

Using strategic sprays to reduce wages

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Shepparton, 22 August 2024



WHAT strategic sprays?

Plant Growth Regulators = PGRs

Regalis, Thin-It, NAA, Ethrel, Carbaryl, Maxcel, Brevis, Accede, Retain, Harvista

WHAT wages to reduce?

| | \$ per Hectare | \$ per Kg |
|-------------------------|----------------|-----------|
| Pruning | \$4,468 | \$0.09 |
| Thinning | \$4,904 | \$0.10 |
| Harvesting | \$10,289 | \$0.21 |
| Other | \$10,172 | \$0.22 |
| Total In-Orchard | \$29,833 | \$0.62 |

The APAL Orchard Business Analysis, 2022 & 23. Yield 45 t/Ha

Orchard design sets the scene;

- Rootstock
- Planting distances
- Tree training
- Trellising
- Variety

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- Tree training
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THEN.....Weather + management change;

- Degree of pruning
- Hand thinning needed
- How the harvest unfolds

1. PRUNING

- Innovation to reduce wages = Regalis (~2006)
- 12 benefits

| Benefit | What to Expect |
|------------------------|------------------------------------------------------------------|
| 1. Less shoot growth | Performs as expected. No failures if use at right timing/dose |
| 2. Less summer pruning | Usually eliminated |
| 3. Less winter pruning | 20 - 50% |

1. PRUNING

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1. Less s

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3. Less v



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>>Regalis treated, Pink Lady



<< Untreated, Pink Lady



REGALIS BENIFITS

8. Improved spray coverage

4. Increase fruit set

9. Improved pest & disease control

5. Changes fruit size

10. Less water use

6. Change pick date

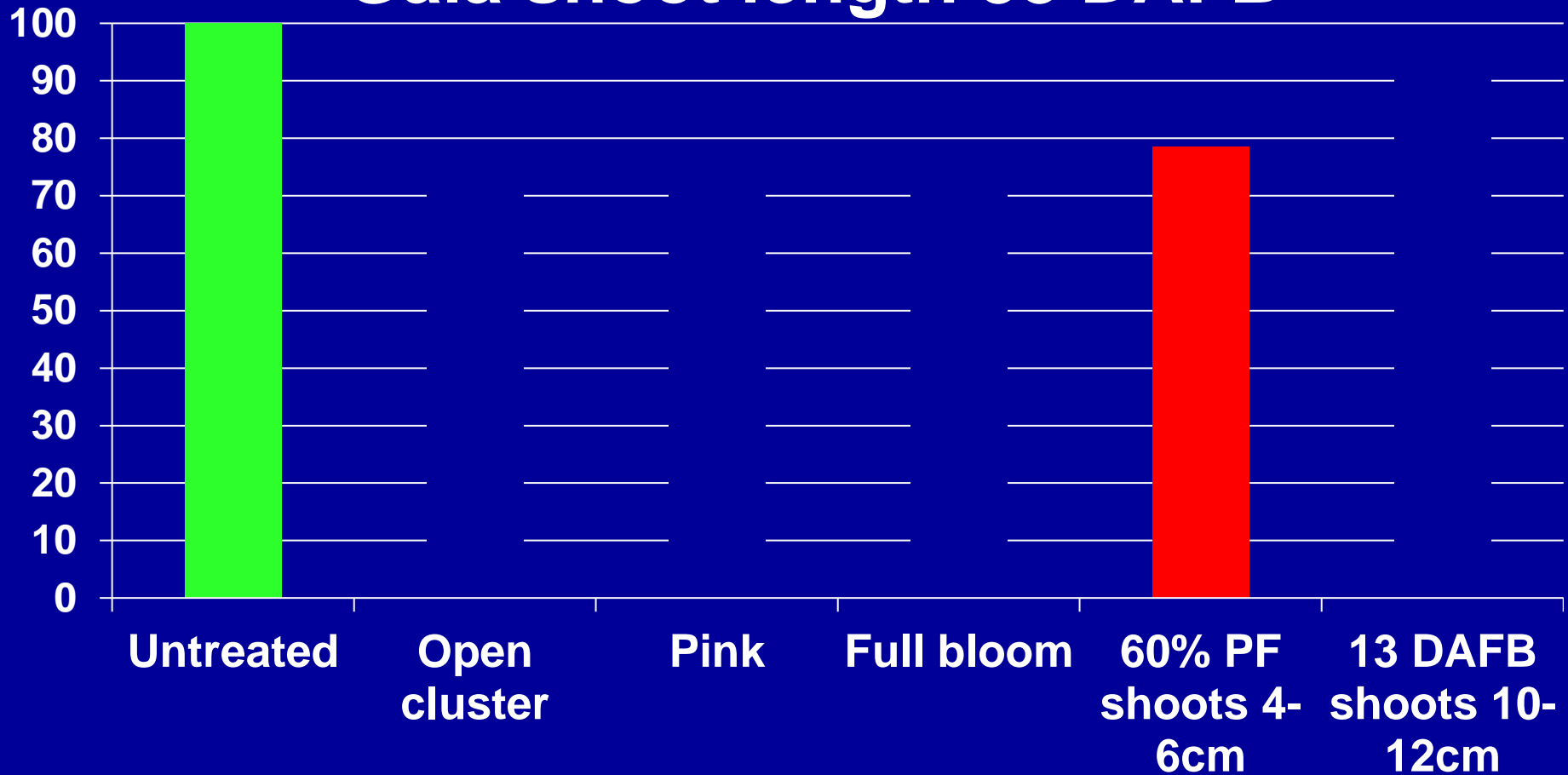
11. Improved buds

7. More fruit colour

12. Frost recovery

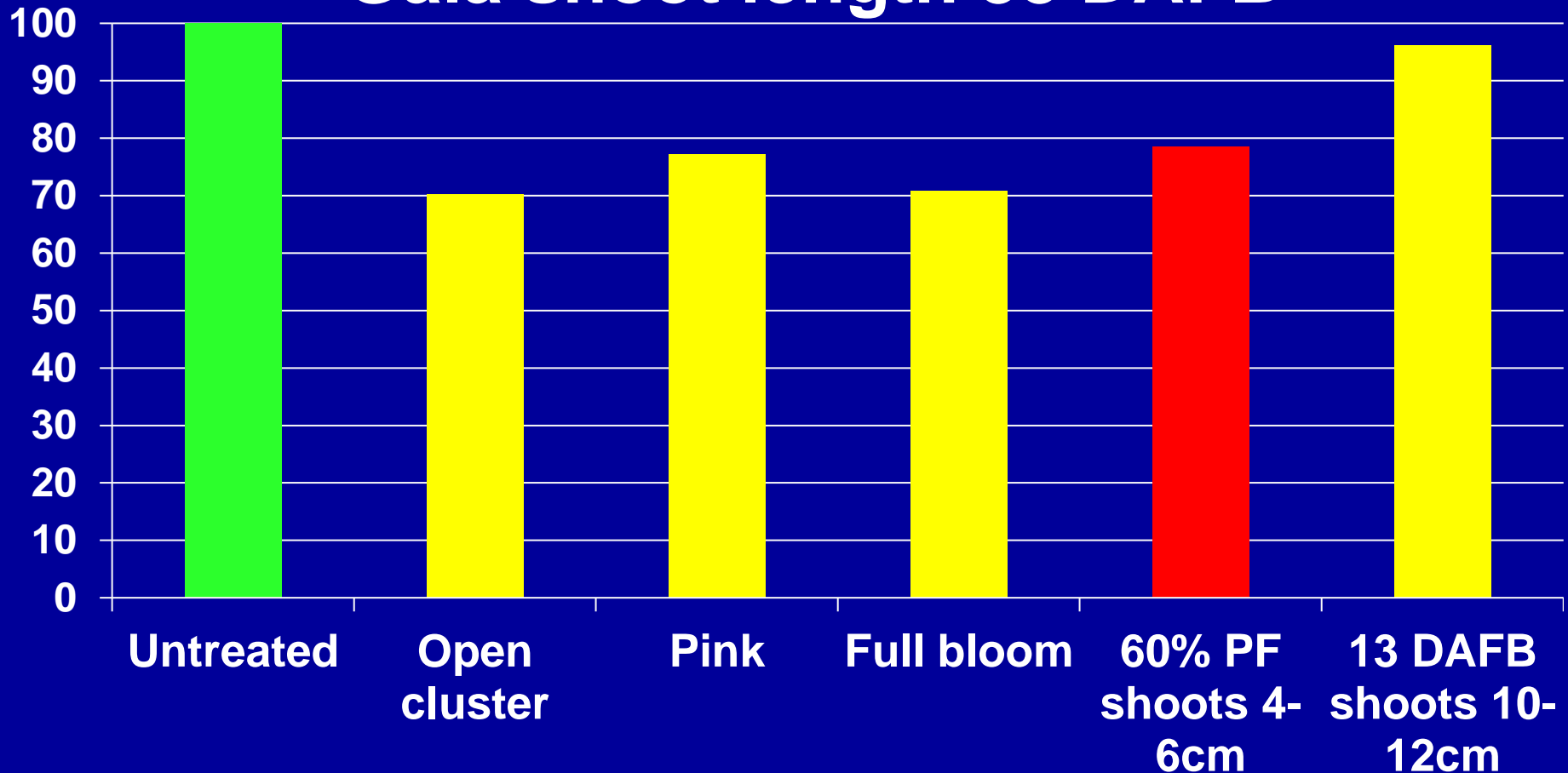
Testing the timing of Regalis

Gala shoot length 38 DAFB



Testing the timing of Regalis

Gala shoot length 38 DAFB



Regalis – Likely Use

- ‘Dream Orchards’ –use less likely
- Tweak good blocks in some years
- Resurrect horror blocks

Regalis – Summary

- Very Useful Tool
- 3 Gears; Rate, Times, Position
- A Reversible Handbrake
- Mitigates effects of net
- Can Boost Profit by ↓ Costs
- Can Boost Profit by ↑ Returns

>> Regalis treated, Pink Lady



<< Untreated, Pink Lady

Royal Gala Stanthorpe, Sept 2005



| | | No Regalis | Regalis 50 g twice | % Reduced Pruning | Net \$/Ha Saved |
|-------------|-----------|------------|--------------------|-------------------|-----------------|
| 2003 | Gala | 157 Hrs | 103 Hrs | 34% | \$364 |
| 2004 | Gala | 61 Hrs | 49 Hrs | 20% | -\$8 |
| 2003 | Pink Lady | 245 Hrs | 208 Hrs | 15% | \$116 |
| 2003 | Pink Lady | 252 Hrs | 160 Hrs | 36% | \$903 |
| 2003 | Pink Lady | 126 Hrs | 92 Hrs | 27% | -\$5 |
| 2003 | Pink Lady | 39 Hrs | 31 Hrs | 21% | -\$146 |
| 2004 | Delicious | 186 Hrs | 90 Hrs | 52% | \$2,901 |
| 2003 | Fuji | 70 Hrs | 51 Hrs | 27% | -\$98 |

2. THINNING

Innovation to reduce wages = Spray Thinning

Spray thinning also increases \$ returns;

- Improves fruit sizes
- Improves return bloom

Primary Thinners - Use during bloom

| | | |
|-----------|----------|---------------------------------------------|
| Thin-It | ATS | Flower burner. May use 1+ |
| Stop Drop | NAA | Timing is earlier & rates are lower |
| Ethrel | Ethephon | Can be aggressive Increases return bloom |
| Accede | ACC | Near full bloom |

Secondary Thinners - Use on small fruitlets

| | | |
|----------------|------------|---------------------------------|
| Bugmaster | Carbaryl | Timing not critical |
| Thiram | Thiragranz | Mild thinner |
| Cytolin/Perlan | GA + BA | Mild thinner |
| Maxcel | BA | Timing and temp important |
| Brevis | Metamitron | At 8 – 16 mm. Use once or twice |
| Accede | ACC | At 15 – 20mm |

