



Mechanical Harvesting System and CMNP Effects on Debris Accumulation in Loads of Citrus Fruit

Tim Spann

Citrus Mechanical Harvesting Field Day

22 April 2009

Does mechanical harvesting increase the debris in loads of fruit?

- Potential for damage to processing equipment
- Economic costs of transporting debris instead of fruit



Sampling Method

- 50 – 60 kg samples are collected as the goat dumps fruit into trailer
- Debris is removed from the sample, sorted, dried and weighed

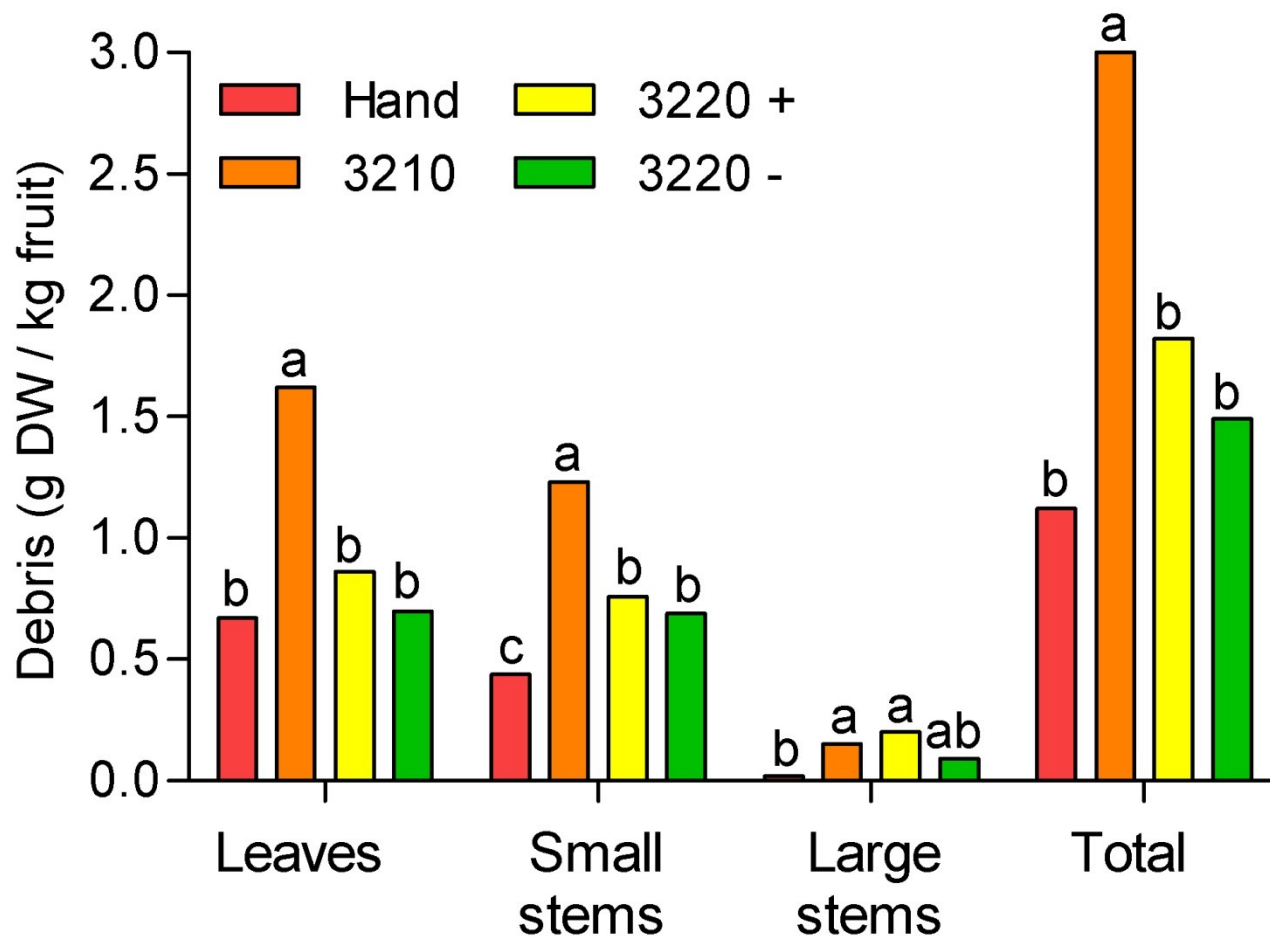


Harvest Methods Sampled

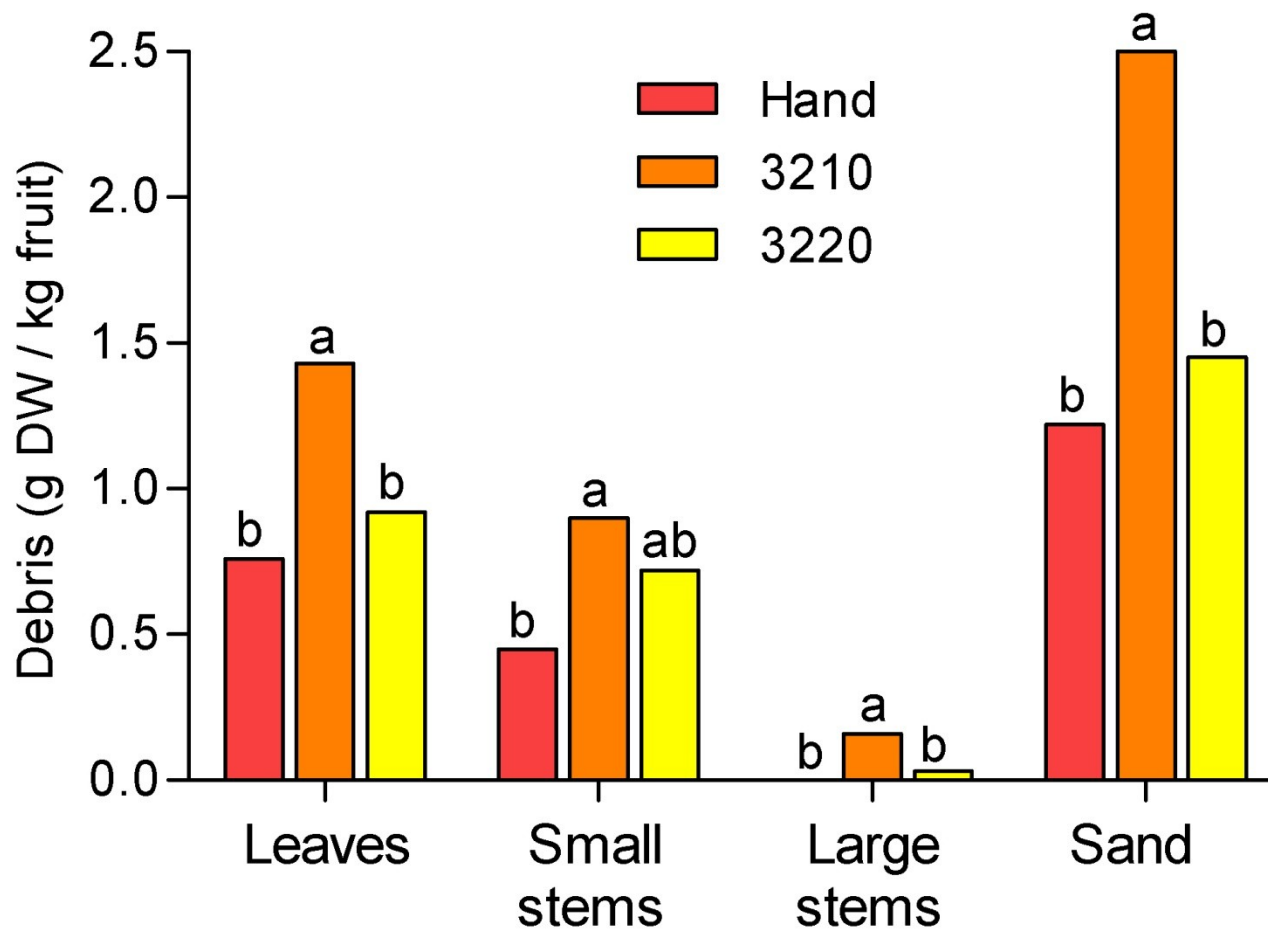
- **All methods were sampled on 3 separate dates, 20 samples per date**
 - Valencia in spring 2008
 - Hamlin Winter 2008-09
- **Hand Harvest (control)**
- **Oxbo 3220 with & without destemmer**
- **Oxbo 3210 with hand pickup**
- **Oxbo 3210 with Oxbo 3200 pickup unit (only 1 sampling date)**



