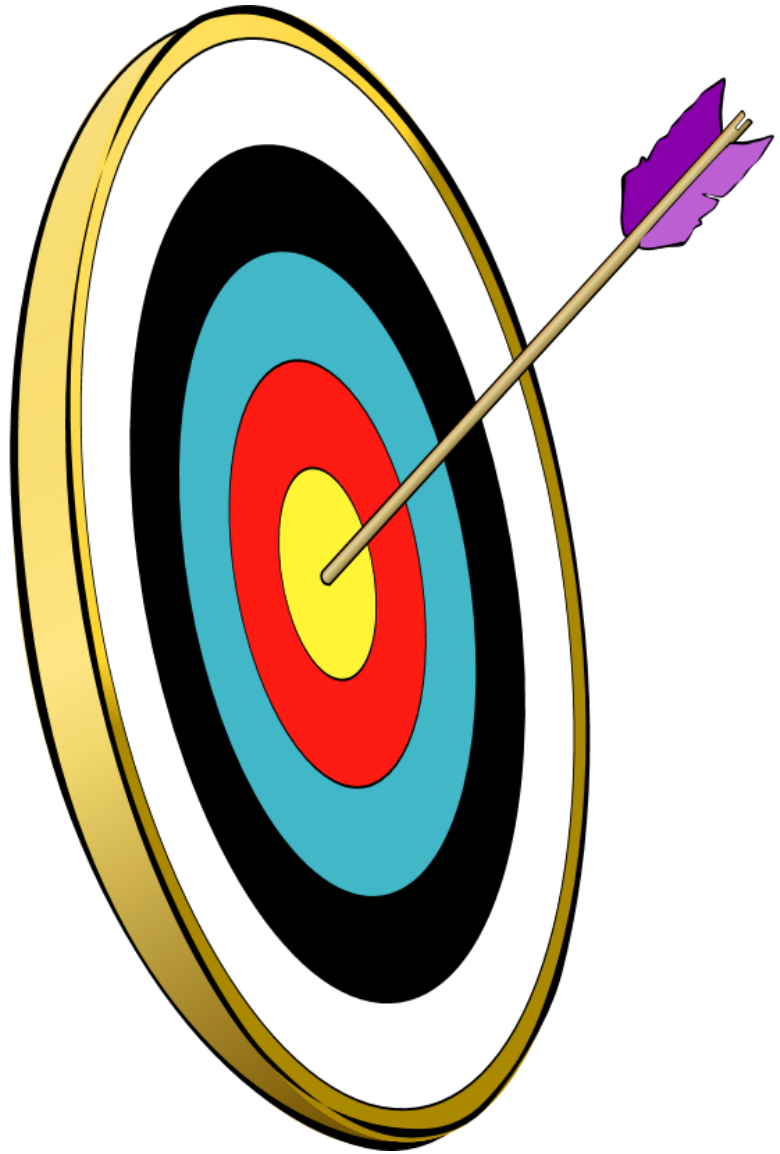
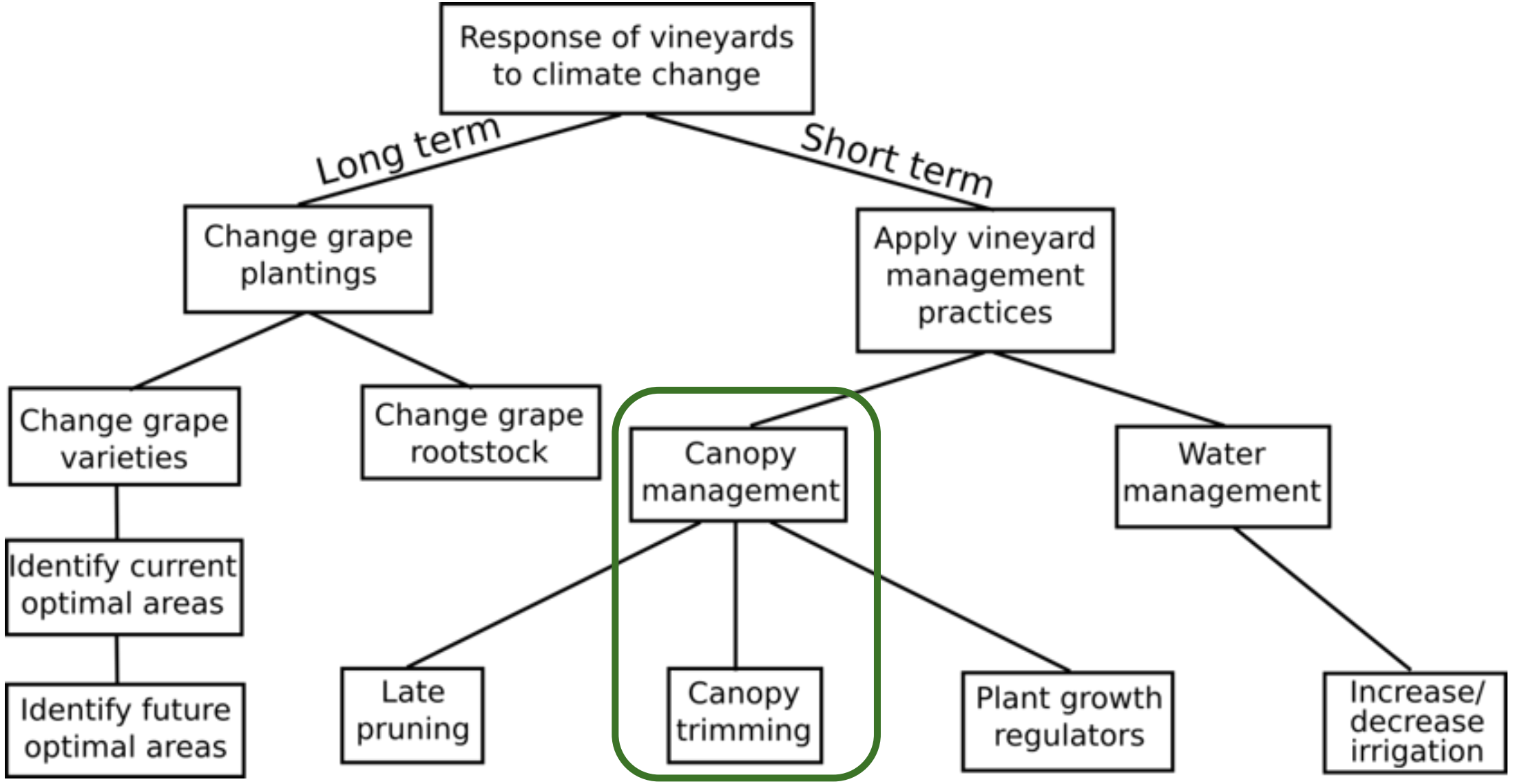
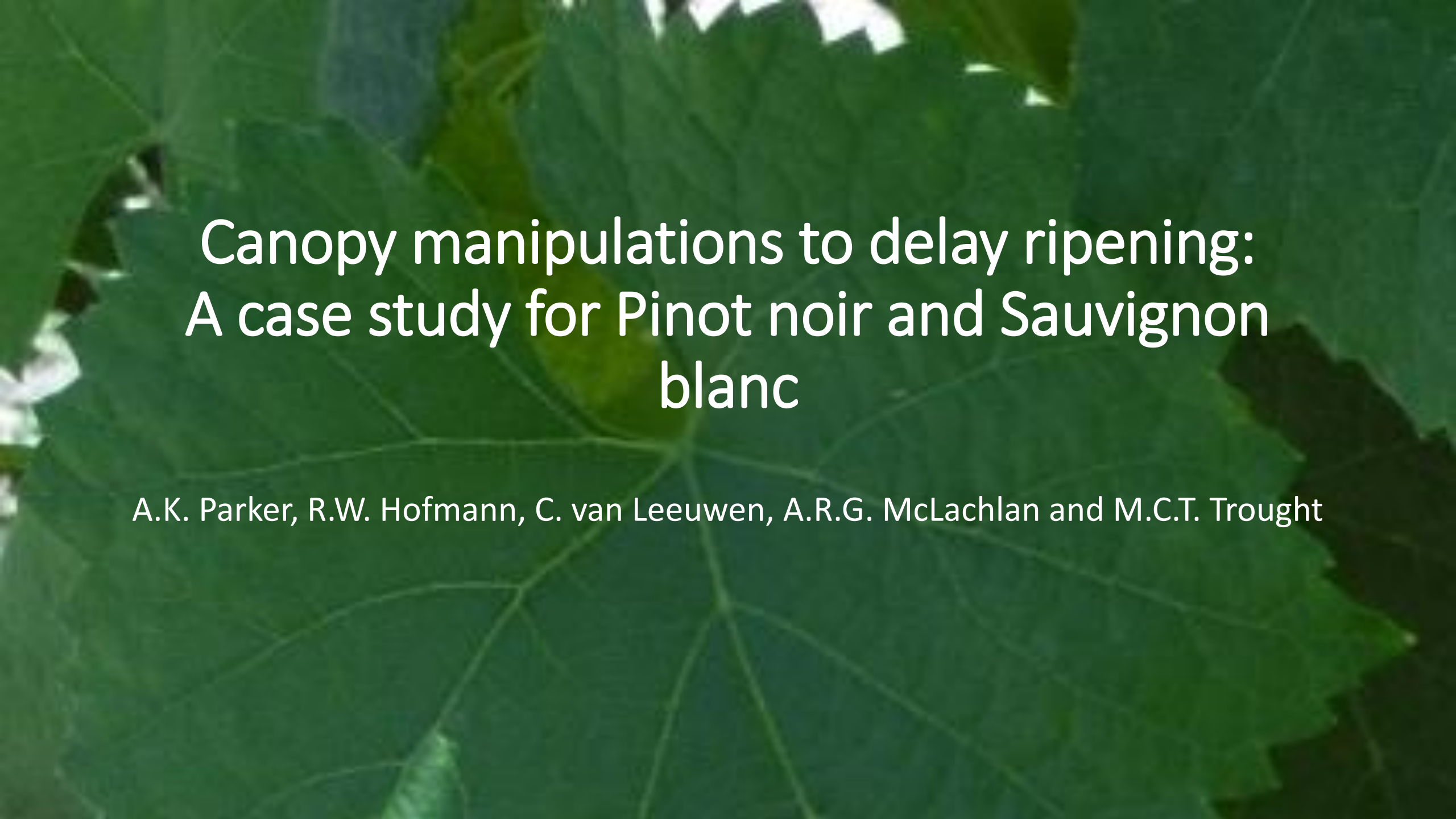


