SESSION NINE

Session Nine
Fruit size and production

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Mulching – is it worth it?

A Sustainable Farming Fund project in association with Perry Environmental Ltd and Living Earth Ltd

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Avocado Industry Council Ltd

Sustainable Farming Fund
www.maf.govt.nz/sff

Introduction

- Mulching is widely regarded as a worthwhile management practice as it:
  - improves yield
  - maintains soil moisture
  - improves root numbers & function
- The negatives are:
  - hard to get a reliable supply
  - becoming expensive
  - impact on fertilizer availability

Introduction

- Utilize greenwaste as a reliable supply of mulch
- Greenwaste companies [Living Earth Ltd and Perry Environmental Ltd]
- Waste material from their composting operations
- Increasing supply of greenwaste
- Greenwaste products are: compost, compost tailings, pasteurized but uncomposted greenwaste

Introduction

Asked four questions:

- What should the mulch be made of?
- How much should be applied?
- Where should mulch be applied?
- When should mulch be applied?

Introduction

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- **What should the mulch be made of?**
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- Where should mulch be applied?
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Experimental

- 5 orchards
- 100 mm thickness
- 1 m wide band centered on the drip line
- Treatments applied to randomly selected trees
- Trees similar size and shape
- 5 trees per treatment
- 7 mulch treatments

Experimental

Mulch treatments were:

- Minimal mulch – regular removal of mulch
- Leaf litter – accumulation

- Compost
- 10 day greenwaste

Experimental

Mulch treatments were:

- Bark + 20% compost

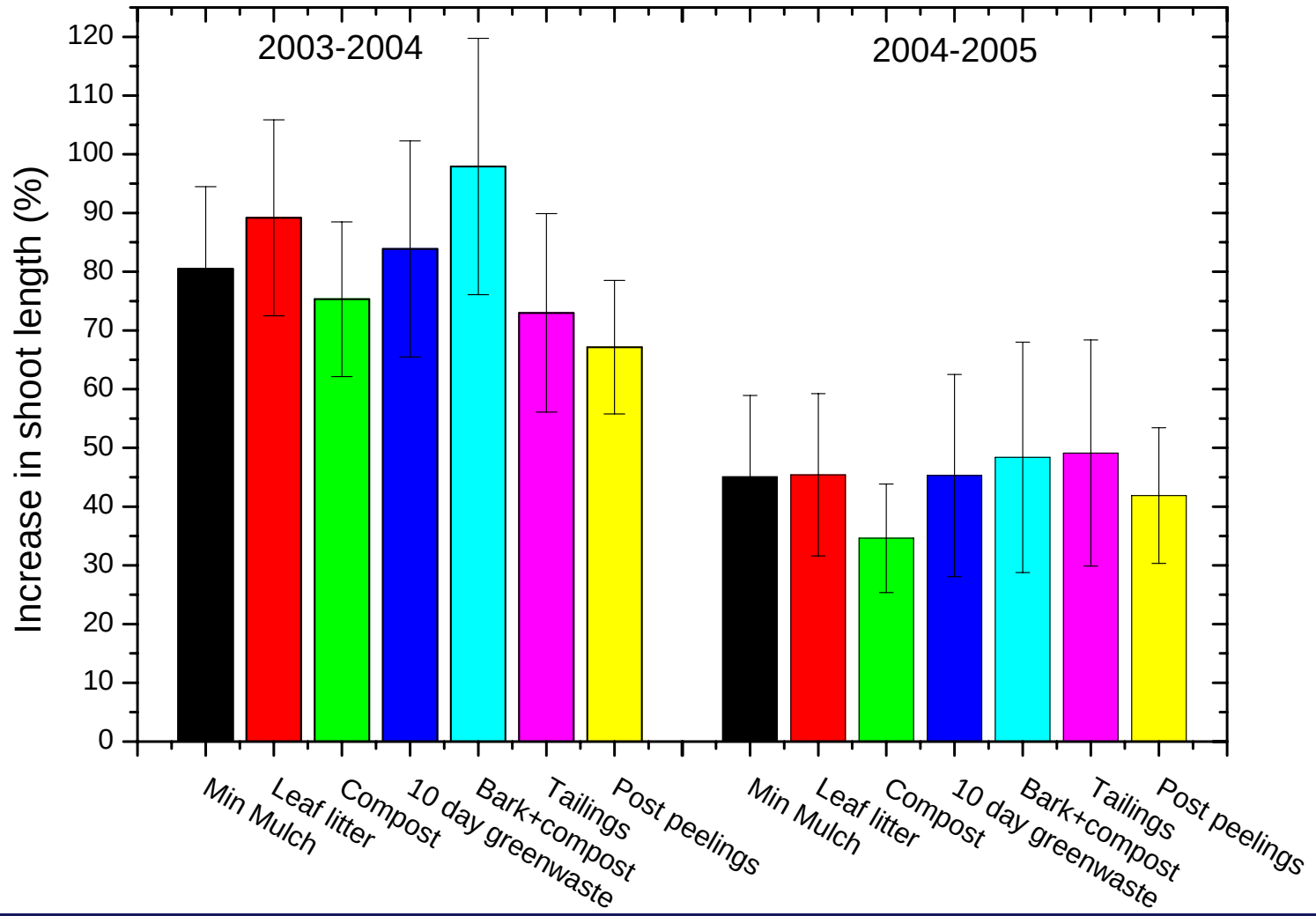
- Post peelings

Controls:- minimal mulch, leaf litter, post peelings

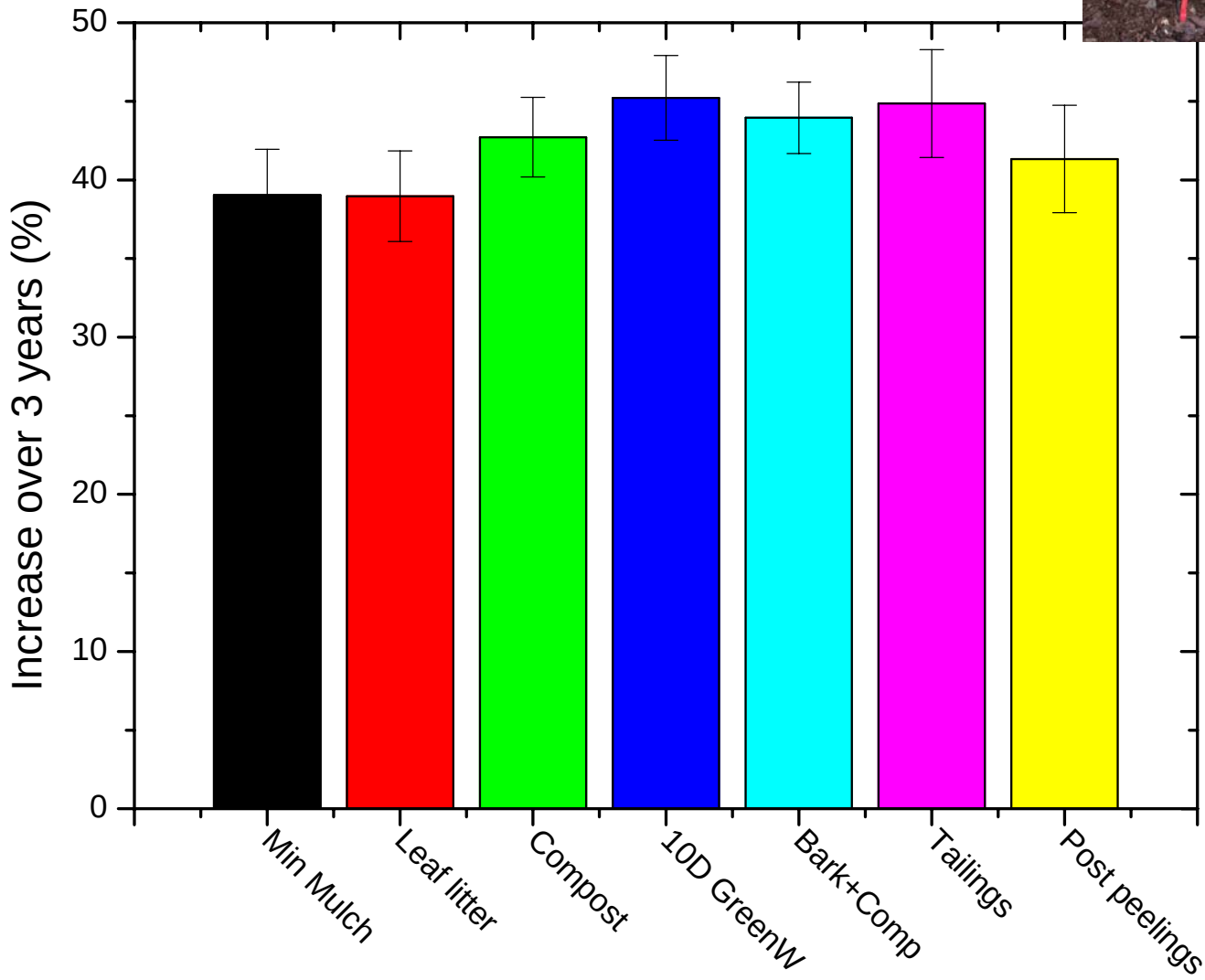
Measurements

- Shoot growth
- Trunk circumference
- Weed cover
- Yield
- Soil moisture
- Roots
- Mulch breakdown
- Minerals

