

Understanding colour development in red-blushed pears



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General introduction

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General introduction

- What did I do?
- Understanding red colour development in red-blushed pears by different experiment
- How to measure colour?

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HORTICULTURE BUSINESS 63

EXPORT OPPORTUNITY

A pale pink blush for pears

By LYNDAL READING

CONSUMER testing in Indonesia and Thailand has given the thumbs-up to two new blush pear varieties.

The varieties, known as ANP-018 and ANP-031, were bred by Agriculture Victoria at Tatura, specifically for the export market.

The pears were assessed by consumers on features such as skin, size, shape, aroma, firmness and colour of flesh.

Agriculture Victoria senior research scientist Bruce Tomkins said previous consumer testing with nectarines in Indonesia found the burgundy colour less popular than a paler pink. "Of the blush varieties consumers preferred more pinkness," he said.

Mr Tomkins presented the consumer test results to growers at the spring orchard walk at Tatura last month.

He explained that price was a factor in getting the new markets to accept the varieties.

He said pears should sell for less than \$10.86 a kilogram in Thailand, and less than \$6.85 in Indonesia.

Hoodies offer new varieties a helping hand

By LYNDAL READING

NEW pear varieties are being fitted with silver "hoods" at Tatura to gauge the speed at which they turn pink.

Masters student Iris Visscher, on placement with Agriculture Victoria, has fitted the new varieties with hoods to block sunlight.

The experiment was conducted with a cultivar, known as ANP-0534, however, it is expected the preliminary data will inform a more detailed project about two new varieties developed for the export market.

The new varieties, blush pears called ANP-018 and ANP-031, have been developed by Agriculture Victoria for export to Thailand and Indonesia.

research manager – plant production science Ian Goodwin said a good colour for the new varieties was the key to them being bought by consumers in Asia.

The experiment involves putting the hoods on for a short period and measuring the colour intensity.

"It's to see the colour development and at what times of the growth cycle," Dr Goodwin said.

"It gives us an indicator of whether we should do summer pruning early."

Ms Visscher said she used a colour meter to give an objective colour measurement. "The results will give us a guide about summer pruning and when to let the radiation in," she said.

The experiment will take about three months.

Mr Tomkins said there was excellent potential for exporting the pears because the fruit was "meeting all purchase intention benchmarks".

"Both markets preferred the new varieties over packham pears," he said.

Mr Tomkins said in Thailand there was "a bit of disposable income" with Japanese watermelons selling for \$403 each and cherries selling for \$25 a punnet in a Bangkok supermarket.

He said that while the colour of ANP-018 was appealing to consumers in China, pears were not part of the free trade agreement.

Apple and Pear Australia quality project manager Andrew Mandemaker said that while apples and blueberries were included in the latest round of trade-deal discussions, "pears were still a long way off".

"Apples are about two years away, could be longer," he said.

Mr Mandemaker said the new varieties would be marketed as Lanya and Delta, with small amounts available next year.

Mr Tomkins said while 81 per cent of consumers in Indonesia and 70 per cent in Thailand preferred to buy loose pears, there was a significant number who preferred pears pre-packed.

"The preference is for slightly smaller pears to get more for their money," he said.



Field test: Iris Visscher, a masters student from the Netherlands, checks the colouring of blush pears with a colour meter at Agriculture Victoria, Tatura.

