SELECTION & PLANTING

Deciduous Fruit Trees
Citrus Trees

December 2010 Edition

Walter Miller MG

Acknowledgements

Technical Assistance: Robin Cleveland
Photography: Kathryn Hall

Goal

To have successful plantings of desired fruit trees

Some desired fruit may not be productive in a particular location

Our focus will be on Backyard Orchards

Index

Part 1: Deciduous Fruit Trees

Part 2: Citrus Trees

Part 1

Deciduous Fruit Trees

Temperate Zone Trees

Cold Hardy for our area.

Basic Requirements

Sunlight:

a minimum of 8 hours direct

Water:

the trees must be irrigated

Space:

tree size at maturity

Other challenges can be overcome

(They will be addressed as they arise)

Space & Size limitations?

Plan

Choose a mature size of tree; this drives spacing.

Is space limited? Determines number of trees.

Size dictates ease or not in “tending” tree.

Tending includes: pruning, netting, thinning, harvesting – all processes necessary to produce fruit.

All trees require pruning!

Selection

Two parts:

- Cultivar (what will be eaten)
- Plant Stock (what will be grown)

Terminology

Variety is type of tree, e.g., Apple

Cultivar is a named variety, e.g., Fuji

Homework

Preparation before purchase

(an impulse buy at the nursery may not work)

Have an awareness of the site of the planting

(Site considerations will be discussed in the Planting section)

Variety/Cultivar selection

Known and Desired
New and Experimental
determined by word of mouth
or taste test
or researching catalogs

Research at Home

Use of catalogs, websites; there are many suppliers
Recommendation Dave Wilson Nursery

It supplies most if not all of the local retail stock.

Out of region suppliers require consideration on compatibility of soils and climate.

ANR publications

REFERENCE PUBLICATIONS

Dave Wilson Publications
- Description of Varieties and Rootstocks
- Fruit and Nut Harvest Dates

Local Nursery Handouts

Taste Test Results

UCANR Publications: The Home Orchard
- The Master Gardener Handbook

Note: Dave Wilson Website ; davewilson.com
UC website; home orchard.ucdavis.com

Considerations

Pollination:

Is cultivar self fertile (not require a pollinator)
or self sterile (require a pollinator)?

Chill Hours:

Is winter cold and long enough to overcome dormancy?

(Generally in our community, this is not an issue. But it could be for high or low chill requirements.)

Bearing Time:

When in the season, fruit is desired. This is relative and based on yearly conditions.

Pollination

Apple	SS, PSF
Apricot	PSF, SF
Cherry	SS, ?
Peach/Nectarine	SF
Pear	SS
Plum	SF, PSF, SS

SS = self sterile
SF = self fertile
PSF = partially self fertile (a pollinator helps)

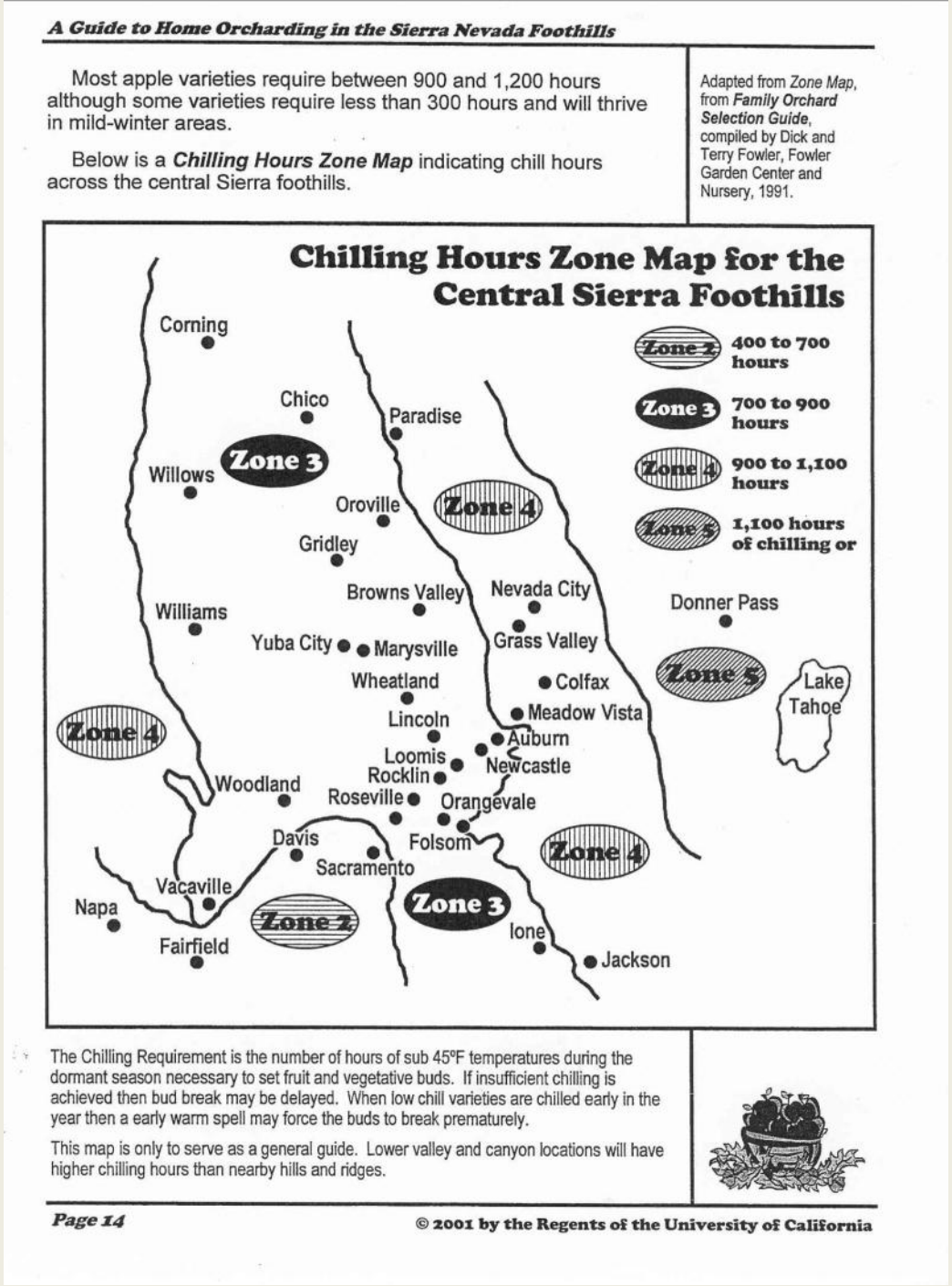
Chill Hours Defined

Basically: an hour at temperatures < 45 deg. F
and >60 deg. F
(<45 = + hour ; >60 = - hour)

It's a complex issue with different measurement systems

Chill Hours

Hours produced by typical winter weather. The county is in Zone 4 (900 to 1100 hours) with the exception of the lower West Slope, Zone 3 (700 to 900 hours)



A Guide to Home Orcharding in the Sierra Nevada Foothills

Most apple varieties require between 900 and 1,200 hours although some varieties require less than 300 hours and will thrive in mild-winter areas.

Below is a ***Chilling Hours Zone Map*** indicating chill hours across the central Sierra foothills.

Adapted from *Zone Map*, from ***Family Orchard Selection Guide***, compiled by Dick and Terry Fowler, Fowler Garden Center and Nursery, 1991.

Chilling Hours Zone Map for the Central Sierra Foothills

Zone 2 400 to 700 hours
Zone 3 700 to 900 hours
Zone 4 900 to 1,100 hours
Zone 5 1,100 hours of chilling or

Corning
Chico
Paradise
Willows
Zone 3
Oroville
Zone 4
Gridley
Williams
Browns Valley
Nevada City
Donner Pass
Yuba City
Marysville
Grass Valley
Wheatland
Colfax
Zone 5
Lake Tahoe
Meadow Vista
Zone 4
Lincoln
Auburn
Loomis
Newcastle
Rocklin
Woodland
Roseville
Orangevale
Davis
Folsom
Zone 4
Sacramento
Vacaville
Napa
Zone 2
Zone 3
Fairfield
Ione
Jackson

The Chilling Requirement is the number of hours of sub 45ºF temperatures during the dormant season necessary to set fruit and vegetative buds. If insufficient chilling is achieved then bud break may be delayed. When low chill varieties are chilled early in the year then a early warm spell may force the buds to break prematurely.

This map is only to serve as a general guide. Lower valley and canyon locations will have higher chilling hours than nearby hills and ridges.

Typical Chill Hours

Apple	500-1000
Apple (low chill)	400-600
Apricot	300-800
Cherry	700-800
Peach/Nectarine	500-800
Pear	700-800
Plum	250-700

Bearing Time

Most cultivars bear in one relatively short period
This is generally the case. (Determinant)
Some cultivars bear over a longer period.
(Indeterminant)

Extended Harvest: a number of cultivars of the same variety bearing over a longer (extended period)

Ref. Dave Wilson Harvest Chart

Fruit Trees
Nut Trees
Shade Trees
Vine & Bush Fruits
Flowering Trees
Flowering Shrubs
Ornamentals
Rootstocks

Backyard Orchard Culture
About Planting Trees
Fruit Tasting Report
Zaigers Genetics

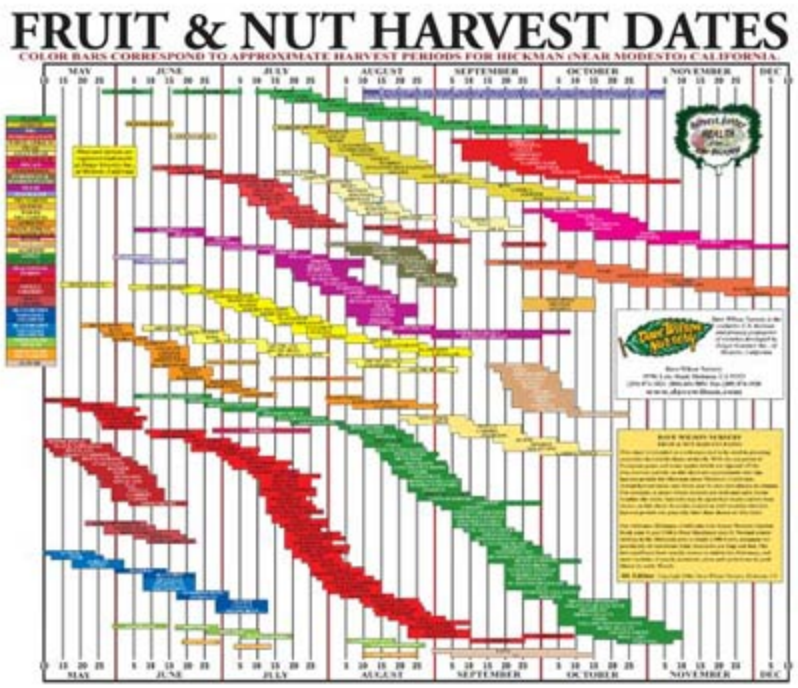
Find Your Retailer
By Variety:
Where Can I Find It?

