

USING CROP SCANNING TECHNOLOGIES TO IMPROVE VINEYARD MANAGEMENT

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Location of Yalumba Vineyards in Australia

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PRE PRECISION VITICULTURE

Vineyards were managed as a single unit with little consideration given to variability.

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REASONS FOR ADOPTING PRECISION VITICULTURE TOOLS

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STIMULUS FOR ADOPTION

1. The need/ want for improvement
2. Stimulation via industry research (Bramley, Lamb...), other industries and seminars
3. Point of difference – limited adoption within the wine industry
4. Availability of usable & affordable technology

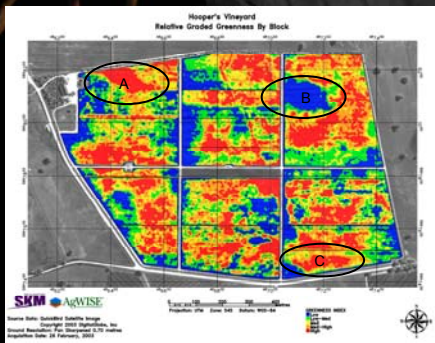


IDENTIFIED IMPROVEMENTS

- Crop estimate
- Strengthen harvesting decisions
- Improve operational processes
- Increase yield
- Build wine quality
- Time saving
- Grow profit



OUR FIRST TASTE



HOW DID WE BEGIN THE ADOPTION PROCESS?



THE MENZIES PROJECT OUR FIRST REAL STEP

- Aim of the project was to improve wine quality using precision viticulture tools
- Plant cell density maps (PCD) were the primary PV tools used
- Ground truthing PCD maps helped to quantify viabilities within vineyard
- Liaised with PV experts

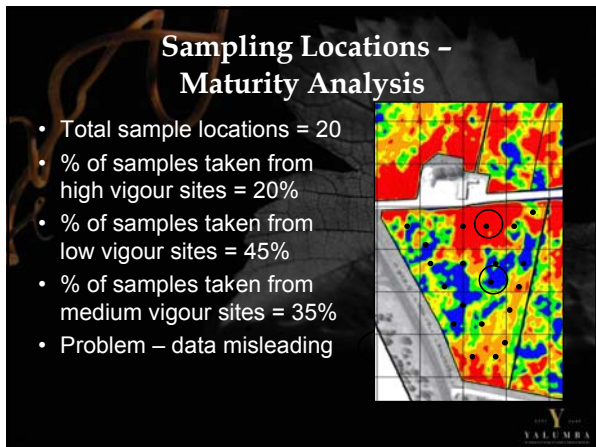
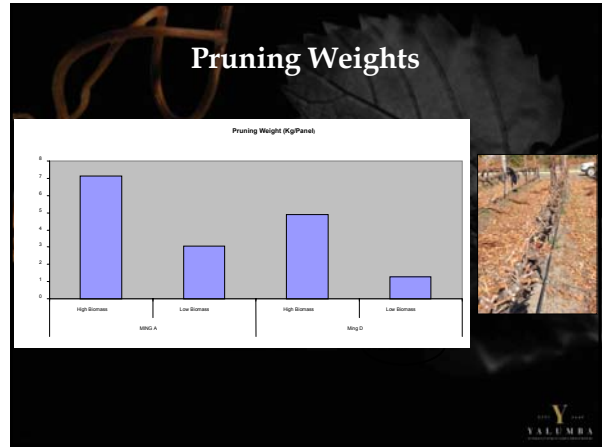
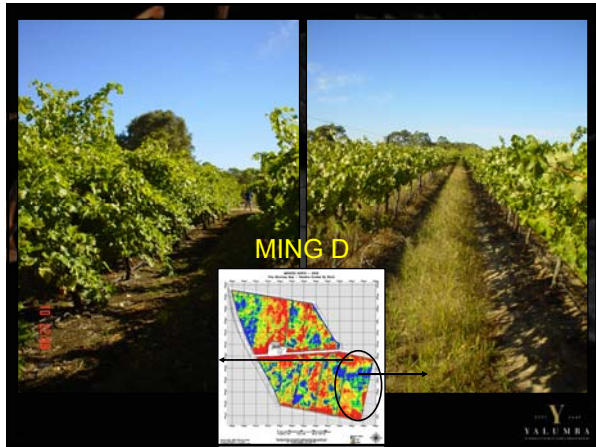
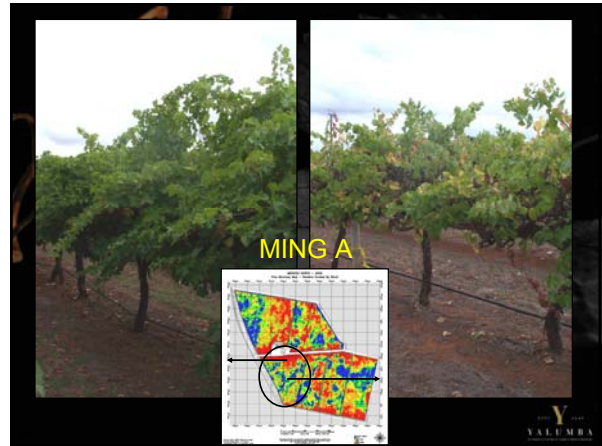
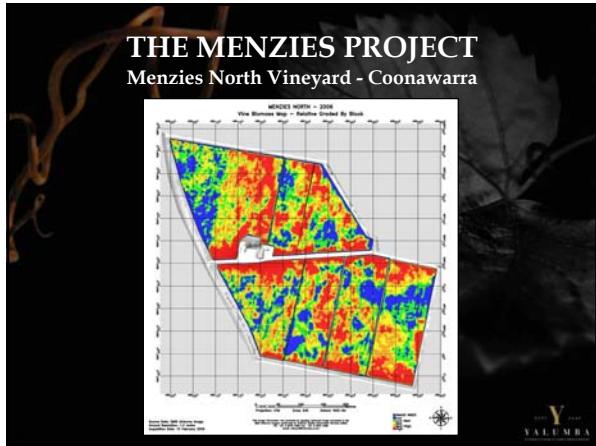


