Woody Landscape Plants

Chapter 16

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Bartlett Tree Experts

Overview of Today's Discussion

- What is a Woody Plant
- Woody Plant Categories
- Hardiness
- Plant Sex
- Woody Plant Sizes & Growth Habits
- Growth Rate
- Functions of Woody Plants

What are Woody Plants?

- Perennials who's shoots persist during dormancy
  - Unlike herbaceous plants that die back
- Continue to grow in size via Xylem accumulation

Exceptions?

- Some woody plants will dieback in northern areas of adaptable range.
  - Can act as a woody plant or herbaceous perennial

How do we distinguish Woody Plants from Herbaceous Perennials?

The shoots and stems of a Woody Plant persist over 12 months and survive through the plant's dormant period. These stems tissues will live for many years and will continue to grow new tissue.

Categories of Woody Plants.

- Trees, Shrubs, Vines, & Groundcovers
  - Ranging in size from hundreds of feet to inches
  - Different care needs and landscape uses

- Common Names Vs. Scientific Names
- Plant Taxonomy
- Varieties Vs. Cultivars
- Manmade Plants: Trademarks & Hybrids

Common Names

- Easily recognized and easily confused
- May be many for the same plant
  - Change from region to region & country to country
- Unreliable

Lets look at a commonly confused Species.

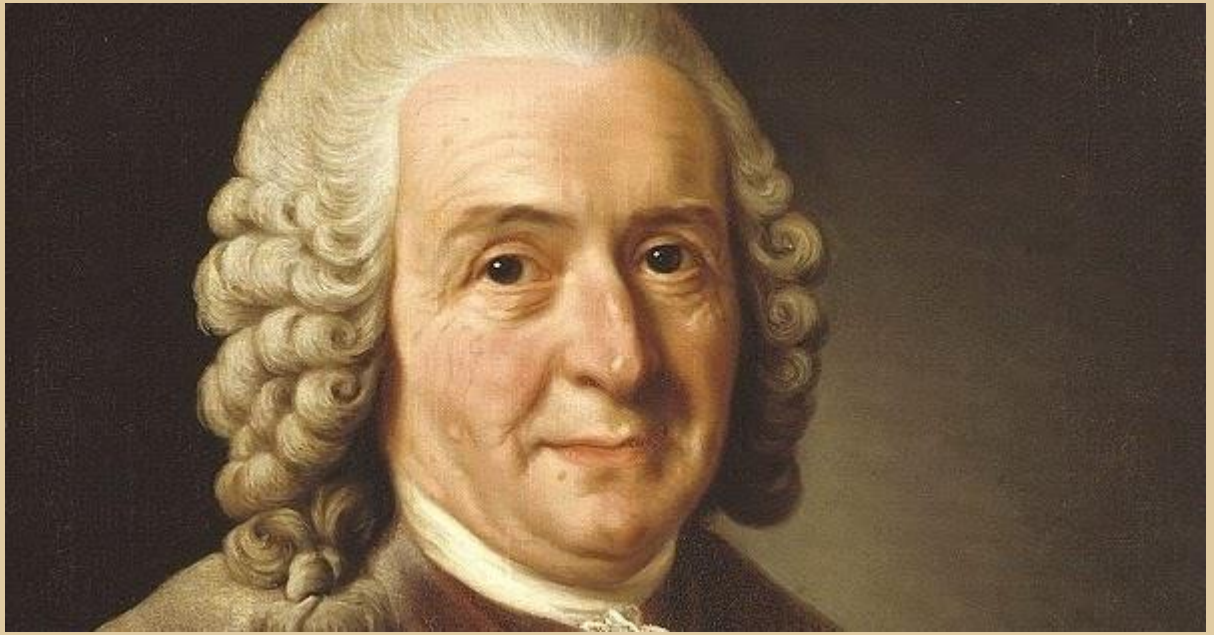
A Truly Misnamed Tree.

