



Control of Premature Ripening of Bartlett Pears

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Premature ripening of Bartlett pears is sometimes a major source of fruit loss and poor quality, especially in districts with relatively cool climates. In certain years, losses have varied from approximately 10 to 100 percent, depending on orchard and site. The disorder has several progressive stages of development. The first symptom is a pink coloration in the calyx lobes, commonly referred to as "pink end," that becomes apparent early in the growing season. Unless additional symptoms appear, subsequent fruit development does not appear to be affected. "Pink end" does not necessarily lead to premature ripening, but it may, depending on later weather conditions. A second symptom is a change in skin color around the calyx—from green to yellow. Further development involves softening of the tissue in this area and ripening throughout the fruit. In an advanced stage of the disorder, a greatly accelerated rate of maturation and ripening causes the fruit to drop before normal harvest.

Evidence from research using controlled temperature cages has conclusively shown that premature ripening of Bartlett pears is a result of cool temperatures that occur within 30 days prior to harvest. During this period, two consecutive cold nights at a temperature around 45° F (7.2° C) with daytime highs about 70° F (21.1° C) are sufficient to initiate premature ripening. Nine days of 50° F nights and 70° F days is sufficient to induce premature ripening. If these cool nights occur anytime during the last 30 days before harvest, warm daytime temperatures will not overcome premature ripening, but will reduce the severity.

Premature ripening occurs most frequently in districts with normally cold climates, but can occur anywhere when temperature conditions are conducive. Within individual orchards, premature

ripening may occur primarily in cold pockets. Orchards where the entire soil surface is shaded by the trees may absorb less heat during the day and be colder at night than orchards where the sun warms the soil during the day. North-facing slopes are generally colder than south-facing ones.

Premature ripening is not associated with any orchard practices such as pruning, fertilizing, or irrigation.

An overdose of stop-drop spray (NAA) can produce premature ripening. Accidental treatment with a synthetic auxin-type herbicide such as 2,4-D can also cause premature ripening. If exposure to herbicide or stop-drop spray (NAA, 2,4D, 2,4,5-T, etc.) occurs during or just before a hot spell, an unusually high dose may not be required to induce premature ripening. The sensitivity of pears to synthetic auxins increases as the fruit matures. A dose of NAA as low as 37 ppm within 6 days before harvest could significantly increase premature ripening.

The natural levels of abscissic acid are higher in Bartletts that have been exposed to cool temperatures. This shift in the internal balance of natural growth-regulating substances makes the fruit more prone to drop from the tree. Such fruits might be expected to react differently than normal fruit to applications of synthetic growth regulators such as NAA. The interaction of cold temperatures and NAA applied as a stop-drop is not certain. A late spray of NAA might increase the severity of a mild case of cold-induced premature ripening, particularly if applied during or just before hot (80° F or more) weather.

Prevention of premature ripening with Alar

A single spray of Alar 85 at 1,000 ppm, if applied soon after the fruit are exposed to cold temperatures, can reduce or prevent premature ripening. Apply Alar 18 to 24 days before anticipated harvest or 85 to 90 days after full bloom.



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Earlier or later applications are ineffective. Thorough coverage of the fruit with the Alar spray is important, but the effectiveness of concentrate application has not been documented. Avoid spraying other pear varieties with Alar because of the possible effect on reduced fruit size. Premature ripening caused by factors other than cool temperatures, such as an overdose of hormone, cannot be averted by application of Alar.

Accelerated harvest in cool seasons

Normally Bartletts in the Mid-Columbia district of Oregon drop about 1 pound in firmness (as measured by a pressure tester) in 4 or 5 days. This means that Bartletts picked at a pressure of 19 to 17 pounds should be harvested in a 10- to 12-day period for optimum quality. In seasons when prevailing temperatures are below normal

before harvest, this optimum harvest period will be greatly reduced. In addition to a shorter harvest period, the fruit is more advanced physiologically and could be harvested at a slightly higher pressure test without a loss of quality.

Care in storage

Fruit that is susceptible to premature ripening should be cooled rapidly as soon after harvest as possible. Any delay in cooling could lead to substantial losses in storage.

Bartletts grown in years when the prevailing night temperatures have been on the threshold levels during the 30-day preharvest period should be segregated from normal fruit in storage and closely watched. These suspicious lots may continue to change color and soften even though recommended temperatures are maintained throughout storage.