

Industry Perspectives
Pears



This Industry Perspective was prepared by AgWest Farm Credit's Tree Fruit Industry Team.
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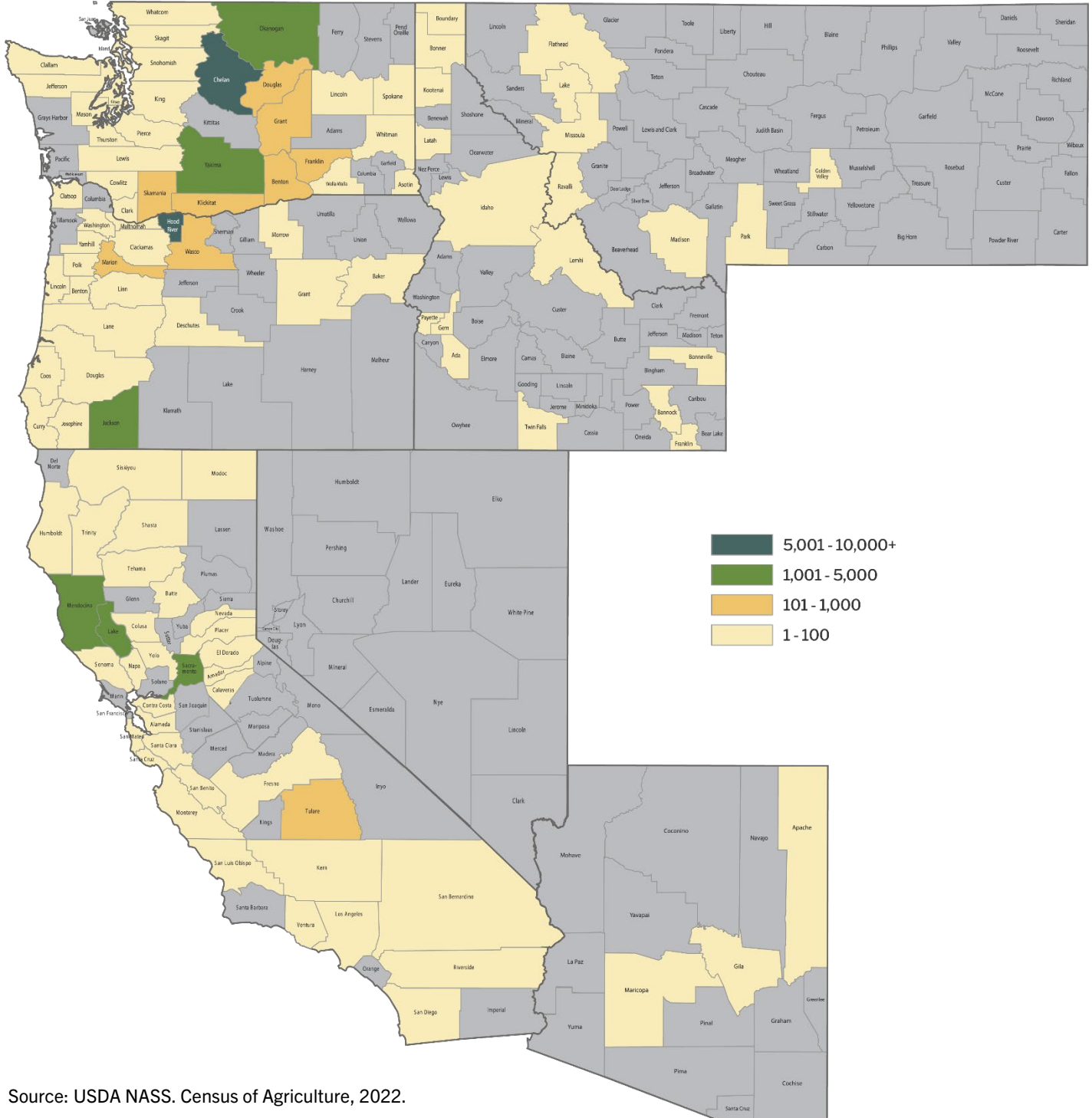
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Introduction

China, the European Union (EU) and the U.S. are the largest pear producers. China is responsible for around 76% of the world's pear crop, while the European Union (EU) and U.S only account for around 7% and 3% respectively.

