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Tree Fruit Care and Production

Larry A. Sagers

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BIOLOGY AND GROWTH OF FRUITS

Many different deciduous tree fruits grow in Utah, but growing fruit here is not always easy. The

most limiting factor for fruit production is the climate. Spring frosts frequently destroy the crop, and cold temperatures in many areas kill trees.

The major tree fruits in Utah include apples, pears, plums, peaches, apricots, and cherries. The botanical characteristics of these differ but their care and maintenance have many similarities.

Fruits are classified according to the way the seeds and flesh form from the flowers. The major tree fruits in Utah fall into the following categories: Drupe, nut, and pome.

Horticultural Classifications of Fruits and Nuts

Drupe - (also called stone fruit) fruit derived from a single carpel, usually having a hard, stony endocarp and a fleshy pericarp; apricot, peach, plum, cherry, almond, date, avocado.

Nut - a fruit in which the carpel wall is hard or bony in texture.

Pome - a fruit in which the true fruits (core sections) are surrounded by an enlarged fleshy floral tube or receptacle; apples, pear, quince.

Fruit and Nut List Classified by Type

The following fruits and nuts are listed and classified according to their type:

Common Name	**Family**	**Scientific Name**	**Type of Fruit**
Cranberry	Vaccineaceae	Vaccinium macrocarpum	berry
Japanese Persimmon	Ebenaceae	Diospyros kaki	berry
Almond	Rosaceae	Prunus amygdalus	drupe
Apricot	Rosaceae	Prunus armeniaca	drupe
Date	Oaknaceae	Phoenix dactylifera	drupe
European plum	Rosaceae	Prunus domestica	drupe
Jujube	Rhamnaceae	Zizyphys jujuba	drupe
Nectarine	Rosaceae	Prunus persica	drupe
Olive	Oleaceae	Olea europea	drupe
Pistachio	Anarcardiaceae	Pistacia vera	drupe
Pomegranate	Punicaceae	Punica granatum	hard-skinned berry
Sour Cherry	Rosaceae	Prunus cerasus	drupe
Sweet Cherry	Rosaceae	Prunus avium	drupe
Citrus	Rutaceae	Citrus sinensis	hesperidium
Mulberry	Moraceae	Morus nigra	multiple fruit
Pineapple	Bromeliaceae	Ananas comosus	multiple fruit
American Chestnut	Fagaceae	Castanea dentata	nut
American Hazelnut	Fagaceae	Corylus americana	nut
Butternut	Juglandaceae	Junglans cinerea	nut
Eastern Chinquapin	Fagaceae	Castanea pumila	nut

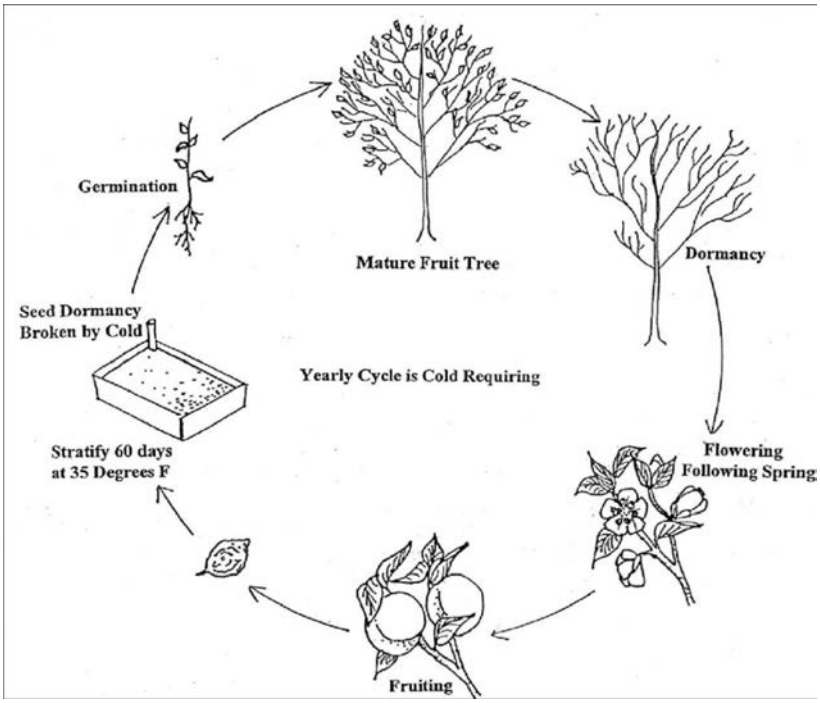
Filbert	Fagaceae	Corylus avellana	nut
Pecan	Juglandaceae	Cara illinoensis	nut
Shagbark Hickory	Juglandaceae	Carya ovata	nut
Walnut	Juglandaceae	Juglans spp.	nut
Apple	Rosaceae	Pyrus malus	pome
Pear	Rosaceae	Pyrus communis	pome
Quince	Rosaceae	Cydonia oblonga	pome
Fig	Moraceae	Ficus carica	synconium

Tree Growth and Development

To understand the practices that produce good fruit crops, it is important to understand how fruit trees grow.

Growth Cycle

Fruit trees are temperate-zone fruits, meaning they must go through a yearly growth cycle that includes a cold period. The time when the tree is dormant is known as the rest period. Different tree species require different lengths of rest period or chilling requirements.