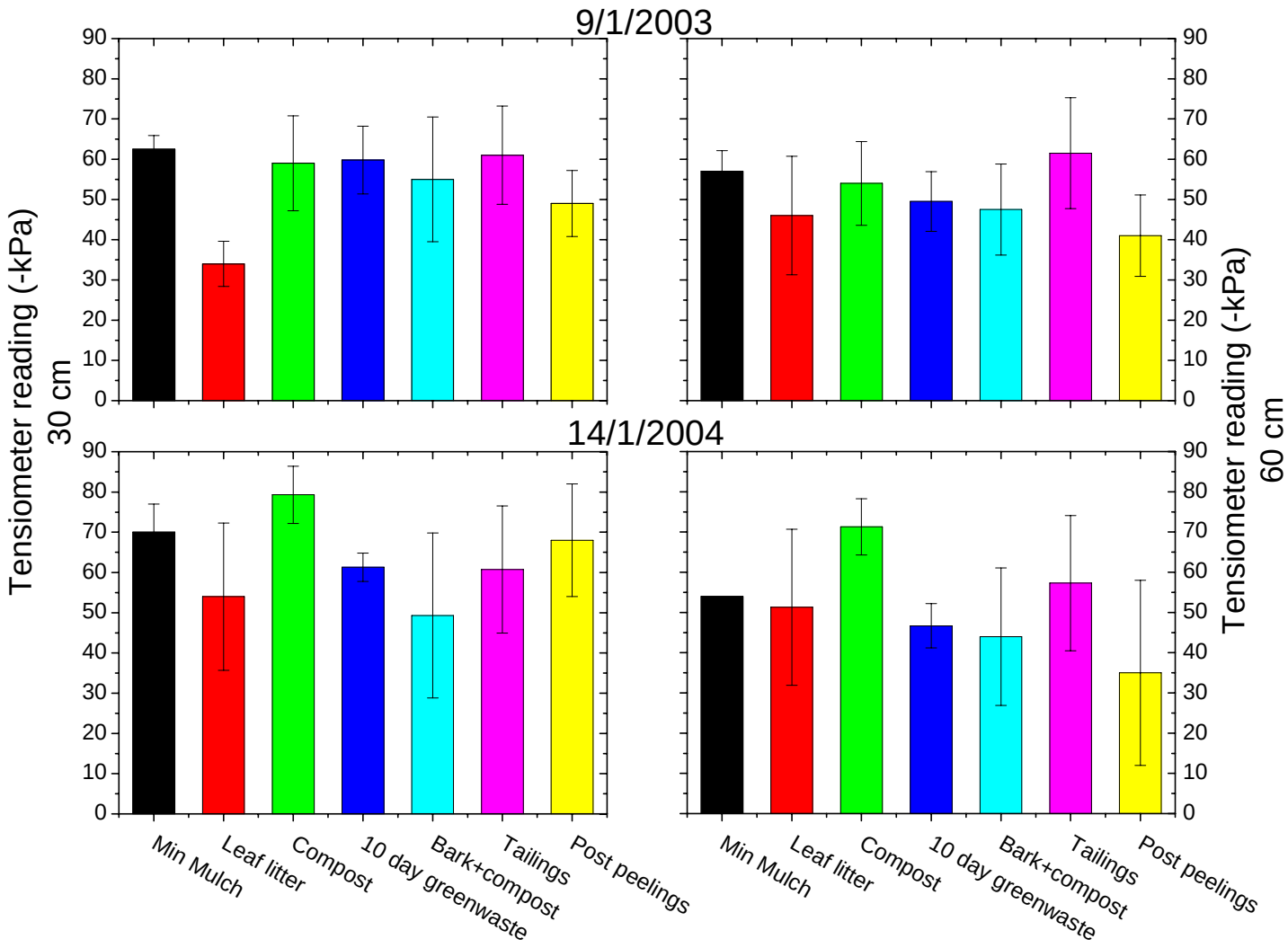
Shoot growth



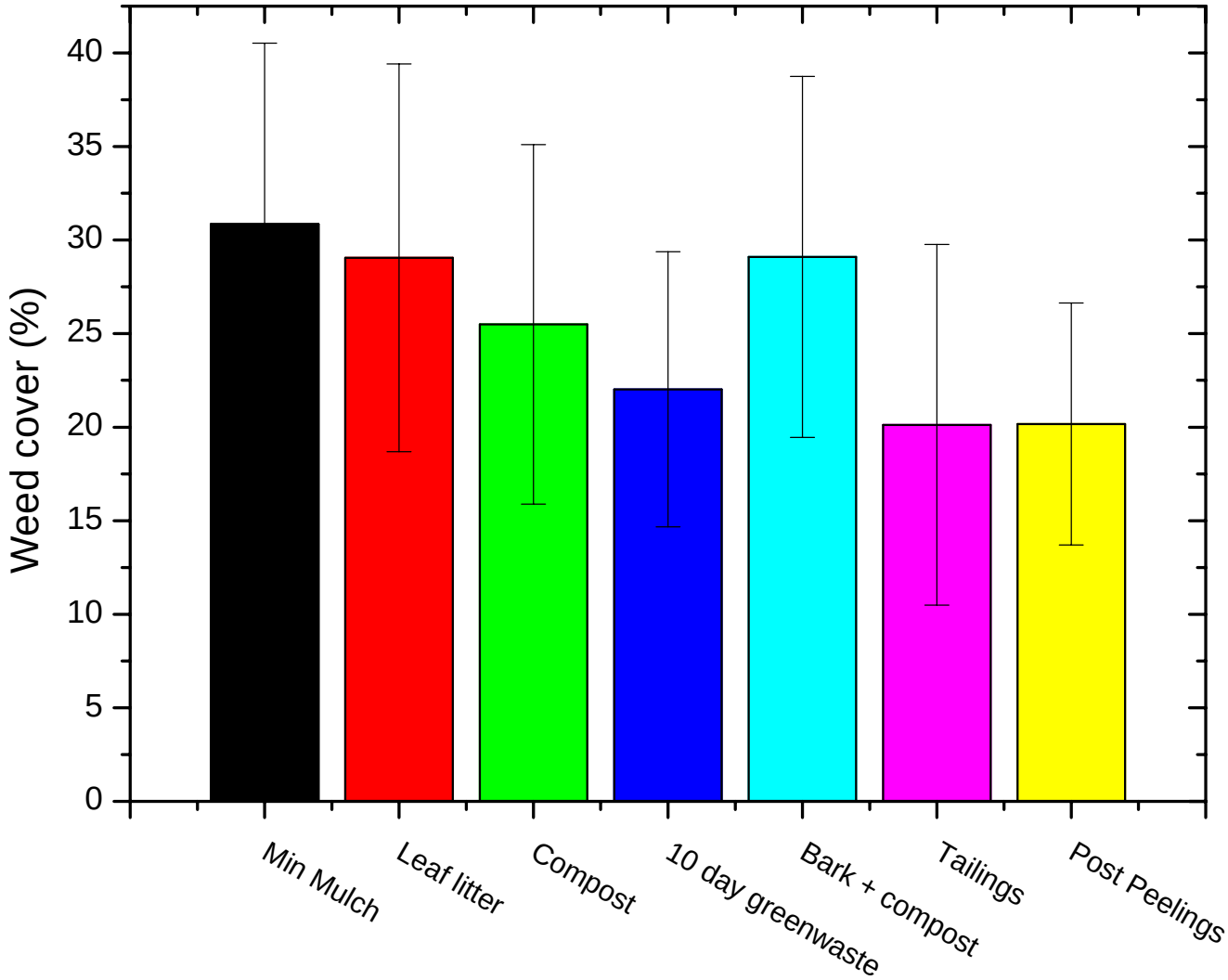
Trunk circumference



Soil moisture



Weeds


Weed cover (%)
0
5
10
15
20
25
30
35
40
Min Mulch
Leaf litter
Compost
10 day greenwaste
Bark + compost
Tailings
Post Peelings

