# Achieving target yields in cool climate Pinot Noir

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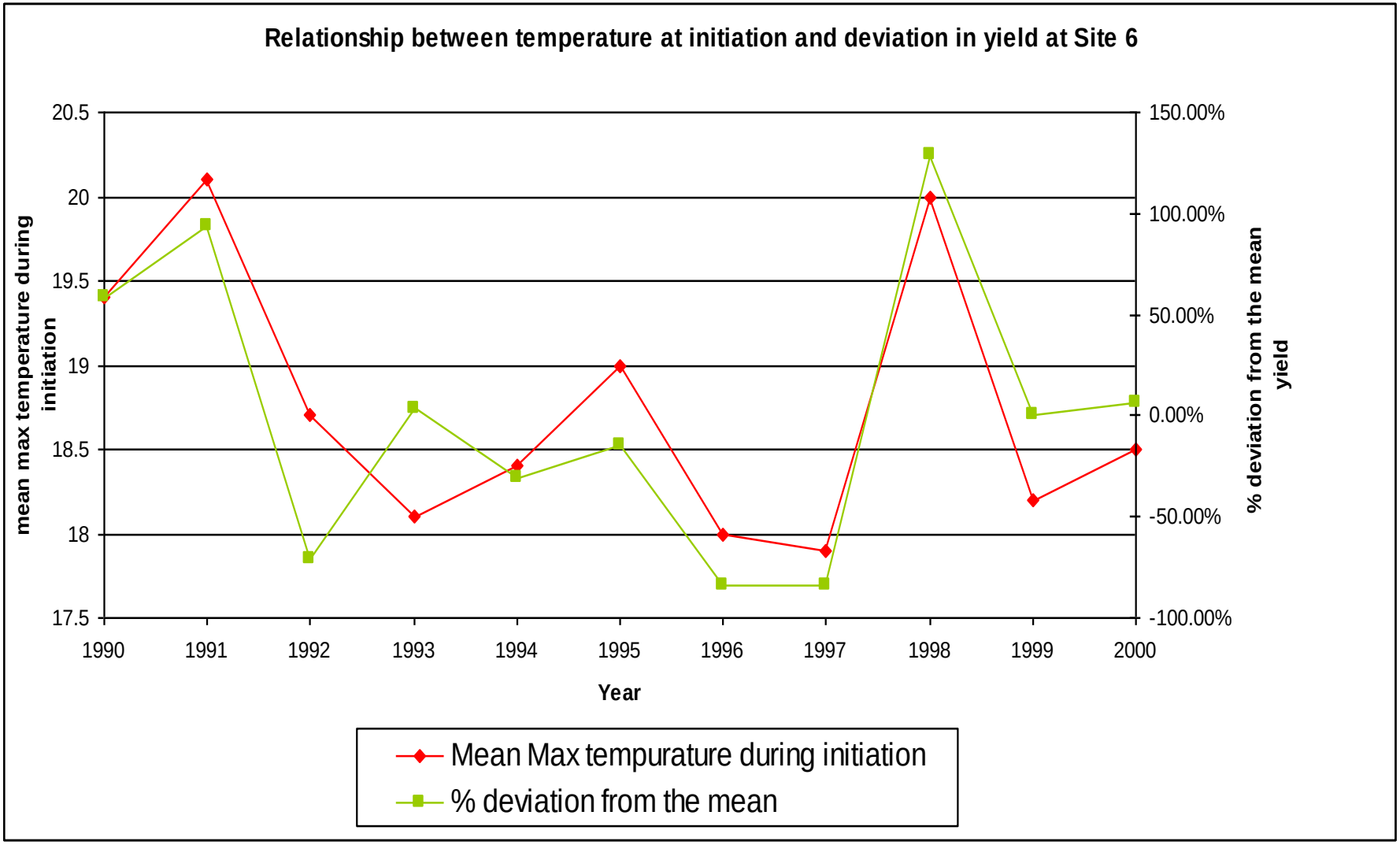
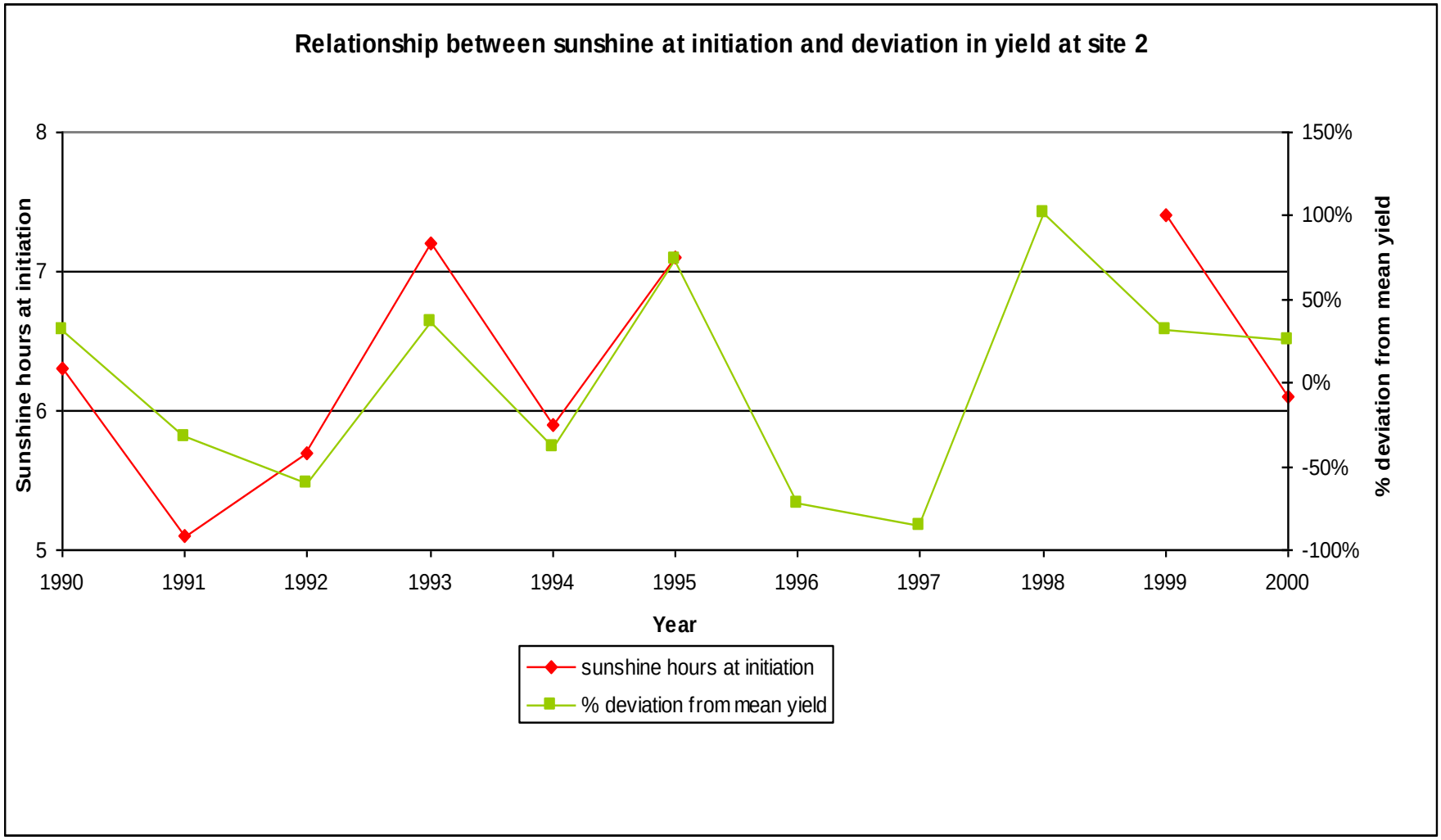
# Background