USDA
Plant Hardiness
Zone Map

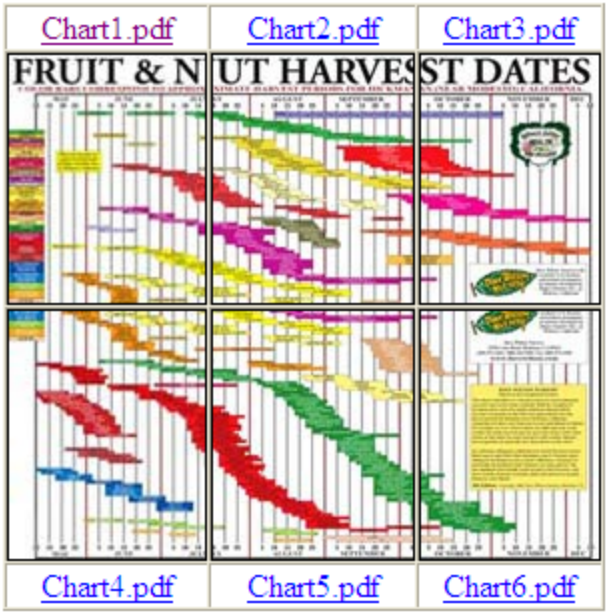
Links

And Now:
the ***Fruit and Nut Harvest Dates*** **chart!** Plan for an extended harvest!

For almost ***immediate gratification,***
here's a big, web-based version at near 1MB



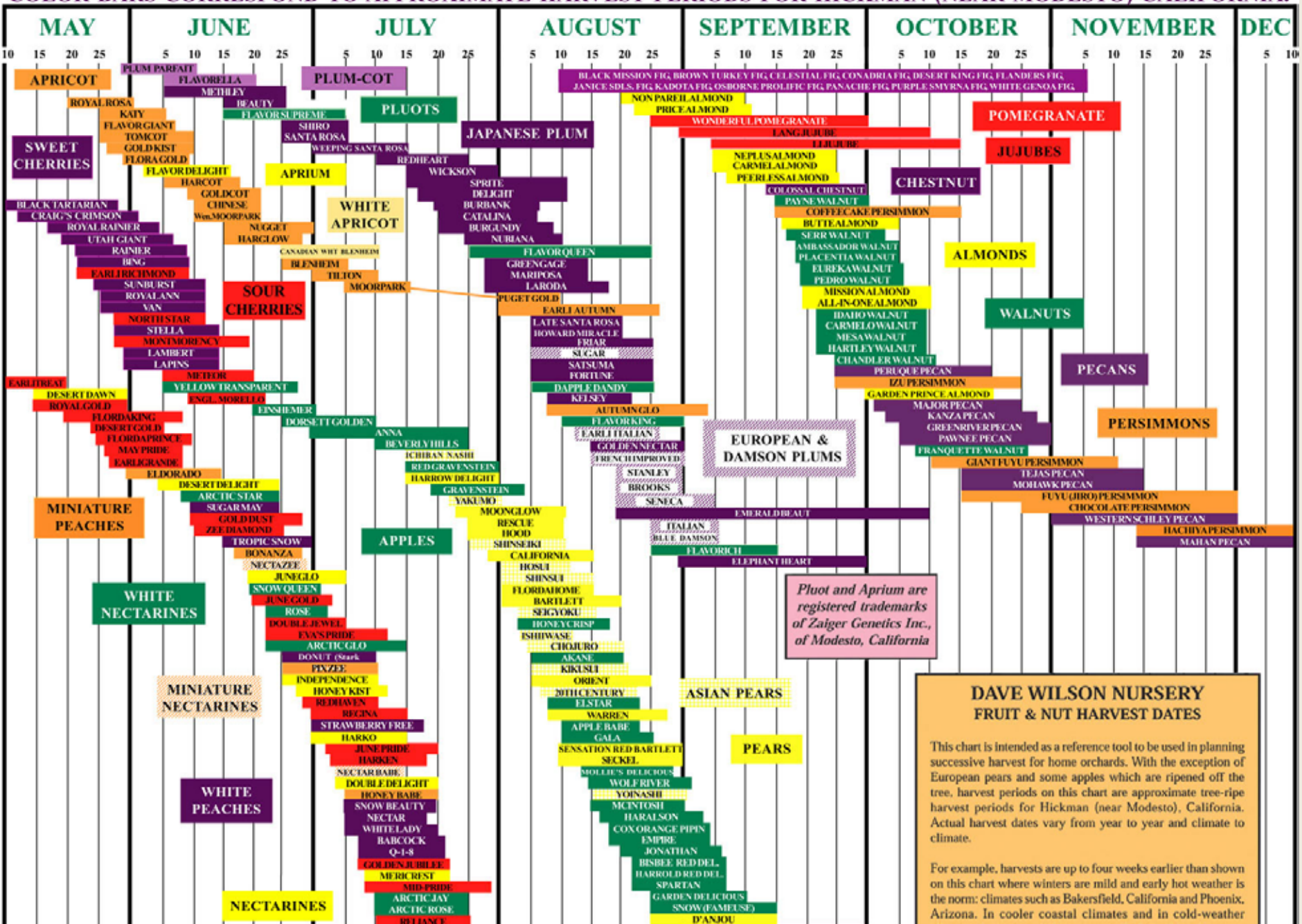
Or...here are **6 large .pdf files** you can download.



You'll need scissors & tape...and some patience...

FRUIT & NUT HARVEST DATES

COLOR BARS CORRESPOND TO APPROXIMATE HARVEST PERIODS FOR HICKMAN (NEAR MODESTO) CALIFORNIA.



Pluot and Aprium are registered trademarks of Zaiger Genetics Inc., of Modesto, California

DAVE WILSON NURSERY

FRUIT & NUT HARVEST DATES

This chart is intended as a reference tool to be used in planning successive harvest for home orchards. With the exception of European pears and some apples which are ripened off the tree, harvest periods on this chart are approximate tree-ripe harvest periods for Hickman (near Modesto), California. Actual harvest dates vary from year to year and climate to climate.

For example, harvests are up to four weeks earlier than shown on this chart where winters are mild and early hot weather is the norm: climates such as Bakersfield, California and Phoenix, Arizona. In cooler coastal climates and in cold-weather

Other Characteristics of tree

Size at maturity:
[This is relevant to the available space]
- genetic dwarfs
- dwarf root stock
- “semi-dwarf” rootstock
- standard trees

Years to Bear

Multiple cultivars

N.B. All trees will require pruning!

Size at Maturity

	height (ft)	spread (ft)
Apples		
dwarf	6 -10	8-10
semi-dwarf	10-14	14-18
standard	25-30	18-20
Apricot	20-25	18-20
Cherry		
genetic dwarf	6-8	~6
semi-dwarf	14-20	14-18
standard	25-35	20-25
Peach/Nectarine		
genetic dwarf	3-6	5-8
standard	8-18	18-20

Years to Bear

Apple	
dwarf	2-3
semi-dwarf	4-5
standard	5-7
Apricot	4-5
Cherry	4-6
Peach/Nectarine	2-4, possibly 1
Pears	3-7

Navigating Dave Wilson

First approach by slides

Second by web search

- With time and if the web cooperates

DWN logo

Fruit, Nut and Shade Tree Growers

for the Commercial and Retail Nursery Industry since 1938

Fruit Trees ~ Deciduous Trees ~ Shade Trees ~ Ornamentals

The Commercial Grower

The Retail Nursery

The Home Fruit Tree Grower

We grow Orchard Stock for

- almond & walnut growers
- growers of packing fruit
- farmer's market & fruit stand growers
- cling peach & prune growers

We grow for

- garden centers & the retail trade
- wholesale buyers of landscape trees

We offer a complete program of retail sales aids and other assistance for our customers

Advice for the backyard orchard grower

- where to buy our trees
- how to plant a fruit tree
- photos of backyard orchards
- Backyard Orchard Culture!

The DWN Backyard Orchard Culture Index - Windows Internet Explorer

http://www.davewilson.com/homegrown/homeindex1.html

File Edit View Favorites Tools Help

The DWN Backyard Orchard Culture Index

- Fruit Trees
- Nut Trees
- Shade Trees
- Flowering Trees
- Vine & Bush Fruits
- Flowering Shrubs
- Ornamental Mix
- Rootstocks
- Where to Buy Our Trees
- Backyard Orchard Advice
- How To Plant Trees
- Photos of Backyard Orchard Culture
- The Fruit Tasting Report
- About Blueberries
- About Persimmons
- About Chill Hours
- Fruit Harvest Chart
- Recipes

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Dave Wilson Nursery FORUMS
for Fruit, Nut & Ornamental Trees

And:

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Now Serving:
Edible Ornamentals

all around the USA
See a variety of Solutions!

DWN Recommended Fruit Tree Selections for the Northwest and Colder Climates: USDA Hardiness Zones 5 to 9

Tom Spellman

Tom's Picks:
Fruit Tree Selections for the Southwest

Multiple Planting
of Fruit Varieties
for Sucessive Harvest

Master Fruit Tasters
can help select the best suited, best tasting varieties for your backyard.

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- Apples
- Apricots
- Asian Pears
- Blueberries
- Cherries
- Citrus
- Grapes
- Multi-Budded Fruit Trees
- Nectarines
- Peaches
- Pears
- Plums & Prunes
- Pluot®
- Aprium®
- Peach x Plum hybrid
- Plumcots
- Cherry Plums
- Fruiting Mulberry
- Figs
- Jujubes
- Kiwis
- Pawpaws
- Persimmons
- Pomegranate

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Dave Wilson Nursery®

Catalog

- Fruit Trees
- Nut Trees
- Shade Trees
- Flowering Trees
- Vine & Bush Fruits
- Lilacs
- Wisteria
- Flowering Shrubs
- Ornamental Mix

- Rootstocks

Sales

- Contact Us
- Policies, Discounts & Warranty
- Sales Aids
- Marketing Tips
- All About Selling Backyard Orchard Culture
- SOFT: Special Order Fruit Trees

The Fruit Catalog

We Sell at Wholesale
to Retail Nurseries & Garden Centers
Farmer's Market & Fruit Stand Growers
Container Growers & Commercial Orchardists
We Do Not Sell Individual Trees

To purchase Dave Wilson Nursery-grown trees, please contact one of our many customers.

Our Special Order Fruit Tree Program may be an option at your local nursery.

Apples	Nectarines	Plums & Prunes
Apricots	NectaPlum™	Pluot®
Aprium®	Peaches	Plumcots
Asian Pears	Peach x Plum Hybrid	Pawpaws
Cherries	Pears	Fruiting Mulberry
Cherry Plum	Persimmons	Jujubes
Figs	Pomegranate	Quince

Dave Wilson Nursery®

Apples

Apple Links | Apple Article from Garden Compass Magazine

Sales
Catalog
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Fruit Harvest Chart

Of all the fruits, the apple appeals to the widest range of tastes. Dave Wilson Nursery continues to collect both old and new varieties that are considered the best in the U.S., though our collection is only a small representation of this wonderful fruit.