START




*Sturman, A. (2015, pers. Comm.)*



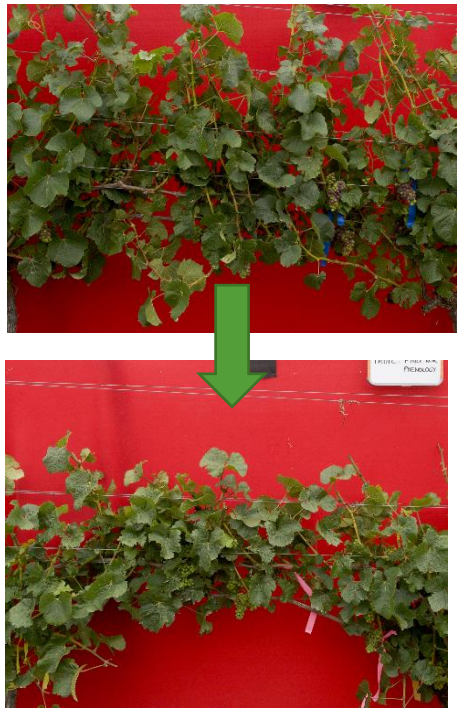
# Canopy manipulations to delay ripening: A case study for Pinot noir and Sauvignon blanc

A.K. Parker, R.W. Hofmann, C. van Leeuwen, A.R.G. McLachlan and M.C.T. Trought

# Canopy management

- Modify leaf area to fruit weight ratio =
  Change carbohydrate source-sink ratio of the vine

↓ Leaf area



↓ Source supply to ripen grapes

# Canopy management

- Modify leaf area to fruit weight ratio =
  Change carbohydrate source-sink ratio of the vine

↓ Yield

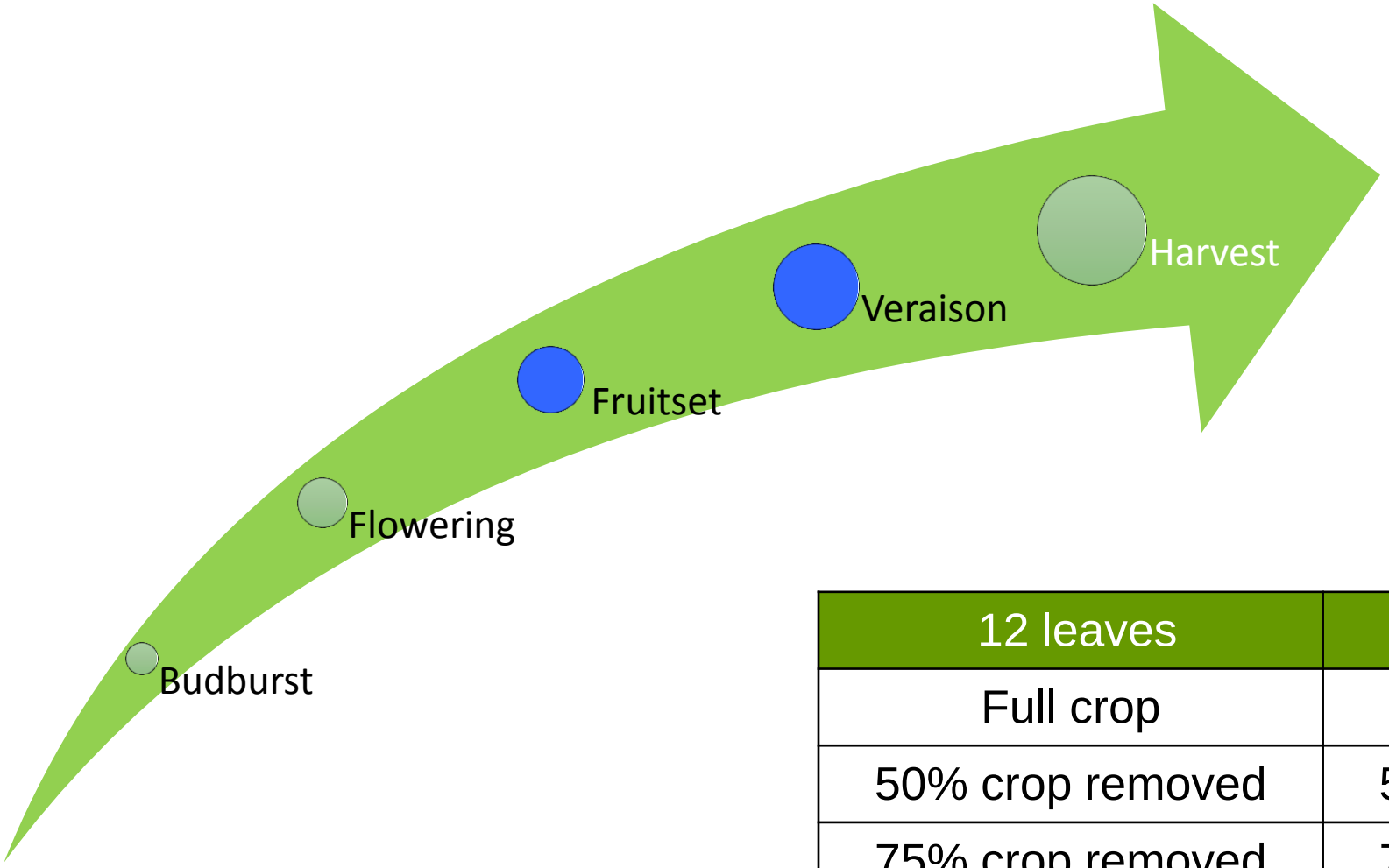
↓ Sink demand
More source for less sink

*PHOTO SOURCE: M.C.T. TROUGHT*

# Aim

To investigate the effects of canopy trimming (which alter the source-sink ratio of the grapevine) on the **timing of veraison** and **berry composition**