- Survey of Tasmanian sparkling producers revealed
  - Uncertainty surrounding cane vs spur pruning
  - No set rules around target yields
    - Sparkling wine yields significantly higher than table wine yields
- Previous TIA research
  - Warm, sunny days at the time of initiation (Dec/Jan) set the scene for high maximum yield (bunch number)
  - Good vine reserves and adequate nutrition aid differentiation (maximises bunch size)
  - Possible for inflorescences to revert to tendrils if growth is not supported
  - Important that growers have an understanding of a block's natural fruitfulness in order to prune to a target yield

# Temperature at Initiation



# Sunshine at Initiation



# Background to cane vs spur trial

- Cane pruning dominates
- Perceived basal bud infertility is the basis for pruning decision
- Cane pruning is considerably more expensive to carry out
- With mechanisation becoming more common in new larger plantings, it is necessary to re-visit which pruning system is best suited to premium sparkling wine production

# Trial Site

- Over 3 seasons; 2010, 2011 and 2012
- 18 year old Coal River Valley premium sparkling wine producing vineyard, pruned by hand to 20 buds
- Pinot Noir (clone D5V12), Chardonnay (clone I10V1)
  - Spur pruned
  - Cane pruned

# Results: Canopy

- Pronounced apical dominance under cane pruning

# Results: Canopy

- 3 point quadrat assessment dates over the bulk of the canopy growth season, measured in mid November, mid December and mid January
- Canopy assessment for Pinot 2010

| | Spur Pruned | | | Cane Pruned | | |
|---|---|---|---|---|---|---|
| | **25-Nov** | **22-Dec** | **28-Jan** | **25-Nov** | **22-Dec** | **28-Jan** |
| **Effective Insertions (%)** [1] | 100 | 100 | 100 | 65 | 80 | 100 |
| **Leaf contacts** | 92 | 116 | 147 | 56 | 92 | 103 |
| **Cluster contacts** | 2 | 8 | 10 | 3 | 7 | 8 |
| **Gaps %** | 0 | 0 | 0 | 35 | 20 | 0 |
| **Leaf Layer Number(LLN)** | 2.30 | 2.90 | 3.68 | 1.40 | 2.30 | 2.58 |

