PPCNZ
Plant Protection Chemistry
NEW ZEALAND

Canopy density effects on spray coverage

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X3 Canopies (Hort 16A)

DENSE:
Mean Leaf layer = 6.5
Mean gap = 4%
Canopy depth = 500 mm

DENSE canopy: canopy area = 96.82%; sky area = 3.18%

MEDIUM:
Mean Leaf layer = 4.1
Mean gap = 15%
Canopy depth = 300 mm

MEDIUM canopy: canopy area = 85.56%; sky area = 14.44%

LIGHT:
Mean Leaf layer = 3.2
Mean gap = >21%
Canopy depth = 300 mm

LIGHT canopy: canopy area = 81.70%; sky area = 18.30%

Canopies

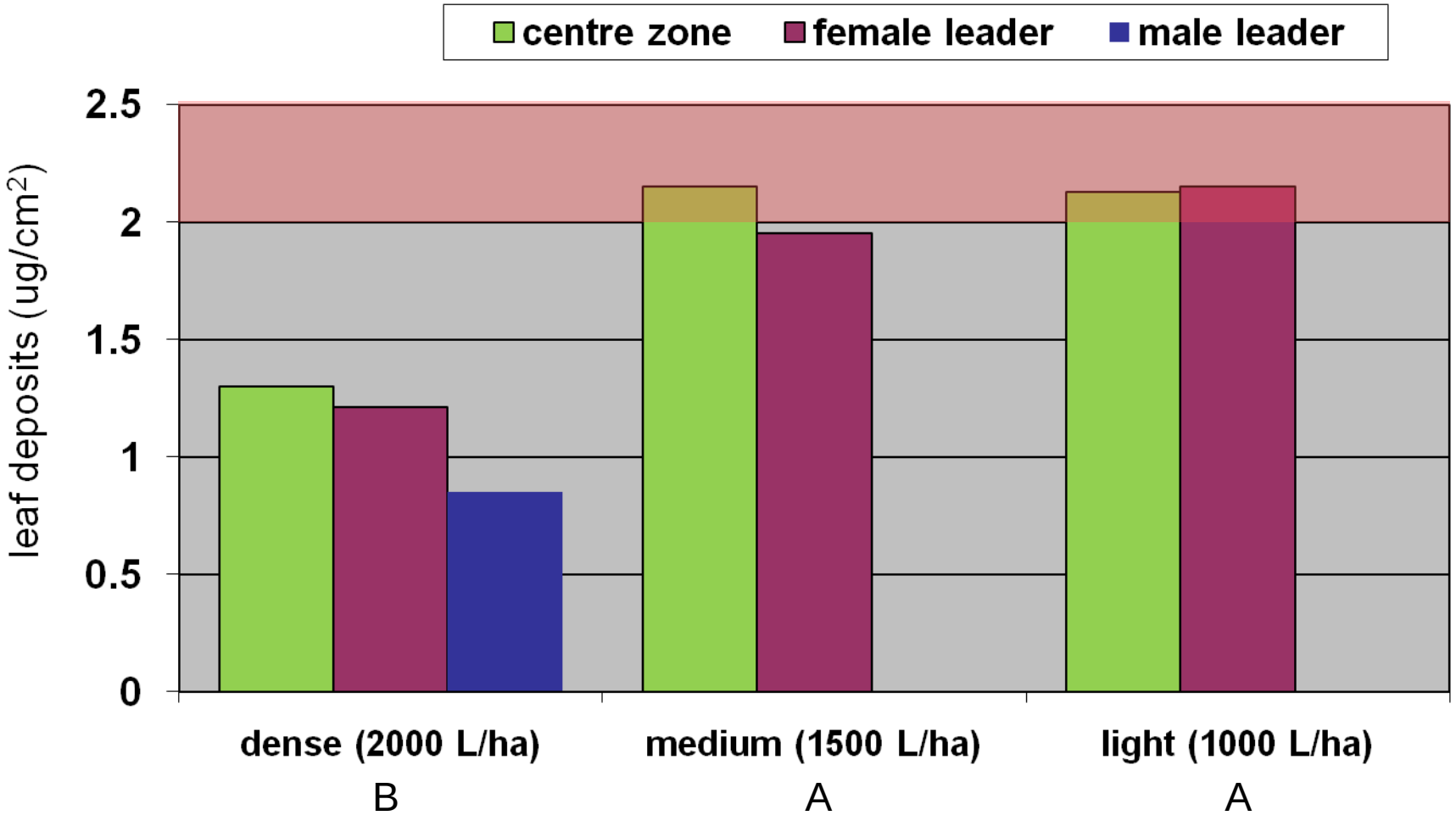
Dense

Leader zones

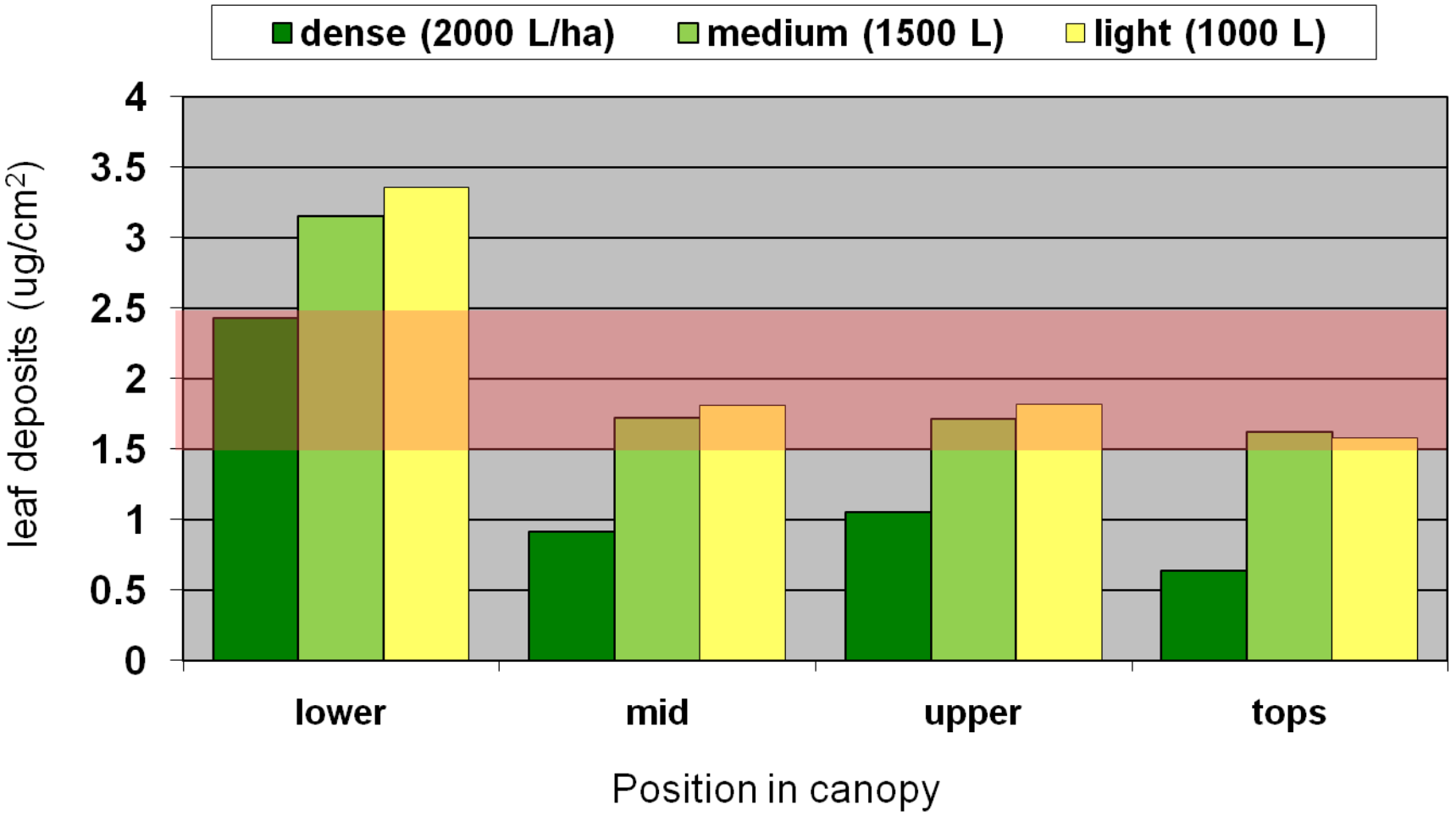
Light

Mean deposits on foliage in centre-row & leader canopy zones

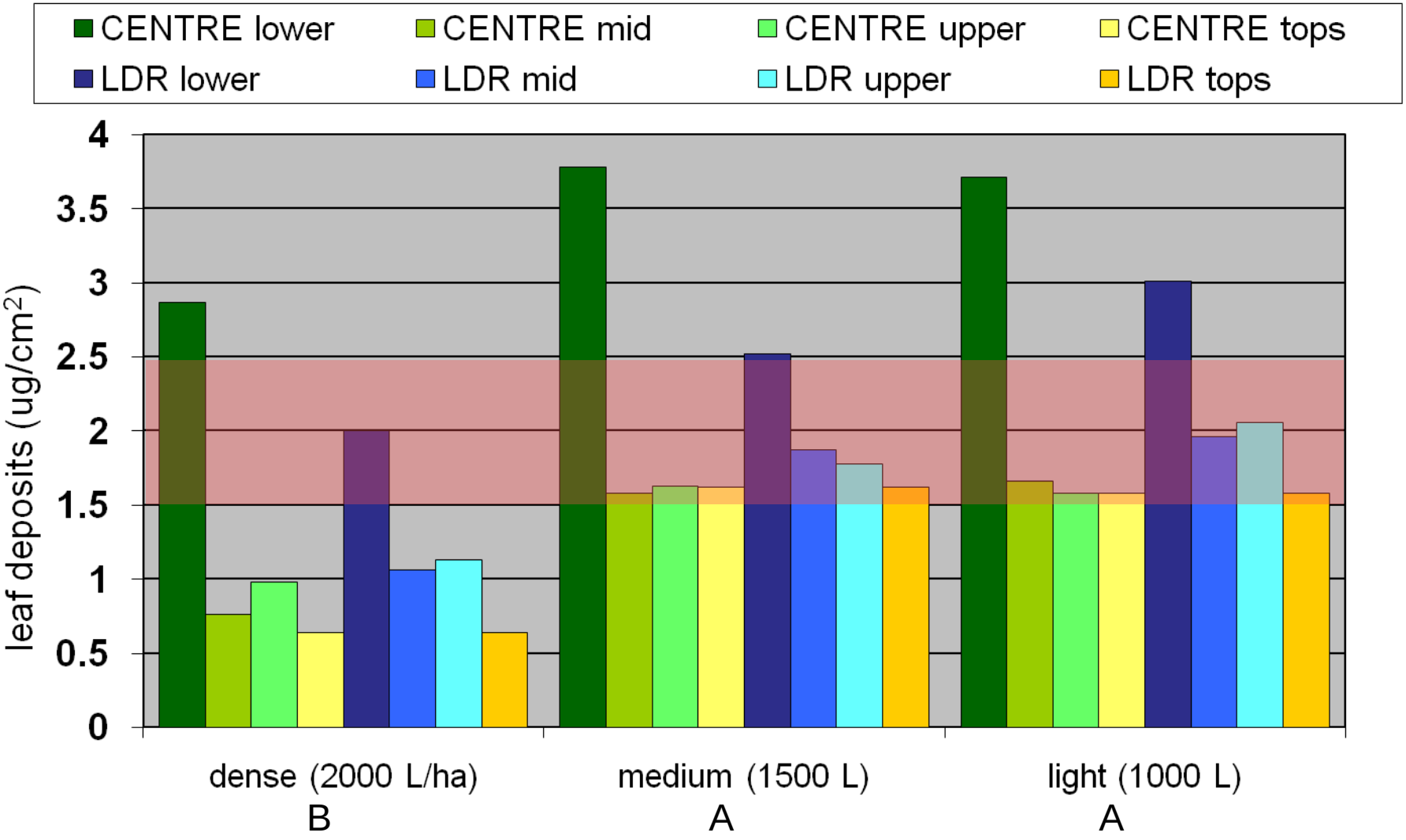
(dilute sprays + Latron B)