# Experiment 1:
# Can we delay phenology and ripening?




| 12 leaves | 6 leaves |
|---|---|
| Full crop | Full crop |
| 50% crop removed | 50% crop removed |
| 75% crop removed | 75% crop removed |

# Trimming at bunch closure delays veraison

**12 main leaves per shoot**

**50% crop removed**

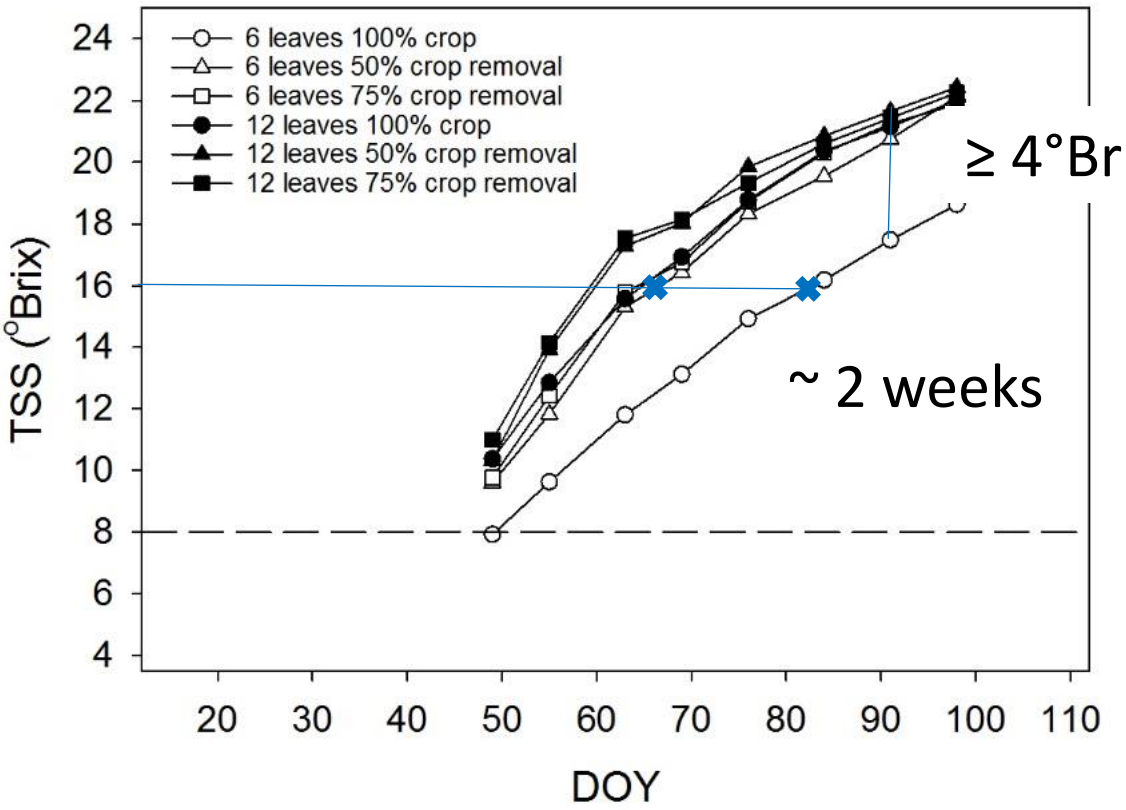
**6 main leaves per shoot**

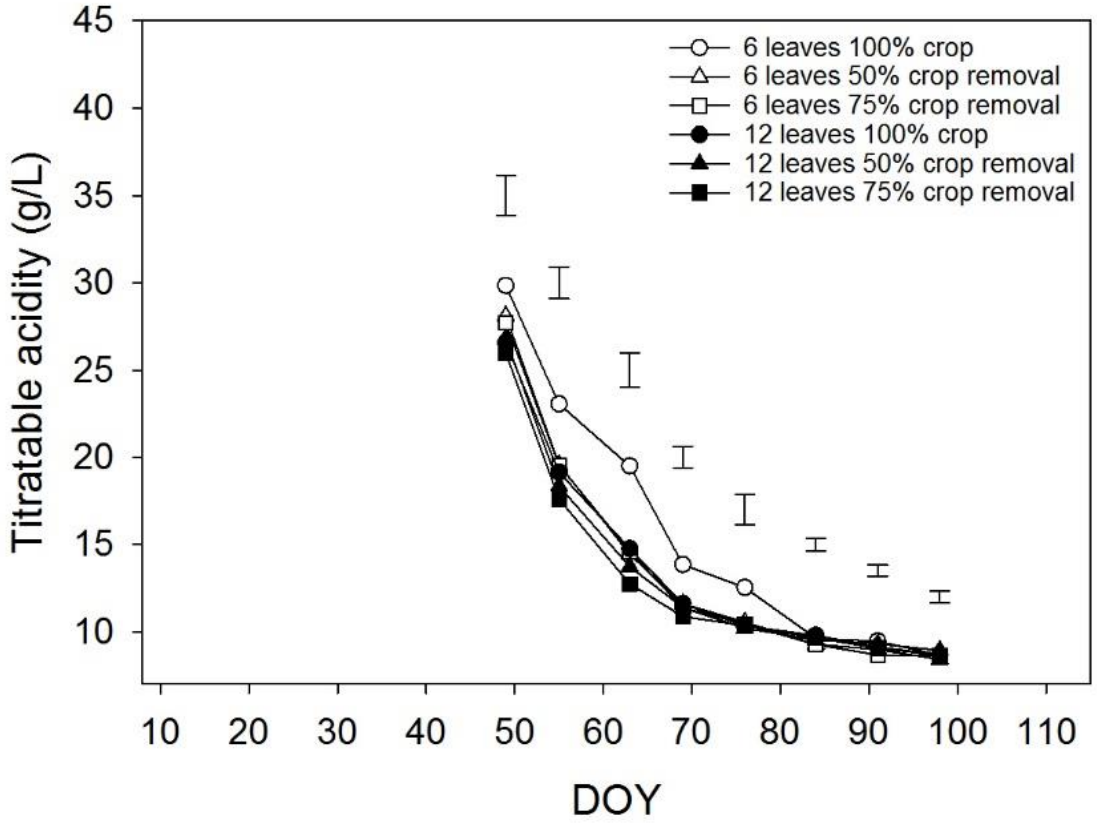
**75% crop removed**

*Results published in* Parker et al. (2014) AJGWR 20, 422-731.

# LA:FW modifications at fruitset decouples SS:TA

## Pinot noir 2009-2010




*Results published in* Parker et al. (2015) AJGWR 21, 266 – 276.

