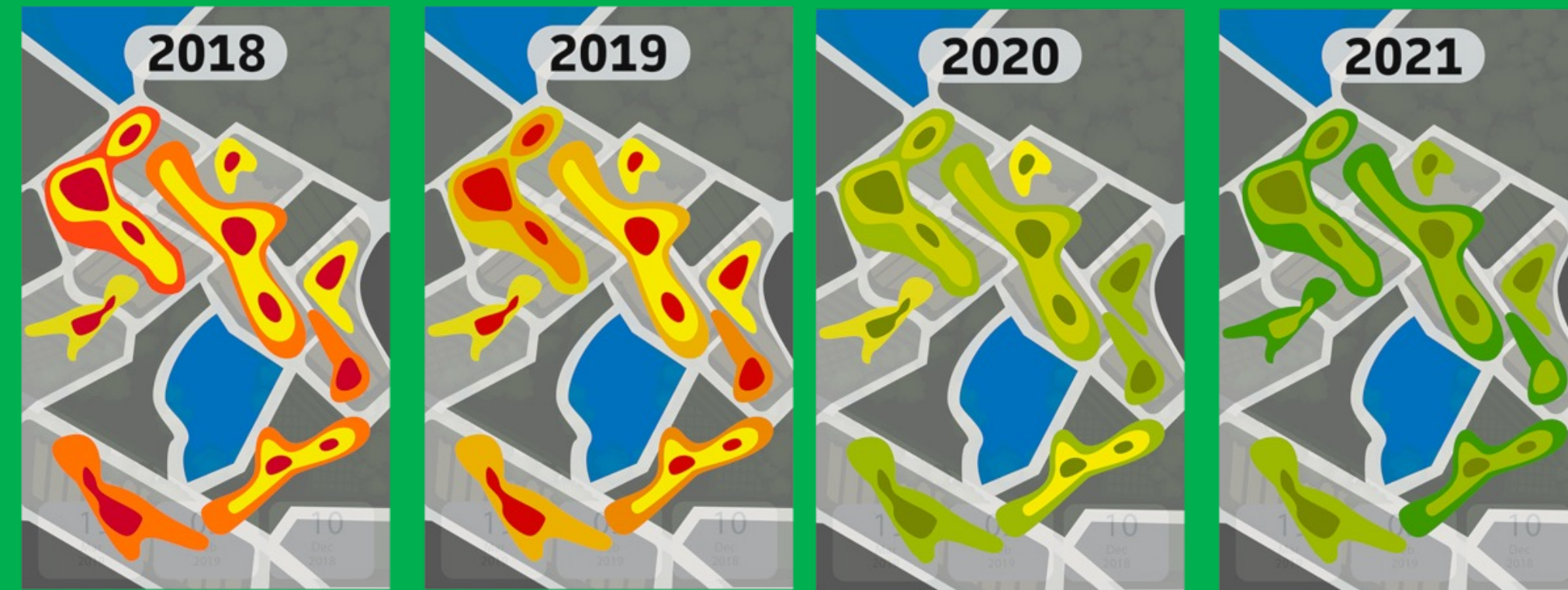


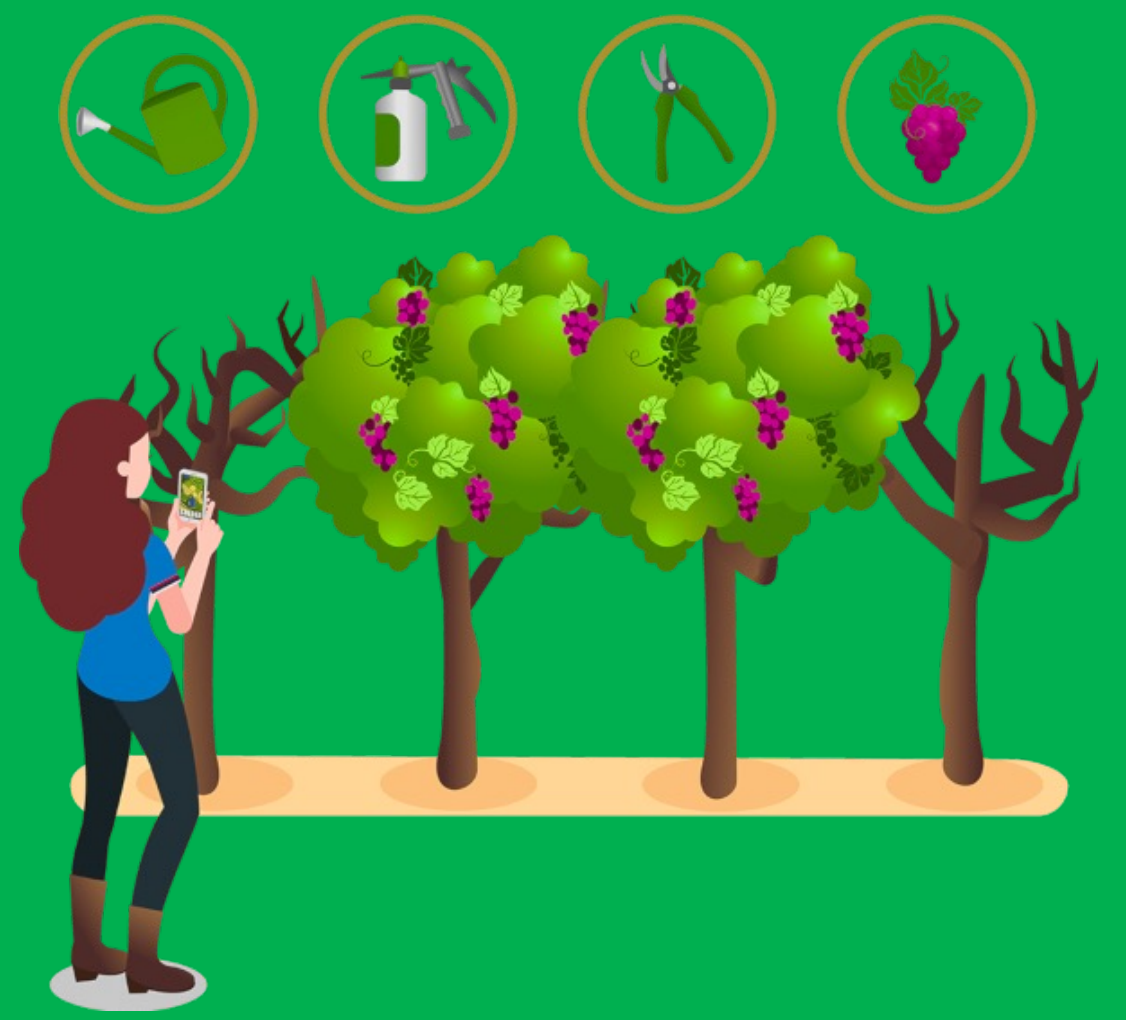
Roberta De Bei and Cassandra Collins

The University of Adelaide, School of Agriculture, Food and Wine, Waite Research Institute, Adelaide, Australia

Understanding vineyard variability to target management strategies, apply inputs efficiently and deliver consistent grape quality to the winery is essential. VitiCanopy provides users with a quick tool to measure grapevine canopy size and porosity by simply taking a snapshot of the vine.



Create maps of your vineyard and identify variability to direct decisions  
Create a history of your vineyard and compare within and between seasons



