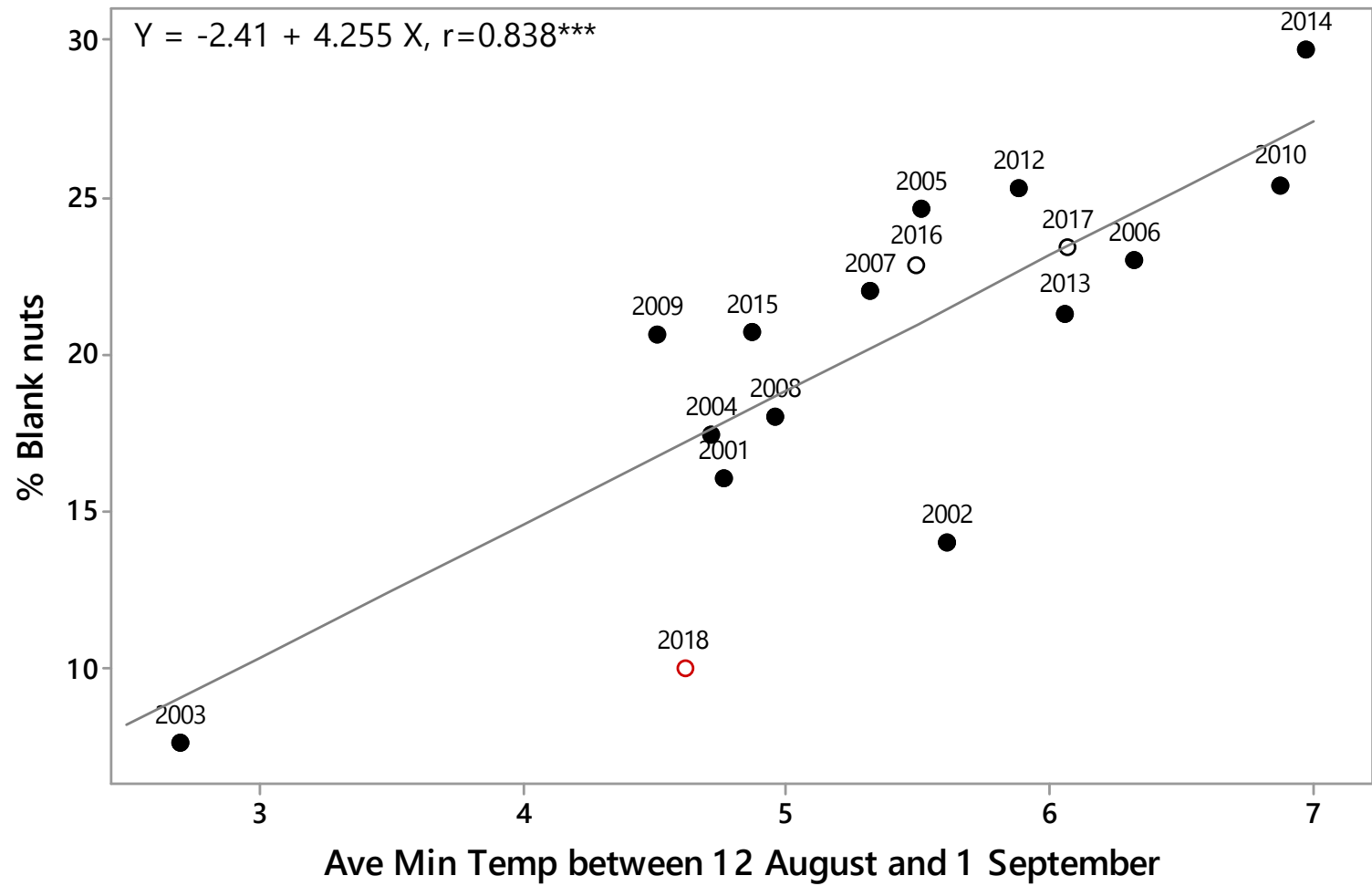


# Influencing chill accumulation in marginal districts

The role of lowering heat  
accumulation on bud wood

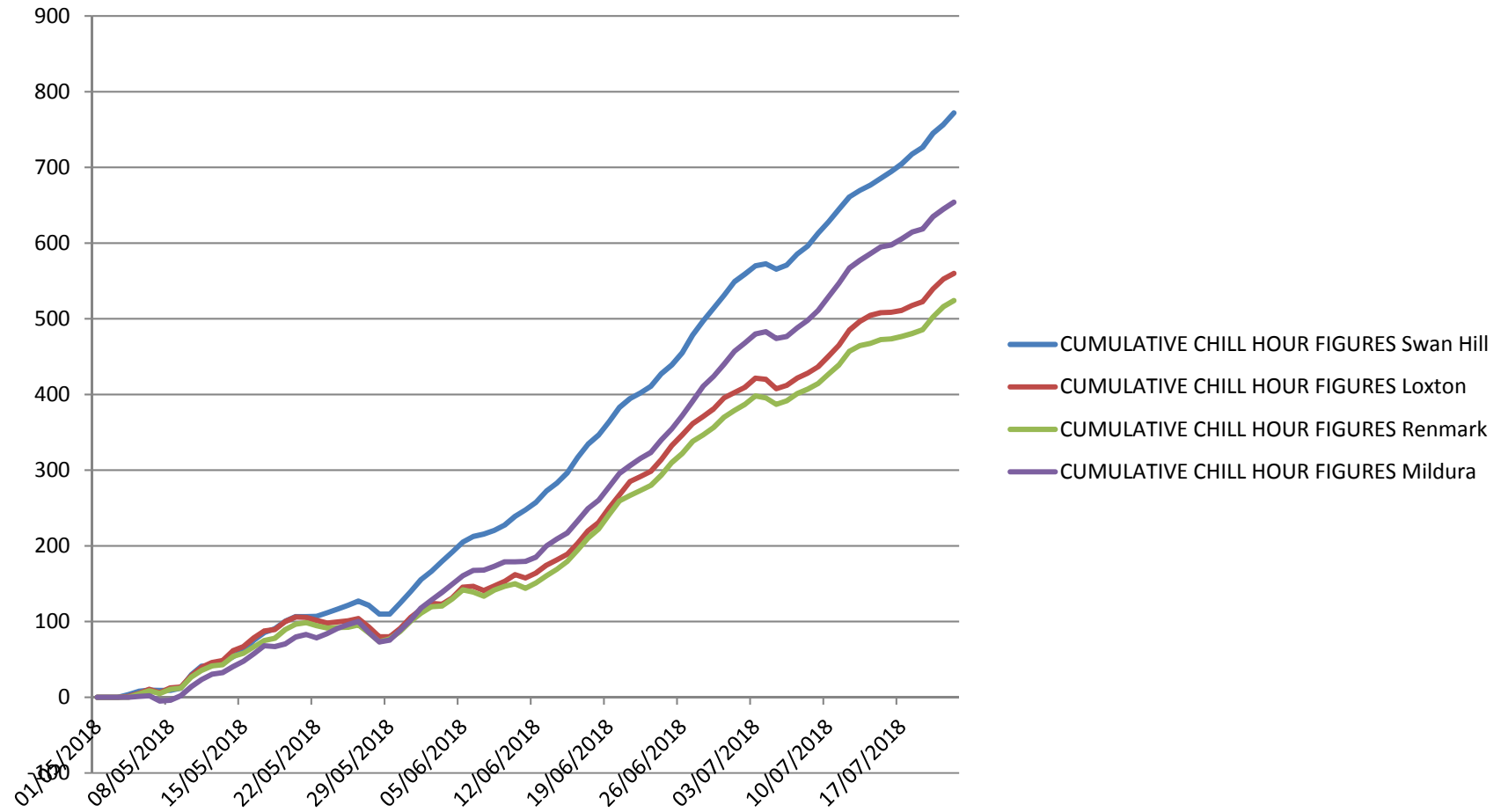
Shane Phillips 13/9/18



# The Richardson Model (10-12x Portions)

- Temperature C Richardson Chill Unit (RCU)
- $<1.5 = 0$
- $1.5-2.5 = +0.5$
- $2.5-9.2 = 1.0$
- $9.2-12.5 = +0.5$
- $12.5-16.5 = 0$
- $16-18 = -0.5$
- $>18 = -1.0$