- The Eastern Red "Cedar"
- The tree is a true Juniper
- *Juniperus virginiana*

- Like calling a dog a cat

Scientific Names

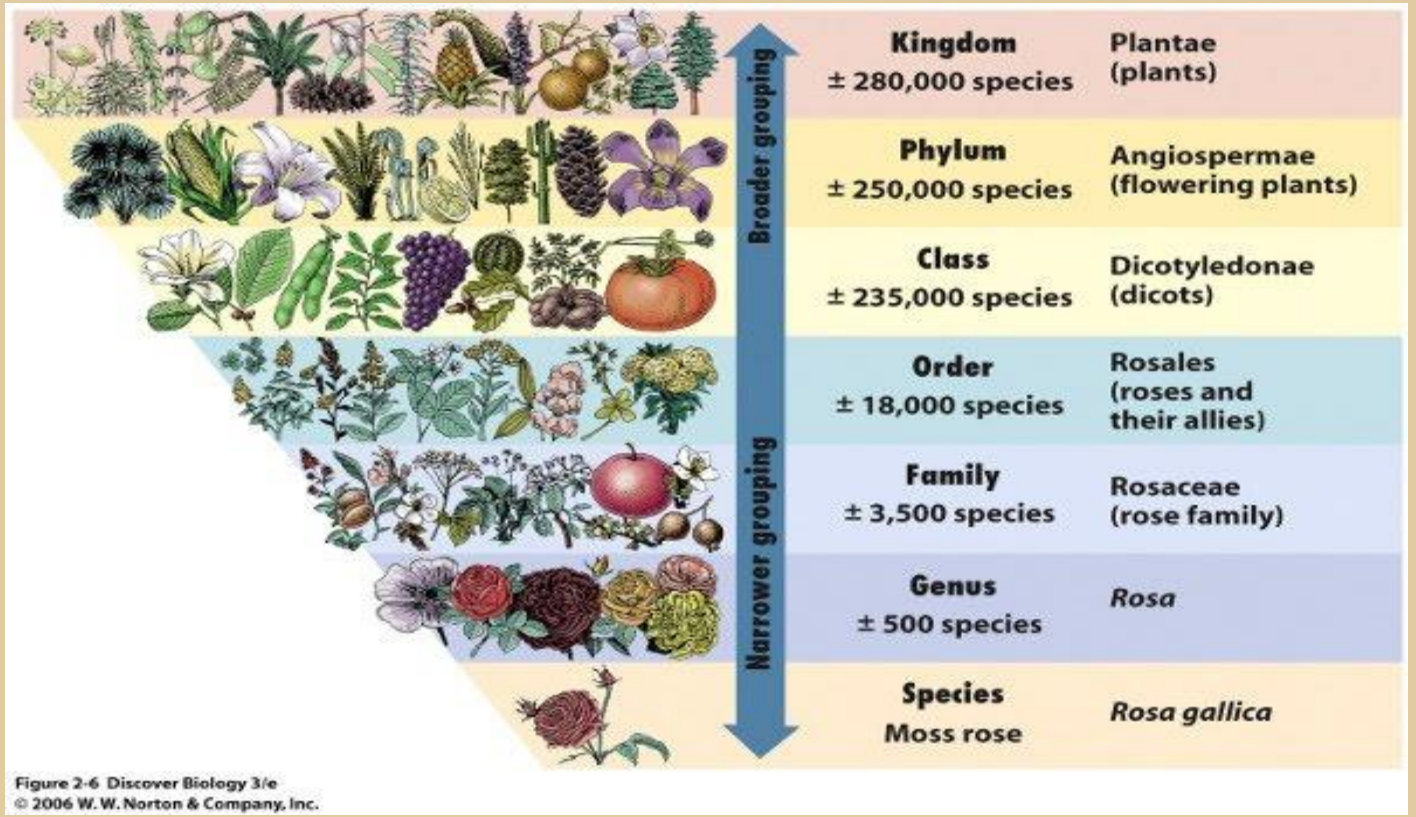
- Carl Linnaeus (my hero)



- Developed Binomial Nomenclature
- Identified, named, and published over 6,000 plants

Scientific Names

- Defines a plant by one Latin name that is common throughout the world
- Utilizes Binomial Nomenclature



Scientific Names

- Allows scientists worldwide to study the same plant.
- Prevents confusion in trade