The Western United States is the nation's dominant player in pear production, accounting for approximately 80% of U.S. acres and production. Pears are primary produced in the Yakima and Wenatchee areas of Washington, Hood River and Rogue River Valley areas of Oregon, and Mendocino, Lake, and Sacramento Counties of California.

Northwest Pear Acres by County



Source: USDA NASS. Census of Agriculture, 2022.

Primary Pear Varieties

Variety	Color	Character	Use	Harvest Time
Green Bartlett	Green	Short shelf life	Processing, fresh	August/September
Red Bartlett	Red	Difficult to grow, short shelf life	Fresh	August/September
D'Anjou	Green	Stores well, easy to grow	Fresh	September/October
Red D'Anjou	Red	Can be difficult to grow	Fresh	September/October
Bosc	Gold Russet	Must have quality finish	Fresh, cooking	September/October
Comice	Green	Low tonnage, delicate	Fresh	September/October
Starkcrimson	Red	Short shelf life	Fresh	August/September

Additional information about pear varieties is available at www.usapears.com.

Value Chain

Growth and Harvest

Pear trees grow from rootstocks, most of which are established in nurseries. Rootstock varieties are selected based on various qualities including anchorage and resistance to pests and diseases. Innovation in rootstock afforded to other tree fruit industries has been slow to develop for the pear industry, which has only a limited selection of dwarfing and vigorously growing varieties.

Rootstock grows in the field for about a year, grafted to specific pear-tree varieties and allowed to grow another year before being moved to an orchard. It takes about five more years to full production and during this time trees are pruned and trained up trellis vines. Pear trees are susceptible to fire blight during the active growth state. Some treatments usually applied when trees are newly planted, help manage exposure. If a tree does become infected, those sections of the tree (or sometimes the entire tree) will be removed. Before harvest, Bartlett fruit trees receive fruitlet thinning (the only variety to do so) to control fruit size. Harvest begins in late June and runs through late October. Pears are picked by hand, moved into bins and sent to the packing warehouses.

Weather is an important variable to consider during the growing season as frost during bloom and/or excessive wind, rain, hail and heat during the growing season can damage fruit quality and thus lower income and increase sorting costs. Conditions can also trigger an extended bloom, which may lead to inconsistent fruit ripening and necessitate multiple harvests on the same ground (increasing labor costs).

During harvest producers face three interdependent variables during harvest: crop size, labor availability and harvest time. A larger-than-average crop harvested within the normal time horizon may not be ideal if there are insufficient workers to handle it. Conversely, during a small crop year, lower-production orchards may have a harder time attracting labor as they are outcompeted by other producers who can offer more work hours.

Packers

After harvest, pears are sent to a packing line where they are washed, sorted, packed and stored. Along the packing line, pears fall into a grader that will sort by shape and size. Packers pick individual pears out of the tub of sorted pears, wrap them in a protective tissue paper and pack them in boxes or bags.

Packers sort pears based on quality and those with favorable sizes, color and internal qualities go to fresh markets while others end up in processed/packaged markets. Those with significant issues will be culled or discarded. Fruit is destined for either retailers or storage based on quality and the needs of marketing desks. Packing houses build up large inventories during harvest and sell into markets throughout the remainder of the year (typically to January and February for smaller packing houses and April to May for larger ones).

The tree fruit industry has seen vertical integration as large warehouses purchase orchards or enter into long-term agreements with large, independent suppliers. This helps reduce costs and manage fruit supply. Marketing tasks have also been consolidated. Several packing warehouses sell their own fruit or more commonly sell through the marketing-sales desks of another packing warehouse.

Marketing-Sales Desks

Large grocery chains dominate the retail market, and they prefer to source from large suppliers with the capacity to reach many stores with high-quality fruit. This has incentivized consolidation within the industry. Packing warehouses join marketing-sales desks, of which only 10 (there are 30 in total) handle the bulk of Northwest fruit supplies to collectively meet grocery chain demand. Fresh pears are normally sold through the same marketing network as apples. Retail buyers typically prefer to purchase mixed loads that include an assortment of apples and pears in every 1,000-box truckload. Packing houses that offer a broad array of fruit are the most successful at making loyal customers of large retail merchants.