Thin-It[®]



THIRAM DG

F U N G I C I D E

Ethrel[®] 720

GROWTH REGULATOR



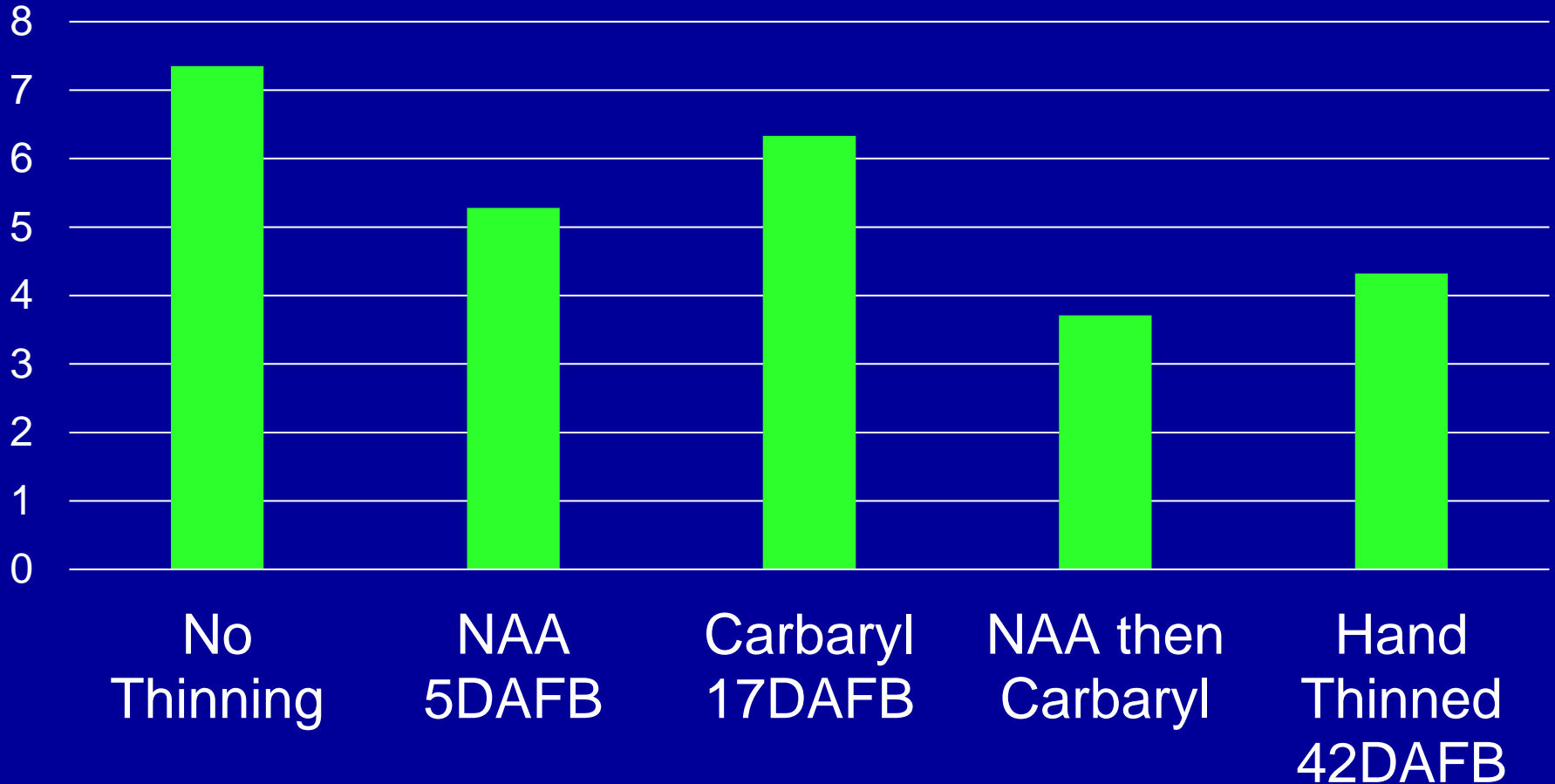
Bugmaster[®]

FLOWABLE

maxcel[®]

Classic Spray Thinning

Apples per cm² TCA



| | Av. fruit weight (g) | Yield (t/Ha) | Saleable Yield (t/Ha) | Extra income \$/Ha | Chemical Thinning Costs \$/Ha |
|----------------------|----------------------|--------------|-----------------------|--------------------|-------------------------------|
| No Thinning | 120 | 37.3 | 29.7 | \$0 | \$0 |
| NAA @ 5 DAFB | 142 | 34.3 | 30.8 | \$5,637 | \$36 |
| Carbaryl @ 17 DAFB | 135 | 36.2 | 32.7 | \$3,864 | \$117 |
| NAA then Carbaryl | 156 | 29.5 | 27.4 | \$588 | \$153 |
| Hand Thinned 42 DAFB | 141 | 27.2 | 25.3 | -\$1,369 | |

Trial at Stanthorpe, Summerdel variety, 1995.

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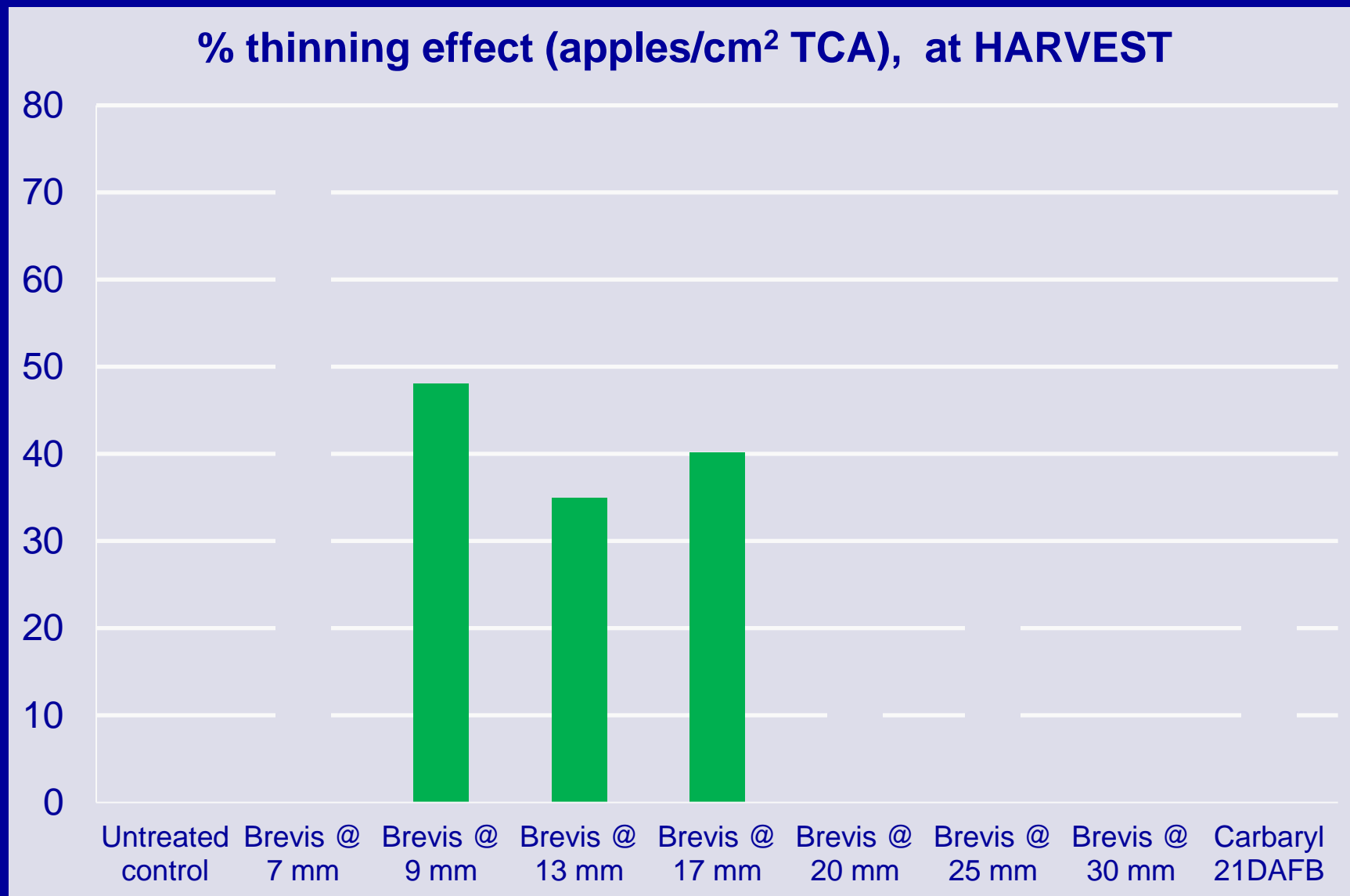
- Spray thinning can 'make' money
- You can over-thin
- A major disadvantage of hand thinning is TIMING

Trial at Stanthorpe, Summerdel variety, 1995.

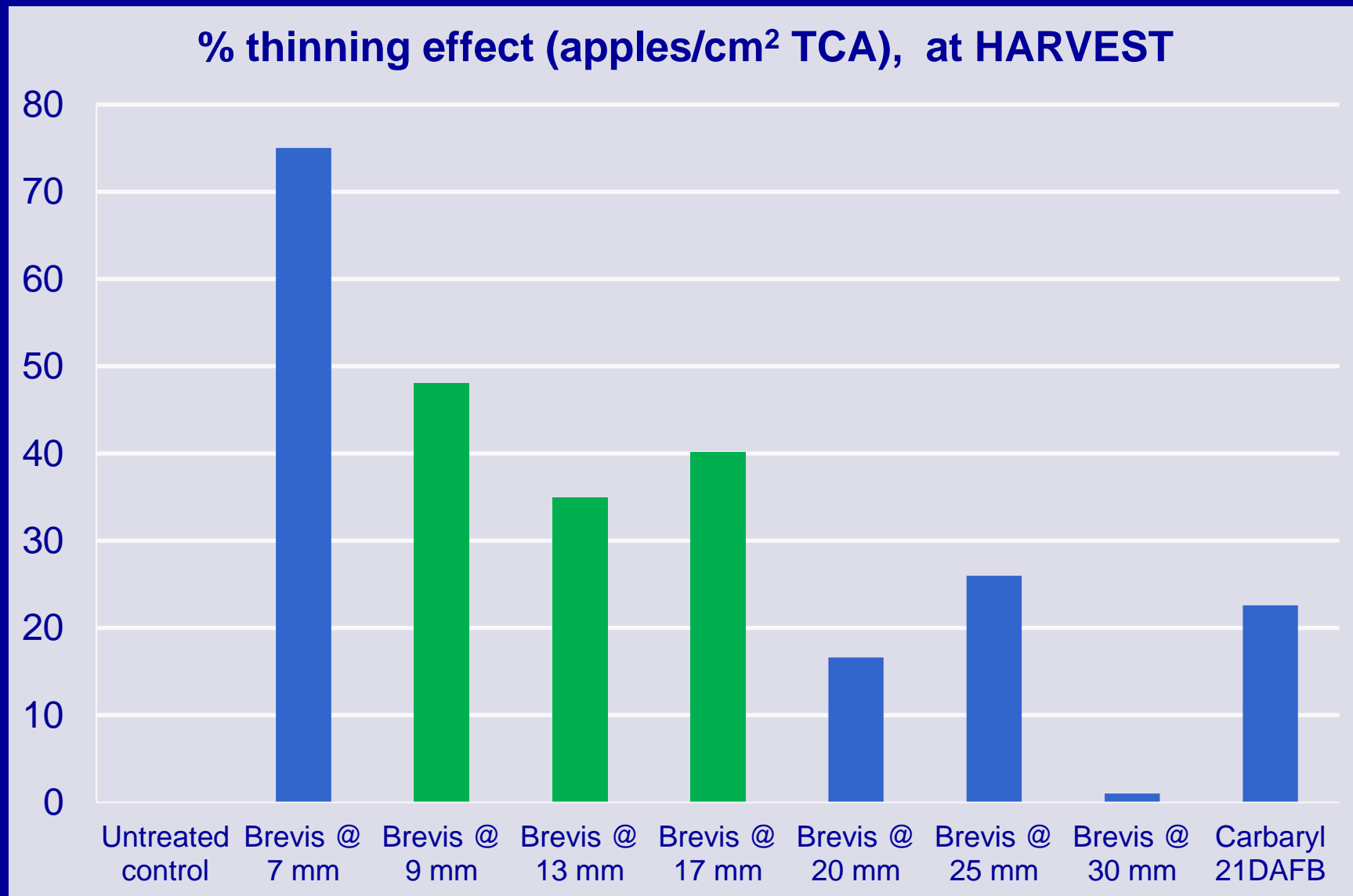
Road testing some recs;