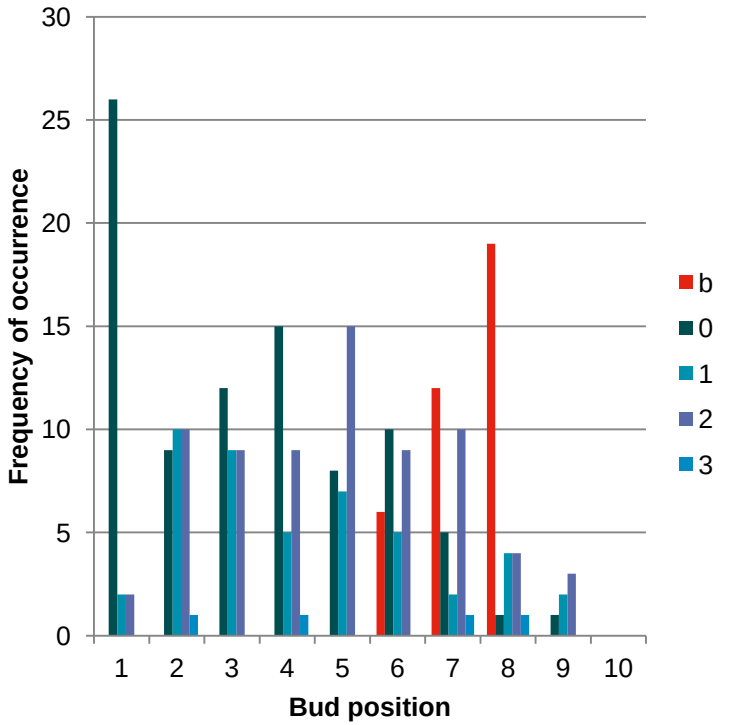
# Results: Canopy

Spur Pruning

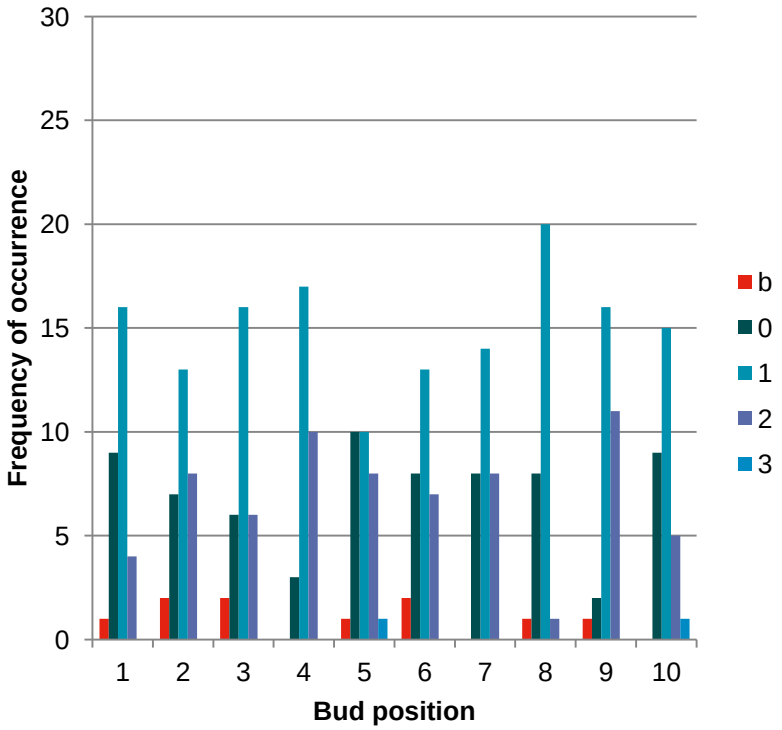
Cane Pruning

# Results: Yield

- Distribution of fruitfulness for Chardonnay 2012




Cane Pruned




Spur Pruned

# Results: Yield

| | | Bunch number | | |
|---|---|---|---|---|
| | | 2010 | 2011 | 2012 |
| **Pinot Noir** | Cane pruned | 22.87 | 26.20 | 17.40 |
| | Spur pruned | 25.13 | 31.87 | 21.00 |
| | Significance | ns | <0.005 | <0.05 |
| **Chardonnay** | Cane pruned | 13.33 | 21.20 | 13.33 |
| | Spur pruned | 18.73 | 26.27 | 19.47 |