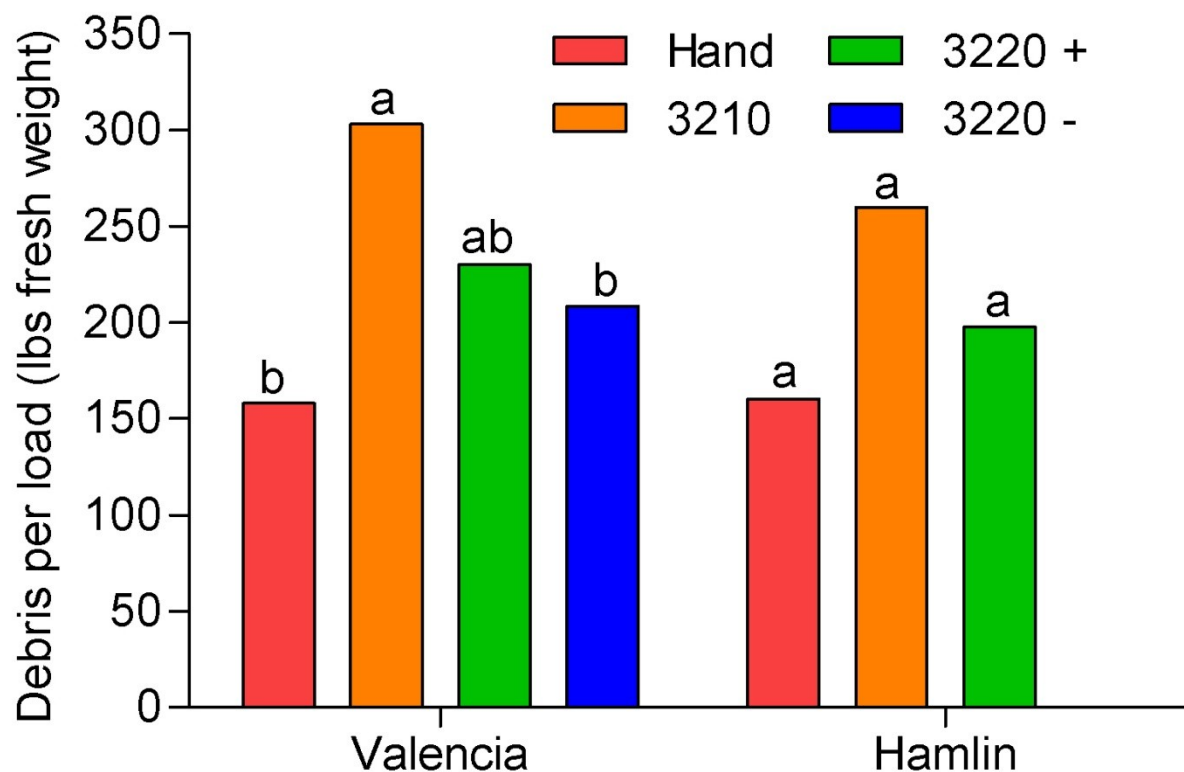
Valencia Debris (Table 1)