- **Timing**
- **Rate**
- **Wetters / Oils**

Label: apply when central fruitlets are 8 to 16 mm
DO NOT apply later than 16 mm stage of central fruitlet



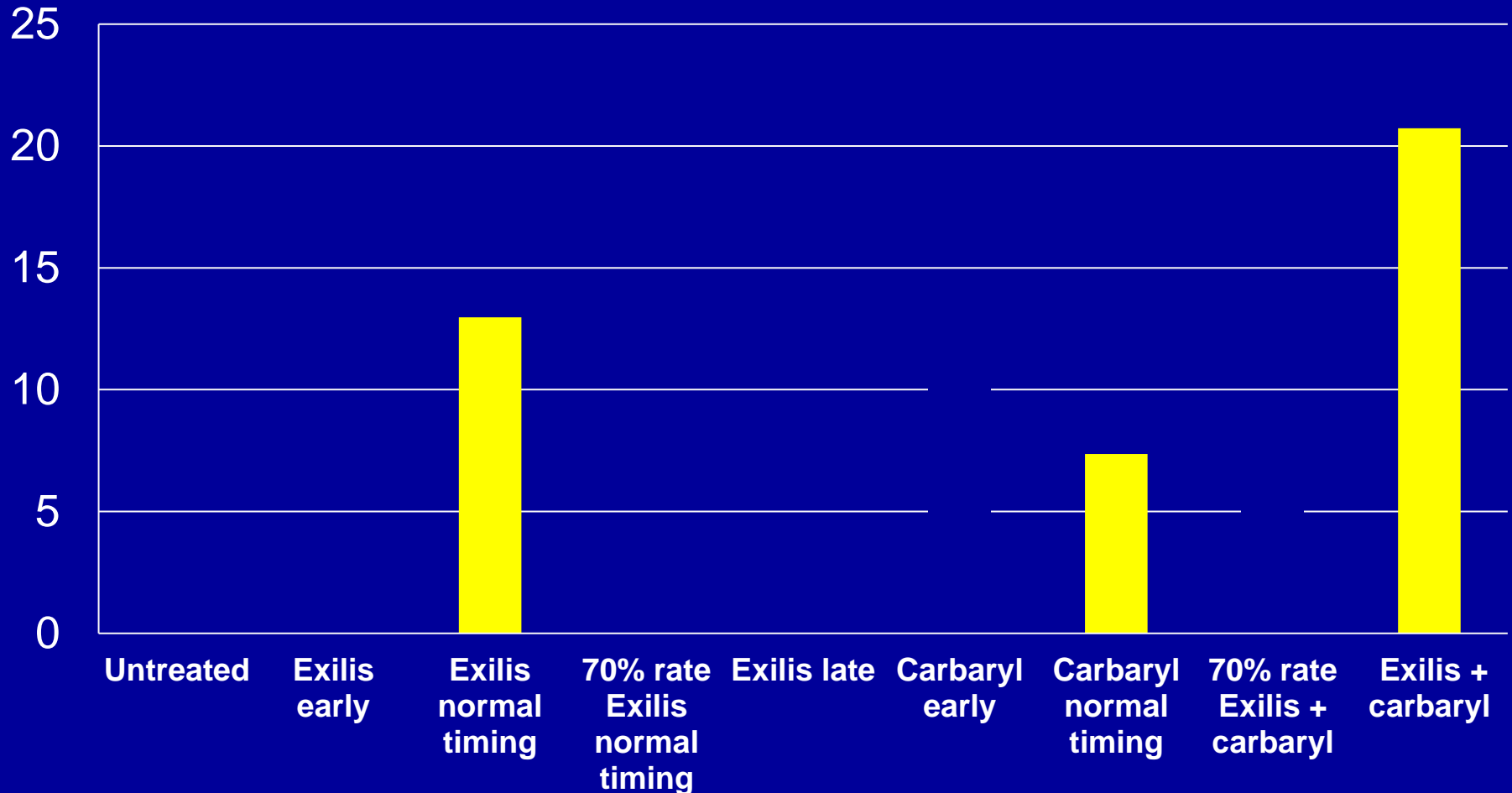
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Gala, Stanthorpe 2018, Brevis @ 1.1 kg