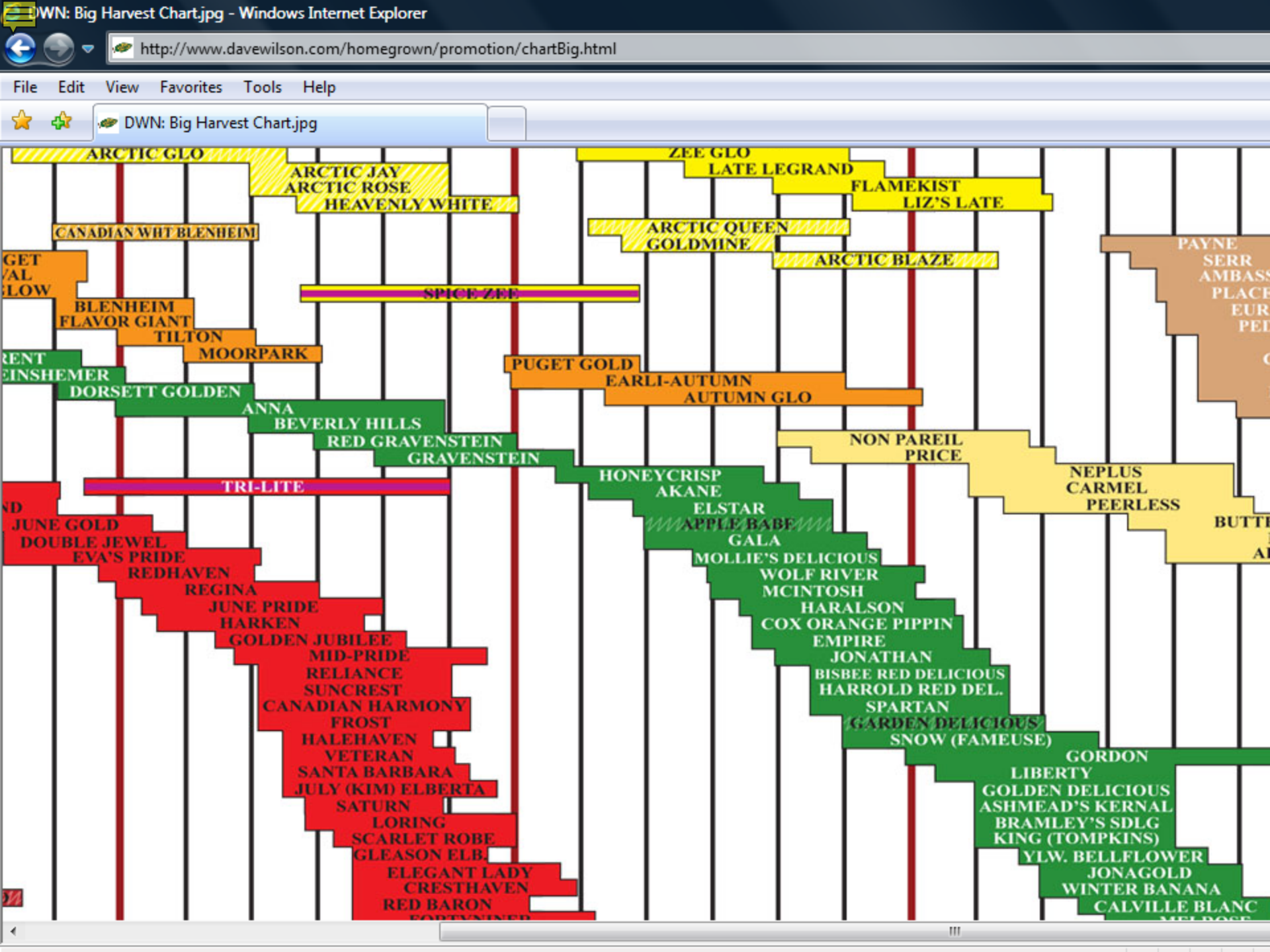
Items accompanied by this symbol are Edible Ornamentals: decorative trees that are perfectly complimentary to your edible landscape.

Akane
Especially nice red dessert apple derived from Jonathan - sweet, rich, spicy flavor. Resists scab and powdery mildew. Harvest in early season (August in Central Calif). 800 hrs. Pollenized by Fuji, Gala, Granny Smith or Golden Delicious.

Anna
Remarkable fruit for mild-winter climates in So. Calif., So. Ariz. Heavy crops of sweet, crisp, flavorful apples even in low desert. Fresh/cooked. Keeps 2 months in refrigerator. 200 hours. Self-fruitful or pollenized by Dorsett Golden or Einshemer.

Apple Babe genetic dwarf
Crisp, sweet, red apple - excellent quality even in hot inland climates. Glossy, russett-free skin. Heavy bearing 8-10 ft compact tree. August. 700 hours. Pollenized by Garden Delicious or other apple. (Zaiger)

Garden Delicious genetic dwarf
Sweet, crisp, superb flavor, even in hot climates. Greenish-yellow with red blush to full red. Dessert/cook, good keeper. September. 8-10 ft. tree, smaller with


DWN: Big Harvest Chart.jpg - Windows Internet Explorer
http://www.davewilson.com/homegrown/promotion/chartBig.html
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DWN: Big Harvest Chart.jpg
ARCTIC GLO
ARCTIC JAY
ARCTIC ROSE
HEAVENLY WHITE
ZEE GLO
LATE LEGRAND
FLAMEKIST
LIZ'S LATE
CANADIAN WHT BLENHEIM
ARCTIC QUEEN
GOLDMINE
ARCTIC BLAZE
PAYNE
SERR
SPICE ZEE
BLENHEIM
FLAVOR GIANT
TILTON
MOORPARK
PUGET GOLD
EARLI-AUTUMN
AUTUMN GLO
DORSETT GOLDEN
ANNA
BEVERLY HILLS
RED GRAVENSTEIN
GRAVENSTEIN
NON PAREIL
PRICE
NEPLUS
CARMEL
PEERLESS
TRI-LITE
HONEYCRISP
AKANE
ELSTAR
APPLE BABE
GALA
JUNE GOLD
DOUBLE JEWEL
EVA'S PRIDE
REDHAVEN
REGINA
JUNE PRIDE
HARKEN
GOLDEN JUBILEE
MOLLIE'S DELICIOUS
WOLF RIVER
MCINTOSH
HARALSON
COX ORANGE PIPPIN
EMPIRE
JONATHAN
MID-PRIDE
RELIANCE
SUNCREST
BISBEE RED DELICIOUS
HARROLD RED DEL.
CANADIAN HARMONY
FROST
SPARTAN
GARDEN DELICIOUS
HALEHAVEN
SNOW (FAMEUSE)
VETERAN
GORDON
SANTA BARBARA
LIBERTY
JULY (KIM) ELBERTA
GOLDEN DELICIOUS
SATURN
ASHMEAD'S KERNAL
LORING
BRAMLEY'S SDLG
SCARLET ROBE
KING (TOMPKINS)
YLW. BELLFLOWER
ELEGANT LADY
JONAGOLD
CRESTHAVEN
WINTER BANANA
RED BARON
CALVILLE BLANC

Go to DWN website

At the Nursery

What to look for and at:

- Labels on trees
  - identification
  - cultivar
  - root stock
  - size
- The Tree
  - cultivar diameter
  - branches
  - graft union
  - roots

Labels on nursery stock

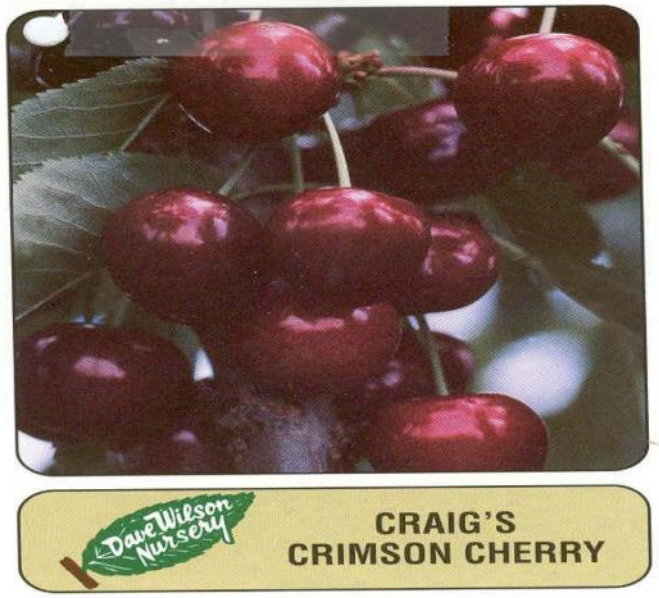
These supply all basic information:

- description of fruit
- pollination requirement or not
- chill hour requirement
- bearing time

(This may cause or help in an impulse buy.)

IF THE TREE DOES NOT HAVE COMPLETE LABELS, DO NOT PURCHASE THE TREE!

Example of labels



BLACK TARTARIAN CHERRY

Long-time favorite sweet cherry. Medium-sized fruit is nearly black with a renowned, rich, sprightly-sweet flavor. Reliable-bearing tree is vigorous, with very upright, narrow growth habit. Cold hardy once fully dormant.

For easy care and harvest, the tree may be kept under 10 ft. high by summer pruning.

Harvest Season Begins (Solid Square)

Very Early	Early Season	Early Mid-	Mid-Season	Late Mid-	Late Season	Very Late
■						
5-1 to 5-25	5-25 to 6-20	6-20 to 7-15	7-15 to 8-10	8-10 to 9-5	9-5 to 9-30	Oct/ Nov

Dates for harvest seasons vary with climate and year. Example dates (below) are approximate for Modesto, CA.

Estimated winter chilling requirement 700 hours below 45 degrees. Sometimes reported to be self-fruitful, but pollenizer recommended. Interfruitful with all popular sweet cherry varieties.

From Russia (via England), first planted in U.S. in early 1800s.

NOTE: IT IS ADVISABLE TO REMOVE THIS TAG WITHIN ONE YEAR.

©1996 PTZ0048 NT2006A

Dave Wilson Nursery
Hickman • Reedley

CRAIG'S CRIMSON CHERRY **Taste test winner. Self-fruitful, natural semi-dwarf, perhaps the finest sweet cherry. Dark red to nearly black, medium to large size, wonderful spicy flavor, very firm texture. Mature tree size about 2/3 of standard (smaller when budded onto Colt or Mahaleb rootstock). Mid-season. 800 hours.**

GM61/1 ROOTSTOCK **Standard cherry varieties dwarfed to half-size, or about 15-20 ft. if not pruned. Relatively tolerant of wet soil. Trees begin bearing at young age. Trees on GM61/1 may be held to any desired height by summer pruning.**

Plant Stock – The Tree

Trunk diameter: 5/8 – ¾ inches

Branches:

- height above the graft union/roots
- spread
  - vertically
  - horizontally

Graft Union:

- is it “healing” or damaged

Roots:

- spread
- for damage and disease


Graft Union or
Bud Union


Roots

Post Purchase

Pruning at nursery (or not)

Transportation (protect roots)

Storing at home (protect roots)

Planting

Site considerations:

- Macro-environment
  - Chill hours (generally)
  - Topography
- Micro-environment
  - Chill hours (specifically)
- Soil/Ground conditions
- Layout
  - Spacing (dictated by tree size)
  - Row spacing & direction

Site Specifics

Factors influencing chill hours:

- Topography (cold air settles down hill)
- Impediments to chill hours

Soil conditions:

- DRAINAGE
- “Digability” (rocks are not your friends)
  (for options, See “Alternative Planting”)
- Texture (soil reservoir)

Site Specifics cont’d

Layout:

- Tree spacing (suggestions)
  - Small trees (6-8’ high) ~7-8 feet apart
  - Large trees (8-12’ high) ~15 feet apart
- Row direction
  - North to South
- Row spacing for maintenance (10-15 feet)
  - Depends on tree size

Planting the tree (finally)

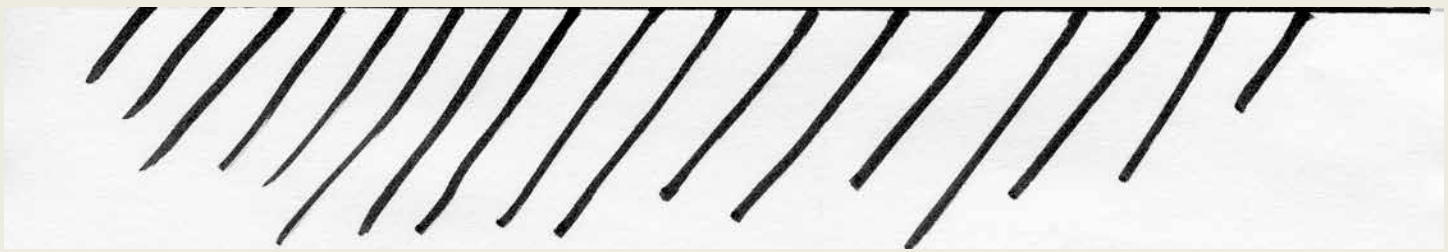
Digging the hole
- “the hole fits the tree”

Placing the tree
- “protecting the crown”

Post planting details
- initial pruning
- sunburn protection
- avoiding compaction and competition

Planting step 1

Ground level



The Ground Level is the basic reference factor.