THE MENZIES PROJECT

Data Collected

- Pruning weights
- Sampling locations
- Maturity data
- Yield
- Grape quality data
- Vine nutrition data
- Sensory analysis

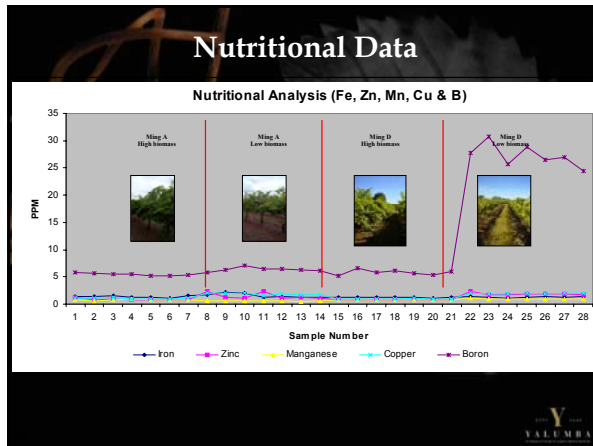




Harvest Data

	MING A			MING D		
	Low Vigour	High Vigour	Difference	Low Vigour	High Vigour	Difference
Baume	14.28	13.74	0.54	17.71	14.43	3.28
Berry Weight (g)	0.68	0.94	0.26	0.43	1.08	0.65
Anthocyanin (mg/g)	2.63	1.89	0.74	2.03	1.97	0.06
Yield (Kg/vine)	4.14	9.69	5.55	0.89	4.49	3.60

YALUMBA



Small Batch Winemaking

- Small batch winemaking
- Made under controlled conditions
- Evaluated by experienced winemakers

Wine Evaluation - Small Lot

Winemaker	Wine Number (score)							High Vigour Mean Scores	Low Vigour Mean Scores
	1 ¹	2 ¹	3 ²	4 ¹	5 ²	6 ²	7 ²		
1	14.5	14.5	14.5	15.5	15.5	16	15	14.83	15.23
2	15	15	14.5	15.5	14.5	14	14	15.17	14.25
3	13	14	15	14	15	15	15	13.67	15
4	16.5	16.5	15	16.5	15	15	15	16.5	15
5	15	15.5	16	15	16	16	16	15.17	16
6	16.5	15.5	17	15.5	16.5	17	15.5	15.83	16.5
7	15.5	15.5	14.5	15.5	15	15	15	15.5	14.88
Mean Score Value	15.14	15.21	15.21	15.36	15.36	15.43	15.07	15.24	15.27

¹ = Wine made from 'high' biomass vines. ² = Wine made from 'low' biomass vines.