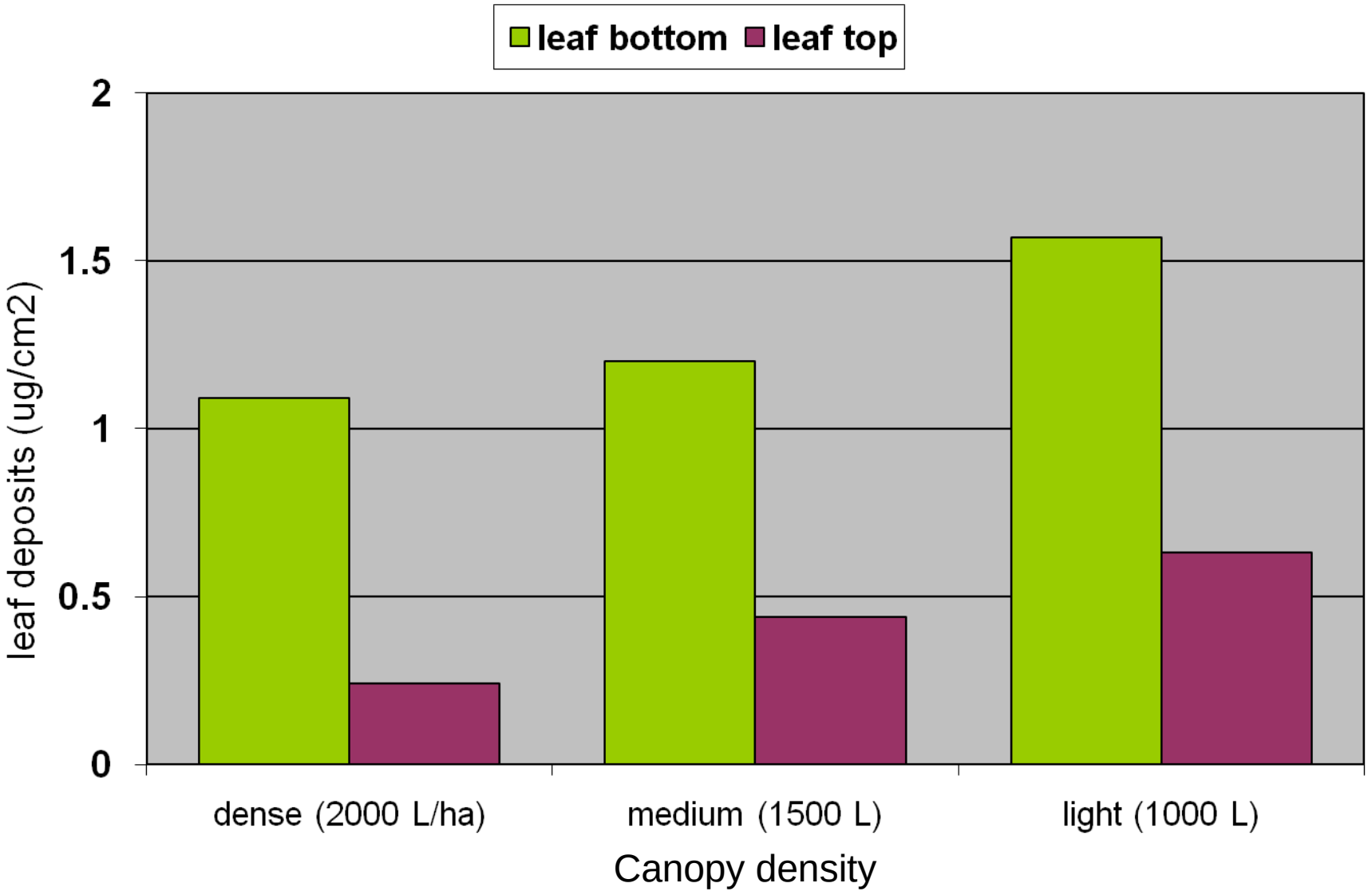
Mean deposits on foliage in 4 positions in canopy



