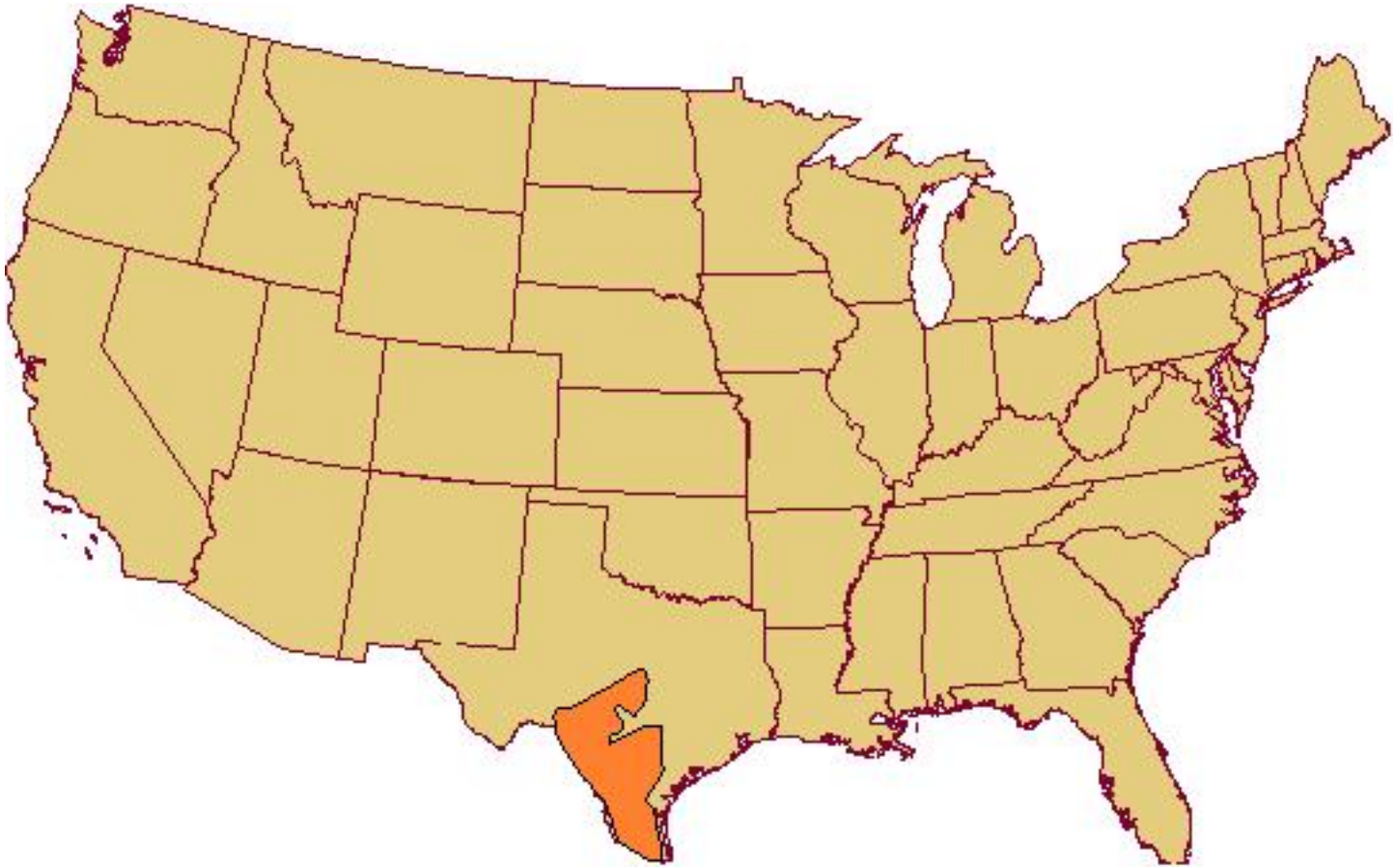
# Wilson County Tree Seminar

**Mark C. Black, Extension Plant Pathologist, Texas AgriLife Extension Service, Uvalde**

**September 30, 2009**

Texas Savanna

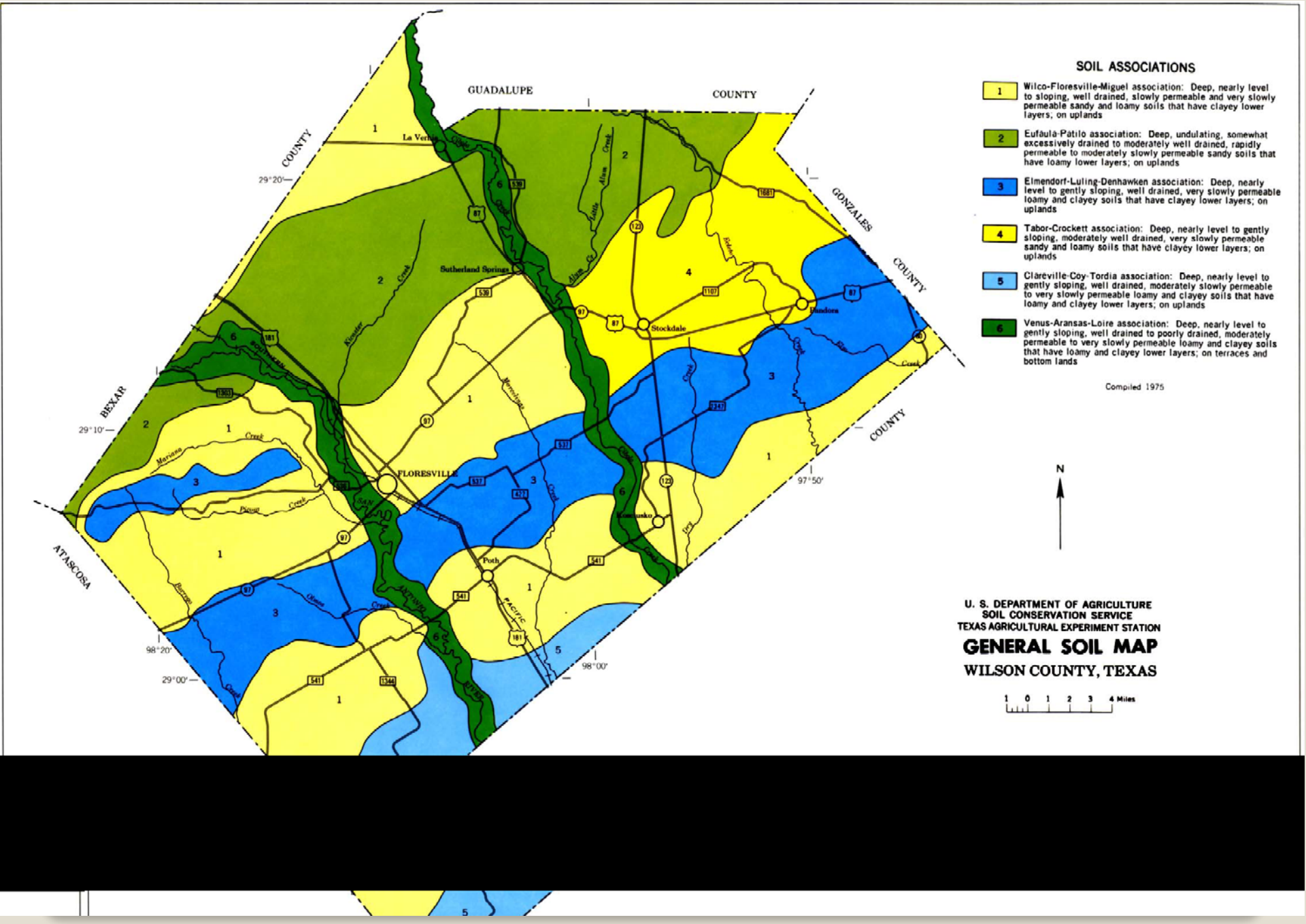
Originally mixed prairie grassland



Now high-shrub savanna

# Wilson County soil associations

- Deep sandy & loamy - 67%, uplands
- Deep loamy & clayey – 33% uplands, terraces & bottoms


GUADALUPE COUNTY
BEXAR COUNTY
ATASCOSA COUNTY
GONZALES COUNTY
29°20'
29°10'
29°00'
98°20'
98°00'
97°50'
La Vernia
Sutherland Springs
Stockdale
Pandora
FLORESVILLE
Poth
Kosciusko
SOIL ASSOCIATIONS
1 Wilco-Floresville-Miguel association: Deep, nearly level to sloping, well drained, slowly permeable and very slowly permeable sandy and loamy soils that have clayey lower layers; on uplands
2 Eufaula-Patilo association: Deep, undulating, somewhat excessively drained to moderately well drained, rapidly permeable to moderately slowly permeable sandy soils that have loamy lower layers; on uplands
3 Elmendorf-Luling-Denhawken association: Deep, nearly level to gently sloping, well drained, very slowly permeable loamy and clayey soils that have clayey lower layers; on uplands
4 Tabor-Crockett association: Deep, nearly level to gently sloping, moderately well drained, very slowly permeable sandy and loamy soils that have clayey lower layers; on uplands
5 Clareville-Coy-Tordia association: Deep, nearly level to gently sloping, well drained, moderately slowly permeable to very slowly permeable loamy and clayey soils that have loamy and clayey lower layers; on uplands
