



# ReTain<sup>®</sup>

Advanced Fruit Management



## ReTain<sup>®</sup> – *Helping Orchardists*

- Manage harvests
- Increase fruit size
- Increase fruit firmness
- Improve storage ability
- Improve fruit set in cherries and walnuts

## What is ReTain®?

The active ingredient in ReTain is aminoethoxyvinylglycine (AVG), a naturally occurring fermentation product that blocks ethylene production in plants. Ethylene affects plant processes such as fruit maturation, ripening and fruit drop. ReTain can be used in apples and stone fruit pre-harvest to suppress ethylene biosynthesis in order to manage the timing of ripening, increase fruit size and firmness and improve storage potential.

## Apples and stonefruit

The ultimate challenge to achieving greater profitability in apple and stone fruit production is to consistently produce fruit that can meet market demand for size, firmness, fruit finish and storage ability – QUALITY.

The use of ReTain will not only help deliver quality fruit, it will assist another important aspect of production – harvest management – by unlocking a critical limiting factor – TIME.

### WHEN TO APPLY RETAIN

#### APPLES

**Apply 21-28 days before harvest to**

- Delay fruit maturation
- Increase fruit size

**Apply 7 days before harvest to**

- Improve fruit quality and storage potential

#### STONE FRUIT

**Apply 7-14 days before harvest to**

- Increase fruit size and firmness
- Improve fruit quality and storage potential

### SIZING AGENT

As a result of slowing harvest maturity, ReTain indirectly provides larger fruit upon harvest. This is due to the fruit growing at its normal rate for an extended time – a benefit of delaying the harvest date. Depending on variety and conditions, fruit held on the tree can increase 1% of its weight per day. ReTain can beneficially shift size pack outs to maximise returns.

#### FIRMNESS

Another advantage of using ReTain is that fruit is firmer than untreated fruit at harvest. The firmer the fruit, the greater its storage and sale ability. This is significant as large fruit is usually softer than small fruit. With ReTain there is the benefit of larger AND firmer fruit.

### IMPROVED STORAGE POTENTIAL

ReTain maintains the quality of fruit well after it has been picked. The higher the quality that goes into storage, the better quality fruit coming out of storage and transport. The fruit maintains its firmness and has a reduced frequency of disorders enabling increased profitability for the grower.

### HARVEST MANAGEMENT

Managing a harvest can become a complex task when considering parts of the process such as organising staff, packing, storage and transport. These aspects combined with variables such as weather and fruit maturity can seriously affect a successful harvest.

ReTain delays fruit maturation and in effect lengthens the harvest season so there is extra time to make important decisions and assign resources efficiently. The result is a successful harvest in all stages from picking to export.

## Cherries

Some varieties of cherry, notably 'Kordia' and 'Regina', are notoriously poor at setting fruit. Research has found that one of the contributors to this problem is the short period that the cherry flower is viable, and therefore able to be pollinated. By extending the number of days that the flower is viable ReTain can help improve fruit set.

**Apply between 30 and 60% flowering.**

## Walnuts

ReTain can be used to increase nut set in walnut varieties susceptible to pistillate flower abortion (PFA).

**Apply at onset of pistillate flower bloom (50-30% pistillate flower receptivity).**



## Directions for use

### Restraints – general:

DO NOT apply if rain is expected within 8 hours of ReTain application.

DO NOT apply products containing either 1-naphthylacetic acid or ethephon after treatment of blocks with ReTain.

DO NOT apply ReTain when trees may be nutrient, water, insect or disease stressed.

DO NOT apply ReTain if fruit have been treated with kaolin clay.

