An independent growers perspective of the 7th International litchi symposium. Hanoi, Vietnam
Regulation of bearing potential for sustainable production and quality improvement of litchi in India subcontinent.
Sanjay Kumar Singh (India)
An overview of fruit abscission in litchi
Jianguo Li (China)

1. Introduction

- In 2013, it is the highest annual output in China in history. But its productivity was only about 6.95 tons/ha. So, litchi is one of the lowest yield fruit crop.
- The excessive fruit drop during fruit development is a major problem causing serious economic loss for the growers.
- Here, we only present advances on fruit abscission waves, physiological factors and practices for reducing fruit drop, mainly including the results obtained by my research team.

2. Anatomy of fruitlet abscission zone (FAZ)

- FAZ consists of 7 to 10 layers of small cells with dense cytoplasm. During abscission, cell separation in FAZ was clearly observed.

3. Fruit abscission waves

- For normal-seeded cultivars, there are 2 obvious waves of fruit drop (Mauzil, 1954; Auldner, 1961; Yaun and Zhang, 1988; Qin et al., 1993). Miura et al. (1983) occurred 7-12 and 21-25 days after fertilization (DAF), sometimes there is a third wave happened on 50-55 DAF.
- For aborted-seeded cultivars, there are additional 2 distinct waves of fruit abscission occurred 35-40 DAF (Qiu et al., 1989) and 10-15 days before harvest (Yau and Zhang, 2003).

4.3 Ring or girdling on the main branches

- According to our observation, there are 5-6 fruit drop waves (I, II, III, IV, V) depend on cultivars. The wave I and wave II are the two main periods of fruit abscission, the wave III and wave V are specific to varieties with aborted seeds.

5. Practices for reducing fruit drop

5.3 Application of plant regulators

- Gibberellin acid. In India, Singh and Lal (1989) found 50 ppm GA3 had the best for enhancing setting. Sprayed on pedicles in the first fortnight of April, when 50-100% flowers had opened.
- In China, 50 ppm GA3 sprayed before the rapid growth of embryos reduced the fourth wave of fruit drop of ‘Huangti’, but had no effect if applied before the flowering (Li et al., 1990).
- Recently, Yang et al. (2015) found 20 ppm GA3 application at 30 days and 20 days before harvest had the best for reducing PFD of ‘Wulei’.
Canopy management for improving productivity in litchi
Vishal Nath (India)

4.1 Canopy Management

Objectives of Canopy architecture
- To restore balance between source and sink
- To maintain the symbiotic relationship between shoot and root
- To develop specific plant geometry amenable for mechanization
- To harness the potential advantage of available resources under the allotted spaces
- To maximize fruit production

Design for Hedge Row System: "Y" Shaped Trellis in Litchi (Initial Frame development)
Management of litchi fruit borer using organic pesticides
Kuldeep Srivastava (India)

4.1 Borer Management

- Conopomorpha sinensis, Bradley has been confirmed as major fruit & shoot borer species using molecular characterization
- Active on litchi trees as shoot borer & leaf miner from August to October
- Maximum fruit damage during May-June while highest population on shoot/leaf during August-September
- Fruit loss and leaf infestation ranges from 24-85% and 7-90%, respectively

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Dose (ml or g/l)</th>
<th>Early stage</th>
<th>Mid stage</th>
<th>Harvest stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rovin</td>
<td>1.25ml/l</td>
<td>0.00</td>
<td>95.79</td>
<td>94.33</td>
</tr>
<tr>
<td>Fungole</td>
<td>1.5+ neem oil 3ml/l</td>
<td>0.00</td>
<td>81.00</td>
<td>73.94</td>
</tr>
<tr>
<td>Krimidote</td>
<td>3ml/l</td>
<td>0.00</td>
<td>49.34</td>
<td>50.44</td>
</tr>
<tr>
<td>Bio dose</td>
<td>1.25ml/l</td>
<td>0.00</td>
<td>27.17</td>
<td>36.00</td>
</tr>
<tr>
<td>Neem oil</td>
<td>4 ml/l</td>
<td>0.00</td>
<td>54.62</td>
<td>71.21</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Efficacy of newer insecticides against litchi fruit borer**

First spray was given with neem oil before flower opening stage in all modules while second, third and fourth spray of different chemicals were applied as per modules at clone size fruit, cardamom size and after 10 days of third spray (about 15 days before harvest)

**Lures developed by PCI**
Study on technological development for reducing SO2 residue problem in fresh longan for export
Wittaya Apai (Thailand)

**6.1 SO₂ Reduction**

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**Conclusion**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Storage life (days) (5°C + display for sale at 25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4 = 1.5% SO₂ + O₂ 1 h</td>
<td>40 + 5</td>
</tr>
<tr>
<td>T5 = 1.5% SO₂ (commercial)</td>
<td>40 + 5</td>
</tr>
<tr>
<td>T2 = 5% HCl + 1% SMS</td>
<td>40 + 5</td>
</tr>
<tr>
<td>T3 = O₂ 2 h + 1.5% SO₂</td>
<td>30 + 5</td>
</tr>
<tr>
<td>T1 = 1.5% SO₂ + SO₂ pad</td>
<td>30 + &lt;5</td>
</tr>
</tbody>
</table>

**Materials and Methods**

The experiment design was CRD comprising 5 selected treatments with 3 replicate (11.5 kg perforated plastic basket)

- **Tr1** = sulfur dioxide (SO₂) 1.5% + sodium metabisulphite (SMS) pad + Perforated LLDPE bag
- **Tr2** = hydrochloric acid (HCl) 5% + SMS 1% for 5 min
- **Tr3** = ozone (O₃) 2 h + 1.5% SO₂
- **Tr4** = SO₂ 1.5% + O₂ 1 h
- **Tr5** = SO₂ 1.5% as commercial treatment (control)

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**Application SO₂ for prolonging shelf life of fresh longan for export**

SO₂ gas produced by burning sulfur powder, since 1989 (Tongdee, 1994)
- Extending storage life at 0-2 °C, 90-95% RH for 42 days
- bleaching agent, inhibit enzymatic browning
- Control fruit disease
- Low cost, easy to implement
  
  High capacity and fast

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**Conclusion (continued)**

- Treatment of 1.5% SO₂ + O₂ 1 h could be used and tested at some commercial SO₂ packing house in the future
- Ozone fumigation for 1 h was more effective and effective on the longan fruit with regard to the SO₂ residue reduction and controlled disease incidence and maintained postharvest-quality of SO₂-treated fruit as compared to SO₂ (commercial) alone.
- Dipping in HCl 5% + SMS 1% could be used to export testing to restrict country where the least SO₂ residues in whole fruit below Codex tolerance at 50 mg/kg found throughout period of time.