Measure canopy architecture easily and objectively any time

Focus inputs where they are needed and increase profitability

## CASE STUDIES

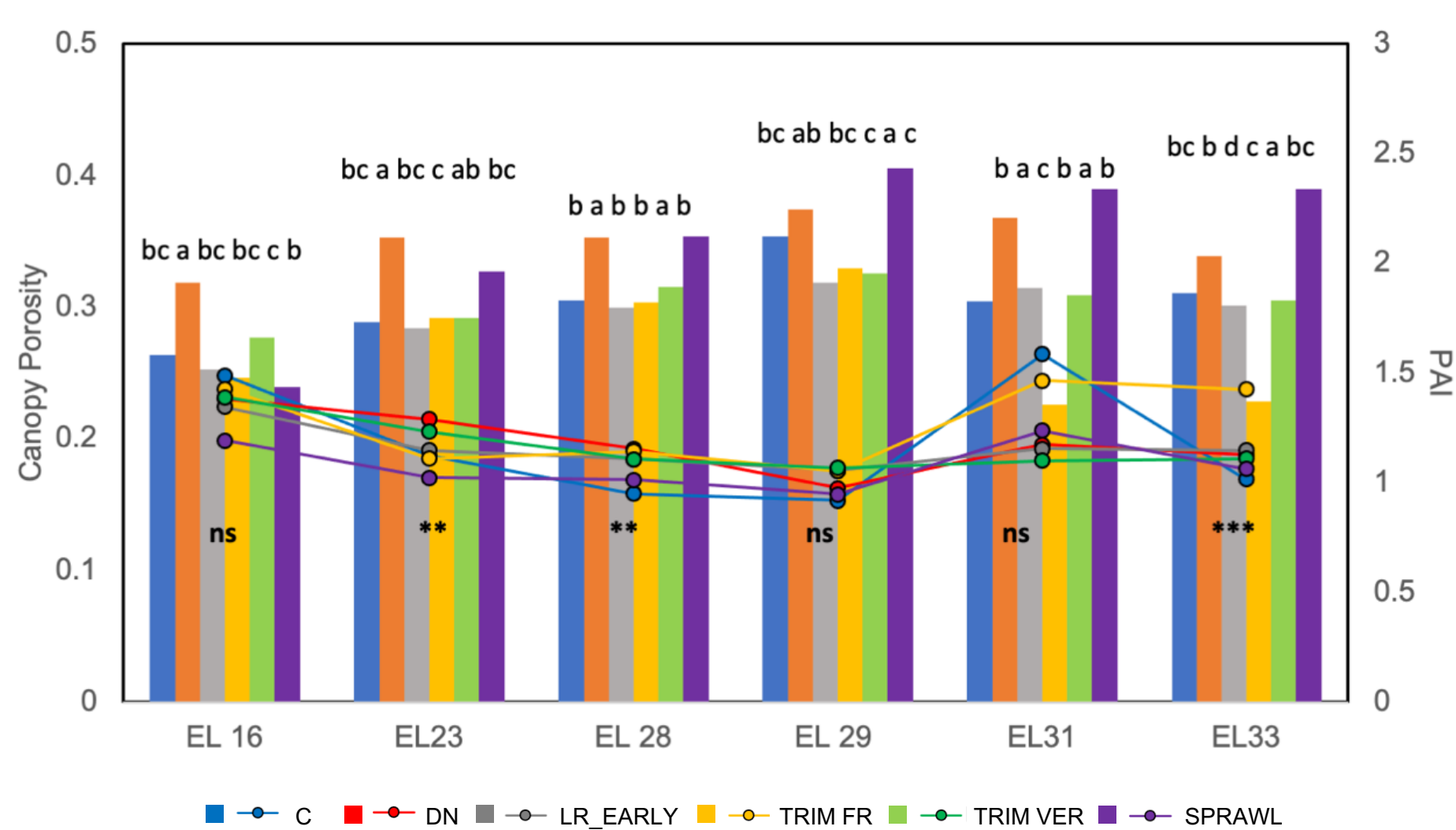


Figure 1: Effect of canopy manipulations on the canopy development (PAI) and canopy Porosity measured with VitiCanopy throughout a growing season in Semillon subjected to different canopy management strategies: C=Control, DN=Light pruning, LR-EARLY=leaf removal at flowering, TRIM FR=trimming at veraison, SPRAWL=sprawling canopy. Treatment effects were analysed with ANOVA and the means separated with Tukey's test.

### Measuring management outcomes

Canopy manipulations influenced canopy architecture throughout the growing season (Figure 1). The same data series is presented as a sequence of maps to show the spatial variability in the vineyard block (Figure 2). These maps show how the canopy management treatments increased variability in the four rows. The greatest difference in PAI is related to the higher node number retained at pruning in DN (top and bottom edge of the block (in blue)) and to the sprawling canopy treatment which corresponds to the green/blue areas along the left side of the map.