| | Significance | <0.001 | <0.01 | <0.001 |

- In all cases, cane pruned vines had fewer, but larger bunches

# Results: Yield

| | | Bunch weight (g) | | |
|---|---|---|---|---|
| | | 2010 | 2011 | 2012 |
| **Pinot Noir** | Cane pruned | 122.95a | 131.12 | 105.61 |
| | Spur pruned | 100.74b | 101.92 | 85.01 |
| | Significance | 0.0003 | 0.013 | 0.021 |
| **Chardonnay** | Cane pruned | 104.6 | 105.21 | 57.33 |
| | Spur pruned | 79.4 | 90.44 | 47.94 |
| | Significance | <0.01 | ns | ns |

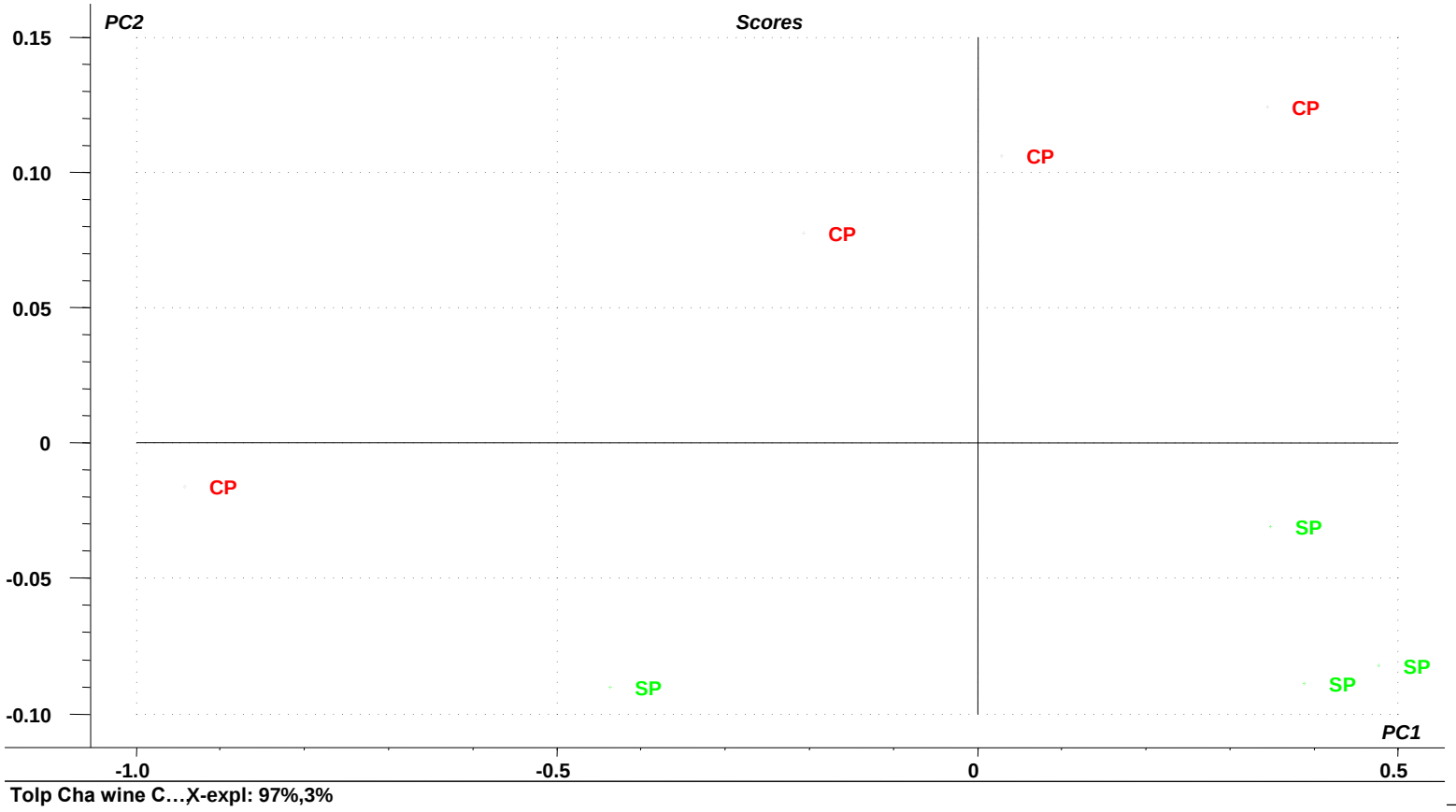
- Yield per vine was not significantly different in any year for Pinot