TIMING

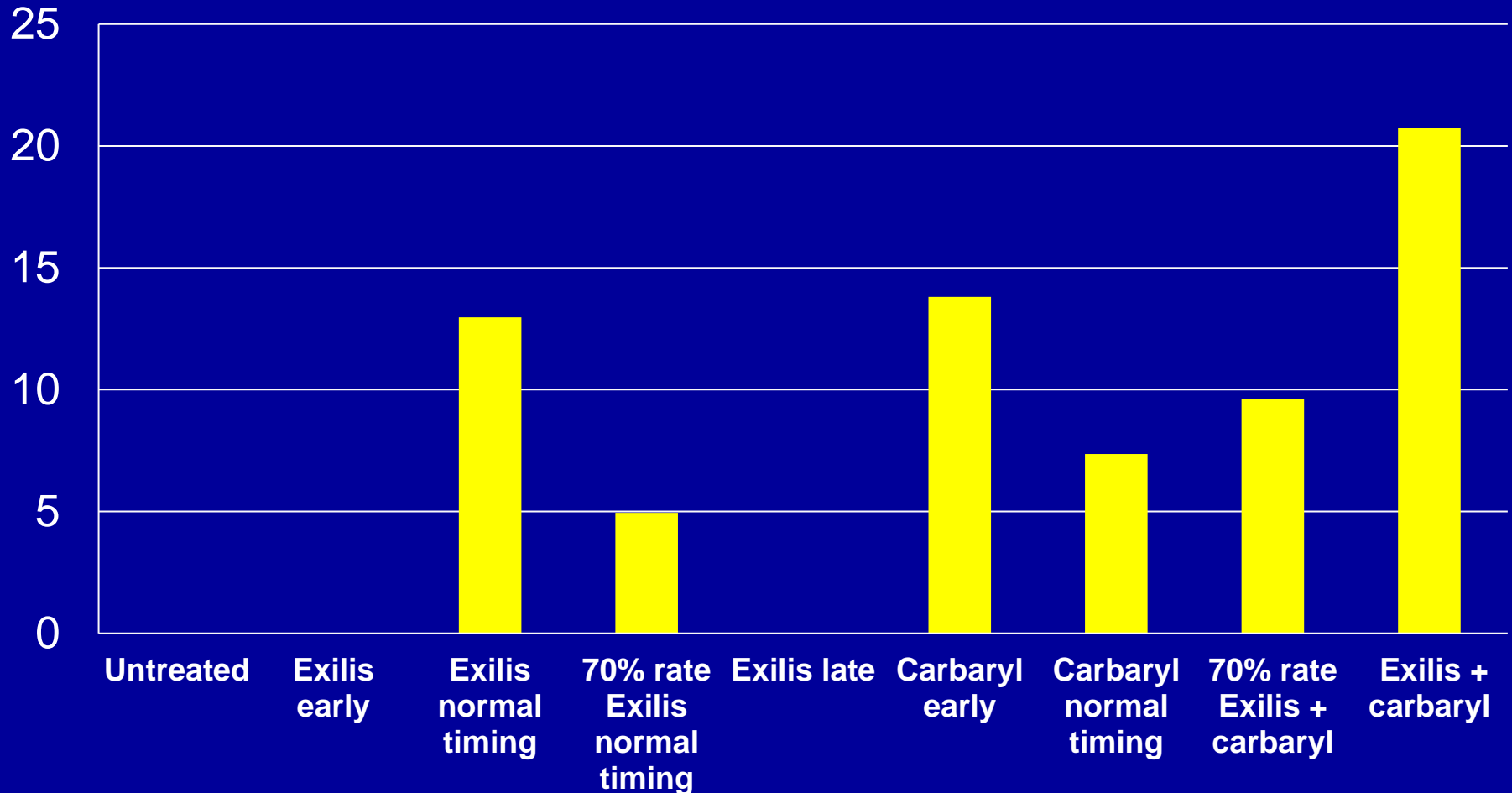
% Gala apples removed



- Trial at Stanthorpe 2013

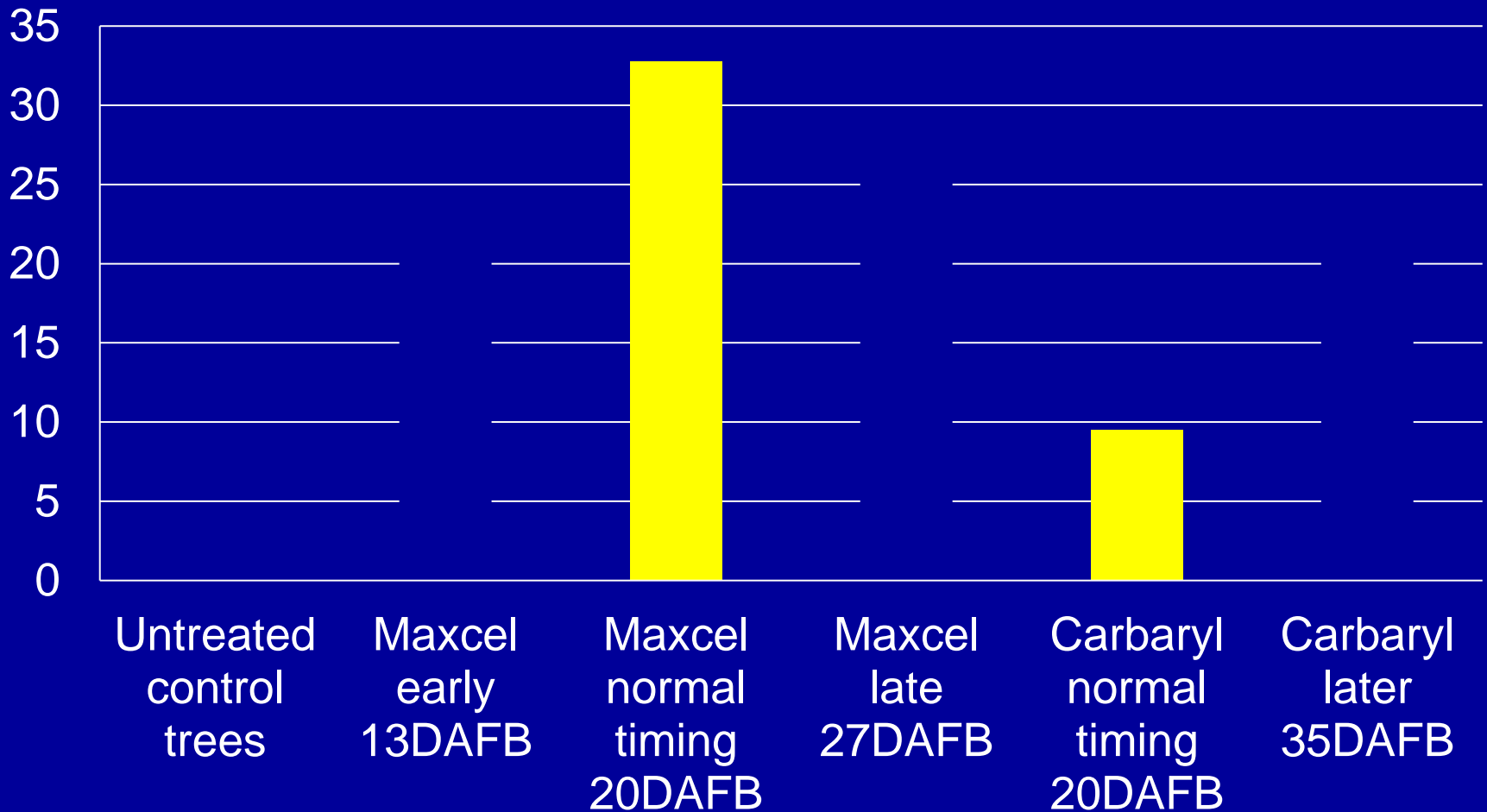
TIMING

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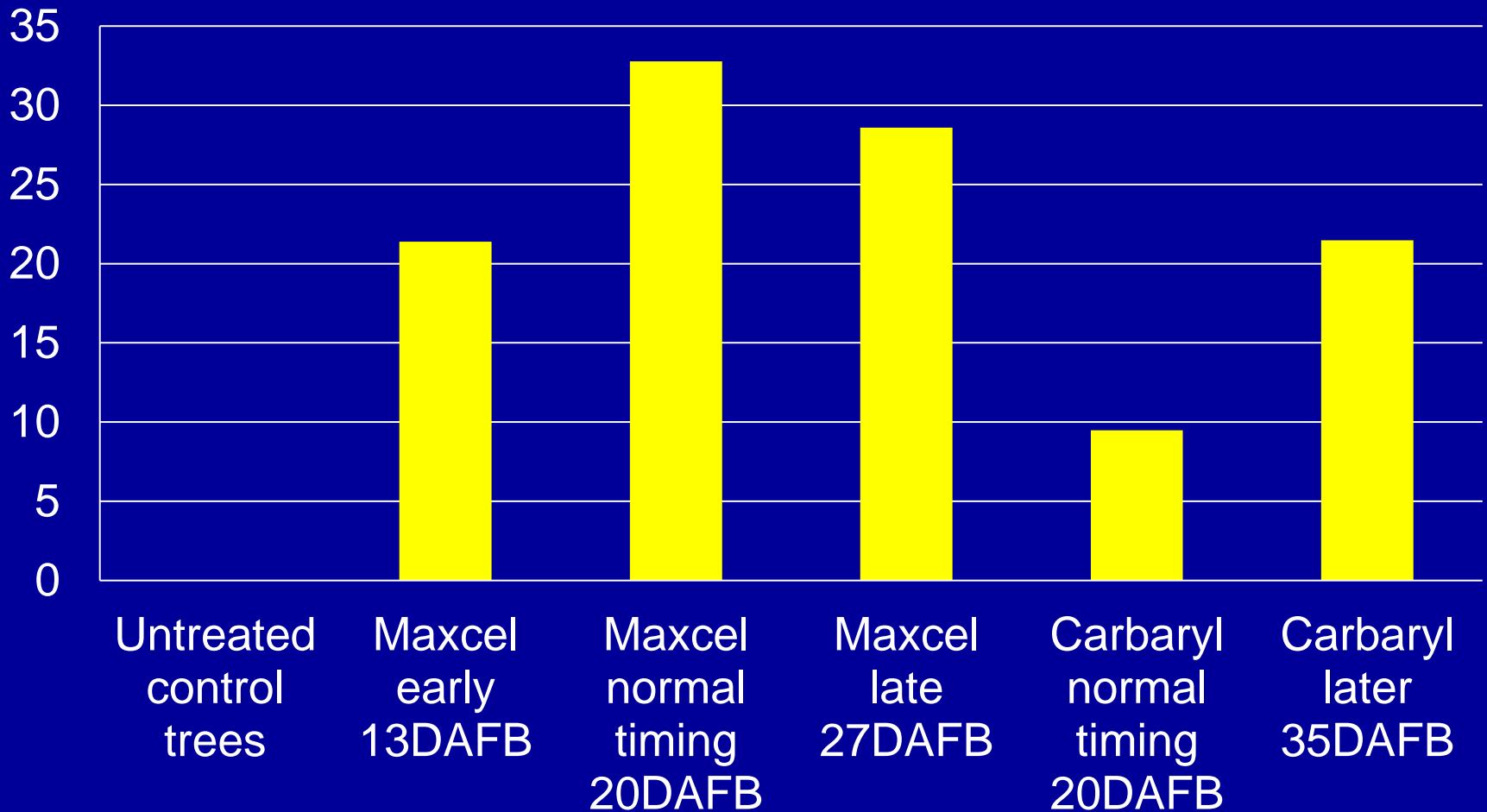


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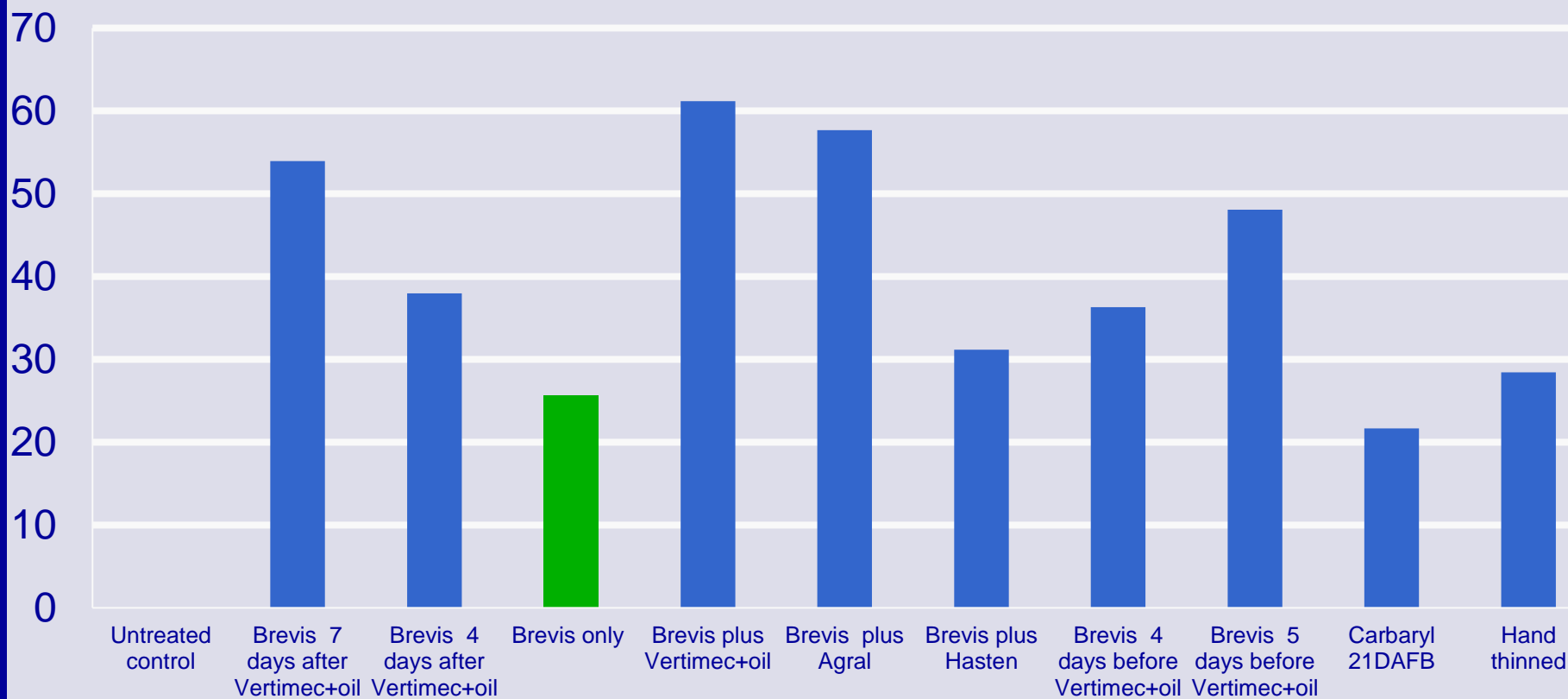


Wetters

“For oil-based products, maintain an interval of at least 7 days before or after application of BREVIS”

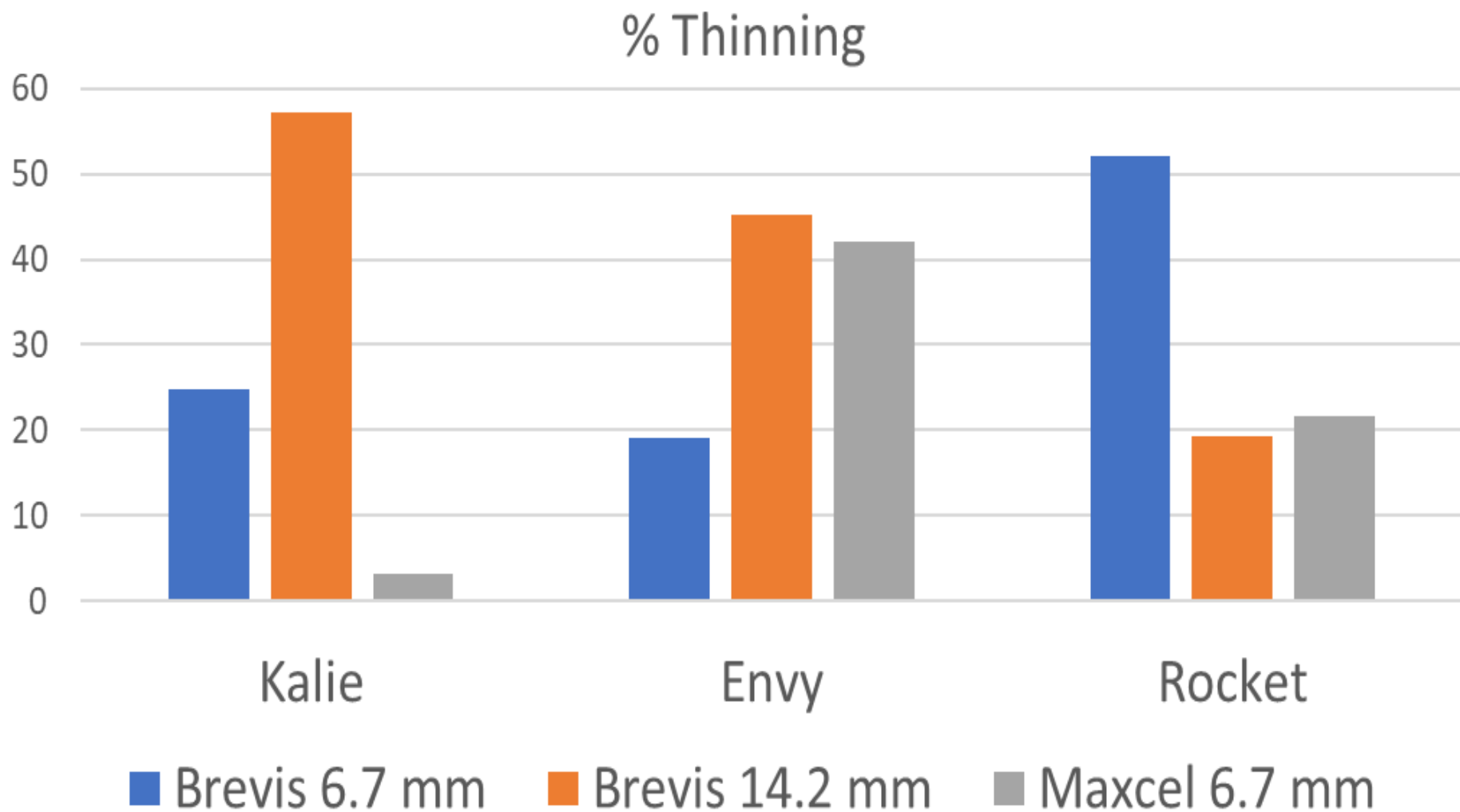
(was 3 days prior to 2021)

