# Growing Fruit in the Edible Landscape

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**College Station, TX**

du/earthkind/

Aggie Horticulture | Academics | Fruit & Nut | Vegetable | Earth-Kind® | Master Gardener | JMG® | Small Acreage

# Earth-Kind®

Landscaping

**http://earthkind.tamu.edu**


Earth-Kind Landscaping uses research-proven techniques to provide maximum garden and landscape enjoyment while preserving and protecting the environment. The objective of Earth-Kind Landscaping is to combine the best of organic and traditional gardening and landscaping principles to create a horticultural system based on real world effectiveness and environmental responsibility. Earth-Kind Landscaping Encourages:

- Landscape Water conservation
- Reduction of fertilizer and pesticide use
- Landscaping for energy conservation
- Reduction of landscape wastes entering landfills

Individuals using Earth-Kind landscaping principles and practices can create beautiful, easy-care landscapes, while conserving and protecting natural resources and the environment.

## Ask an Expert

- Earth-Kind® Home
- 10 Ways to Make Your Landscape Earth-Kind®
- Take the Earth-Kind® Challenge
- Planning the Home Landscape – Earth-Kind® Edition
- Earth-Kind® Plant Selector
- Search the Earth-Kind® Plant Selector
- Earth-Kind® Publications
- Landscape Publications
- Master Gardener On-Line Training
- Additional Earth-Kind® Resources
- Earth-Kind® Drought Preparedness

# Goals of Earth-Kind

1. **Conservation of water**
2. **Reduction of chemical and fertilizer use**
3. **Energy conservation**
4. **Reduction of solid waste**

# Seven principles of Earth-Kind:

1) Planning and design
2) Soil analysis and preparation
3) Practical turf areas
4) **Appropriate plant selection**
5) Efficient irrigation and rainwater harvesting
6) Effective use of mulches
7) Appropriate maintenance

# Why Use Edibles in the Landscape?

- ✓Expands the available plant pallet
- ✓Growing demand for locally- and sustainably-grown produce
- ✓Additional interest and educational aspect
- ✓Spark interest in gardening for children

# Earth-Kind Herb Trial

# What are some of the most attractive and best-adapted perennial herbs for Texas?

- ✓ Focus on landscape value and adaptation
- ✓ Plot prep / maintenance consistent with other Earth-Kind Plant Trials
- ✓ Cultivars of three major herbs (rosemary, sage, and oregano)
- ✓ Cultivars with known culinary value
- ✓ Five test sites across the state

TEXAS A&M AGRILIFE EXTENSION

Texas A&M AgriLife Extension

# ‘Bergartten’ Sage

AS A&M
RiLIFE
XTENSION

# ‘Gorizia’ (barbecue) Rosemary

Texas A&M AgriLife Extension

# ‘Blue Lady’ Rosemary

Texas A&M AgriLife Extension

# ‘Hot & Spicy’ Oregano

EXAS A&M
GRILIFE
EXTENSION

# ‘Balsamic Blooms’ Basil

TEXAS A&M
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EXTENSION


TEXAS A&M AGRILIFE EXTENSION

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# Feijoa / Pineapple Guava

*Acca sellowiana*

- USDA 8 to 11
- Full sun to partial shade (some afternoon shade beneficial)
- Spread: 8’-12’ high x 7’-9’ wide with gray-green foliage
- Tolerant of a variety of soils, but prefers well-drained
- Moderate heat and drought tolerance
- Showy (edible) pink flowers give way to tasty fruit in late fall

TEXAS A&M AGRILIFE EXTENSION


CRAFTED BY HAND
AROHA
Sparkling
Feijoa
FRUIT DRINK


Fejoas
$3.50per

# Fruit & Nut Resources

https://aggie-horticulture.tamu.edu/fruit-nut/

## Fruit and Nut Fact Sheets

- Apples
- Avocados
- Blackberries
- Blueberries
- Figs
- Pierce's Disease Tolerant Grapes
- Texas Grape Growers' Pierce's Disease Management Guide
- Olives
- Peaches
- Pears
- Pecans-Improved
- Pecans-Native
- Persimmons
- Plums and Other Stone Fruit
- Pomegranates
- Low Tunnel Strawberry Guide

- Banana
- Citrus
- Evaluating Pecan Problems
- Grape Arbors – New Interest In an Old Tradition
- Jujube
- Mango
- Mayhaw
- Muscadine
- Papaya
- Pecans as a Health Food
- Texas Wine Vineyards
- Walnut

### New TAMU Peach and Nectarines Varieties

- Texas Stone Fruit Testing Program 2019
- New Stone Fruit Cultivars
- Peach Testing Program – 2019 – Order Form
- Zest Peaches
- White Delight Nectarines
- Flat Delight Peaches
- Smooth Texas Nectarines
- Smooth Delight Nectarines
- Smooth Zest Nectarines
- Tropical Peaches

### Other Resources

- Texas Winegrapes
- Patio Citrus
- Texas Citrus
- Guava
- Grapefruit
- Lemons
- Limes
- Loquat
- Mandarins
- Misc. Citrus
- Oranges
- Pineapple
- Citrus Greening
- Home Psyllid Control
- Topguard Terra 24 (c) Label (Grapes)

## Texas Pecan Grafting

Fruit and Nut Production

- Texas Fruit Growers Blog
- Texas Inlay and Four Flap Grafting
- Commercial Pecan Orchards In Texas
- Fact Sheets
- How to Grow the Peanut and 105 Ways of Preparing it for Human Consumption

## Texas Fruit Growers Blog

- 2020 Texas A&M University Stone Fruit Testing Program
- 2018 Texas Fruit Conference Program
- 2017 Texas Fruit Conference Tentative Program
- 2016 Texas Fruit Conference Program

# Why don’t we grow more fruit in Texas???

- Inconsistent chilling
- Spring freezes
- Hail Damage
- Disease
- Labor, deer, water, others?