# Experiment 2: Developing response functions of delayed phenology and ripening in relation to LA:FW ratio manipulations

| Main leaves per shoot | 3 | 6 | 9 | 12 | 15 | 18 |
|---|---|---|---|---|---|---|
| Crop | Full crop | | | | | |
| | 50% crop removed | | | | | |

| Main leaves per shoot | 3 | 6 | 9 | 12 | 15 | 18 |
|---|---|---|---|---|---|---|
| Laterals | Present | | | | | |
| | Absent | | | | | |

Pinot noir and Sauvignon blanc

Measured Main LA:FW at harvest

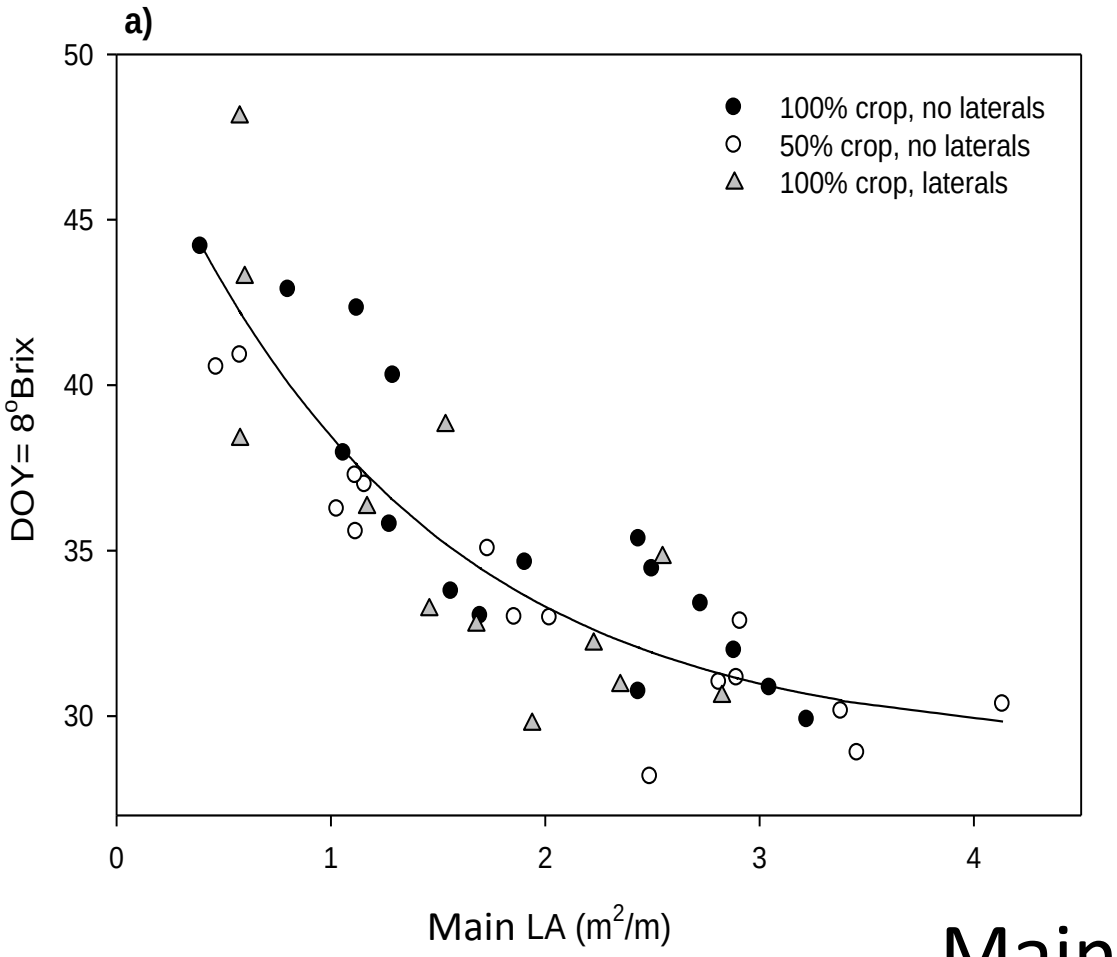
# Laterals

**Present**

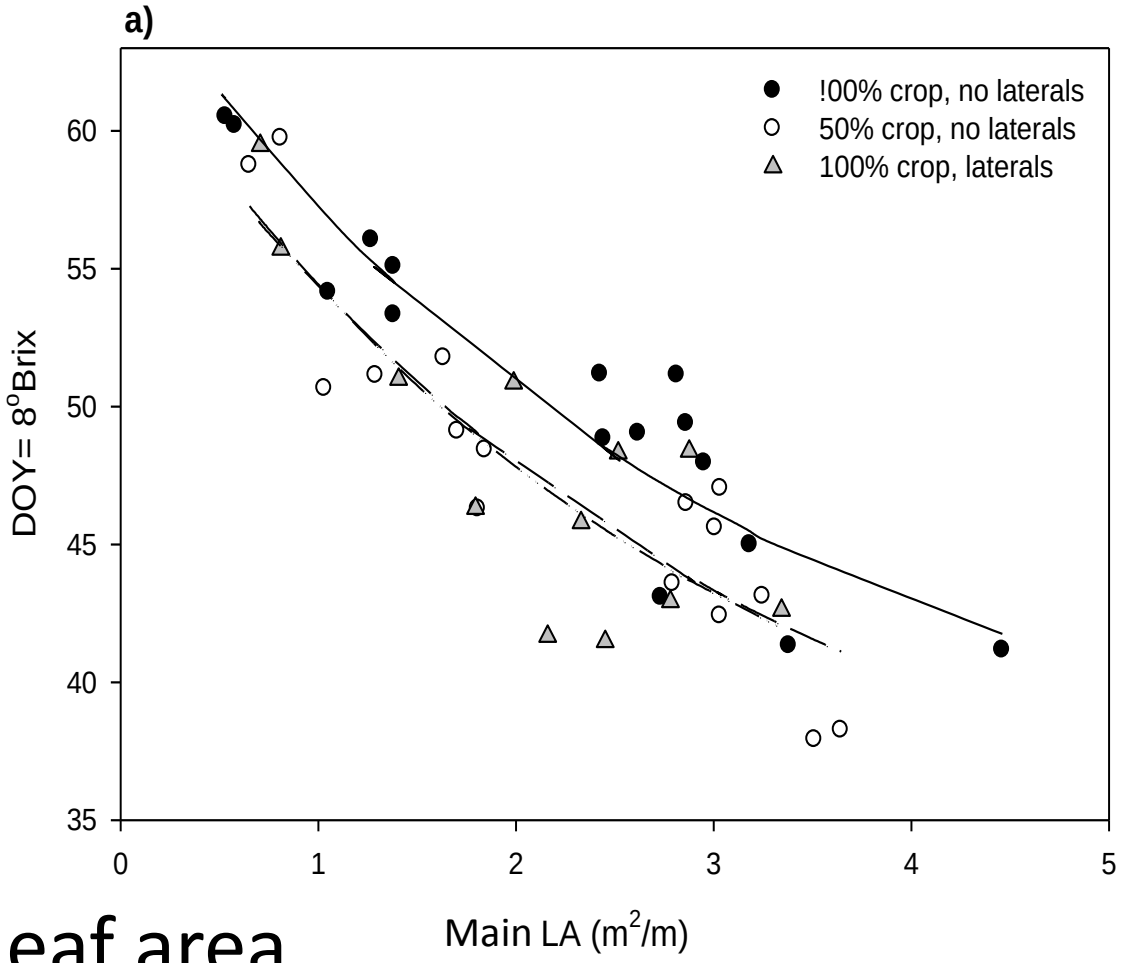

**Removed**

# Time to reach 8°Brix (veraison)

