

2006  
SPRAY  
THINNING  
GUIDE  
( & ReTain)

OKANAGAN TREE FRUIT  
COMPANY

## **NOTES ON THINNING STRATEGIES**

An aggressive thinning is becoming a vital part of any thinning strategy. When growers have the confidence that their blocks have been **well pollinated** it makes the decision to thin aggressively much easier. There are a number of excellent products out there, each with it's own particular strength.

### **Gala, Red Delicious and Fuji:**

We must stress the need to get the overall crop load reduced early with chemicals so hand thinning can be delayed a couple of months. In general, long stem varieties do not fully size differentiate early so when hand thinning is done early, too many runts are left behind. The problem can be exacerbated with the use of NAA.

### **Spartan:**

Experience shows that Sevin plus NAA or Sevin plus Accel very rarely thin Spartans enough, but Spartans are the easiest of all varieties to thin with ATS, as the kings open so much earlier than the side blooms. Spray ATS when the king bloom are set and as soon as two or more side blooms are open in the majority of clusters.

### **McIntosh:**

Experience shows that 2 applications of ATS set up McIntosh for a good chemical thinning job. The king and side bloom open fairly close together making timing critical. For the best results on McIntosh, be aggressive. Start with a early spray at 40% full bloom followed by another at 80% full bloom. McIntosh blocks sprayed with ATS often over thin the bottom of the tree and leave the top heavy, adjust the spray nozzles accordingly. Follow with Sevin plus NAA when king fruit are 10 to 12 mm size to complete the job.

### **Golden Delicious:**

Experience shows that Golden thin well after the application of ATS. Spray ATS after king bloom are set and as soon as three or more side bloom are open in the majority of clusters. Follow with Sevin plus NAA when king fruit are 10 to 12 mm size to complete the job.

# **FACTORS AFFECTING CHEMICAL THINNING**

## **WEATHER**

### **Easy to thin when:**

- High temperature is accompanied by high humidity before or after spraying.
- Blossoms and young leaves are injured by frost before spraying.
- Foliage is conditioned for increased chemical absorption by prolonged cloudy periods or rain before spraying.
- Prolonged cloudy and warm periods reduce photosynthesis before or after spraying.

### **Hard to thin when:**

- Low humidity causes rapid drying of sprays therefore decreasing spray absorption.
- Limbs and or spurs slightly girdled from winter injury.
- There is cold, sunny periods after bloom.

## **CROP LOAD**

### **Easy to thin when:**

- Bloom is heavy, especially after a heavy crop the previous year.
- Fruit set appears heavy on easily thinned cultivars like Red Delicious.
- Fruit sets in clusters rather than singles.
- Cultivars that tend to have a heavy "June Drop".

### **Hard to thin when:**

- it is the "ON" year for a biennial bearing variety.
- Fruit sets in singles rather than clusters.

## **TREE VIGOUR**

### **Easy to thin when:**

- Nitrogen or Boron is low.
- Soil moisture is inadequate.
- Fruit spurs are low in vigor on shaded inside branches.
- Root systems are weak due to injury or disease.
- Trees are young with many vigorous upright branches.

### **Hard to thin when:**

- Trees have good vigor with 12-18" terminal growth and no nutrient deficiencies.
- Fruit spurs are in well-light areas of the tree like the top and outer canopy.
- Precocious trees come into fruiting with good vigor and mature bearing habits. Trees with horizontal or spreading fruiting branches.

## **POLLINATION**

### **Easy to thin when:**

- Trees are poorly pollinated due to lack of bee activity or cross pollination

### **Hard to thin when:**

- Bees are active in orchards with cross pollinated varieties.

