Observations of First Year Bactericide use.

Tom Jerkins, Premier Citrus
June 15, 2017
FCM - Bonita Springs
There is Hope.....

We do not have to fail....
we can beat this disease...
we’re running out of time but we’re close......

......some of these bactericides may be close enough to matter,
and bridge the gap to better bactericides, and then better bactericides, and then maybe genetically resistant plants......

But we need singular focus and ONE MESSAGE:

“We need Bactericides, NOW !!”
Premier Citrus
General Description of Large Field Trials

........generally be at the maximum labeled rates and approved application intervals.

........ same ag inputs....irrigation, pest control, nutrition & pruning

........Rootstock and tree ages are comparable in large trials, reducing those variables.

Attempt to eliminate all variables other than the use of the AB’s

Our geographical footprint would cover 6 counties, with 7 different managers.

On Valencia’s, due to the late approvals, we have no treatments prior the completion of the 2015/16 harvest, so

......most blocks received 2 early summer treatments (2016), 3 fall treatments (2016), and often, but not always, one 2017 winter treatment 40 days prior to harvest.

We attempted to alternate the compounds for each application.

Applications were generally at spray dilute rates 100gal/acre or higher, often mixed with other spray products

Tet was applied at night, and Strep usually in the daytime.

We did not establish a preferred adjuvant, so we had variable use of adjuvants by manager.
We did not leave any meaningful controls for Grapefruit, as we are convinced that strep is a useful canker control, and would not forgo its use for that disease on Grapefruit.

We intended to leave some meaningful control blocks for Hamlin's oranges, but the Hamlin controls did not get established well enough for confidence in what they might reveal.

We did have some good discipline in our Valencia controls and this is what I want to share.
Premier Citrus
Bactericide Large Field Trials
Harvest Timing complications relating to Yield data

% Harv vs Est per Week

Finishing processing by mid May might save the industry 6% of fruit and solids...maybe more.

What do Packing houses do? They operate around the fruit, not the other way around.
Premier Citrus
Discussion of Graphic Summary

- Companywide, **PC was about 8% off Year to Year** Valencia’s covering over 10,000 acres.
- Likely reason of relatively successful overall YTY yield results was pretty good control of PFD, **BUT**, where we missed, we missed big.
- Most of the good control comparisons came off of 5 large groves, which show....
- **Mixed Results**
  - In the aggregate, not easy to see supporting evidence of efficacy, at least measured by Year over Year yield.
  - However, there may be important details in the data worth considering closer.
    - The first detail relates to this “chasing drops” variable.
    - A second relates to leaf drop with “Tet” applications in the 60 days or so preceding harvest.
    - Maybe “adjuvants”? Tactic?
## Five Large Groves - Over 800 Acres Each

<table>
<thead>
<tr>
<th>Trts</th>
<th>Last</th>
<th>Total</th>
<th>Trt</th>
<th>UnTrt</th>
<th>YTY Change in % Yield</th>
<th>Useful?</th>
<th>Why?</th>
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<tbody>
<tr>
<td><strong>1</strong></td>
<td>North</td>
<td>4</td>
<td>Strp</td>
<td>29</td>
<td>16</td>
<td>13</td>
<td>-36%</td>
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<td>Ovr Avg</td>
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<td>Ovr Avg %</td>
<td>38%</td>
<td>31%</td>
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<td><strong>2</strong></td>
<td>South</td>
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<td>Strp</td>
<td>32</td>
<td>16</td>
<td>16</td>
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<td>Ovr Avg</td>
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<td>6.26</td>
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<td>Ovr Avg %</td>
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<tr>
<td><strong>3</strong></td>
<td>East</td>
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<td>Tet</td>
<td>59</td>
<td>22</td>
<td>37</td>
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<td>Ovr Avg</td>
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<td>Ovr Avg %</td>
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<td><strong>4</strong></td>
<td>West</td>
<td>5</td>
<td>Tet</td>
<td>48</td>
<td>29</td>
<td>19</td>
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<td>Ovr Avg %</td>
<td>41%</td>
<td>53%</td>
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<td><strong>5</strong></td>
<td>Center</td>
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<td>Ovr Avg %</td>
<td>58%</td>
<td>0%</td>
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<tr>
<td><strong>6</strong></td>
<td>All PCM Val Groves (17)</td>
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5 large Groves plus 11 smaller groves over 10,000 acres
Premier Citrus
Company Conclusions & Action

• Most, not all managers think they see some tree health improvement, but all concede at least for Premier that is not measurable.
• The harvest data in the aggregate is not compelling with variable results, but some potential glimpses of individual areas suggest possible benefit.
• We may look more closely at adjuvants
• We may drop some of the Tet sprays, so the annual totals AB sprays may be less.
• Premier will repeat the treatments next year with the same controls, so as to have two year data of treatment and controls.
Premier Citrus
Beyond these formulations of Bactericides

As to oranges, let’s not say disappointing, but we did not get an easily seen consistent visual or measurable result with the first year use.

As to grapefruit, let’s just say it: disappointing. It may be measurable that some HLB benefit against controls exist, but nothing in the now two years use suggests that the AB’s are slowing down the rapid grapefruit decline. Premier will continue to use the strep product for canker control, but likely drop any Tet applications.

Even with the mixed results, Premier will likely support the registrants towards another year of Section 18 use, due to 1) the possibility of year of year compounding benefit and 2) the lack of any viable alternative foreseen for 2018.

While we hope that the product use may compound incremental health improvement year to year results in easily measured yield improvement, we (the Industry & the Foundation) need to accelerate our focus on other potential short term products or processes. (Registrants: Improve the products we have....get the active ingredients into the phloem)