## Pinot noir



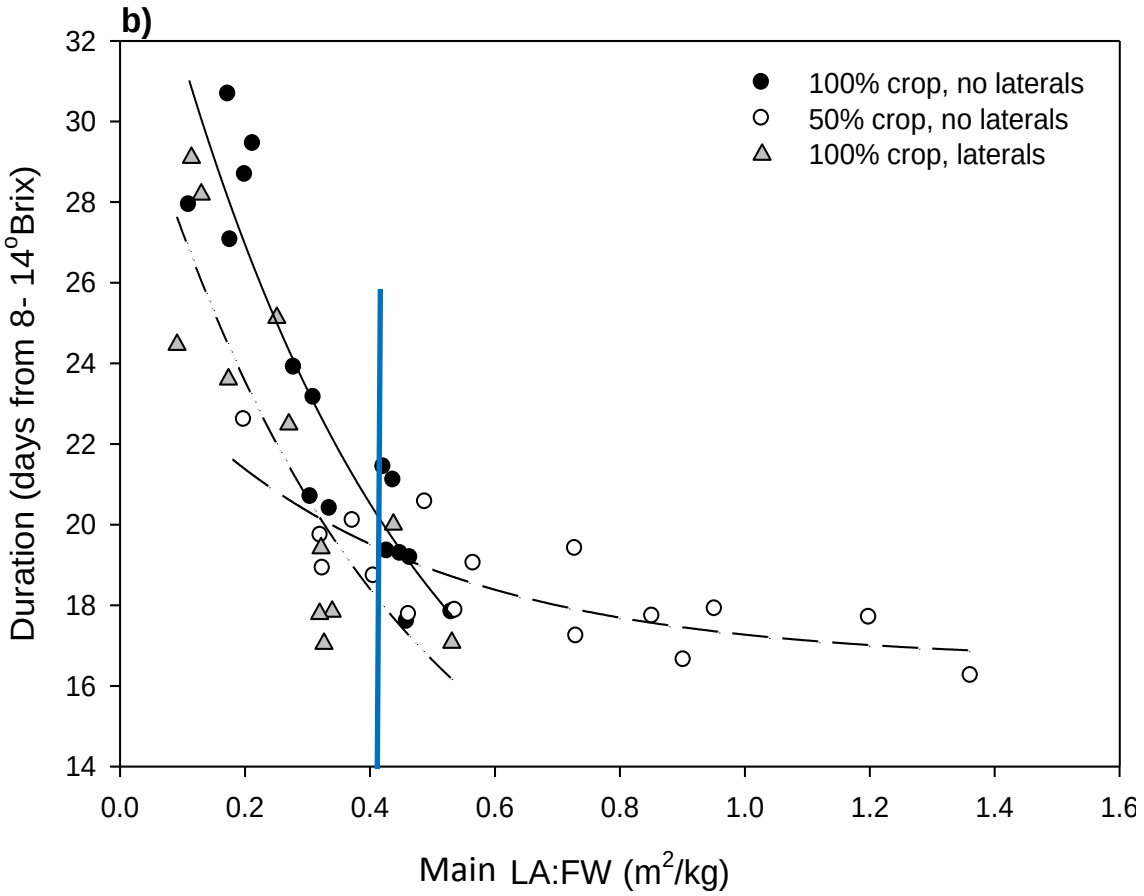

## Sauvignon blanc



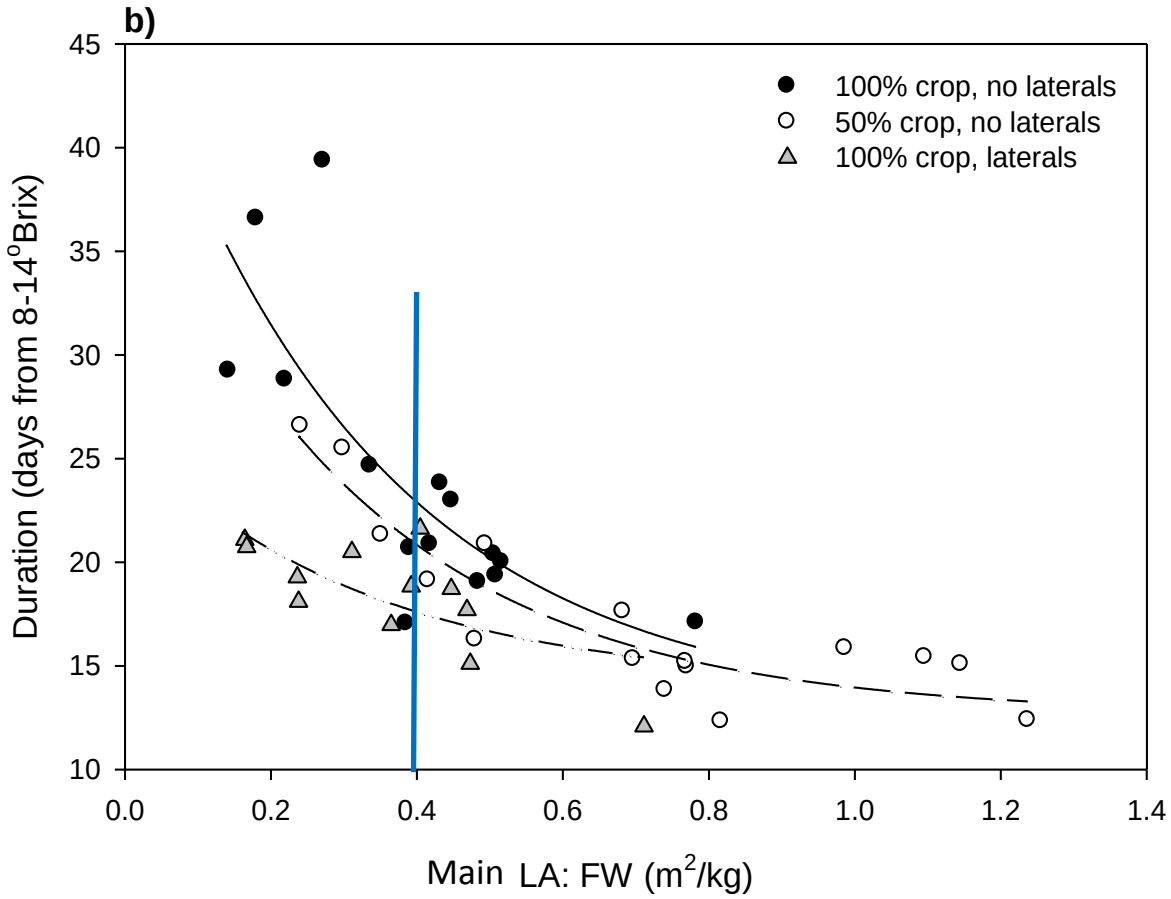

Main leaf area

# Initial soluble solids accumulation

## Pinot noir

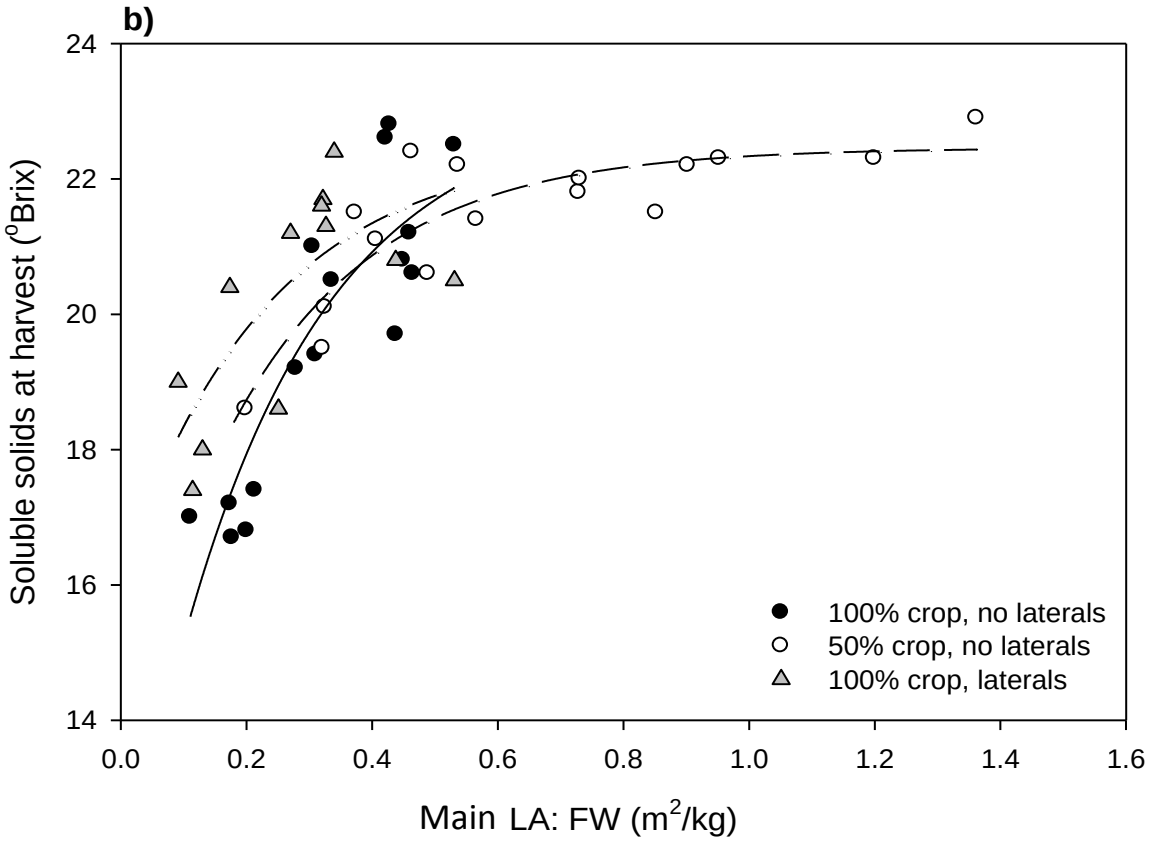



## Sauvignon blanc

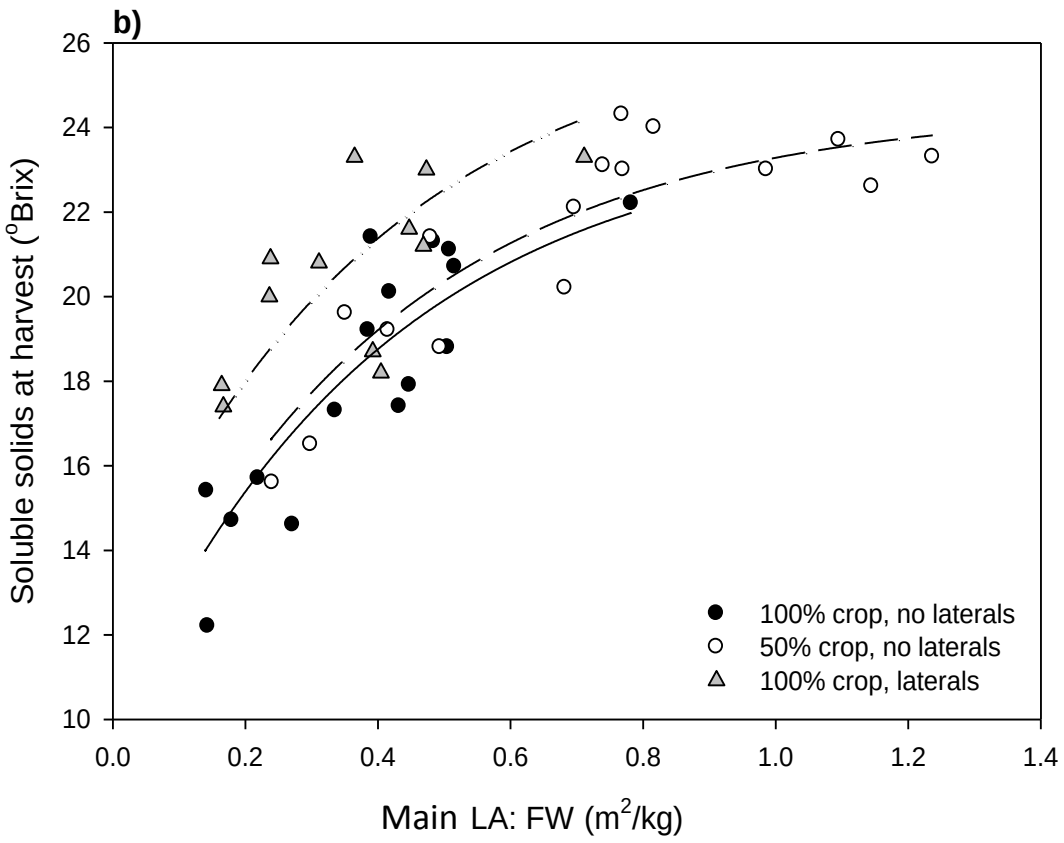