# **BLOOM THINNING - ATS**

## **GENERAL INFORMATION**

<b>Specifications</b>	- Ammonium Thiosulphate, Liquid Fertilizer, 12-0-0 plus 26% Sulphur pH of 7.5 – 8.
<b>Storage</b>	- DO NOT FREEZE: active salt precipitates out below -2°C

## **RECOMMENDATIONS FOR USE**

<b>Spray Volume</b>	- spray in high volumes of water (to run off)
<b>Timing</b>	<p>*** <b>WATCH BEE FLIGHT AND POLLINATION ACTIVITY</b> ***</p> <ul style="list-style-type: none"> <li>- consider application beginning 60 to 80% full bloom</li> <li>- watch for king petal fall on north side of the tree</li> <li>- ensure the kings are pollinated before application</li> <li>- late applications will still have the benefit of removing 1 year bloom</li> </ul>
<b>Activity</b>	- burning the top of the style and stigma
<b>Result</b>	<ul style="list-style-type: none"> <li>- stops pollination</li> <li>- enhances the effect of postbloom thinners.</li> <li>- very consistent spray for return bloom</li> </ul>
<b>WettingAgent</b>	- DO NOT USE

## **RATES BY VARIETY**

VARIETY	RATES (lt per 100 lt) (gal per 100 gal)	RESULTS
Ambrosia	1.6	Good
Red Delicious	1.0 to 1.6	<b>USE CAUTION</b> - over thinning possible
McIntosh	1.6 to 2.0	Variable due to mixed bloom
Spartan	1.6	<b>Excellent</b>
Golden Delicious	1.6	Good
Gala	1.0 to 1.2	Good (with multiple sprays)
Jonagold	1.0 to 1.2	Spray Early - used to limit king bloom
Fuji	1.6	Good (with multiple sprays)
Empire	1.0 to 1.2	Good
Braeburn	1.0 to 1.2	<b>USE CAUTION</b> - over thinning possible
Sunrise	1.0 to 1.2	<b>USE CAUTION</b> - over thinning possible
Granny Smith	1.0 to 1.2	<b>USE CAUTION</b> - over thinning possible

## **THINGS TO CONSIDER**

<ul style="list-style-type: none"> <li>- concentrate sprays do not work well, coverage is critical</li> <li>- compatible with Dipel and Foray sprays</li> <li>- on many varieties, multiple sprays 2 days apart have proven very effective</li> <li>- leaf burning occurs if applied in rain or if heavy rain follows application</li> <li>- leaf burning is possible when spray volumes are too concentrate</li> <li>- slight leaf burning may occur when sprayed with hot temperatures or very high water volumes</li> </ul>
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# **SHAPE ENHANCEMENT - PROMALIN**

## **GENERAL INFORMATION**

<b>Spray Volume</b>	- spray with at least 900 litres per hectare (100 US gallons per acre)
<b>Best Absorption</b>	- in cool temperatures with high humidity - late evenings or early morning
<b>Best Activity</b>	- best applied when highs of 18°C to 24°C on days following application - do not spray if forecast highs are below 10°C or above 30°C - lower the pH of the tank to 6

## **RECOMMENDATIONS FOR USE**

<b>Varieties</b>	- commonly used only on Red Delicious
<b>Rate</b>	- <b>TO INCREASE FRUIT "TYPE" ONLY: 475 ml per acre</b>
<b>Timing (High Rates)</b>	- at the beginning of a warming trend - apply at 50 to 80% full bloom or 80 to 100% full king bloom - <b>DO NOT USE HIGH RATES IF BLOSSOMS ARE FROST INJURED</b>
<b>Activity</b>	- Promalin is absorbed by the flower petals - it is a growth hormone that is naturally occurring in apples - increases cell division and cell elongation - can cause fruit thinning, especially on weak buds
<b>Result</b>	- increases the length of apples
<b>Wetting Agent</b>	- <b><u>NOT RECOMMENDED</u></b>

## **THINGS TO CONSIDER**

<ul style="list-style-type: none"><li>- Promalin is absorbed in 6 hours, a heavy rainfall shortly after application will reduce benefits</li><li>- <b><u>DO NOT</u></b> apply with ATS, as it will decrease the absorption. Wait 2 or 3 days after Promalin for ATS application</li><li>- Nutrient products tank mixed with Promalin is <b><u>NOT</u></b> recommended</li></ul>
Factors negatively influencing Promalin response: <ul style="list-style-type: none"><li>- poor tree nutrition: especially Boron, Zinc, Magnesium and Nitrogen</li><li>- poor light penetration yielding weak buds</li><li>- frost injury on the bud</li><li>- poor pollination</li><li>- fast drying conditions</li><li>- cold soil conditions (avoid watering till after bloom)</li></ul>