Retailers

One of the greatest challenges with pears is timing ripening with consumer purchases. Pears do well in cold storage, but quickly ripen and then degrade at room temperature. While handling has improved significantly to fulfill customers' expectations, retailers have not yet reached complete agreement as to the most effective techniques. In the past, packing houses used anti-ripening agents; however, they were not very effective and lowered customer experience. Instead, pre-ripening, where packers and retailers allow fruit to ripen in a controlled environment, has become more common and is leading to a better customer experience. New technologies, combined with shipping and handling improvements, will continue to bring the industry closer towards consensus methods.

Pears, particularly the Bartlett variety, are unique within the tree fruit industry in that about a third of the crop is grown specifically for canned markets. Processors sell directly and/or through food brokers to chain stores, institutional buyers and food wholesalers. They are usually packed according to buyer specifications and under buyer-specified labels.

Drivers

Technology

Technological advances in the tree-fruit industry are driven by the need to maximize labor and monetary and natural resources, while increasing yields and productivity. The cost of technology is significant, but producers reap substantial economic rewards when proven technologies are implemented as part of an overall business strategy.

Technological advances play an important role in tree fruit operations. GPS and variable-rate technologies for fertilizer and water applications continue to gain acceptance among tree-fruit producers. Growers increasingly used remote-controlled drip irrigation to address a growing need for oversight in water management. The use of shade cloth is less common in cherries than in some other tree fruits; however, some late-season cherry growers may utilize the product. Drone use is helping to improve the availability and quality of data for orchard managers. An array of camera and sensor options provides detailed analysis of soil, moisture, erosion and temperature conditions.

Capital intensive technological investments have become a feature of the packing side of the tree fruit industry. Packing lines are now able to sort for internal defects, color and size, which provides consumers higher-quality products by minimizing human error. Cameras and highly sophisticated software programs work faster than human hands and throughput capacity is not compromised when sorting through a hail- or other weather-damaged crop. Precise sorting technology captures gradable fruit from a lot that would historically have been culled or downgraded a size, thereby securing the highest possible returns for a producer. Robotic palletizing also cuts down on labor requirements and increases worker safety, eliminating the need to manually lift and transport heavy bins, boxes and crates.

Adoption of automated warehouse technologies has reduced labor demand by 30%-40%, relieving what was previously a significant capacity constraint (especially during harvest). While it reduces labor costs, it increases fixed costs and subsequently the required throughput (approximately 80,000 bins per year) to be profitable.

Labor

Labor scarcity is a persistent concern in the tree fruit industry and growers are taking a proactive approach to address this. This includes raising wages, working with labor contractors, keeping well-maintained labor camps and modifying practices (utilizing different varieties, production sites and harvest-timing technologies) to improve efficiencies, reduce risk and spread labor requirements over a longer time horizon.

The H-2A Temporary Agricultural Worker program is an important source of labor, but the process is costly and complex. Employers must guarantee employment for 75% of the contracted workdays and provide transportation, housing and a place to prepare meals. Vertically integrated operations can spread these costs by transitioning workers from field work to packing.

Global Trade

The bulk of Northwest tree-fruit crops are sold in the domestic market. However, key foreign markets for pears include Mexico, Canada, the UAE (namely Dubai) and Brazil. Mexico and Canada are by far the largest importers of Northwest pears. Pear imports peak twice a year, first from February to May (from Argentina and Chile) and then October to January (from South Korea and China). The World Apple and Pear Association estimated a 4% increase in Southern Hemisphere production overall in 2023.