# Results: Fruit Quality

- There was no difference in TSS, pH nor Titratable Acidity, in any year.

# Results: Wine Quality

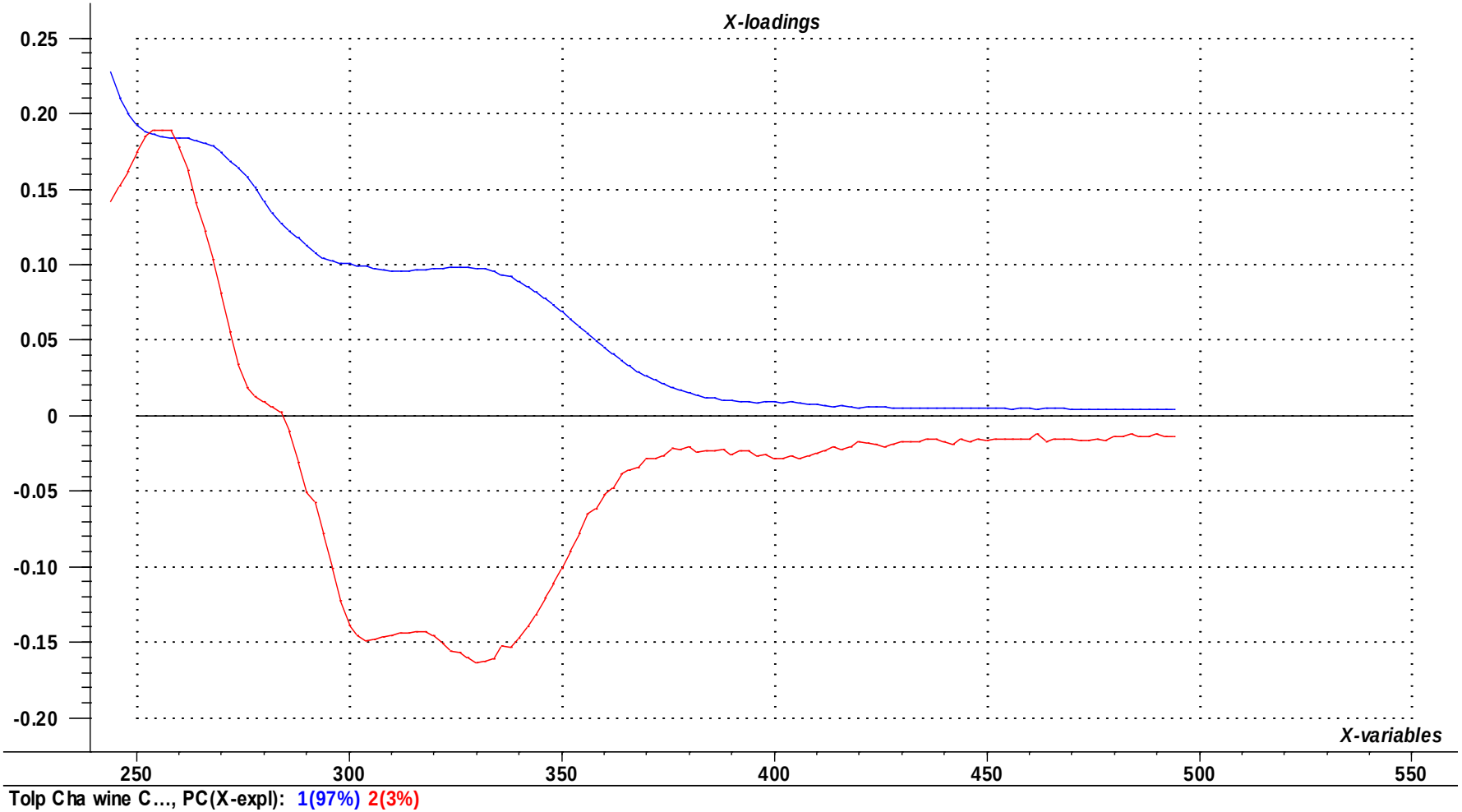
- When analysing the base wine spectra, in all years there was distinct separation of the pruning systems