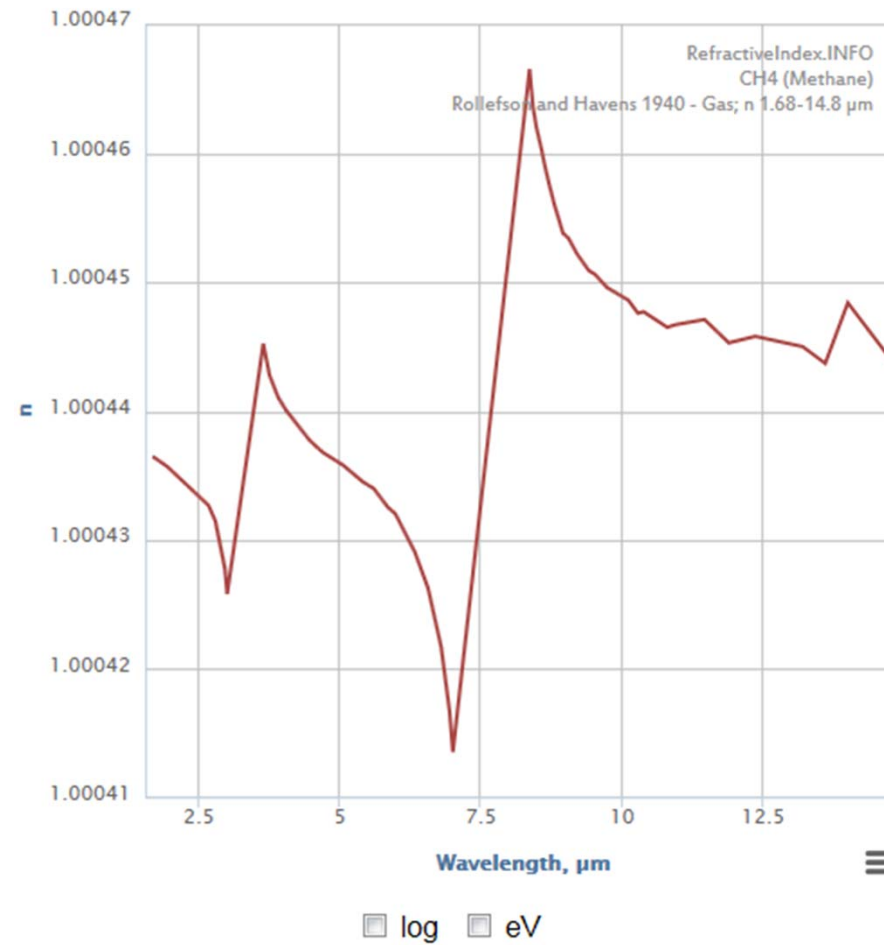
# Chill is seasonally variable



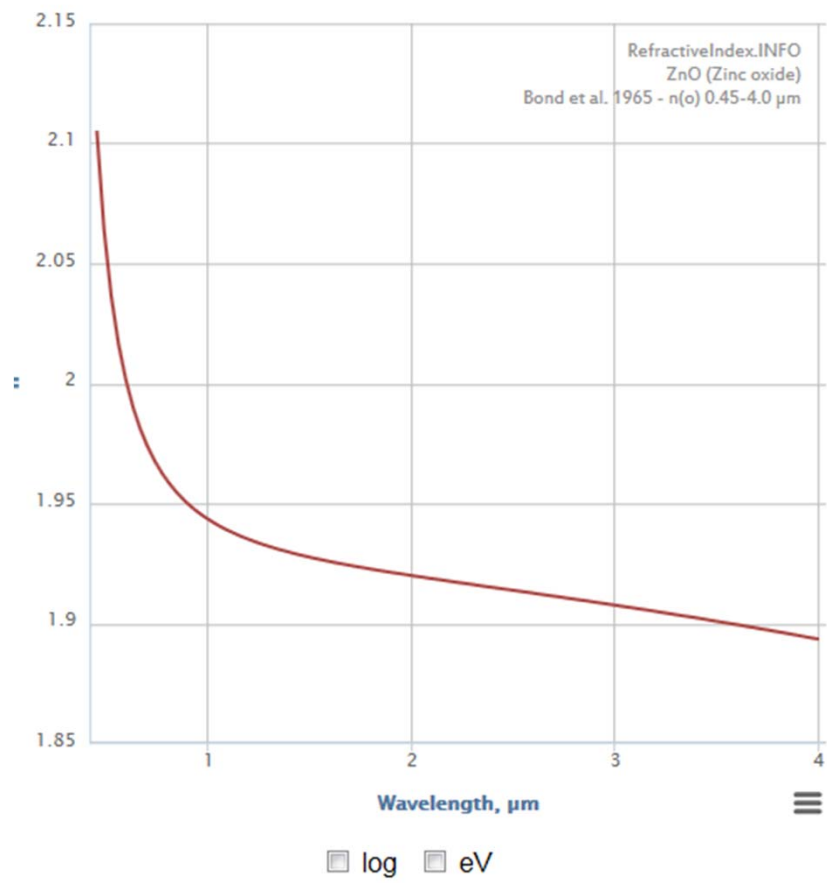
# Reflective agents

- Reflective agents reduce heat accumulation on the bud wood.
- While I was at Menindee we used calcium carbonate suspensions applied at 75L/1000L to whitewash trees and increase chill accumulation-any less did not work
- Was popular in the late 1940's in the Riverland to set high chill dried peach varieties