# Soluble solids at harvest

## Pinot noir

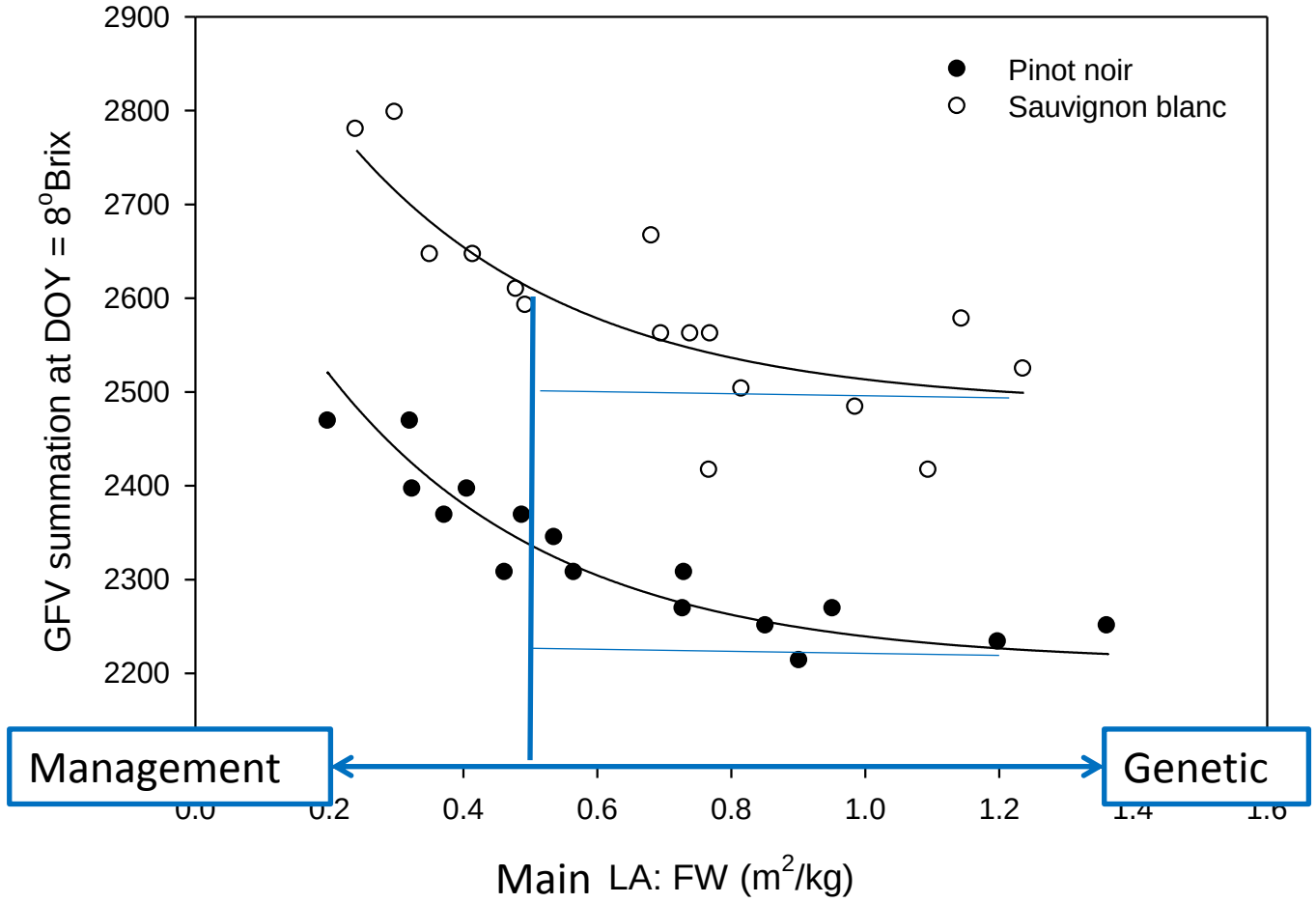



## Sauvignon blanc

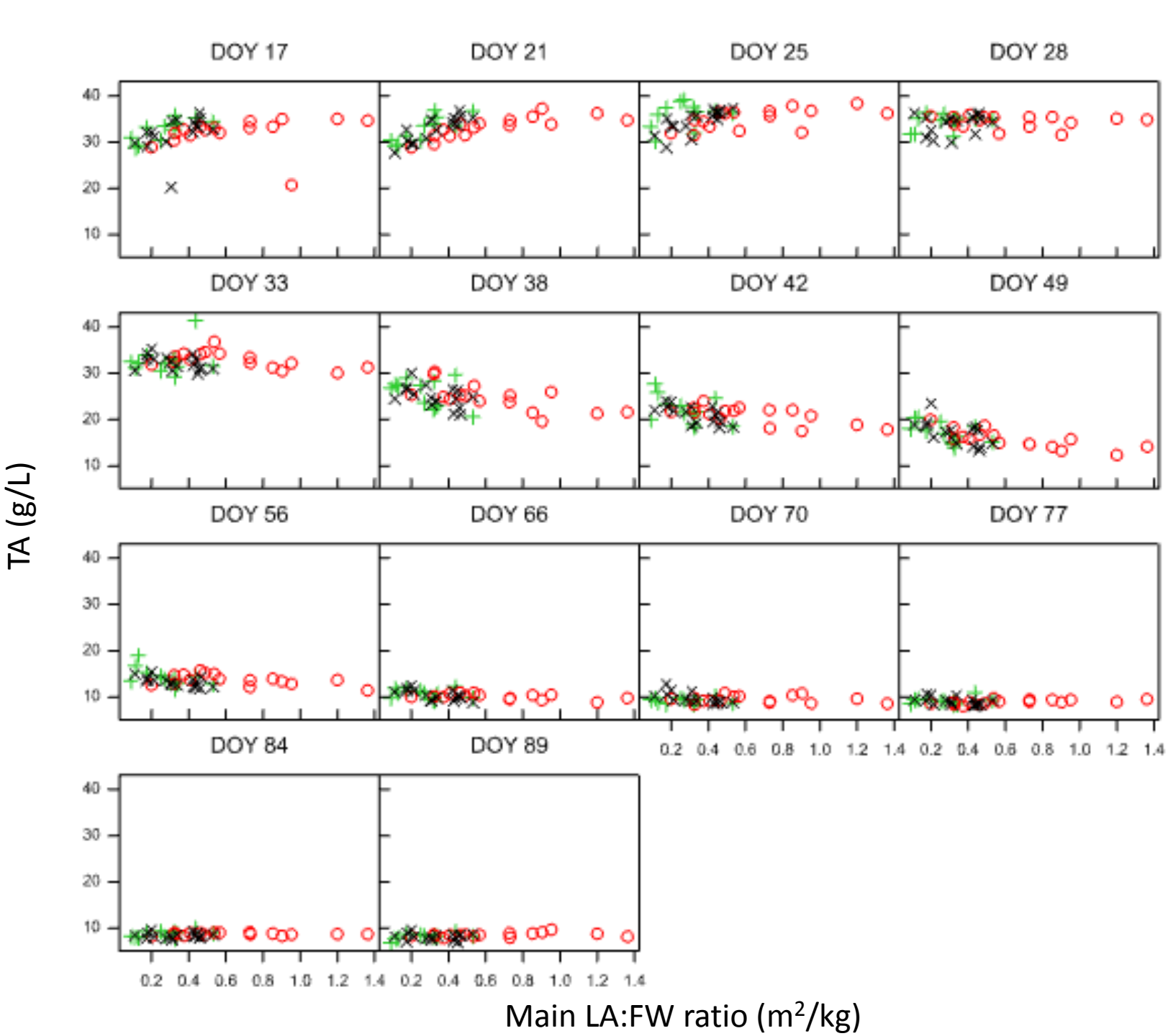



# Thermal time (GFV) to reach 8°Brix for different varieties

- Minimum GFV value
  - variety dependent
- Trend similar for both varieties
- E.g. delay at 0.5 Main LA: FW
  - 100°C.d.

