California Citrus Quality Council
Annual Conference

James R. Cranney
President
CCQC Mission

- Core mission is to facilitate trade
  - Maximum Residue Limits (MRLs)
  - Phytosanitary issues regarding insects and plant diseases
- Provide access to crop protection tools
CCQC ACTIVITIES

• Organize workshops for education and communication
• Build relationships with domestic and international regulators, registrants and the international citrus industry
• Collaborate with research leaders to solve market access problems
• Host regulatory tours and international regulators
• Request Emergency Exemptions for Pesticides
• Work to establish more MRLs
• Resolve MRL issues
• Manage the Australia preclearance and NAVEK programs
• Develop food safety resources and education
• Submit comments on priority regulatory issues
CCQC’s Coordinating Role
(MRL, Chemical and Phytosanitary Issues)
Top Orange Export Markets
(Thousand U.S. Dollars)

- India, $3,711
- Indonesia, $3,038
- Philippines, $4,470
- New Zealand, $7,168
- Australia, $20,280
- Mexico, $10,232
- Singapore, $13,863
- Malaysia, $23,018
- China, $29,272
- Japan, $107,938
- Hong Kong, $67,028
- United Arab Emirates, $2,487
- Taiwan, $7,529
- Other, $13,167
- Canada, $128,837
- Korea, South, $213,137
Top U.S. Lemon Export Markets
(Thousand U.S. Dollars)

- Canada: $43,083
- Japan: $44,825
- Korea, South: $6,626
- Australia: $8,719
- China: $4,858
- Hong Kong: $4,215
- Russia: $1,725
- Other: $2,371
Market Summaries

- China – New protocol; MRLs; Food safety
- Korea – FRB pilot; 2,4-D MRL
- Australia – Quarantine insects
- Canada – Food safety
- Food Safety as an emerging trade issue
Reopening the China Market

- Adaskaveg conducted two commercial scale studies; one lab study and attended bilateral
- Walse developed a mathematical model to estimate the efficacy of a systems mitigation strategy
China

- Market reopened in August 2014
- The protocol is a pilot
- Compliance is important
- No news about violations
- Agreement possibly renegotiated in two years
- AQSIQ officials complimented our technical response
## China Phytophthora Inspections in California

<table>
<thead>
<tr>
<th>Phytophthora</th>
<th>Inspections</th>
<th>Rot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tulare</td>
<td>924</td>
<td>7</td>
</tr>
<tr>
<td>Kern</td>
<td>101</td>
<td>0</td>
</tr>
<tr>
<td>Ventura</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Riverside</td>
<td>74</td>
<td>5</td>
</tr>
</tbody>
</table>
Potassium Phosphite MRL

- Registration in China
  - Requires data developed in China
  - Postharvest data is from IR-4
- No Import Tolerance Process
- No MRLs for Alternative Fungicides

Phytophthora Symptoms
China Food Safety Proposal

- Drafting food safety regulations
- Primary target is domestic production
- Food safety regulations apply to imports and domestic producers
Korea Export Issues

- Fuller’s Rose Beetle
  - Pilot program to test for FRB eggs on arrival in Korea
- 2,4-D MRL
  - CCQC working with AMVAC and USDA to increase the orange MRL
## Fuller Rose Beetle

<table>
<thead>
<tr>
<th></th>
<th>Inspections</th>
<th>FRB Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tulare</td>
<td>1,513</td>
<td>18</td>
</tr>
<tr>
<td>Kern</td>
<td>126</td>
<td>0</td>
</tr>
<tr>
<td>Ventura</td>
<td>140</td>
<td>0</td>
</tr>
<tr>
<td>Riverside</td>
<td>81</td>
<td>0</td>
</tr>
</tbody>
</table>
Korea Export Issues

- CCQC working with AMVAC, Korea Embassy and USDA-FAS
- US tolerance of 3 ppm based on dried citrus pulp
- Requesting MRL increase from .05 ppm to .3 ppm
Korea Export Issues

- Fuller’s Rose Beetle Research
  - Pesticide decline curves
  - Treatment evaluation
# Kryocide Residue Decline Curves

<table>
<thead>
<tr>
<th></th>
<th>60 DAT ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>.73</td>
</tr>
<tr>
<td>Kryocide - Unwashed</td>
<td>1.65</td>
</tr>
<tr>
<td><strong>Kryocide - Washed</strong></td>
<td>.86</td>
</tr>
<tr>
<td>Kryocide - Washed with Fluorinated water</td>
<td>.97</td>
</tr>
<tr>
<td>Kryocide - High pressure washed</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: Beth Grafton-Cardwell
FRB Egg Masses
(Per 100 Fruit)

Source: Beth Grafton-Cardwell
FRB Research
Pre and Post Harvest

- Ethyl formate
- Phosphine
- Acidic dips
- Trap and Kill
Fuller Rose Beetle Eggs

Effect of EF fumigation on FRB eggs at 68ºF (20ºC) after lactic acid pre-treatment at 86ºF (30ºC)