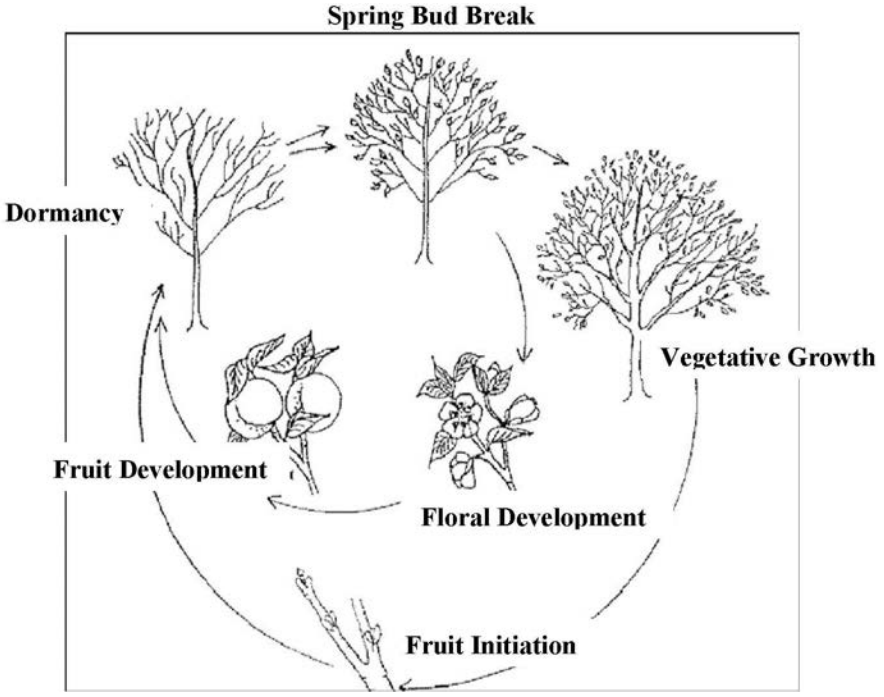


Growth cycle from Seed to Mature Tree

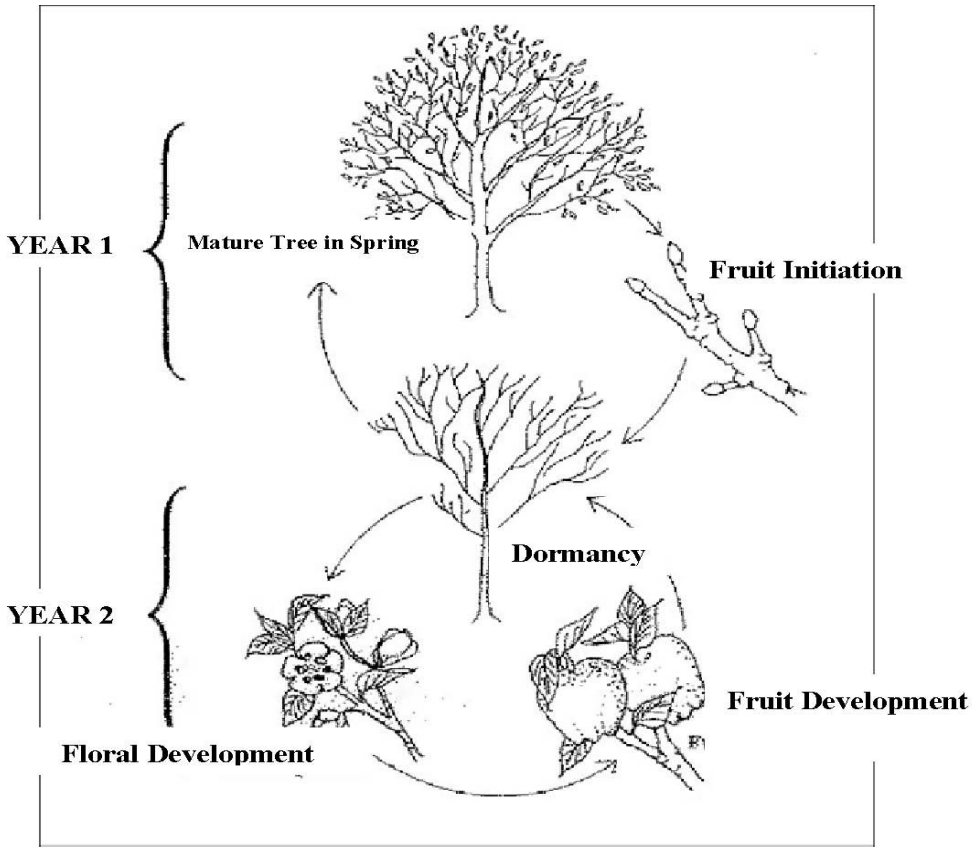
Blossom and Fruit Development

Fruit trees have vegetative buds and fruit buds. Their growth cycles greatly affect the fruit crop. Fruit formation depends on the flower buds. The two most common types of flowers on fruit trees grown in

Utah are pome fruits such as apples and pears, and stone fruits such as peaches, plums, and cherries.

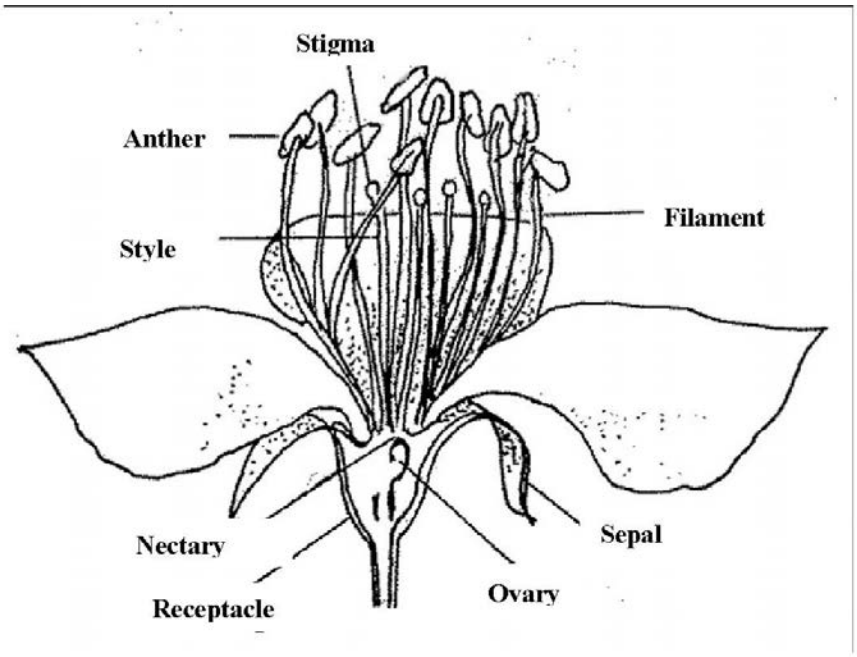


Stone Fruit Development



Pome Fruit Development

In an apple, the true fruit is the core section. This contains five ovules where the seeds form. The edible part is an enlarged floral tube or receptacle. Many of the floral parts are visible in a cross section of a mature apple.



