Vineyard Management at Mere Road

Precision Viticulture:

- Assumes uniform management is not an optimal strategy.
- Seeks to gain control over the production system
- Aims to increase the likelihood that outputs are desirable ones

- Rob Bramley CSIRO

Introduction

Welcome to "*Site Specific Vineyard Management*", a MAF Sustainable Farming Fund project focused on enhancing the financial sustainability of grape growing.

Winegrowers and viticulturists in Hawke's Bay have teamed up with LandWISE to look at benefits of managing different vineyard zones differently; planning and implementing practical site specific management strategies and assessing financial costs and benefits.

Different parts of vineyards have different inherent production characteristics. Variability causes non-uniform development, implying benefit from different management strategies. Uniform management means some areas under-perform while others have excessive inputs for the value achievable. Targeting appropriate inputs to defined zones can save money and improve quality.

Three case study vineyards have been identified, representing small and large producers. Canopy sensing to define management zones will build on successful trials by Spatial Solutions. Other information such as soil, vigour or harvest quality maps will be assessed by LandWISE, growers and viticulturists.

Vineyard management advisory teams including the grower, viticulturist and winery representatives are meeting to develop block management plans. Plans will include recommendations for pruning, through canopy management and crop loading, to harvest.

If you want to be involved in the project, register your interest with:

Dan Bloomer, 021 356 801, info@landwise.org.nz

The Mere Road Vineyard

The vineyard at Mere Road is on the edge of the Gimblett gravels, where the effect of varying soils is noticeable. Deposited by the Ngaruroro River when it flowed along what is now Omahu Road, the soils have the typical braided-river effect with varying textures and stone content. This shows in the vigour of the planted vines.

In March 2007, Spatial Solutions measured the vigour of the canopy in a trial area using a GPS-connected Crop Circle sensor. An NDVI biomass/vigour map was created. The vineyard was divided into management zones, with varying management applied.

In October 2010, the site's soils were mapped using an EM38 sensor. This identifies soil variability based on electrical conductivity.

The canopy was re-mapped in January 2010 and a second NDVI map prepared. After several years of site specific management targeted at canopy vigour, the differences within the block appear to be reducing. This impacts current management.

Setting up for the season, how did the manager:

- determine appropriate pruning strategies
- calculate a suitable contract rate
- ensure pruners knew what was expected?

Through the rest of the season, how will the manager:

- determine canopy management strategies
- manage irrigation
- ensure the right thing is done in the right place?