- Imagine buying a Red Maple to only find that it is a Silver Maple

Scientific Names

- Follows Binomial Nomenclature
  - Kingdom
  - Phylum
  - Class
  - Order
  - Family
  - Genus
  - Species
- We will be focusing on Genus and Species
  - Typically written in *Italics* with Genus capitalized and species lower case Example: *Cercis canadensis* (Eastern Redbud)

Willow Oak Vs. Pin Oak Revisited

Quercus phellos

Willow Oak or Pin Oak

Quercus palustris

Pin Oak or Swamp Spanish Oak

Scientific Names in the Industry

- Nurseries and landscapers use Scientific Names for trade to prevent misunderstandings

ACER BUERGERANUM MINO YATSUBUSA	10G	1	$185.00
ACER BUERGERANUM TRIDENT MAPLE 6' 15G	15 GAL	2	$125.00
ACER CIRCINATUM VINE MAPLE 4-5'	B&B	1	$60.00
ACER DAVIDII HANSU SURU	3G	3	$40.00
ACER GINNALA BAILEY'S COMPACT	7G	5	$85.00
ACER GINNALA FLAME (AMUR MAPLE) 6-7'	B&B	5	$135.00
ACER GRIS. X NIK. GINGERBREAD MAPLE 5-6'	10G	1	$75.00
ACER GRISEUM PAPERBARK MAPLE 25G	25G	1	$325.00
ACER GRISEUM PAPERBARK MAPLE 3G	3G	16	$40.00
ACER GRISEUM PAPERBARK MAPLE 4'	15G	7	$95.00
ACER GRISEUM PAPERBARK MAPLE 6G	6G	16	$85.00
ACER JAPONICUM ACONITIFOLIUM 3G	3G	1	$40.00
ACER JAPONICUM ACONITIFOLIUM 5G	5G	1	$100.00
ACER JAPONICUM ACONITIFOLIUM 7G	7G	1	$85.00

Genus and Species

- Genus is a larger group of plants such as Maples
- Species are the specific type of plant in the larger group

Acer rubrum

Acer saccharum

Intra-Specific Variation in Species

- It is common to find genetic variation in a species
  - Much like the difference between you and me
- Use general characteristics to identify a species
  - Multiply lobe and serrated margins, not red petioles

Acer rubrum

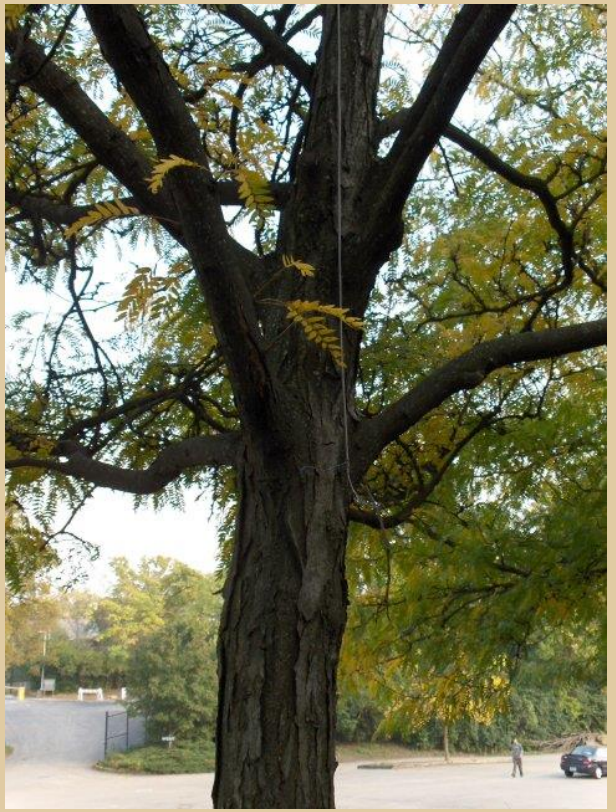
Going Beyond Genus and Species

- Varieties
  - A variation amount a species that is inheritable
- Cultivars
  - A cultivated variety that only exists because of man
- Hybrids
  - The result of breeding two similar plants
- Trademarked plants
  - Plants that have been developed by a person or corporation and can only be grown with the consent of that individual

Varieties

- Variety is a subspecies that has a specific trait which is distinctive from the species
- This trait is inheritable and is stable through multiple generations

