



# Retain<sup>®</sup>

## PLANT GROWTH REGULATOR FOR CALIFORNIA

FOR USE ON APPLE, PEAR, STONE FRUIT, WALNUT, ALMOND AND CUCUMBER

### ACTIVE INGREDIENT:

[S]- <i>trans</i> -2-Amino-4-(2-aminoethoxy)-3-butenic acid hydrochloride	15% ww
OTHER INGREDIENTS	85% ww
TOTAL	100%

EPA Reg. No. 73049-58  
EPA Est. No. 33762-IA-001

List No. 12017

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### KEEP OUT OF REACH OF CHILDREN CAUTION

1.0 FIRST AID	
<b>If inhaled:</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>If on skin or clothing:</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>

### HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-892-0099 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-6-VALENT (682-5368).

## 2.0 PRECAUTIONARY STATEMENTS

### 2.1 HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if inhaled or absorbed through skin. Avoid breathing spray mist. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

### 2.2 Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves

Hand-wand applicators must wear dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C), or a NIOSH approved respirator with N, R, P or HE filter when applying this product.

Follow manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

### 2.3 User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then, wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### 2.4 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate. This product is moderately toxic to avian species and exposure to birds must be avoided.

## 3.0 DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State/Tribal agency responsible for pesticide regulation.

## 4.0 AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170.

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#### 4.0 AGRICULTURAL USE REQUIREMENTS (Cont'd)

This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements in this labeling about Personal Protective Equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks

#### 5.0 GENERAL INFORMATION FOR USE

**IMPORTANT:** Before application, read all use directions thoroughly. Use ReTain® only as directed. For specific information on the best use practices for your location, consult with your Valent Agricultural Specialist (1-800-6-VALENT).

*ReTain* contains 15% (wt/wt) [S]-*trans*-2-amino-4-(2-aminoethoxy)-3-butenic acid hydrochloride, commonly known as aminoethoxyvinylglycine, aviglycine HCl, or AVG HCl. AVG HCl is a potent plant growth regulator produced by fermentation. AVG HCl inhibits the production of ethylene in plant tissues. Ethylene affects plant processes such as flower development, fruit set, fruit maturation, fruit ripening, and fruit abscission.

#### 6.0 GENERAL APPLICATION INSTRUCTIONS

##### IMPORTANT

- Do not apply this product through any type of irrigation system.
- *ReTain* is packaged in a water-soluble bag sealed inside a metallized polyester pouch. Each water-soluble bag contains 11.7 oz (333 grams) of *ReTain*. Once the outer pouch is opened, the entire water-soluble bag must be used.
- Because the proper timing of *ReTain* application is particularly important to product performance, serious consideration is to be given, on a block-by-block basis, to any site conditions (e.g., elevation, sun exposure, soil texture), growing condition(s) (e.g., prevailing or anticipated weather patterns such as high temperature, chilling, drought or flood conditions, nutrient levels) or production practices (e.g., crop load, pruning severity) that could impact flowering, fruit set, or fruit maturation during the course of the season.
- Apply *ReTain* in a sufficient amount of water to ensure that flowers, fruits, and foliage receive thorough spray coverage using calibrated spray equipment. Adjust water volumes based on plant size and spacing. However, excessive spray application volumes resulting in spray runoff will reduce product efficacy.
- Prepare spray solution by mixing the required amount of product with water in a clean, empty spray tank. Dispose of any unused spray material at the end of each day.

- Avoid applications during the heat of the day. For best results, apply *ReTain* under slow drying conditions, e.g. early in the morning or at night, in order to maximize absorption.
- Maintain solution pH between 6 and 8.
- Do not apply *ReTain* to plants or fruit under stress (e.g. heat, water, disease, insect). Injured or stressed plants or fruits may not respond to *ReTain*.
- Do not use overhead cooling or irrigation equipment for at least 8 hours following *ReTain* application.
- Do not apply *ReTain* if rain is expected within 8 hours of application.

#### 7.0 COMPATIBILITY WITH OTHER AGRICULTURAL PRODUCTS

*ReTain* can be tank mixed with DiPe®, Biobit®, and XenTari® biological insecticides. Compatibility and performance data for *ReTain* with other agricultural products are not available. Do not tank mix *ReTain* with other products unless compatibility has been verified. If considering tank mixing *ReTain* with other products use the following **compatibility jar test** before mixing a whole tank:

Add water from the same water source to a clear glass or plastic jar. Add the pesticides in correct proportions. Mix thoroughly and let stand for a minimum 15 minutes. Separation, gelling, or generation of heat are all signs of incompatibility.

