UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UC Master Gardener Program
Amador County

Today's program will be recorded and posted on our website and our Facebook page.

https://ucanr.edu/sites/Amador_County_MGs/

Look under "Classes & Events" then "Handouts & Presentations" from our home page. Today's handouts will also be posted here.

https://www.facebook.com/UCCEAmadorMG/

Look for "Facebook Live" during the meeting or find the video link on our feed.

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UC Master Gardener Program
Amador County

Have a Gardening Question?

UC Master Gardeners of Amador County are working by phone and email to answer your gardening questions!

Phone: 209-223-6838
Email: mgamador@ucanr.edu
Facebook: @UCCEAmadorMG

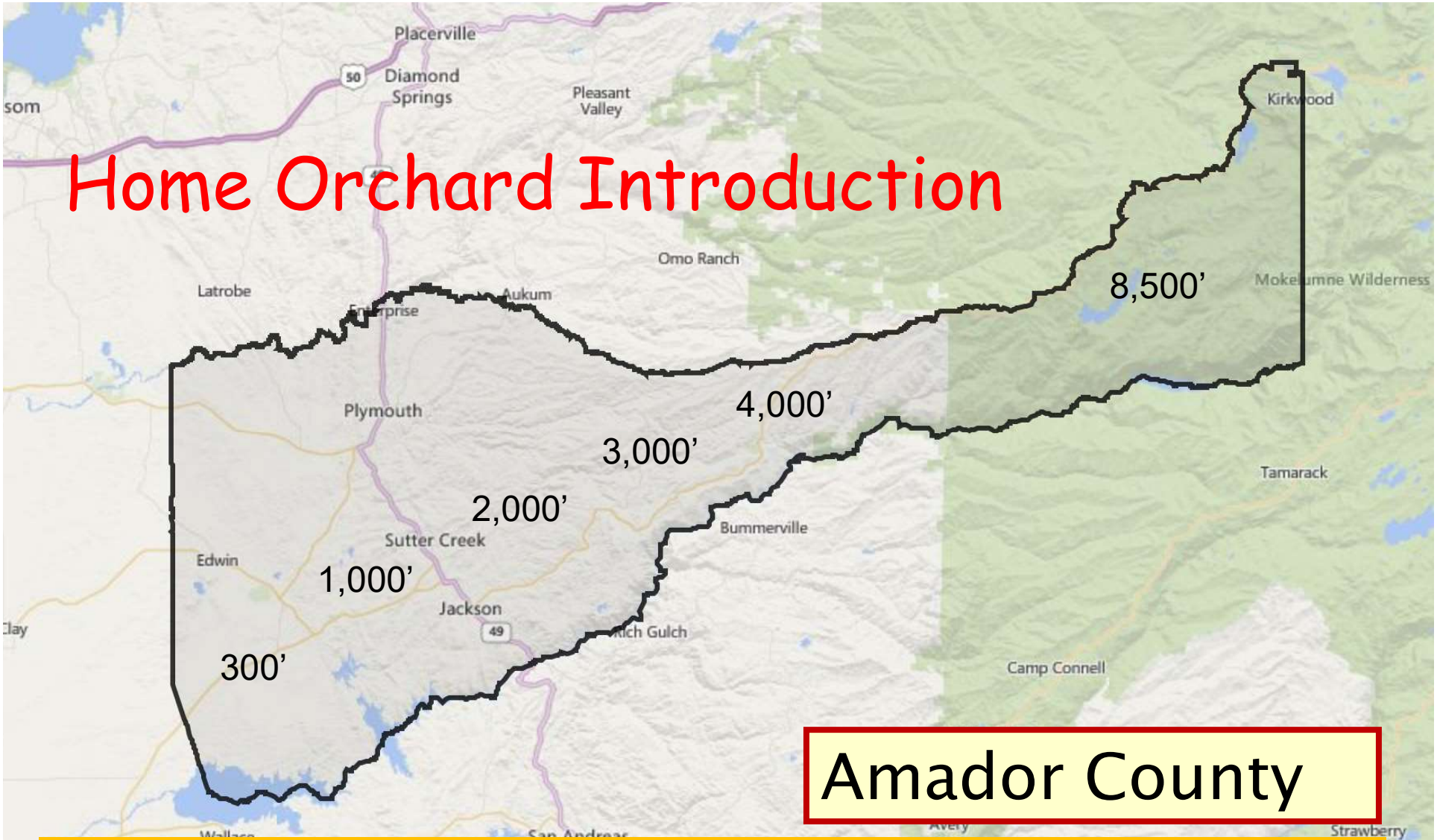
Not in Amador County? Find your local Master Gardener program by doing a web search for “UCCE Master Gardener” and your county name.

Your Home Orchard:
APPLES & PEARS

by UCCE Amador County Master Gardeners
John Otto & Hack Severson - October 10, 2020

To be discussed

- Home Orchard Introduction
- What are Apples & Pears?
- History & "Lore"
- Orchard Planning
- Considerations for Selection
- Varieties for the foothills



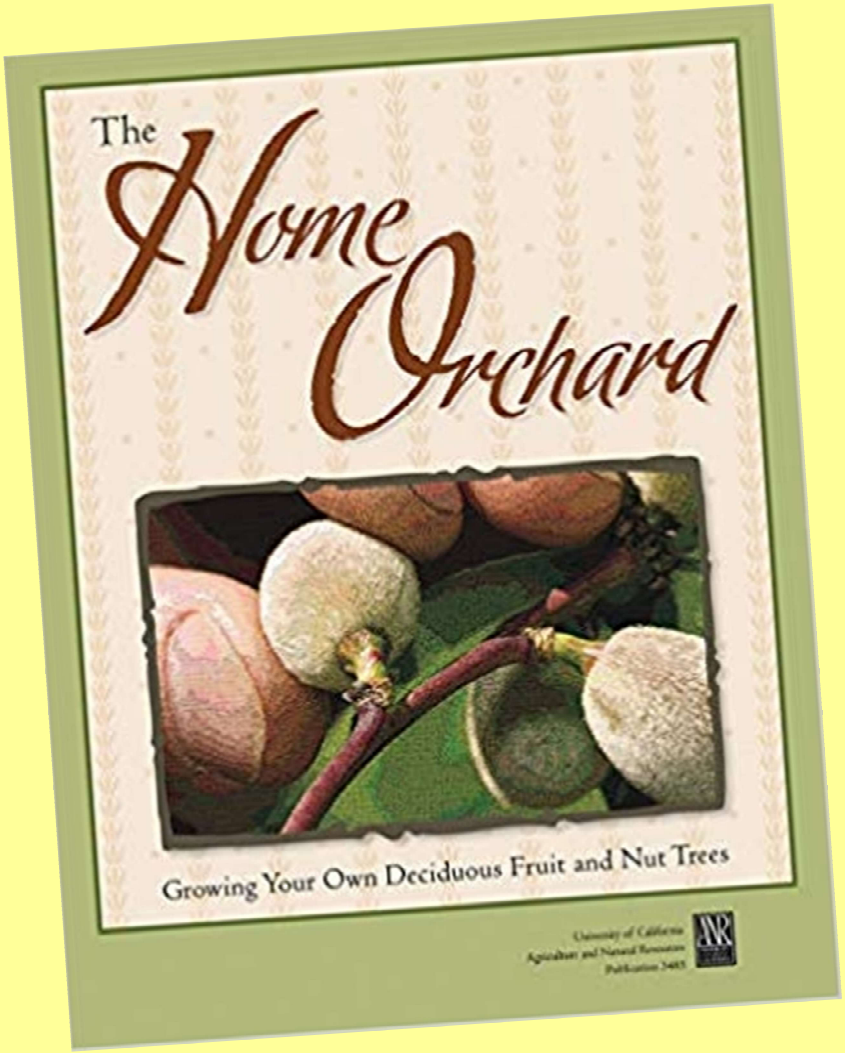
There are a variety of fruit and nut trees grown in the Sierra Foothills but elevations and micro-climates make selection an adventure.