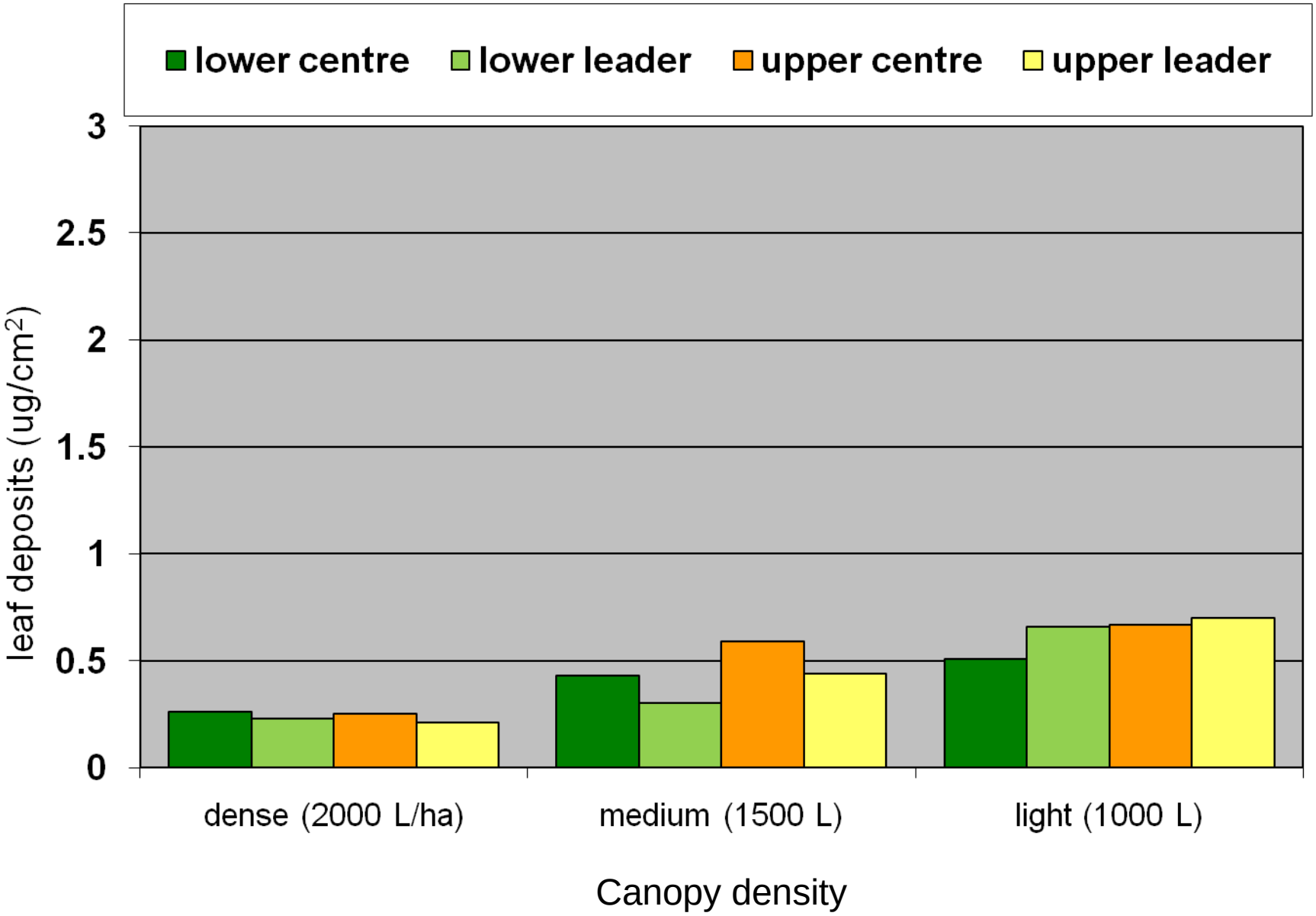
Mean deposits on foliage in all canopy zones