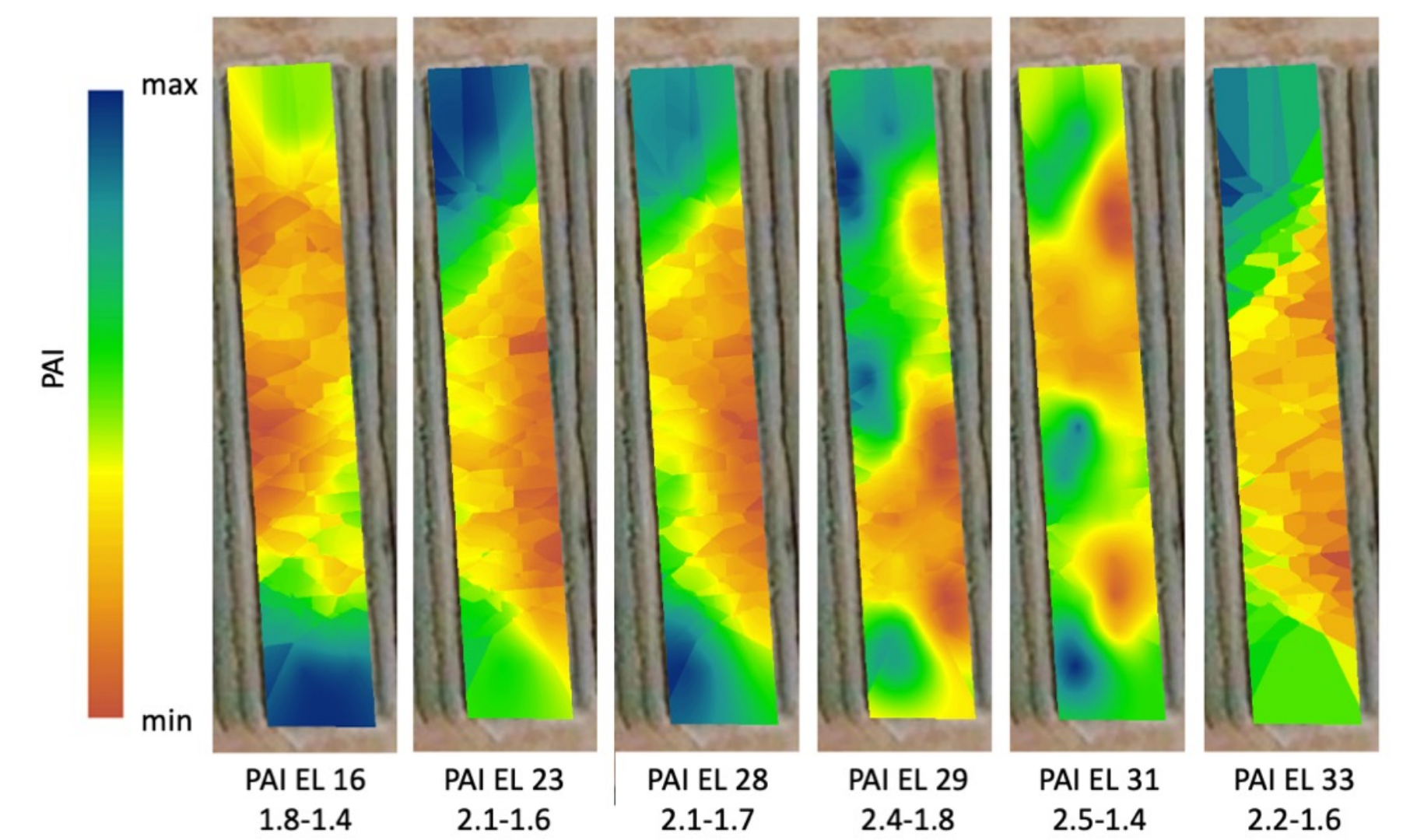


Figure 2: Spatial variability of the PAI in a Semillon block at different phenological stages within the same growing season.

### Measuring pruning weight at dormancy

In winter 2020, VitiCanopy was used to estimate the pruning mass of dormant vines. Images before and after pruning were taken together with the measure of the pruning mass (Figure 3). The coefficients of determination ( $R^2$ ) of the relationship between the values obtained with VitiCanopy (canopy cover rather than PAI) and the measured pruning weight was 0.94 (Figure 4).

