

refine™ 3.5 WSG

Plant growth regulator for thinning and control of pre-harvest drop of apples and pears,
and for promoting return bloom of apples the following season

Active Ingredient: 1-Naphthaleneacetic Acid, Sodium Salt* 3.5%
Other Ingredients: 96.5%
Total: 100.0%

*Equivalent to 3.1% of 1-Naphthaleneacetic Acid

KEEP OUT OF REACH OF CHILDREN

EPA Reg. No. 62097-37-82917

EPA Est. No. 89578-TX-001

Net Contents: 20 oz (0.57 kg)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

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

USER SAFETY RECOMMENDATIONS

Users should:

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

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 washwaters or rinsate. Do not contaminate irrigation ditches or water used for irrigation or domestic purposes. Do not apply when weather conditions favor drift from treated areas.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labelling and with the Worker Protection Standard, 40CFR part 170. 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 on this label 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 entry into treated areas during the restricted entry interval (REI) of 48 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:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride or viton

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 requirement specific to your state or tribe, consult the state or tribal agency responsible for pesticide regulation. Do not apply this product through any type of irrigation system.

Do not use in a greenhouse.

PRODUCT INFORMATION

Refine 3.5 WSG is a plant growth regulator for use in fruit production. The response of fruit trees to an application may vary depending on factors such as variety, climatic factors, tree vigor, etc. Users need to consider these factors before choosing the desired rate and timing for application. Always apply Refine 3.5 WSG using sufficient water to ensure complete and uniform spray coverage. Application can be made in the range of 50-400 gallons of water per acre. The appropriate spray volume is determined by the type of equipment used, tree size and density of foliage. Consider all variables in rate and application timing for each variety and orchard location when establishing the spray program.

Refine 3.5 WSG thins the fruit of apples and pears during heavy bearing years resulting in increased fruit size. The use of Refine 3.5 WSG also promotes adequate return bloom the following season. Furthermore, an additional non-fruit thinning application may provide return bloom next year on certain apple varieties.

Refine 3.5 WSG can also be used to control pre-harvest drop of apples and pears leading to a higher yields and a reduction of losses from factors such as windfall and knockdown.

Refine 3.5 WSG, when diluted with the specified amount of water, is physically compatible with a wide range of commonly used spray products. However, evaluating the full ranges of compatibilities under all conditions is impossible. Therefore, it is advised that users pre-mix a small quantity of a desired tank mix and observe for possible adverse changes (settling out, flocculation, etc.). Avoid mixtures of several materials and very concentrated spray mixtures. Observe all limitations and precautions on labeling of all products used in any tank mix. Consult your local Extension Pomologist for guidance or when tank mixing any product you have not previously used with Refine 3.5 WSG. In addition, always test spray a small area prior to the general use of a tank mix that you have not previously used.

Note: All use of ppm refers to the active ingredient (a.i.) not the formulated product.

Table 1. Refine 3.5 WSG spray preparation chart for dilute application.

Rate (ppm)	Gallons of spray per acre			
	100	150	300	400
3	1.2 oz	1.8 oz	3.6 oz	4.8 oz
5	2.1 oz	3.0 oz	6.0 oz	8.0 oz
7.5	3.0 oz	4.5 oz	9.0 oz	12.0 oz
10	4.0 oz	6.0 oz	12.0 oz	16.0 oz
15	6.0 oz	9.0 oz	18.0 oz	24.0 oz
20	8.0 oz	12.0 oz	24.0 oz	32.0 oz

APPLICATION INSTRUCTIONS

Chemical thinning - apples:

Due to differences in varieties, climatic factors before and after application, tree vigor and fruit set and fruit size at time of application, the application rates can range from 3-20 ppm (see Tables 1 and 2) and application timing can range from full bloom petal fall to 30 days after full bloom. Limit higher concentrations to vigorous trees with high fruit set potential. Reduced concentrations are recommended on weaker, less vigorous trees with lower fruit set potential.

Do not use Refine 3.5 WSG on early season varieties (those that mature before McIntosh) such as Early Williams Red and Oldenburg as injury may occur. In addition, make applications of Refine 3.5 WSG to trees younger than 5 years of age with care as damage to the trees may occur.