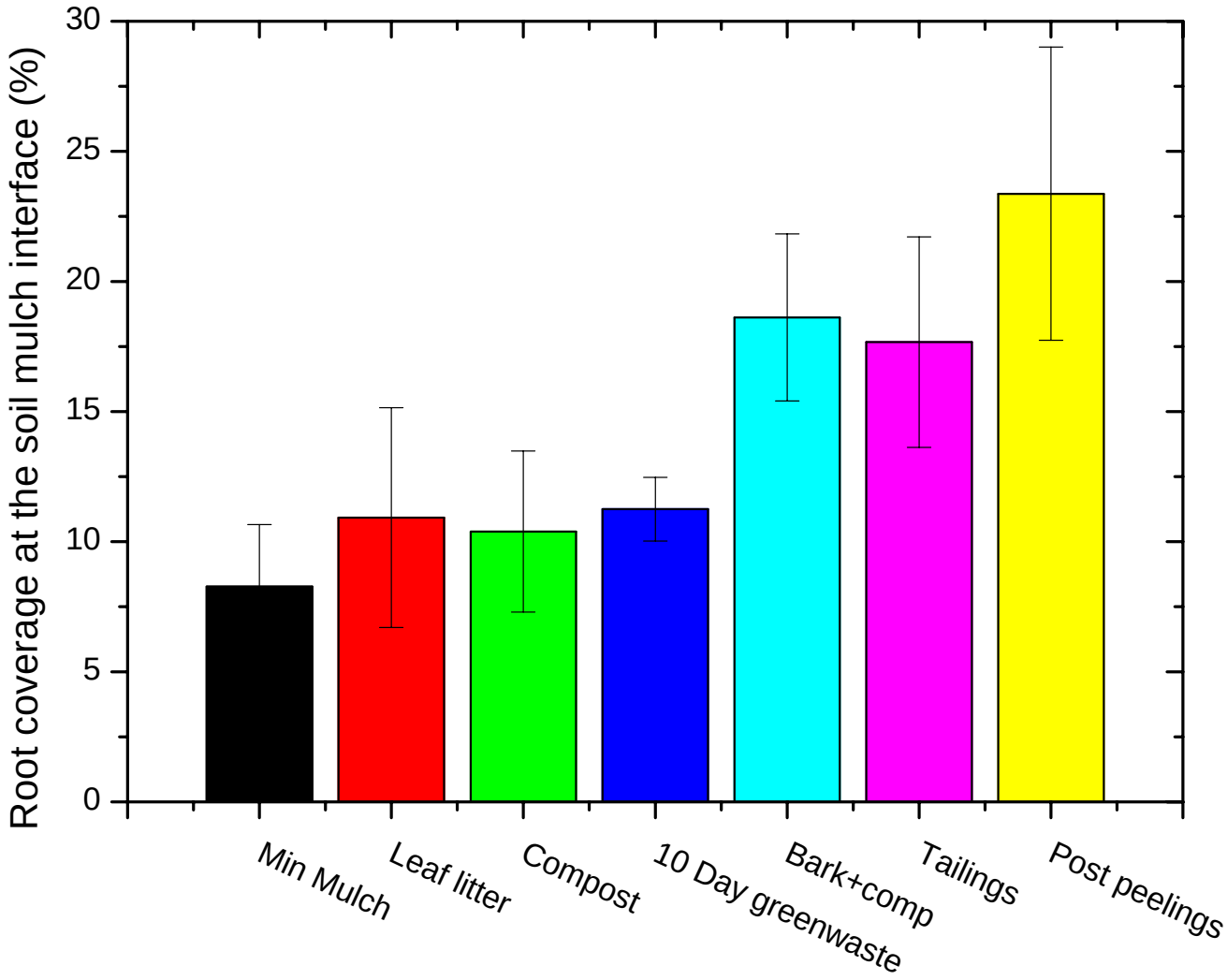
Yield

- Third harvest in 2005/06 season
- 2003/04 and 2004/05 low crop years
- 2004/05 harvest suggest compost and post peelings had highest yields