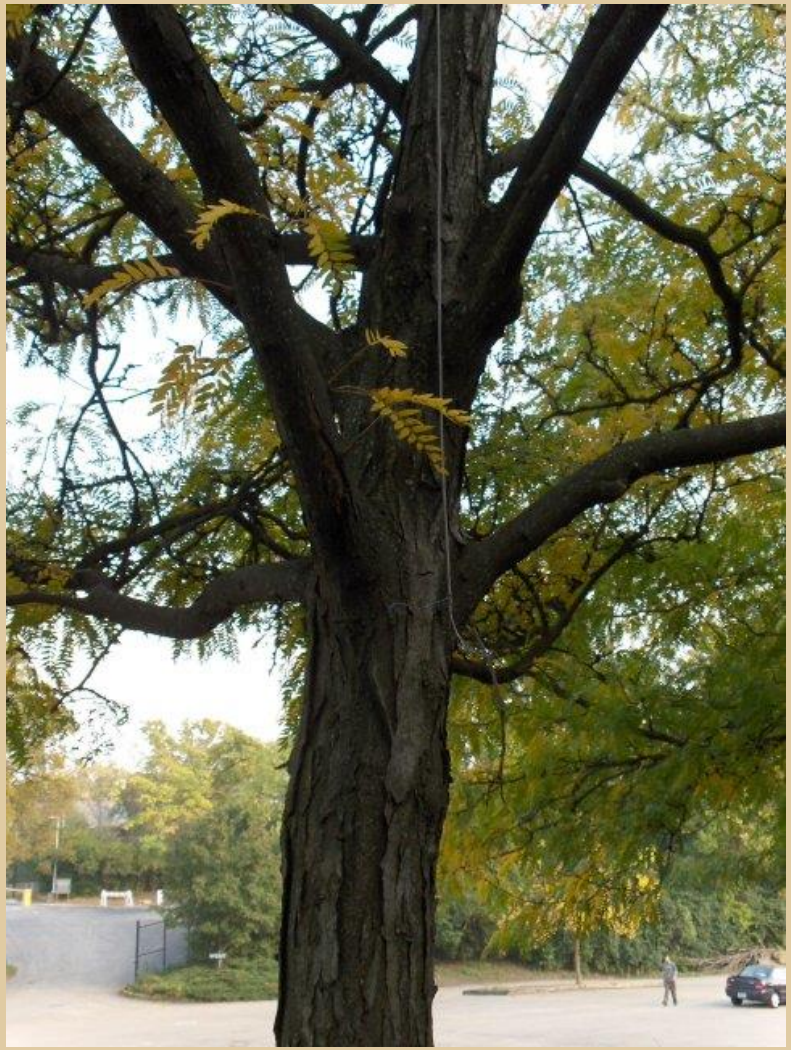
Gleditsia triacanthos



Gleditsia triacanthos var. *inermis*

Varieties

- Variety is part of a scientific name and is abbreviated as var. without italicization
- The name of the variety then follows and is italicized
- Subspecies (subsp.) is uncommonly used but is correct as well.



Gleditsia triacanthos var. *inermis*

Varieties

- Traits can include: Leaf Color, Flower Color, Plant Form, Dwarfism, Pest Tolerance, Environmental Extremes
- These naturally occurring traits a adaptation that allow the plant to flourish in different environments
- Naturally occurring Varieties can be Trademarked and cloned

Cultivars

- A cultivar is a Cultivated Variety that has naturally occurred or been bred for distinct characteristics
- These characteristics are then stable when appropriately bred (cloned or sexually bred)
- Most Cultivars exist due careful breeding and are maintained through propagation

Gleditsia triacanthos var. *inermis* 'Shademaster'

Cultivars

- Cultivar is an addition to the scientific name and is added at the end
- The Cultivar is a capitalized and is found in single parentheses
- The 'Shademaster' Honeylocust is recognized for its strong vase shape which is a desirable trait

Gleditsia triacanthos var. *inermis* 'Shademaster'

Trademarked Plants

- Trademarks indicate the source of the plant and do not label an individual cultivar
- The ™ superscript gives a business the right to the name
- Many newly developed plants are trademarked as large amounts of money are spent on development