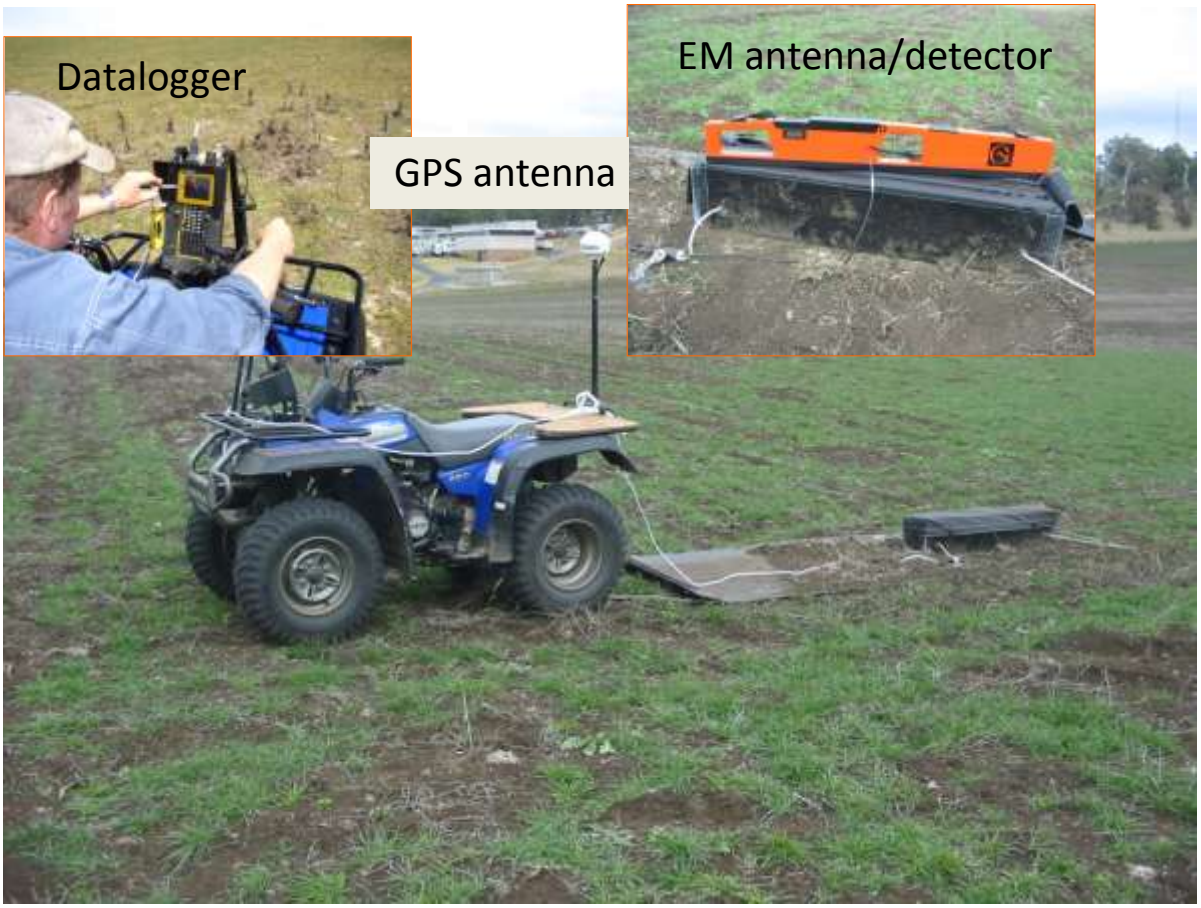
Is different management based on vigour potential a winning strategy?

Tool Kit Options 1: Soil Mapping

EM38 – Electro-magnetic resonance

EM38 is a technology that measures the apparent electrical conductivity of the soil. Conductivity is affected mostly by water and clay content, along with density and salinity. On very gravelly soils, the responses are often quite low compared to results from silty or clay loam soils.

Best done when soil at field capacity – usually May through October.