Stone Fruits: Almond, Apricot, Cherry, Nectarine, Peach, Plumb, Prunes, Plumcots

Nut Crops: Chestnuts, Filberts (Hazelnut), Pecans, Walnut, Almond (truly a stone fruit)

Citrus: Lemon Lime, Orange (incl. Mandarin, Tangarine, others), Grapefruit, Kumquat, Tangelo

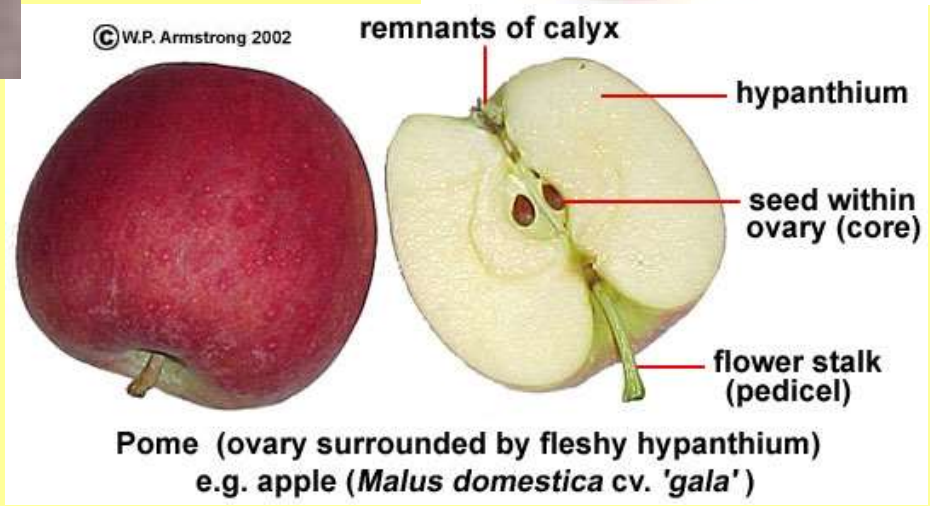
Pome Fruits: Apple; Pear; Pomegranates; Quince



"The Home Orchard", ANR publication #3485
https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3485

Apples and Pears Are??

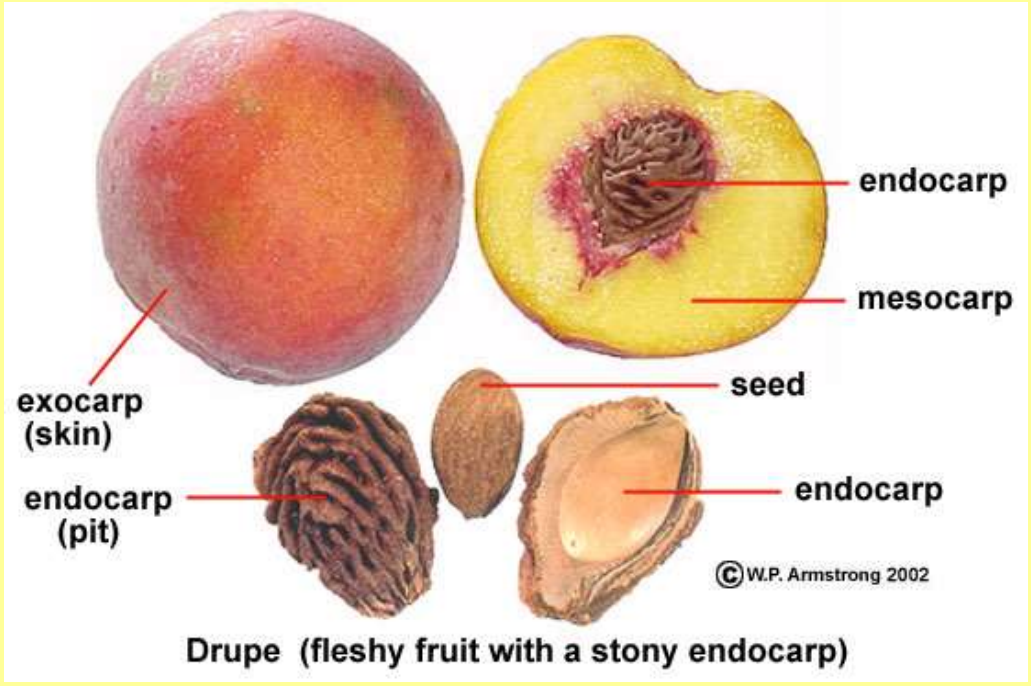
- How are Apples and Pears different from other fruits??
- They are **"Pome"** fruit (also pomegranate & quince). A fleshy fruit with a leathery core with many seeds.



Pome (ovary surrounded by fleshy hypanthium)
e.g. apple (*Malus domestica* cv. *'gala'*)

Apples and Pears Are Not!

Not a "stone" fruit (also known as "dupe") such as apricot, cherry, nectarine, peach, plum, prune, etc.