Consumer Demand

Consumers increasingly view pears as a staple food item and market demand for domestic fruit is generally strong. However, as market conditions change, pear demand may change as consumer demand shifts. There has been a gradual decline in pear consumption since 2011, mainly driven by the canned market, whereas fresh fruit has held constant. Consumers increasingly view pears as staple food items, but for many, they remain novelty purchases. Direct contact through social media helps producers debunk misconceptions about tree-fruit production, market fresh fruit and related products, and obtain insight into changing consumer preferences. Warehouses reducing the use of anti-ripening agents, adding information on packing to help customers determine when fruit is ripe and USA Pears increasing marketing dollars are some ways the industry is attempting to improve consumers' experiences.

Appendix A

Best Practices

The following summarizes the best practices common among successful and progressive tree-fruit growers and processors. These primarily relate to issues of production and warehousing.

Orchard Production Best Practices

- Successful businesses have defined goals and are continually in the process of executing specific strategies in their business. These strategies may include growth (e.g., diversification, replication, integration, networking), downsizing/rightsizing or intensifying (i.e., improving efficiency).
- Growers increase gross revenue through a combination of reaping high yields, producing desirable fruit varieties and peaking on a demanded size profile.
- Growers manage fixed and variable expenses, which allows for lower break-even levels.
- Focusing on orchards of an economic size is key to long-term cost competitiveness.
- Growers achieve diversification by growing multiple types and varieties of fruit.
- Successful growers diversify, when possible, by cultivating crops in differing geographic areas to hedge against widespread weather-related adversity.
- Growers use available risk management tools, such as crop insurance, to mitigate the risk of adverse and unforeseen events that could drastically affect the business. Crop insurance options include three variations of

coverage: production based, revenue based and named peril. Most producers use some combination of these products to tailor a protection strategy that matches the specific safety needs of their business.

- Weak blocks need to be updated. Over 15% of total planted acres on average may be pre-productive at any one time.
- When their operations lack critical mass, successful producers align with other growers to attract picking crews and assure them of a consistent supply of work that extends from the start of cherry through pear and apple harvests. Access to a dependable labor force will continue to be an important piece of orchard production going forward.
- Growers also might partner with other growers to leverage volume discounts for equipment, chemicals, fertilizers, fuel and other necessary inputs. Successful growers align with successful packing or storage warehouses that provide competitive services at reasonable costs. These warehouses need to have quality facilities and current fruit-handling and -packing equipment. Growers who align with successful warehouses tend to perform with more consistent profitability.
- Successful growers place fruit with packing and storage warehouses aligned with a strong marketing-sales desk. This provides ready access to large domestic and international retail markets, which translates into the most competitive returns.
- Successful fruit growers have established and implemented a labor strategy for their business that will ensure their seasonal labor needs are met.
- Progressive tree-fruit growers need to be prepared to furnish housing and year-round employment as a means of retaining key employees.
- To help alleviate labor shortages during peak harvest times, producers have begun planting several varieties at different locations or elevations. This creates varied harvest times and a steadier labor-demand window.
- Larger producers are able to move workers from one orchard to another over larger geographic areas to ensure the labor force is retained.
- Most producers are successfully using the H-2A Temporary Agricultural Workers program. Although somewhat expensive, the program provides a feasible solution to labor needs, as domestic labor becomes increasingly difficult to find. One of the options to replace domestic labor is through H2A, either direct or through a contractor.
- Some producers have successfully used contractors who, for a fee, offer full-service labor. However, this practice has met some resistance, mostly because of timing and scheduling considerations.
- Development of labor-reducing or “picker-friendly” tree-planting styles is proving to be an advantage in terms of the ability to attract and retain an adequate labor supply.
- Successful operations use accrual-based reporting to assess true financial position and performance. These growers also use enterprise accounting to assess profitable and unprofitable business units or orchard blocks.
- Orchardists with strong liquidity and lower leverage are able to absorb market down cycles and take advantage of strategic opportunities.
- A business should assess the adequacy of its financial position annually using tools such as financial ratios, peer financial benchmarks and historical trend analyses.
- Stress case scenarios may also be used to give an accurate picture of the true financial position of the business given possible adverse scenarios.