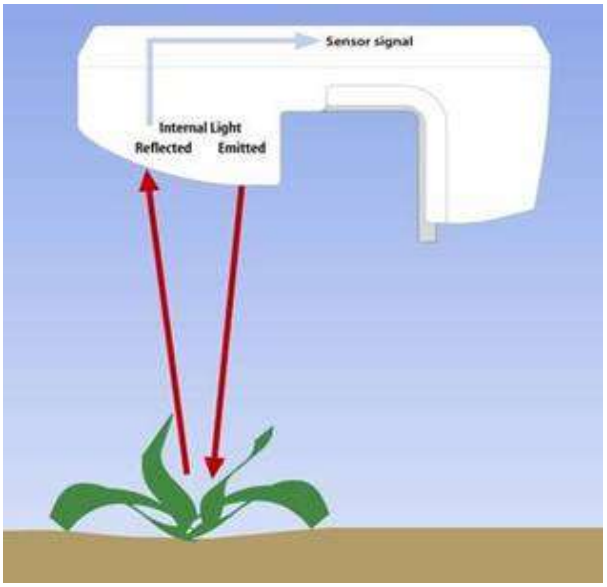


Thanks: David Lamb, University of New England, Armidale, NSW

Tool Kit Options 2: Canopy Sensing

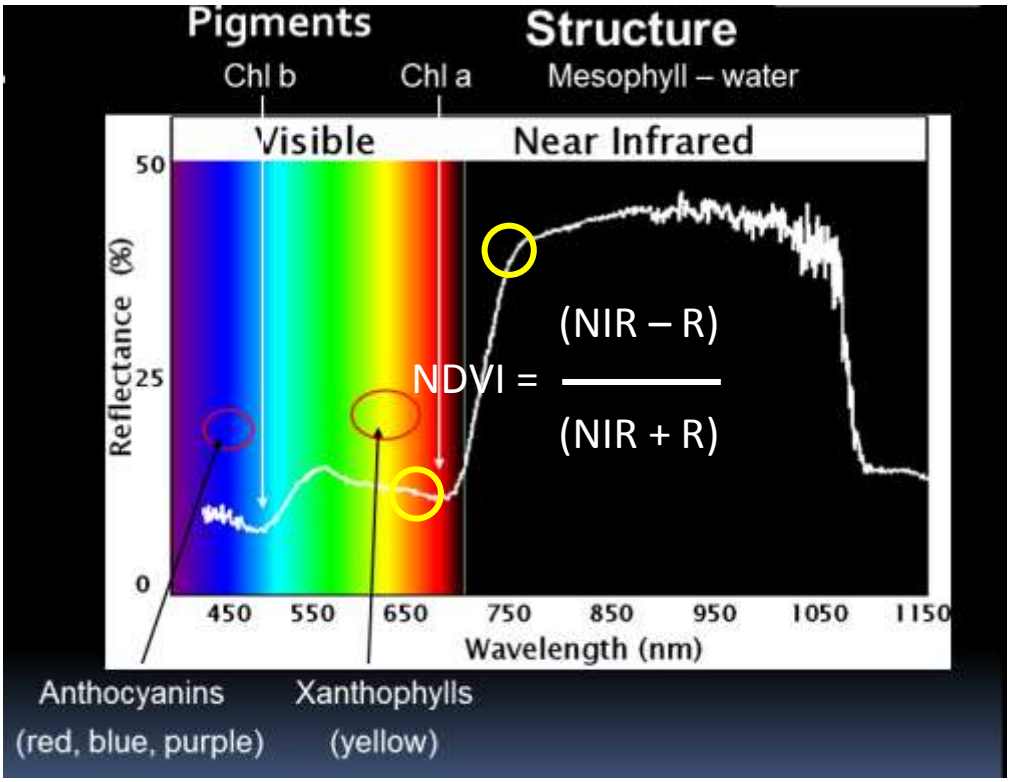
Light Source

Detector

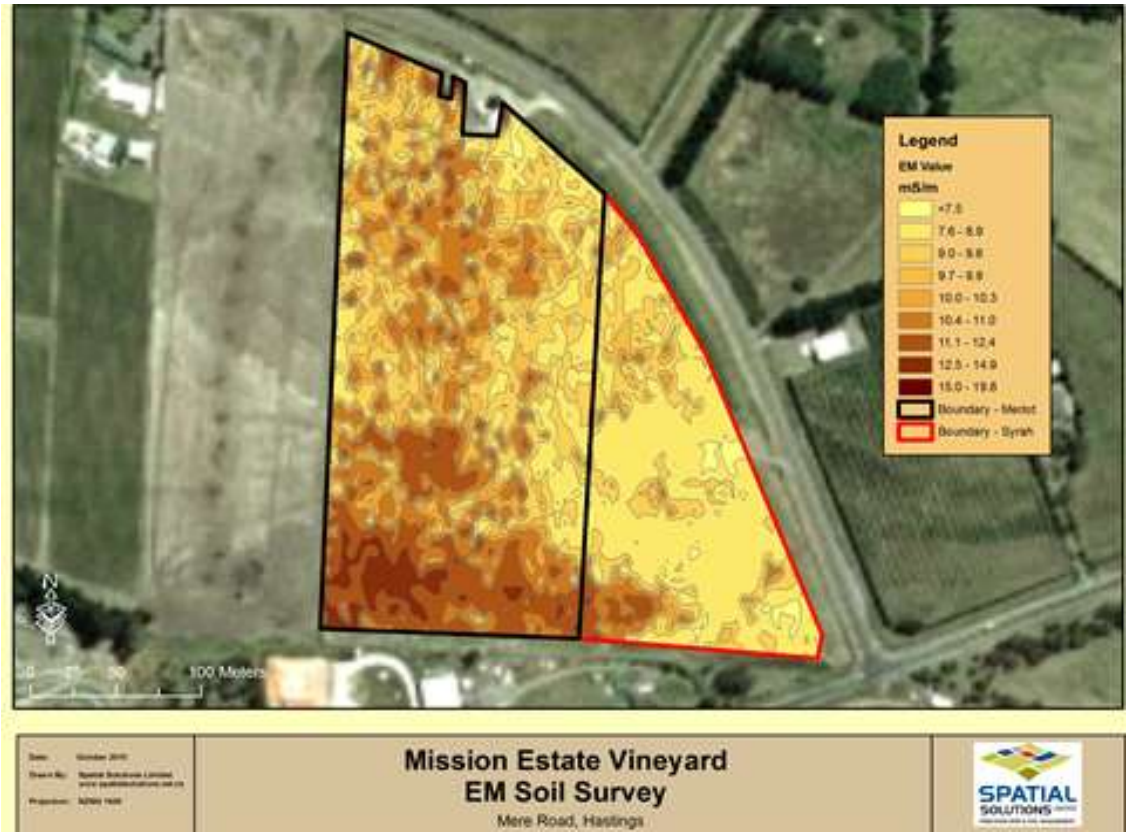