<table>
<thead>
<tr>
<th>Lactic acid %</th>
<th>Dip time (minutes)</th>
<th>Ethyl formate (g/m³)</th>
<th>Fumigation time (Hours)</th>
<th>Subjects tested</th>
<th>Mean mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>776</td>
<td>39.44</td>
</tr>
<tr>
<td>15</td>
<td>1.5</td>
<td>-</td>
<td>-</td>
<td>635</td>
<td>45.20</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>652</td>
<td>46.63</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>3137</td>
<td>99.97</td>
</tr>
<tr>
<td>15</td>
<td>1.5</td>
<td>2</td>
<td>6</td>
<td>3708</td>
<td>100.00</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>3942</td>
<td>99.92</td>
</tr>
</tbody>
</table>

Source: Mitcham & Bikoba

Control mortality was 11.09%
Commercial Phosphine Fumigation Trial

1000 ppmv for 48 h at 5.0 ± 0.5° C

*Pantomorus cervinus* – Fullers rose beetle

688 egg survivors from 10,379 treated, 93% control (Probit 6.47)

“systems approach” to decrease time

Probit 9 in ~6 d

Source: Spencer Walse
Malic acid dunks versus FRB

- Quantified effect(s) of malic acid concentration (v/v%), temperature during dunking/submersion, and drying time at 25C

- FRB egg mortality is directly related to
  - the duration drying following submersion
  - inversely related to Temp. at the time of submersion

- Results predict control with a 10% malic acid dunk at 20 C (68 F) for 30 seconds, followed by drying for 18-24 h

- Current evaluating phytoxicity and quality impacts

Source: Spencer Walse
Other FRB research (walse)

• Radio frequency-based approach incorporated onto pack line

• Attract and kill of adults and neonates in the field

• Integrating all control elements in an systems-based approach

Source: Spencer Walse
Canada Export Issues

- Removal of 0.1 ppm default MRL
  - Not immediate problem
- Food Safety regulations
Canada Food Safety Issues

- Proposing sweeping changes similar to FSMA and grade standards
- Coordination through the Regulatory Cooperation Council
- Probable equivalency/recognition with FSMA
- Focus on prevention; industry responsibility and accountability
- Not final yet; mid-2015
- Licensing requirements
- Traceability
Canada Food Safety Issues

- Written Preventative Control Plans (PCP) – growers and validated
- Dispute Resolution Corporation (DRC) membership mandatory for fruit and vegetable buyers and sellers
Australia Export Issues

- **Bean Thrips**
  - High populations, more detections this season
  - Ethyl formate delayed

- **Mites**
  - Greater emphasis during inspection
  - Finding more mites
  - Long delays for identification
### Bean Thrips

<table>
<thead>
<tr>
<th>Inspections</th>
<th>Bean Thrips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tulare</td>
<td>790</td>
</tr>
<tr>
<td>Kern</td>
<td>238</td>
</tr>
<tr>
<td>Ventura</td>
<td>99</td>
</tr>
<tr>
<td>Riverside</td>
<td>74</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Total Volume - 31 DEC</td>
<td>230,287</td>
</tr>
<tr>
<td>Total Volume - Year End</td>
<td>591,364</td>
</tr>
</tbody>
</table>

Source: Dave Riggs, Australia Preclearance Manager
## Volume By Variety Through 12/31

<table>
<thead>
<tr>
<th></th>
<th>11-12</th>
<th>12-13</th>
<th>13-14</th>
<th>14-15</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navels</td>
<td>151,424</td>
<td>153,554</td>
<td>376,541</td>
<td>259,485</td>
<td>-31%</td>
</tr>
<tr>
<td>Lemons</td>
<td>90,199</td>
<td>251,369</td>
<td>320,205</td>
<td>304,802</td>
<td>-5%</td>
</tr>
<tr>
<td>Clementine/Mandarin</td>
<td>67,965</td>
<td>46,790</td>
<td>23,992</td>
<td>16,679</td>
<td>-30%</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>12,574</td>
<td>16,122</td>
<td>25,515</td>
<td>26,847</td>
<td>5%</td>
</tr>
<tr>
<td>Pummelos</td>
<td>12,852</td>
<td>5,166</td>
<td>21,483</td>
<td>9,097</td>
<td>-58%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Dave Riggs, Australia Preclearance Manager
Market Access Mite Research

Richard Stouthamer  Joseph Morse  Veronique Bikoba  Beth Mitcham

Spencer Walse  Beth Grafton Cardwell  Kris Godfrey
Market Access Mite Research

- Grafton-Cardwell – Establishing colonies
- Mitcham & Bikoba – Evaluating ethyl formate; acidic dips
- Walse – Evaluating phosphine and acidic dips
- Stouthamer & Morse – Establishing molecular technique for mite identification
- Godfrey – Testing vector capability of various mite species for citrus leprosis
Market Access TASC Grant

- Walse drafted a $1.2 million TASC grant to fund Korea, China & Australia market access research
- USDA funding for 3 years
- Administered by CRB

Spencer Walse
Pesticide Policy Issues

- EPA drinking water model
- Endangered Species policy
- Pollinator policies
  - Neonicotinoid policy
- Chlorpyrifos (Lorsban®)
Meet Mr. Food Safety

Hello I’m Mr. Food Safety. I’m your next trade barrier!
Trade Dimensions of Food Safety

- Potential nontariff trade barrier
- Country by country compliance required
  - Similar to multiple retailer audits
- Domestic outbreaks may result in over reaction or “global recalls”
  - Caramel apple recall resulted in recalls in international markets
- Conclusion: Food safety is migrating to an integrated process within firms
CCQC ACTIVITIES

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Questions