# Other Problems



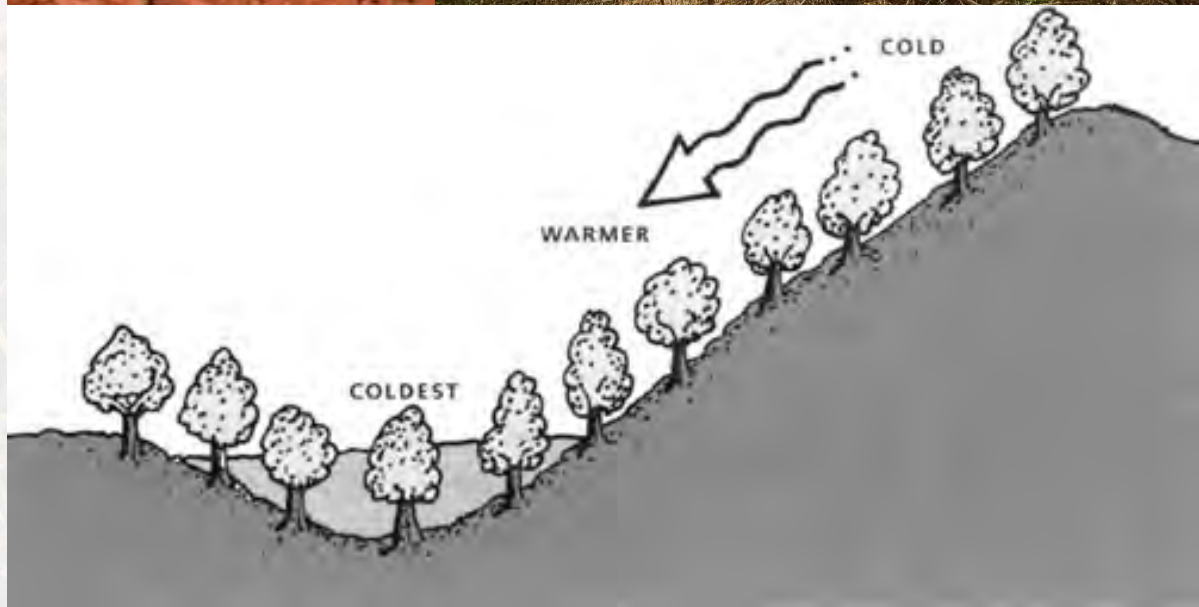



# Not All Fruit Are Equally Easy (or Difficult)

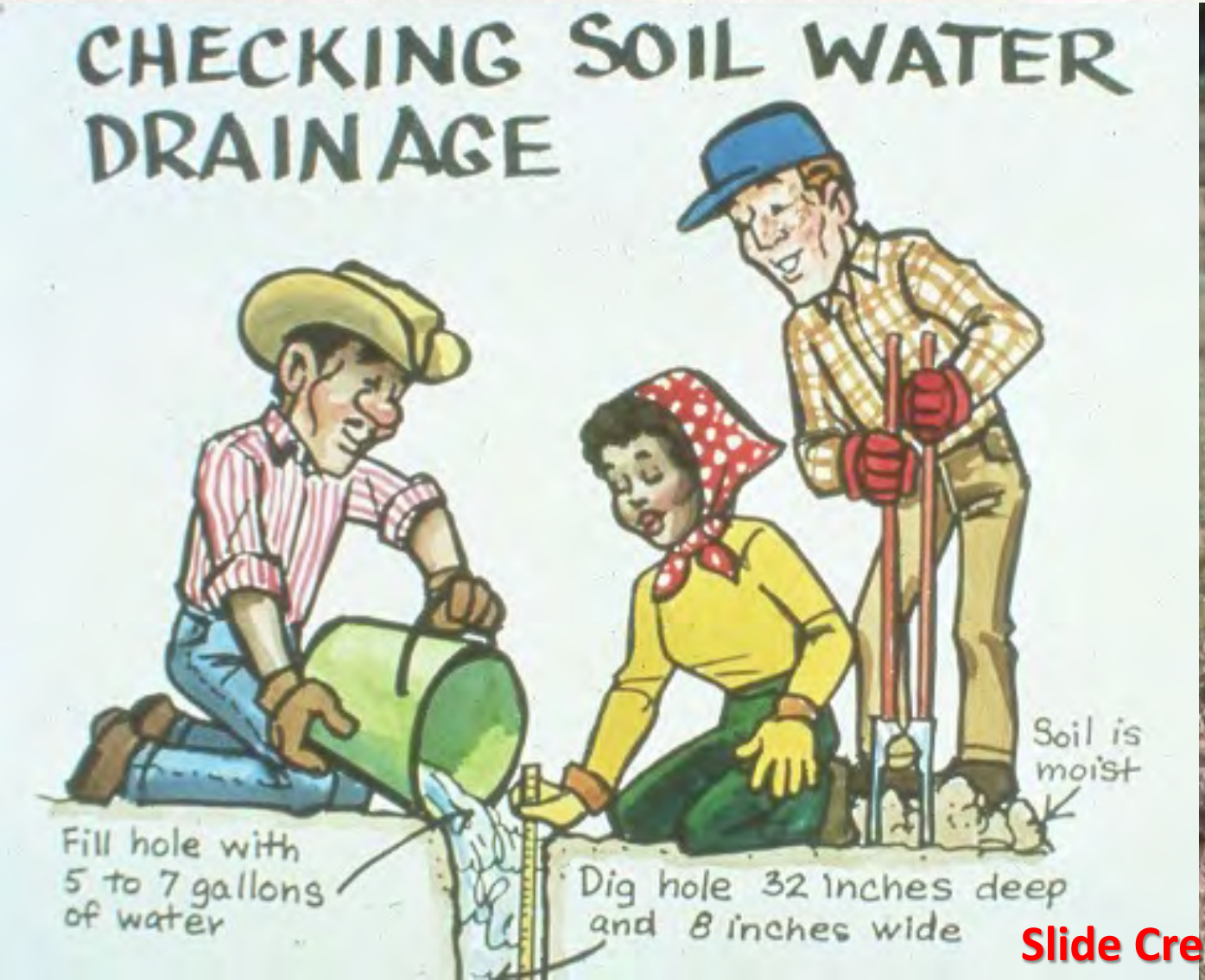
- **Low-input**
  - Asian persimmon
  - Grapes (European-American hybrids)
  - Jujube/Chinese Date
  - Pomegranate
- **Medium-input**
  - Blackberry
  - Blueberry
  - Fig
  - Loquat
  - Pear (Asian-European hybrids)
  - Strawberry
- **High-input**
  - Apple
  - Citrus
  - Kiwifruit
  - Peach and other stone fruit (apricot, cherry, nectarine, plum)
  - Pecan
  - Pear (Asian and European varieties)
  - Wine & table grapes

# Site Selection and Planning

- Deep , well drained soils
- “Berming” / terracing on poorly-trained soils
- Avoid sites previously in oak forest
- Select sites with adequate AIR drainage
- Full-sun, avoid competition from existing trees
- Protection from herbivores
- <u>Get your soil tested!</u>



# Percolation Test




1-8 Hours=Very Good
8-24 Hours=Good
24-48 Hours=Marginal
>48=Unacceptable

Slide Credit: Monte Nesbitt

# Overcoming poor drainage with raised plantings

# Winter Chilling in Temperate Fruit

- Most temperate plants require rest period
- Varies by species and by cultivar
- Typically considered to be hours (C.U.) < 45°F or 32°F to 45°F
- Many other models exist (Utah, Dynamic, Richardson, etc.)
- Varieties selected with appropriate chilling for local climate
- Insufficient chilling: delayed / sporadic bud break, reduced flowering
- Too much chilling (too early): buds break too early, subject to freeze injury
- Delayed pruning, mulching, shading to delay bud break

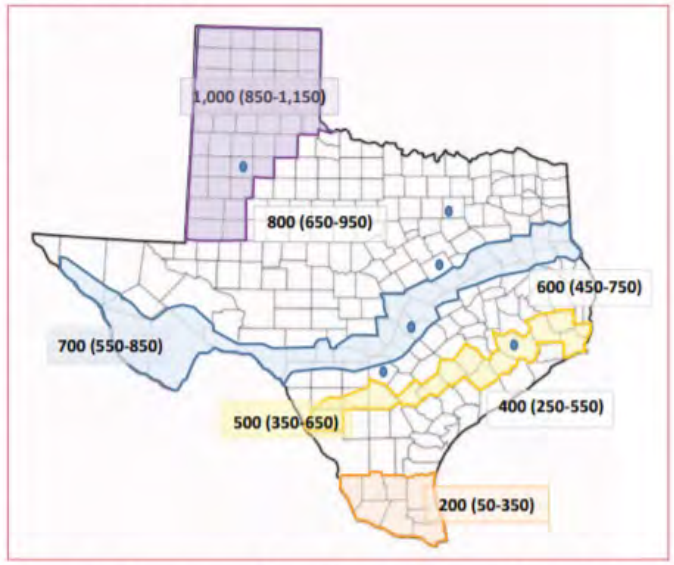



Figure 3. Average number of hours of winter chilling below 45° F in Texas.

# Planting & Establishment

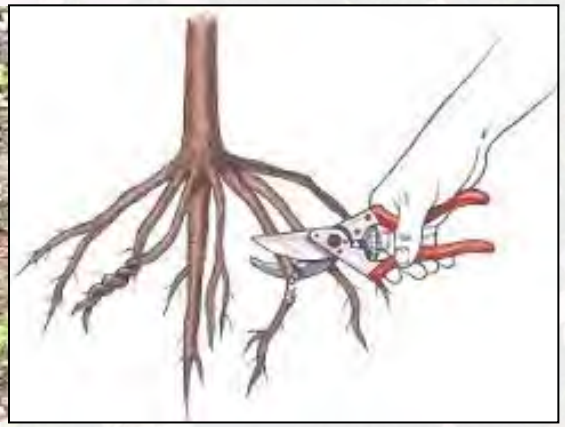
- Bare-root trees (field-grown)
  - Mainly available through mail-order
  - Often cheaper than container-grown
  - Shorter planting window (January-March)
- Container-grown trees
  - Available at nurseries / garden centers on-site
  - Typically more expensive than field-grown
  - Longer planting window (November-April)
- Removal / cutting damaged / circling roots
- Plant at same depth and backfill with native soil
- Stone fruit: cut back to height of 18 to 30 inches; branches back to stubs
- Pome fruit, persimmons, others: remove approximately 1/3 of top
- Maintain >3-feet diameter weed-free zone around young trees!