Picture: LYNDAL READING

Eye on

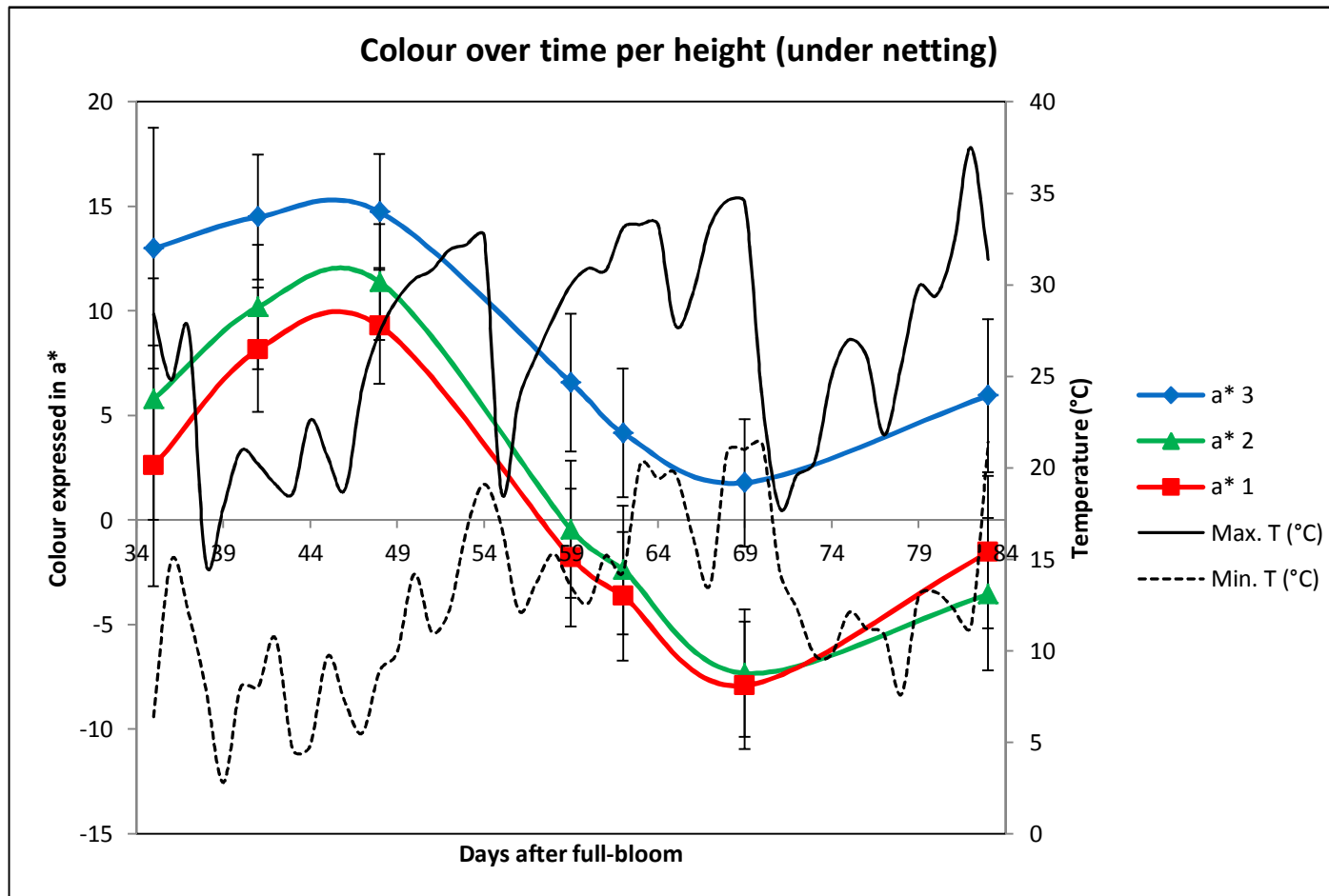
Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears

- Cultivar:
 - On red-blushed pear cultivar ANP-0131 (branded Deliza®) grafted on BP1
- Treatments:
 - Mulch
 - No mulch
 - Under netting versus outside netting
- Measurement:
 - Light
 - Colour
- Duration:
 - 7 weeks



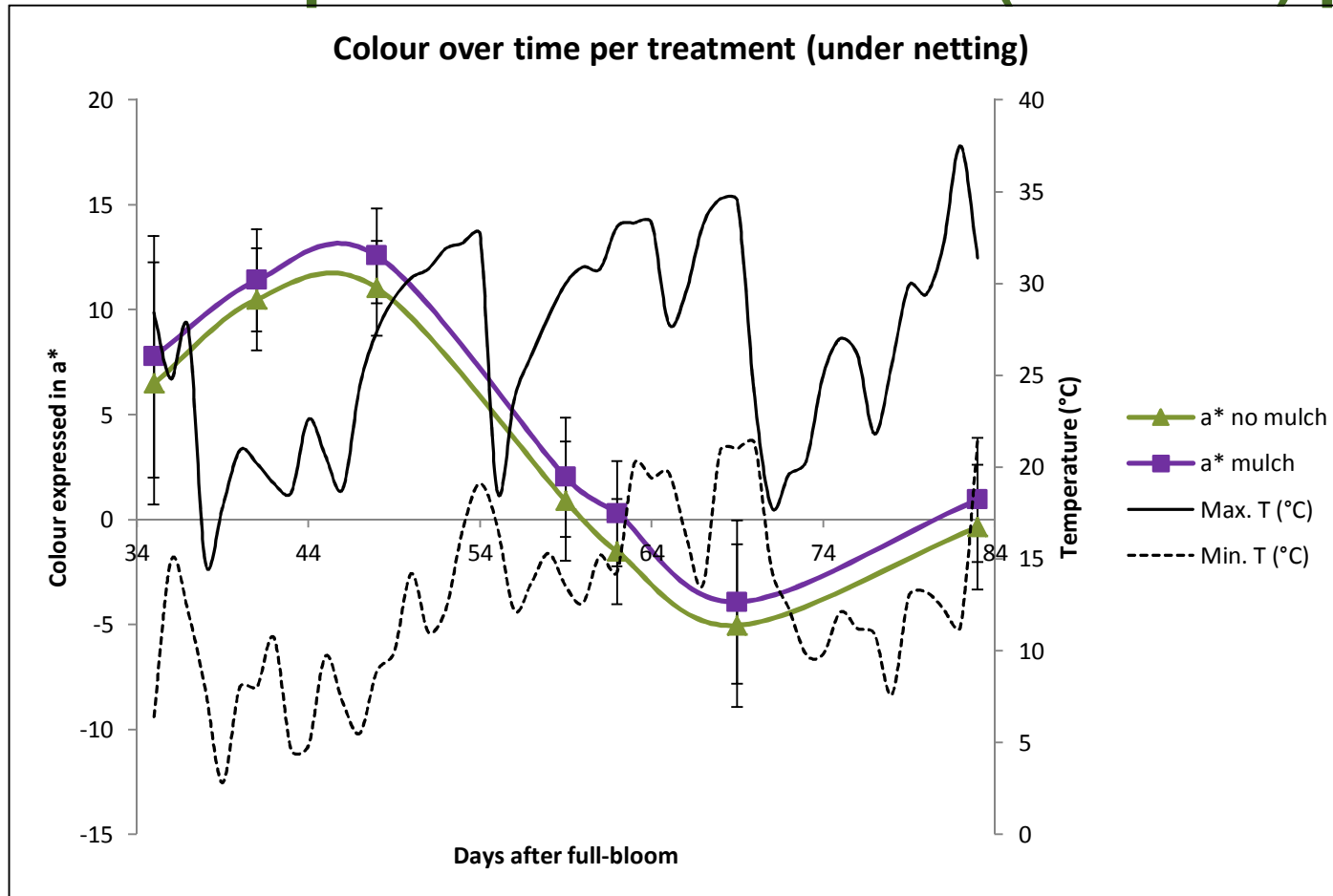
Reflective effect applied to orchard floor; inside netting

Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears



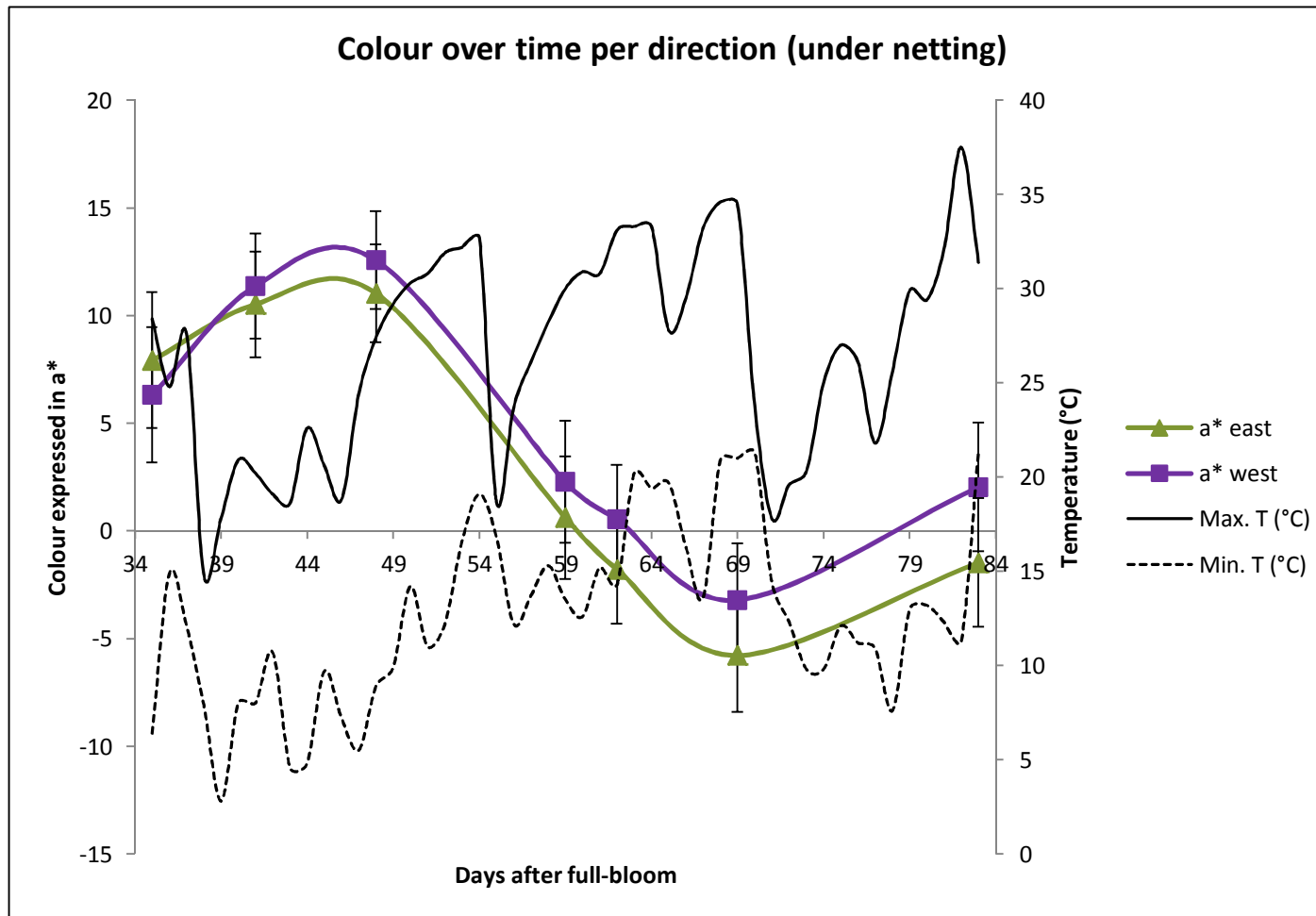
Significant effect in colour at different heights

Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears



No significant effect in colour for different treatment

Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears



No significant effect in colour for different directions

Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears

			Under netting		Outside netting	
			RM	Control	RM	Control
Height 1	Incoming radiation	absolute	1580	1586	2077	2082
	Reflected radiation	absolute	326	56	581	99
		%	20.63	3.53	27.97	4.76
Height 2	Incoming radiation	absolute	1618	1600	2100	2097
	Reflected radiation	absolute	297	63	521	93
		%	18.36	3.94	24.81	4.43
Height 3	Incoming radiation	absolute	1677	1673	2128	2135
	Reflected radiation	absolute	237	66	419	105
		%	14.13	3.95	19.69	4.92

Amount of light reflected using reflective mulch (RM) is higher compared to control

Experiment 1 – effect of reflective mulch on red colour development in ANP- 0131 (Deliza®) pears

- Conclusion:
 - Reflective mulch has no significant effect on red colour development of ANP-0131 pears when used between 35 and 83 days after full bloom
- Further research
 - Extend OR choose other period of covering orchard floor
 - More light measurement

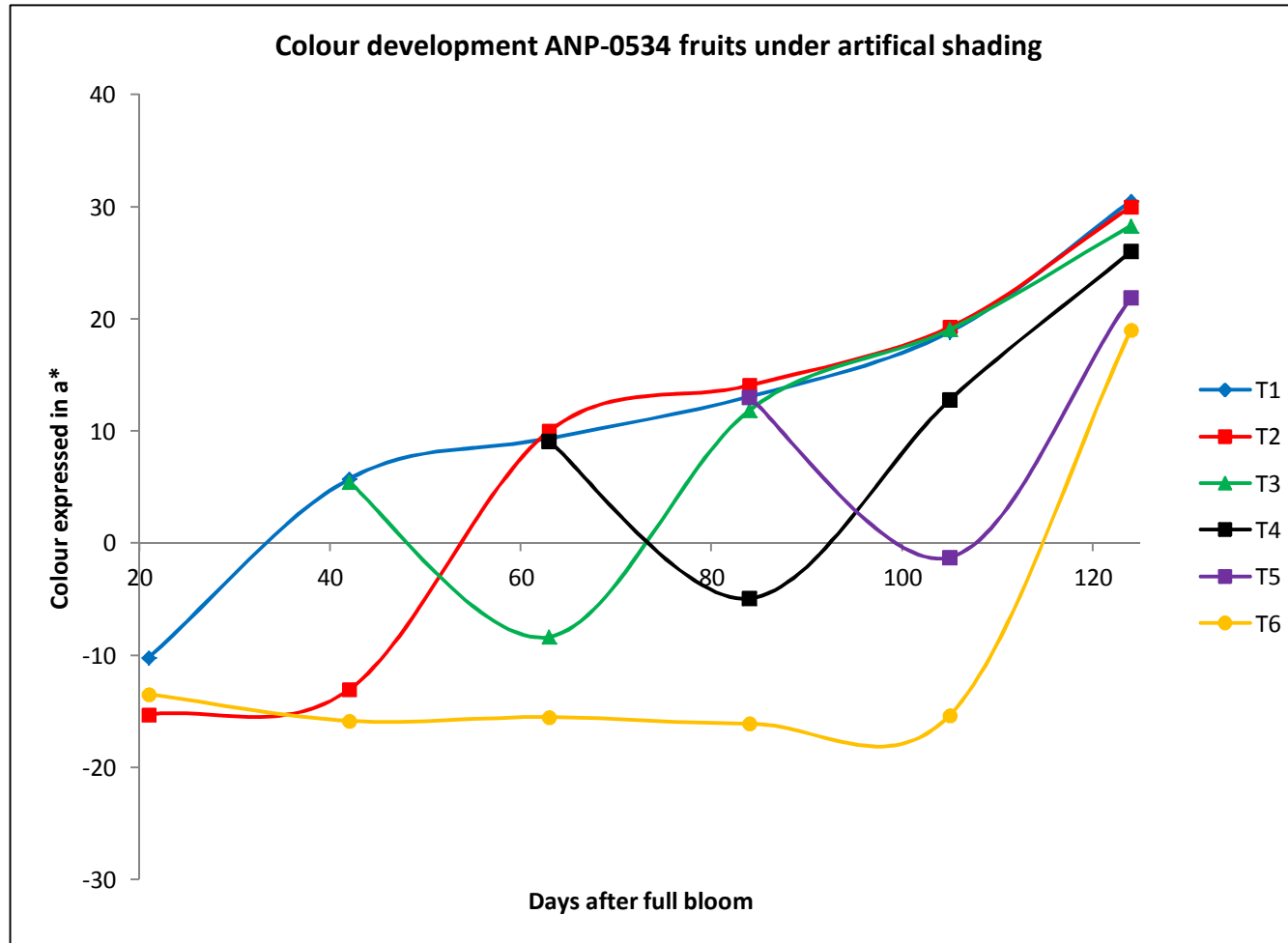
Experiment 2 – effect of artificial shading on red colour of ANP-0534 fruits