Mean deposits on individual leaves

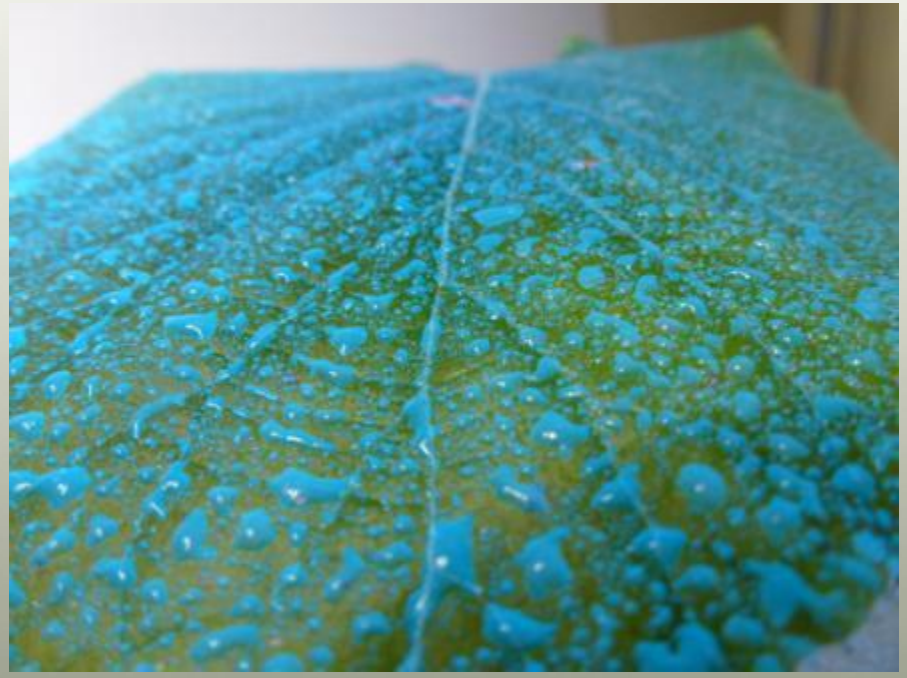


Mean deposits on single leaves: **top surfaces**



Spray deposits on top surface of Hort 16A leaf

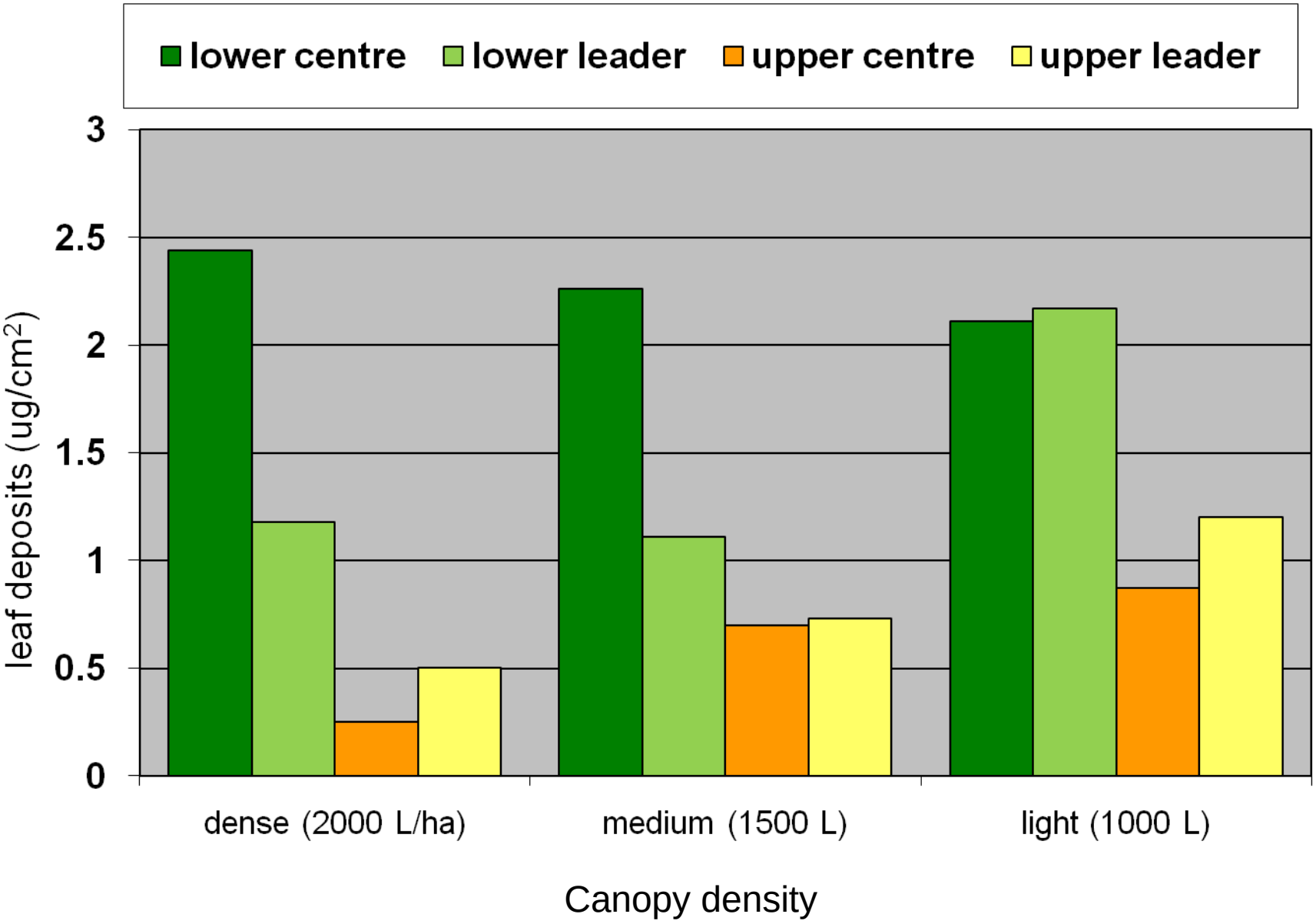
(all sprays contain a fluorescent dye visualised under UV light)



Dilute copper applied to runoff

Concentrated low-volume + Du-Wett

Mean deposits on single leaves: **bottom surfaces**



Spray deposits on bottom surface of Hort 16A leaf

(spray contains a fluorescent dye visualised under UV light)

Dilute copper, no adjuvant

Spray deposits on bottom surface of Hort 16A leaf

(spray contains a fluorescent dye visualised under UV light)

Concentrate low-volume + Du-Wett adjuvant

CONCLUSIONS

- spray deposits on all foliage in dense canopy were unacceptable, except on leaves directly exposed to the sprayer

- increasing spray volumes does not increase coverage in dense canopies

Dense, poorly managed canopies cannot be adequately protected with sprays applied in typical dilute spray volumes, even using the current best type of sprayer and setup available

- deposits on all foliage zones in managed canopies were acceptable

If canopies (male & female) are managed to reduce their density (to an even 3-4 leaf layers) then all foliage can be covered with protectant sprays applied with a well set-up sprayer

CONCLUSIONS (2)

- bottom (hairy) surfaces of leaves retain more spray deposits than the top, but if deposits don't contact the leaf surface they may not protect it?

  - ❖ Dilute spray – 0.025% Latron B
  - ❖ Concentrate spray – 0.15% Du-Wett

- Concentrated airblast sprays are more efficient in managed canopies compared to dilute, high volume sprays, and the addition of a suitable adjuvant will benefit spray retention and coverage on foliage.

  Phytotoxicity? Foliage vs Fruit?

Thankyou...

- Mike Muller
- orchard owners D&K Walker
- R&R Tractors
- ZESPRI & MAF Sustainable Farming Fund