Figure 5. Cutting back at planting and aluminum foil wrapping of lower trunk.

# Preparation for Planting

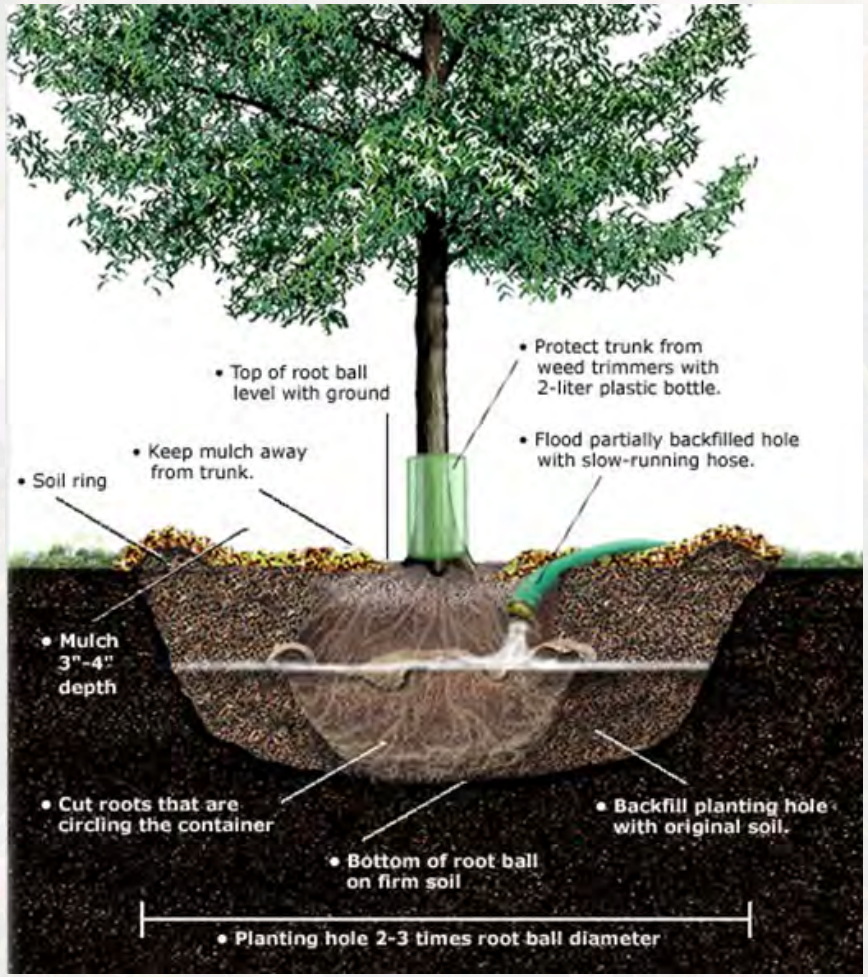
Circling roots on container plants should be cut with a knife or shovel to prevent stunting and severe damage later.

Broken / damaged and circling / crossing roots should be removed from bare-root plants before planting.



# Proper Planting Technique

1. Dig hole twice as wide, no deeper
2. Plant at original depth
3. Backfill with ORIGINAL soil
4. Water deeply
5. Stake loosely (if necessary)
6. Cut back top appropriately
7. <u>NO FERTILIZER AT TIME OF PLANTING!!!</u>



# Irrigation

- Most fruit trees are sensitive to water-logging!
- Over-watering leads to poor health and *Phytophthora*
- Watering dictated by soil texture and depth
- Typical water requirements of 1 inch per week if no rain
- Sprinklers: good distribution, but inefficient, disease problems
- Flood irrigation: cheap, inefficient, can spread disease
- Drip / micro irrigation: efficient, reduced weed / disease problems
  - Drip emitters
  - Drip tape / in-line drip tubing
  - Micro-sprays / micro-sprinklers

**TABLE 2: Gallons of water needed per week for 1- and 2-year-old peach trees**

| Year | April | May | June | July | Aug | Sept |
|---|---|---|---|---|---|---|
| 1 | 7 | 7 | 14 | 28 | 28 | 21* |
| 2 | 14 | 14 | 28 | 56 | 56 | 28* |

*Applying supplemental irrigation in September and October may be unnecessary if seasonal rainfall arrives.

# Fertility Management (peaches)

- ALWAYS test your soil first!
- Avoid fertilizer application unless new growth seen by May
  - One cup of 21-0-0 or similar nitrogen (only) fertilizer)
- Frequent (monthly applications best (March, April, May, June)
- Applications should be made at least 18” from tree base
- 2nd year: one cup fertilizer (18-6-12 or similar) per month (peach)
- 3rd year: two cups fertilizer (18-6-12 or similar) per month (peach)
- Full-grown trees should receive 0.5-0.7 lbs Nitrogen per tree per year (peac
  - Phosphorus and Potassium based on soil / leaf tissue testing!!!
- Micronutrient (iron) may be needed on soil pH >7.8
  - Only Iron chelate (EDDHA) products work in alkaline soils



# Weed Control

- Young trees compete POORLY with weeds
  - Including TURF GRASS
- Maintain ≥4’x4’ weed-free area around young trees
- Area should be expanded as tree grows
- Systemic agents: glyphosate, grass-killers
- Contact agents (vinegar, glufosinate, etc.)
- Preemergent herbicides
- Mulch (3”-4” layer, organic) out to drip-line BEST!

# Alternative Pest/Disease Control Products

- “Smothering agents” (Neem, insecticidal soap, oils)
- Neem Oil (miticidal, insecticidal, and fungicidal activity)
- Neutral copper fungicides
- Surround™ kaolinite clay
- Spinosad products (caterpillars, thrips, ants)
- *Bacillus thuringensis* products
- Rotenone and pyrethin (natural form)


# Bagging Fruit as an Alternative to Spraying?

BAGGED PEACHES IN SOUTH CAROLINA

GROWING FRUIT WITHOUT BLEMISHES

## How to Use Your Fruit Bags

by J.C. Melgar and G. Schnabel, Clemson University; jmelgar@clemson.edu

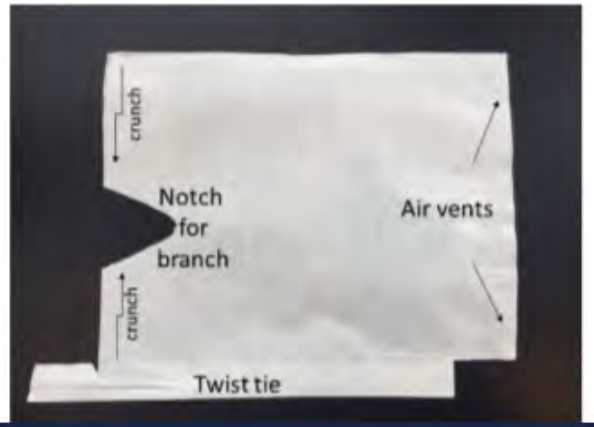
### Tree Preparation

-prune tree in winter: remove suckers and unwanted branches
-if needed, adjust soil pH and apply fertilizer (between bloom and petal fall); manage weeds
**-apply fungicide+insecticide (e.g. Bonide Tree Fruit Spray from Lowe's) immediately after bloom and 10 to 14 days later**
-thin when fruit is thumbnail sized, leaving 1 fruit every 4 to 5 inches

### Bagging Fruit

**-apply fungicide+insecticide one day prior to bagging** (sanitation)
-slide bag over fruit so that the branch fits into the V-shaped notch (see picture on the right)
-cinch the two sides next to notch **tightly** together around the branch until the bag is closed (see picture on right)
-wrap the twist tie **firmly** around the cinched top of the bag
(Youtube demo https://www.youtube.com/watch?v=pzFA-Oll2wM)