Even if a mix passes the jar test for compatibility, it is imperative to test it on a designated area to evaluate for phytotoxicity or ineffectiveness.

Always read and follow all label directions and precautions of each product. When using combinations of products the most restrictive of label limitations and precautions must be followed. Do not mix with any pesticide that has a prohibition against tank mixing. For further information consult your Valent Agricultural Specialist (1-800-6-VALENT).

#### 8.0 APPLE AND PEAR - FOR HARVEST MANAGEMENT AND IMPROVEMENT OF FRUIT QUALITY

CROP	OBJECTIVE/ BENEFIT	APPLICATION TIMING/ USE INSTRUCTIONS
Apple	<p>Depending on cultivar, orchard conditions, application timing, and grower objectives, one or more of the following benefits will be associated with <i>ReTain</i>:</p> <ul style="list-style-type: none"><li>• Delayed fruit maturity</li><li>• Improved harvest management</li><li>• Reduced preharvest fruit drop</li><li>• Additional time for increase in fruit size</li><li>• Additional time for color development</li><li>• Maintenance of fruit firmness</li><li>• Improved fruit quality (e.g., reduced incidence and/or severity of watercore and stem bowl cracking)</li><li>• Enhanced storage potential</li></ul>	<p><b>Single Pick Harvest:</b> Apply one pouch of <i>ReTain</i> per acre three to four weeks prior to the anticipated <i>beginning of the normal harvest period of untreated fruit</i> for the current season. <i>ReTain</i> applied three to four weeks before harvest will delay the harvest period up to 7 to 10 days. Applications made either too early or too late will significantly reduce the efficacy of the product.</p> <p><b>Multiple Pick Harvest:</b> To improve the fruit quality and storage potential of later picked apples (2nd, 3rd, 4th picks) apply one pouch of <i>ReTain</i> per acre, one to two weeks prior to the anticipated <i>beginning of the normal harvest period of untreated fruit</i> for the current season. <i>ReTain</i> applied one to two weeks before harvest typically will not delay the start of the harvest (1st pick), but will help control the maturation rate of the later picks.</p>

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## 8.0 APPLE AND PEAR (Cont'd)

CROP	OBJECTIVE/ BENEFIT	APPLICATION TIMING/ USE INSTRUCTIONS
Pear	<i>ReTain</i> will offer one or more of the same benefits as listed for apples, depending on the cultivar, growing conditions, and grower objectives.	Apply one pouch of <i>ReTain</i> per acre 7 to 16 days prior to the anticipated <i>beginning of the normal harvest period of untreated fruit</i> for the current season.
<p><b>Note:</b> Harvest management and fruit quality benefits from <i>ReTain</i> will be greatest when applied at one pouch per acre. Under difficult coloring conditions, color development of certain bi-color apple cultivars such as Gala and Honeycrisp™ will be delayed when <i>ReTain</i> is applied at one pouch per acre. For specific information on the best use practices for your location, consult with your Valent Agricultural Specialist (1-800-6-VALENT).</p>		
<p><b>Water Volume:</b> <i>ReTain</i> efficacy requires that fruit and foliage receive thorough spray coverage. To ensure thorough coverage adjust water volumes based on tree size and spacing and use calibrated spray equipment (i.e. orchard air blast sprayer). Excessive spray application volumes that result in spray runoff will reduce product performance. In most cases, 100 gallons per acre has been shown to be effective.</p>		
<p><b>Adjuvants:</b> For optimal response, use <i>ReTain</i> with a 100% organosilicone surfactant. Use a final surfactant concentration of 0.05 to 0.1% (v/v) in the spray tank. To prevent possible spotting, use the 0.05% (v/v) concentration when high temperature (in excess of 86°F) weather conditions prevail or are anticipated. Do not use a surfactant concentration greater than 0.1% (v/v). To reduce foaming, add the adjuvant last and minimize agitation.</p>		
<p><b>Harvest:</b> The normal harvest period for a particular orchard block refers to that time when fruits not treated with <i>ReTain</i> would be harvested for long term storage. To help determine the <i>beginning of the normal harvest period</i>, refer to historical trends for harvest dates and the “days from full bloom to harvest” interval for each cultivar in your area.</p>		
<p><b>Additional Notes:</b></p> <ul style="list-style-type: none"> <li>• Apply <i>ReTain</i> before laying reflective film or foil mulch under <i>ReTain</i> treated apple trees. <i>ReTain</i> may be applied either before or after laying fabric groundcovers under <i>ReTain</i> treated apple trees.</li> <li>• <i>ReTain</i> has a 7 day preharvest interval (PHI) for Apple and Pear.</li> <li>• Do not tank-mix <i>ReTain</i> with sunburn protection product. If sunburn protection products are used, apply at least 3 days before or after <i>ReTain</i> application.</li> </ul>		

