Use of AVG (ReTain) to increase fruit set

Poliana Francescatto and Terence Robinson
Poor fruit set – Minneiska apple

Due to...
- Lack of pollinizers (early bloom)?
- Lack of compatible pollinizers?
- Poor stigmatic receptivity?
- Poor ovule longevity?
- Thinning effects of other PGRs
Increasing Fruit Set

**AVG - Aminoethoxyvinylglycine**

*Cherries, pears and apples*

**AVG** - No precursor for ethylene production

- Extends Blossom Viability
  - Cherries – 1 to 2 pouch / acre
  - Apples – 1 pouch / acre
  - Pears – 1 pouch / acre

Up to FB

Up to FB and at 10mm
Increasing Fruit Set

Effects of AVG (ReTain) on fruit set

Extends flower viability by reducing senescence.

Helps maintain the abscission zone inactive.
Use of ReTain to increase fruit set of Minneiska

2017 – Trial 1

<table>
<thead>
<tr>
<th>Trt No.</th>
<th>Full Bloom May 3</th>
<th>Petal Fall May 16</th>
<th>10mm May 23</th>
<th>Flag color</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>UTC</td>
<td>UTC</td>
<td>UTC</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>Retain 1 pouch</td>
<td></td>
<td></td>
<td>Yellow Red dot</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Retain 1 pouch</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Retain 1 pouch</td>
<td></td>
<td>Purple</td>
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</table>

Minneiska/B9 – 7 years old
Tunnel sprayer (Lipco) – 90 GPA
5 reps
No Provide program

Cold Spring – 35-55F
Increasing Fruit Set with Retain
Minneiska Apples – Trial 1

Number of fruit per tree

An increase of yield of approximately 30-50%

Duncan test (P<0.05)
### Use of ReTain to increase fruit set of Minneiska

**2017 – Trial 2**

**Minneiska/B9**
- 7 years old
- Backpack sprayer – runoff
- 4 reps (3 trees/rep)

<table>
<thead>
<tr>
<th>Trt No.</th>
<th>Pink Stage May 3</th>
<th>Full Bloom 5/10/17</th>
<th>Petal Fall 5/18/17</th>
<th>10mm 5/24/17</th>
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<tr>
<td>2</td>
<td>Retain ½ pouch</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Retain ½ pouch</td>
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<tr>
<td>4</td>
<td>Retain ½ pouch</td>
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<tr>
<td>5</td>
<td>Retain 1 pouch</td>
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<td>6</td>
<td>Retain 1 pouch</td>
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<td>7</td>
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<td>Retain 1 pouch</td>
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<td>8</td>
<td>Retain 1 pouch</td>
<td>Retain 1 pouch</td>
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<tr>
<td>9</td>
<td>4 oz Apogee</td>
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<td>4 oz Apogee</td>
<td>4 oz Apogee</td>
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<tr>
<td>11</td>
<td>4 oz Apogee + Retain ½ pouch</td>
<td>4 oz Apogee + Retain ½ pouch</td>
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</tr>
<tr>
<td>12</td>
<td>4 oz Apogee + Retain ½ pouch</td>
<td>4 oz Apogee + Retain ½ pouch</td>
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<tr>
<td>13</td>
<td>2 oz ProVide</td>
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<td>4 oz ProVide</td>
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<tr>
<td>15</td>
<td>2 oz ProVide + Retain ½ pouch</td>
<td>2 oz ProVide + Retain ½ pouch</td>
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<tr>
<td>16</td>
<td>Retain ½ pouch</td>
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<td>Retain ½ pouch</td>
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</tbody>
</table>
Increasing Fruit Set with Retain Minneiska Apples – 2017 Trial 2

Bars: LSD test (P<0.05)
Increasing Fruit Set with Retain Minneiska Apples – 2017 Trial 2

Fruit set
Using AVG (ReTain) to Inhibit Ethylene Production and Increase Fruit Set
Minneiska flowers/fruitlets (2017)
Use of ReTain to increase fruit set of Minneiska

2018 – Trial 1

<table>
<thead>
<tr>
<th>Trt No.</th>
<th>Full Bloom 5/16/18</th>
<th>Petal Fall 5/22/18</th>
<th>12mm 5/28/18</th>
<th>Flag color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UTC</td>
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<td>UTC</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Retain 1 pouch</td>
<td></td>
<td></td>
<td>PBD</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Retain 1 pouch</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Retain 1 pouch</td>
<td>OBS</td>
</tr>
</tbody>
</table>

Minneiska/B9 – 8 years old
Tunnel sprayer (Lipco) – 100 GPA
5 reps
No Provide program
Increasing Fruit Set with Retain Minneiska Apples – 2018 Trial 1

Number of fruit per tree (>2017)

- Untreated Control
- 1 pouch Retain at FB
- 1 pouch Retain at PF
- 1 pouch Retain at 10mm

Fruit number per tree

Graph showing the comparison of fruit numbers per tree with different treatments.
Ethylene evolution in apple flower/fruitlet - 2018

- Gala
- Fuji
- Honeycrisp
- Minneiska

Ethylene rate (µL L⁻¹ h⁻¹)

Days after full bloom

New York
Using AVG (ReTain) to Inhibit Ethylene Production and Increase Fruit Set
Minneiska flowers/fruitlets (2018)

Days after full bloom

Ethylene rate (µL L⁻¹ h⁻¹)

- Control
- 333g/acre (FB)
- 333g/acre (PF)
- 333g/acre (12 mm)

FB

PF

12 mm

New York
Using AVG (ReTain) to Inhibit Ethylene Production and Increase Fruit Set
Minneiska flowers/fruitlets (2018)

Ethylene rate (µL L⁻¹ h⁻¹)

½ Pouch Retain ½ Pouch Retain

Control

-•-333g/acre (FB)

Ethylene measurements in trial 1
No ProVide sprays

Days after full bloom
Preliminary Conclusions

No negative in fruit quality
No increase in seed numbers
Fruit size – crop load effect

Two applications of ReTain at (rate and timing) has shown better efficacy – when?