6 Venus-Aransas-Loire association: Deep, nearly level to gently sloping, well drained to poorly drained, moderately permeable to very slowly permeable loamy and clayey soils that have loamy and clayey lower layers; on terraces and bottom lands
Compiled 1975
N
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TEXAS AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
WILSON COUNTY, TEXAS
1 0 1 2 3 4 Miles

- Hot, humid summers
- Mild, dry winters
- Large variations in winter temperature
- Average annual precipitation 29”
- Lake evaporation 56” (27” difference)

# From “Soil Survey of Wilson County, Texas” 1977

# Change . . . . .

| | | | |
|---|---|---|---|
| 10,000 yr ago | Cool, wet | → | Warm, dry |
| | Forest | → | Savanna |
| 150 yr ago | Savanna | → | Brush |
| ~20 yr ago | Climate change | → | Desert? |

# Texas climate & trends

- Variable, sometimes extreme
- >Warm since late 1960s
- >Average rainfall
- >Extreme rainfall events
- Northers bring drops of 30-40 F within hours

# Climax Vegetation

- “…stabilized plant community that reproduces itself and does not change as long as the environment remains unchanged”
- “…plants that were growing there when the region was first settled”

- Land in or predominantly in grass

http://www.merriam-webster.com/dictionary/prairie

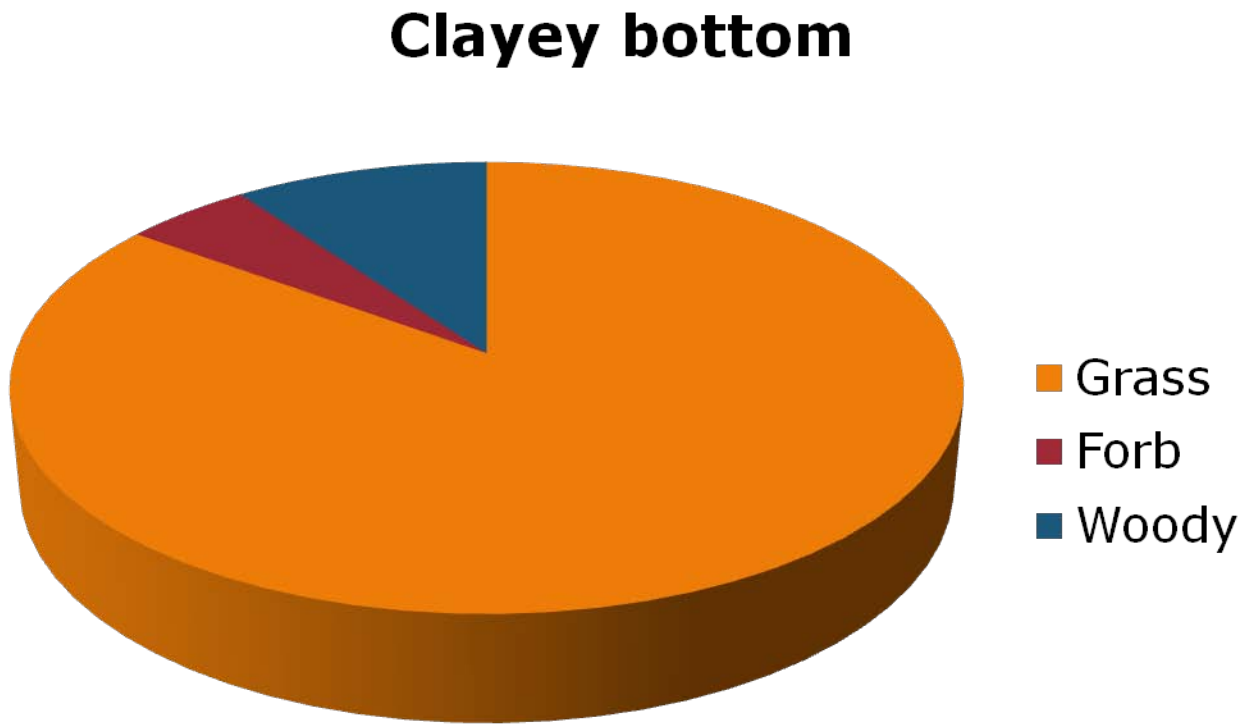
- Has temperate climate; moderate rainfall; grasses, herbs, and shrubs as the dominant vegetation