Measures side profile of the canopy to assess vigour/vine biomass. Best when full canopy achieved – pre-veraison to pre-harvest

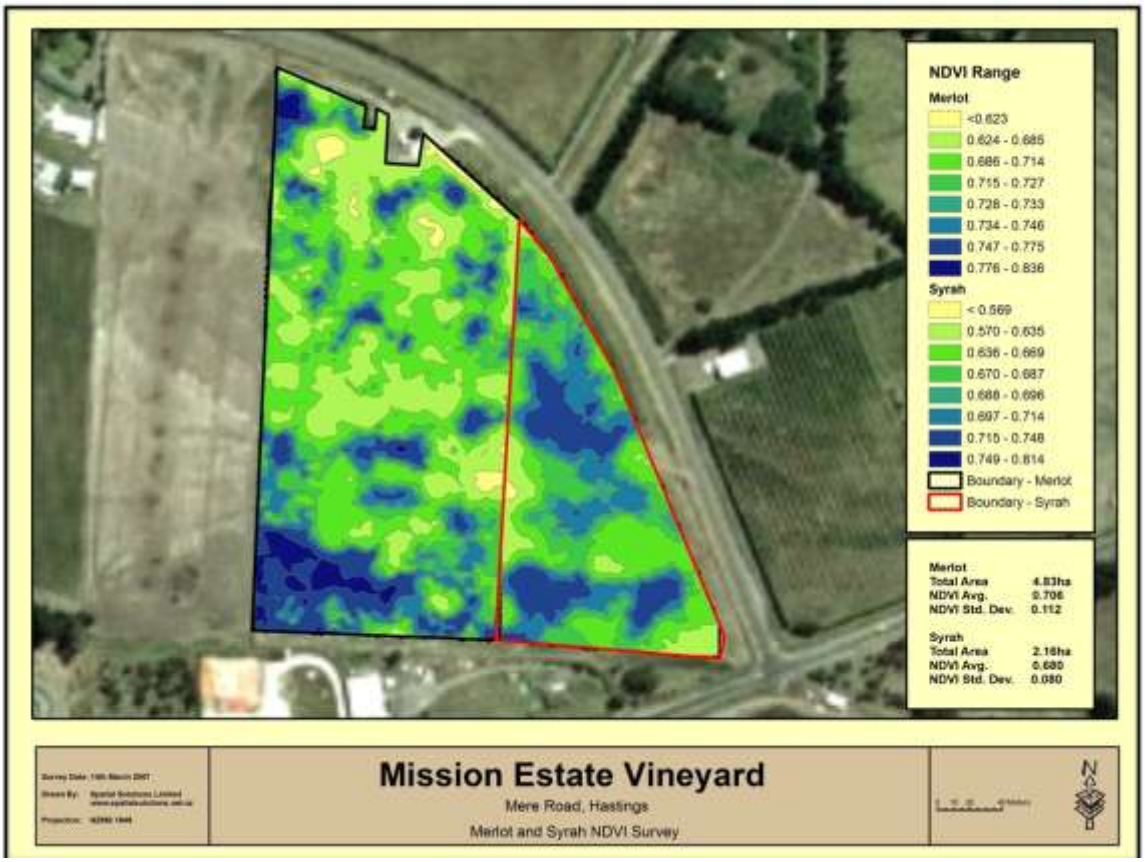
NDVI – ratio of near-infra-red and red reflectance