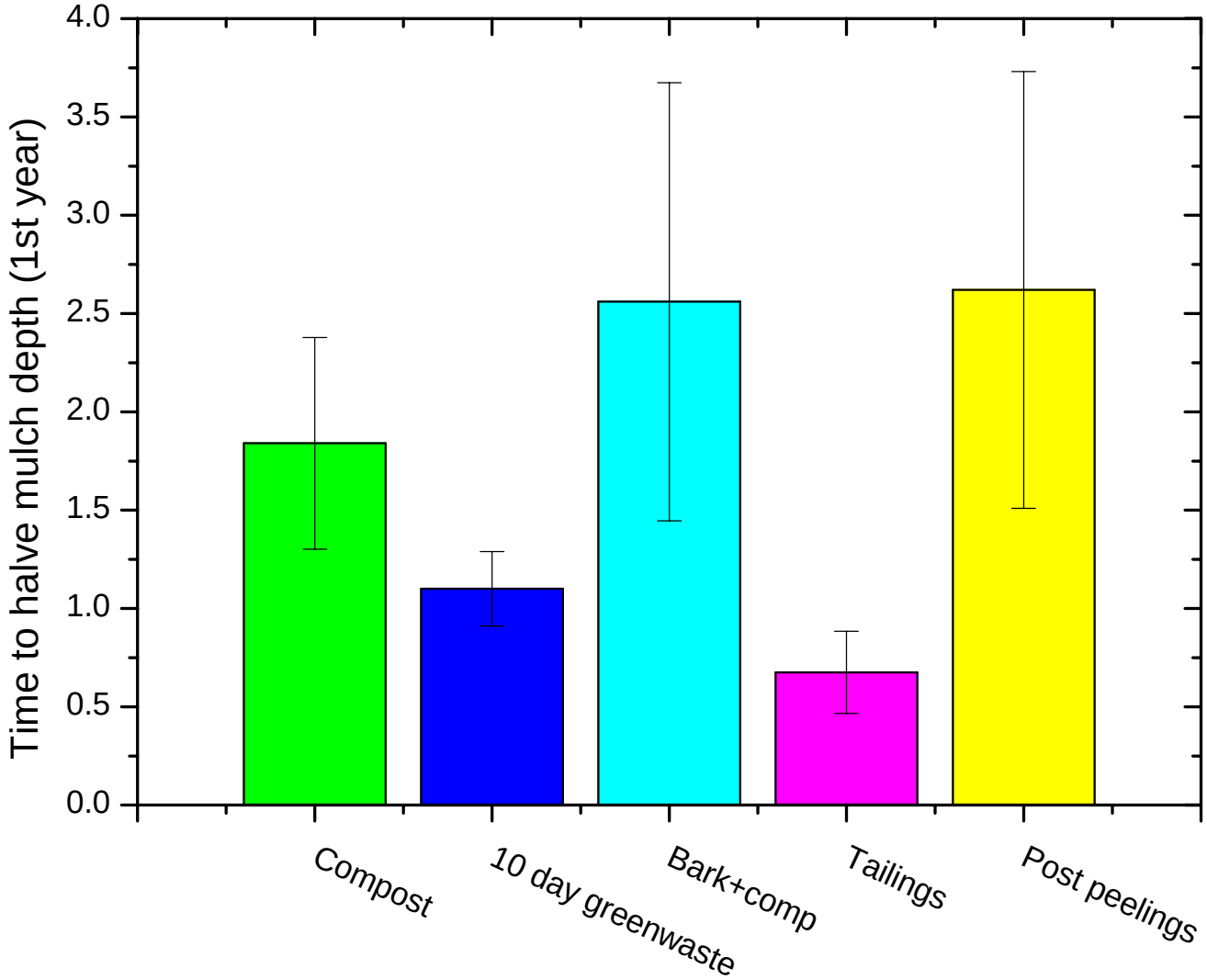
  -but off a very low yield base

- Reserve judgment until after final harvest

Roots


Root coverage at the soil mulch interface (%)
0
5
10
15
20
25
30
Min Mulch
Leaf litter
Compost
10 Day greenwaste
Bark+comp
Tailings
Post peelings