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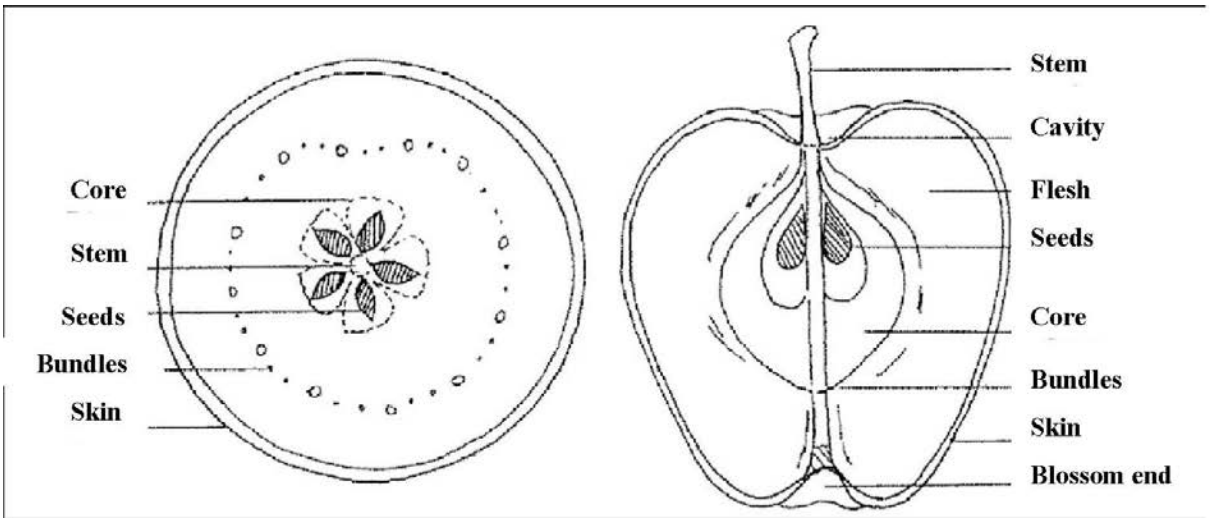
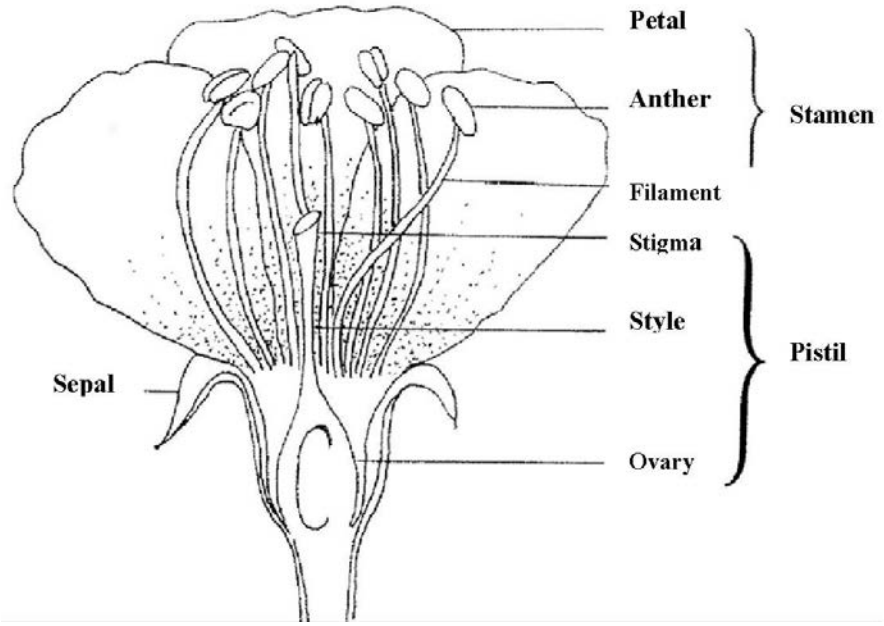
The following diagram is a longitudinal and cross section of an apple.



Peaches and other stone fruits develop fruit differently. The ovary matures after pollination to produce

the fruits. A single carpel matures with a strong endocarp, or pit. This is surrounded by a fleshy pericarp which is the edible fruit. The diagram shows the section of a cherry flower.



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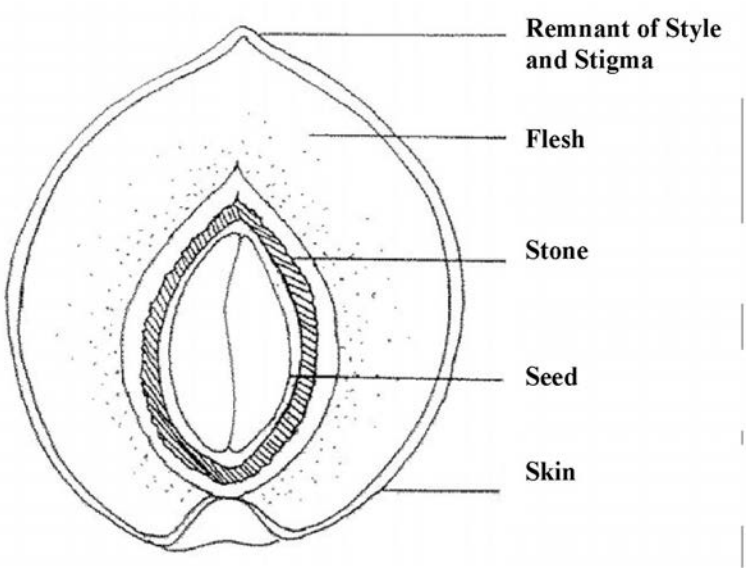