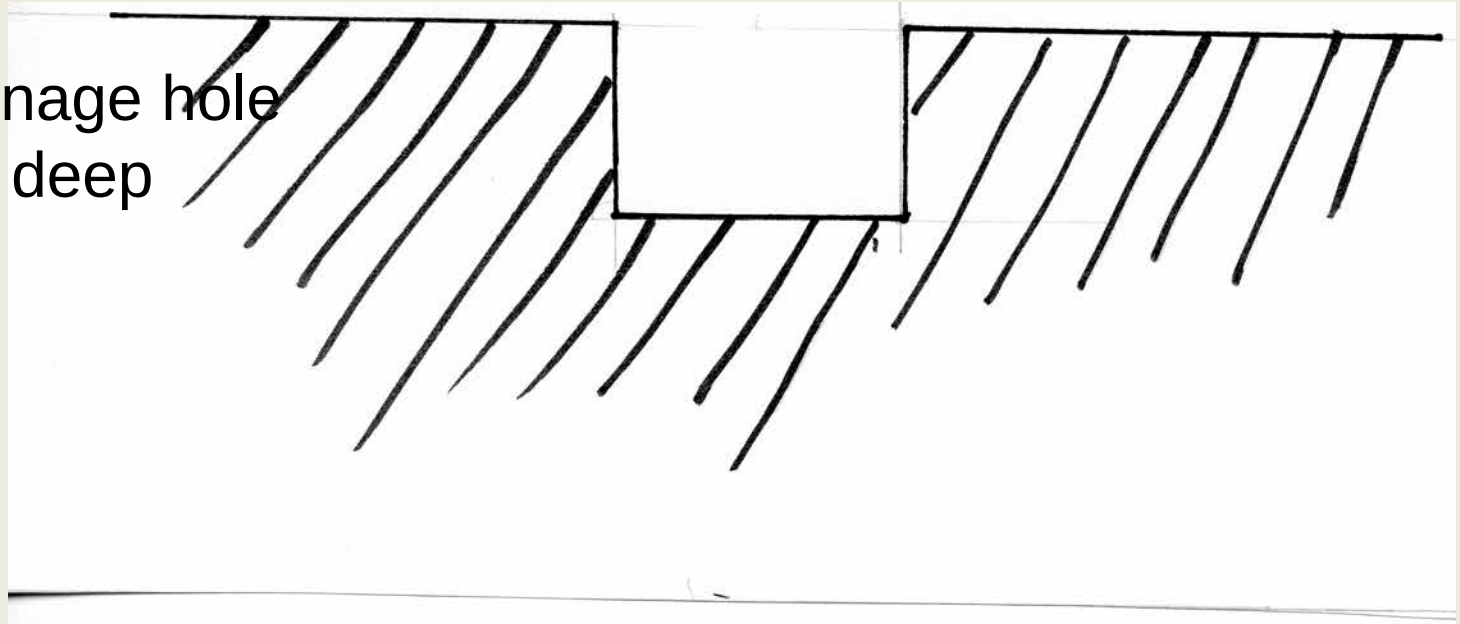
Planting step 2

Test for Drainage

Fill hole with water
It should drain in 3 hours.
If not, consider alternative planting methods

Ground level

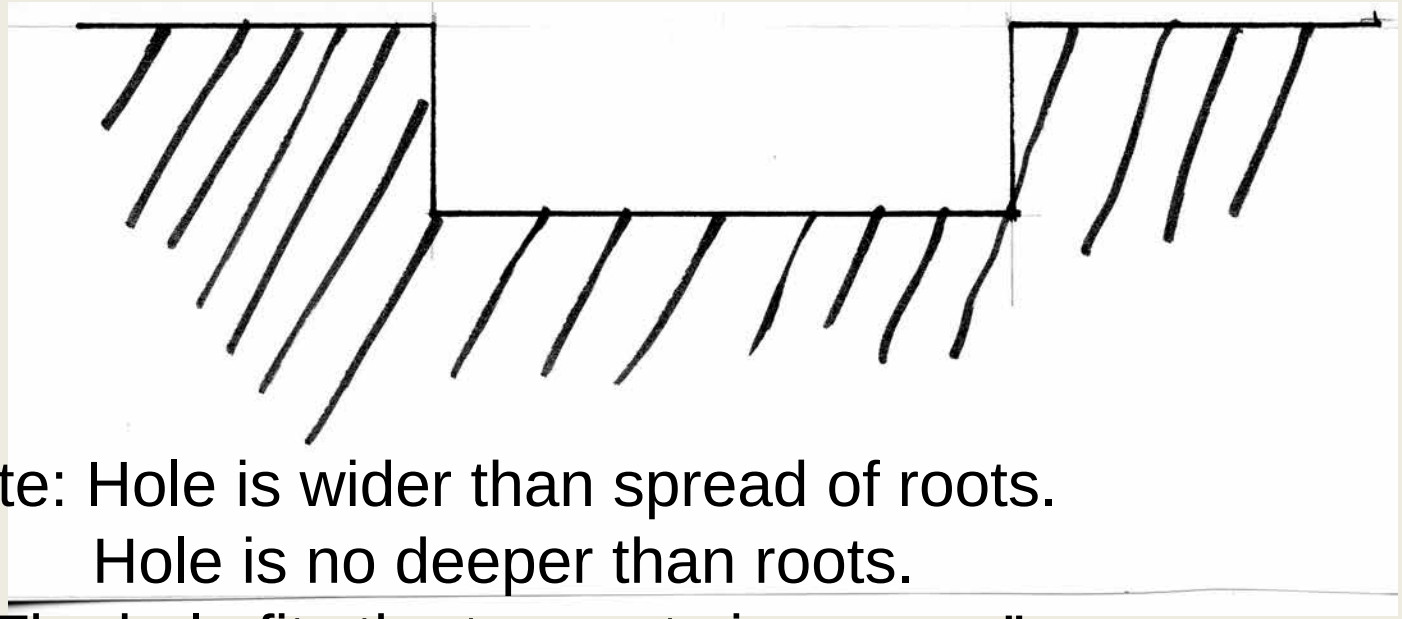
Drainage hole
12 “ deep



Planting step 3

Dig hole for tree

Ground Level



Note: Hole is wider than spread of roots.
Hole is no deeper than roots.
“The hole fits the tree not vice versa.”

Plant Stock reference points

Crown: where trunk joins roots
Soil line: point on trunk where it grew in ground
Graft or Bud Union: location where cultivar was grafted