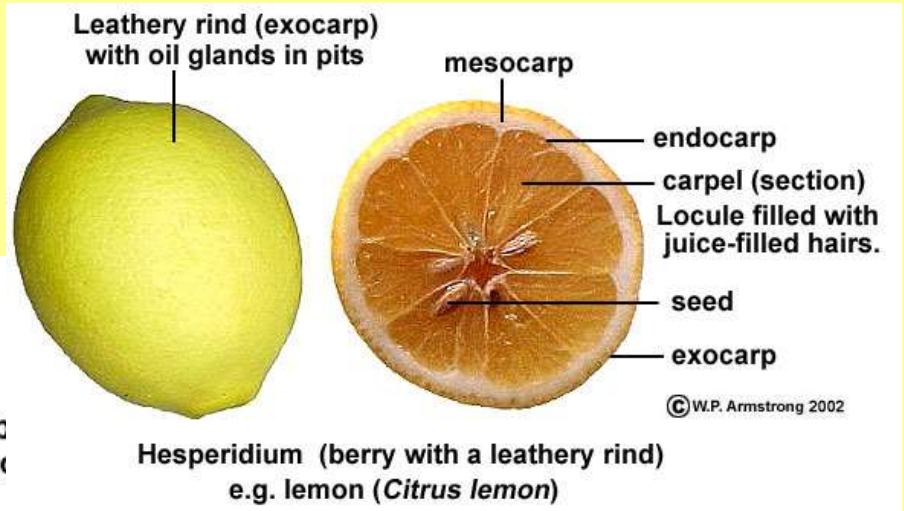


Drupe (fleshy fruit with a stony endocarp)

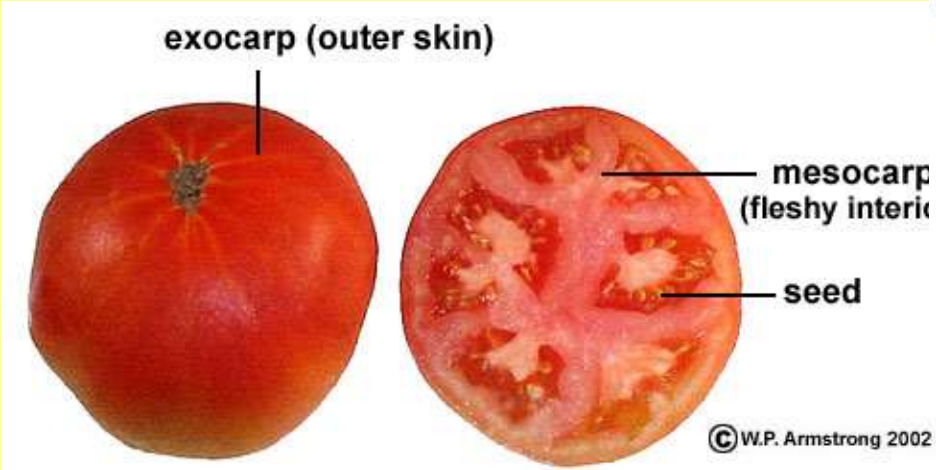
Stone Fruits are a simple fleshy fruit with a hard pit (woody endocarp).

Apples and Pears Are Not!

Not a "berry" like tomato, or citrus



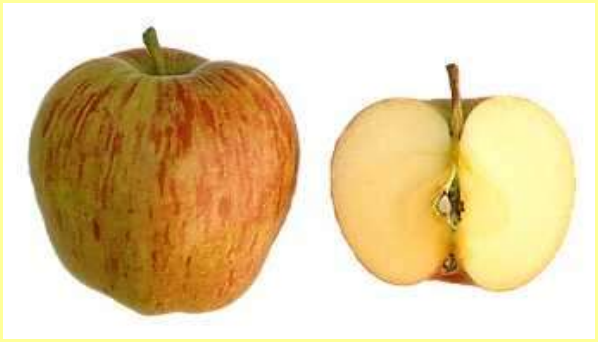
Hesperidium (berry with a leathery rind)
e.g. lemon (*Citrus lemon*)



Berry (All of most of pericarp is fleshy)
e.g. tomato (*Lycopersicon esculentum*)

What are Apples??

Our domesticated Apple is classified as ***Malus domestica***
a derivation of the wild apple ***Malus sieversii*** native to the mountains of Central Asia, around the Caspian Sea region, Southern Kazakhstan.



Apple Facts

- We eat approx. 17 pounds of fresh apple and 29 pounds of processed apple products a year.
- Eat it all. The skin has twice the antioxidants as the rest meat.
- Apples are fat, sodium and cholesterol free.
- A medium apple is about 80 calories.
- The crabapple is the only apple native to North America.
- “An apple a day keeps the doctor away” is true. Hippocrates 400 BC use Apples as a primary remedy for ailments.
- For more interesting Apple Facts go to: . https://web.extension.illinois.edu/apples/facts.cfm

What are Pears??

- Pears are typically not found in the “wild”, unlike apples.
- Cultivated long before the Christian era.
- Similar introduction to the Americas as the apple but fewer varieties, but still thousands.
- The European pear, ***Pyrus communis***, is characterized by melting flesh fruit with an aromatic quality and a noticeable sugar/acid balance European pear generally “elongated”.
- Asian pears are derived from distinctly different species such as ***Pyrus ussuriensis*** and ***Pyrifolia*** native to China, Manchuria and Korea.
- Asian pear often oval.
- Generally sweeter and softer than apples.

Pears

- Pears are classified as “European” or “Asian varieties.
- Many varieties, such as the Asian “Nashi” pear, are not “pear shaped”.
- Non-fruiting varieties of pear, such as the Bradford pear, are grown as ornamentals.

Pear Facts

- There are over 3000 varieties of pears grown around the world.
- Like Apples the Pear are native to Asia and Europe
- Introduced into North America early 1600's in the Massachusetts Bay colony.
- Before tobacco was introduced in Europe, pear leaves were smoked.
- Most US pears grown in Washington and Oregon states. China is the world leader in Pear production.

Orchard Planning

Site Selection

- Full sun is best
- Sloping ground = better drainage.
- Some protection from strong winds.
- South facing slopes usually better than north facing.

Golden Delicious

Orchard Planning

Soils

•Dig up your property.

•https://casoilresource.lawr.ucdavis.edu/gmap is a user friendly interactive map locator of soils on your property as of the 1960's. The website created by University of California and the Natural Resources Conservation Service.

•View the "Soil Survey" of your County at the Co. Agriculture Dept. There is a "*Soil Survey - Amador Area"* (Series 1961, No. 26, Issued Sept. 1965).