Warehousing Best Practices

- Successful businesses have goals and are continually in the process of executing specific strategies in their business. These strategies may include growth (e.g., diversification, replication, integration, networking), downsizing/rightsizing or intensifying (i.e., improving efficiency).
- Successful warehouses maximize use of fixed assets.
- Improved use results in reduced per-unit costs, which enables warehouses to maintain competitive grower returns.
- Warehouses, as processing entities, must contain fixed and variable costs to maintain competitive packing charges and maximize income levels.
- Cost containment allows a warehouse to reduce the level of throughput needed to break even in short crop years when fruit supplies are more scarce than usual.
- Allied packing warehouses trade packing and storage capacity to use assets to their fullest potential. This situation is most often seen with warehouses using a common marketing-sales desk.
- Aligned warehouses can dedicate a specific line to a particular variety with fewer changeovers.
- Sharing and balancing storage needs, improving the variety and size profile of manifest for marketing-sales desks and working together to realize increasingly efficient logistics and distribution are inherent advantages of partnership.
- Successful packing warehouses align with marketing-sales desks that have steady access to a wide range of retail customers that use a broad portion of the total manifest, ultimately, to maximize fruit returns to the grower.
- Some integrated operations also own and operate a marketing-sales desk.
- Successful packing warehouses must closely monitor marketing-sales desk performance to ensure that competitive returns are realized on packed fruit.
- New technology, both in the field and in the warehouse, could reduce labor requirements substantially over the next five to 10 years. Packing and sorting automation, storage automation, palletization automation and orchard automations are all expanding.
- Automation involves exchanging a high fixed cost (machinery) for variable cost (labor), and in the process, encourages producers to grow to take advantage of economies of scale. Especially as labor availability shrinks, automation will increase in popularity.
- Packing warehouses align with growers to ensure their targeted product throughput.
- Integrated operations grow a significant portion of the fruit that they pack.
- When working with retailers, value-added processes may prove to be a competitive differentiator. Such processes include inventory management, labeling, traceability programs, promotions and other value-enhancing activities.
- Warehouses with strong liquidity and lower leverage are able to weather adversity and take advantage of strategic opportunities.
- A business should assess the adequacy of its financial position annually by using tools such as financial ratios, peer financial benchmarks and historical trend analyses.
- Stress case scenarios may also be used to give an accurate picture of the true financial position of the business.

Appendix B

Glossary

Pears are hauled and stored in bins, but packed for shipping in smaller, cardboard boxes. A box of pears is 44 pounds.

Found in the axils (the upper angle between a leaf stalk or branch and the stem or trunk from which it is growing), a bud is basically a dormant and compressed shoot, which given the right conditions will resume growth.

Controlled atmospheric storage (CA storage) varies in size to hold from 10,000 boxes to 100,000 boxes. These rooms are sealed, and oxygen levels are reduced by the infusion of nitrogen gas to reduce the level of oxygen from approximately 20% down to 1%-2%. The temperature of these rooms is kept between 32° and 36° Fahrenheit. This helps to keep the pears fresh tasting long after harvest because it slows the ripening process of stored pears. After pears are taken out of CA storage, they are moved to a ripening room with higher temperatures that initiate ripening.

The thin layer of tissue, often green or greenish yellow, between the bark and the wood on a tree; in grafting, it is important to line up the cambium between rootstock and scion.

Central leader. A tree where the main branch goes straight up the center.

Clone. A genetically identical group of plants derived and maintained from one individual by vegetative propagation.

Cold has (hardy). The ability of plants to withstand cold injury (autumn-winter).

Cold storage. A form of refrigerated storage.

Cross pollination. Pollen moving from one flower to another, whether on the same plant or among flowers on different plants. Pollen moved between different plants often results in fruit that is different from either parent (i.e., a hybrid of the two).

Culls. Fruit that is discarded at the warehouse and will not go to market.

Cultivar. A plant variety that has been produced by selective breeding.

Dormant. The inactive or sleeping state in which a plant stops growing but is still alive.

Drip irrigation. Watering through soaker hoses or emitters placing water at plant bases on the soil surface; the least wasteful method of watering.

Drip line. The rough circle that may be drawn on the ground around a tree where rain would drip off the outermost leaves. The most active roots are often located along this line.

