frost events each winter to evaluate the machines but each year we get a little more and are confident that we now have a machine that is doing the job, in the absence of an effective inversion layer. Something that cannot be achieved with either wind machines or helicopters.

We have been working seriously on this technology now for five years and we have progressed from 2 ha to 10 plus. The original work showed that this system was able to provide protection in -3 degree frosts for Blackcurrants at zero loss, compared with 20% loss using a helicopter and 65% loss with no protection.



We have also learned about operational issues from the previous winter and now have got one of our machines fitted with an LPG powered engine that is fitted inside the machine body. This means that we are able to offer this version which has automatic start and stop functions without running out of fuel. This unit has proven to be totally reliable and we have mounted the solar panels on the machine so that there are no bits and pieces to move when it is time to take it out of the crop. Towing it on its own wheels and drawbar has made life a lot easier when using small vineyard tractors.

Earnscy Weaver has been running this unit for us in Cromwell and has found it very simple to operate.

Where to from here

If you have had a frosty night that has affected your grapes this spring it could be worth your while checking us out. We are taking orders for next season and obviously the sooner we know about your intentions the sooner we can plan to meet your needs, early enough to guarantee delivery of your personal Heat Ranger configured for PTO drive or engine powered.

Stop press: When we say **Quiet Progress** we mean Noise levels are very low - **below 40 decibels at 200m**
Councils & Neighbours love this



Bruce Koller – Heat Ranger - Fred Phillips

Fred Phillips
Project Manager
3/12/15

Leading the Revolution in Climate Management Systems