% thinning effect (apples/cm² TCA)

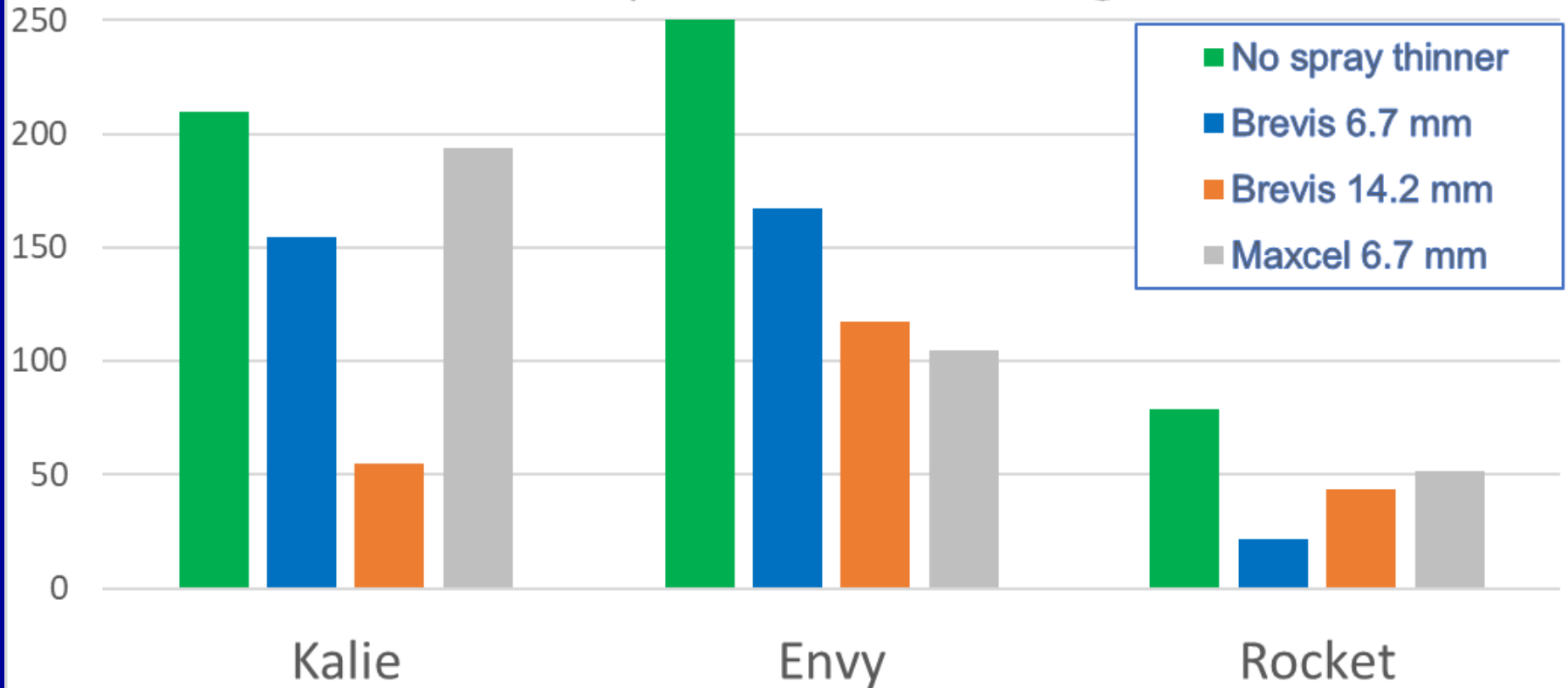


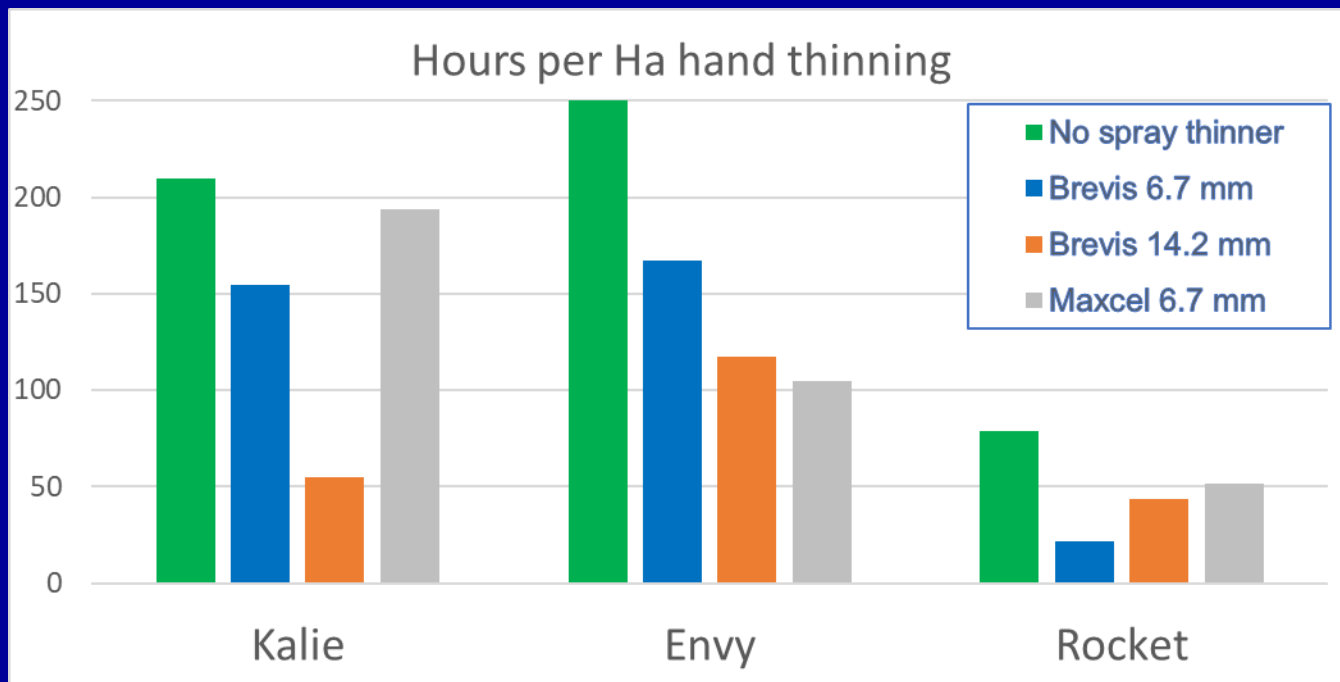
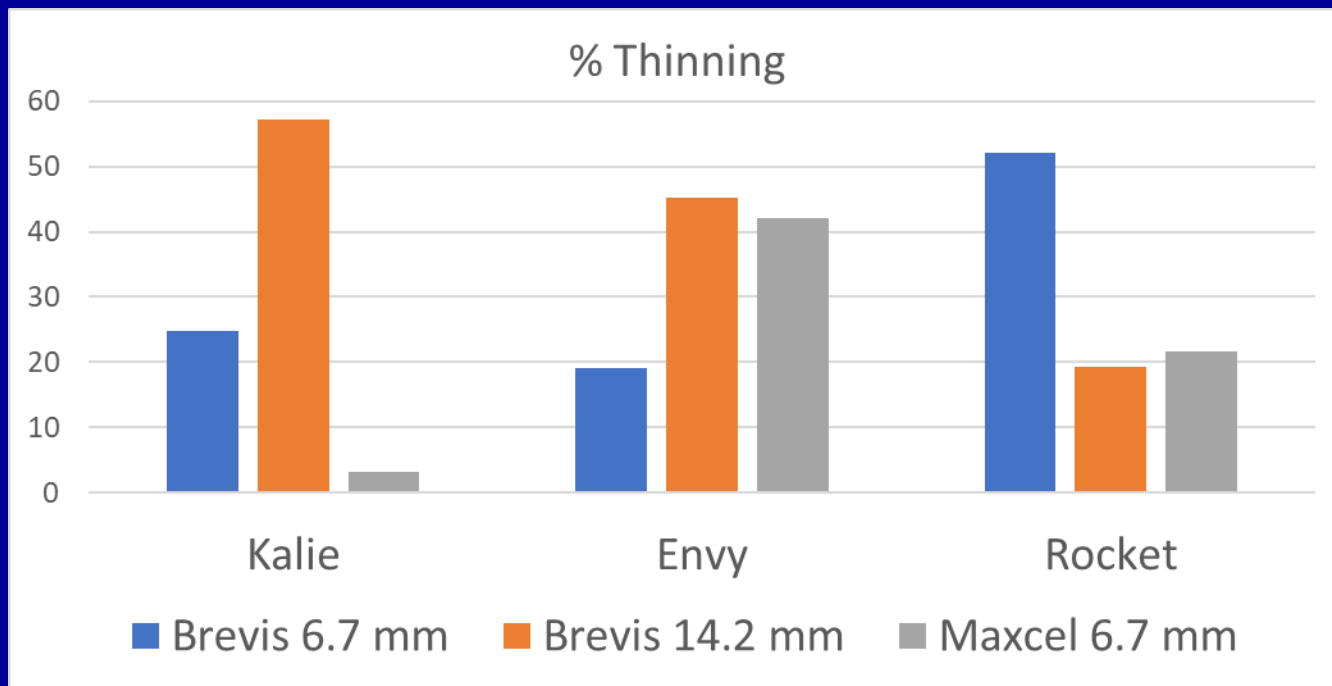
Trial at Stanthorpe 2018, Gala variety, Brevis @ 1.1 kg/ha

What about New Varieties?