http://en.wikipedia.org/wiki/Prairie

# Prairie: part of grasslands, savannas, and shrublands biome

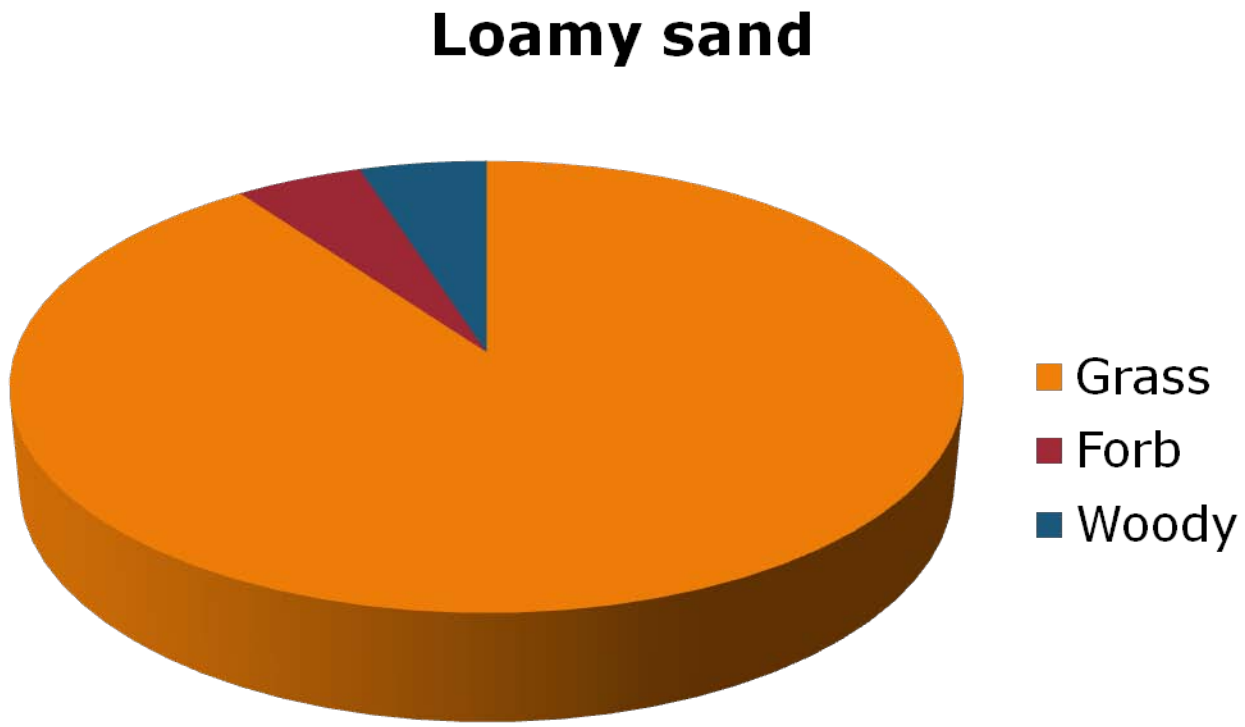
RANKIN
REALTY
southtexasbroker.com

## Climax community in Wilson County



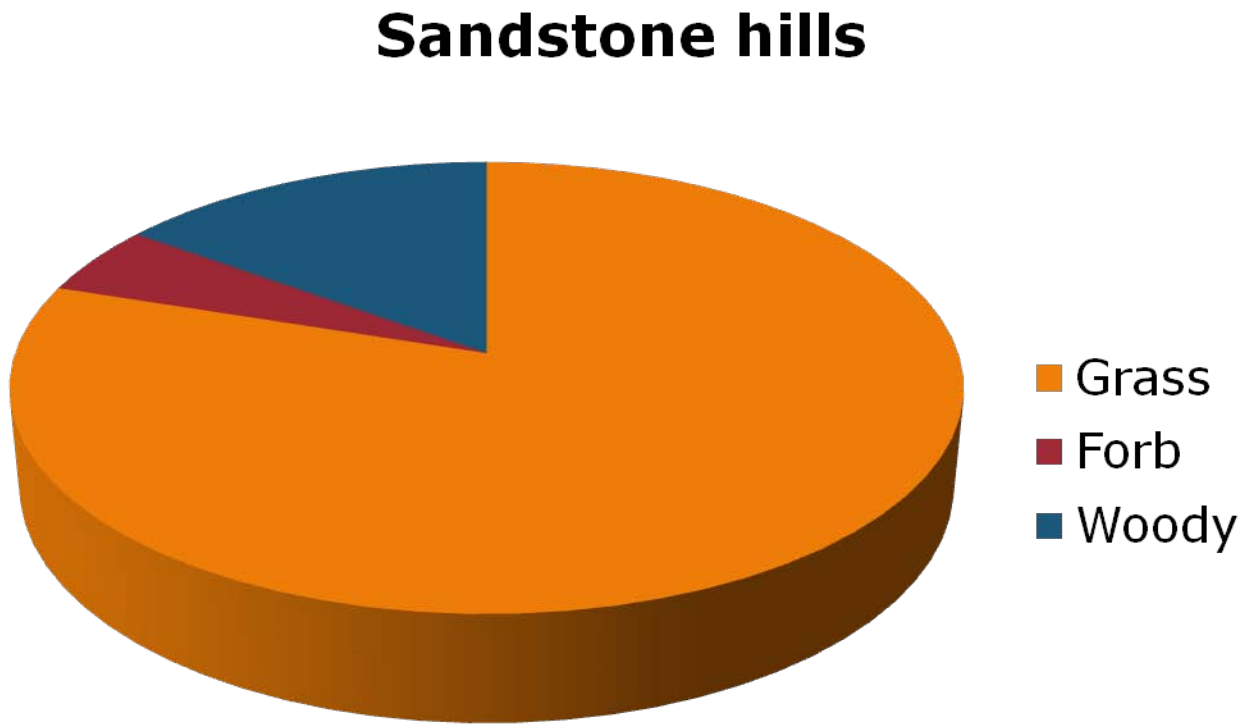

Oak, elm, hackberry, pecan, etc.