Fruiting Habit

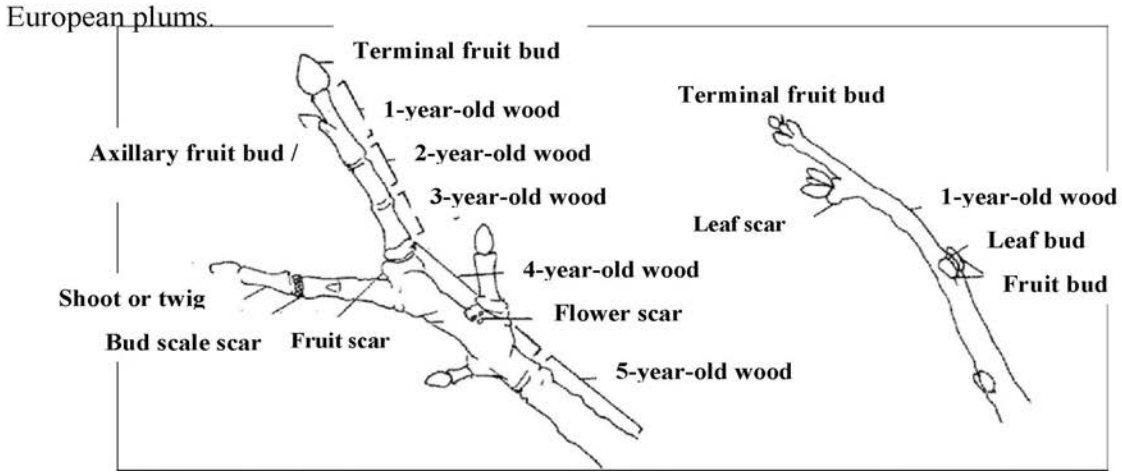
In order to get good production from fruit trees, they must be pruned correctly. To do that, it is important to understand where the fruit forms. The location of fruit buds on trees is as follows:

- Apple - terminal with some lateral, on spurs
- Pear - same as apples
- Peach - lateral, never terminal, on year-old wood
- Apricot - mainly on lateral spurs, also on year-old wood
- Sweet Cherry - lateral, never terminal, on spurs and shoots
- Sour Cherry - lateral, mostly on shoots, not as many on spurs as with sweet cherry

Spurs on plum and cherry bear flower buds laterally, and terminal buds are generally leaf buds. Apples and pears frequently form terminal flower buds and further elongation of the spur is forced out of a straight line.

These differences in fruiting habits help determine tree management. Apples produce on spurs, so it is important to prune to encourage and develop the spurs. Peaches bear on one–year-old wood, so prune to renew an adequate area of prime fruit-producing wood.

This diagram illustrates the fruiting habits of apples, peach, tart and sweet cherries, and plums.



GROWTH AND PRODUCTION FACTORS

Bud Differentiation

Fruit production requires flowers. Without flowers, fruit trees are ornamentals. During the summer,

fruit buds form that will bloom the following spring. Fruit buds form according to the following schedule:

Apple - early June to early July
Pear - late June to early July
Peach - late July
Apricot - early August
Sweet Cherry - late June to July
Sour Cherry - July
Plum - late July to August

The treatment or growing condition of the plants influences whether a bud differentiates as a shoot or flower. Learning how to encourage fruit bud formation is critical to produce healthy crops of tasty, high-quality fruit. These factors affect flower bud formation:

Carbohydrate Accumulation. Fruit trees manufacture their own food as carbohydrates and other compounds which are used in creating flower buds. If carbohydrates are inadequate, fewer buds form. With plenty of nutrients, good leaf surfaces without pest damage, high light intensity, and proper moisture, trees produce ample carbohydrates.

Nitrogen Fertilizer. Low nitrogen levels reduce metabolism so trees produce fewer carbohydrates. Excessive nitrogen levels stimulate vegetative growth instead of fruit bud formation.

Adequate Foliage. Each fruit requires a certain number of leaves to grow and mature. With insufficient leaves, trees do not produce enough carbohydrates, and fruit quality and production declines.

Biennial Bearing. Apple and pear spurs only bear fruit every other season.

Excessive Pruning. Removing too much of the tree stimulates excessive vegetative growth instead of fruit buds.

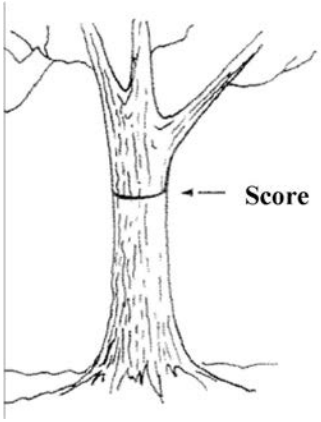
Trees fail to produce fruit for many other reasons:

Other Considerations

- Winter injury to dormant flower buds.
- Spring frost damage to flowers.
- Unfavorable weather which prevents bees from pollinating the flowers.
- Insects feeding on the fruit pollen.
- Low temperatures that prevent pollen-tube growth.
- Poor pollen distribution or insufficient cross-pollination.
- Certain fungicide sprays applied during bloom destroy pollen.

- Low vigor of trees because of overbearing or from defoliation by insects or diseases.

Scoring



Scoring before bud initiation can promote fruiting the next year. Scoring means making a small cut around the tree that injures the cambial tissue, which then keeps carbohydrates near the spurs, by blocking movement into the roots.

Pollination

Pollination occurring on the same tree is called self-pollination. Pollen transfer between different cultivars is called cross-pollination. Some kinds of fruit trees fail to set a crop unless the flowers are fertilized by pollen from another cultivar. These are self-unfruitful. Cultivars that set fruit with their own pollen are self-fruitful. Fruit trees not only have to supply the right kind of viable pollen, but they must bloom at the same time as the cultivar that needs pollination.

Honeybees and other bees are the primary means of pollen transfer in deciduous fruit trees. They are critical to fruit production. Never spray with insecticide during bloom. Bees do not fly when temperatures are below 40 F or when it is windy or raining. Eliminate dandelions and other blooming weeds that may attract bees away from fruit blossoms.

Apples

No apple cultivar is sufficiently self-fruitful. Some cultivars, which produce no viable pollen are not only self-unfruitful, but will not pollinate other cultivars. Plant these trees with two other cultivars that produce viable pollen.

Red sports of Delicious, McIntosh, Jonathan, Northern Spy, and Rome are incompatible with the parent cultivar. When choosing two or more sports of the same cultivar, plant a good pollinator with them.

Any of the following cultivars will satisfactorily pollinate most kinds of apples, provided their periods of bloom overlap by a day or more. Crabapples are good pollinators for most other apples.