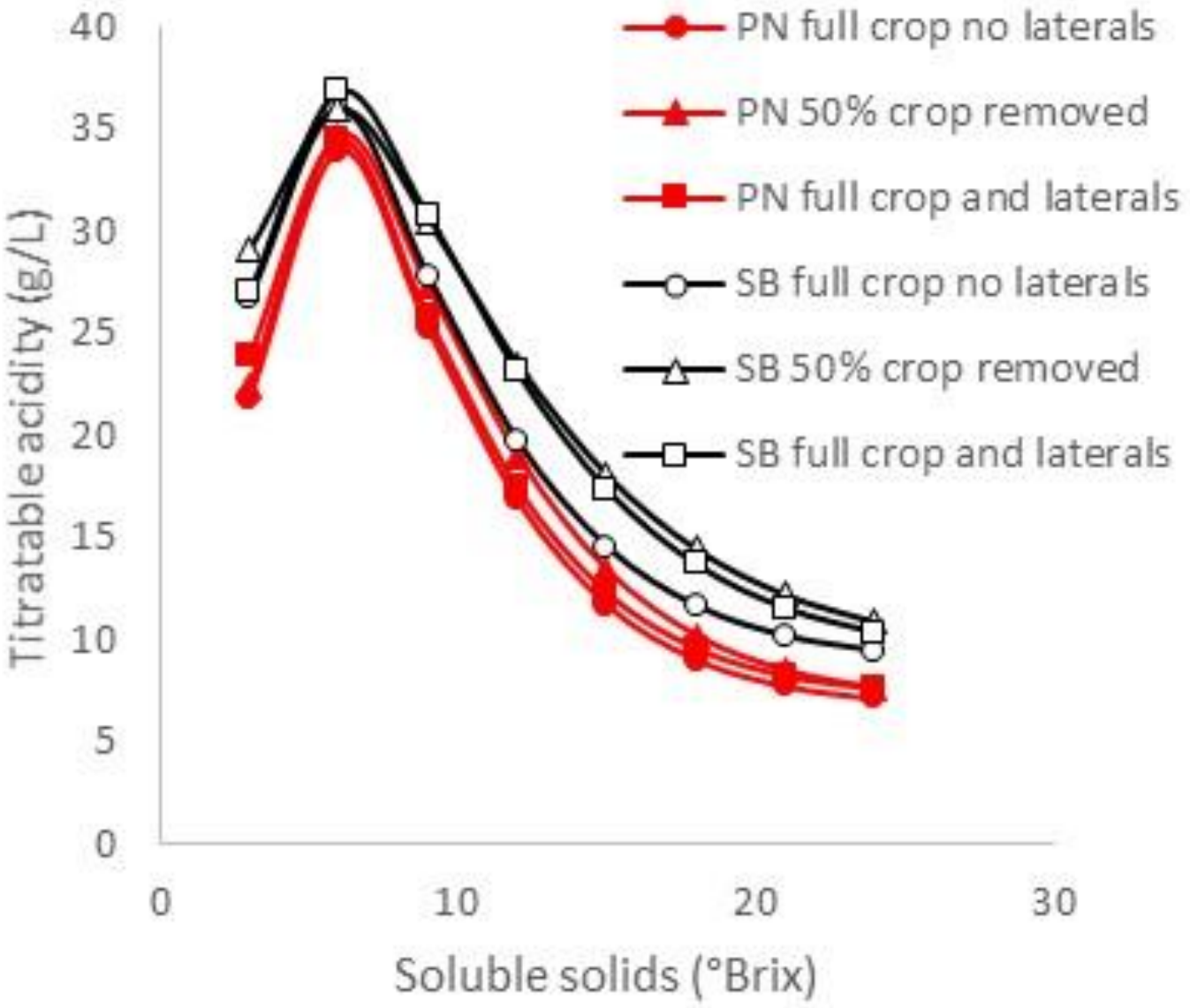



# Titratable Acidity Pinot noir



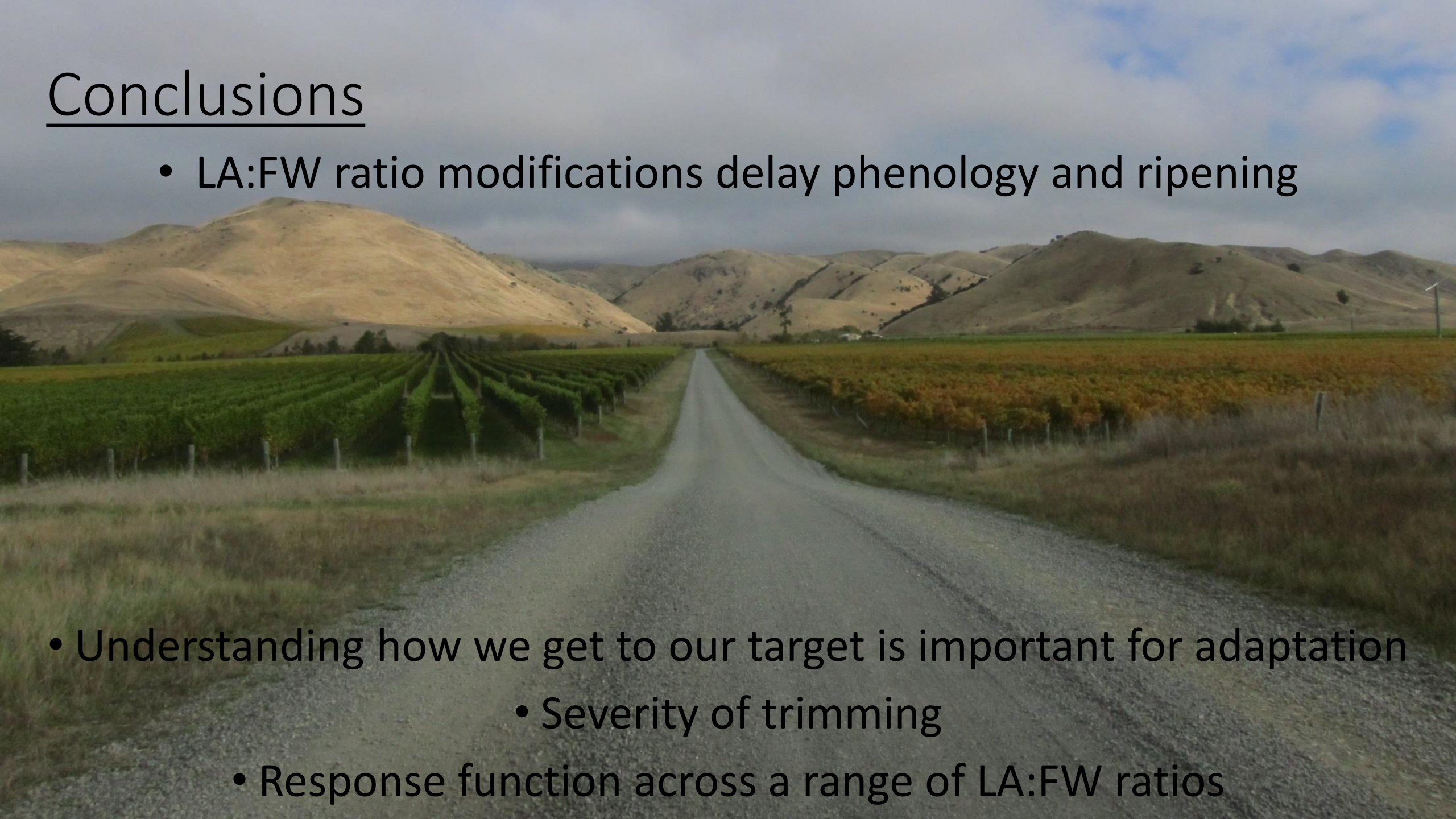

+ Laterals full crop
x No laterals full crop
o No laterals 50% crop removed

# Soluble solids - TA relationship



# Conclusions

- LA:FW ratio modifications delay phenology and ripening



- Understanding how we get to our target is important for adaptation
  - Severity of trimming
  - Response function across a range of LA:FW ratios

# Current and future perspectives

- Flavour and aroma profiles + sensory analysis of wine from different trim heights
- Carry on effects to the next year – reserve carbohydrates
- Site specificity- yield and baseline rates before considering LA:FW modifications

# Acknowledgements


- AGMARDT
- Team at Plant and Food Marlborough and Palmerston North
- Team at Bordeaux-Sciences Agro-ISVV
- Pernod Ricard NZ Ltd, Andrew Naylor, John Argyle and team at Brancott Estate
- The Foundation for Research Science and Technology (Designer Grapevines - CO6X0707)
- New Zealand Wine Growers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# References

Parker, A.K., Hofmann, R. W., van Leeuwen, C., McLachlan, A.R.G and Trought, M.C.T. (2015) Manipulating the leaf area to fruit mass ratio alters the synchrony of total soluble solids accumulation and titratable acidity of grape berries. Australian Journal of Grape and Wine Research 21, 266 – 276.

Parker, A.K., Hofmann, R.W., van Leeuwen, C., McLachlan, A.R.G., and Trought, M.C.T. (2014) Leaf area to fruit weight ratio determines the time of veraison in Sauvignon Blanc and Pinot Noir grapevines. *Australian Journal of Grape and Wine Research,* 20, 422-731.

Sturman (pers.comm)

# LA:FW modifications at Fruitset: effects on yield and LA:FW

| Leaves per shoot | Crop removal (% removal) | Yield ($kg/m^2$) | Yield (T/ha) | Leaf area ($m^2/m$) | LA: FW ($m^2/kg$) |
|---|---|---|---|---|---|
| 6 leaves | 0 | 4.10 | 15.2 | 1.18 | 0.29 |
| | 50 | 1.93 | 7.2 | 1.03 | 0.54 |
| | 75 | 1.16 | 4.3 | 1.10 | 0.98 |
| 12 leaves | 0 | 3.82 | 14.2 | 1.72 | 0.45 |
| | 50 | 1.98 | 7.3 | 1.94 | 0.99 |
| | 75 | 1.34 | 5.0 | 2.33 | 1.8 |