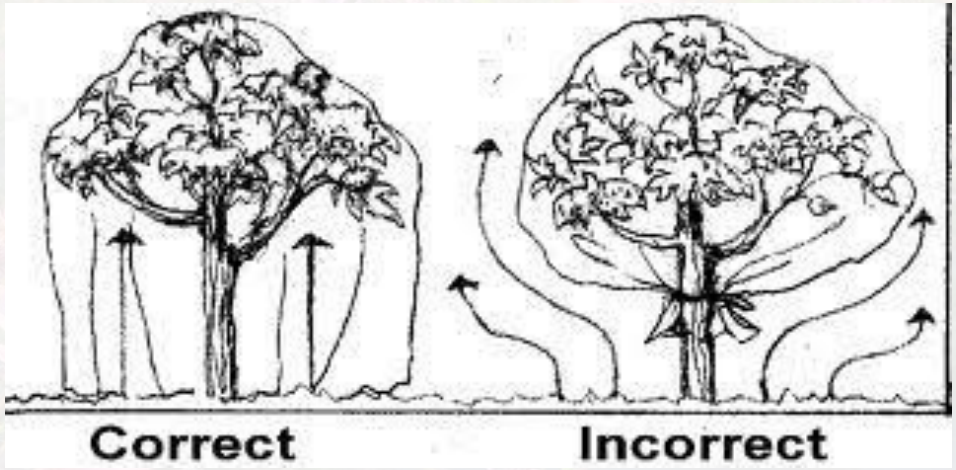
Order Clemson Fruit Bags at www.peachdoc.com





# Frost/Freeze Protection

- Fully dormant trees (and buds) are very cold hardy
- Susceptibility to cold occurs in late-winter / early spring
- Tolerance threshold ('Critical Temp') depends on devel. Stage
- Two types of freeze:
    1. Radiational: calm, clear, protection feasible
    2. Advective: windy, protection very difficult
- Protection by covering (insulating materials)
- Protection by wrapping / banking
- Protection by "icing" (continuous sprinkler application)




# Deer and Varmint Control

# Raccoons, possoms, squirrels, and birds



# General Guidelines for High-Density Fruit Planting

- ✓Select dwarfing/smaller crops and varieties
- ✓Water and fertilize judiciously (especially nitrogen)
- ✓Allow plant to crop heavily
- ✓Consider alternative pruning/training systems
- ✓Consider growing in containers (if appropriate)

| **Low Input** | **Major Limitations** |
|---|---|
| Persimmon | Fruit drop, limb decay |
| Jujube | Root suckers |
| Olive | Crop consistency, frost tolerance |
| Pomegranate | Fruit rot & sunburn, frost tolerance |
| Grapes-hybrid & muscadine | Training, birds, lower fruit quality, pH (muscadines), disease |
| **Medium Input** | |
| Blueberry | Spring Frost, pH, water quality |
| Blackberry | Training, pests & diseases |
| Fig | Birds, frost tolerance, nematodes, fig rust |
| Pear | Fireblight, pear decline |
| Strawberry | Frost tolerance (winter & spring), mites, diseases |
| **High Input** | |
| Peach and other stone fruit | Borers, curculio, brown rot, scab, spring frost |
| Pecan | Zinc requirements, pest/disease, tree sizeg |
| Apple | Cotton root rot, fireblight, pest/disease, chilling |
| Citrus | Frost tolerance, pests, diseases |
| Vinifera (wine) grapes | Training, fruit diseases, Pierce's Disease |

# Asian Persimmon: *Diospyros kaki*

- Small to medium deciduous tree from eastern Asia
- Plants typically dioecious (separate male/female)
- Parthenocarpic (seedless fruit)
- Attractive as ornamental
- Orange fruit dried, eaten fresh, and desserts
- Few pest or disease problems
- Astringent and non-astringent varieties
- October through December

# Persimmon Culture & Production

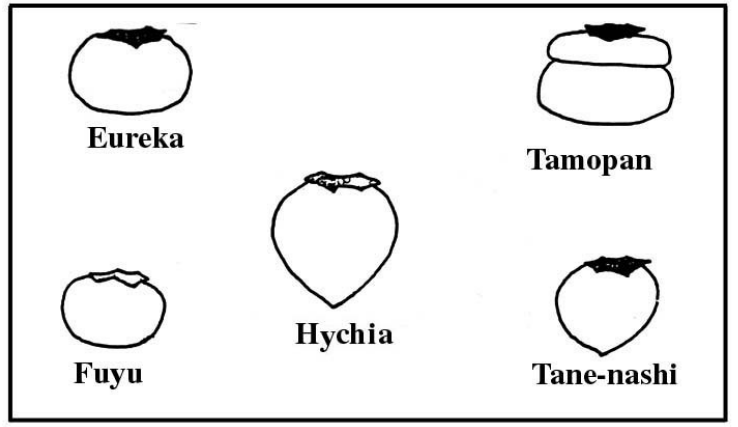


Figure 1. Shapes of major oriental persimmons grown in Texas

- Well-adapted to essentially all of Texas
- Low (<100 cu) chilling requirement
- Relatively high heat unit requirement (later-blooming)
- Spacing: 15 to 18 feet in-row; 20 feet between rows
- Pests: Persimmon clear-wing borer, varmints
- <u>Astringent:</u>
  - Tannins make fruit bitter until fully ripe (soft)
- <u>Non-astringent:</u>
  - Tannins break down before fruit soften
  - Remain firm and can be eaten with skin (crisp texture)


# Jujube

*Ziziphus jujuba*

- Thorny tree from South Asia
- Date-like fruit similar to “dry” apple
- Extremely drought tolerant
- Can be eaten fresh or dried like dates
- Very few pest / disease problems
- Usually grafted (*Z. jubjuba or Z. spinosa*)
- Suckering a hindrance to more widespread planting


AUG 27 2017

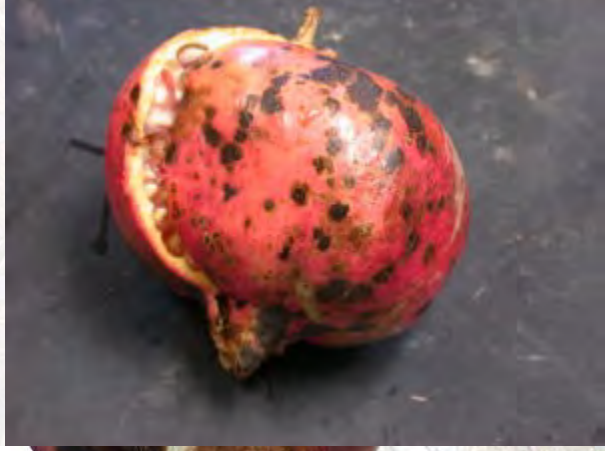

Honey Jar
Tsao
Li
Abbeyville
Sugarcane

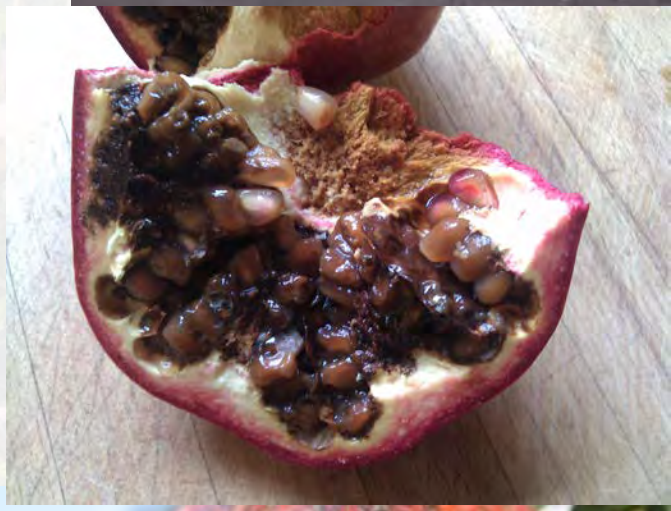
# Pomegranate
*Punica granatum*

- USDA 7 to 10 (varies considerably by cultivar)
- Max. spread: 2’-4’ feet for dwarf types, 8’-10’ (up to 20’) for normal forms
- Full sun to partial shade (full sun best for flower and fruit production)
- Ancient plant adapted to most soils, heat / drought tolerant
- Red/orange single or double flowers and showy edible fruit