## Climax community in Wilson County



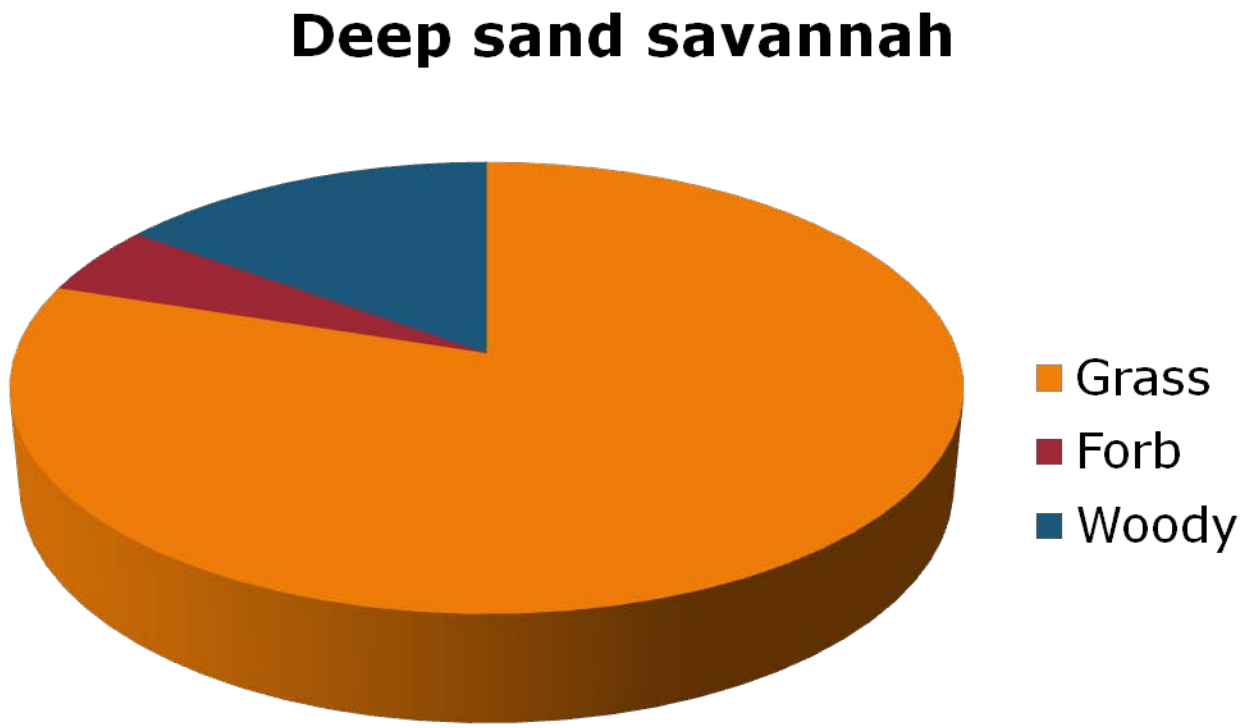

Live oak, post oak, hackberry, etc.

## Climax community in Wilson County




Post oak, blackjack oak, etc.

## Climax community in Wilson County




Oak, hickory, etc.

# Four Horsemen of Texas Prairies

- Big bluestem – moderate moisture, dominant
- Indiangrass – slightly drier
- Switchgrass – moderate to wet
- Little bluestem – dry, shallow soils

# Invaders

- Whitebrush
- Mesquite
- Oak
- Pricklypear cactus
- Low brush

# Drought and heat adaptations

## Water management

- Thick reduced leaves
- Thick short stems
- Thick waxy cuticle
- Leaf & stem hairs
- Sunken & fewer stomata
- Dormancy, leaf drop
- Tolerate extreme dehydration
- Long roots
- Water storage
- Root grafts

## Energy efficiency

- C4 or CAM, not C3 photosynthesis
- Annuals & ephemerals
- Aspect (slope direction)
- Energy storage

- Planning and design
- Soil analysis
- Practical turf areas
- Appropriate plant selection
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

# Xeriscape

https://agrilifebookstore.org/publications_search.cfm

- Mulch
- Improve soil structure with O.M.
- Surface materials
- Ground cover plants
- Turf choice, area, mowing height
- Plant choices – prairie & Mediterranean
- Plant zones
- Drainage (clay)
- Aeration (turf)
- Irrigation
- Rainfall capture
- Raingarden
- Rainfall storage
- Gray water

# ↘ Evaporation, ↗ Infiltration

# Concepts

- Fire-adapted species – regrow from roots or crown after fire
- Savanna – grassland ecosystem with spaced trees, canopy does not close
- Competition
- Spacing
- Planting and training