Thanks: Eileen Perry, DPI, Vic

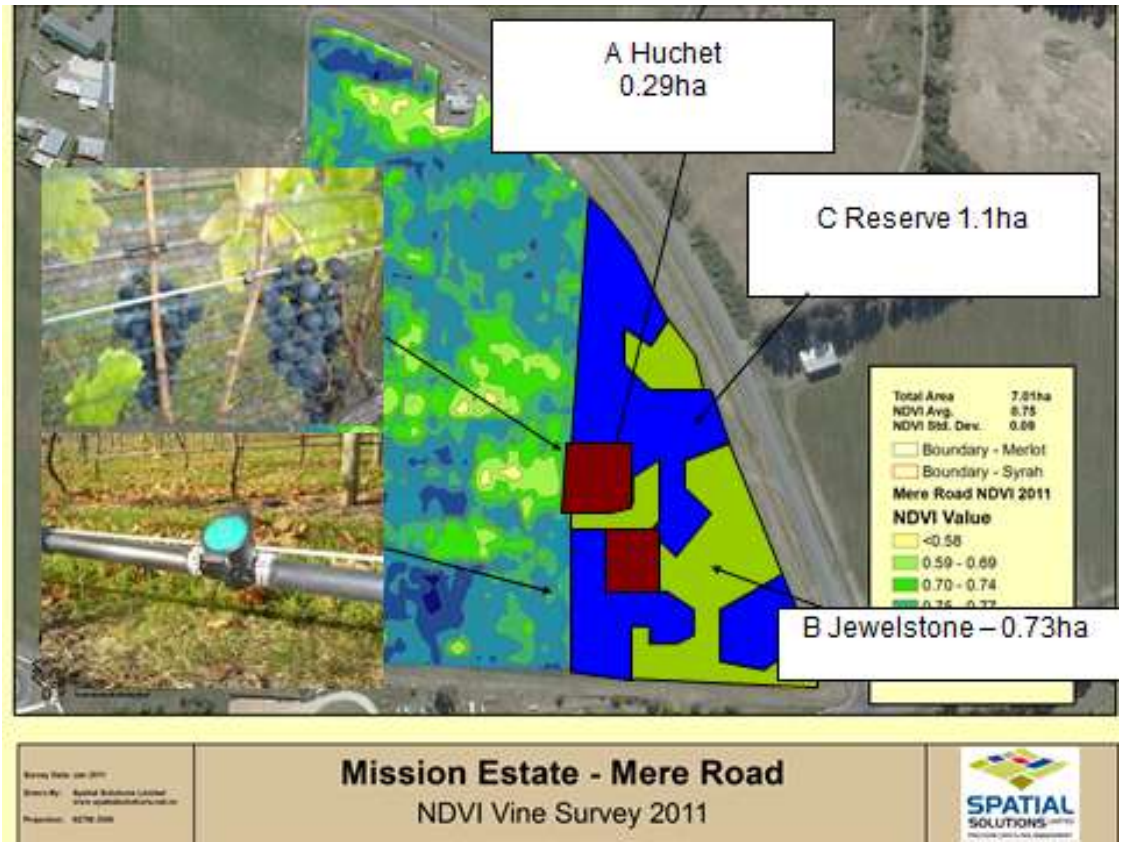


Mere Rd, 2010 EM Soil Survey



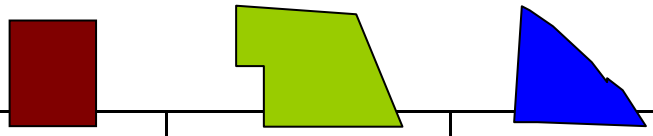
Mere Rd, 2007 NDVI Canopy Vigour Survey

Mere Rd, 2011 NDVI Canopy Vigour Survey



Mere Rd, 2011 Management Zones

Management Zone Cost Structure – 2010



	Huchet	Jewelstone	Reserve
Task	**Cost/vine**	**Cost/vine**	**Cost/vine**
Pruning	0.45	0.5	0.6
Shoot thinning	0.15	0.2	0.25
100% leaf removal	0.1	0.15	0.2
Crop removal	0.25	0.2	0.25
Pinning of shoots	0.55	0	0
Lateral thinning	0.15	0.20	0.2
TOTAL INPUT COST	1.65	1.25	1.5
Yield/vine	1.9	2.5	3
$/Kg	3.5	2.5	2