## 9.0 STONE FRUIT (EXCEPT CHERRY) - FOR HARVEST MANAGEMENT AND IMPROVEMENT OF FRUIT QUALITY

CROP	OBJECTIVE/ BENEFIT	APPLICATION TIMING/ USE INSTRUCTIONS
Apricot Nectarine Peach Plum Prune (Inter-specific variations of these crops, such as Plumcot, Pluot®, and Aprium®)	Depending on cultivar, orchard conditions, and grower objectives, one or more of the following benefits will be associated with <i>ReTain</i> : <ul style="list-style-type: none"> <li>• Improved harvest management</li> <li>• Additional time for increase in fruit size</li> <li>• Maintenance of fruit firmness</li> <li>• Reduced preharvest fruit drop</li> <li>• Improved fruit quality</li> <li>• Enhanced storage potential</li> </ul>	Apply one pouch of <i>ReTain</i> per acre one to two weeks prior to the anticipated <i>beginning of the normal harvest period of untreated fruit</i> for the current season.
<p><b>Water Volume:</b> <i>ReTain</i> efficacy requires that fruit and foliage receive thorough spray coverage. To ensure thorough coverage adjust water volumes based on tree size and spacing and use calibrated spray equipment (i.e. orchard air blast sprayer). Excessive spray application volumes that result in spray runoff will reduce product performance. In most cases, 100 gallons per acre has been shown to be effective.</p>		
<p><b>Use of Adjuvants:</b> For optimal response, use <i>ReTain</i> with a 100% organosilicone surfactant. Use a final surfactant concentration of 0.05 to 0.1% (v/v) in the spray tank. To reduce foaming, add the adjuvant last and minimize agitation.</p>		

**Harvest:** The normal harvest period for a particular orchard block refers to that time when fruits not treated with *ReTain* would be harvested. To help determine the *beginning of the normal harvest period*, refer to historical trends for harvest dates and the “days from full bloom to harvest” interval for each cultivar in your area, and closely monitor the fruit maturity development for the current season.

**Additional Notes:**

**Pre Harvest Interval (PHI):** *ReTain* has a 7 day (PHI) for labeled Stone Fruit.

## 10.0 NUT AND STONE FRUIT CROPS - FOR INCREASING FRUIT AND NUT SET

CROP	OBJECTIVE/ BENEFIT	APPLICATION TIMING/ USE INSTRUCTIONS
Almond**	To increase nut set*	Apply one pouch of <i>ReTain</i> per acre between 10% bloom and full bloom. Applications made either too early (pre-bloom) or too late (after full bloom) will reduce the efficacy of the treatment. Do not apply <i>ReTain</i> after petal fall.
Cherry	To increase fruit set.	Apply one pouch of <i>ReTain</i> per acre, as a single application, to cherry trees during bloom. Applications between popcorn stage to first bloom are more effective than earlier or later applications. Do not apply after petal fall.
Walnut**	Increased nut set in cultivars affected by pistillate flower abortion (PFA).	Apply one to two pouches of <i>ReTain</i> per acre, when most pistillate (female) flowers are receptive to pollination. <i>ReTain</i> may be applied as a single application of up to two pouches, or as sequential applications of one pouch per application. One application of <i>ReTain</i> at 5-30% pistillate flower bloom has been shown to be effective for a short pistillate flower bloom period. Sequential applications at 5-30% and 45-65% bloom are effective and cover a broader window of pistillate flower bloom. Applications made either too early (pre-bloom) or too late (full bloom or later) will significantly reduce efficacy of the treatment.  Use higher rates on cultivars/orchards that have experienced high incidences of poor nut set due to PFA.
<p><b>Important</b></p> <ul style="list-style-type: none"> <li>• For sweet cherry, do not apply more than one pouch for increasing fruit set. Do not apply <i>ReTain</i> to sweet cherry trees when fruit are present.</li> <li>• For walnut, do not apply more than 2 pouches of <i>ReTain</i> per acre per year.</li> </ul>		
<p><b>Water Volume:</b> <i>ReTain</i> efficacy requires that open flowers receive thorough spray coverage. To ensure thorough coverage use calibrated spray equipment (i.e. air blast sprayer) and adjust water volumes based on tree size and spacing. Use sufficient water volume to achieve thorough coverage without excessive runoff. In most cases, a spray volume of 100 to 200 gallons per acre has been shown to be effective.</p>		
<p><b>Use of Adjuvants:</b> Use of adjuvants with <i>ReTain</i> for bloom applications has not been fully researched. Some adjuvants will cause a bloom thinning effect and will reduce the benefits of <i>ReTain</i>.</p>		
<p>* <b>Additional Note:</b> Use of <i>ReTain</i> has often been shown to increase the occurrence of doubles (two nut kernels per shell) in almond.</p>		
<p>** <b>Aerial Application Instructions for Almonds and Walnuts:</b> Apply <i>ReTain</i> with fixed wing or helicopter. Applications by air need to be done using a minimum of 15 gallons per acre to ensure thorough coverage. Do not apply <i>ReTain</i> when the risk of excessive drift is expected due to temperature inversion, wind patterns and humidity. To prevent drift into neighboring crops and bodies of water: Consider the direction of the wind in relation to the spraying pattern that the aircraft will have to follow to make the application. Do not apply if wind direction can push droplets towards other crops and bodies of water. Do not apply when wind speeds are greater than 10 mph and consider droplet size. Smaller droplets, which include smaller than 200 microns, are more likely to cause drift. Consider a larger size droplet that also provides good coverage on the crop canopy. Nozzle orientation and boom size must be based on the wing span and type of aircraft (e.g., fixed wing vs. rotary wing) to consider air streams, vortices and lift properties of the aircraft.</p>		