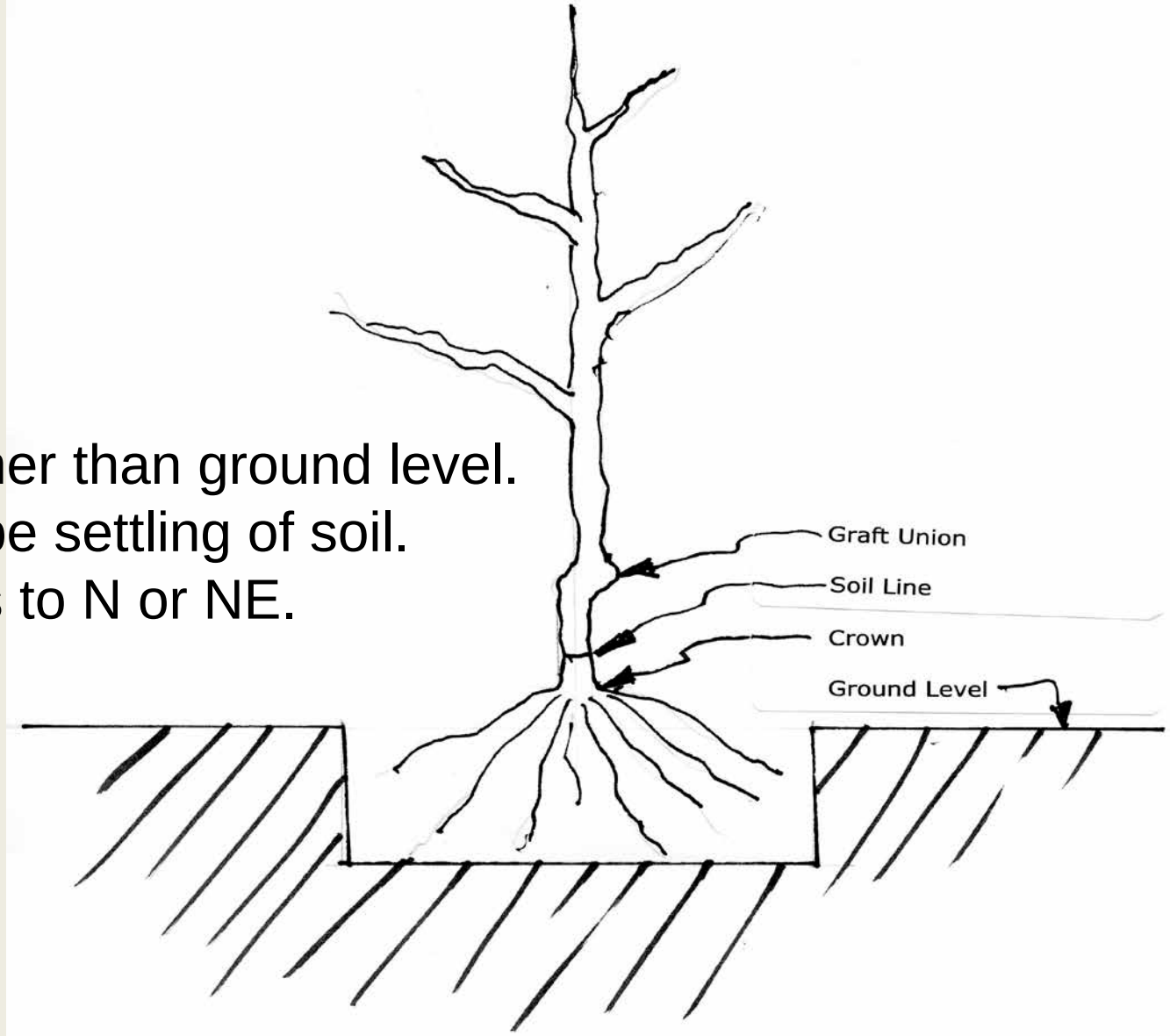

Crown


Soil Line

Graft Union or
Bud Union

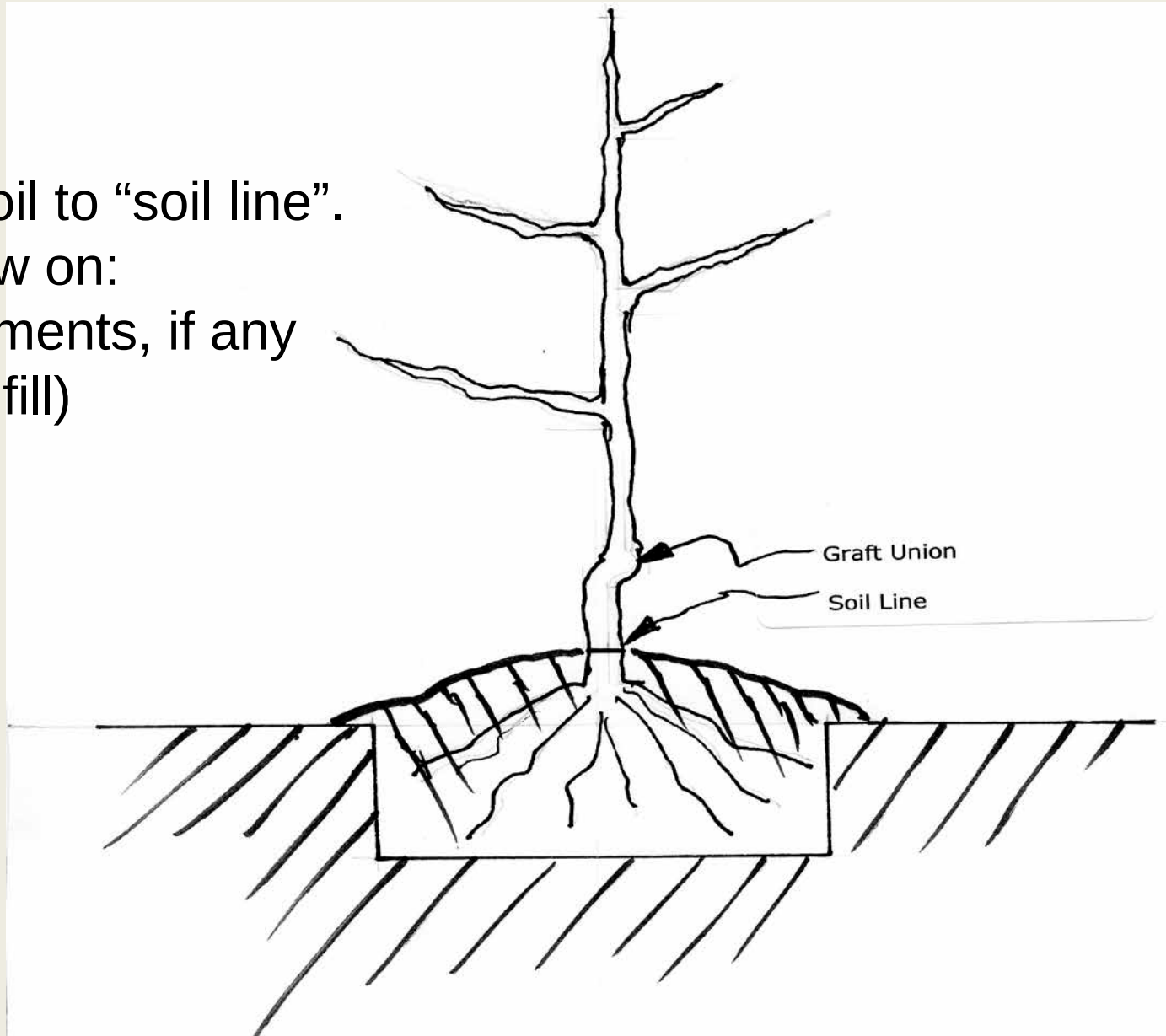
Planting step 4

Crown is 3-4” higher than ground level.
There will be settling of soil.
Graft Union points to N or NE.



Planting step 5

Fill (mound) soil to “soil line”.
(Notes to follow on:
Amendments, if any
How to fill)



Additives in hole (if any)

Fertilizer is not necessary, is not recommended.

Possible exceptions are:

Super phosphate or

Weak organic fertilizer (Dr. Earth)

Amendments are not necessary. But depending on the soil texture may be added. Any amendment should be organic and totally decomposed.

Filling the hole

Use native soil or good soil mix.
Use soil to achieve proper level of tree in hole.
Proper level should be 3-4” high as soil will compact naturally.
Be gentle.
Do not vigorously compact soil.
Fill to soil line, “mound” soil to ground level.
If soil is damp from recent rains, do not water.
Any irrigation should be gentle, like a soft rain.

Initial pruning at planting

Heading cut is determined by training method or the desired height at maturity.

And/or by existing branches or buds.

The recommendation is at “knee height” about 15 – 18 inches.

Head back side branches to two or three buds.

Do not thin out side branches below the heading cut. See which grows best to achieve desired training method.

Headed to 2 or 3 buds

infestation by borer insects. For this purpose, use white interior latex paint diluted to half strength with water. Apply the paint mixture from 2 inches (5 cm) below the soil surface up the entire trunk, including the dormant buds.

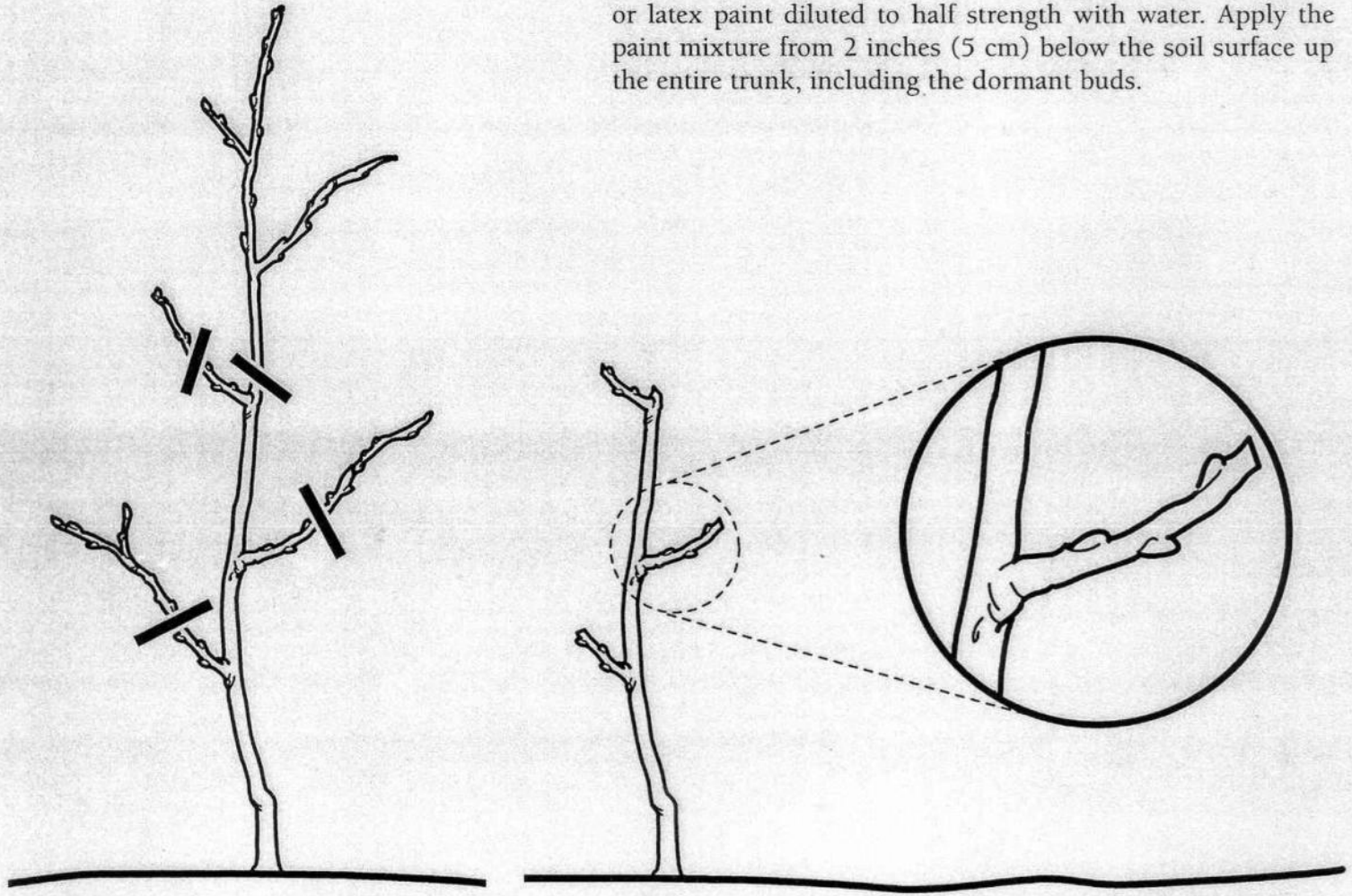


Figure 3. Larger trees often have lateral branches that can be headed back, leaving stubs 3 inches (7.5 cm) long with two or three lateral buds.

Initial Heading Cut

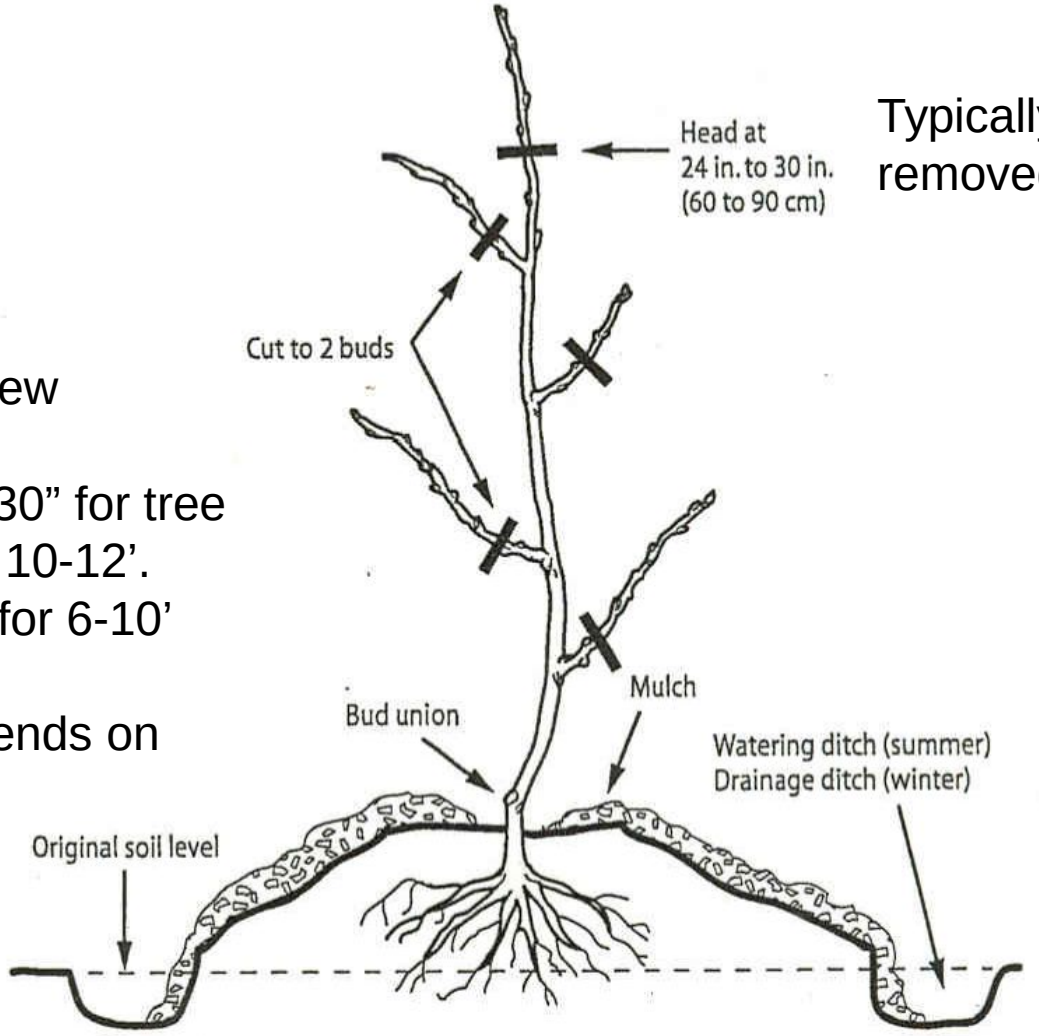
Double Jewel Peach
Planted 12.28.09
Headed at 30”, tree had no lower branches. Kept 6 stubs.
Later removed top 2; kept 4