USE	TIMING	RATE	COMMENTS
<b>STONEFRUIT (except cherries):</b>			
Increase fruit firmness and size, and increase fruit quality and storage potential	7-14 days before 'Harvest'	830 g/ha in 1000-1500 L/ha	'Harvest' refers to the first pick of fruit for the current season and should be determined by the timing of previous seasons and progress of the crop in the current season. ReTain will delay the harvest of most stonefruit varieties by about 3 days. Increase in fruit size is a consequence of taking advantage of this delay in maturation. To ensure good coverage ReTain must be used with Maxx Organosilicone Surfactant™ at 50-100 mL/100 L in the spray tank.
<b>CHERRIES:</b>			
DO NOT apply to cherry trees after 60% flowering.			
Extend flower life	30-60% flowering	830 g/ha in 1000-1500 L/ha	ReTain will extend flower life which may increase fruit set under poor pollination conditions or in varieties with low natural fruit set. The use of surfactants is not recommended.
<b>APPLES:</b>			
DO NOT apply ReTain to apples within 7 days of any calcium spray.			
DO NOT use ReTain with management tools that affect apple maturity such as girdling, etc.			
Delay fruit maturation (delay the harvest period) and increase fruit size, improve fruit quality and storage potential	Apply 21-28 days before the average starch pattern index (SPI) of the block is 1.5. An average SPI of 1.5 is generally regarded as the earliest possible time fruit can be harvested for long term storage. <i>(see attached chart to determine index)</i>	830 g/ha in 800-1200 L/ha	ReTain will delay responsive varieties (e.g. Pink Lady, Gala) by 7-14 days. ReTain will delay less responsive varieties (e.g. Fuji, Granny Smith) by 2-5 days. Increase in fruit size is a consequence of taking advantage of the delay in maturation. To ensure good coverage ReTain must be used with Maxx Organosilicone Surfactant. <b>For Gala, Royal Gala, Jazz, Envy and related varieties (includes all crosses and sports):</b> use Maxx at a final concentration of 50 mL/100 L in the spray tank. <b>For all other varieties:</b> use Maxx at a final concentration of 50-100 mL/100 L in the spray tank. Use the lower rate in hot, dry growing conditions where the surfactant and other products such as calcium may persist longer on the fruit.
Improve fruit quality and storage potential of later picks in the normal harvest period	Apply 7 days before the average starch pattern index of the block is 1.5. This is when the average SPI of the block is 0.5 and occurs about 7 days before the earliest possible time fruit can be harvested for long term storage. <i>(see attached chart to determine index)</i>		Slows the rapid maturation of later pick fruits of multiple-pick varieties such as Pink Lady and Gala (e.g. 2nd, 3rd, 4th picks) increasing harvest quality and storage potential. Will NOT delay the start of harvest. To ensure good coverage ReTain must be used with Maxx Organosilicone Surfactant. <b>For Gala, Royal Gala, Jazz, Envy and related varieties (includes all crosses and sports):</b> use Maxx at a final concentration of 50 mL/100 L in the spray tank. <b>For all other varieties:</b> use Maxx at a final concentration of 50-100 mL/100 L in the spray tank. Use the lower rate in hot, dry growing conditions where the surfactant and other products such as calcium may persist longer on the fruit.
Retain can be applied to apples at both timings if the benefits of both are required.			
<b>WALNUTS (<i>Juglans regia</i>):</b>			
Increase fruit (nut) set in cultivars affected by pistillate flower abortion (PFA)	Apply at onset of pistillate flower bloom (5-30% pistillate flower receptivity), around late September to early October, depending on area and variety.	830 g/ha in 1000 L/ha	DO NOT apply more than once per season. Apply in at least 1000 L water/hectare, using high volume spraying equipment. Applications too early (pre-bloom) or too late (full bloom or later) will significantly reduce efficacy of the treatment. The use of surfactants is not recommended.