Early Bloom	Midseason Bloom	Late Bloom
Transparent	Cortland	Early McIntosh
Lodi	Delicious	Greenings
McIntosh	Jonathan	Golden Delicious
Idared		Northern Spy
		Rome Beauty

Pears

Pears require cross pollination. Bartlett is the most popular canning cultivar. Bosc, Comice, and Anjou are favored as cross pollinators for Bartlett. Asian pears pollinate other pears if they bloom at the same time. Bartlett and Seckel are cross-incompatible.

Cherries

Cherries are generally self-unfruitful. Bing, Emperor Francis, Lambert, and Royal Ann cultivars are incompatible sop planting multiple trees from this group will not give good pollination. Black Tartarian, Schmidt, Stella, Windsor, and Van are good pollinators of other common cultivars. Stella and Lapins are self-fruitful and still produce good crops without other cherries.
All commonly grown cultivars of tart cherries are self-fruitful but bloom too late to pollinate sweet cherries.

Plums

Plums vary in their requirements for cross-pollination, depending upon both species and cultivar.

European Plums

Several cultivars of European plums, including Stanley and Monarch, are self-fruitful, but they set better crops when pollinated with another cultivar. Albion, Archduke, Bradshaw, Brooks, Diamond, Grand Duke, Hall, Imperial Epineuse, Italian Pond, President Tragedy, and others are consistently self-unfruitful. Choose pollinators for European plum cultivars from other European cultivars.

Japanese Plums

Most cultivars are self-unfruitful. The most common cultivars, Santa Rosa, Satsuma, Elephant Heart, Burbank, and Abundance are self-unfruitful but are dependable pollinators for each other. European cultivars are not satisfactory pollinators for Japanese cultivars.

Damson Plums

Shropshire and French Damson, the two most common cultivars of this species, are self-fruitful and produce good crops without cross pollination.

Peaches and Nectarines

Most peaches and nectarines are self-fruitful and do not require pollination. The exceptions are most Hale--type peaches including J.H. Hale, Stark Halberta, and Stark Honeydew Hale. Any other peach cultivar with the exception of the very early ones will pollinate J.H. Hale.

Quince

All cultivars are sufficiently self-fruitful.

Apricots

Apricots are self-fruitful except for Perfection, Riland, and Rival which require pollinators.

Fertilization

Managing nitrogen fertility, important in Utah, can be determined by observing shoot growth. Check the past season's shoot growth each winter. Last year's shoots are brighter colored than older wood. Two-year-old and older wood has heavier bark that is developing a dull or grayish appearance.

Measure several of last year's shoots and determine the average length. The following table suggests average shoot growth for healthy trees. Increase the fertilization rate if shoot growth is below average, and decrease if it is above average.

Average shoot growth in inches

Fruit Tree	Young trees up to 6 years old	Bearing trees over 6 years old
Apple, dwarf, and semi-dwarf	10 to 20	4 to 8
Apple, standard, and spur types	10 to 20	6 to 10
Peach, nectarine, and apricot	10 to 24	8 to 15
Sour cherry and plum	10 to 20	8 to 12

Pears frequently do best without fertilizer as fire blight disease tends to be worse on young, vigorous growth.

Spread the nitrogen on the soil below the outer edge of the branches. For young trees, band the fertilizer two feet away from the trunk. Spread the fertilizer on the soil or snow between December and early March.

Nitrogen Requirements For Fruit Trees

Pounds of Nitrogen for Fruit Trees (per tree)

Age of Trees When Planted	Actual Nitrogen (Do not apply	Ammonium Sulfate (21-0-0)

	commercial fertilizers at planting time)	
1 - 3 years	1/4 - 1/2	1 1/4 - 2 1/2
3 - 8 years	1/2 - 1	2 1/2 - 5
Mature trees	1 minimum	5 minimum
	Large apple or cherry	
1 ½ - 3 years	4 ½ - 9	7 ½ - 15

It takes large amounts of manure or other organic fertilizers to supply enough nutrients for good tree growth.

Iron chlorosis is a very common problem on all kinds of fruit trees in Utah. It is not caused by the lack of iron in the soil, but because alkaline soil conditions make it unavailable. It is greatly aggravated by over-watering, especially in the early spring.

The best control of iron chlorosis for fruit trees growing in western soils is an iron sequestrene compound, sold as Iron Sequestrene 138 or Millers Ferriplus.

Frost and Frost Protection

Spring frosts limit fruit production more than any other factor. Homeowners can provide very limited protection against freezing temperatures that can damage buds, blossoms, and small fruit.

Covering

Blankets or quilts can insulate small trees from some frosts. They trap heat rising from the soil and maintain a few degrees of protection. Covering with one layer of plastic does little or no good unless a heat source is placed beneath it. Electric bulbs under a cover may help prevent damage if temperatures are not too low.

Sprinkling

Freeze protection is done by sprinkling but most sprinklers apply too much water to the trees and can damage the limbs and branches. Sprinkling for frost protection is not recommended for homeowners.

The following chart indicates the temperatures that buds and blooms can withstand at different stages of development.

Minimum Temperatures (Fahrenheit) Fruit Buds Can Withstand At Various Stages of Development

- Bud scales separating, small green tip showing on apples. Pears and cherries inner bud scale showing at tip.

  Delicious 14-16 degrees Pears 18 degrees

  Goldens 14-16 degrees Cherries 21 degrees

  Romes 14-16 degrees

- Delayed dormant. Bud scales widely separated but still attached. Squirrel ear leaves on apples showing. Pear and cherry blossom buds exposed.

  Delicious 20-22 degrees Pears 23 degrees

  Goldens 20-22 degrees Cherries 25 degrees

  Romes 20-22 degrees

- Pre-Pink. Buds are widely separated. Flower parts show no color. Flower cluster still stuck together.

  Delicious 23-26 degrees Cherries 28 degrees

  Goldens 23-26 degrees Apricots 23 degrees

  Romes 23-26 degrees Peaches 23 degrees

  Pears 24 degrees

- All buds showing color and separated in cluster. Primary leaves fairly well developed on apples

  Delicious 24-26 degrees Rome 24-26 degrees

  Peaches 25 degrees Pears 27 degrees

  Italian prunes 23 degrees

- Full Bloom.

  Delicious 27-28 degrees Bartlett pears 28 degrees

  Golden 27-28 degrees Anjou pears 30 degrees

  Rome 27-28 degrees Apricots 28 degrees

Cherries 28 degrees

Italian prunes 27 degrees

Peaches 27 degrees

- Small Green Fruits.