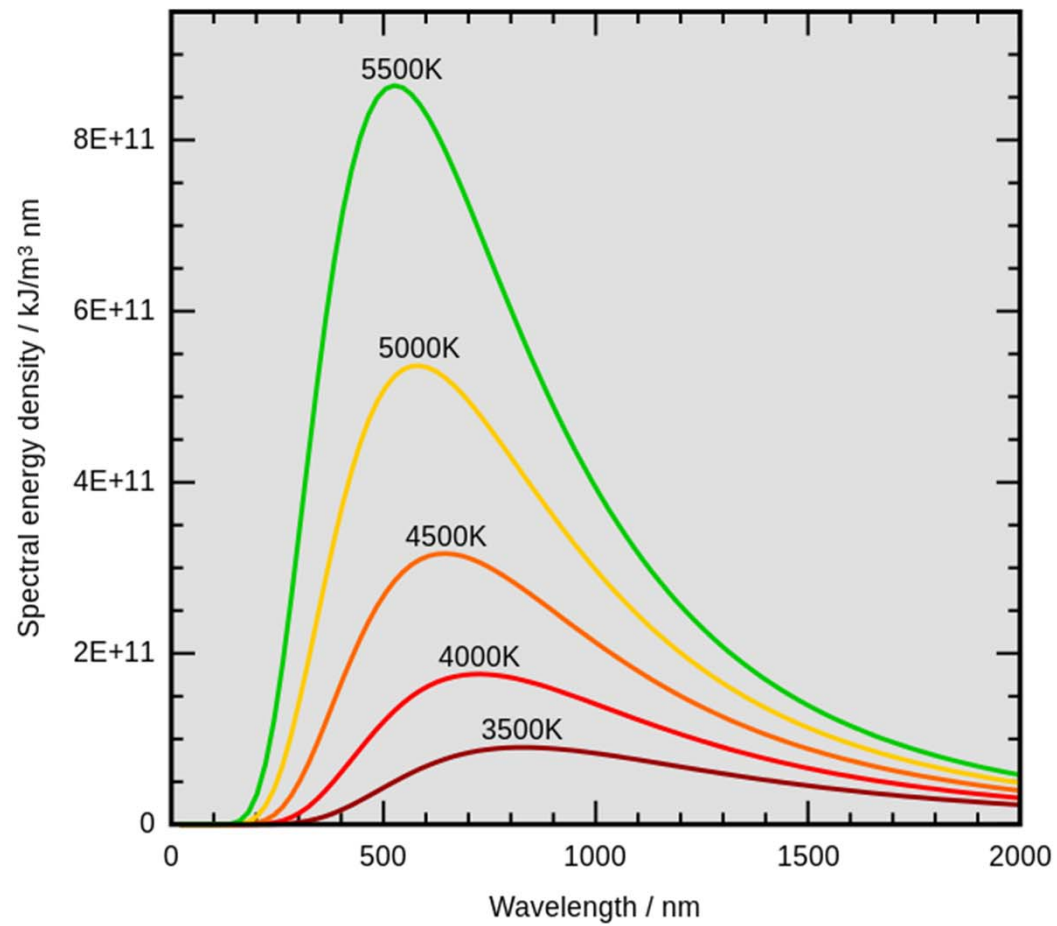
# Calcium carbonate



# Zinc Oxide



# Heat is absorbed over differing wavelengths





# Comparative differences

- Zinc oxide and calcium carbonate both reduce wavelength accumulation
- Both effective but significant differences for spectrum
- Graph on calcium carbonate is more erratic but the higher spectrum filtering is with zinc oxide at the critical wavelengths
- However is this significant in terms of impact on chill accumulations?

# Moving to polymer coolants

- Seen to have a significant impact on lowering temperatures – role in snow making
- Easier to handle than suspension concentrates
- Significantly lower cost. I was spending up to \$1000/ha in suspension concentrates to whitewash trees, polymer applications were down to \$10-15/ha.