Rhododendron 'Roblez' PPAF (Autumn Fire ™)

Trademarked Plants

Wave® Petunias

Petunia x hybrid
'Wave® Lavender'

Encore™ Azaleas

Rhododendron 'Roblez'
PPAF (Autumn Fire™)

Hybrids (Interspecific Hybrid)

- Hybrids are created by cross breeding two similar species
- The hybrid is denote in the scientific name with an x directly before the species

The London Planetree is a hybridization of *Platanus occidentalis* (American Sycamore) and *Platanus orientalis* (Oriental Plane)

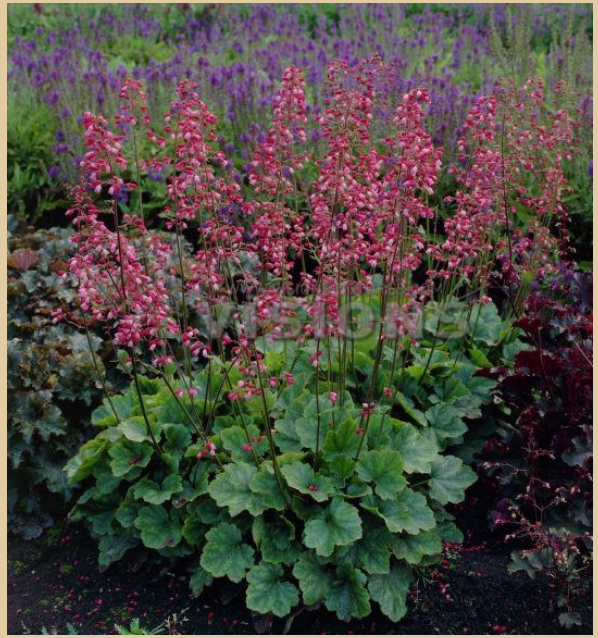
Plantanus xacerifolia var. 'Bloodgood'

Hybrids (Intergeneric Hybrid)

- Intergeneric Hybrids are created by cross breeding two similar Genus
- This type of Hybrid is much more rare than an Interspecific Hybrid

x*Huecherella* 'Solar Eclipse'

Huecherella (not a woody plant)