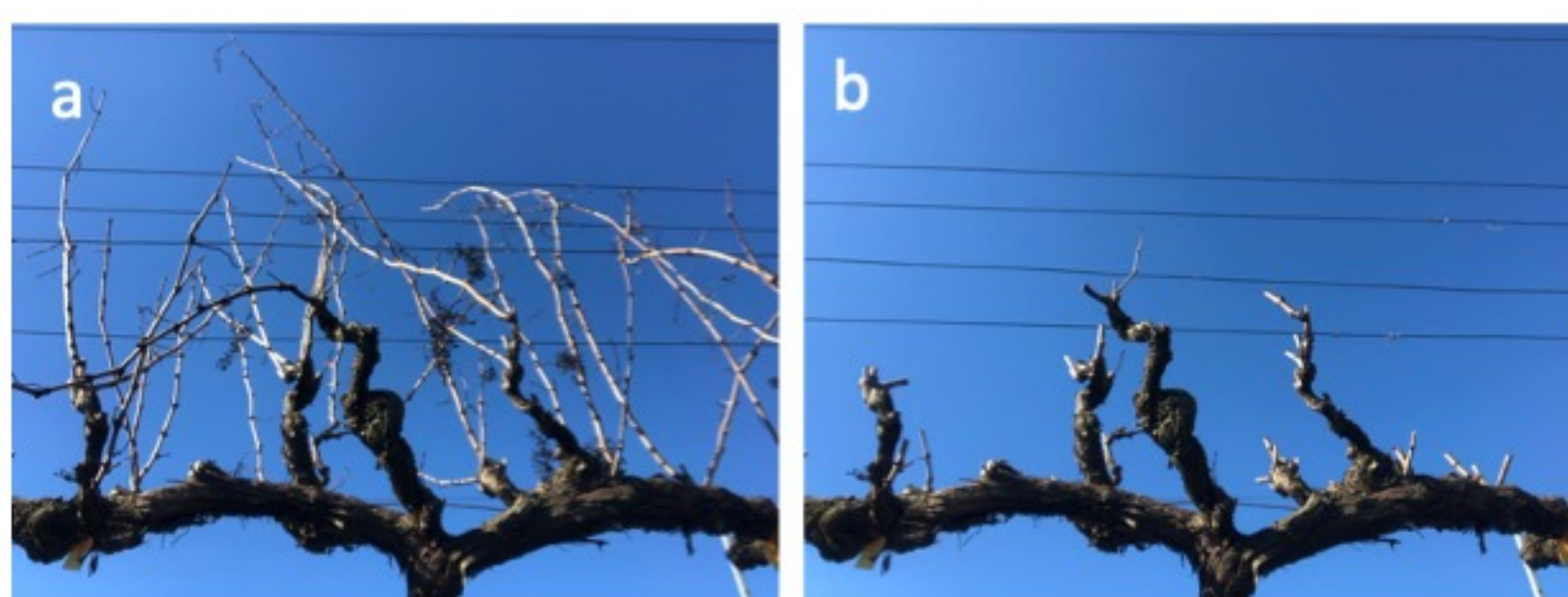


Figure 3: images of Semillon vines taken before (a) and after (b) pruning.