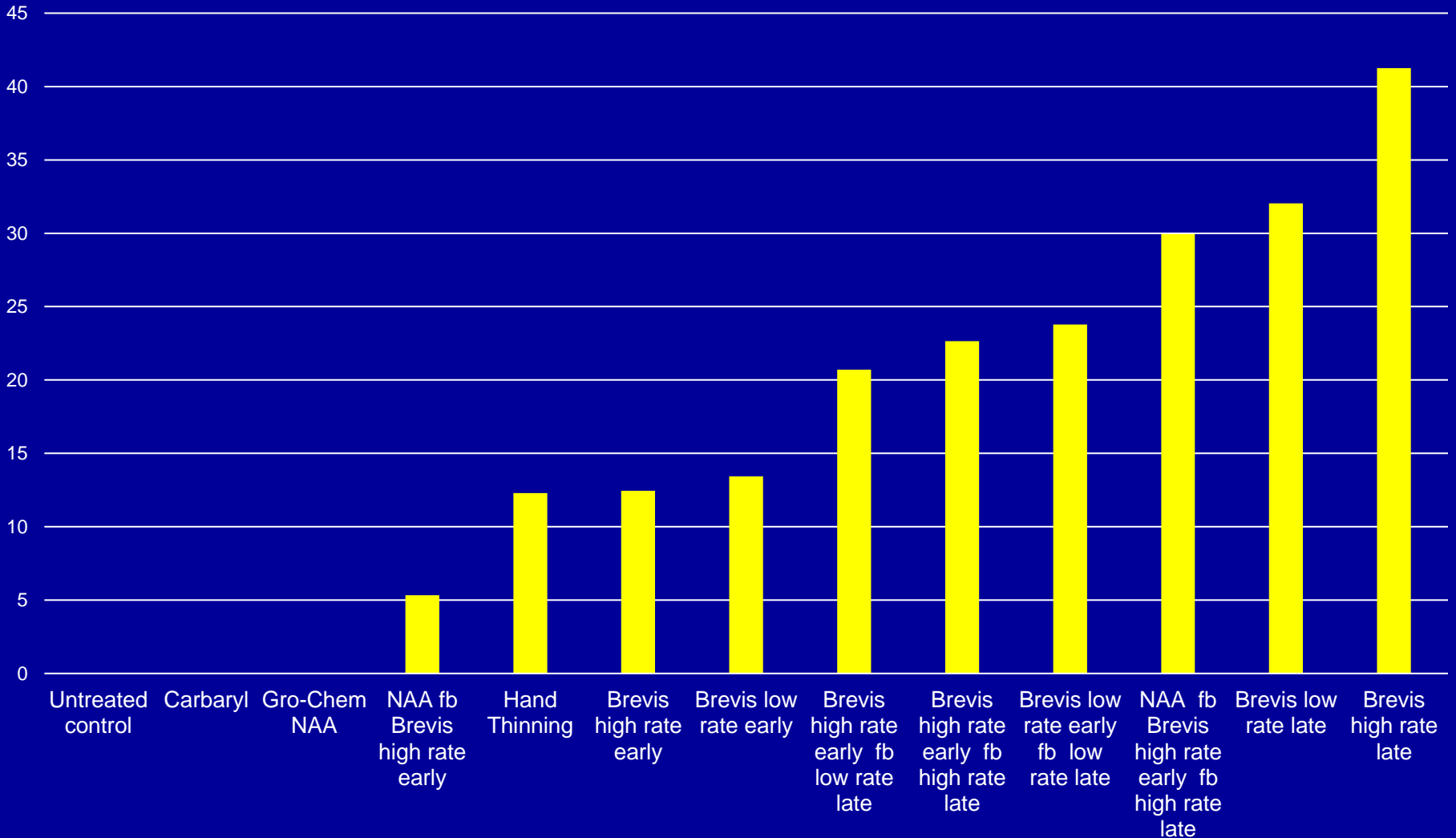
Hours per Ha hand thinning





PEARS

% thinning Williams pears, 121DAFB, Shepparton Vic 2020-21.



16 Days after 1st
application



Untreated



Carbaryl

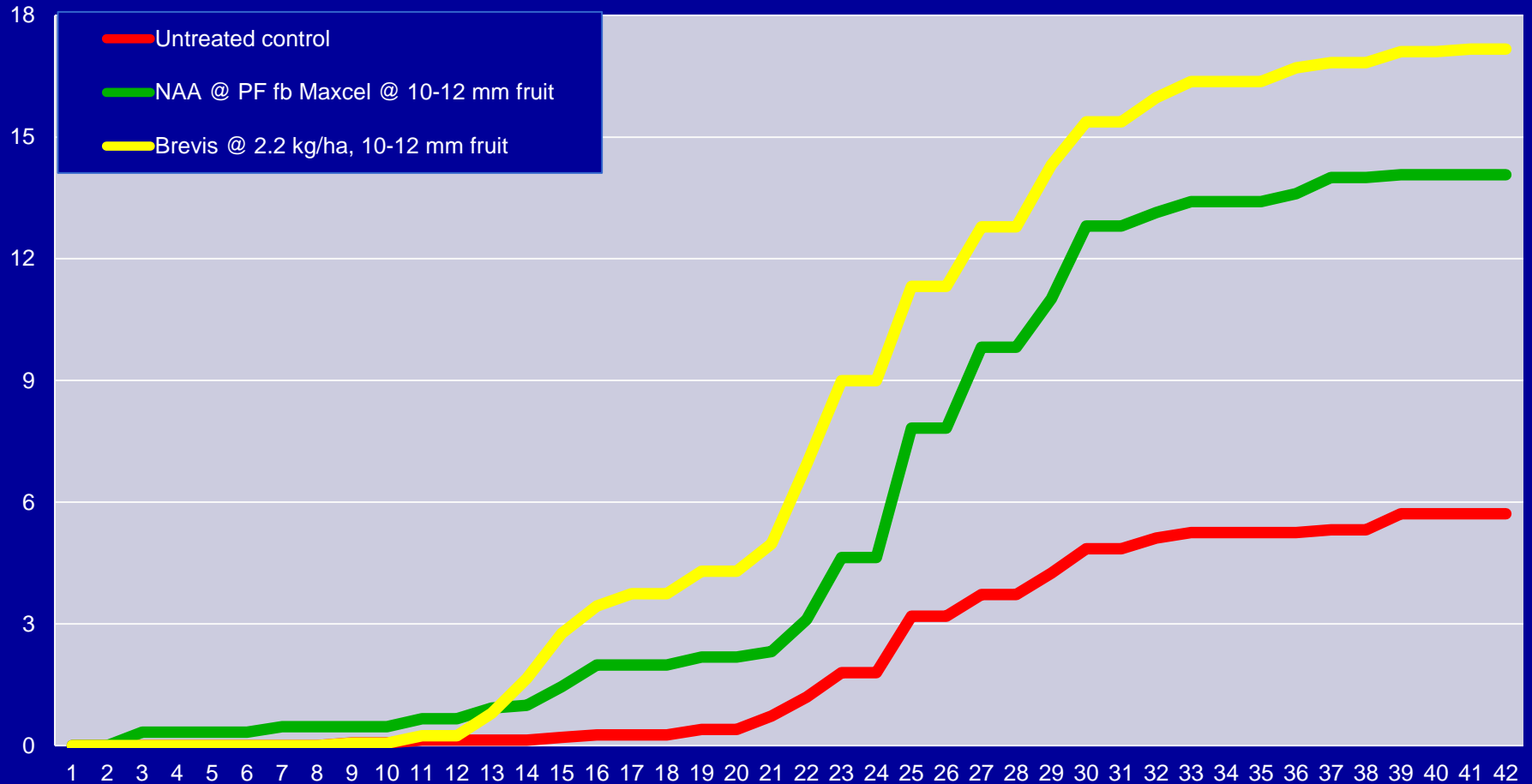


Brevis



Fruit Drop 5 – 6 weeks

% Gala apple drop, from 1DAA (22DAFB) to 42DAA(63DAFB), Stanthorpe Qld 2018



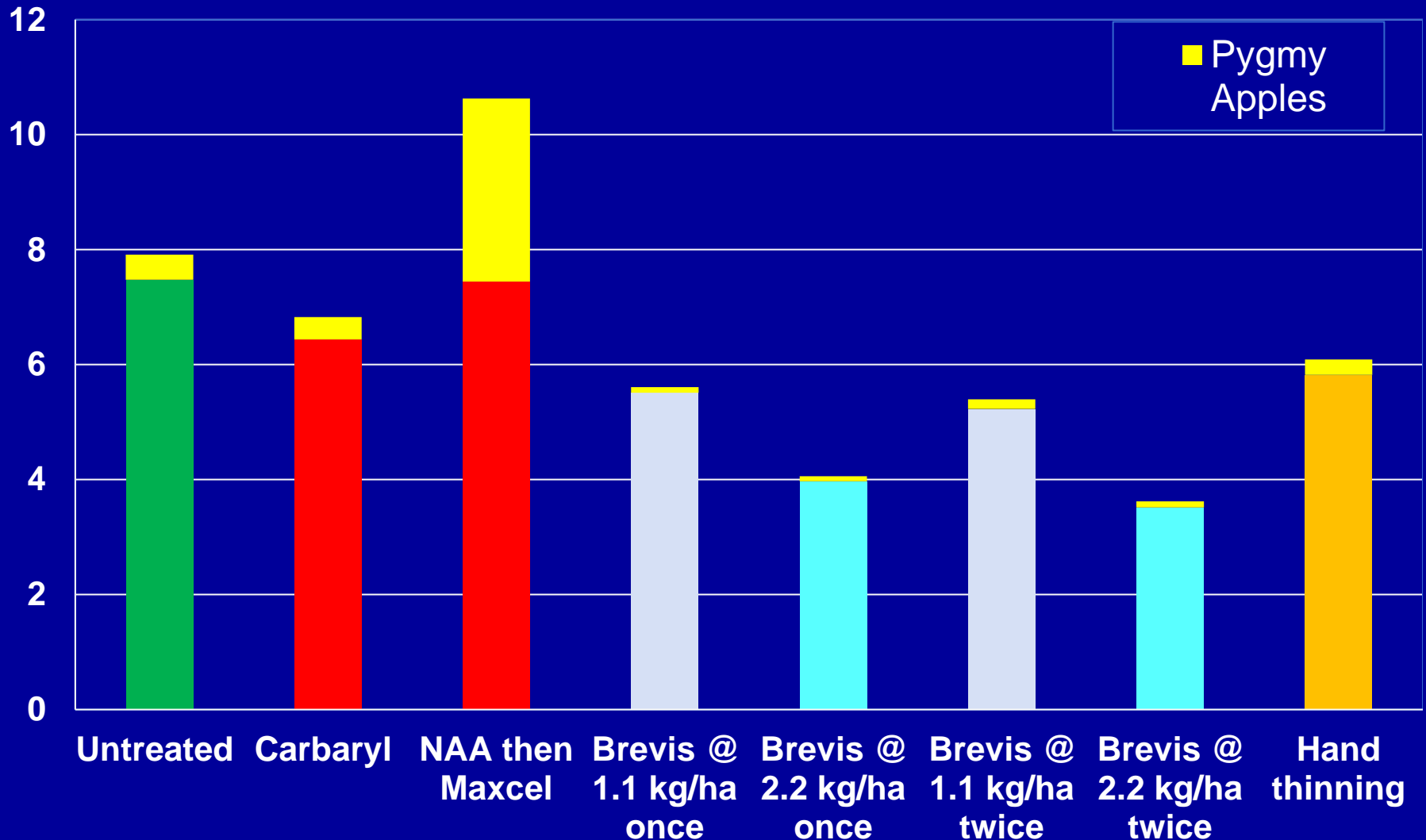


1. Spray thinners work
2. Spray thinners save \$
3. Spray thinners make \$

1. Spray thinners work
2. Spray thinners save \$
3. Spray thinners make \$
4. Be cautious under hail netting
(more shade, bees less effective)
5. Learning required
 - be brave with secondary not primary
 - on new varieties (products, weather, timing)
 - with new thinners (variety, weather, timing etc)
 - BrevisSmart tool to help you