Mulch breakdown



Minerals

Mineral composition as kg per m^3, Mn, Zn, CU, B are g per m^3

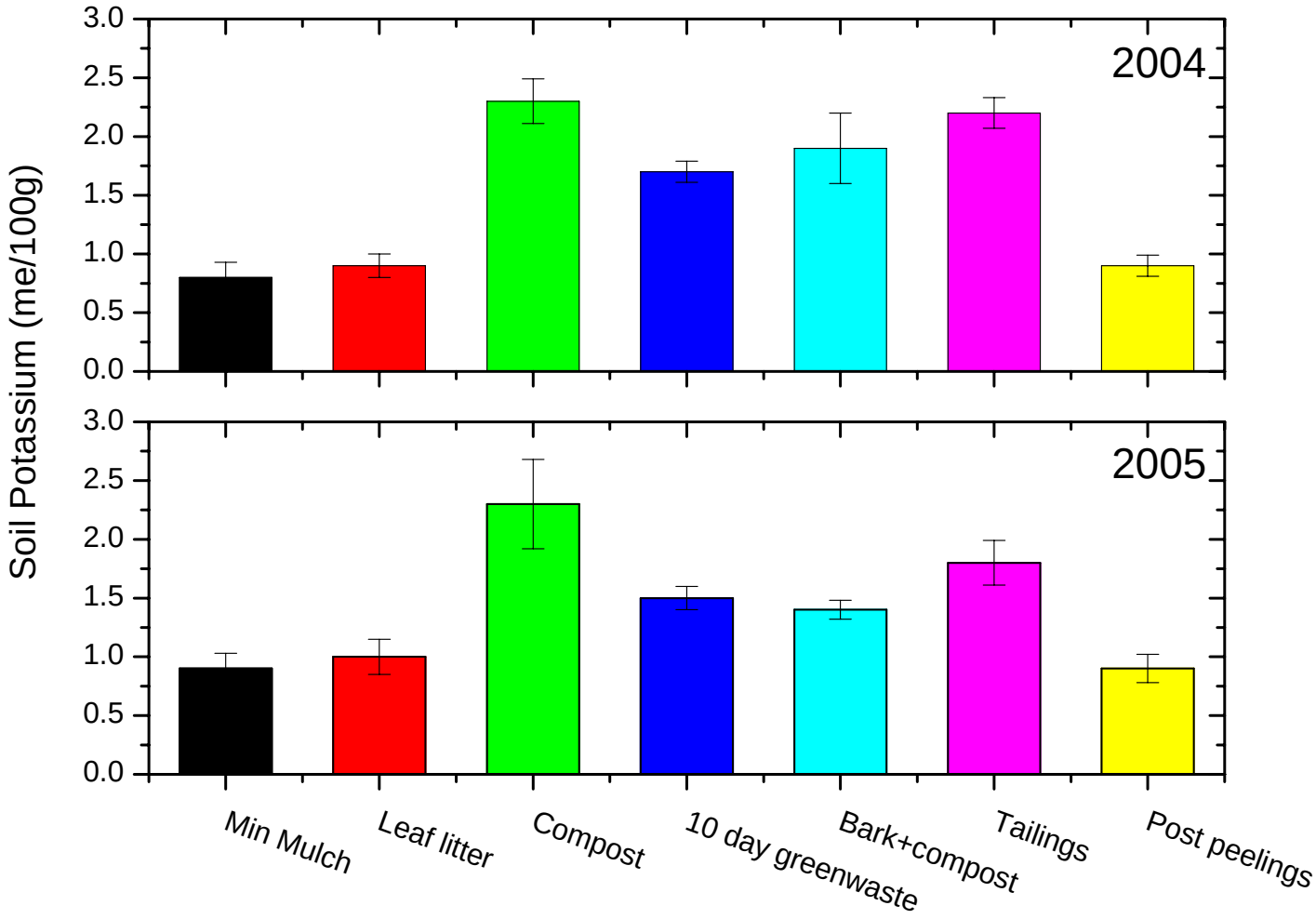
Mulch material

Mineral	Compost	10 Day greenwaste	Bark +compost	Tailings	Post peelings
N	8.1-6.8	3.8-3.2	5.1-3.4	5.1-4.8	1.0-0.2
P	2.5-2.1	0.7-0.4	1.2-0.9	2.3-2.1	0.07-0.03
S	1.4-1.1	1.0-0.4	0.8-0.6	1.4-1.2	0.09-0.03
K	4.3-1.6	2.3-0.7	3.4-0.7	4.9-1.9	0.8-0.1
Ca	17.3-13.1	6.2-4.7	10.2-8.9	9.5-9.2	0.7-0.2
Mg	1.8-1.7	1.5-0.8	1.3-0.8	1.3-1.1	0.2-0.08
Na	0.9-0.2	0.4-0.2	0.7-0.02	1.1-0.05	<0.01
Fe	5.5-4.2	3.9-1.8	1.7-1.7	2.7-1.6	0.2-0.15
Mn	217-193	156-72	122-119	194-136	22-18
Zn	114-91	85-42	110-49	122-59	9-3
Cu	39-29	28-8	35-11	37-14	2-1
B	15-8	7-6	12-7	10	3-0