2010

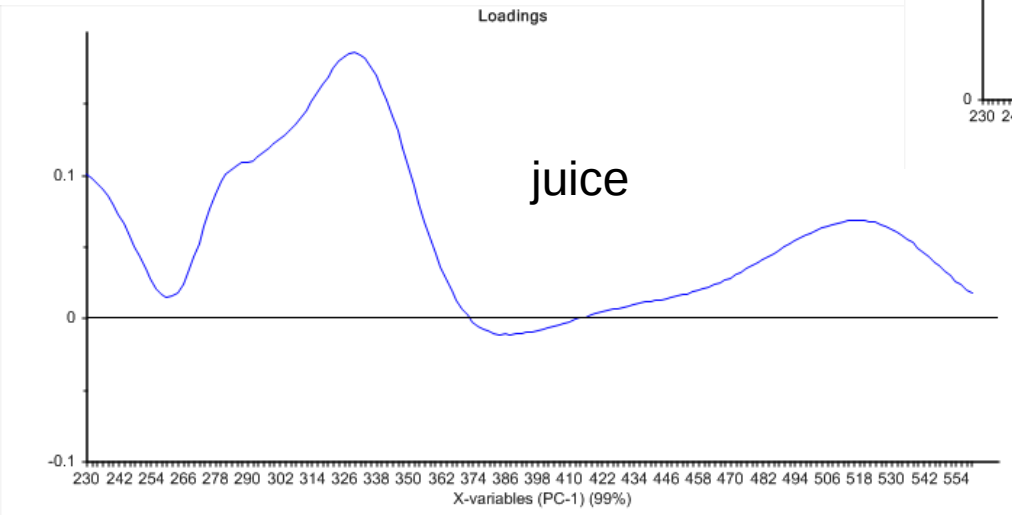
# Results: Wine Quality

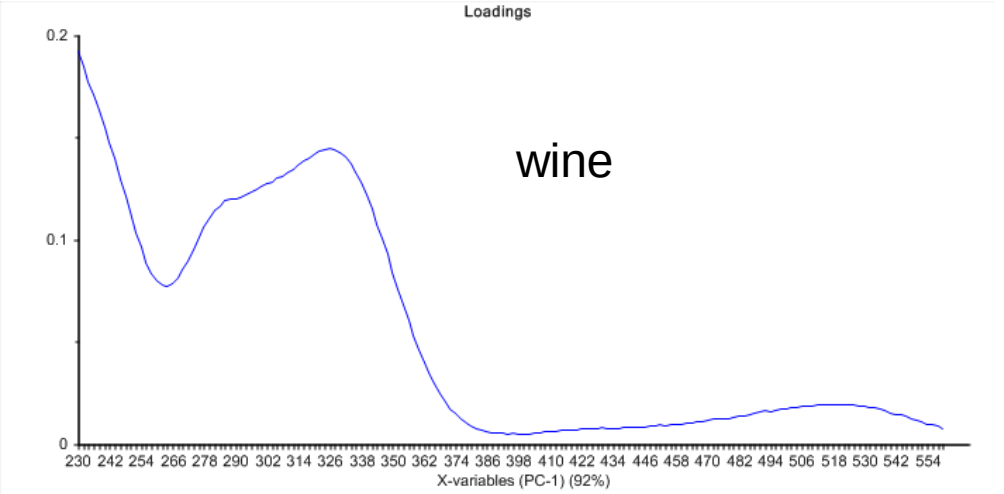
- 2010 vintage, 265, 300 and 330 nm feature
- 280 nm not significant



# Results: Wine Quality

- Similarities existed between juice and base wine spectra, however not in all cases
- e.g. Pinot 2012




Trough at 260nm and 280nm
Peak at 320nm

# Results: Carbohydrates

| | | Cane starch (mg/g) | |
|---|---|---|---|
| | | 2010 | 2011 |
| **Pinot Noir** | Cane pruned | 77.81 | 53.20 |
| | Spur pruned | 71.64 | 64.07 |
| | Significance | ns | <0.01 |
| **Chardonnay** | Cane pruned | 78.53 | 56.02 |
| | Spur pruned | 80.03 | 54.70 |
| | Significance | ns | ns |