- Cultivar:
 - On red-blushed pear cultivar ANP-0534 grafted on D6 rootstock
- Treatments:
 - No artificial shading (T1)
 - Artificial shading for certain period (T2 – T6)
- Measurement:
 - Colour of fruits at one height
 - Quality (not finished)
- Duration:
 - 15 weeks



Visual colour difference in pears after period of artificial shading

Experiment 2 – effect of artificial shading on red colour of ANP-0534 fruits



Experiment 2 – effect of artificial shading on red colour of ANP-0534 fruits

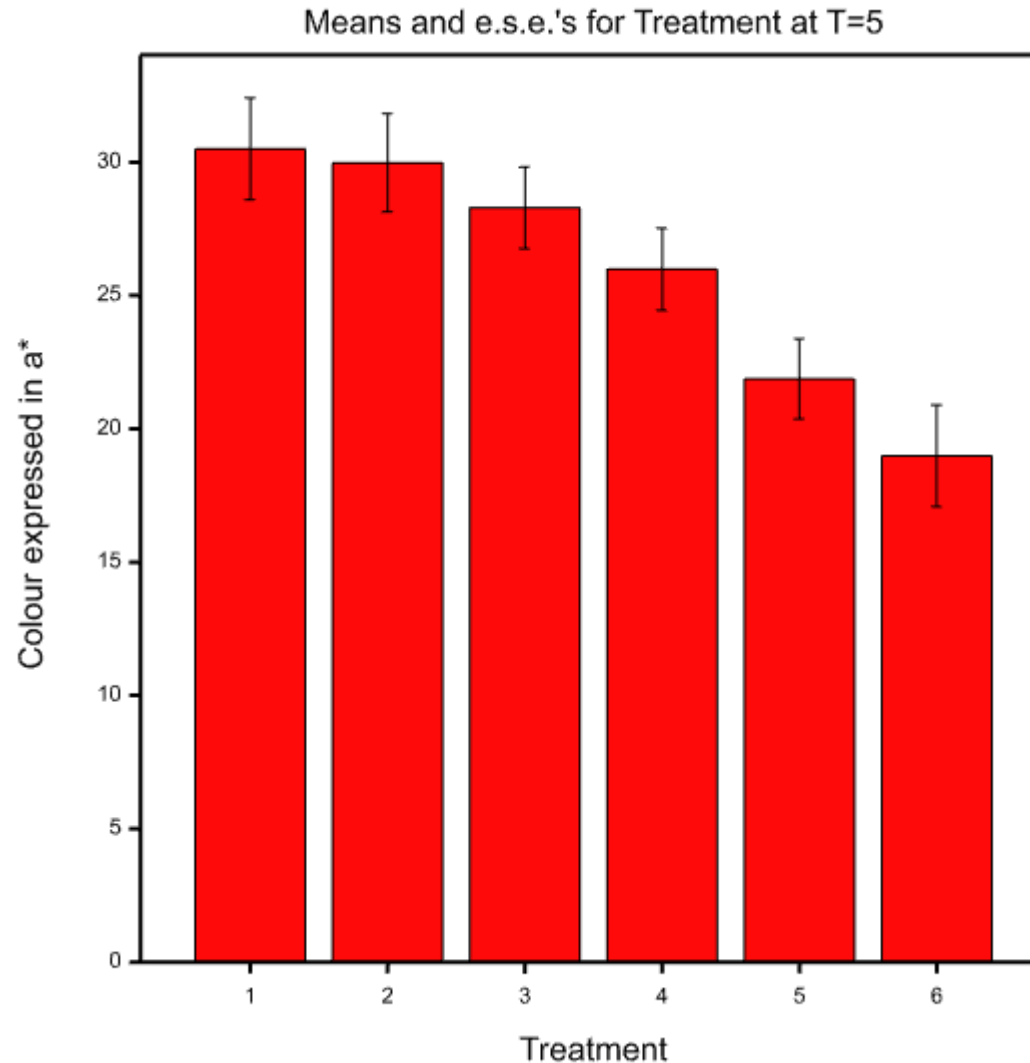
Treatment	Time point					
	T=0	T=1	T=2	T=3	T=4	T=5
T1	✓	✓	✓	✓	✓	✓
T2	✓	✓	✓	✓	✓	✓
T3	×	✓	✓	✓	✓	✓
T4	×	×	✓	✓	✓	✓
T5	×	×	×	✓	✓	✓
T6	✓	✓	✓	✓	✓	✓

Significant difference between colour of fruits during experiment

Treatment	Time point					
	T=0	T=1	T=2	T=3	T=4	T=5
T1	-10.22 b	5.71 b	9.33 c	13.05 c	18.83 d	30.49 c
T2	-15.30 a	-13.08 a	10.00 c	14.06 c	19.26 d	29.98 c
T3		5.43 b	-8.37 b	11.84 c	19.03 d	28.29 c
T4			9.05 c	-4.95 b	12.74 c	25.98 bc
T5				12.98 c	-1.29 b	21.87 ab
T6	-13.50 a	-15.85 a	-15.52a	-16.10 a	-15.35 a	18.98 a
LSD	2.387	3.633	2.609	2.773	4.668	5.353