Same Tree

Picture taken 09.22.10
Height 8 feet.
Note: Tree will be a test for a new training technique for peach/ nectarine trees. By author; not in UCCE literature

Figure 17.12

Mound planting of temperate fruit and nut trees.



Typically, the leader is removed.

Final Overview

Head at 24-30” for tree height of 10-12’.
Head lower for 6-10’ tree.
(Height depends on stock.)*

Avoid having roots or crown immersed in water for any length of time.

Post Planting

Whitewash entire tree with 50% dilute interior white latex paint.

Mulch tree but not within 12’ of trunk. (optional)

Staking is not necessary, if tree was “headed”.

Prevent weeds from competing with tree; remove all within three feet of trunk.

Alternative Planting

Raised Beds or Boxes
Planting on the ground

Note: These alternatives insure the crown is well-above the ground line.

These methods are the solution to drainage problems in the orchard.

Raised Bed
4’ X 4’ x 12”
Harcot Apricot
Planted 2009.
Taken 03.04.10.

Part 2

Citrus Trees

Subtropical Zone Trees

The subtropical nature requires a consideration of climate conditions and their limitations.

Basic Requirements

Suitable Climatic Environment
Sunlight
Water
Space
Wind Protection

(Plant protection will be discussed, *supra)*.

Climatic Environment

Cold-hardiness varies with variety as follows:
(from most tender to hardiest)

- citron
- Mexican Lime
- lemon
- grapefruit = pummelo
- sweet orange = tangelo = tangor
- sour orange
- Satsuma mandarin = Meyer lemon
- Kumquat

Note: temperature effects tree and fruit.

Hardiness cont'd (tree)

Table 1. Relative frost sensitivity of selected citrus trees

Common name	Scientific name	Sensitivity to frost*	
	TREES		
citron	*Citrus medica*	H	
grapefruit	*Citrus* × *paradisi*	M	
kumquat	*Fortunella* spp.	L	18-20F
lemon	*Citrus limon*	H	
lime	*Citrus aurantiifolia*	H	32F
mandarin orange hybrids	*Citrus reticulata* ssp.	M	
orange	*Citrus sinensis*	M	
Satsuma mandarins	*Citrus reticulata* ssp.	L	
	ROOTSTOCKS		
rough lemon or Alemow	*Citrus macrophylla*	H	
trifoliate orange	*Poncirus trifoliata*	M	
Troyer and Carrizo citrange	× *Citronicirus Webberi*	M	

Note: * H = high sensitivity; M = moderate sensitivity; L = low sensitivity. Trees with a high sensitivity are more easily damaged by frost than trees with a low sensitivity. For information on frost sensitivity of particular cultivars in your area, consult reliable nursery staff or your local University of California Cooperative Extension county office.

Hardiness cont'd (fruit)

Table 2. Critical frost damage temperatures for selected citrus fruits

Fruit	Critical temperature* °F	°C
lemon buds and blossoms	27.0	–2.8
lemons, button, <½ inch (13 mm) diameter	29.5 to 30.5	–1.4 to –0.8
lemons, green, >½ inch (13 mm) diameter	27.0 to 29.5	–2.8 to –1.4
lemons, tree-ripe	26.0 to 30.5	–3.3 to –0.8
oranges, green	28.5 to 29.5	–1.9 to –1.4
oranges, grapefruits, and mandarins, half-ripe	27.0 to 29.0	–2.8 to –1.7
oranges, grapefruits, and mandarins, tree-ripe	25.0 to 29.0	–3.9 to –1.7

Note: *Critical temperature is affected by relative humidity and duration. Fruits can withstand the lower temperature ranges in drier air and shorter durations of cold.

Research at Home

Websites:

four wind growers nursery

homeorchard.ucdavis.com

Publications:

Master Gardner Handbook

“Citrus”, Lance Waldheim

Selection

Review Publications and Websites

Suggest :

- Walheim, “Citrus”
- Four Wind Growers website

Four Winds Growers

Our Citrus Varieties
Purchasing Our Trees
- Order Trees Online
- Where to Buy in California
- Customer Testimonials

Growing Dwarf Citrus
- In The Ground
- In Containers
- As Houseplants
- In A Greenhouse/Solarium

Citrus Problem Solver
- Frequently Asked Questions
- Search for Answers:

Search

Citrus Recipes
Meyer Lemons
Kaffir Limes

Dwarf citrus from Four Winds Growers: bringing smaller trees with delicious, full-sized fruit to your garden

Four Winds Growers is a **family owned and operated** citrus nursery in California. In the late 1940s, our founder developed the world's first Dwarf Citrus trees. Today, we offer more than 60 varieties of fine Citrus trees online. These include a selection of rare and unusual Citrus varieties, some of which are not yet available at retail nurseries in California.

Evergreen Dwarf Citrus produce fragrant flowers, followed by full-sized citrus fruit, making them a welcome addition to your garden and table. Carefully hand-grafted, our trees are well suited to growing in **containers** or as **houseplants**. They can also be planted in the **ground** in suitable climates. One of our most popular varieties is the **Dwarf Meyer Lemon**, which is also well suited for indoor growing. Other favorites are **Kaffir Lime**, **Bearss Lime**, **Mexican (Key) Lime** and **Sweet Lime**.

Our Edible Ornamentals available in California nurseries and garden centers

These include not only Citrus, but also Avocado, Blueberry, Cane Berry, Fig, Grape, Jujube, Multi-grafted Deciduous fruit trees, Olive, Persimmon, and Pomegranate. See **Fruits and Berries** to learn more about the varieties we have available and their care.

Online citrus problem solver

New: Organic Meyer Lemons!
We are excited to announce our first organic citrus trees.

Featured Trees
What's new at Four Winds Growers?
Yuzu
Gold Nugget Mandarin
Australian Finger Lime

Four Winds TRUE DWARF CITRUS Growers

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Citrus Recipes
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Family Tradition

Four Winds Citrus Variety List

Most everyone knows the basic citrus varieties, but many are surprised to learn just how many different forms the citrus fruit can take. Below we list all varieties we sell, from the everyday to the otherworldly.

For specific information by variety on cold hardiness, heat requirements, suitability for indoor growing, and bloom/fruit seasons, be sure to visit our **Citrus Variety Information Chart**

Special Order Options: Is there a variety of citrus that you are interested in purchasing that you do not see in our collection? We may be able to help. Contact Aaron Dillon in the Four Winds Growers Special Orders Department at specialorders@fourwindsgrowers.com

---

- Sweet Oranges
- Blood Oranges
- Sour Oranges
- Mandarins
- Lemons
- Mediterranean Lemons
- Limettas
- Limes
- Grapefruits
- Kumquats
- Citrons
- Other Interesting Varieties

Sweet Oranges

TROVITA ORANGE ▲

Sweet oranges have been cultivated and enjoyed by people around the world for thousands of years. Varieties have been adapted to suit numerous climatic conditions and local taste preferences.

- **Washington Navel Orange [IN]** - California's famous winter-ripening variety. Sweet, seedless fruit ripens in ten months. See photo.
- **Trovita Orange [IN]** - Spring ripening. Good in many locations from coastal areas to desert. Few seeds, thin skinned fruit, heavy producer and excellent flavor.
- **Cara Cara (Pink) Navel Orange** - Early-ripening Navel Orange with medium red colored flesh. Fruit has rich sweet flavor. Venezuelan introduction. See photo.
- **Lane Late Navel Orange** - Spring/summer ripening seedless Navel Orange with fine, rich flavor. A Washington Navel hybrid developed in Australia. A new choice for oranges to peel and eat or juice in the summer. See photo.
- **Robertson Navel Orange** - Bestselling winter-ripening variety. Early and heavy bearing. Cultivar of Washington Navel. See photo.
- **Shamouti Orange (Jaffa/Palestine)** - Fabled orange from Middle East. Very few seeds. Spring to summer ripening. Good Flavor. See photo.
- **Valencia Orange** - Summer-ripening juice or eating orange. Fifteen months to ripen. Grow your own orange juice. See photo.

Growing Citrus in the Ground

Growing dwarf citrus trees in the ground can be immensely rewarding, and it naturally produces the biggest and most vigorous specimens. However, before planting a citrus tree in the ground, you must determine whether or not the location you have in mind will provide a suitable home for your new dwarf citrus tree.

On this page:

How Will It Look? | Climate | Location
Soil | Planting | Watering | Fertilizer | Mulches
Suckering | Thorns | Pruning | Pollination | Espaliering
Beneficial Insects | Pest Insects | Frost

How Will Citrus Look In My Yard?

Sometimes people aren't quite sure about using citrus as a landscape plant. In fact, citrus work extraordinarily well in most any landscape, offering beautiful evergreen foliage, lovely (and fragrant) blossoms, and colorful fruit. If you'd like to see some examples of successful landscape plantings, take a look at our landscaping slide show.

Climate

In general, ground-planted citrus trees are happiest in warm, temperate areas. Some varieties are much more frost-tolerant than others. For information on a specific variety, please refer to our hardiness table.

Location

Four Winds TRUE DWARF CITRUS Growers

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Family Tradition

Citrus Variety Information Chart

For each variety we sell, the following table lists that variety's suitability for indoor growing; its minimum tolerable temperature for winter; its bloom and fruiting seasons; and its recommended summer heat level to produce good fruit. Lemons, limes and citrons are most sensitive to frost, while sweet oranges, grapefruit, tangerines and calamondins are intermediate. Kumquats and Owari Mandarin Satsuma are the most frost-tolerant, tolerating temperatures in the low twenties.

Trees grown as houseplants or indoor/outdoor plants are not necessarily subject to these zone limitations. See our heat requirements page for more information on ripening.