- Expected to see a difference in overwintering starch but we didn't (except in 2011 Pinot Noir vines)
- Also no significant difference in soluble sugars between pruning treatments
- Large seasonal difference in stored starch and soluble sugars
- NB starch measured in 2011 is what is available for budburst and inflorescence size development for 2012 vintage

# Seasonal climate data

| | Vintage | | |
|---|---|---|---|
| | **2010** | **2011** | **2012** |
| Mean January Temp °C | 23.8 | 22.7 | 23.7 |
| Growing Degree Days (Oct – Apr) | 1291.1 | 1110 | 1247.8 |
| Growing Season Rain (mm) (Oct – Apr) | 331.6 | 345.4 | 296.6 |

- Helps to explain yield and carbohydrate results

# In summary…

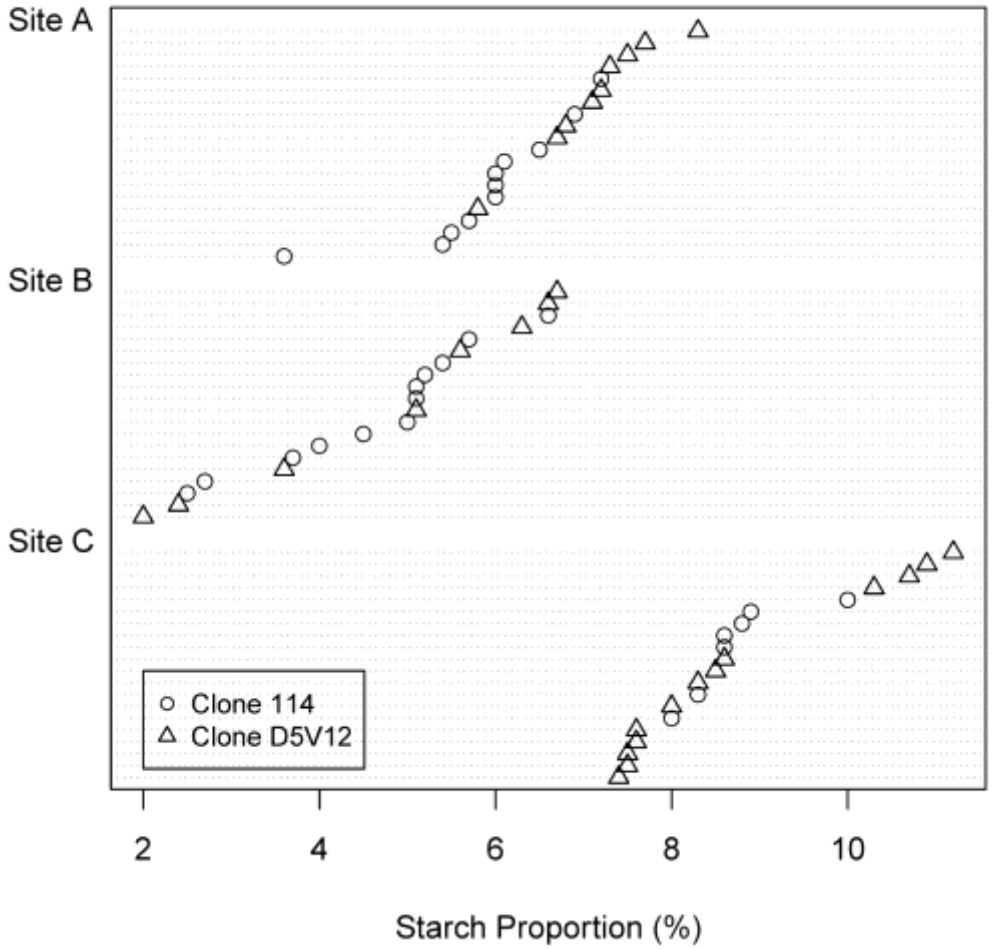
- Spur pruned canopies established more quickly and were more even
- Spur pruned vines had a greater number of smaller bunches, however yield per vine was not significantly different
- Juice quality parameters were not significantly different
- Base wine spectra showed distinct separation between pruning systems
- Spectra suggest sensory effects eg Hydroxycinnamates
- Very little difference in carbohydrates