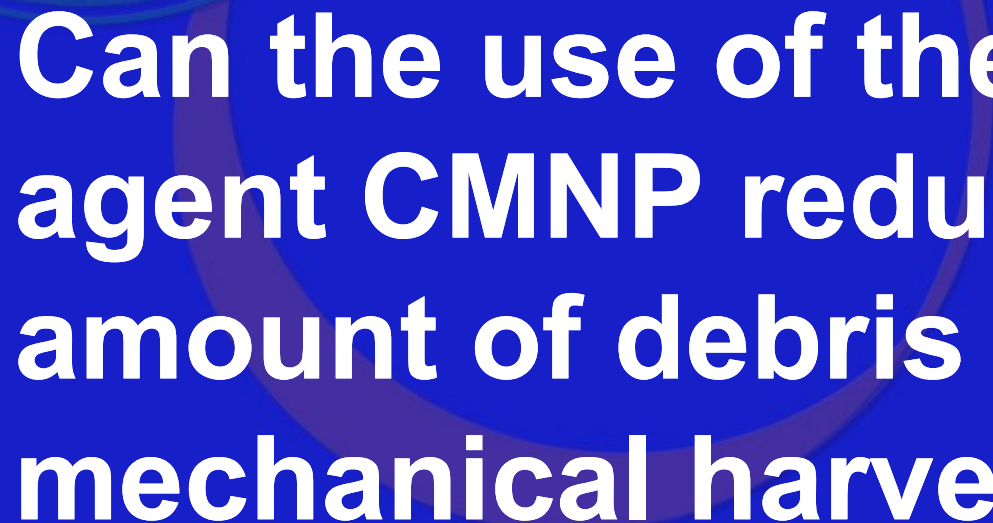


Hamlin Debris (Table 2)



Total Debris Per Load



A stylized graphic of an orange and a leaf, rendered in shades of blue and purple, positioned in the upper left quadrant of the slide. The orange is partially obscured by the text.

Can the use of the abscission agent CMNP reduce the amount of debris from mechanical harvesting?

CMNP Trials

- **Parson Brown**

- December 2007 (Table 3)
 - Harvest w/ and w/o CMNP
 - Application was followed by cold weather
- January 2007 (Table 4)
 - w/ and w/o CMNP @ 230 or 270 CPM
 - Hand harvested samples were also obtained