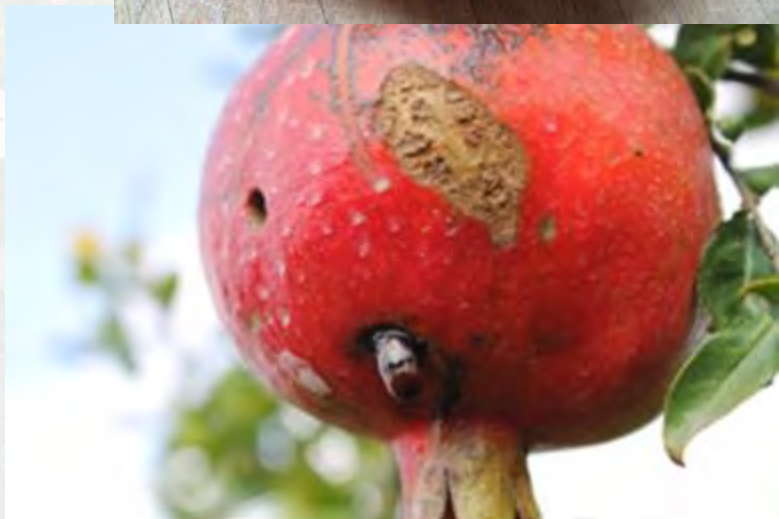
# Not adapted to Texas???

- Cold tolerance?
- Sunburn, superficial blemishes, heart rot
- Extensive trialing of dozens of cultivars
- ‘Austin’ appears to be most tolerant of heart rot









# Blackberry

*Rubus spp.*

- Native, American fruit crop
- Trailing to bushy habit
- Some trellis usually required
- Biennial cane: primo- & floricanes
- Thornless and primocane-fruiting
- Fungal diseases and stinkbugs
- White drupelet disorder
- Harvest: late-April through late-June
- **New cvs.: ‘Prime Ark Traveler, ‘Tupi’, ‘Sweetie Pie’, ‘Caddo’, ‘Ponca’**

# Blueberry

## *Vaccinium spp.*

- Northern High Bush: POOLRY ADAPTED TO TX
- Rabbiteye: lower maintenance, self-incompatible, small-medium fruit size
- Southern High Bush (SHB): higher maintenance, self-fertile, med.-large fruit size
- Well-drained, acid (pH = 4.0-5.5) soil with EXCELLENT quality water
- Containers/raised planters  with rainwater or reverse-osmosis water ONLY!
- 20 to 45 gallon containers with composted pine and/or peat moss
- Yield potential 5 to 15 pounds of fruit per year
- Season: mid-May through July
- Problems: spring frost (early-blooming), soil/water, birds

**New Texas Superstar introduced: Victoria Red grapes**

March 29, 2017

- Writer: Adam Russell, 903-834-6191, adam.russell@ag.tamu.edu
- Contacts: Dr. Larry Stein, 830-278-9151, larry.stein@ag.tamu.edu
  David Rodriguez, 210-631-0400, dhrodriguez@ag.tamu.edu

COLLEGE STATION – Texas grape growers face various obstacles, including disease, but an established variety has been recognized for its resilience, vigor and productivity as both an ornamental and edible plant – the Victoria Red grape.

Victoria Red grapes have been named a 2017 Texas Superstar plant by Texas A&M AgriLife Research and Texas A&M AgriLife Extension Service horticulturalists after years of field trials around the state.

*Victoria Red grapes are the latest Texas Superstar promotion by Texas A&M AgriLife Research. (Texas A&M AgriLife Extension photo by Jim Kamas)*

According to AgriLife Extension horticulturists, to be designated a Texas Superstar, a plant must not only be beautiful but also perform well for consumers and growers throughout the state. Texas

‘Lomanto’
‘Champanel’
Muscadine (*V. rotundifolia*)
Victoria Red (medium-input!)

# Muscadine

## *Vitis rotundifolia*

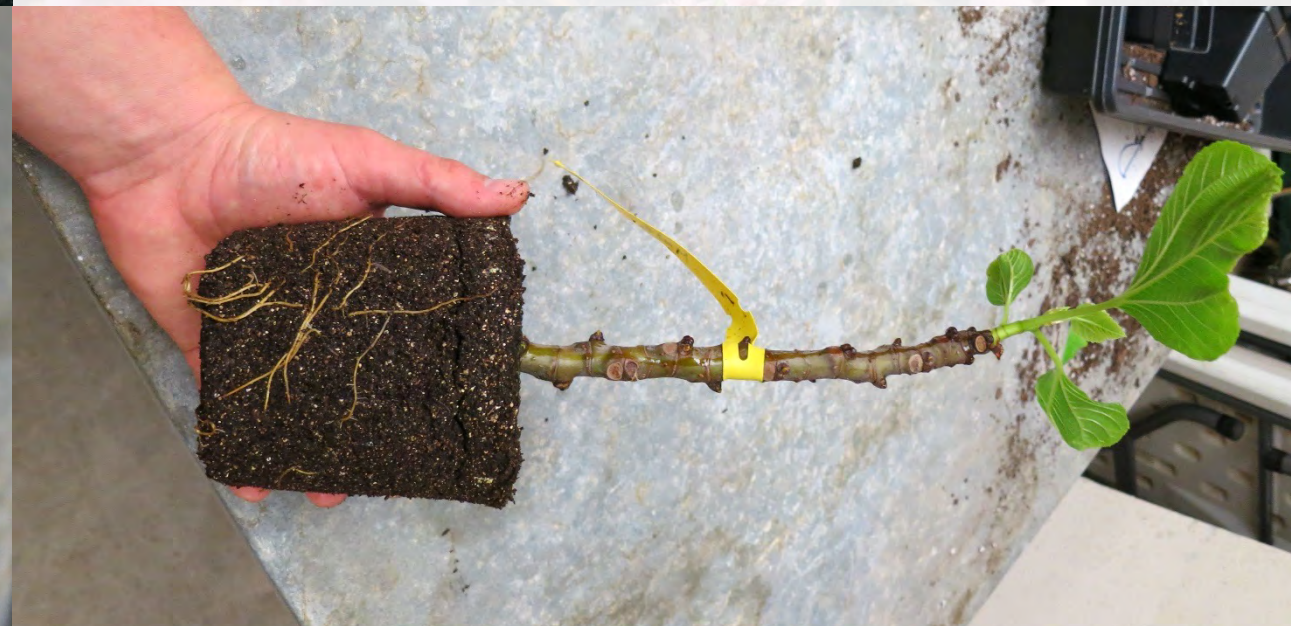
# Common Fig

*Ficus carica*

- Ancient fruit (mentioned in the Bible)
- Native to the Middle East
- Large shrub to small tree
- Fruit an is inside-out flower (synconium)
- Easily propagated by cuttings
- Harvest: June through October
- Major problems: cold, birds, fig rust

# Many different cultivars!!!

# Propagation



# Pear

- <u>Three types of pears</u>
  - European pear (*Pyrus communis*)
  - Asian pear (*P. pyrifolia* and *P. ussuriensis*)
  - Hybrids (Asian x European)
- Hybrid varieties among the toughest fruit trees in TX
- Fire blight resistance
- Rootstocks
- Training to modified central leader, limb-spreading
- Varieties: ‘Ayers’, ‘Warren’, ‘LeConte’, ‘Magness’,’Moonglow’, ‘Orient’, ‘Kieffer’, ‘Skinko’, ‘Shinseiki’, ‘20th Century’, ‘Shin Li’, ‘Chojuro’, and ‘Housi’

Figure 1. European hybrid pears.

Figure 3a. Third-year dormant pear tree, before pruning.

