



# Using remote sensing to predict spatial variability in phenolics and colour at harvest in a Cabernet Sauvignon vineyard

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Test site: 7.3 Ha Cabernet Sauvignon, Coonawarra SA, single wire trellising.

## We asked...

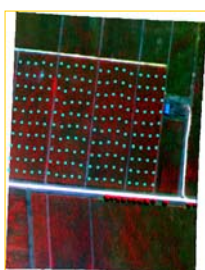
If remote sensing can discriminate between different levels of photosynthetically-active biomass (PAB) in vine canopies, then can it indirectly map variation in fruit quality (total phenolics & colour) in red winegrapes ?

## We set out to evaluate...

- Whether observed differences in canopy architecture (density, area) are associated with differences in colour/phenolics.
- The best time to image the vine canopy (for highest association).



CSU's multispectral airborne imaging system. 4-bands: NIR (770 nm), R (650 nm), G (550 nm), B (450 nm)



A false-colour (NIR, R & G) image with field sampling sites overlaid

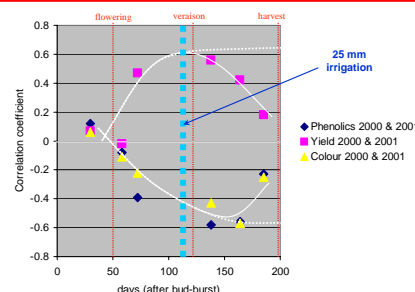
## We measured and we processed...

- Multispectral airborne imagery was acquired using an airborne imaging system.
- Images were converted to NDVI (normalized difference vegetation index).
- NDVI values were extracted from image pixels coincident with on-ground measurements.
- Correlations between NDVI and total phenolics and colour were investigated over a 200-day period after bud-burst.

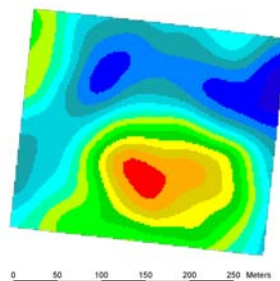
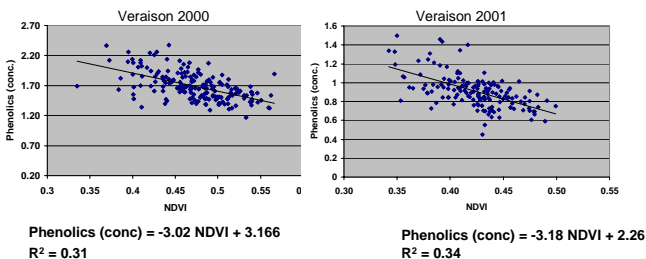
## We found

(for this vineyard, which has a sprawling, unconfined canopy over a scenscing grass cover-crop)

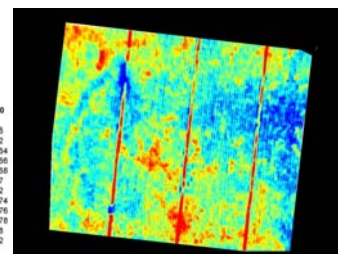
- NDVI imagery, with spatial resolution comparable to the inter-row spacing, **did** show regions associated with different colour and phenolics levels.
- Correlations increased with days post bud-burst with a **maximum at veraison**.



Example correlation plots



Map of phenolics interpolated from on-ground data



Phenolics map estimated from airborne image acquired at veraison



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**Note:** A large portion of this work was completed while DL was a member of NWGIC, CSU Wagga Wagga, NSW 2678

The CRC for Viticulture is a joint venture between the following core participants, working with a wide range of supporting participants.