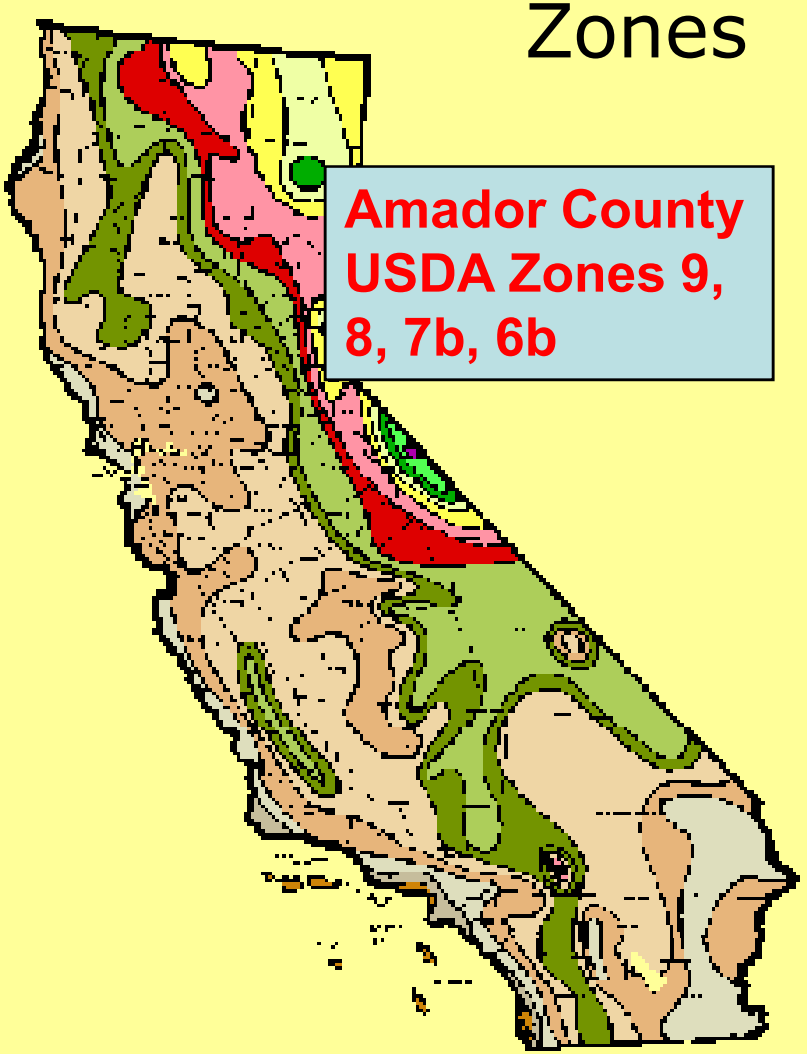
•Note: If your property has been "altered" since 1960, the surface soil types have likely been changed.

Orchard Planning - know your zones?

Sunset Climate Zones

Amador County' Sunset Zones 9. 7, 1A

USDA Plant Hardiness Zones



Amador County USDA Zones 9, 8, 7b, 6b

Orchard Planning

Tree Sizes

- Standard-------- 25 to 30 ft
- Semi-Dwarf---- 15 to 20 ft
- Dwarf---------- 8 to 10 ft

Controlling Tree Size

- **Why?** To ease management, no ladders for spraying, pruning or harvesting.
- **How?** Periodic pruning to size and shape. Maintenance pruning once tree is at desired size.

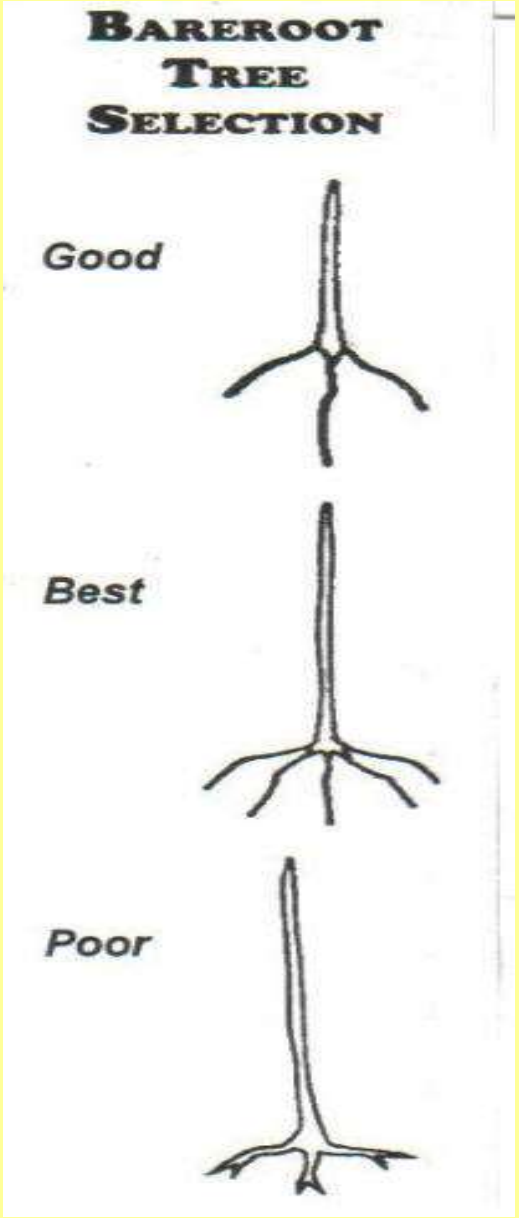
Orchard Planning

Bare Root Tree Selection

- Purchase December - February.
- Plant January – March. Plant at higher elevations later than lower elevations.
- Can pre-order in October at local nurseries.
- Select size from 3/8” to 5/8” diameter.
- Check out root structure.