Fire blight. A bacterial disease that causes the branches and fruit on a pear tree to turn black and die. An apt name, the plant looks as if it has been scorched.

Fresh. Fruits (or vegetables) that are harvested and sold without the intention of further processing. Generally, fresh fruits will be consumed raw or cooked by the consumer.

Frost damage. Cold-temperature injury during some stage of the growing season. Parts affected are flower buds, flowers, and young fruit (spring) or near-mature fruit or other tissues (fall).

Fruiting wood. The smaller wood or spurs on which the fruit is actually grown.

GLOBALGAP. An internationally recognized set of farm standards dedicated to Good Agricultural Practices (GAP). Through certification, producers demonstrate their adherence to GLOBALGAP standards. For consumers and retailers, the GLOBALGAP certificate is reassurance that food reaches accepted levels of safety and quality, and has been produced sustainably, respecting the health, safety and welfare of workers and the environment, and in consideration of animal welfare issues. Without such reassurance, farmers may be denied access to markets.

Grafting. A way to propagate a plant by inserting a section of one plant (the scion) into another plant (the stock).

Hardiness. Ability of the plant to withstand temperature extremes; usually refers to cold hardiness

High density. Ground planted at 135 pear trees per acre is considered high density.

King blossom. The larger dominant blossom that is usually found in the center of the blossom cluster, surrounded by the yet unopened 'side blossoms.' The largest fruit will come from the king blossom.

Organic certification. Verifies that a farm or handling facility complies with USDA organic regulations. This certification allows the holder to sell, label and represent products as organic. Farms all over the world may be certified to the USDA organic standards. Most farms and businesses that grow, handle or process organic products must be certified.

Packouts. The number of boxes of fruit that can be packed out of a bin.

Packer. The company that owns the warehouse where pears are packed, stored and shipped.

Pickers. Workers who pick the tree fruit by hand, and carefully handle it to ensure good quality fruit. The picker wears a bucket that has a canvas bottom, held shut with a drawstring. When the bucket is full, the worker empties it into a wooden bin by releasing the string.

Pollination. The transfer of pollen from the male part of flowers (the anthers) to the female part (the stigma). In most tree fruit, the transfer is accomplished by insects. There are not enough wild bees to pollinate commercial orchards, and poor pollination results in a small fruit crop. To ensure good pollination, growers place beehives throughout the orchard for 10 to 14 days during the bloom. Full bloom is when good pollination is essential.

Processing. Fruit that is typically canned, sliced or juiced and not sent to the fresh market.

Pruning. The removal of living canes, shoots, leaves and other vegetative parts of the branch.

Rootstalk. Sometimes called stock, this is the root system (plant) propagated from seed (seedling) or vegetatively. Various cultivars are budded or grafted onto rootstalk. Many rootstocks are used and possess traits that relate to anchorage, size control, tolerance of light and heavy soils, "wet feet," specific nematodes and other plants and diseases.

Marketing-sales desk. Sells and markets fruit on behalf of packers.

Scion. A detached stem, usually dormant, used in asexual propagation by grafting techniques. The scion is the actual fruit variety that gets grafted on to the rootstock.

Set. The amount of fruit held on the tree.

Shoot. Wood that is usually not over one or two years old and is longer than the short, stubby spur growth.

Spur. A short shoot with compressed internodes. Spurs grow from two-year or older branches and produce flowers and fruit. Flower spurs are best exemplified in apple and pear trees.

Sucker. A cane that emerges from below the bud union, and therefore comes from the rootstock rather than from the variety grafted onto it. On other plants, a sucker is any unwanted, fast-growing, upright growth from roots, trunk, crown or main branches.

Sunburn. The damage caused by the hot summer sun on the branches, "cooking" or destroying the bark and tissues.

Thinning. Removal of flower clusters, immature clusters or part of immature clusters.

Training. Certain practices that are supplementary to pruning and necessary for shaping the vine.

Variety. Commonly used to mean the same as cultivar. Technically, variety means a naturally occurring variant of a species.

Vigor. Refers to the amount and rate of growth; relative among cultivars, climates and horticultural practices.