# Comparison of fruitfulness of Pinot clones

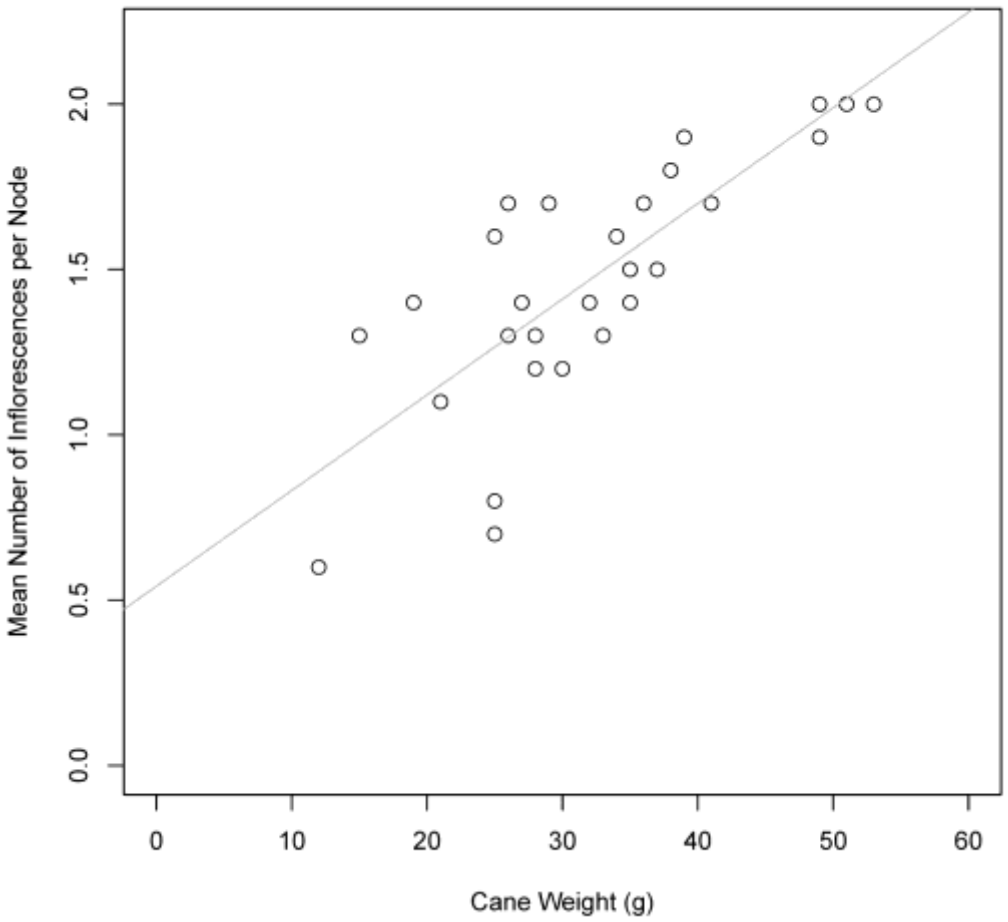
- 3 Southern Tasmanian sites
- 2 Pinot Noir clones
  - 114 and D5V12
- Did bud dissections to count inflorescence primordia microscopically
- 3 weeks after budburst counted actual inflorescences

***Predicted probability of counts of inflorescence primordia (determined microscopically) and inflorescences (determined 3 weeks after bud burst) of two Pinot Noir clones (114 and D5V12) each at three sites in Southern Tasmania. Blind = no shoot, 0 = a shoot with no inflorescence, 1 = a shoot with 1 inflorescence, 2+ = a shoot with 2 or more inflorescences.***

| | Probability of Count Category | | |
|---|---|---|---|
| Site | A | B | C |
| Inflorescence Primordia Category | | | |
| 0 | 0.062 | 0.066 | 0.018 |
| 1 | 0.314 | 0.277 | 0.335 |
| 2+ | 0.624 | 0.657 | 0.648 |
| Inflorescence | | | |
| Blind | 0.068 | 0.295 | 0.036 |
| 0 | 0.143 | 0.201 | 0.275 |
| 1 | 0.546 | 0.243 | 0.621 |
| 2+ | 0.244 | 0.262 | 0.069 |




- Site B had the highest probability of blind or unfruitful buds




- Cane selection at pruning is important for fruitfulness

# Managing Pinot Noir Fruitfulness

- No significant difference in yield between spur and cane pruning
  - Vines more balanced under spur pruning
  - Cane selection very important, perhaps could get very different results with focus on cane selection
- Overwintering carbohydrate status important in marginal years
- Bud dissections a valuable tool to assist in understanding natural fruitfulness of different clones of Pinot Noir in your vineyard
- Fruitfulness work continuing with Fiona's current project

# Acknowledgements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