# **GROWTH ENHANCEMENT & THINNING- ACCEL**

## **GENERAL INFORMATION**

<b>Spray Volume</b>	- spray with at least 900 litres per hectare (100 US gallons per acre)
<b>Best Absorption</b>	- in cool temperatures with high humidity - late evenings or early morning
<b>Best Activity</b>	- best applied when highs of 18°C to 24°C on days following application - do not spray if forecast highs are below 10°C - lower the pH of the tank to 6

## **RECOMMENDATIONS FOR USE**

<b>Varieties</b>	- any variety that will benefit from large size - commonly used on Gala, Fuji, Spartan
<b>Rate</b>	- to increase fruit size and some thinning: 1000 ml per acre - for enhanced thinning effect: 1500 to 2000 ml per acre - <b>DO NOT GO BELOW 40 ppm (eg 1Ltr/100 USgal)</b>
<b>Timing</b>	- <b>WHEN THE WEATHER IS FAVOURABLE ... SPRAY!</b> - consider application at 5 to 10 mm king fruit size - timing window 1 to 21 days post bloom - can be applied with Sevin XLR with good effect - best timing just before 2 or 3 warm to hot days
<b>Activity</b>	- Accel is a growth hormones that naturally occurring in apple - increases cell division in fruit. - thinning effect enhanced in smaller trees and tighter plantings - the closer the spray is to full bloom the stronger the thinning effect
<b>Result</b>	- increases the diameter of apples - good cluster thinning when applied close to full bloom
<b>Wetting Agent</b>	- may be added to enhance absorption - not needed if spray coverage is excellent - when combining with Sevin XLR - no additional surfactant needed

## **THINGS TO CONSIDER**

<ul style="list-style-type: none"><li>- Nutrient products tank mixed with Accel is <b>NOT</b> recommended</li><li>- <b>DO NOT SPRAY IN THE SAME SEASON AS NAA where pigmy fruit can be a problem.</b></li></ul>
Factors negatively influencing Accel response: <ul style="list-style-type: none"><li>- poor tree nutrition: especially Boron, Zinc, Magnesium and Nitrogen</li><li>- poor light penetration yielding weak buds</li><li>- frost injury on the bud</li><li>- poor pollination</li><li>- fast drying conditions</li><li>- cold soil conditions (avoid watering till after bloom)</li></ul>

# **POSTBLOOM THINNING - SEVIN XLR**

## **GENERAL INFORMATION**

<b>Spray Volume</b>	- spray in high volumes of water
<b>Best Absorption</b>	- in cool temperatures with high humidity - late evenings or early morning
<b>Best Activity</b>	- in warm temperatures <b>over 20°C</b> following application - best effect when fruit growing actively i.e. WARM WEATHER

## **RECOMMENDATIONS FOR USE**

<b>Rate</b>	- <b>ONE RATE</b> (1.8 litres / acre or 4.5 litres / hectare)
<b>Timing</b>	- at the beginning of a warming trend  - <u>EARLY SEVIN</u> - best when the king fruitlet are less than 5 mm size - <b>CAUTION &gt;&gt;&gt; SEVIN KILLS BEES &lt;&lt;&lt;</b> - ensure bees have been removed from orchard. - first application can go on soon after petal fall.  - <b>Sevin is ineffective between 5 and 10 mm King fruit size</b>  - <u>LATE SEVIN</u> - best when the king fruitlet are 10 to 15 mm size - 15 mm for Red Delicious - 10 to 12 mm for the rest
<b>Activity</b>	- interferes with nutrient transport causing seed abortion - primarily absorbed through the apple, not the leaf <b>(Coverage is critical!)</b>
<b>Result</b>	- acts to reduce number of fruit per cluster rather than whole clusters - results vary with fruit size and fruit vigor - the slow growing, smaller side bloom are thinned easier than faster growing, larger king bloom
<b>Wetting Agent</b>	- not needed, Sevin XLR has a built-in surfactant - if adding NAA or Accel – no additional surfactant needed

## **THINGS TO CONSIDER**

<ul style="list-style-type: none"><li>- Light blooms are more difficult to thin with Sevin than heavy blooms</li><li>- Better thinning occurs when combined with Accel or NAA</li><li>- Nutrient products tank mixed with Sevin, Accel or NAA is <b>NOT</b> recommended</li><li>- Sevin thinning better after ATS applications due to weaker side blooms</li></ul>
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# **POSTBLOOM THINNING - NAA**