FUJI apples/cm² TCA, Stanthorpe 2016



ROCKET

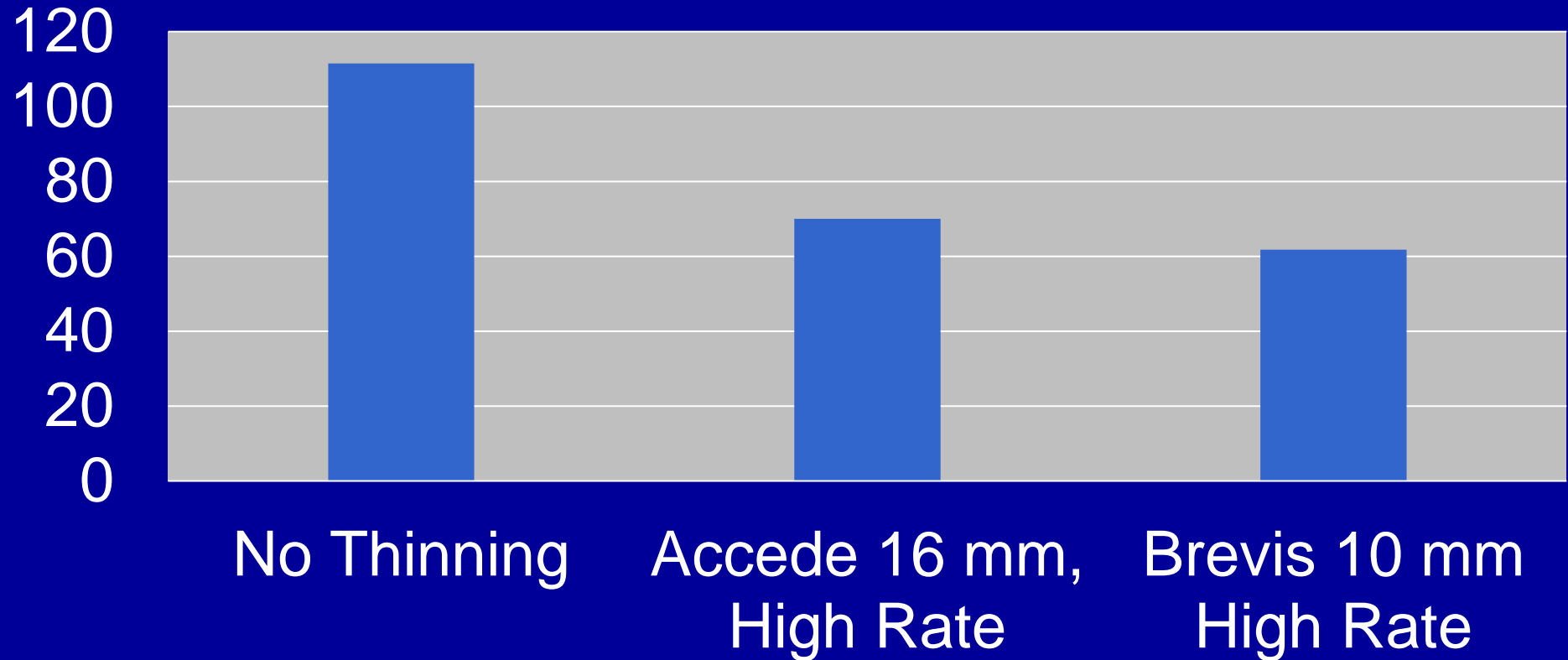
- 1.1 kg/ha @ 9.2 mm
- 52 % Thinning
- 57 Hours/Ha less hand thinning



| | Brevis | Carbaryl | Maxcel |
|------------------------|---------------------------------------------------------------------|---------------------------------|---------------|
| Temps | Warm nights & cloudy days increase effect Brevis Smart Model | Warm is best Caution if cold | Max > 15°C+ |
| Export | Ok | Restrictions | Ok |
| Rate response | Yes | No | Probably |
| Timing window | Medium | Wide | Narrow |
| Multiple sprays | Yes | Yes | No |
| Predatory mites | OK | Toxic | Ok |

New Thinner

Fuji apples per tree, Stanthorpe 2019



PRODUCT COSTS

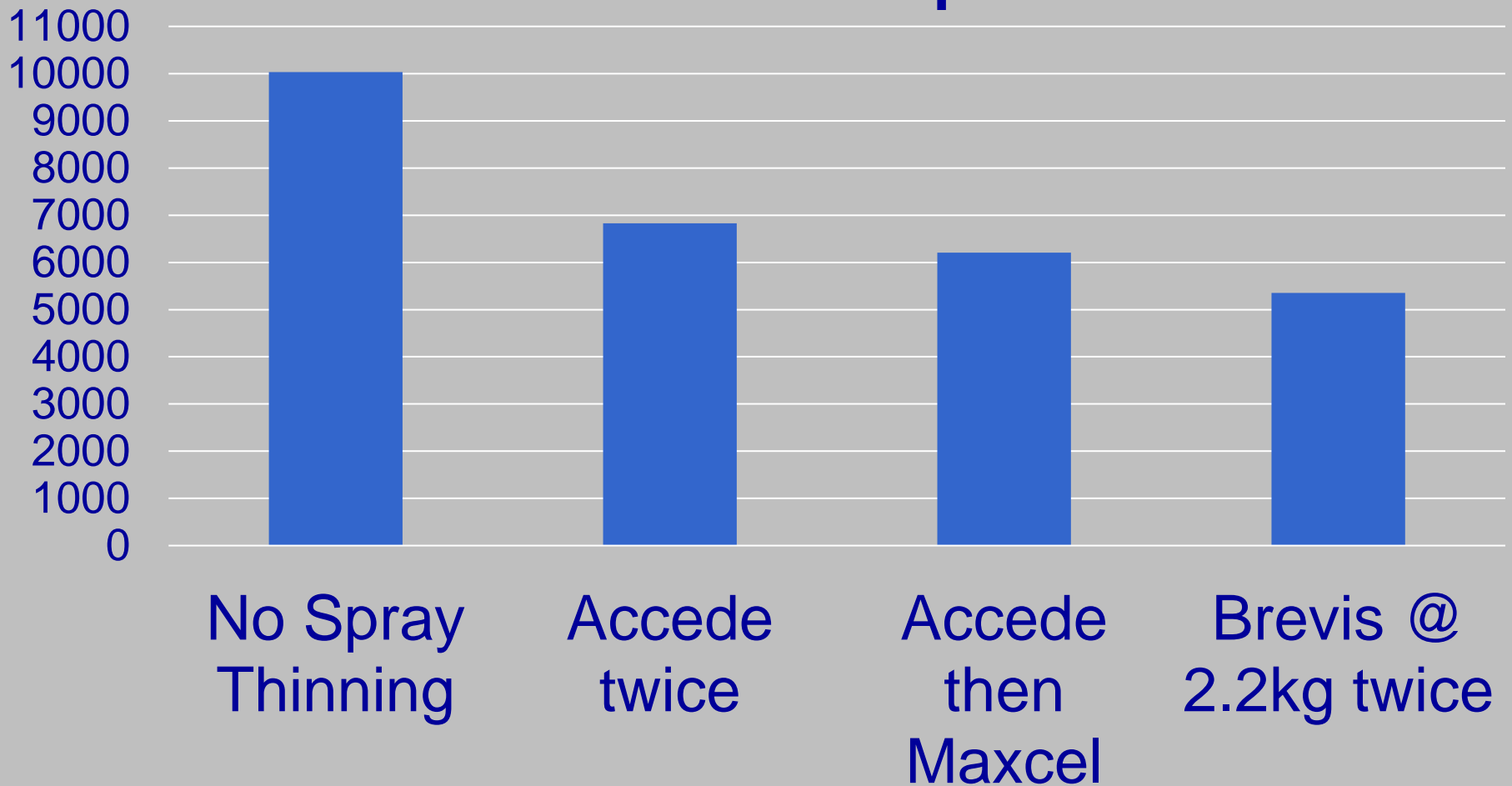
| PRODUCT | \$/Ha Including labour +machinery |
|--------------------------------------|--------------------------------------------------|
| Ethrel | \$ 32 |
| NAA | \$ 36 |
| Thin-It (Twice) | \$ 89 |
| Carbaryl | \$117 |
| Brevis (Once, mid rate) | \$357 |
| Maxcel | \$444 |
| | |
| Regalis (twice) low rate 50 g | \$423 |

LABOUR COSTS

| | |
|-----------------------------|---------------------|
| Base rate (Casual, Level 1) | \$29.33 |
| Super (11.5%) | \$ 3.37 |
| Workcover (2.1%) | \$ 0.69 |
| Payroll Tax (3.75%) | \$ 1.23 |
| Total | \$34.62/hour |

Reducing Costs

**\$/hectare to hand thin Fuji apples,
Stanthorpe 2023**



| | | Hand Thinned | Spray Thinning | | Av Hours Saved/Ha | Net \$/Ha Saved |
|-------------|----------------|--------------|-------------------|------------------------------|-------------------|-----------------|
| 2018 | Gala | 60 Hrs | Brevis 43 Hrs | Maxcel 54 Hrs | 12 19 % | -\$1 |
| 2019 | Gala (Shep) | 219 Hrs | Brevis 157 Hrs | NAA then Maxcel 164 Hrs | 59 27 % | \$1,608 |
| 2020 | Gala | 201 Hrs | Brevis 172 Hrs | Carbaryl + Maxcel 174 Hrs | 28 14 % | \$512 |
| 2020 | WBC (Shep) | 151 Hrs | Brevis 110 Hrs | Carbaryl 122 Hrs | 35 23 % | \$976 |
| 2019 | Fuji | 72 Hrs | Brevis 43 Hrs | NAA then Maxcel 40 Hrs | 31 42 % | \$639 |
| 2022 | Fuji | 290 Hrs | Brevis 155 Hrs | Carbaryl + Maxcel 180 Hrs | 123 42 % | \$3,783 |

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The APAL Orchard Business Analysis, 2022 & 23. Yield 45 t/Ha

3. HARVESTING

Innovation to;

Reduce wages by less picks

Efficiency by spreading harvest

Improved fruit size/color

Maintain background colour

Less fruit drop

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Innovation to;

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Maintain background colour

Less fruit drop

NAA

ReTain

Harvista

| | Flesh firmness | Ease of stem separation | Background color change |
|----------|-----------------------|--------------------------------|--------------------------------|
| Harvista | Firmer | Late | Late |
| ReTain | Firmer | Late | Late |
| NAA | Softer | Late | Early |

CHRIS WATKINS, Cornell NY

APAL Post-Harvest Seminar, Melbourne 2019

| NAA Stop Drop | ReTain | Harvista |
|------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Less fruit drop | <p>Reduced ethylene production</p> <p>Improved harvest management</p> | <p>Reduced sensing of ethylene</p> <p>Improved harvest management</p> |
| 12 to 14 days before harvest | <p>21-28 days before harvest</p> <p>7 days to just improve fruit quality + storage potential</p> | 3-21 Days before harvest |
| Doesn't slow maturity | <p>Extend harvest 7-14 days (Gala, PL, Del)</p> <p>2-5 days (GS, Fuji)</p> | Extend harvest 7-14 days |

