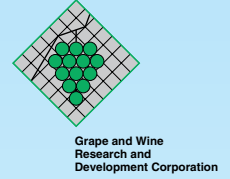


Aiding soil management decisions through the use of precision viticulture technologies

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Background

Vineyards require the implementation of soil management strategies that enable the sustained production of fruit of a target quality. At any individual site, selection of the most suitable soil management strategy for a desired vine performance is difficult and in Australia, has often relied on local conventional wisdom rather than robust guidelines. Through the use of precision viticulture technologies, it is possible to address this dearth of information experimentally through the application of different soil management treatments across entire vineyard blocks. In such a way, treatment effects on vine performance can be linked to other input parameters such as soil fertility or a particular soil constraint.

A Langhorne Creek example

An experiment was established in a 7 ha block of Shiraz characterised by highly variable soil properties and variable rooting depth (Figure 1).

Two treatments aimed at increasing access to stored soil moisture, plus a control, were applied across the block in a highly replicated design (Figure 2). The two treatments were deep ripping of the wheel tracks and use of composted grape marc applied as a surface mulch. The ripping was intended to improve root penetration into the mid-row; the mulch was used to suppress soil water evaporation.

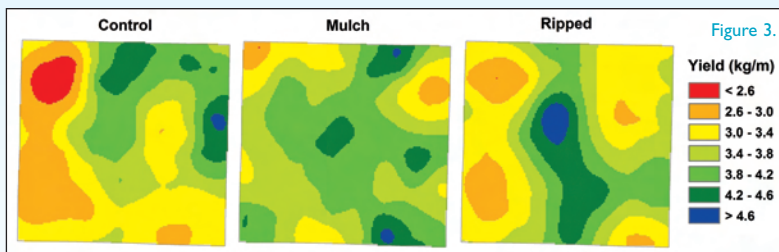
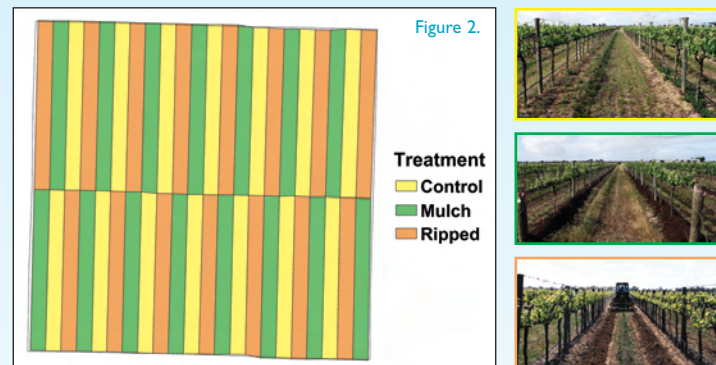
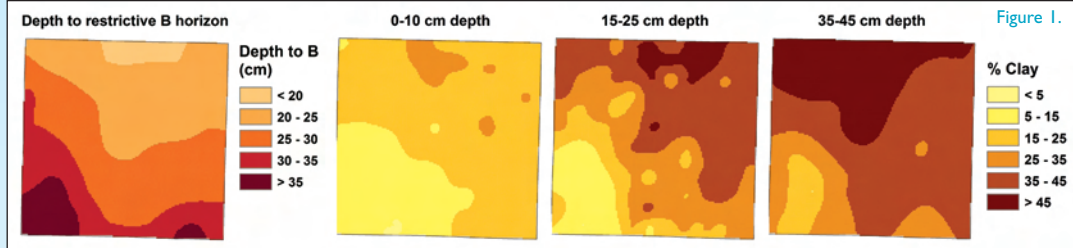


Figure 3 shows vine yield response whilst Figure 4 shows how this vine response is linked to vineyard soil properties.

Conclusions

- The effect of the imposed treatments on vine performance can be linked to the underlying soil conditions.
- The mulch was more effective in increasing yield in lighter soils than ripping.
- This experimental approach has enabled the vineyard manager to understand the variable response to these management options in this block whilst providing useful information that can be transferred to other vineyards with similar soil properties and climate.

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