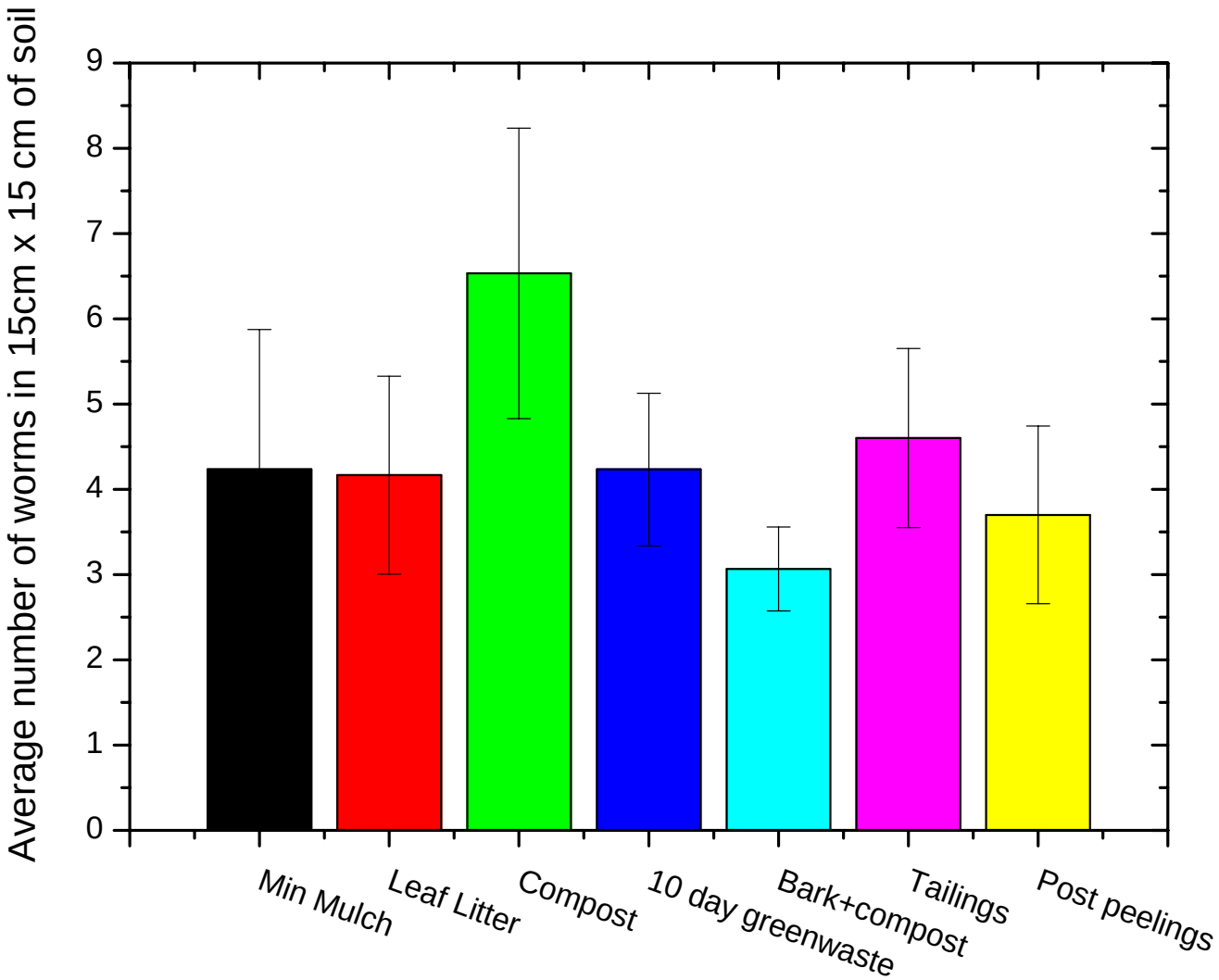
Minerals

- Only soil P, K, Mg and B showed differences
- Present at higher amounts in the soil under mulches
- Not reflected in leaf mineral content
- Probably reflect orchard fertilizer programme and soil moisture
- Expect mulches to release nutrients slowly depending on soil biological activity

Minerals


Soil Potassium (me/100g)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
Min Mulch
Leaf litter
Compost
10 day greenwaste
Bark+compost
Tailings
Post peelings

Biological activity



Summary

Mulches:

- led to a tendency for greater trunk growth
- can increase the amount of roots
- can increase the amounts of some minerals in the soil
- some are effective slow release fertilizers
- are not a substitute for irrigation
- improve soil biological activity

Is there a payback for mulching?

- Yes but it is long term and not easy to quantify
- An improved root environment and root numbers should help with productivity
- May be a useful management tool to change the soil environment
    - e.g. increasing soil biological activity may mean applying a mulch with some compost
- Other factors appear to have more influence on the tree than mulch, e.g. alternate bearing cycle, fertilizer programme

New Zealand AVOCADOS
Avocado Industry Council Limited

Acknowledgements

Growers, packhouses, SFF etc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