Heuchera xbrizoides

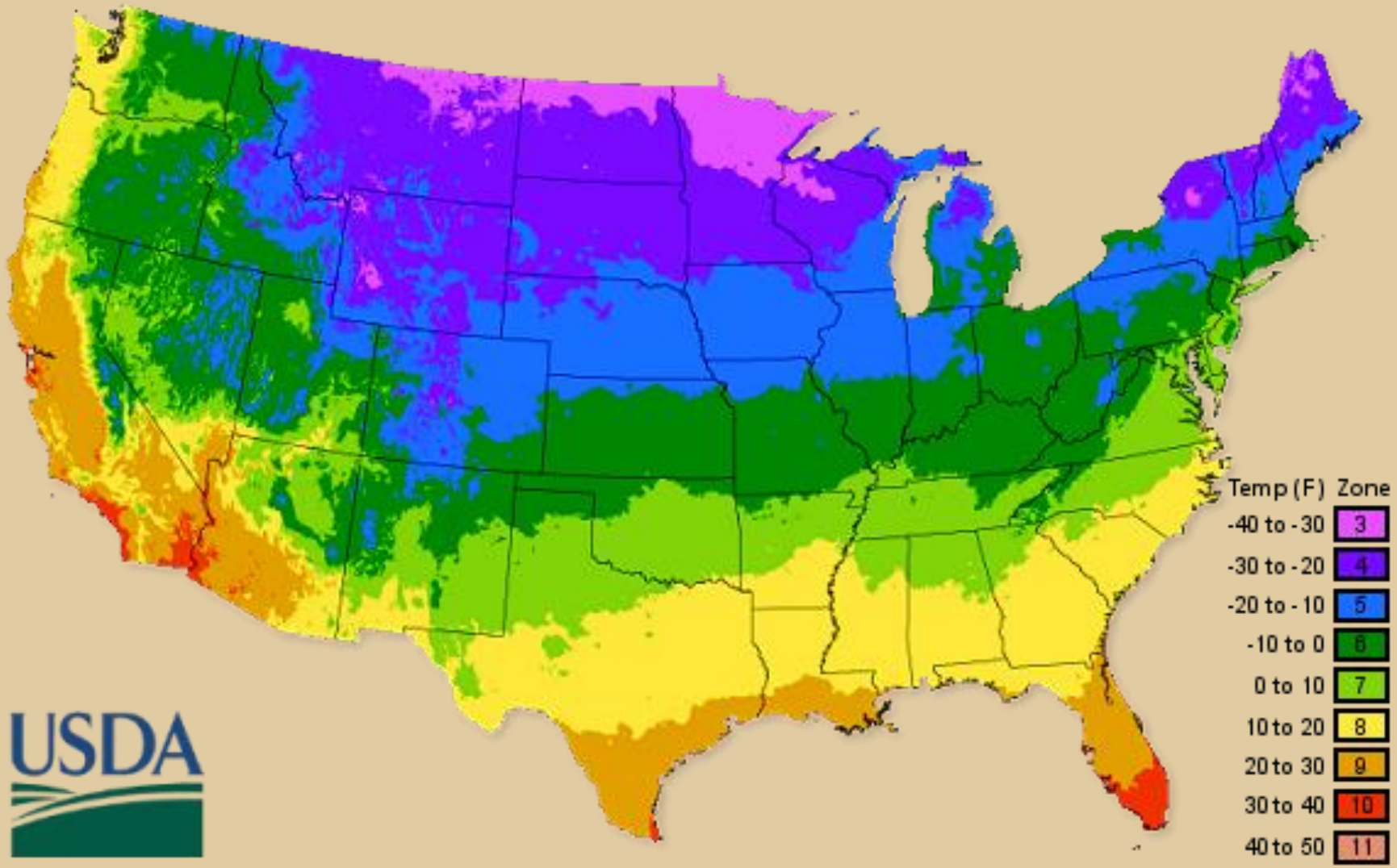
Tiarella cordifolia

x*Huecherella* 'Solar Eclipse'