- **Valencia – early season**

- Two trials April 2008 (Tables 5 & 6)
 - 300 ppm CMNP @ 0, 100, 200 and 300 GPA

- **Valencia – late season**

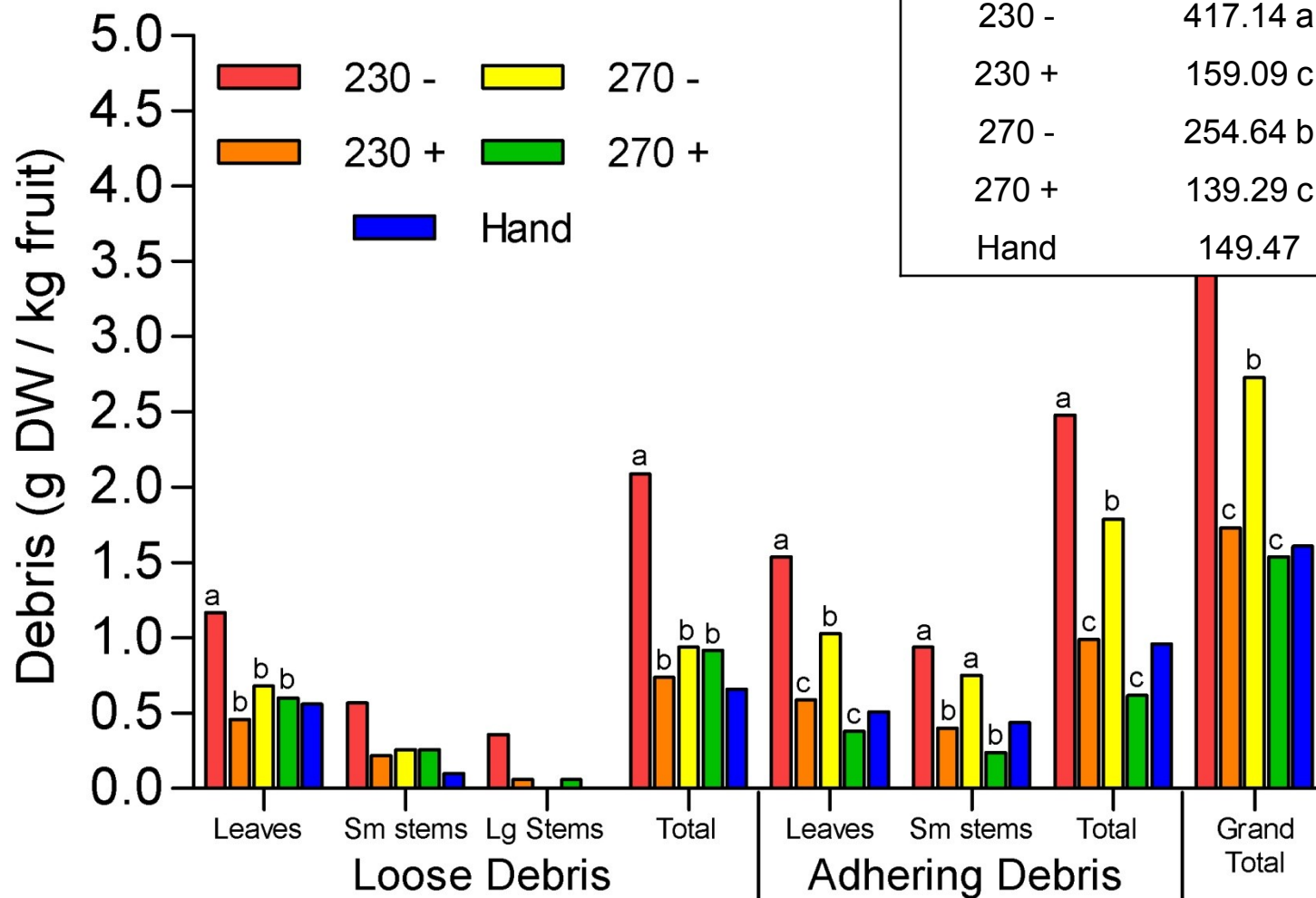
- May 13 and 27, 2008 (Tables 7 & 8)
 - Speed (0.5 and 1.0 mph) × CPM (145 and 185) × CMNP (+ or –)