**NOT TO USED FOR ANY PURPOSE, OR IN ANY MANNER CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.**

### WITHHOLDING PERIODS:

**HARVEST (Apples/Stonefruit (except Cherries)): DO NOT HARVEST FOR 7 DAYS AFTER APPLICATION.**

**HARVEST (Walnuts/Cherries): NOT REQUIRED WHEN USED AS DIRECTED.**

**GRAZING: DO NOT GRAZE TREATED VEGETATION, OR CUT FOR STOCK FOOD FOR 14 DAYS AFTER APPLICATION.**

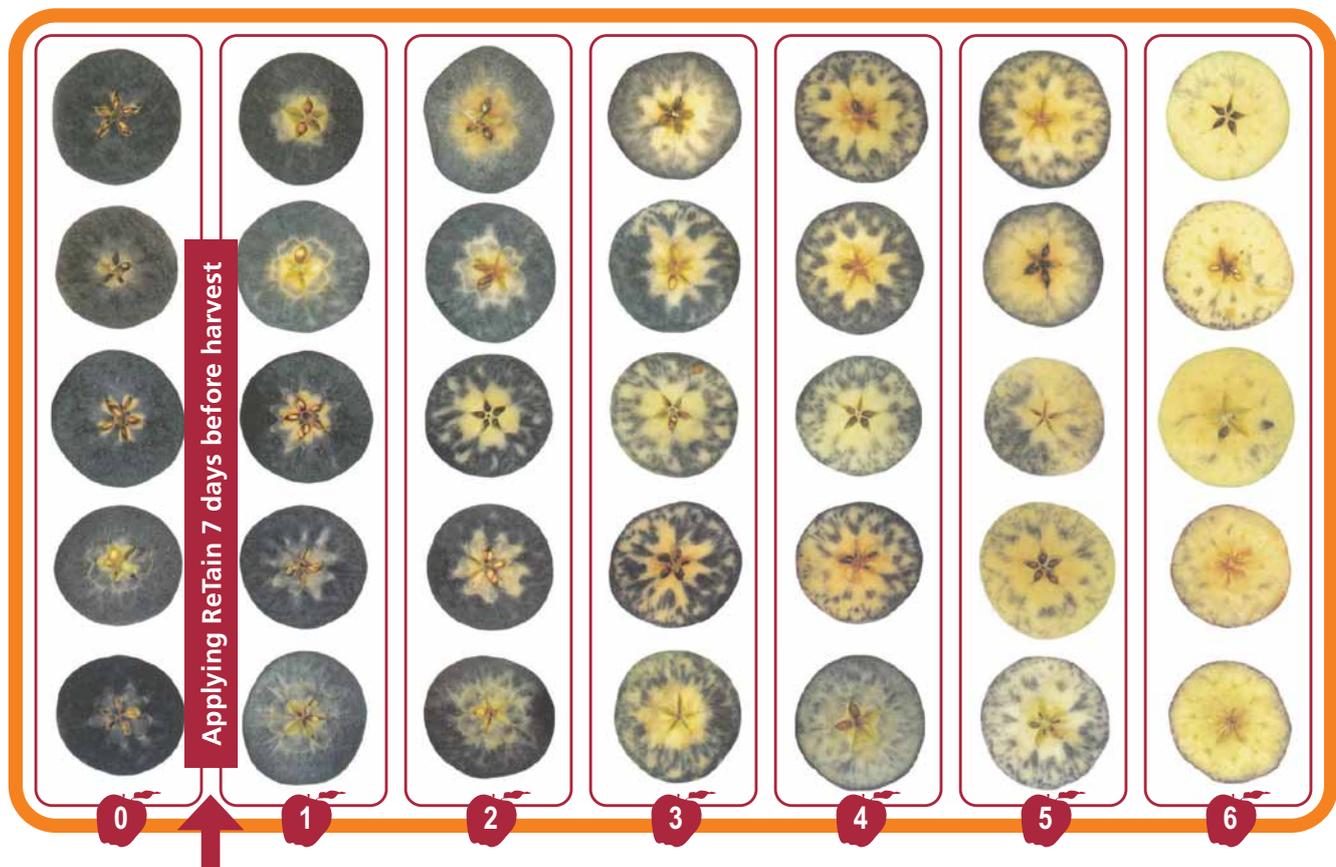
# ReTain®

## Starch Pattern Index (SPI) chart

Starch pattern index (SPI) is most commonly used to determine the maturity of the apples in a block. It is important that growers wanting to use ReTain monitor their SPI prior to harvest as it gives the best indication of timing for ReTain application. There are various methods and before treating the user should consult with their local Department of Agriculture or Sumitomo Chemical Australia representative to obtain a detailed method. In general however a representative sample of at least 20 apples is collected from the block and sliced in half. One half of each of the apples is treated with an iodine solution and this reacts with starch in the apples to produce dark staining. Where there are areas on the apple section that do not stain, this indicates starch has been

converted to sugars. The larger these areas, the more advanced is maturity. The chart provided with this label covers a range of varieties and is intended to be used as a guide to application timing. We regard the earliest time fruit can be harvested for long-term storage to be when a representative sample of fruit has an average SPI score of 1.5. In the case of the earlier ReTain application of 21 to 28 days before an average SPI of 1.5, growers will need to consider the harvest timing and maturity of previous crops and progress of the current crop.

Deciding on apple maturity and timing harvest is critical for success. Using iodine solution in conjunction with the **SPI chart\*** will help determine apple maturity.



**ReTain**<sup>®</sup> ADVANCED FRUIT  
MANAGEMENT



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