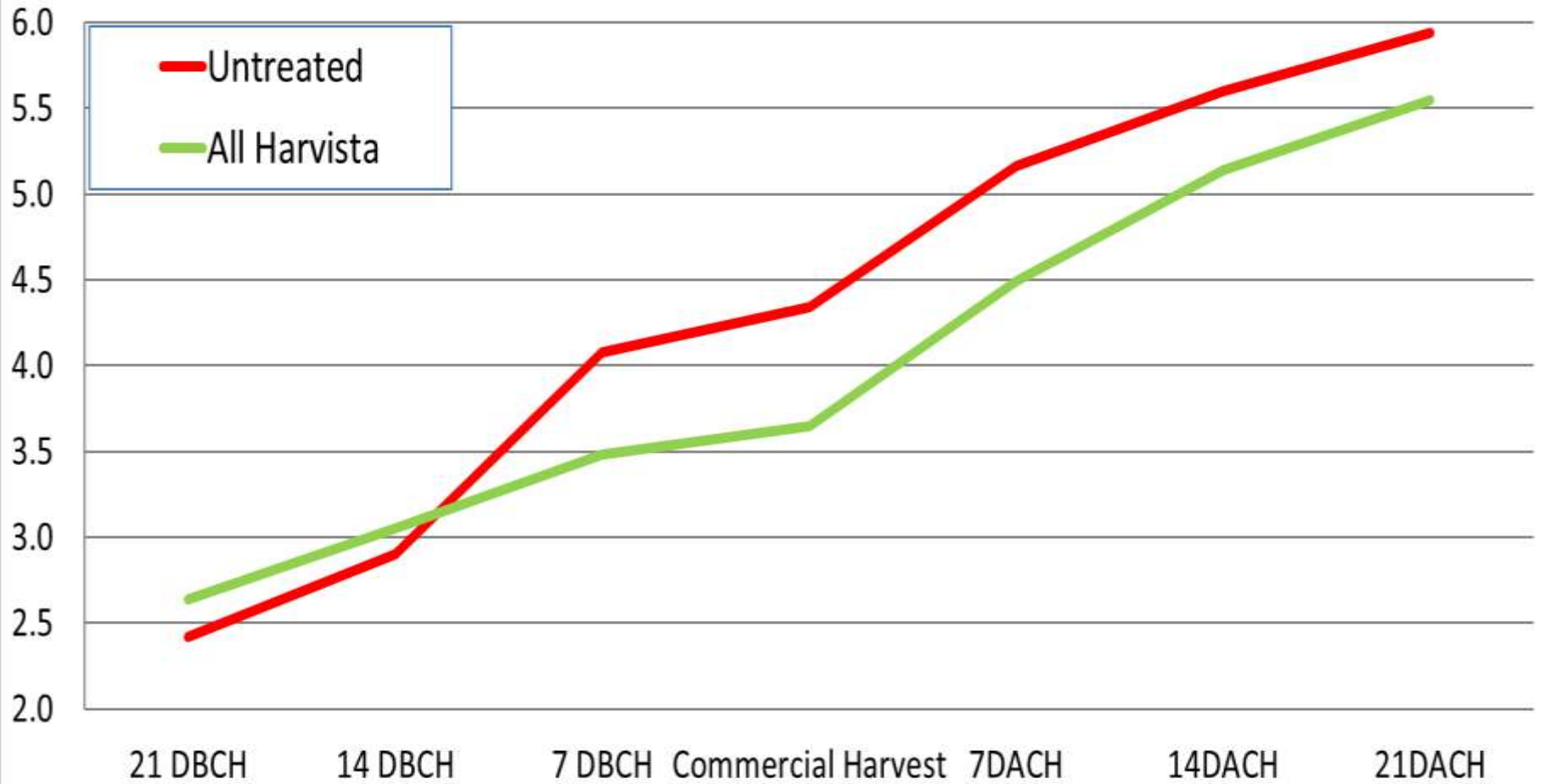
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| NAA | ReTain | Harvista |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | Increase fruit size | Increased fruit size |
| | Increase storage potential | Delayed loss of starch |
| Fruit softens so less storage life, esp. if hot after spraying | <p>Improve fruit quality</p> <p>Green background maintained</p> <p>Greater or less red skin colour in some areas, some varieties, some weather (NZ).</p> <p>Maxx surfactant</p> | <p>Maintains fruit firmness</p> <p>Green background maintained</p> <p>Additional time for colour development</p> |
| ~\$70/Ha | \$1,250/Ha | \$1,300/Ha |
| Use 1.5 times | Use 1 - 1.5 - 2 times | Use 1 – 1.5 – 2 times |

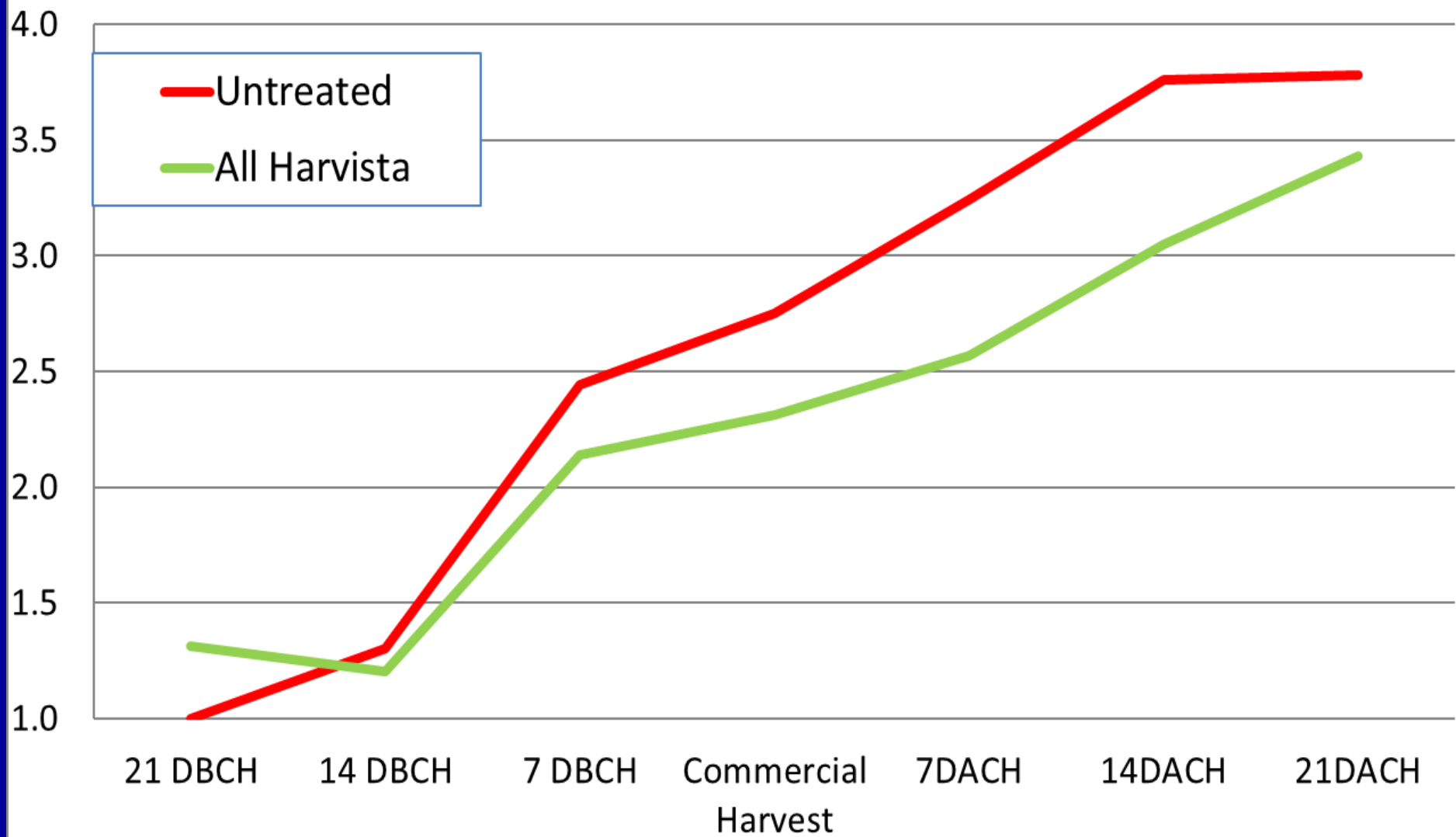
Harvista Trial, Stanthorpe 2019

| | |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|
| | |
| Starch | Harvista fruit progressed slower. Most backward fruit received 2 Harvistas |
| Background Colour | Harvista slowed going from green to yellow |
| Fruit drop | Lot less from Harvista treated trees. |
| Red skin colour - amount & intensity | Similar |
| Sugar (TSS) | Similar |
| Size & weight gain | Similar |
| Pressure | No differences |

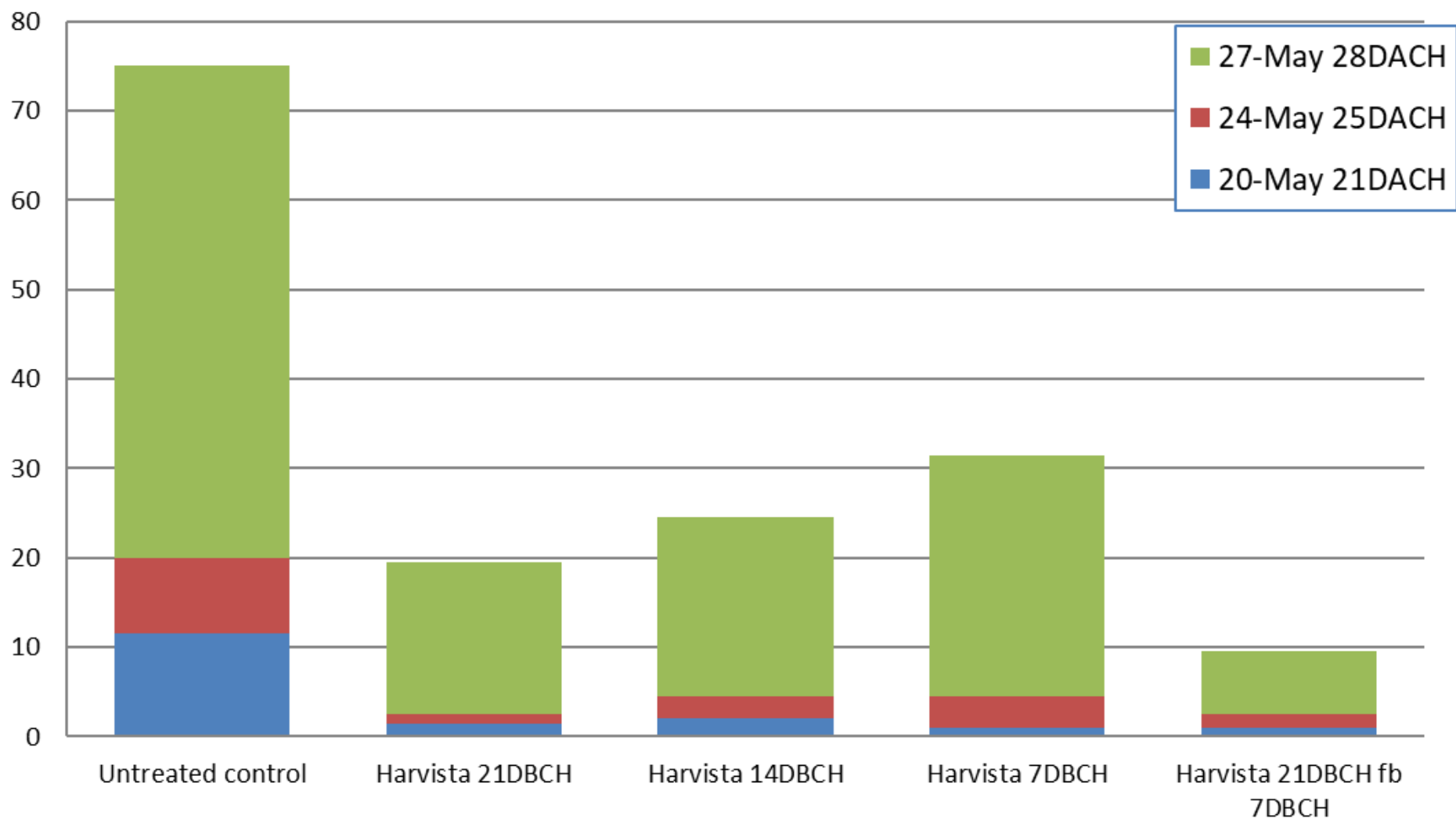
Starch index (1 - 6 scale), Stanthorpe 2019



Skin background colour, Stanthorpe 2019



Pink Lady apples dropped per tree, Stanthorpe Qld, 2019



SUMMARY

| PRUNING | THINNING | HARVESTING |
|-------------------------------------|-------------------------------------------------|----------------------------|
| BREVIS | PRIMARY & SECONDARY | RETAIN & HARVISTA |
| LESS PRUNING - TO SAVE \$ | LESS HAND THINNING - TO SAVE \$ | SPREAD HARVEST |
| 8 OTHER BENEFITS TO INCREASE INCOME | TIMING ADVANTAGE = BIGGER FRUIT & HIGHER YIELDS | IMPROVE / MAINTAIN QUALITY |
| | | REDUCE FRUIT DROP |

PGRs Reduce costs + Increase income