Container Tree Selection

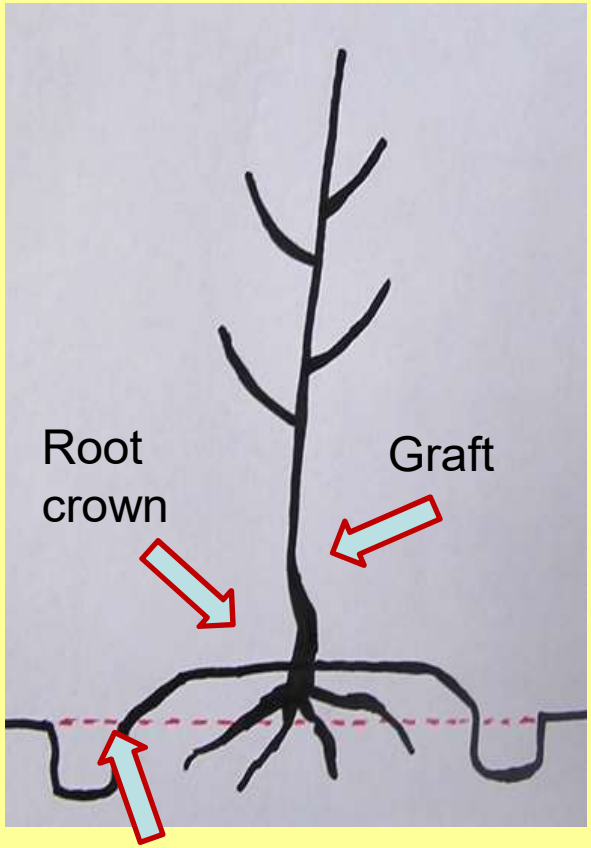
- Purchase almost any time.
- Plant typically in the spring – March –May. Plant at higher elevations later than lower elevations.
- Select size from 1/2” to 3/4” diameter.
- Take out of pot and check root structure.



Orchard Planning

Planting

- Planting hole needs to be no deeper than the root system. Spread roots over a ball of soil.
- The hole can be wider. Loosened the soil on the sides with a spading fork.
- Orient graft (bud union) towards the north or north east to protect from sun exposure.
- Keep root crown above original soil level to allow for settlement.



- Backfill with native soil. In general, do not add soil amendments or fertilizer of any kind. Except that phosphorous is deficient in much of foothill soils. If needed add phosphate at the bottom of hole and cover with 3” of soil.
- Make a water basin ring approx. **3 ft**. from the trunk, BUT at least 4 inches away from the trunk.

Orchard Planning

Maintenance

- Protect trunk – Use 50-50 mix of water & white latex paint (flat not gloss) to prevent sunburn.
- Keep leaves and grass free of drip line.
- Summer watering – Deep but not often
- Fertilizing – Late summer / early fall **AND** early spring
- Pruning - To provide light - allow for air circulation - manage height and shape
- Dormant spray - Fixed copper and oil or lime sulfur and oil. Winter. (DO NOT use sulfur products on apricots)

Bosc pear

Fujii apple

Braeburn

Jonagold

Gala apple

Orchard Planning

"Frost" issues:

- Select Varieties suited to your micro-climate. Consider "chill hours" and "Cold hardiness".

- Consider Site orientation. Bottom lands (valleys) and north slope exposures.
- Consider the need for "Protection". Provide air circulation, water spray and/or fabric cover.

Orchard Planning

Thinning

- Blossom Thinning in spring.
- Fruit Thinning in late spring.
- There is “natural fruit drop”.
- Apples = thin to 6” to 8” apart.
- Pears need less thinning.

Comice pear

Spartan apple

Benefits of Thinning:

- Fruit develops to its maximum size.
- Less chance of limb breakage.
- Reduced chance of some diseases.

Orchard Planning

Fertilization

- Early spring
- Late summer / early fall
- Keep fertilizer away from trunk.
- Don't over fertilize! Keep N (nitrogen) to no more than 1 pound per year. Too much N causes excessive growth & shading of lower wood.

Arkansas Black apple

- Use organic amendments / composts which provide micronutrients slowly over time.
- Other nutrients are usually sufficient except that we do need phosphorous in most areas of the foothills.

Apples and Pears

Considerations for Choosing Varieties

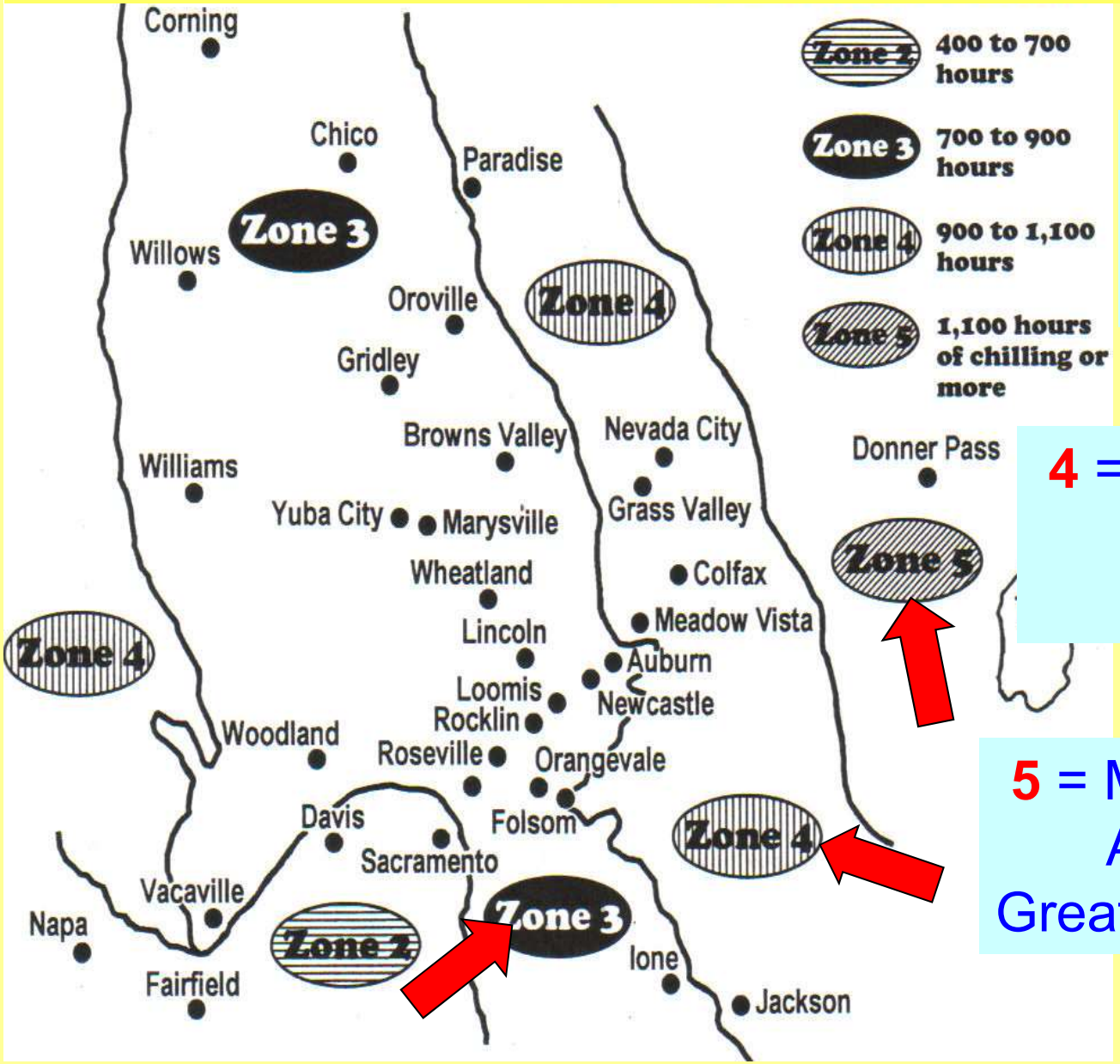
- Chill hours
- Root stocks
- Years to production
- Pollination
- Diseases
- Fruit Maturity