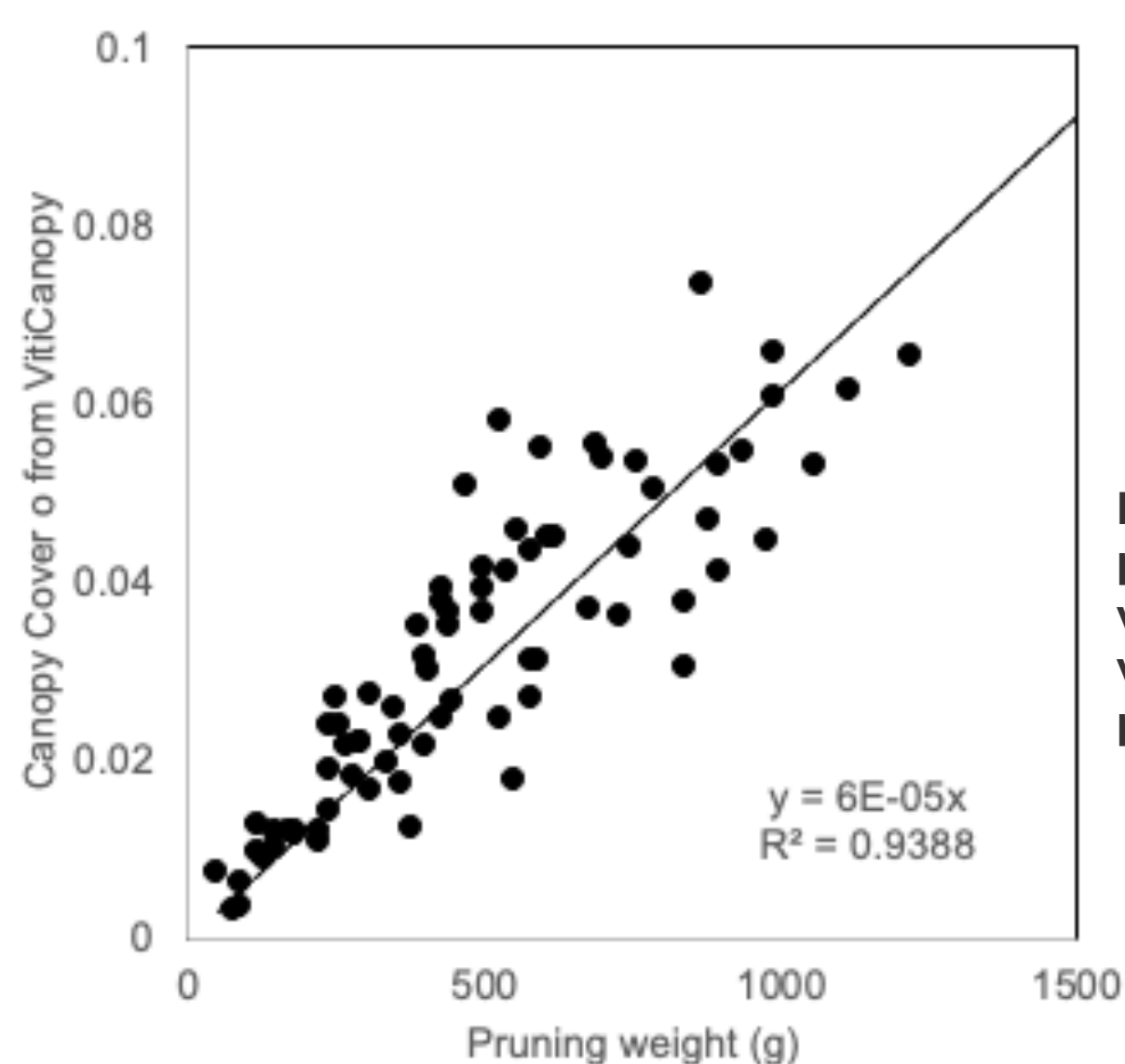


Figure 4: Relationship between pruning weight and canopy cover values obtained by imaging Semillon vines with VitiCanopy before and after pruning.

### Assessing vineyard variability

Three blocks of Chardonnay within the same vineyard were imaged at veraison and they showed different PAI values (Figure 5). Block C had very low PAI with possibly areas of concern toward the eastern edge, lined with trees. The maps captured at veraison were used by management to implement an irrigation strategy aimed to increase PAI in blocks B and C that were deemed too low for the developmental stage. The new irrigation regime for blocks B and C achieved the desired effect of increasing canopy size. Block B not only achieved higher PAI values towards harvest but also greater uniformity across the block. In block C, irrigation was able to increase PAI for most of the area but the edges, with the eastern edge remaining unchanged, due to competition for water resources from neighbouring trees.