## 11.0 CUCUMBER – FOR SEED PRODUCTION ONLY

CROP	OBJECTIVE/ BENEFIT	APPLICATION TIMING/ USE INSTRUCTIONS	
<b>Cucumber</b> Gynoecious inbred breeding lines.	Promotion of staminate (male) flowers in gynoecious (female flowering) cucumber-breeding lines for the purpose of producing inbred and hybrid cucumber seed.	Apply <i>ReTain</i> directly to gynoecious plants to be converted to staminate flowers. Make one to six applications of 250 ppm to 1000 ppm AVG HCL beginning at early first leaf stage through tenth leaf stage. Use the appropriate skip row technique to achieve desired sex ratio of plants.	
<b>Water Volume:</b> Apply <i>ReTain</i> in a sufficient amount of water to ensure good thorough coverage. In most cases, 26 to 52 gallons per treated acre will be sufficient. The application rate and frequency of application will depend on the sensitivity of the individual inbred line to <i>ReTain</i> . Leaf yellowing can occur at high rates. If unacceptable leaf yellowing is noted, use lower concentrations in subsequent applications.			
<b>Dilution Table:</b> Parts Per Million (ppm) AVG HCL with varying Gallons (gal) of spray solution and pouches of <i>ReTain</i> for cucumber use.			
Gal Spray Solution	Pouches of <i>ReTain</i>	Grams AVG HCL	PPM AVG HCL
13	1	50	1000
26	1	50	500
52	1	50	250
<b>Use of Adjuvants:</b> Addition of an adjuvant to <i>ReTain</i> increases the likelihood of leaf yellowing in young cucumber plants.			
<b>Additional Note:</b> Do not reapply <i>ReTain</i> within 24-hours of application. Use of <i>ReTain</i> on cucumber is for gynoecious breeding line and hybrid seed production only. Do not apply directly to, or allow spray to drift to cucumber crops grown for fresh or processed markets. Fruit from plants treated with <i>ReTain</i> is not to be used for human or animal consumption.			

## 12.0 STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

**Pesticide Storage:** Store product in a cool and dry place. Avoid extended storage conditions at temperatures above 25°C (77°F).

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on-site or at an approved waste disposal facility.

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Completely empty container into applicable equipment. If recycling is not available dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

## 13.0 NOTICE TO USER

**Warranty and Disclaimer Statement:** To the extent consistent with applicable law, seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the use of this product other than as indicated on the label. To the extent consistent with applicable law, user assumes all risks of use, storage or handling not in strict accordance with accompanying directions.

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Valent BioSciences LLC  
1910 Innovation Way, Suite 100  
Libertyville, IL 60048

44-1000/R10 (Pkg. 04-9672/R17)  
Distributed by Valent U.S.A. LLC  
P.O. Box 5075  
San Ramon, CA 94583-5075



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