Experiment 2 – effect of artificial shading on red colour of ANP-0534 fruits

	T=5
T1	30.49 c
T2	29.98 c
T3	28.29 c
T4	25.98 bc
T5	21.87 ab
T6	18.98 a
LSD	5.353



Experiment 2 – effect of artificial shading on red colour of ANP-0534 fruits

- Conclusion:
 - No significant difference between control and some artificial shading treatments
 - Relation between a^* , b^* , L^* unclear
 - Colour peak at end of experiment (~ harvest) which is favourable
- Further research
 - Repeated experiment confirm results

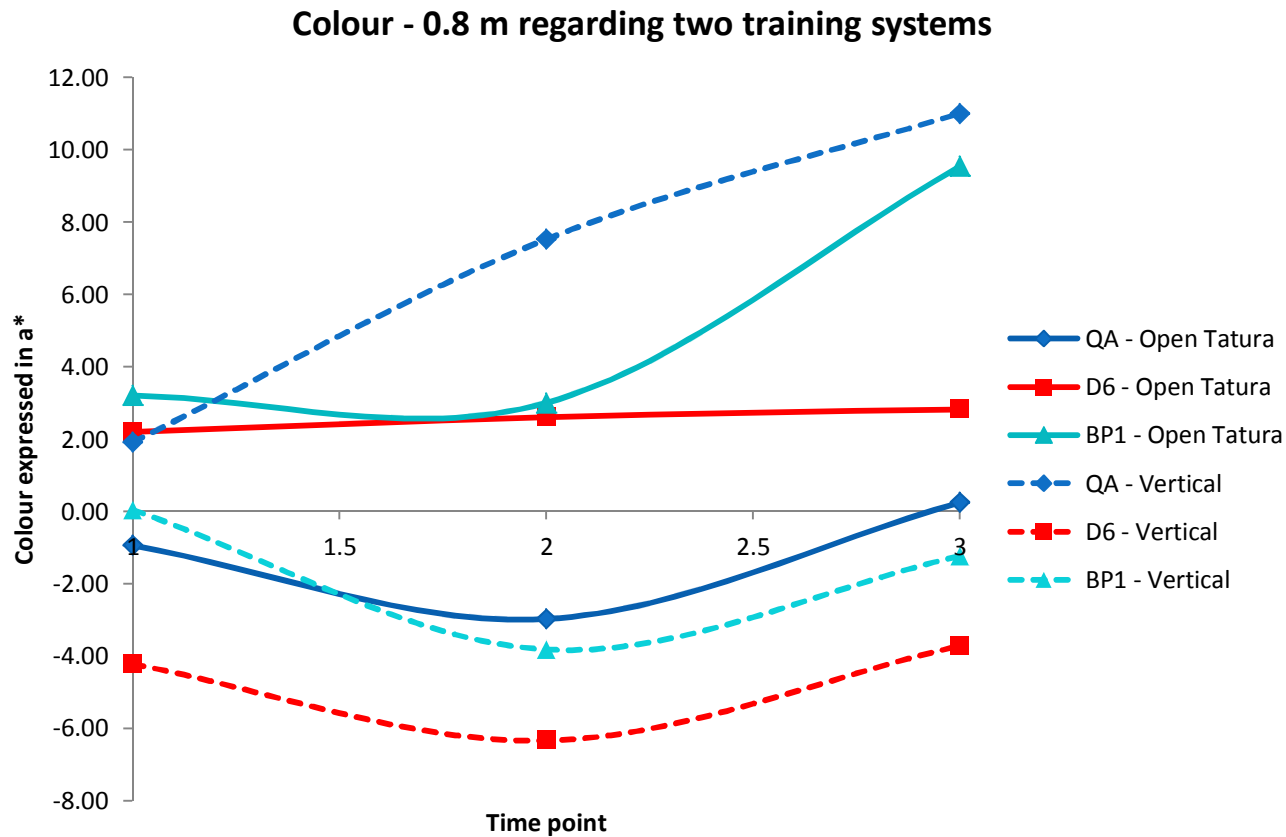
Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears

- Cultivar:
 - On red-blushed pear cultivar ANP-0131 grafted on D6, QA or BP1 rootstock
- Treatments:
 - Trainings system
 - Rootstock
- Measurement:
 - Light
 - Colour of fruits
- Duration:
 - 6 weeks