Pygmy fruit formation may occur under the following conditions: 1) high concentrations of Refine 3.5 WSG >15 ppm; 2) high temperatures >85°F; 3) and/or late applications when fruit size >15 mm. This is especially true on the Delicious-type varieties.

Refine 3.5 WSG is most effective for fruit thinning when applied once the king apple fruitlets are 5-10 mm in diameter. Under low temperature conditions, delay application as necessary until the largest fruits are 7-10 mm in diameter and anticipated daytime temperatures are likely to rise above 60°F within the next 5 days. The preferred application temperature is between 70°F and 75°F. Applications of Refine 3.5 WSG are not recommended below 60°F or above 80°F. Over thinning may occur at daytime temperatures above 85°F. Satisfactory thinning can be obtained with lower rates of Refine 3.5 WSG under high temperature conditions.

Early applications of Refine 3.5 WSG one week after full bloom (petal fall) when fruit size is 3-7 mm fruit size and/or 2-3 weeks after full bloom (early fruit set) when fruit size is 8-10 mm fruit size are the preferred application timing(s). Direct Refine 3.5 WSG sprays to the top two-thirds of the tree canopy.

Dilute spray: Varieties differ in their response to Refine 3.5 WSG application(s). Use the varieties in Table 2 as a guide to adjust your thinning rates for Refine 3.5 WSG. **NOTE: Use this table only as a guide. Use personal experience and observations on thinning to refine the rates and timing for best results.**

Concentrate spray: Use Refine 3.5 WSG at the rate of 0.25 lb per acre (4 oz)-0.50 lb per acre (8 oz) in sufficient water to ensure good coverage at petal fall to early fruit set. Uniform and even coverage is crucial for good results.

Table 2.

Varieties	Thinning Rates	Application Timing
Easy-to-thin: Braeburn, Cortland, Empire, Ginger Gold, Paulared, Idared, Jonathan, Northern Spy, McIntosh, Red Delicious, Winesap and others.	5-10 ppm	Petal fall (3-7 mm fruit size) and/or early fruit set (8-10 mm fruit size)
Moderate-to-thin: Jerseymac, Rome, Jonamac, Spartan, Gala, Mustu and others.	10-15 ppm	Use the lower concentrations for weaker trees, cooler weather, less food reserves and lower fruit set potential and slow drying conditions
Difficult-to-thin: Fuji, Golden Delicious, Lodi, Wealthy Spur Delicious, Macoun, York, Rhode Island Greening, York Imperial and others.	15-20 ppm	

If Refine 3.5 WSG is used with a non-ionic surfactant or in a tank mix with another apple thinning product, reduce the application rate of Refine 3.5 WSG to $\frac{1}{2}$ - $\frac{2}{3}$ of the normal rate. If a surfactant is used, always follow manufacturer's guidelines but never use more than 1 pint per 100 gallons of spray mix.

Tank mix combinations: Tank mix combinations of Refine 3.5 WSG applied at concentrations between 5-7.5 ppm plus Carbaryl have been shown to effectively thin early maturing, heavy-setting varieties as well as hard-to-thin apple varieties. A petal fall application of Refine 3.5 WSG followed 7-10 days later by an application of Refine 3.5 WSG (5-7.5 ppm) + Carbaryl (0.5 lbs ai/100 gals) has improved thinning of hard-to-thin apple varieties. Do not mix Refine 3.5 WSG with any product containing a label restriction against such mixing. Always apply in accordance with the limitations and precautions of the most restrictive label.

To promote return of bloom the following season - apples:

Refine 3.5 WSG may be used to promote return bloom in "off years". This application acts as a return bloom enhancer to certain apple varieties such as Fuji, Jonagold, Mutsu, Braeburn and Golden Delicious. Apply a spray concentration of 3-5 ppm (see Table 1) 5-6 weeks after full bloom in sufficient water to ensure good coverage. If desired return bloom is not achieved following first year's application, an additional 1-2 applications at 7-10 days interval may be required for certain varieties.