Figure 3b. The tree after pruning and after weights were added to help spread the limbs

# Peach: “the fruit that everyone kills, but keeps planting…”

- ✓ **Historically most-important fresh fruit crop in Texas (approx. 6,000 AC)**
- ✓ **Huge demand for commercial production and backyard trees**
- ✓ **“High-risk” crop with many potential problems, but huge potential!**

# Variety Selection

- Select varieties appropriate for your *average* chilling
  - 150 -200 C.U. below average. and 100-150 C.U. above average
- Ripening date (somewhat dependent on bloom date)
- Disease resistance (mainly bacterial leaf spot)
- Cling-stone vs. free-stone vs. semi-cling
- Flesh color (yellow vs. white; red in flesh)
- “Acid” vs. “low-acid”
- Nectarine vs. peach; Pantao (“doughnut”) vs. round

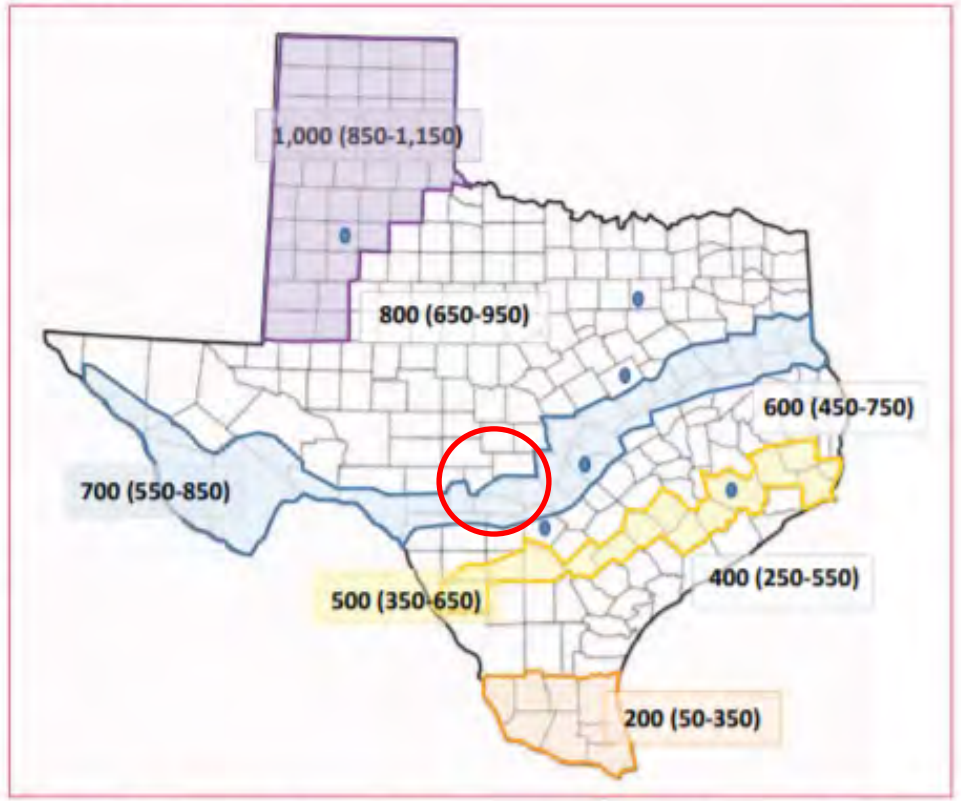



Figure 3. Average number of hours of winter chilling below 45° F in Texas.

**TABLE 1: Recommended peach varieties for Texas.**

## High-chilling varieties (700–1,000-hour zones)

| Variety | Chilling requirement | Stone freeness | Days ripening before *'Elberta'* |
|---|---|---|---|
| *'Flavorich'* | 700 | Cling | 64 |
| *'Regal'* | 700 | Semi-cling | 54 |
| *'Junegold'* | 650 | Cling | 46 |
| *'Surecrop'* | 1,000 | Semi-free | 42 |
| *'Juneprince'* | 650 | Semi- free | 35 |
| *'Sentinel'* | 850 | Semi-free | 34 |
| *'GaLa'* | 750 | Semi-free | 34 |
| *'Harvester'* | 750 | Free | 26 |
| *'Ranger'* | 1,000 | Free | 24 |
| *'Fireprince'* | 850 | Free | 20 |
| *'Cary Mac'* | 750 | Free | 20 |
| *'Topaz'* | 850 | Free | 18 |
| *'Majestic'* | 850 | Free | 16 |
| *'Redglobe'* | 850 | Free | 13 |
| *Cresthaven* | 850 | Free | 3 |
| *'Dixiland'* | 750 | Free | 3 |
| *'Redskin'* | 750 | Free | 2 |
| *'Flameprince'* | 850 | Free | 14 |
| *'Parade'* | 850 | Free | 30 |
| *'Fairtime'* | 750 | Free | 35 |

## Medium-chilling varieties (450–650-hour zones)

| Variety | Chilling requirement | Stone freeness | Days ripening before *'Elberta'* |
|---|---|---|---|
| *'Flordacrest'* | 425 | Semi-cling | 55 |
| *'Flordaking'* | 450 | Cling | 51 |
| *'Junegold'* | 650 | Cling | 46 |
| *'TexKing'* | 450 | Cling | 42 |
| *'Juneprince'* | 650 | Semi-free | 35 |
| *'Texstar'* | 450 | Semi-free | 32 |
| *'Southern Pearl'* | 650 | Free | 28 |
| *'TexRoyal'* | 600 | Free | 25 |
| *'Suwanee'* | 650 | Free | 22 |
| *'TexPrince'* | 550 | Free | 20 |
| *'La Feliciana'* | 600 | Free | 18 |

# New Peach Varieties from the TAMU Breeding Program

## Fire, Royal and Golden Zest Peaches

The Zest peach series is being released by Texas A&M University to provide firm, attractive, yellow-fleshed, high quality peaches for the medium chill zone. These six peach cultivars would supply peaches over 6 weeks from early May until late July in the medium chill zone of Texas and similar regions.

**Productivity**: These peach cultivars have cropped consistently in the region where 'TexRoyal', 'JuneGold' and 'Harvester' are grown commercially.

**Size**: Medium to large depending on the number of fruit left on the tree.

**Quality**: Traditional tart sweet flavor. Excellent.

**Flesh**: Firm yellow flesh.

**Ripening season**: Ripen consecutively from early May to late June in the medium chill zone of Texas.

**Chilling requirement**: Based on the relative bloom times of standard cultivars, these new peaches need between 500 and 600 chilling units (CU). The latest blooming releases 'Royal Zest One', 'Royal Zest Four', and 'Golden Zest' require 600 chilling hours, whereas 'Fire Zest One' and 'Royal Zest Three' require 550 chilling hours and 'Royal Zest Two' requires about 500 chilling hours to break dormancy.

**Availability: Budwood available under license for budding.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

Fire Zest One - Early to Mid May

Royal Zest One Mid to Late May

Royal Zest Two Early June

Royal Zest Three – Early to Mid June

Royal Zest Four – Mid to Late June

Golden Zest – Late June

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## Smooth Delight Nectarines

The Smooth Delight nectarines are firm attractive subacid nectarines for the medium chill zone. These nectarines ripen from early to mid May through early June. These are the first subacid nectarines released for use in the medium chill zone of the southeastern United States.

**Productivity**: High when grown in the zone where 'Flordaking' and 'TexKing', 'June Gold' are grown commercially.

**Size**: Medium to large depending on the thinning done.

**Quality**: Low acid, sweet. Excellent.

**Flesh**: 'Smooth Delight One' and 'Smooth Delight Three' have white flesh and 'Smooth Delight Two' has yellow flesh. No tendency to brown, form split pits or crack.

**Ripening season**: 'Smooth Delight One' and 'Smooth Delight Two' ripen in early to mid May whereas 'Smooth Delight Three' is ripe in late May.

**Chilling requirement**: The chilling requirement for 'Smooth Delight One' and 'Smooth Delight Two' is between 350-450 chill units whereas 'Smooth Delight Three' requires 500-500 chill units to break dormancy.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

Smooth Delight One

Smooth Delight Two

Smooth Delight Three

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## Smooth Zest Nectarines

The 'Smooth Zest One' and "Smooth Zest Two' nectarines provide firm, attractive, nectarines with the traditional tart sweet flavor for the medium chill zone. This complementary pair of nectarines ripen in early to mid May.

**Productivity**: High when grown in the zones where 'Flordaking' and 'TexKing' are grown commercially.

**Size**: Medium to large depending on the number of fruit left on the tree.

**Quality**: Traditional tart, sweet flavor. Excellent.

**Flesh**: 'Smooth Zest One' has white flesh and 'Smooth Zest Two' has yellow flesh. Neither have shown a tendency to brown, form split pits or crack.