- **Hamlin – rate × frequency (Tables 9 – 11)**

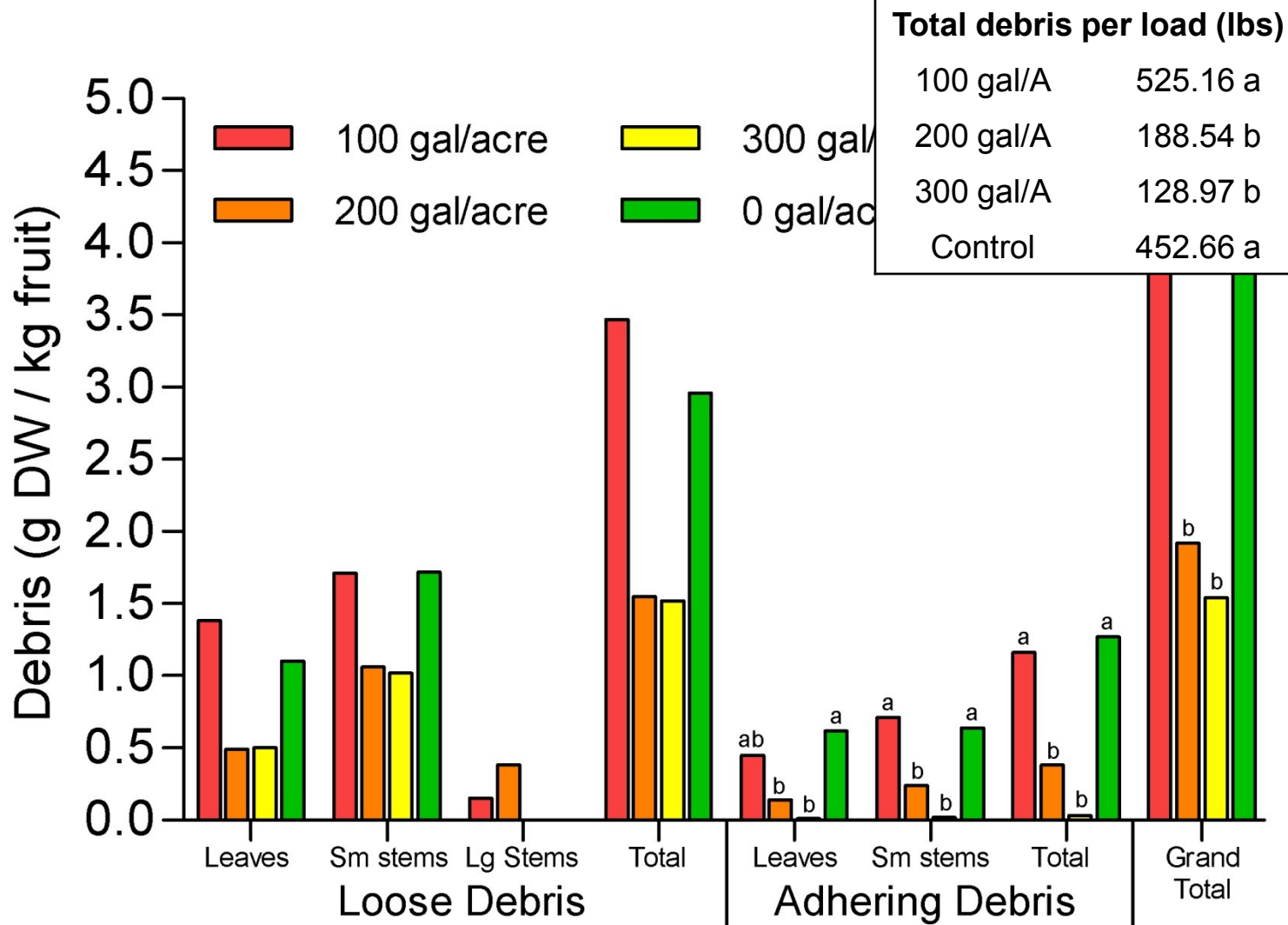
- December 12, 2008 and January 9 and 30, 2009

- **Data collected was the same, except debris was separated into adhering (attached to fruit) and loose (not attached)**