VARIETY	BEST FOR INDOOR GROWING	PROTECT BELOW THESE TEMPS	USUAL BLOOM SEASON	USUAL FRUIT SEASON	NEEDS SUN/ HEAT TO SWEETEN FRUIT
SWEET ORANGES					
 WASHINGTON NAVEL ORANGE	X	28	Spring	Winter	X
TROVITA ORANGE	X	28	Spring	Spring	
 CARA CARA (PINK) NAVEL ORANGE		28	Spring	Fall/Winter	X
 LANE LATE NAVEL ORANGE		28	Spring	Spring/Summer	X
 ROBERTSON NAVEL ORANGE		28	Spring	Winter	X

FWG website

Navigating online

Planting Site

Suitable site determined by climatic conditions.

- Macroenvironment:
  - elevation
  - slope
- Microenvironment (plant location):
  - In ground

Note:

Other options are movable containers or indoors.

Site (elevation & exposure)

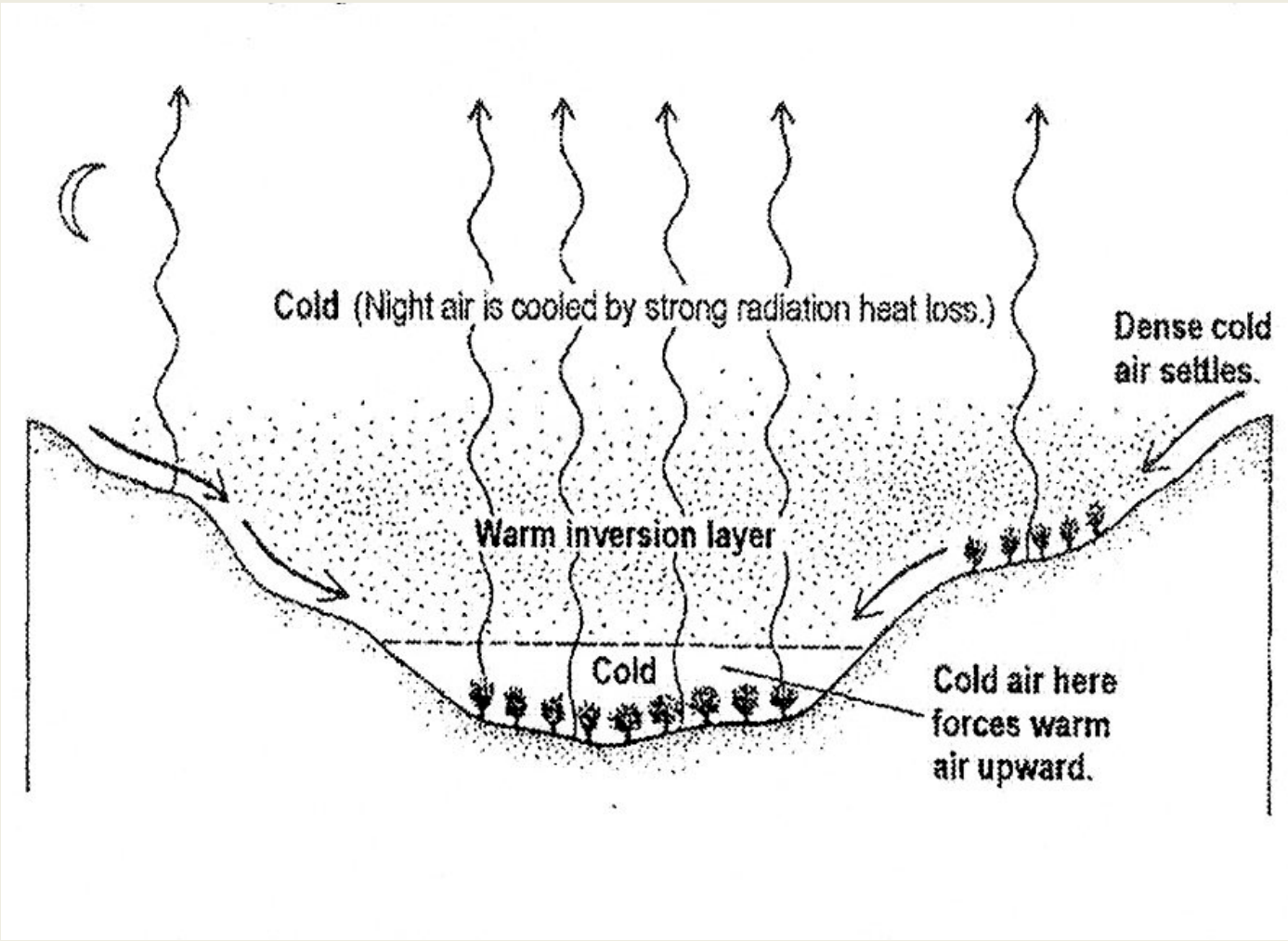
Generally the higher the elevation the lower the temperature readings.

Exposure (or not) to the winter sun is important.

- Site should face south (not sun blocked).
- Building(s) to the north are beneficial.
- Wind screens not blocking sun are beneficial

Site (slope)

Locations on a ridge is best – cold air drainage. Locations in a depression are troublesome - cold air settles.



Site (size of mature tree)
Time to Bear

Mature standard-sized Orange and Grapefruit trees can grow to 20 – 30 feet.

Time to bear depends on tree purchased.

- In container with roots developed, first season.
- In sleeve, 3 – 4 years.

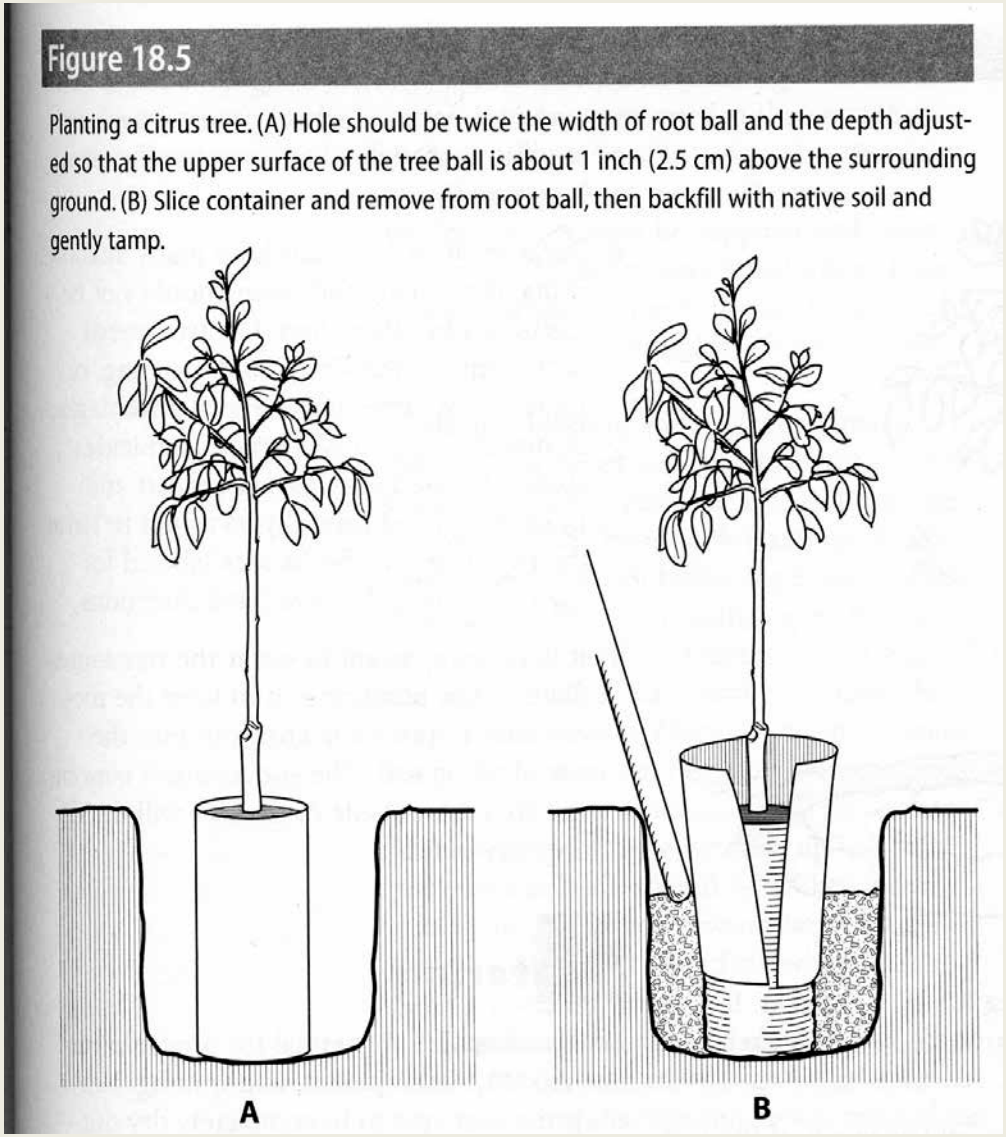
Planting

Note:

Stock will be available in pots or sleeves. The soil level in either container determines the level in the hole; one inch higher than the ground level.

Planting (sleeve)

Note:
Slide sleeve out gradually.
Fill hole partially and then slide sleeve up to next level until it is removed entirely.
Remember 1” rule.



Planting (irrigation)

Avoid watering the trunk of plant.
Irrigate root ball but not trunk. Use dams.

Plant Protection

Changing the microenvironment for both:

- trunk (by insulating)
- fruit and foliage.

Techniques:

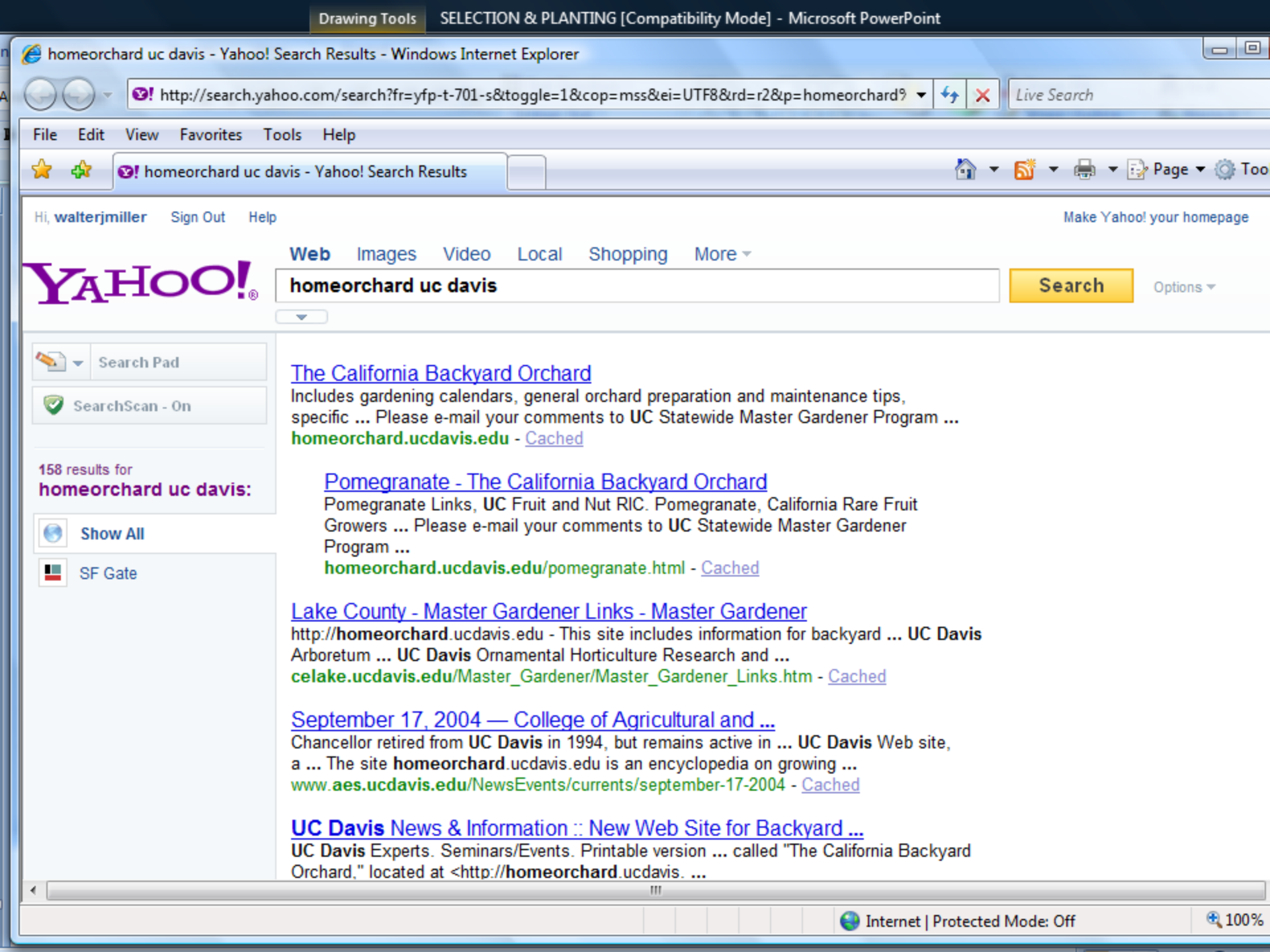
- irrigation, wet soil produces heat
- lights, incandescent, e.g., Christmas
- covers, permeable, e.g., row cover

Reference: ANR Publication 8100 (for discussion of frost and protection.)


r 8, 2009

Navigating HO for ANR 8100

Pages as follows:
Home Page
The California Backyard Orchard
Citrus
Scroll to “Frost Protections, etc.”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www.aes.ucdavis.edu/NewsEvents/currents/september-17-2004 - Cached
UC Davis News & Information :: New Web Site for Backyard ...
UC Davis Experts. Seminars/Events. Printable version ... called "The California Backyard Orchard," located at <http://homeorchard.ucdavis. ...
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the california backyard orchard

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Fruits & Nuts

⇒ Almond
⇒ Apple
⇒ Apricot
⇒ Avocado
⇒ Berries (Includes blackberry, blueberry, raspberry, and strawberry.)
⇒ Cherry
⇒ Chestnut
⇒ Citrus (Includes grapefruit, lemon, mandarin, and orange.)
⇒ Fig
⇒ Filbert (Hazelnut)
⇒ Loquat
⇒ Nectarine
⇒ Olive
⇒ Peach
⇒ Pear
⇒ Pecan
⇒ Persimmon
⇒ Pistachio
⇒ Plum & Prune
⇒ Pomegranate

Citrus

RELATED LINKS
Fruits & Nuts
Tree Selection

UC IPM RESOURCES

- Citrus Pests in Gardens and Landscapes
- Site Selection
- Planting
- Watering
- Training, pruning, & thining
- Fertilizing
- Sanitation
- Harvesting & storage

OTHER RESOURCES

- Citrus Links, UC Fruit and Nut RIC
- Cold Wet Weather May Cause Oranges To Drop, Ed Perry, Stanislaus Co. UCCE
- Store Navel Oranges In A Cool Place, Ed Perry, Stanislaus Co. UCCE
- Oranges: Safe Methods to Store, Preserve, and Enjoy, Jennifer Snart, Mary Lu Arpaia, Linda Harris
- Growing Backyard Citrus in Kern County, Craig Kallsen, Kern Co. UCCE
- Budding & Grafting Citrus & Avocados in the HomeGarden, Pam Elam, Fresno Co. UCCE
- Frost Protection for Citrus and Other Subtropicals, Pamela M. Geisel and Carolyn L. Unruh, Fresno County

PUBLICATION 8100

Frost Protection for Citrus and Other Subtropicals

PAMELA M. GEISEL, University of California Cooperative Extension Farm Advisor, Environmental Horticulture, Fresno County; **CAROLYN L. UNRUH**, staff writer, University of California Cooperative Extension Fresno County.

UNIVERSITY OF CALIFORNIA
Division of Agriculture and Natural Resources
http://anrcatalog.ucdavis.edu

In many areas of California, winter temperatures can pose a threat to the fruit and foliage of citrus and other subtropical trees such as avocado (*Persea americana*), loquat (*Eriobotrya japonica*), guava (*Psidium* spp.), and macadamia (*Macadamia* spp.). Susceptibility to frost depends on the health and vigor of the plants, the characteristics of individual species or cultivars, the rootstock on which the individual trees are grown, and the intensity and duration of the cold.

TYPES OF FROST

Injury to plants from temperatures below freezing can be called "frost" or "freezing"; in this publication it is referred to as "frost." Plants can also be injured by cold temperatures above freezing; this is called "low-temperature injury" or "chilling injury" and is not covered in this publication (for more information on low-temperature injury, see *Abiotic Disorders of Landscape Plants: A Diagnostic Guide*, ANR Publication 3420, 2003). There are two types of frost: radiation frost and advective frost.

Radiation frost occurs on cold nights when the air is clear and dry and heat is lost, or radiated, from the earth's surface into the atmosphere. Soil, buildings, plants, and other objects at the earth's surface act as a heat reservoir by absorbing heat during the day. Plants are damaged when enough heat is lost from this reservoir to lower the temperature at the surface to below critical temperatures. Radiation frost is the most common type of frost in California.

Advective frost occurs when a mass of cold air displaces a mass of warmer air at the earth's surface. This displacement can be caused by a temperature inversion, which forms when a layer of warm air creates a low ceiling that traps cold air close to the ground. Advective frost can also occur when masses of cold, polar air move into warmer areas. Advective frost is relatively uncommon in California.

SYMPTOMS OF FROST INJURY

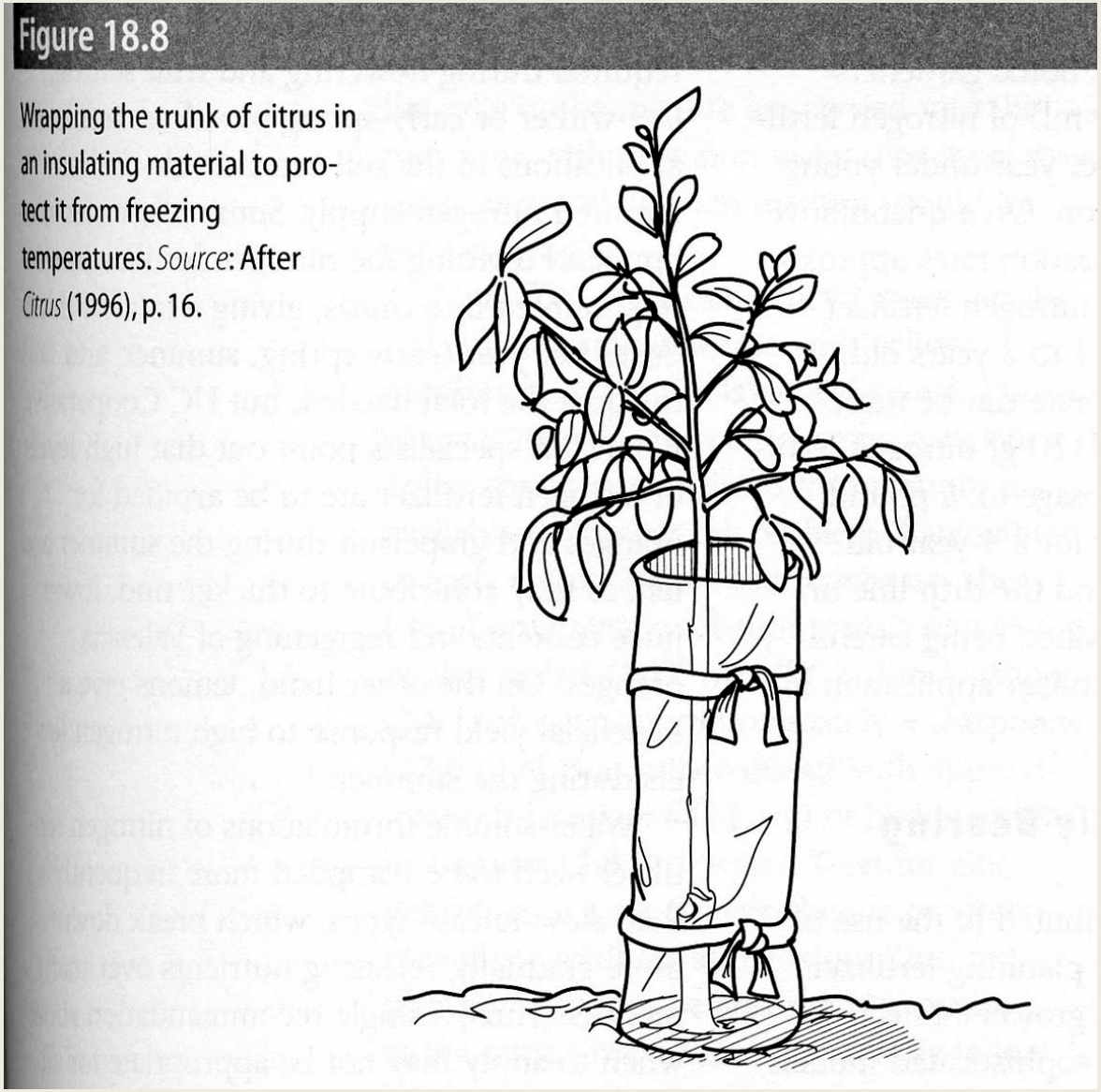
Frost injures plants by causing ice crystals to form in plant cells, making water unavailable to plant tissues and disrupting the movement of fluids. Frost-damaged leaves or twigs appear water-soaked, wither, and turn a dark brown or black. Unprotected, sensitive young trees or regrafted trees may die, but frost seldom kills mature trees. In cold-winter areas, highly frost-sensitive trees rarely live to maturity before being killed by a frost.

Citrus fruits can be damaged by frost as well. Within a few hours after a frost, the juice vesicles inside the fruit rupture as ice crystals form inside them. This results in water loss, causing the fruit to dry out. Frost-damaged fruit can be used soon after the frost, but they break down quickly and are subject to decay by bacteria and fungi. Deterioration of frost-damaged fruit usually occurs within a few days to 2 weeks, depending on storage conditions, temperature, and other environmental factors.

UC PEER REVIEWED

Trunk Insulation

Materials:
Thermal wraps, layers of newspaper, corrugated cardboard, cylinder of sawdust (6” diameter). Protect from ground to 6-12” above bud union.



Heat/Sun considerations

Sunburn: exposed limbs should be painted with a whitewash.

Heat: fruit needs heat to ripen some more than others, e.g., grapefruit.

excessive heat may cause splitting.

Closing Remarks

This was a UCCE Eldorado County Master Gardener production.