Apples 29 degrees

Peaches 30 degrees

Pears 30 degrees

Apricots 31 degrees

Cherries 30 degrees

Plums/Prunes 30 degrees

Pruning and Training

Pruning unwanted limbs and wood increases plant strength and fruit production. This skill is acquired through learning about the tree to be pruned, practice, and observing the tree's response to the pruning. The primary purposes of pruning are to:

- Improve the tree strength so it will carry a load of fruit
- Facilitate cultural and harvesting operations
- Adjust or partially control tree size and shape

Unpruned or neglected fruit trees become tall, dense, and unmanageable; and fruit production is limited to the outer edges and the top where there is more sunlight. The interior of the tree becomes a tangled mass of branches with very little productive fruiting wood. Unpruned trees are very difficult to spray and harvest. Though unpruned trees may bear, the fruit size, color, and quality are inferior.

Pruning does not "ruin the tree." Trees will eventually replace a part removed with a poor cut. The greatest mistake is not to prune.

There is no right or wrong pruning system. Develop pruning systems to fit tree needs using basic pruning principles and understand plant growth. Pruning dwarfs the tree and although it may stimulate localized areas, it reduces the plant size overall.

No two trees grow and develop exactly alike, which is frustrating to novice growers. Learn the ideal and modify it to suit the individual tree while developing the general shape.

Annual pruning is important throughout the tree's life. Young trees need annual pruning to develop the desired tree structure, but excessively pruning young trees delays fruit bearing and production. Prune young trees moderately to develop a well-shaped, structurally strong tree.

Prune older trees to stimulate fruit wood production and prevent trees from becoming too large or dense.

The following list gives the severity of pruning for various fruit trees.

- Most Severe
  - Peaches, Nectarines
  - Japanese Plums
  - Apples
  - Apricots
  - Sour Cherries
  - European Plums
- Least Severe
  - Sweet Cherries

General Pruning Rules

1. Clean up the tree by removing:
   a. Dead, diseased, and broken branches
   b. Water spouts and suckers
   c. Branches that rub or cross
   d. Weak, drooping, and unproductive branches

2. Let the light in by removing branches that:
   a. Compete with other branches for light
   b. Shade the center of the tree
   c. Grow back into the tree

When to Prune

Light pruning can be done any time of the year, but do heavy pruning in late winter or early spring. Earlier pruning increases winterkill problems.

Remove water sprouts and suckers during the summer instead of cutting them out during the dormant season. They are much easier to rub off when they are 2 inches high than to prune off when they are 4 feet high. Water sprouts invite insect and mite pests and make trees harder to spray.

Corrective Pruning

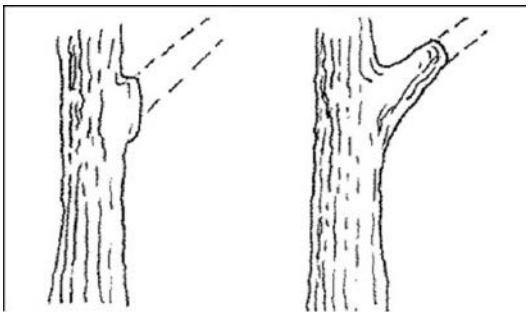
One frequent problem for most homeowners is not understanding how to prune newly planted fruit trees or inheriting incorrectly pruned trees.

Start correcting problems by thinning out some of the main branches. First, select several good larger branches with wide-angle crotches to keep for scaffolds. Remove unwanted branches from the trunk by cutting out one-third of them over the next three years. Excessive pruning in one year may upset normal bearing for several years and encourage excessive regrowth of long, unproductive sprouts.

Shorten branches that are too long or tall. Thin out excess branches over the same 3-year time frame. Do not fertilize trees during the corrective pruning period because pruning provides enough growth stimulation.

Make all pruning cuts next to the branch collar and do not leave stubs. Latent (non-growing) buds on the stub grow and shade the interior of the tree. The tree cannot effectively heal or close the bark over the stub allowing insects and diseases to enter.

A pruning cut by the branch collar like the one shown on the left heals quickly while a stub cut like the one on the right heals slowly. Wound compounds painted on pruning cuts usually do little good.



Training Home Orchard Trees

There are many different systems for training fruit trees, and each system has advantages and disadvantages. The two most common are discussed here, but others are useful under some circumstances. The two systems are the central leader and the open center.

Use the central leader system for newly planted semi-dwarf apples, pears, and occasionally sweet cherries.

Use the open-center system for peaches, nectarines, plums, apricots, and pie cherries. It is an easier system for homeowners to develop and maintain.

Central leader

An ideal semi-dwarf or spur-type apple tree trained and pruned to a central leader system has these characteristics:

- One main trunk 8 to 15 feet high.
- Three tiers of branches with 3-5 scaffold branches in each with the crotches of the scaffold branches forming a 40- to 90- degree angle with the trunk.
- Lowest tier of branches 24 to 48 inches from the ground with a similar spacing between the next two tiers.

The number and spacing of scaffold branches and the height of the trunk or leader varies with the type of tree (dwarf, semi-dwarf, or standard) and the type of fruit (apple, pear, or cherry). A properly shaped, modified-leader tree has low and well-spaced branches, with well-distributed fruiting wood, and is close enough to the ground to allow easy pruning, spraying, and picking.