**Ripening season**: This complementary pair of nectarines ripen in early to mid May after 'Flordaking' and before 'TexKing'.

**Chilling requirement**: Full bloom occurs a few days before 'Flordaking' and 'TexKing' in the medium chill zone. Thus its chilling requirement is between 350-400 chill units.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

Smooth Zest One

Smooth Zest Two

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## Tropical Peaches

The tropical peach series consists of six yellow-fleshed peaches with a traditional tart sweet peach flavor.

**Productivity**: High when grown in low chill zones where 'Tropic Beauty', can be grown

**Size**: Medium to large depending on the number of fruit left on the tree.

**Quality**: Traditional tart sweet peach flavor. Excellent.

**Flesh**: All the peach cultivars have yellow flesh.

**Ripening season**: Depending on the location 'TexFirst', 'Tropicprince' and 'TropicZest One' ripen in late April to early May. 'Tropic Zest Two' ripens with 'Tropic Beauty' in mid May. 'Tropic Zest Three' and Tropic Zest Four' ripen in late May.

**Chilling requirement**: Full bloom occurs with or shortly after 'Tropic Beauty'. Chilling requirement is estimated to be between 150-250 chill units.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

TexFirst

Tropic Zest Two

Tropic Zest Three

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## White Delight Peach Series

The White Delight peach series are firm attractive subacid white-fleshed high quality peaches for the medium chill zone. These new peach cultivars supply a high quality, attractive, subacid, white-fleshed peach over six weeks from late May until early July.

**Productivity**: High when tested in Fairfield and Terrell, Texas where 'June Gold' and 'Harvester' are grown commercially. 'White Delight Two' is also productive in Floresville, Texas where 'Flordaking' and 'TexKing' are grown commercially.

**Size**: Medium to large depending on the thinning done.

**Quality**: Low acid, sweet. Excellent.

**Flesh**: White and melting.

**Ripening season**: A series of four peach cultivars that ripen from late May until early July.

**Chilling requirement**: 'White Delight One' and 'White Delight Two' require 550 chilling hours whereas 'White Delight Three' and 'White Delight Four' require about 700 chilling hours to fruit normally.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

White Delight One - Late May

White Delight Two - Mid June

White Delight Three - Late June

White Delight Four - Early July

## Flat Delight Peaches

The 'Flat Delight One' and 'Flat Delight Two' donut peaches provide firm, attractive, donut peaches with a sweet subacid peach flavor for the medium chill zone. This pair of donut peaches ripen in late May to early June.

**Productivity**: High when grown in the zones where 'Flordaking', 'TexKing' and 'June Gold' are grown commercially.

**Size**: Medium to large depending on the number of fruit left on the tree.

**Quality**: Sweet subacid peach flavor. Excellent.

**Flesh**: 'Flat Delight One' has white flesh and 'Flat Delight Two' has yellow flesh.

**Ripening season**: 'Flat Delight One' ripens in late May and 'Flat Delight Two' ripens in early June.

**Chilling requirement**: Full bloom occurs with or after 'TexKing' and before 'Texstar'. Chilling requirement is between 450-550 chill units.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

Flat Delight One

Flat Delight Two

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## Smooth Texan Nectarines

The Smooth Texas nectarine series consists of firm attractive early ripening nectarine cultivars for the medium chill zone. These new nectarine cultivars would supply a nectarine fruit over 3-4 weeks from mid May until early to mid June in the medium chill zone of Texas and similar regions.

**Productivity**: High when tested in Fairfield and Terrell, Texas where 'June Gold' and 'Harvester' are grown commercially.

**Size**: Medium to large depending on the number of fruit left on the tree.

**Quality**: Excellent. 'Smooth Texan One' and 'Smooth Texan Two' have traditional tart sweet flavor whereas 'Smooth Texan Three' has a subacid sweet flavor.

**Flesh**: Yellow, melting, and firm.

**Ripening season**: A series of three nectarine cultivars that ripen from mid May until early to mid June.

**Chilling requirement**: 'Smooth Texan One' and 'Smooth Texas Two' require 550-600 chilling hours whereas 'Smooth Texan Three' requires about 650 chilling hours to fruit normally. This is based on the relative bloom times in relation to the standard cultivars 'June Gold' and 'Regal'.

**Budwood available under license.**

**Contact: David Byrne at dbyrne@tamu.edu or Robert G. Brummett at Robert.Brummett@ag.tamu.edu**

Smooth Texan One - Mid May

Smooth Texan Two – Late May

Smooth Texan Three – Early June

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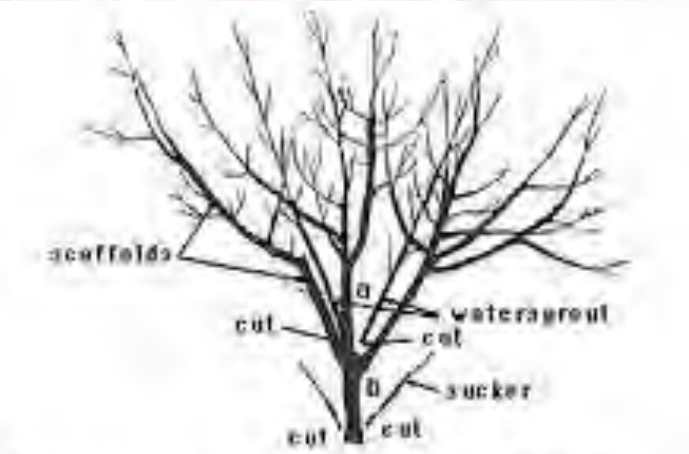



Figure 3. Training during year 1, 2 or 3 depends on rate of growth. Remove watersprouts (vigorous upright shoots) (see a). "Subscaffolds" develop after clipping the tips from the scaffolds. Remove suckers regularly (see b). Remove larger branches that usually fill the bowl shaped center of tree but leave sufficient short leafy growth in the center to provide shade protection for the scaffolds.

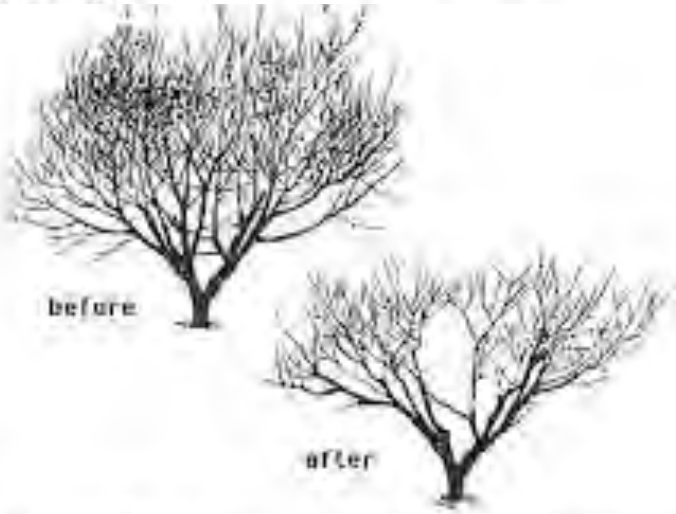


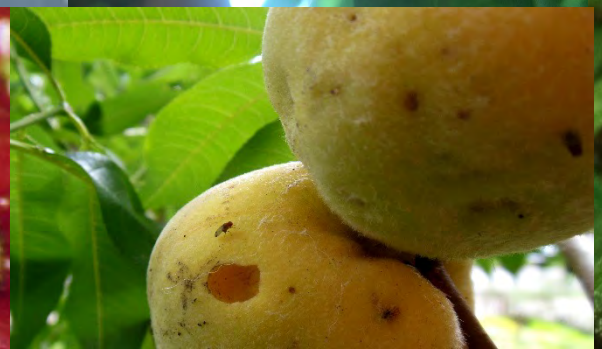

Figure 4. Bearing trees. Clip subscaffolds and other branches to maintain a practical tree height (usually 6 1/2 to 7 feet above the ground). Fruit are set on 1 year old shoots so these must be renewed from year to year. Thin out crowded shoots that will receive little sunlight. Remove low, "in-the-way" branches that may sag to the ground under a crop load.