  (Early, mid and late season)

Chill Hours

- In the winter months, the tree's internal processes are in a state of rest, known as **dormancy, due to the presence of growth inhibitors.**
- Chill hours equal the number of hours from 45 to 32 degrees F, between November and mid-February typically. Cumulative chill hours are required to break dormancy.
- Once the appropriate number of hours of chilling have been achieved, active growth resumes in the spring, but only after trees are exposed to warm enough temperatures for natural growth processes to begin. Without adequate "chill" buds will open slowly or not at all.
- Most of Northern California including Amador County receives between **800 and 1,500 hours** of dormancy each winter. Southern California may only receive 100–400 hours.
- ***Educated guess: Ione at 800 Jackson at 1000; Pioneer at 1600; Amador Pines at 1800. Consider your micro-climate!***

Chilling Hours Zones for the Foothills



3 = Ione Valley - Jackson
700 – 900 hrs.

4 = above Hwy 49 - Pioneer
900 – 1,100 hrs.

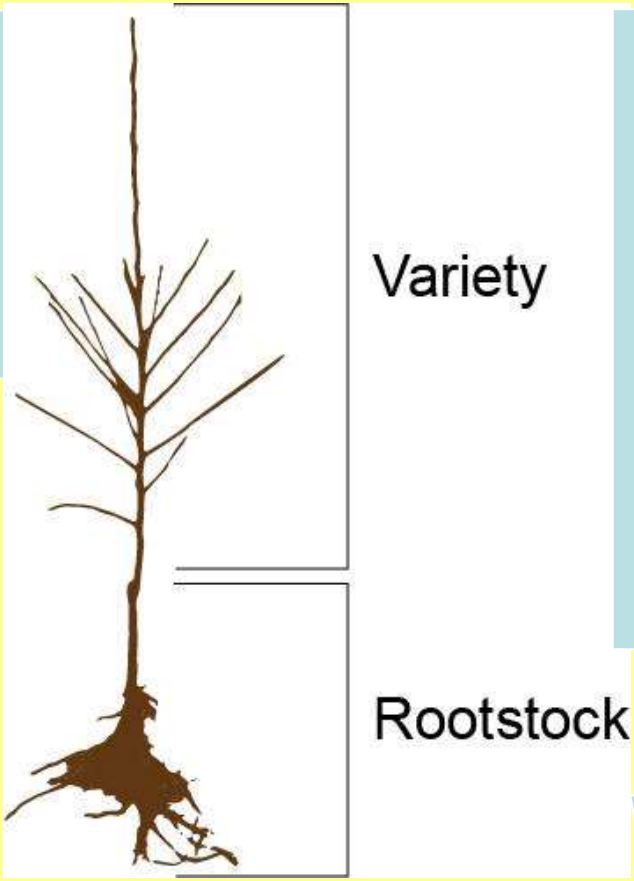
5 = Mace Meadows - Amador Pines
Greater than 1,100 hrs

Fruit Tree Rootstocks

Apple:

M-111 **M-26**

M-9 **M-7**



Pear:

Winter Nelis
OHxF97
OHxF333
Calleryana
Betulaefolia

Plumb:

Myrobalan 29-C
Marianna 2624

Cherry:

Mahaleb
Colt
Mazzard

Peach:

Citation **Atlas**
Nemaguard
Lovell

Lots of Choices?

Rootstock Purpose

- To improve growth, vigor, disease resistance and size.
- **Apples** have a variety of rootstocks, with **M-111** being the most common and hardy for our area. M111 is a Semi-dwarf rootstock and Usually produces a tree 80% the size of the same tree on seedling rootstock. M111 tolerates many soil conditions.

- **Pears** also have a variety of rootstocks. A common rootstock for Bartletts is **"Winter Nelis"** or **"OHxF 87 or 97"** (*Old Home x Farmingdale)* which are somewhat fire blight resistant.
- Asian pears are typically on **Betulaefolia** root stock.

- Let the nursery recommend and determine the root stock that is available and best for your area.

Years to production

- Varies greatly depending on the variety.
- Standard size tree:
  Apples approximately 4-7 years
  Pears approx. 4 – 8 years
- Semi-dwarf tree:
  Apples approx. 3-4 yrs;
  Pears longer
- Dwarf tree: Apples
  approx. 2-3 years;
  Pears longer
- Climate & Soils are
  the big determiner.

Barton Orchard – tree #9 (9/13/13)

Apples and Pears

Apple and Pear trees are "resilient" and even with years of neglect can survive, and even thrive!

Barton orchard trees planted in the 1920's and still producing good fruit.

Pollination

Pollenizer = A tree of one variety used to provide pollen to a nearby tree of a different variety.

Pollinator = An insect (usually a bee) that carries pollen from one tree or flower to another.

King James Orchard -

All apple and pear trees need pollination. Most will set adequate fruit on their own, but will set more fruit if pollinated by another variety. Certain varieties (triploids), do not produce fertile pollen, will not fertilize their own flowers or those of other apples. If a pollinating variety grows in your neighborhood, you need not plant one yourself.

	Braeburn	Cortland	Fuji	Gala	Golden Delicious	Honey Crisp	McIntosh	Red Delicious	Jonagold	Spartan	Jonamac
Braeburn	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Cortland	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Fuji	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y
Gala	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y
Golden Delicious	N	Y	N	N	N	Y	Y	Y	N	N	N
Honey Crisp	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y
McIntosh	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
Red Delicious	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
Jonagold	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Spartan	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
Jonamac	Y	Y	Y	Y	Y	Y	X	Y	N	Y	N

Y= good cross pollinator for that cultivar

N= will not cross pollinate with that cultivar

IMPORTANT: NEED to check “blossom time” compatibility.