# Planting a tree

- Dig the hole
- Backfill, no amendment
- Berm
- Mulch
- Stake?
- Water

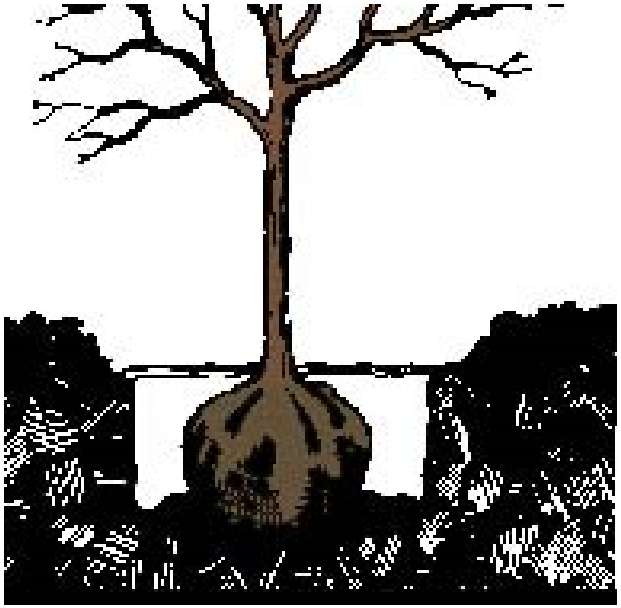
15-30 minutes

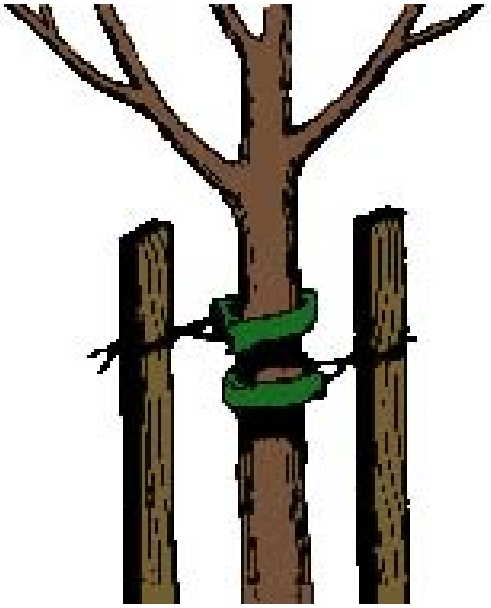
- Train

5-10 years

- Prune

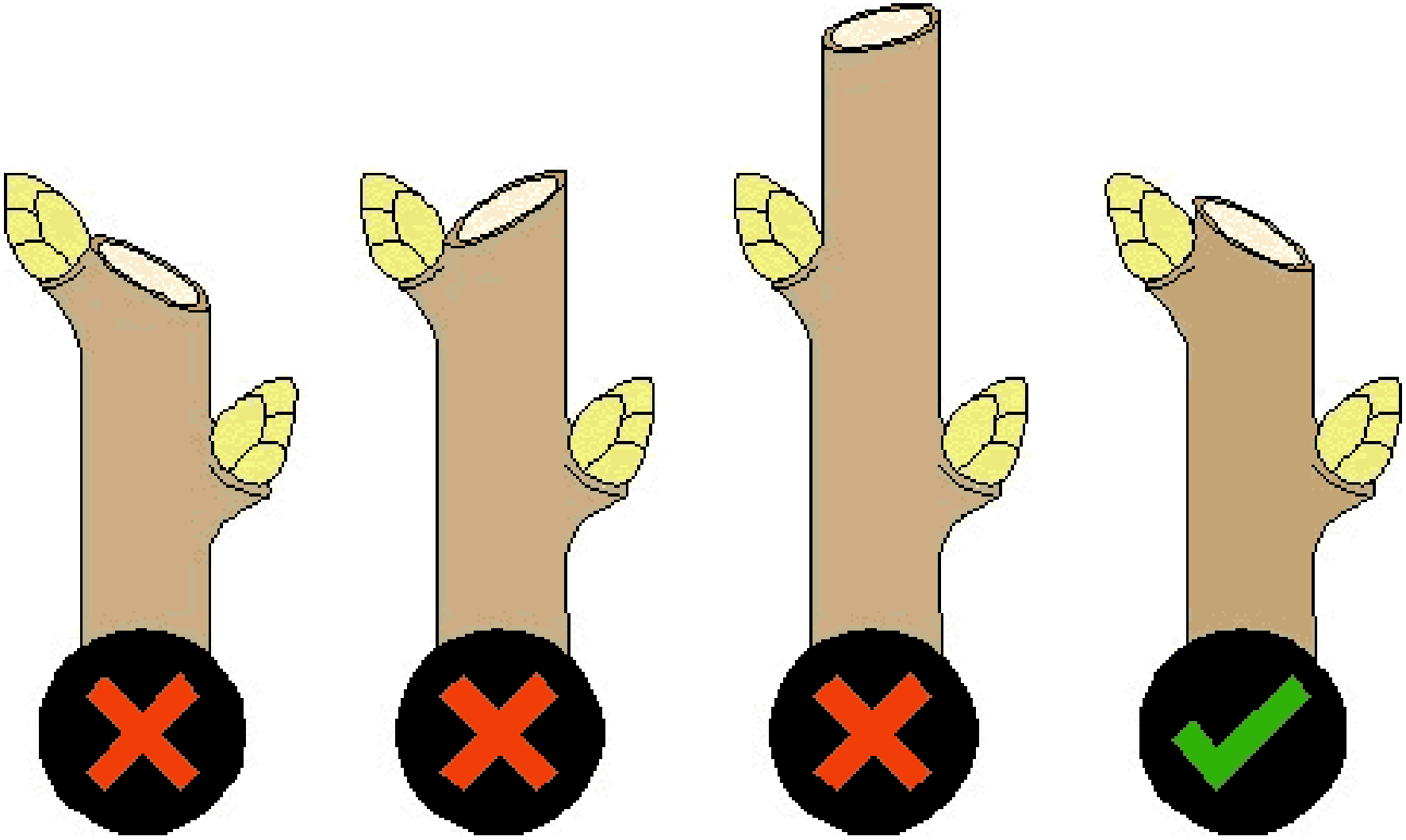