# Common Pests of Peach / Nectarine







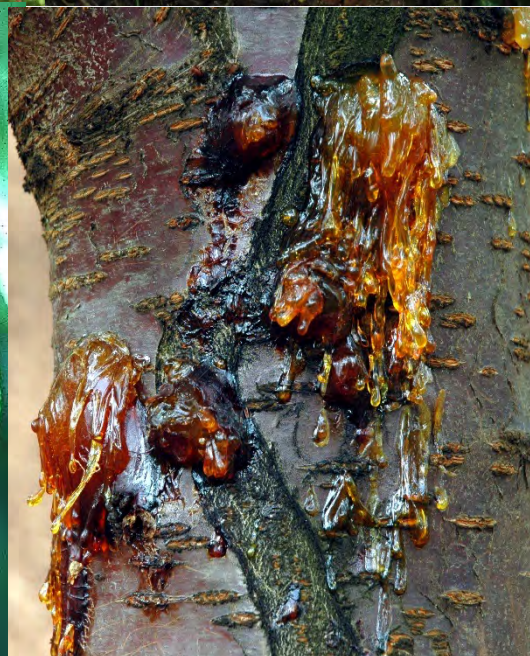
# Common Diseases of Peaches / Nectarines











https://agrilifeextension.tamu.edu/library/gardening/homeowners-guide-to-pests-of-peaches-plums-and-pecans/



# Homeowner's Guide to Pests of Peaches, Plums and Pecans

*By: Allen Knutson, Kevin Ong, James Kamas, Bill Ree and Dale Mott*

Insects and diseases can cause problems in peaches, plums, nectarines and pecans. Homeowners who grow these fruit trees can more easily identify the problems and select the proper control methods if they are familiar with insect pests and diseases, their life cycles and the damage they cause.

Because such problems vary from one area of Texas to another and from one year to the next, it is important that you keep records of pest and disease occurrences. These records can help you make wise control decisions, such as on the timing of pesticide applications.

**Table 3. Homeowner's spray guide for peaches and plums**

| Timing | Pest | Pesticide | Remarks |
|---|---|---|---|
| **Dormant season** | **Insects**<br>Scale insects | 97% dormant oil | Apply when temperature is between 45 and 70 degrees F. Apply only if scales are observed. Repeat applications in 2-3 weeks. Agitate the spray mixtures enough to prevent the oil and water from separating. |
| **Late dormant** | **Diseases**<br>peach leaf curl | copper fungicide<br>or<br>chlorothalonil<br>(see listing of products, Table 4) | Apply if there is a history of leaf curl. |
| | Bacterial spot | copper fungicides | |
| **Petal-fall**—when 75% of the petals have fallen, 5 days after bloom; combination products are an option – see Table 6. | **Insects**<br>Plum curculio | malathion<br>(malathion 50% EC)<br>or<br>carbaryl (Sevin® liquid)<br>or<br>permethrin 2.5% EC | Use insecticides only if there is a history of insect damage. Removal of wild plums can eliminate overwintering sites of plum curculio and reduce infestations. Repeated applications of permethrin may promote scale and mite outbreaks. Insecticides applied during bloom will kill honey bees. |
| | Peach twig borer | permethrin 2.5% EC | |
| | Lesser peach tree borer | permethrin 2.5% EC | |
| | **Diseases**<br>Scab | captan<br>or<br>chlorothalonil<br>or<br>sulfur<br>(see listing of products, Table 4)<br>or<br>thiophanate-methyl<br>(Topsin-M® 70% WP)[1] | Treat where there is a history of disease problems. |

**Peaches and plums (continued)**

| Timing | Pest | Pesticide | Remarks |
|---|---|---|---|
| **Shuck split**—when the calyx separates from base of newly formed fruit, 14 days after bloom; combination products are an option – see Table 6 | **Insects**<br>Catfacing insects, plum curculio | Same insecticides as for petal fall | Treat where there is a history of catfacing insects and/or plum curculio. |
| | **Diseases**<br>Scab | Same fungicide selection as at petal fall | |
| **Cover sprays**—repeat at 14-day intervals; combination products are an option – see Table 6 | **Insects**<br>Catfacing insects, plum curculio | Same as for petal fall | Removing brown rot mummies (diseased fruit) during fall and winter can reduce disease infection the following spring. |

AGRILIFE EXTENSION

# Insect and Disease Pests of Peaches, Plums, and Blackberries in a Small Fruit Orchard

Allen Knutson[1], Kevin Ong[2], and Bill Ree[3]

Peaches, plums, and blackberries are among the most commonly grown small fruits in Texas landscapes and small fruit orchards. However, insects and diseases reduce fruit production and quality and threaten the plants' health. Identifying these pests and understanding their life cycles and damage can help you choose the most effective control practices. Pests of peaches and plums are especially difficult to control because the fruit are susceptible to many kinds of pests over a long period, from petal fall through harvest (Table 1).

This guide explains how to identify and manage some of the most damaging insects and diseases that attack peaches, plums, and blackberries. The focus is on integrated pest management practices for backyard and small, noncommercial orchards.

Fortunately, not all of the pests listed in this publication will increase to damaging levels every year in every orchard. Identify the pest problems in your planting and select the appropriate controls. To reduce the risk of pests, follow the cultural practices listed below and then monitor your plants for diseases and insect pests.

To be most effective, pesticides for some insects and diseases must be applied at specific stages of crop development (Table 2).

**Table 1. Stages of fruit development in peaches and plums**

| Stage | Timing |
|---|---|
| Dormant | Late fall to early spring, before bud swell |
| Budbreak | Buds begin to swell. |
| Bud swell | Buds are noticeably swollen, but no green tissue is present. |
| Pink | Just before the flower buds open |
| Bloom | Flowers open |
| Petal fall | Last petals are falling |
| Shuck-split | Most of the developing fruit have split away from the remains of the dried flower |

[1]Professor and Extension Entomologist
[2]Professor and Director of the Texas Plant Disease Diagnostic Laboratory
[3]Extension Program Specialist II–IPM Statewide Pecan IPM Programming
The Texas A&M University System

https://extensionentomology.tamu.edu/files/2019/01/ENTO-087-Insect-and-Disease-Pess-of-Peach-Plums.pdf

# Thinning & Harvest

- Three-hundred large fruit is better than one-thousand plum-size fruit!
  - ✓ Regulates size of fruit
  - ✓ Avoids unnecessary limb-breakage
  - ✓ Maintains tree health and fruiting wood for next year
- Thin to 6 to 8 inches between fruit (all directions)
- Ripening date may vary by year
  - Color (ground color and red blush) - not always reliable
  - Firmness (“slight give” most common for commercial)
  - “Tree-ripe” stage fruit for homeowners

# REVIEW: General Guidelines for Successful Peach Production

- ✓ Selection for local chilling accumulation (<150 to >150 average)
- ✓ Selection for fruit traits (ripening, acidity, size, cling- vs. free-stone)
- ✓ Rootstock selection: soil pH, chilling requirement, limited selection
- ✓ Site selection: soil drainage and air drainage
- ✓ Proper training of young trees and heavy pruning of bearing trees
- ✓ Practice good weed control!
- ✓ Following strict spray schedule (especially for scab, brown rot, plum curculio, and borers)
- ✓ Proper thinning of crop (more is not always better!)
- ✓ Control of varmints (four-legged and two-legged!)

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# Mail Order / Retail Fruit Tree Sources

- Womack Nursery: https://womacknursery.com/
- Texas Pecan Nursery: https://texaspecannursery.com/
- Bob Wells Nursery: https://bobwellsnursery.com/
- Legg Creek Farm: http://leggcreekfarm.com/
- Stark Brothers Nursery (Missouri): https://raintreenursery.com/
- Just Fruit & Exotics (Florida): https://justfruitsandexotics.com/
- Ison's Nursery (Georgia): https://www.isons.com/
- One Green World (Oregon): https://onegreenworld.com/
- Rain Tree Nursery (Washington): https://raintreenursery.com/

# Thank you!