Gross per vine	6.65	6.25	6
Net per vine	$5	$5	$4.50

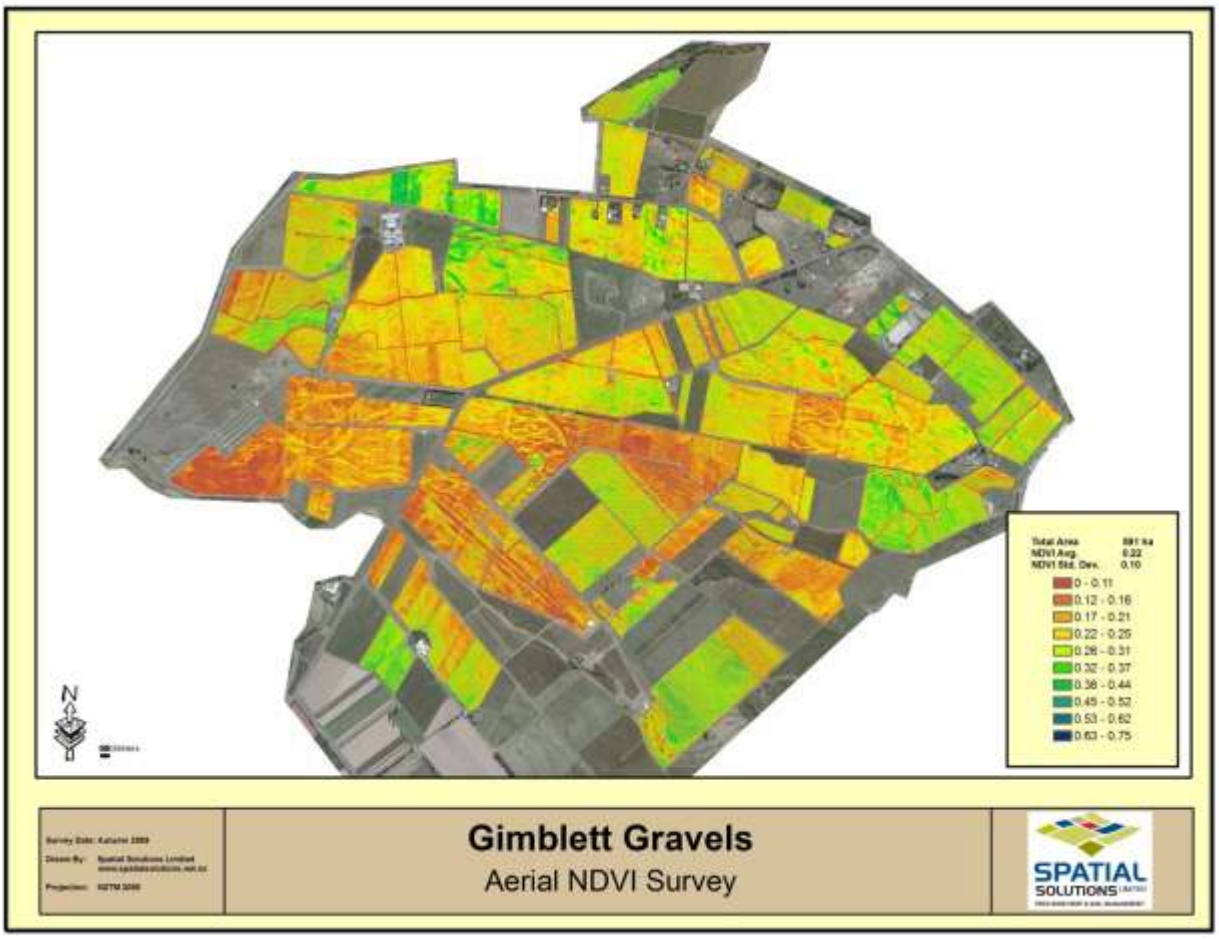
Date	Range	Brix	pH	TA	
26/03/2010	A - Huchet	22.9	3.12	10.13	
26/03/2010	B - Jewelst	21.9	3.14	10.65	
26/03/2010	C - Reserve	21.4	3.14	10.87	
9/04/2010	A - Huchet	24	3.172	9.75	
9/04/2010	B - Jewelst	21.3	3.16	10.21	
9/04/2010	C - Reserve	21	3.146	10.82	
13/04/2010	A - Huchet	24.7	3.237	9.54	
13/04/2010	B - Jewelst	21.4	3.156	10.17	
13/04/2010	C - Reserve	21.3	3.149	10.79	
17/04/2010	A - Huchet	24.2	3.436	8.25	HARVEST
20/04/2010	B - Jewelst	23.9	3.455	9.00	HARVEST
20/04/2010	C - Reserve	22.9	3.249	9.75	HARVEST