10-150 years

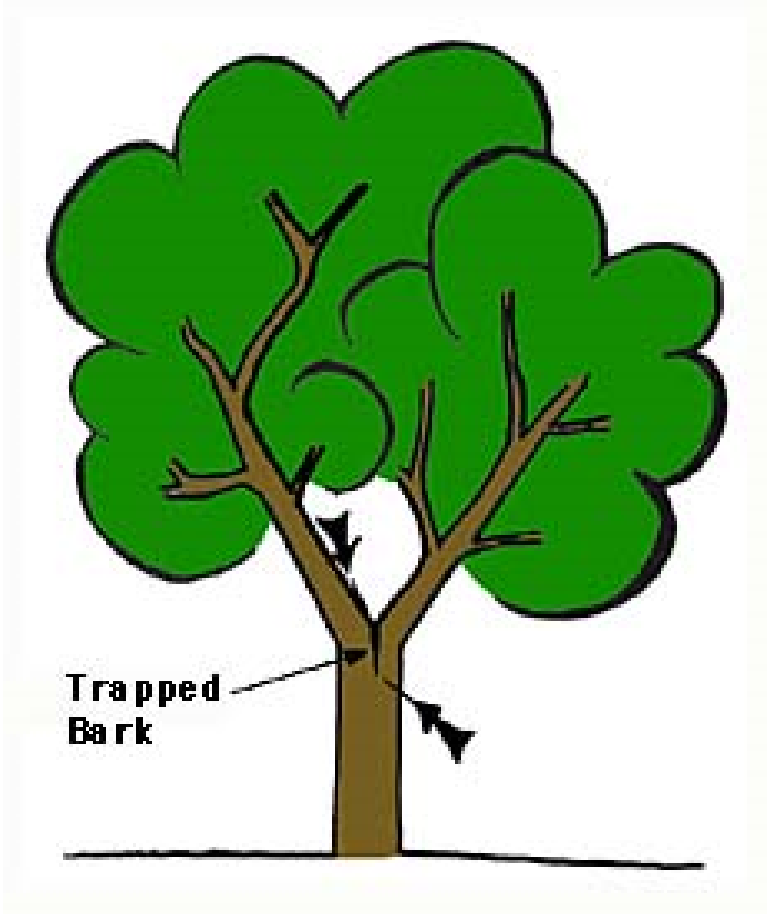


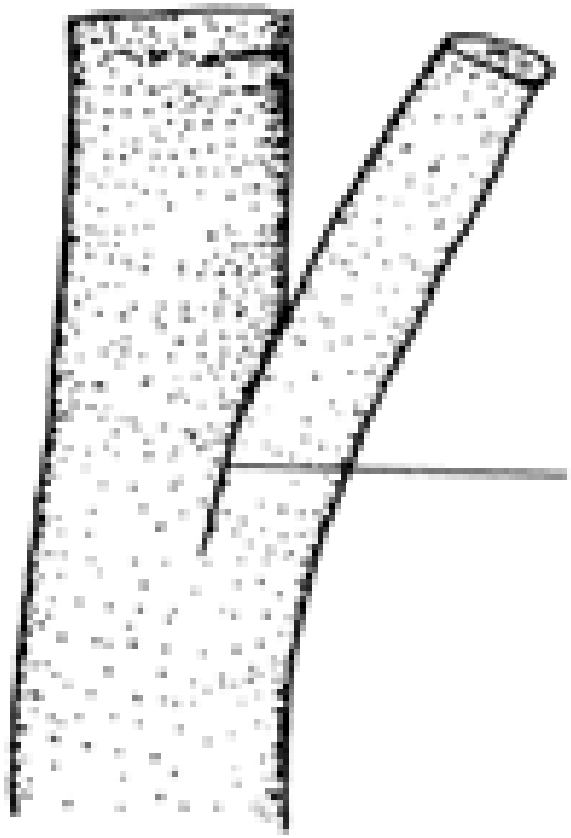


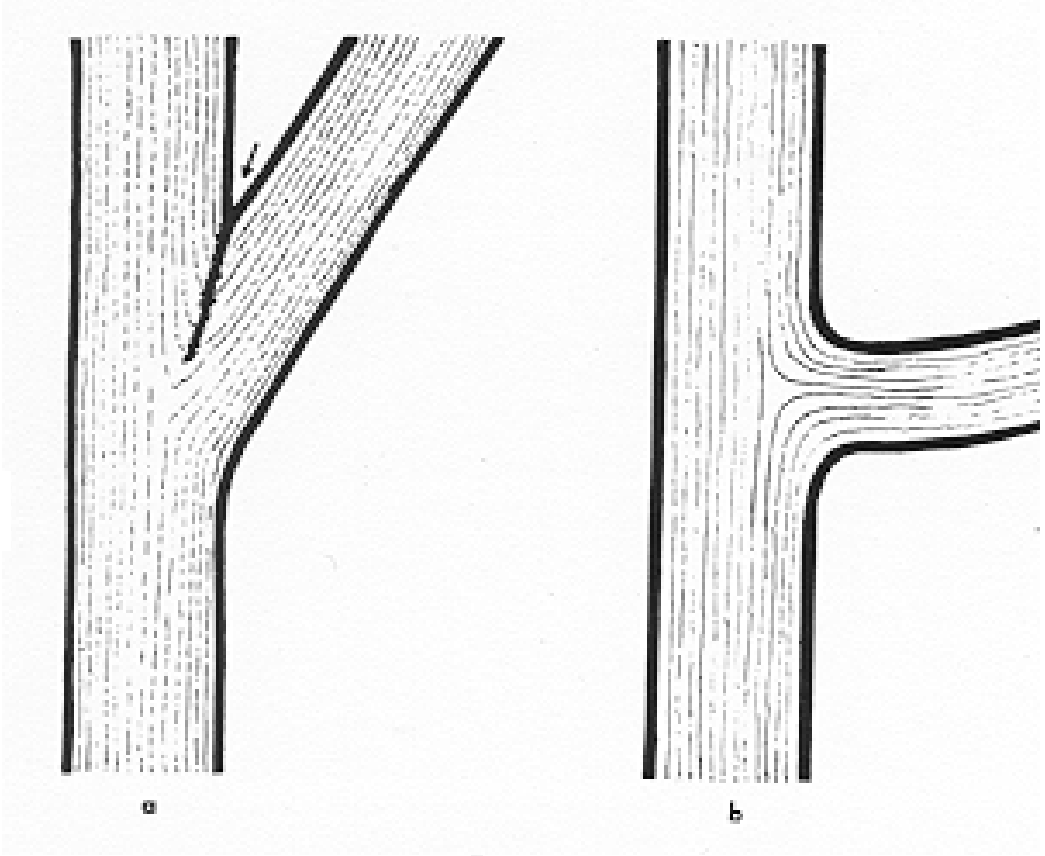
http://aggie-horticulture.tamu.edu/extension/homelandscape/tree/planting.html