Summary of Trial

- The impact to yield, grape maturity and grape colour caused by vineyard variability varied from block to block
- Grape sampling data can be distorted by vineyard variability if variability is not taken into consideration
- Vine nutrition status can change across a vineyard
- Wine quality – assessment of quality very subjective hence difficult to draw a conclusion

Commercial Approach -Harvesting-


- Different vigour sections identified (harvest zones)
- Harvest zones harvested separately
- Wine is made separately at the winery

Commercial Approach -Wine Evaluation-

- Wines from high vigour sites were rated higher in post vintage classification tastings
- Low vigour sites were eliminated from the Menzies wine blend

Controlling the Uncontrollable

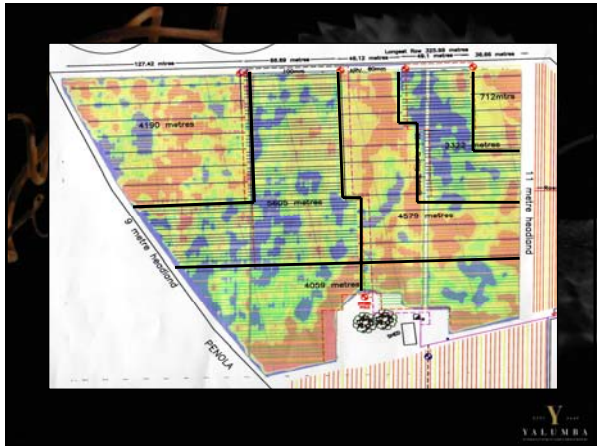
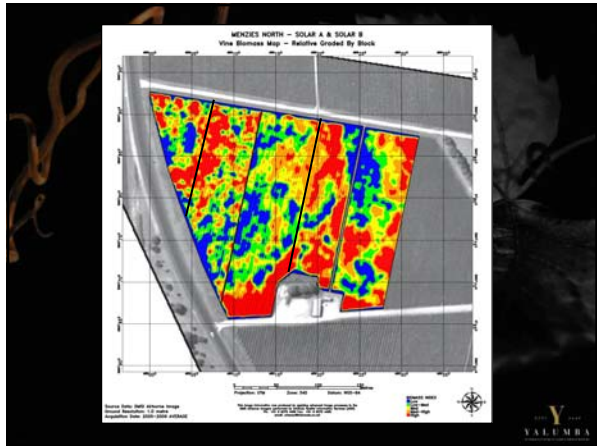
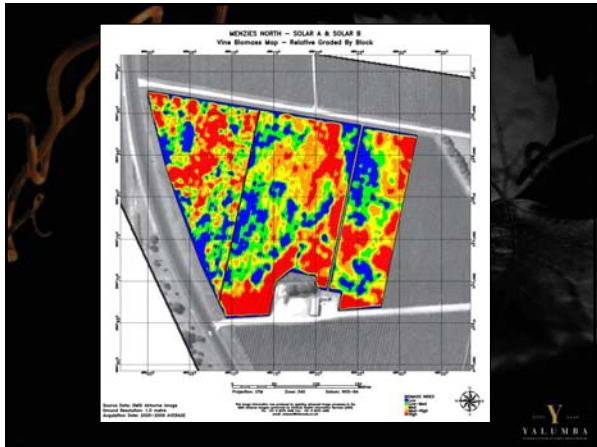
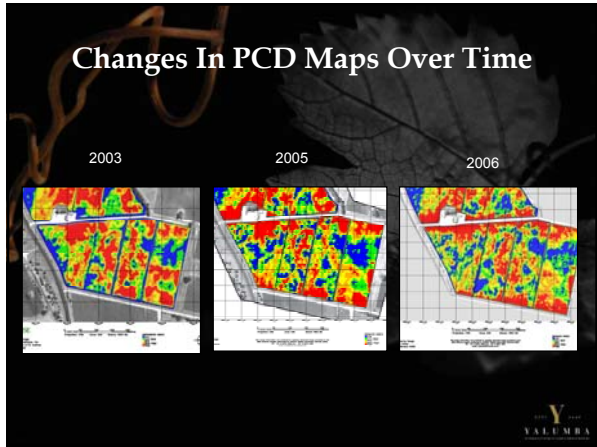
Managing Vineyard Variability



Band Aid Approaches

- Mulch spreading
- Extra drippers
- Blank drip lines
- Mounding
- Pruning techniques








Summary

- The adoption process has been a learning process.
- Cost of adoption has been low.
- The benefits of adoption have been high.
- Adoption by growers has been slow.
- PV is the new frontier for vineyard development and management.
- PV will aid in building better businesses through improved knowledge.



THE FUTURE