What will be different in 2011-2012?

- Block cane pruned
- Shoot thinning change within zones
- Low and medium vigour zones - one bunch per shoot
- Higher vigour zone - two bunches per shoot
- 100% leaf removal from bunch zone
- Varying crop loads across zones
- Fruit quality, quantity monitored across zones
- Financial performance assessed

Monitoring with Precision Tools

- Primarily to quantify variation. Significant or not?
- Are there significant yield differences?
- Are there significant quality differences?
- Are there significant flavour differences?
- Is there money to be saved and gained through managing vineyards based on variation?
- Can economic performance be improved by managing these different areas?



About LandWISE

- A sustainable farming group established in 1999
- Provides extension and research to support cropping
- Strategic relationships: farmers and growers, regional councils, sector groups, science and industry
- An incorporated society of voluntary members
- Resources freely available at www.landwise.org.nz
- Regional and topical discussion groups
- Annual Conference in May

Opportunities for Wine Growers

- Make sure you are aware of precision tools
- Understand their ability to add value
- Beware of “agri-porn”, it may not give real value
- Contact wine growers who are already involved
- Take part in the Site Specific Vineyard project
- Form a precision viticulture discussion group
- Develop a session at LandWISE Conference 2012

The Case Study Vineyards

- Villa Maria, Omahu Road
- Mission Estate, Mere Road
- Kokako Vineyards, Ohiti Road

Project Event Plan

Pruning and Thinning – 17 August 2011

- Villa Maria, Omahu Vineyard
- Zone marking, pruning decisions, example pruning

Setting up the Season – 26 October 2011

- **Mission Estate – Mere Rd Vineyard**

Leaf Plucking – Early November

- Early vigour sensing, canopy density, costing estimates

Crop Thinning – Mid December

- Zone based yield estimation, target yields, thinning strategy

Pre-Harvest – Late February

- Zone sampling analysis, Review of yield data

Post-Harvest Wrap up – Early May

- Zone yield information, juice analysis, winemaker feedback

Contacts for more information

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