Open-center

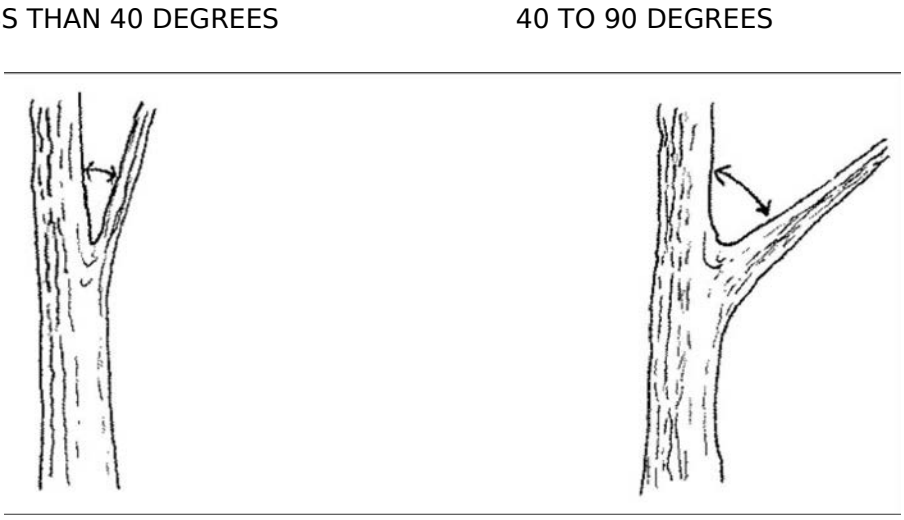
An ideal standard peach tree trained and pruned to the open-center system has:

- A single trunk 18 to 30 inches high.
- Three or four scaffold branches, all located six to eight inches apart vertically near the top of the trunk and kept about equal in size by pruning. All scaffold branches form a crotch angle of 40 to 90 degrees with the trunk and spaced as uniformly as possible from each other.

Properly shaped, an open-center (or vase) tree develops into a low-growing tree that allows easy pruning, spraying, and picking. The open center allows light to reach the inner branches to color the fruits.

Developing Good Angles and Strong Crotches

Trees that form narrow branch angles need to be spread to develop strong crotch angles. In the illustration below, the wide-angle crotch on the right is stronger than the narrow angle crotch on the left.



Branch spreaders help train young trees to the central leader system. Boards with a nail in each end, stiff wire, or metal rods sharpened at each end make good branch spreaders.

Apple and pear branches tend to curve and grow straight upward even though the crotch forms a satisfactory angle. Spreaders keep the branches growing at the desired angle.

Espalier

Training fruit trees to grow in picturesque shapes on walls or other permanent structures is a technique practiced for hundreds of years in Europe. Fruit can grow in limited spaces in small home gardens. Properly pruning and fastening the branches in place allow growers to develop different patterns.

Size Control

Tree size varies by cultivar, growth habit, or variations in rootstocks or interstems. Many cultural

factors help determine ultimate tree size including soil type and fertility, soil moisture, pruning and training, and fruit production during early growth.

Cultivar size refers to the mature plant size. For example, healthy Red Delicious trees are larger than healthy Rome Beauty trees.

> **Spur type** apple trees develop long limbs with few side branches but many fruiting spurs. These trees are more open and grow about three-fourths the size of a standard tree. The shorter internode length between buds gives many more fruiting spurs per limb than non-spur trees. Spur types are not available for all cultivars.

Rootstocks and interstocks are other ways to produce size-controlled trees.

> **Dwarfing rootstocks** dwarf the cultivar tree size but not the fruit size. Different rootstocks provide various size dwarf trees.
>
> **Dwarfing interstems** are grafted between the rootstock and scion wood of the tree. The advantages of these are that the correct rootstock can be selected for soil conditions and anchorage without sacrificing dwarfing. Interstems are less common in retail nurseries.

Apples

Standard apple trees are produced by planting seeds, growing the seedlings for 2 years, and grafting on the desired cultivar. Dwarf trees are created using dwarfing rootstocks or interstems. The Malling Research Stations helped select many dwarfing rootstocks, and these carry the designation M (Malling) and a number.

Pears

Pears are often grafted onto Quince A rootstock. Most homeowner trees are done this way, but Old Home Farmingdale rootstock is also satisfactory.

Stone Fruits

Dwarf cherries, peaches, and plums are available using various seedling and clonally propagated rootstocks. The amount of dwarfing varies widely, and stone fruit dwarfing is not as satisfactory as in apples and pears. Compatibility problems of the rootstock and scion often produce short lived trees.

Winter Injury

Winter injury includes blackheart, crotch and trunk injury, crown and collar injury, winter sunscald, trunk splitting, and dieback of twigs and young branches. Symptoms on trees are as follows:

Blackheart

As the name implies, this disease kills the pith, and the heartwood turns dark while the cambium and bark remain alive. With blackheart, the tree continues to grow and can form new sapwood and bark. It forms in fruit trees during severe winters.

Crotch Injury

The bark, cambium, and sapwood in the branch crotches can be killed, leaving other portions of the tree uninjured. Bark splitting may occur, and injury may extend several feet up the limb from the crotch.

Winter Sunscald

Sunscald develops during the winter on the southwest sides of tree trunks. Painting the exposed trunk with exterior latex paint, using trunk protectors, or shading the trunk also controls the problem.

Crown or Collar Injury

This injury is winter kill of the bark at or near the ground surface. Applying white paint or wrapping the trunk down to the soil line may reduce this injury.

Splitting of the Trunk

Long splits in the trunk, often to the pith, may occur in extremely cold weather. The cracks usually close when temperatures rise and the bark calluses over. Cracks are common on sweet cherry trees.

Dieback of Young Branches and Twigs

In severe winters, dieback is common on many kinds of fruit trees. It occurs frequently on young, vigorous trees and is more severe on less hardy species and cultivars.

Injury to Leaf and Flower Buds

Leaf and flower buds are damaged or killed by extreme low temperatures. Flower buds of some cultivars of apples will withstand -40 degrees F. Peaches and some stone fruits are damaged at 5 degrees F.

Killing of Roots

Roots are not as hardy as parts of the tree above ground. Apple roots can die at temperatures from 10 to 25 degrees F. Sudden temperature drops after warm winter days rarely kills roots, but extended ground freezing may cause root injury. Heavy snow or mulch helps protect the roots.

Irrigation

Proper irrigation is critical to produce quality fruit. Apply water under the branch canopy but not

against the trunk. Tree roots spread 15 to 20 feet from the trunk in all directions. Form a doughnut-shaped basin around young trees so water will not collect around the trunks. Keep at least 2 feet of bare soil around the tree base. Irrigate established trees deeply every 14 to 21 days. Trees in lawns often develop crown and root rots from shallow, frequent irrigation.

Thinning

Fruit trees often set more fruit than they can support. Thinning increases the size of the remaining fruit and improves fruit color and quality. Thinning helps maintain regular annual bearing in some apple cultivars and permits more thorough spraying for effective disease and insect control.