# Twig and small branch pruning




Trapped
Bark

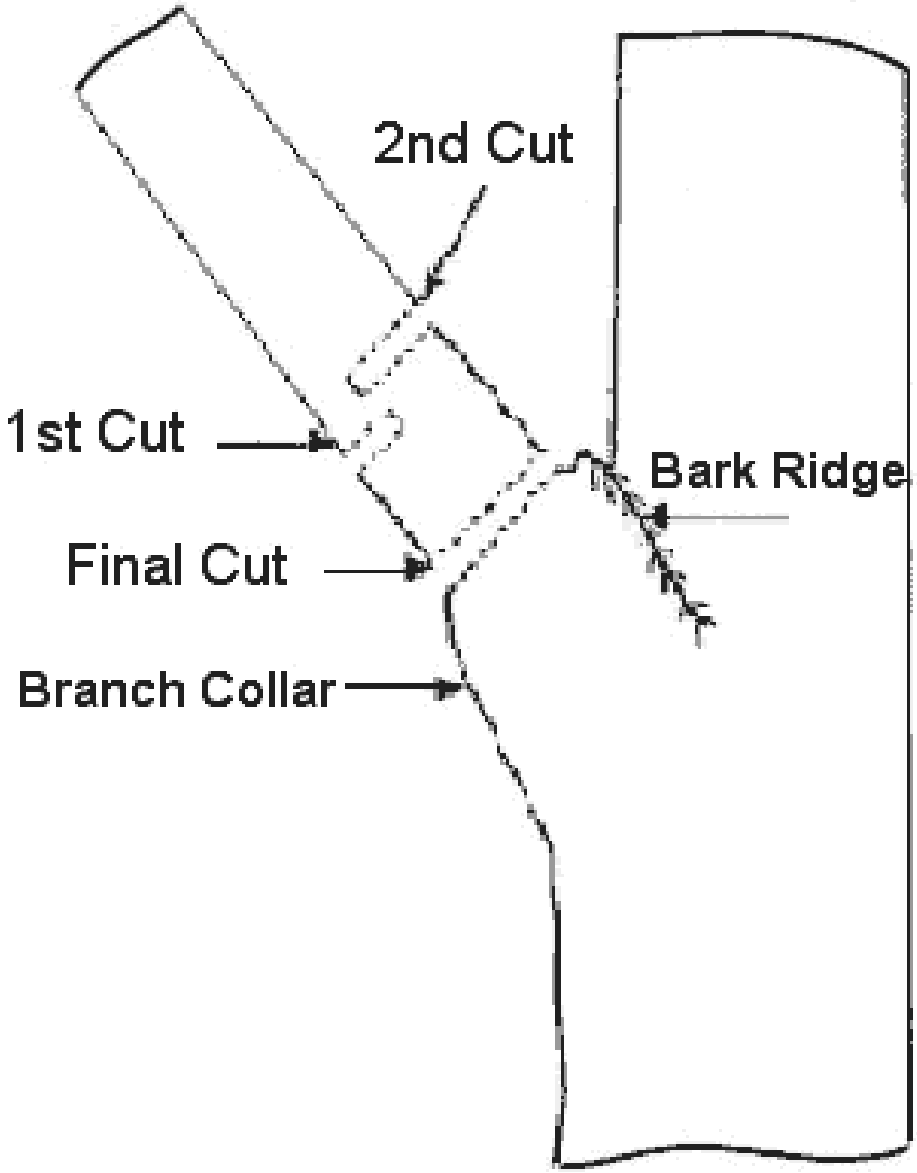





**Included bark**

**Strong branching**

# Limb removal



40

# Tree maintenance

- Remove all branches that rub
- Remove branches with included bark
- Remove all dead, dying, broken branches
- Thin over-crowded branches
- Structural pruning to develop long term tree shape (form)

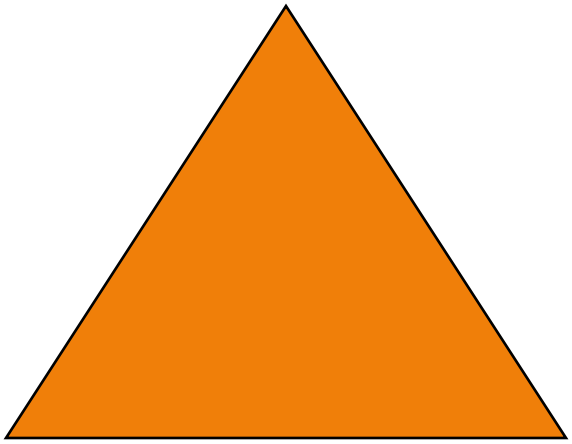
http://www.tryacer.co.nz/The%20pruning%20cut%2011.htm

# Topics

- Oak wilt

- Predisposition
- Symptoms
- Management
  - Treatments
  - Prevention
  - Clean up and implications
  - Landscaping

# *Disease Triangle:*
## *Oak wilt*



Oak wilt, Bandera County

Disease name: **Oak wilt**

Pathogen name: ***Ceratocystis fagacearum***, a fungus

Disease category: **Vascular wilt**

Spread: **Through connected roots**
**In moist red oak firewood**
**On sap beetles**

# Some facts

- Fungus, complex life cycle
- All oaks (red, live, white) killed with artificial inoculation
- Red oak:  conidia (asexual) + spore mat (sexual)
- Live oak:  conidia
- White oak:  avoids/limits disease (field resistance)

Live oak, N.G.Flaigg

d

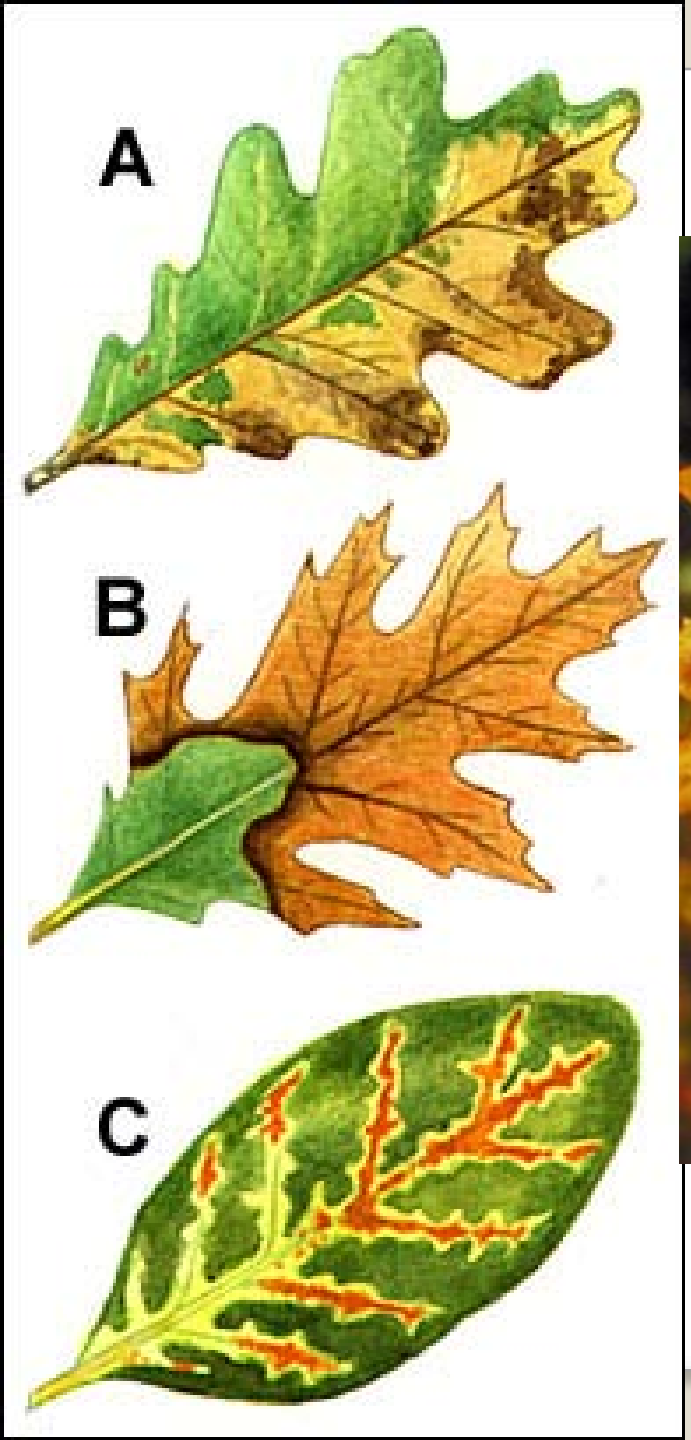

A
B
C

Figure 4. Bark section showing an exposed spore mat on both surfaces.