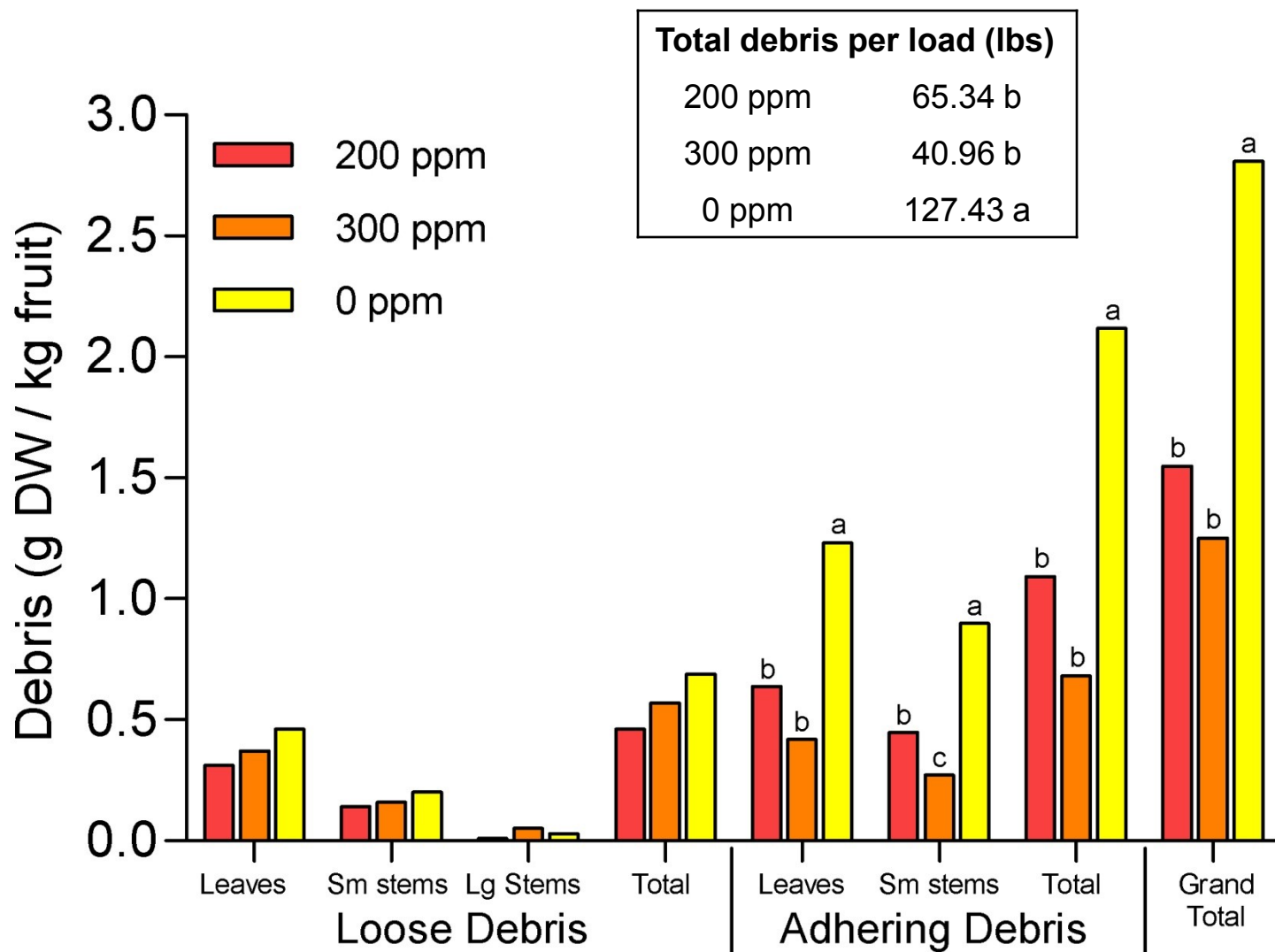
Parson Brown – Jan 2008 (Table 4)



Valencia – April 2008 (Table 6)



Hamlin – December 2008 (Table 9)



Conclusions

- **Mechanical harvesting increases debris 2-3x over hand harvesting**
- **The variability seen in mechanically harvested samples suggests that factors other than the machine influence debris**
- **The use of the abscission compound CMNP can reduce debris to levels equivalent to or below hand harvesting**

A stylized graphic of an orange and a leaf, rendered in shades of blue and purple, positioned in the upper left quadrant of the slide. The orange is a large circle, and the leaf is a smaller shape above it, both with a slight shadow effect.

Questions?