Chemical thinning - Pears (Bartlett, Bosc and Comice):

Apply Refine 3.5 WSG at a spray concentration of between 10-15 ppm for dilute spray in up to 400 gallons of water per acre. Use at a rate of 0.75 lb-1.25 lb of product per acre for a concentrate spray. Apply Refine 3.5 WSG once per year 15-28 days after full bloom with a labeled surfactant (wetting agent).

During seasons when the bloom period has been prolonged by low temperatures, delay application of Refine 3.5 WSG by at least 21 days after bloom or when fruit is 10-15 mm in diameter. Apply in sufficient water to ensure good coverage.

Refine 3.5 WSG may not adequately thin Bartlett during some seasons. The preferred application temperature is between 70°F and 75°F. Applications are not recommended below 60°F or above 80°F.

Control of pre-harvest drop - apples:

Apply Refine 3.5 WSG to apples 7-14 days prior to harvest. Do not make more than 2 applications and do not delay harvest beyond optimum maturity. Do not spray within 2 days of harvest. Refine 3.5 WSG is effective 1-3 days after application and controls drop for about 2 weeks depending upon climactic conditions. For maximum effectiveness, apply Refine 3.5 WSG when temperature is 70°F or higher. Apply Refine 3.5 WSG to the entire canopy to assure complete coverage. Use the following rate recommendations only as a guide as variety, climatic conditions and other factors will determine the actual rate required.

Ground application - dilute: In the Eastern US, a single application of 10-20 ppm is recommended (see Table 1). In the Pacific Northwest, a single application of 15-20 ppm is recommended (see Table 1). Two applications at 10 ppm applied 21 days and 7 days prior to harvest may in some cases delay drop more than a single application of 20 ppm. Repeated applications of Refine 3.5 WSG at 5 ppm in 4 weekly intervals before anticipated harvest is recommended in some states for stop-drop of apples. Repeated applications at spray concentrations of 5-10 ppm have little influence on fruit quality i.e., flesh firmness, soluble solids concentration, or starch index either at harvest or following cold storage.

Ground application - concentrate: Apply Refine 3.5 WSG at a rate of 1.75-3.5 lb per acre in sufficient water to ensure sufficient coverage. Under normal conditions, 3.5 lb per acre is recommended for the Pacific Northwest.

Aerial application: Apply Refine 3.5 WSG at the rate of 1.75-3.5 lbs. in at least 5 gallons of water per acre. Utilize aircraft spray equipment that gives thorough coverage to all portions of the tree canopy. Apply Refine 3.5 WSG only when weather conditions favor minimal spray drift. Use lower rates for normal foliage and fruiting. For dense foliage and heavy fruiting, higher rates may be necessary.

Control of pre-harvest drop - pears (Bartlett, Bosc and D'Anjou):

Apply to pear trees 5-7 days prior to harvest. Do not make more than 2 applications and do not delay harvest beyond optimum maturity. Refine 3.5 WSG is effective 3-4 days after application and controls drop for about 2 weeks. Do not apply within 2 days of harvest.

Ground application - dilute: Apply Refine 3.5 WSG at a rate of 10-15 ppm in sufficient water to ensure good coverage.

Ground application - concentrate: Apply Refine 3.5 WSG at the rate of 0.88-1.75lb per acre in sufficient water to ensure good coverage. Under normal conditions, use the 1.75 lb rate. If Bartlett and Bosc are inter-planted, apply products containing NAA only once per season.

Aerial application: Use 0.88-1.75lb of Refine 3.5 WSG in at least 5 gallons of water per acre. Utilize aircraft spray equipment that gives thorough coverage to all portions of the trees. Apply only when weather conditions favor minimal spray drift. Use lower rates for normal foliage and fruiting, and higher rates for dense foliage and heavy fruiting. Do not apply Refine 3.5 WSG within 2 days of harvest.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in original container only. After partial use, close the container tightly. Store in a secure place that is temperate and dry. High humidity and moisture will cause product to harden. Use spray and stock solutions within 24 hours. Immediate use is required if another component is added to the spray solution.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of onsite or at an approved waste disposal facility.

CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container $\frac{1}{4}$ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, if available, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

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