Disease

Useful Integrated Pest Management (IPM) website:
http://www.ipm.ucdavis.edu

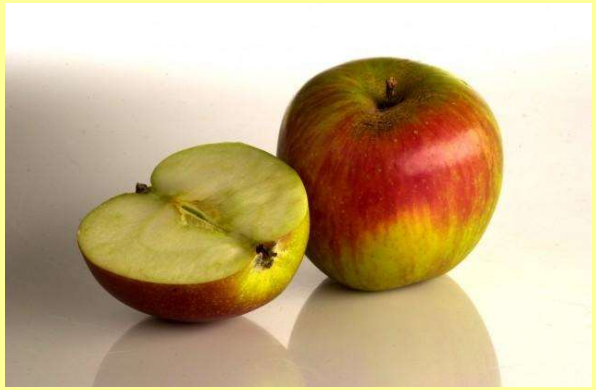
Apples:

- Codling Moths (pest)
- Fire Blight (bacterial)
- Apple Scab (fungal)
- Woolly Apple Aphids (pest) mostly controlled with M-111 rootstock.
- Apple Maggots (pest)

Pears:

- Fire Blight (bacterial)
- Pear scab (fungal)
- Sooty Blotch (fungal)
- Pear Decline (typically a rootstock issue)

Fruit Maturity (Harvest Time)



Gravenstein

Seckel Pear

Some Popular Varieties

Early Season - June – July:

Apple: Gravenstein; Gala; Lodi

Mid Season - July – September:

Apple: Empire; Jonagold; Johnathon; Red Delicious; Honeycrisp;

Pear: Seckel; Bartlett/ D'Anjou

Late Season - September – December:

Apple: Golden Delicious; Fuji; Granny Smith; Pink Lady; Arkansas Black;

Pear: Bosc; Conice;

Varieties of Apples & Pears

D'Anjou Pear

- Consider your "micro-climate" conditions!
- Higher elevations: Above 3500': Choose varieties requiring higher chill hours and colder hardiness zone.

Apple Varieties

Fuji Apple

Some Popular Varieties (2019)

- Fuji
- Gala
- Honeycrisp
- Cripps Pink Lady
- Granny Smith
- For the Varieties at Apple Hill check these good websites:
  www.applehillorchard.com/copy-of-apple-varieties
  www.applehillfarm.com/about-the-farm/apple-varieties/

Honeycrisp

Granny Smith

Apple Varieties

Honeycrisp

Crisp and juicy fruit, aromatic flavor. Winter hardy and early season harvest. Stores well. Needs a pollenizer with similar chill hrs. 800 to 1,000 chill hrs.

Gala Apple

Nice rich flavor, a blend of sweet and tart. Good pollenizer for other varieties. Early season. Less than 500 chill hrs.

Apple Varieties

Cripps Pink Lady

Very crisp, sweet tart, good keeper. White flesh resists browning. Self pollinating Even later season than Fuji. 300 to 400 chill hrs.

Fuji Apple

Sweet, very crisp & sweet, excellent keeper. Excellent pollenizer for other apples. Late season. Less than 500 chill hrs.

Apple Varieties

Granny Smith

Granny Smith

An antique variety, grass green with crisp tart flavor. Good pollenizer. Excellent keeper. Self pollenating. Very late season. 400 chill hrs.

Jonagold

Superb flavor, crisp, juicy, all-purpose and great for cooking. Needs a pollenizer. Excellent keeper. Mid to late season harvest. 700 – 800 chill hrs.

Old Apple Varieties that have grown well locally
[King-James and probably Barton orchards]

Old Apple Varieties that have grown well locally

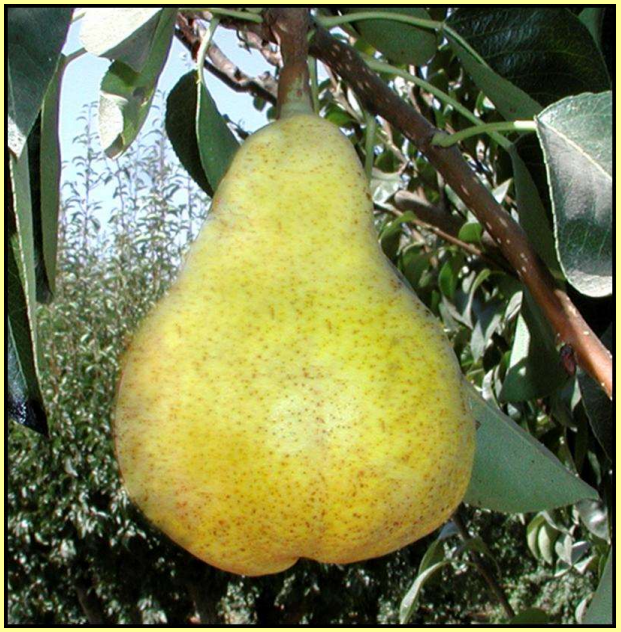
[King-James and probably Barton orchards]

Old Apple Varieties that have grown well locally
[King-James and probably Barton orchards]

European Pear Varieties

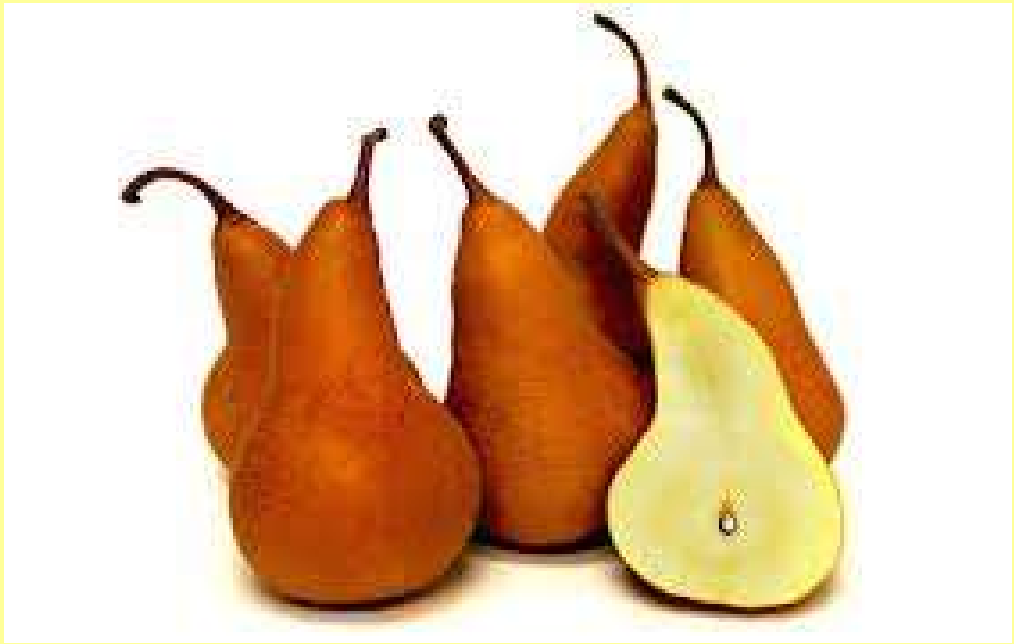
Bartlett Pear

Classic pear shape, smooth green skin, turn yellow when ripe. Mostly self-fruitful. 800 chill hrs.