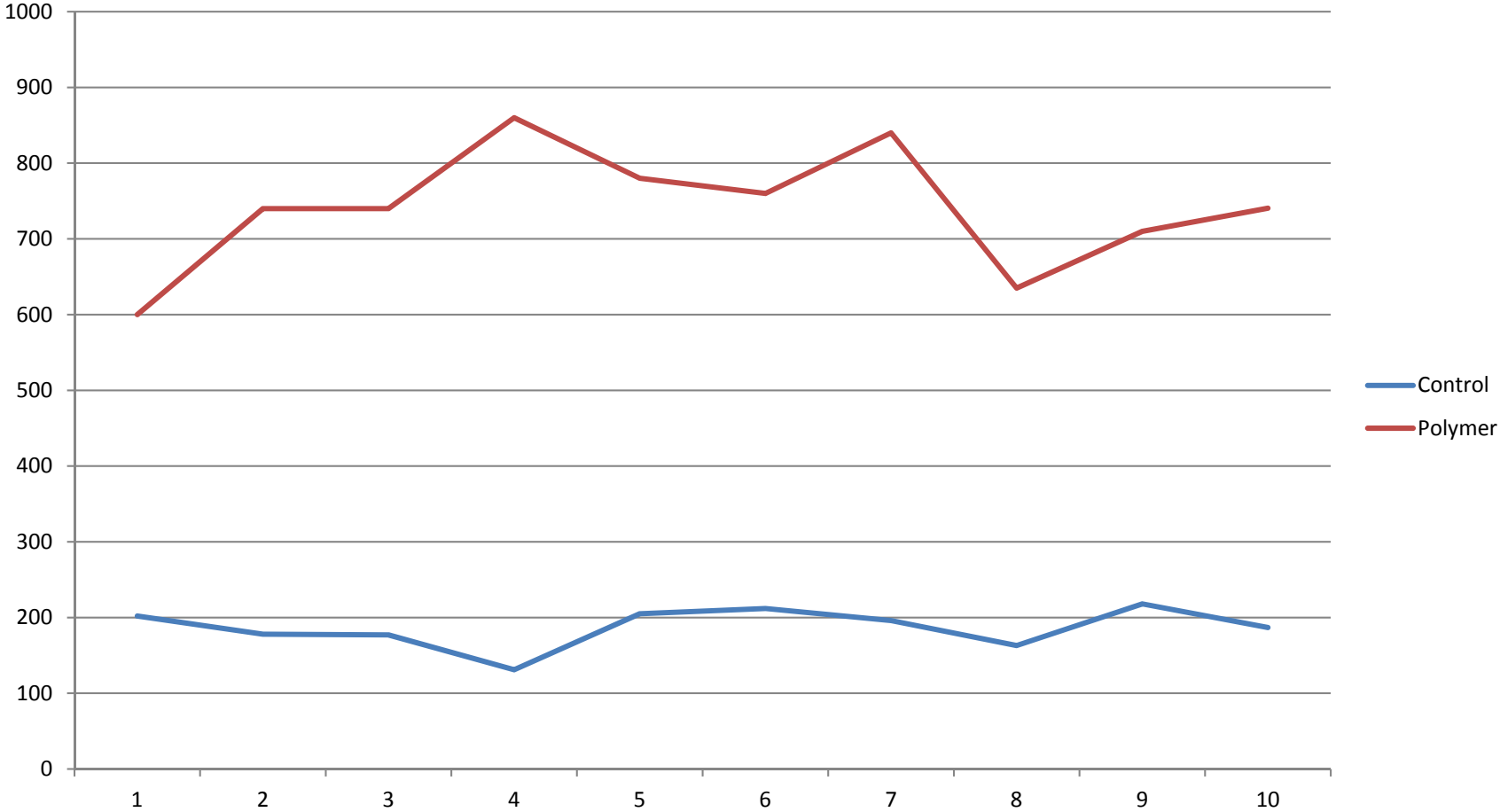
# What does additional chill mean in fruit maturity Pink Lady Apples ? Loxton March 2018



Polymer treated trees with fruit near maturity  
29/3/18 larger fruit consistently in the chilled  
trees



# Fruit Counts per tree Bookpurnong Fruits Oct 2016 Carene Nectarine



# Varieties are highly responsive to additional chill accumulation

Jason Size fruit counts October 12 2017												
<b>Carene</b>												MEAN
<b>Treated</b>	ET	210	260	300	260	260	170	200	220	240	240	236
	WT	260	280	320	300	360	450	380	340	310	320	332
<b>Control</b>	EC	90	92	80	120	80	100	120	140	140	140	110
	WC	120	110	80	70	140	100	140	160	180	120	122

# Pistachio polymer work

- Applied rates of 5 and 10L/1000L at the Simpfendorfer property Renmark
- Aim to see if this has a cooling impact on the buds and lowers the numbers of blanks
- Does heat accumulation on the side of the tree influence the positioning of blanks in the tree profile
- Laser temperature readings undertaken