## **GENERAL INFORMATION**

<b>Spray Volume</b>	- spray in high volumes of water
<b>Best Absorption</b>	- in cool temperatures with high humidity - late evenings or early morning
<b>Best Activity</b>	- in warm temperatures <b>over 20°C</b> following application - best effect when fruit growing actively i.e. WARM WEATHER

## **RECOMMENDATIONS FOR USE**

<b>Rate</b>	<b>VARIABLE</b> (Lower rates for easy to thin / higher rates for hard to thin)
<b>Ranges</b>	- <b>none</b> on Non-Spur Reds (over thinning, may cause pigmy fruit) - <b>1 to 3 PPM</b> (5.68% NAA at <b>10-30 ml/100gal</b> ) <b>Spur Reds</b> - <b>1 to 3 PPM</b> (5.68% NAA at <b>10-30 ml/100gal</b> ) <b>Gala, Fuji</b> - <b>3 to 5 PPM</b> (5.68% NAA at <b>30-50 ml/100gal</b> ) <b>Spartan</b> - <b>4 to 10 PPM</b> (5.68% NAA at <b>40-100 ml/100gal</b> ) <b>McIntosh</b> - <b>8 to 10 PPM</b> (5.68% NAA at <b>80-100 ml/100gal</b> ) <b>Golden Delicious</b>
<b>Activity</b>	- indirect action on fruitlet to abort seeds and loosen fruitlet
<b>Action</b>	- creates a physiological stress on the tree (as seen in tree wilt) which makes the tree produce ethylene which induces seed abortion and stem abscission.
<b>Result</b>	- acts on individual fruit and whole clusters
<b>Wetting Agent</b>	- must be added to enhance absorption - when combining with Sevin XLR - no additional surfactant needed

## **THINGS TO CONSIDER**

- Better thinning occurs when combined with Sevin.
- NAA's mode of action is stressing the tree, this can result in reduced cell division. If large size fruit is your goal, consider alternate methods of thinning like Sevin by itself, ATS, and Accel (or some combination of the 3)
- Nutrient products tank mixed with NAA is <b>NOT</b> recommended

# ReTain

## **GENERAL INFORMATION**

<b>Spray Volume</b>	- spray with at least 900 litres per hectare (100 US gallons per acre)
<b>Best Absorption</b>	- in high water volumes or dilute sprays recommended
<b>Best Activity</b>	- pick the <b>correct timing</b> and rate for the variety and block

## **RECOMMENDATIONS FOR USE**

<b>Varieties</b>	- any variety that suffers from watercore, stop drop or stem end splitting - commonly used on McIntosh, Spartan or Gala
<b>Rate</b>	<b>Gala</b> - suggested range 50% to 100% <b>Spartan</b> - suggested range 35% to 75% <b>McIntosh</b> – suggested range 70% to 100% - higher rates for higher tree vigour and/or heavy crop loads
<b>Differential Spraying on Gala</b>	- Spraying on one side of the tree but not the other is proving effective. - Spraying the south side of east/west rows helps even out maturity and reduces picks. - Spraying the west side of north/south rows appears to have the same effect.
<b>Timing</b>	- 6 weeks before <b><i>anticipated</i></b> harvest - early application is better than late
<b>Activity</b>	- it temporarily blocks ethylene production between 7 and 14 days.
<b>Result</b>	- the effect is to delay fruit maturation and over mature characteristics like drop, stem splits and watercore
<b>Wetting Agent</b>	- <b>MUST</b> be used with Sylgard at a rate of: <b>Hot Weather</b> at time of application: <b>50ml per 100 litres</b> <b>Cool Weather</b> at time of application: <b>100ml per 100 litres</b>

## **THINGS TO CONSIDER**

Factors negatively influencing ReTain response:

- stressed trees or fruit due to droughting or sunburn
- incorrect rate for the vigour of the block and the crop load
- late timing of application occurring after ethylene production has begun
- too low a Sylgard rate

### **CAUTION**

- once ReTain is applied: **BE PREPARED TO WAIT!**
- for Gala, McIntosh and Spartan: there can be a delay in colouring after ReTain treatment.
- if too high rate of Sylgard is used, especially with high water volumes, fruit lenticels damage may occur.