Bosc Pear

Slender shape, mottled tan to gold color, subtle nutty flavor. Recommend Bartlett pollinator. 800 chill hrs.



European Pear Varieties

Comice Pear

Short & squat, greenish yellow color & red, blush when ripe. Perhaps the best pears for eating raw. Self-fruitful. 600 chill hrs.

Florelle Pear

Small bell shape, green then ripen to yellow color & red blush. Similar to Seckel pear but slightly larger. Assumed similar to Seckel, self-fruitful. 800 chill hrs.

European Pear Varieties

Seckel Pear

Petite, bite size, red or red & green color. Perhaps the best dessert pear. Self-fruitful. 800 chill hrs.

D'Anjou Pear

Large, squat shape, firm, variety of colors (green, yellow, red), will not change color after ripening. Recommend Bartlett pollinator. 800 chill hrs.

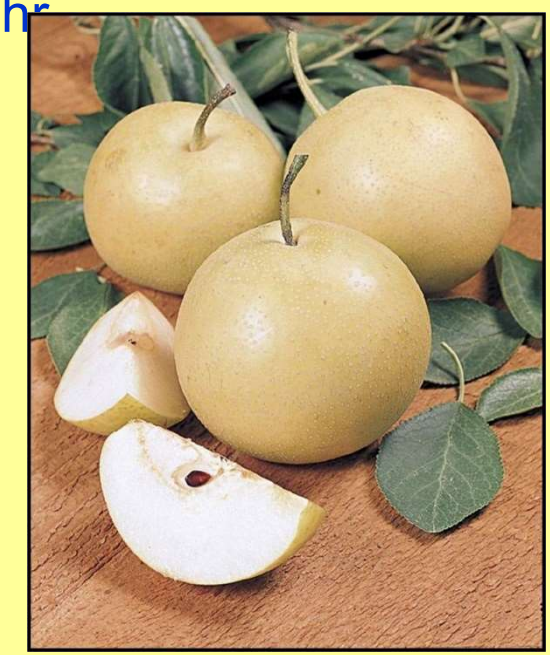
Asian Pear Varieties

Asian Pear - Chojuro

Medium, round. Greenish-brown to russet brown skin. Flesh white, mildly sweet, very finn texture, crisp, somewhat coarse, good quality, good aroma. Variety of pollinators. 300-500 chill hrs.

Asian Pear-Hosui

Medium to large. Golden russeted skin. Juicy, sweet, flavorful, fine textured flesh. Crisp and refreshing like an apple. Good keeper. Variety of pollinators. 300-400 chill hr



Asian Pear Varieties

Asian Pear-Shinko

Medium to large. Brownish-green skin. Excellent, rich, sweet flavor. Fine texture. Russet type. Variety of pollinators. 450 – 500 chill hr.

Asian Pear- Shinseiki

Medium to large, round, yellow, thick, smooth skin, crisp and juicy flesh. Good quality. Self pollinating. 350 – 450 chill hrs.

References:

- "The Home Orchard", ANR publication #3485
  https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3485
- "California Master Gardener Handbook", Second Edition
  (Chapter 16), ANR pub. #3382
- Local Nurseries like Ridge Garden Center, Pine Grove
- Sunset Western Garden Book
- Online sources:
  http://homeorchard.ucdavis.edu/
  www.davewilson.com/home-gardens/backyard-orchard-culture
  www.davewilson.com/product-information/category
  www.groworganic.com/
  www.sierragoldtrees.com/varieties/apples
  www.raintreenursery.com/
  www.calpear.com/our-fruit/selecting-fruit

The best source is to ask what others have grown!

Help Us Grow!

Our follow-up survey provides us the tools we need to grow and improve the quality of our program.

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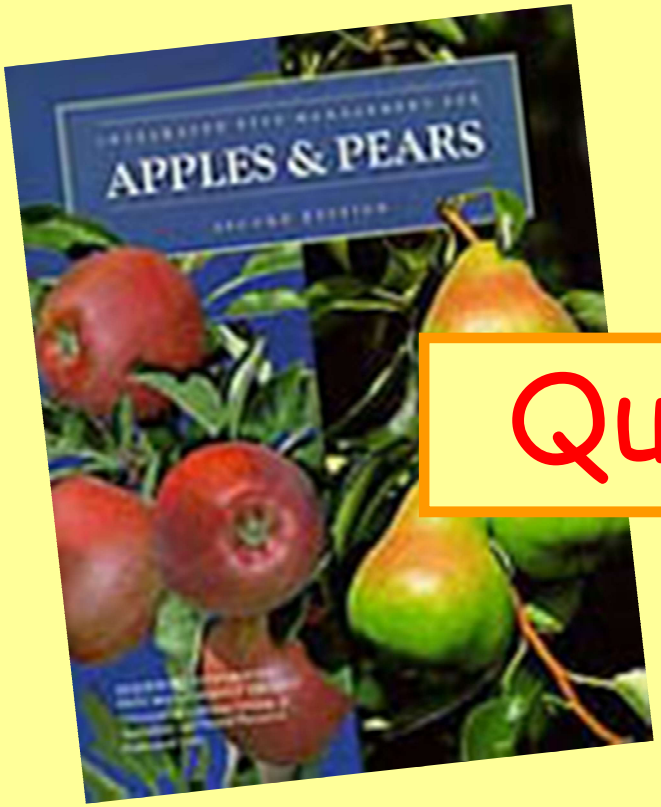
UC Master Gardener Program



Questions?

"The Home Orchard", ANR publication #3485
https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3485

"Integrated Pest Management for Apples and Pears" pub. #3340
https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3340