Apples and Pears

Thin apples and pears as soon as possible after the fruit has set. Do the first thinning within 20 to 25 days after full bloom. Many unpollinated apples drop naturally; but if too many survive, thin them again.

Leave 6 to 10 inches between fruits. The center or king apple in a cluster is usually the largest and best apple. Leave fewer fruit if larger apples are desired. Thin pears the same way.

Peaches

Thin peaches very severely. The sooner they are thinned after the bloom, the larger the fruit is at harvest. Final fruit size will not increase if thinning is done after pits begin to harden. Removing smaller fruits allows the remaining fruit to grow much larger. Leave one fruit for every 6 inches of new growth and leave more than 6 inches between the fruits.

Thin apricots and large plums the same as peaches, leaving one fruit every 3 to 4 inches along the limb.

Thinning sweet and pie cherries and smaller plums is not necessary.

Harvesting

Home grown fruits and nuts should be harvested and used at just the right time at "the peak of perfection," direct from the orchard or garden.

Apples

Pick apples when the fruit is fully colored for the cultivar. Some sound (not wormy or damaged) fruit will drop from the tree. Seeds will turn dark brown. With green or yellow apples, the ground color will show considerable yellowing. Taste is a good indicator of maturity. Mature apples separate easily from the spur with a gentle, upward twist. Spurs are productive over many years, so do not damage them when picking the fruit.

Pears

Pears do not ripen properly on the trees. If they turn yellow on the tree, the center turns brown and soft with a gritty flesh texture. A pear's color will begin to turn from a dark green to a light yellowish green. Dark brown seeds also indicate maturity and the flesh will soften slightly. Some sound fruit will drop from the tree. The fruits will also separate easily from the spur with a gentle, upward twist. Summer pears ripen in a few days at 70 degrees.

Peaches

Watch the color of the flesh, not the red color of the skin. It must be yellow and not green. It should soften slightly and the fruit should separate easily from the tree with a slight twisting motion.

Plums

Use the taste test on Japanese and European plums. They should be slightly soft, sweet, and juicy.

Apricots

Ripe apricots are completely yellow, but pick them before the fruit becomes too soft.

Cherries

Let cherries get completely ripe on the tree. They will be juicy and sweet but still firm. Do not break off the spurs when picking cherries because that is where blooms form for next year's harvest.

Almonds

Harvest in the fall by shaking them from the trees onto tarps or cloths on the ground. Moisten the outer husks if they do not open easily and crack open the softer, inner shells. Dry the kernels in a well-ventilated, dry place away from sunlight.

Hazelnuts (Filberts)

Once ripe nuts fall to the ground, gather them up every day so the squirrels do not get them. Put them in mesh bags or on shallow trays to dry. Fully dry nuts have a crunchy texture when eaten.

Walnuts

Walnuts fall to the ground as they ripen. Gather them and remove the husks and spread them on shallow trays in a shady place to dry. English walnuts require faster drying than black walnuts. Store them in mesh bags until cracking them. They are dry enough when the membrane between the halves breaks when it is bent.

Quality fruit can be produced in the home garden in Utah, but the process is not always easy or without expense or problems. Good production requires careful attention to soil and water management, pruning, and insect and disease control. Neglected trees are a source of disease and insect problems for other homeowners and commercial orchards.

Site Selection

Plant trees in deep, rich soil with good water and air drainage. Fruit trees will grow on a wide variety of soil types and poor soil can be improved by fertilization and cultural practices. Avoid extremely heavy or poorly drained soils when possible. Locate trees where they get full sun but avoid planting them in lawns or other areas where they receive excessive water.

Fruit Tree planting to	Years from bearing in years	Useful life 3 yrs	Estimated production per tree at: 6 yrs	10 yrs
Apple Dwarf	2 - 4	3 - 4	3 - 4	4 - 6
Semidwarf	3 - 4	10 - 15	15 - 20	15 - 20
Spur type	4 - 6	15 - 20	15 - 20	none
Standard	5 - 8	20 - 30	20 - 30	none
Apricot	3 - 5	15 - 20	0 - 1 p	1 - 2 b
Nectarine	2 - 3	10 - 15	1 - 2 p	1 - 3 b
Peach	2 - 3	10 - 15	1 - 2 p	1 - 3 b
Pear	3 - 4	10 - 15	0 - 2 p	1 - 2 b
Plum	3 - 5	15 - 20	0 - 2 p	1 - 2 b
Sour Cherries	3 - 5	15 - 20	0 - 1 p	2 - 4 p
Sweet Cherry	4 - 7	15 - 20	none	0 - 3 p

b = bushel p = peck

Buying Trees

Buy the best nursery stock available from reputable nurseries that guarantee the trees to be true to name, high quality specimens. Beware of bargain and incorrectly labeled trees. High prices do not necessarily mean high quality, but good, well-grown trees are not cheap.

If possible, purchase 1-year-old trees. One common mistake is to select oversized or ready-to-bear

nursery trees. Younger trees bear almost as soon, transplant better and are easier to develop into productive, healthy trees. Older trees cost more to grow so they are more expensive.

Planting the Home Orchard

Soil preparation is very important when planting the home orchard. Spade, till, or plow the soil 10 to 12 inches deep. Thoroughly mix any organic amendment into the soil before planting.

Home orchard pest control

The most difficult part of growing fruit in Utah is controlling the pests. Fruit trees are long-lived perennials with many pests, so they cannot be easily rotated to move them away from pests.

Utah residents are fortunate to have an excellent Integrated Pest Management (IPM) team which has developed and continues to refine the best methods for controlling fruit tree pests in the state. The appendix contains a list of Utah's tree fruit pests. However, control recommendations change frequently as pesticide registrations change. To stay current, Master Gardeners should sign up for the weekly pest advisories and access the home orchard pest control publication for the latest and most accurate information available. Log onto www.utahpest.usu.edu .

Review Questions

1. Define stone fruit, pome fruit, and nut.
2. What happens during the winter part of the growth cycle to temperate zone fruit trees in Utah?
3. When are the fruit blossoms that bloom in the spring formed on fruit trees?
4. What are the two general pruning rules?
5. How would a Master Gardener create a dwarf apple tree?
6. What is an espalier tree?
7. What are two common training systems for fruit trees?
8. Where is the best place to go to get current fruit pest control information?