Figure 5. Bark split caused by pressure pad of the oak wilt fungus.

Ripper Bar

Back Hoe

Rock Saw

# Root connections

- Root grafts
- Mots from root sprouts

- Trenching 4 (-6 in sand) ft deep, 100 ft away
- Roguing
- Open areas (>300 ft???)
- Natural root barriers
- Major roads, deep utilities

# Propiconazole Fungicide Labeled for Oak Wilt

- Quali-Pro, Alamo, Kestrel

## Propiconazole Fungicide **Not** Labeled for Oak Wilt

- Banner Maxx, Orbit, Tilt

# Resistant to oak wilt

- Lacey oak
- Chinquapin oak
- Monterrey oak
- Bigelow oak (scaly-bark oak)
- Vasey oak (shin oak)
- Bur oak
- Post oak

- Non-oaks

# Topics

- Hypoxylon canker
- Predisposition
- Symptoms
- Management
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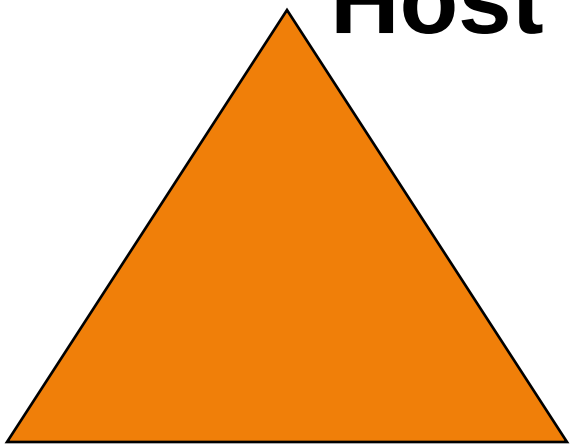
  - Landscaping

# *Disease Triangle:*

## *Hypoxylon canker*



Southwest Caldwell
County
Red Oak Tree
May 2009

Southwest Caldwell
County
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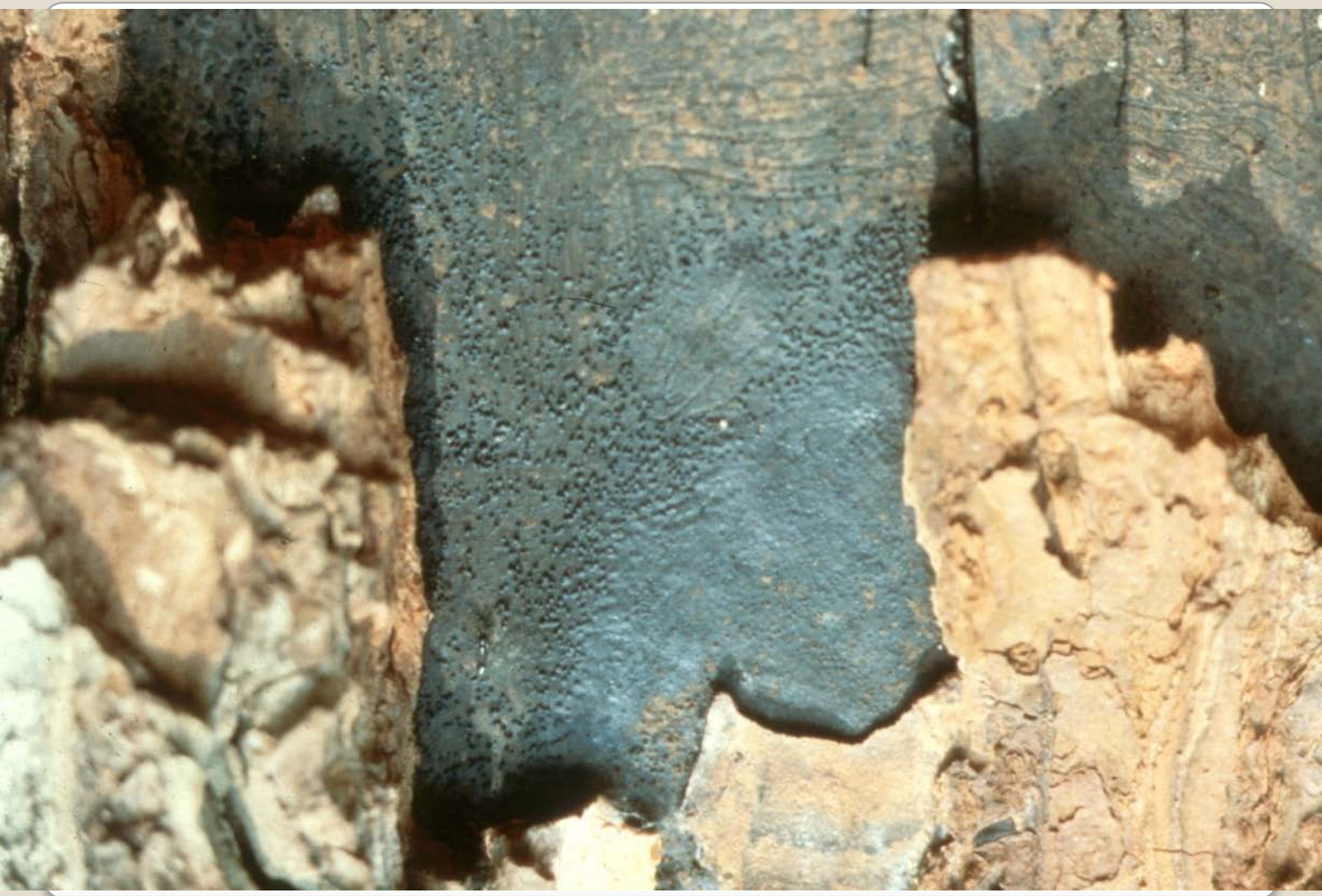
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