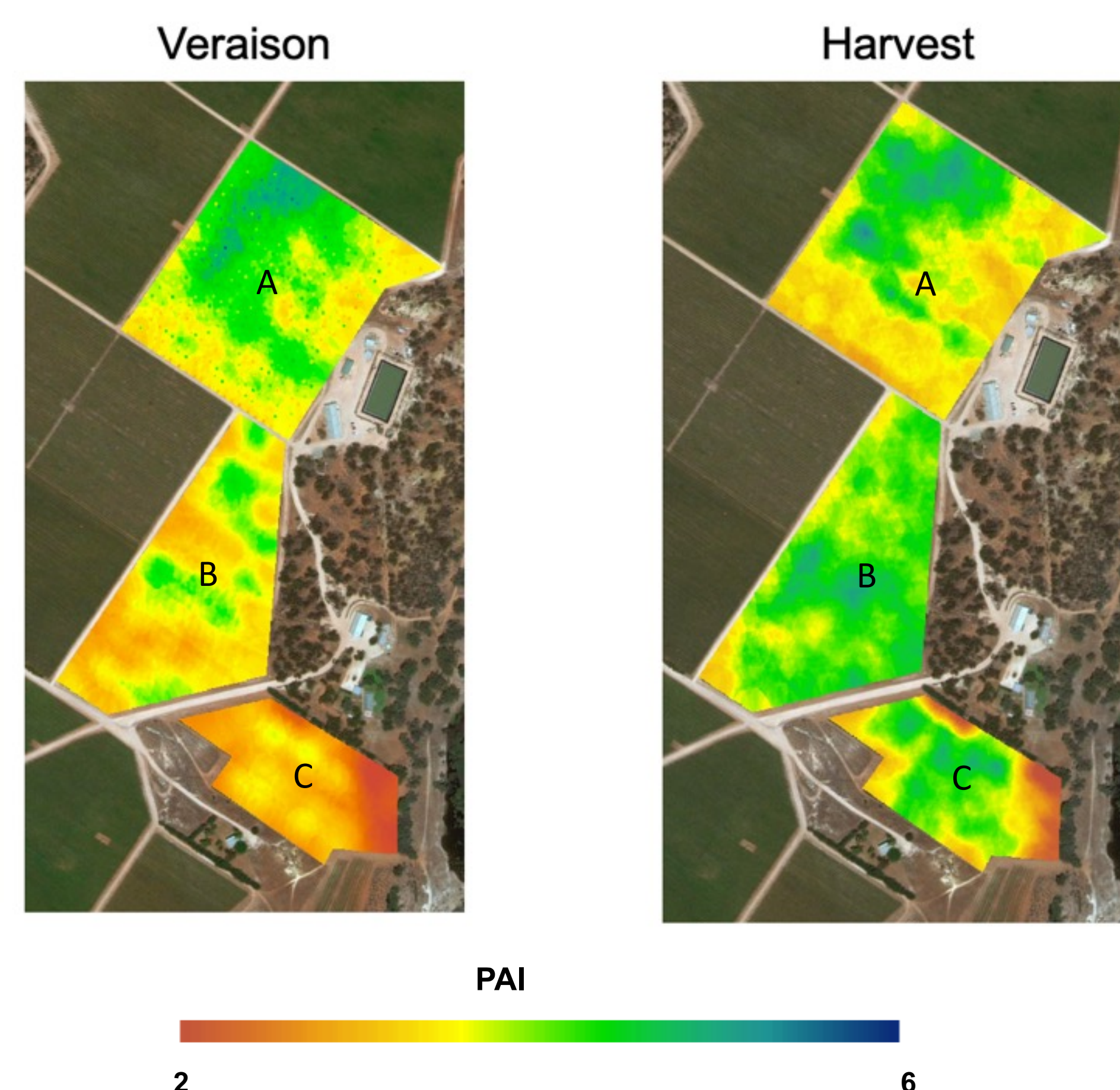


Figure 5: Maps of vineyard PAI variability in three vineyard blocks, A, B and C (Chardonnay) at two timepoints (veraison and harvest) during the same growing season.

### Further reading:

- De Bei, R et al., 2016. VitiCanopy: A free computer App to estimate canopy vigor and porosity for grapevine. *Sensors*, 16(4), p.585.
- De Bei, R. et al., 2019. Vineyard variability: can we assess it using smart technologies? Original language of the article: English. *IVES Technical Reviews, vine and wine*.
- De Bei R. and Collins C, 2022. Mapping and tracking canopy growth. *Wine & Viticulture Journal*. Volume 37, No 2, 2022 – Winetitles
- De Bei, R. et al., 2015, May. Linking canopy architecture to grape quality using the LAI canopy app. In *Proceedings of the 19th International Meeting of Viticulture GIESCO*, Montpellier, France (pp. 585-588).
- Ouyang, J. et al., 2020. UAV and ground-based imagery analysis detects canopy structure changes after canopy management applications. *OENO One*, 54(4), pp.1093-1103.

### Download VitiCanopy now