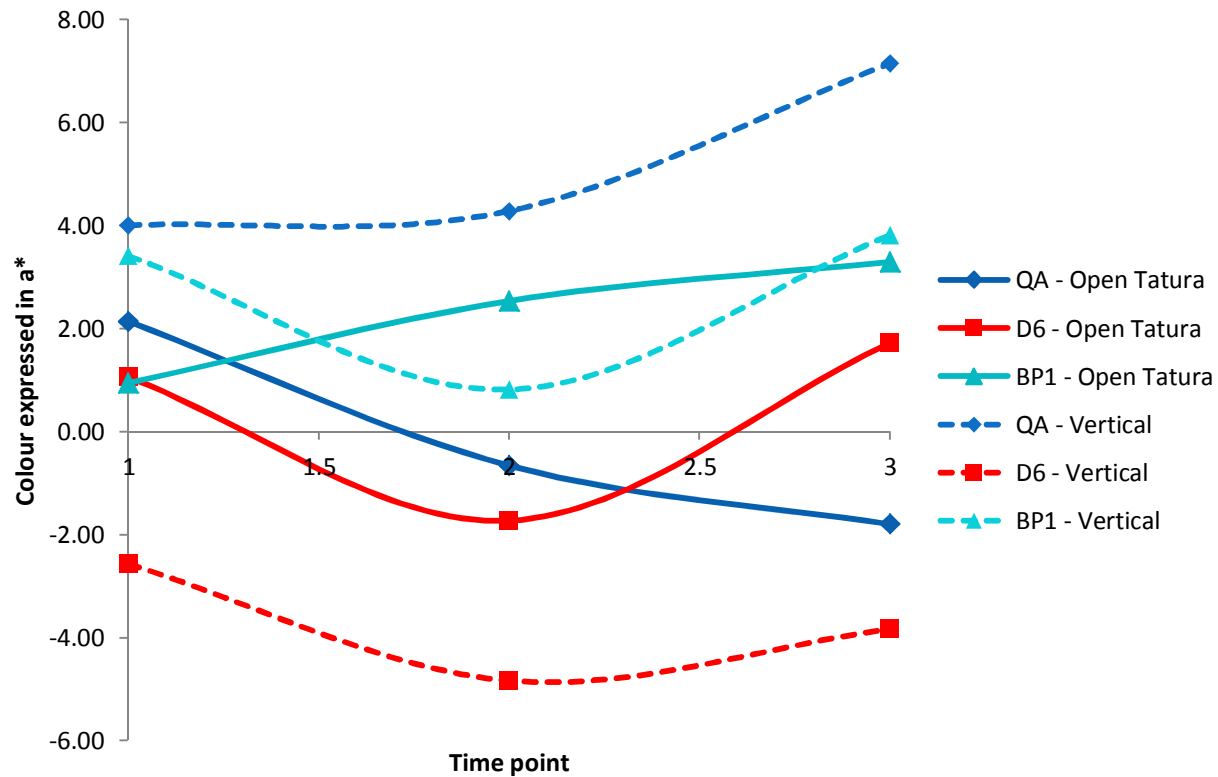
Vertical versus Open Tatura training system

Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears



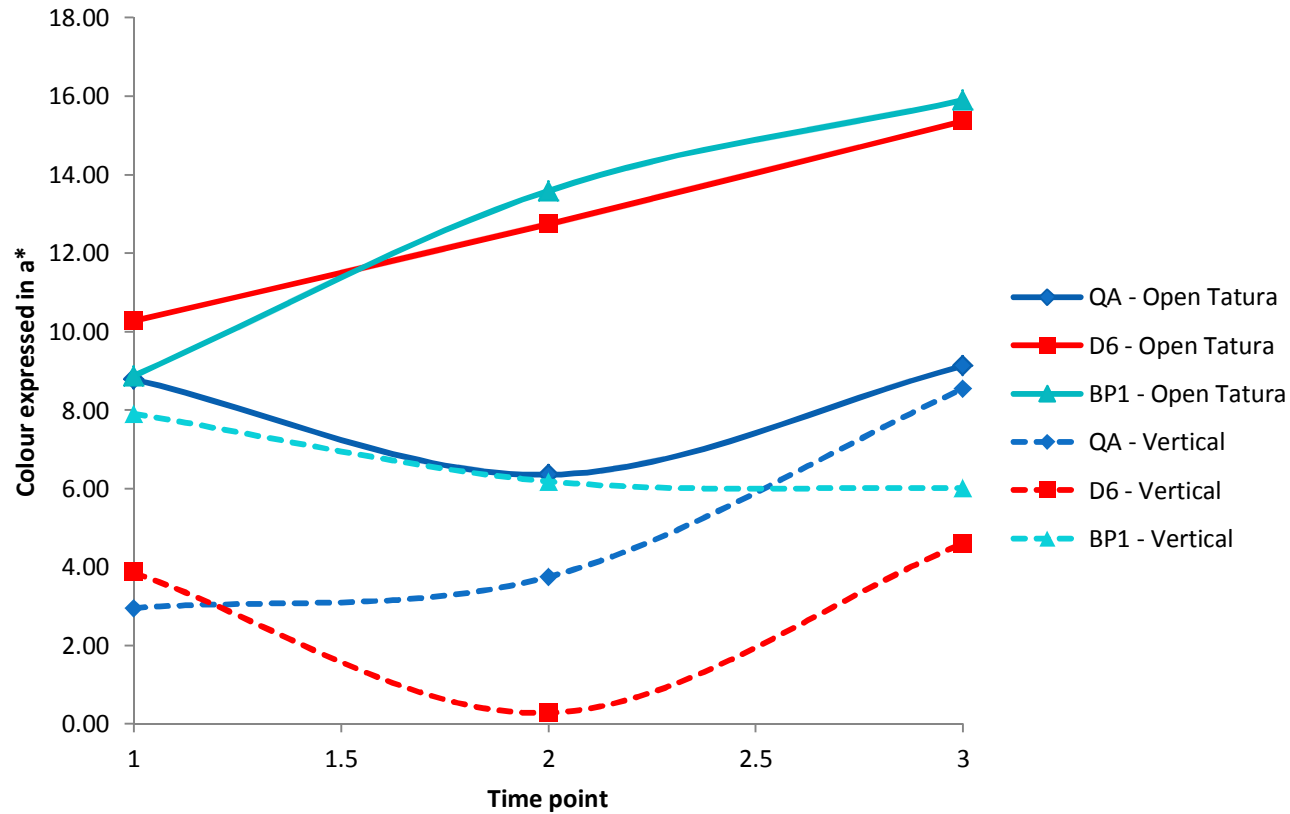
Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears

Colour - 1.6 m regarding two training systems



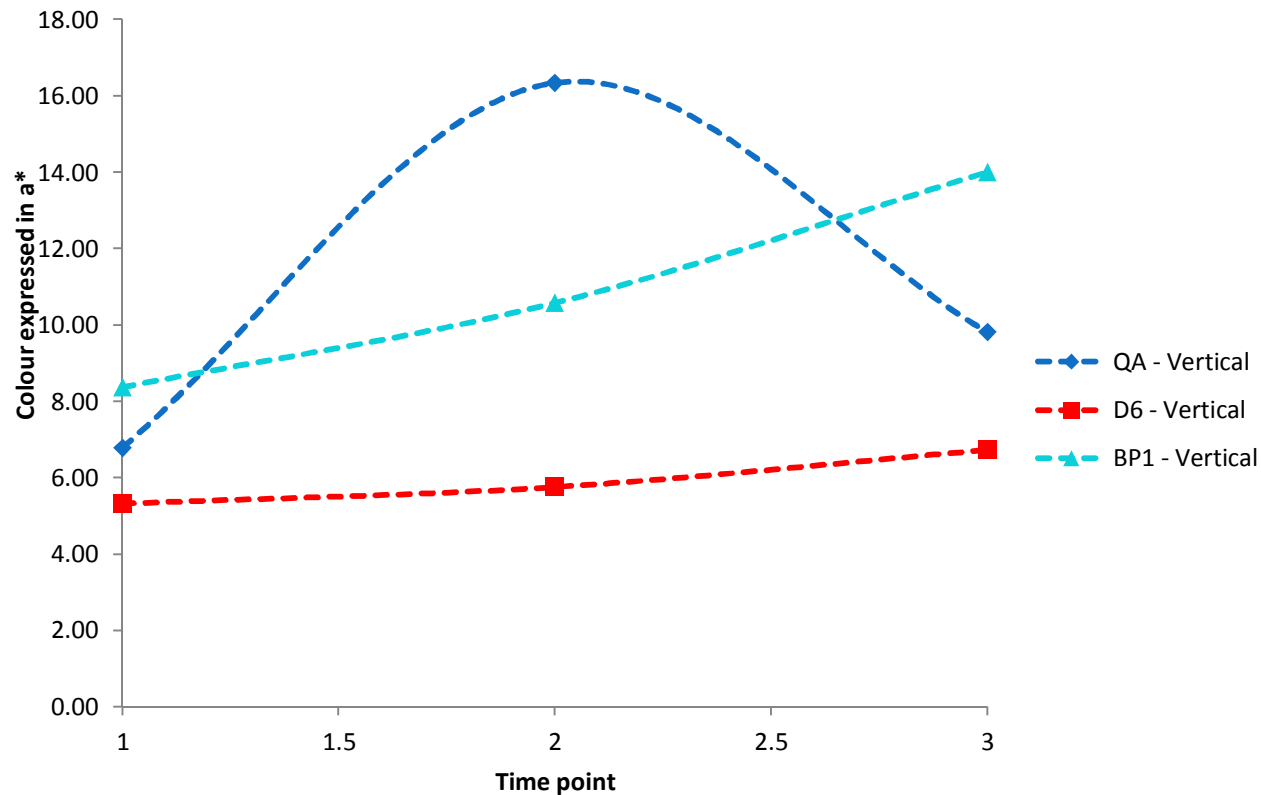
Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears

Colour - 2.4 m regarding two training systems



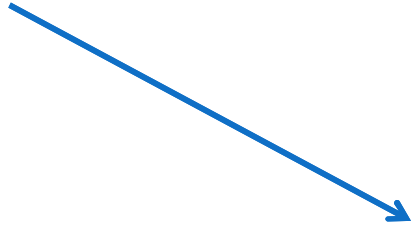
Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears

Colour - 3.2 m regarding one training systems



Experiment 3 – effect of training system and rootstock on red colour of ANP- 0131 (Deliza®) pears

- Conclusion:
 - Colour increase across height
 - 2.4 m colour generally higher – Open Tatura
 - Rootstocks mixed up
 - D6 lowest over all heights and times
 - No statistical analysis



ONLY SUGGESTIONS....

What did I learn?

- How colour develops in different cultivars
 - Improved English writing and speaking skills
 - Afterwards: how to set-up GOOD experimental design
-
- A lot about Australia, things I will never forget!

Understanding colour development in red-blushed pears

Questions?

