

the sweetness of early cider, or for getting an early start on harvesting a large crop. In summer cultivars it may be possible to harvest in one picking rather than 2 or 3.

McIntosh that are treated with ethephon 2–3 weeks prior to normal first harvest can be ready to pick within 5–12 days after treatment. However, fruits that are ripened and picked more than about 1 week before normal are often inferior in quality and size compared to full-term fruits. The speed with which treated fruits ripen is influenced by the rate of ethephon applied, the nearness to normal ripening, the temperature during and after application, and the cultivar. High temperatures hasten all ripening responses except red color development. Serious losses have resulted in some instances where growers did not anticipate potential problems. Treat only small amounts of any cultivar until you have experience with managing the harvest and the marketing of that cultivar. Inspect treated fruit daily for maturity (firmness) on the tree, and frequently after harvest. Move harvested fruit quickly into cold storage, market, or cider.

Uniform within-tree response to ethephon (and other growth regulator sprays) is rarely possible with concentrated, low-volume sprays. Response of each fruit is related to the amount of ethephon deposited on that fruit's spur leaves, and other very nearby leaves. Therefore, dilute application is recommended, spraying to completely wet all fruited areas.

DOSAGES. Where stimulated ripening is desired, the following ethephon rate choices are suggested:

- Use 1/3 to 2/3 pint per 100 gals. for summer cultivars that will be stored for no longer than 2 weeks. Apply within 4–10 days before normal first harvest.
- Use 1/3 to 2/3 pint per 100 gals. for McIntosh that will be held at 32°F for up to one month. Apply within 4–12 days before normal first picking.
- Use 1/4 to 1/2 pint per 100 gals. for McIntosh that will be held at 32°F until January 1. Apply 5–10 days before normal first picking. Ethephon-treated fruits intended for storage at 32°F for sale in November and December must be harvested quickly and cooled to storage temperature as soon as possible. Any delay in harvest or immediate

cooling will result in fruit much too soft for these later sales.

The restricted entry interval for ethephon is 48 hours.

NAA for Ethephon Treatments. To delay fruit drop, naphthaleneacetic acid (NAA), 10–20 ppm can be included in the ethephon tank mix. **The restricted entry interval and preharvest interval for NAA products are: 24 hour REI and 2 day PHI for K-Salt Fruit Fix; 48 hour REI and 5 day PHI for Fruitone-N.**

PREHARVEST DROP CONTROL

ReTain is a stop drop and maturity management tool for apples. The active ingredient in ReTain is aminoethoxyvinylglycine (AVG), a natural inhibitor of ethylene synthesis. Fruit treated with ReTain produce much less ethylene than untreated fruit. This delays ripening, reduces preharvest drop, and slows the loss of fruit firmness. Fruit treated with ReTain can be picked during the normal harvest period for enhanced retention of firmness in CA storage, or harvest may be delayed, allowing the fruit to continue to grow and develop red color for an extended time. Flavor components of some varieties may be noticeably muted after Retain application. Growers with Pick-Your-Own blocks can also benefit from using ReTain on a portion of the trees intended for late harvest. The following suggestions are offered to assist growers in optimizing the use of ReTain as a harvest management tool.

- ReTain should only be used in blocks with large crops of unblemished fruit. ReTain will be much less effective in trees that are under water, heat or mite stress.
- ReTain must be applied well in advance of the first visible signs of ripening in order to obtain satisfactory results. Application approximately 4 weeks prior to the anticipated harvest date of untreated fruit gives the best response. **The preharvest interval for ReTain is 28 days and the REI is 12 hours.**
- Apply ReTain with at least 100 gallons of water per acre.
- Apply ReTain with a 100% organosilicone surfactant. Silwet L-77 at 0.1% (vol/vol) enhances the