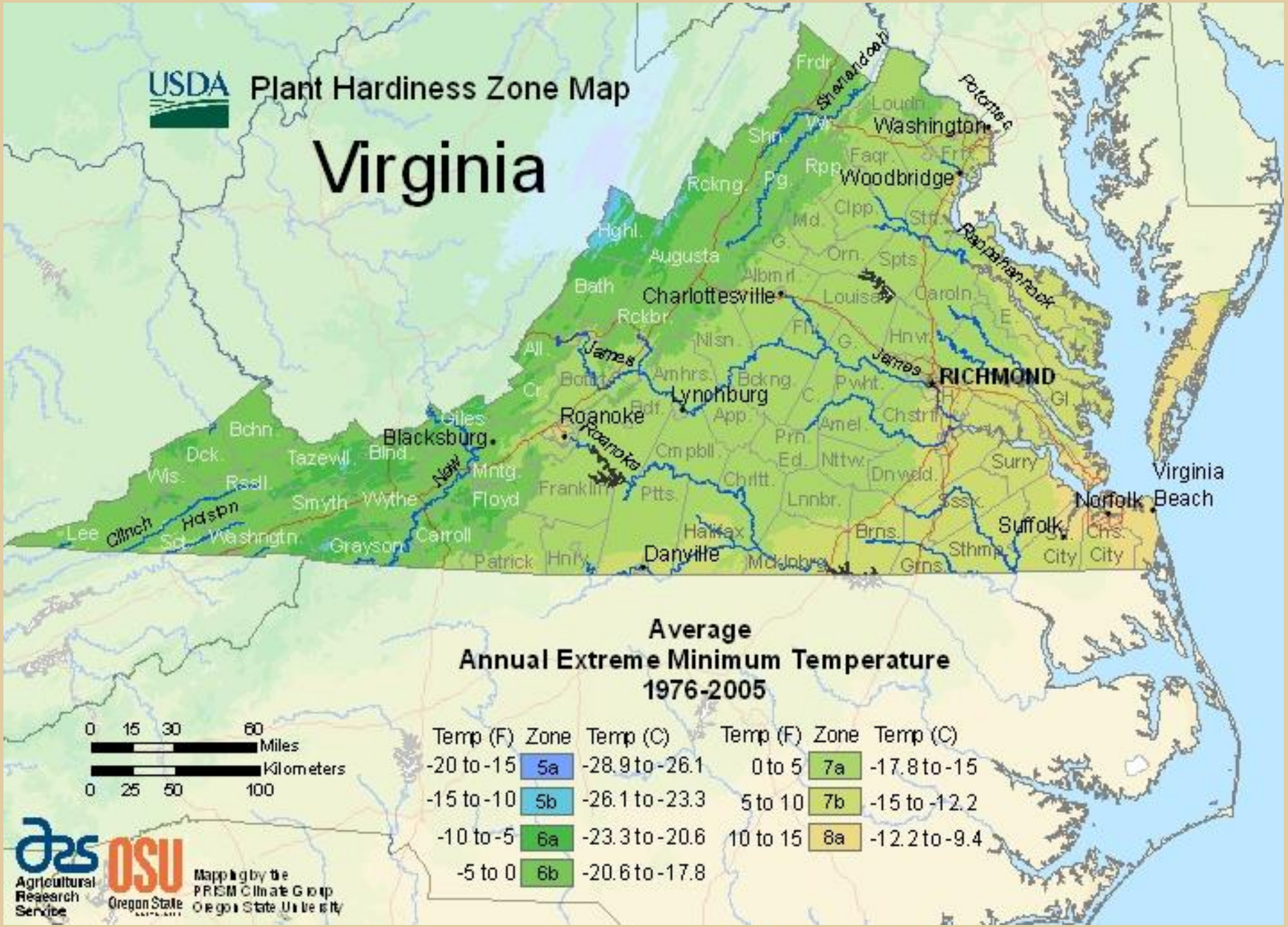
Study Questions

- Why are common names a poor way to refer to plants?
- What are the parts of this scientific plant name?
  - *Gleditsia triacanthos* var. *inermis* 'Sunburst'
- All family names end in what five letters?
  - "ACEAE"
- For woody plants will seeds from a **variety** produce a plant that will generally exhibit the variety trait?
- For woody plants, will seeds from a **cultivar** produce a plant that will generally exhibit the cultivar trait?
- For woody plants, will seeds from a **hybrid** produce a plant that will generally exhibit the cultivar trait?

Hardiness



USDA


USDA Plant Hardiness Zone Map
Virginia
Washington
Woodbridge
Charlottesville
Augusta
Lynchburg
Roanoke
Blacksburg
RICHMOND
Danville
Norfolk
Virginia Beach
Suffolk
Average
Annual Extreme Minimum Temperature
1976-2005
Temp (F) Zone Temp (C)
-20 to -15 5a -28.9 to -26.1
-15 to -10 5b -26.1 to -23.3
-10 to -5 6a -23.3 to -20.6
-5 to 0 6b -20.6 to -17.8
Temp (F) Zone Temp (C)
0 to 5 7a -17.8 to -15
5 to 10 7b -15 to -12.2
10 to 15 8a -12.2 to -9.4
0 15 30 60 Miles
0 25 50 100 Kilometers
Agricultural Research Service
OSU Oregon State University
Mapping by the PRISM Climate Group Oregon State University

Hardiness Zones

- Richmond & Chesterfield are borderline zone 7a/7b
- Sometimes plants can be planted in a zone colder than their proper hardiness zone but not without risks
- Possibly an "herbaceous perennial"

Gardenia jasminoides 'Chuck Hayes'

Hardiness

- Microclimates can extend a zone if properly protected
- Prevailing Winds

Winter Burn Vs. Hardiness

- Winter burn is desiccation of leaf tissue
- Hardiness is plants ability to survive a certain temperature.

Hardiness Zones

- Hardiness zones don't only include lower temperature limits
- Many northern evergreens will either die or suffer in zone 7
- Remember that zones can change and are constantly being updated

Abies fraseri

Hardiness

- Late frosts and swings in high/low temperatures can drastically affect a plant's hardiness
- Tip Dieback

Magnolia soulangeana

Hardiness of Potted Plants

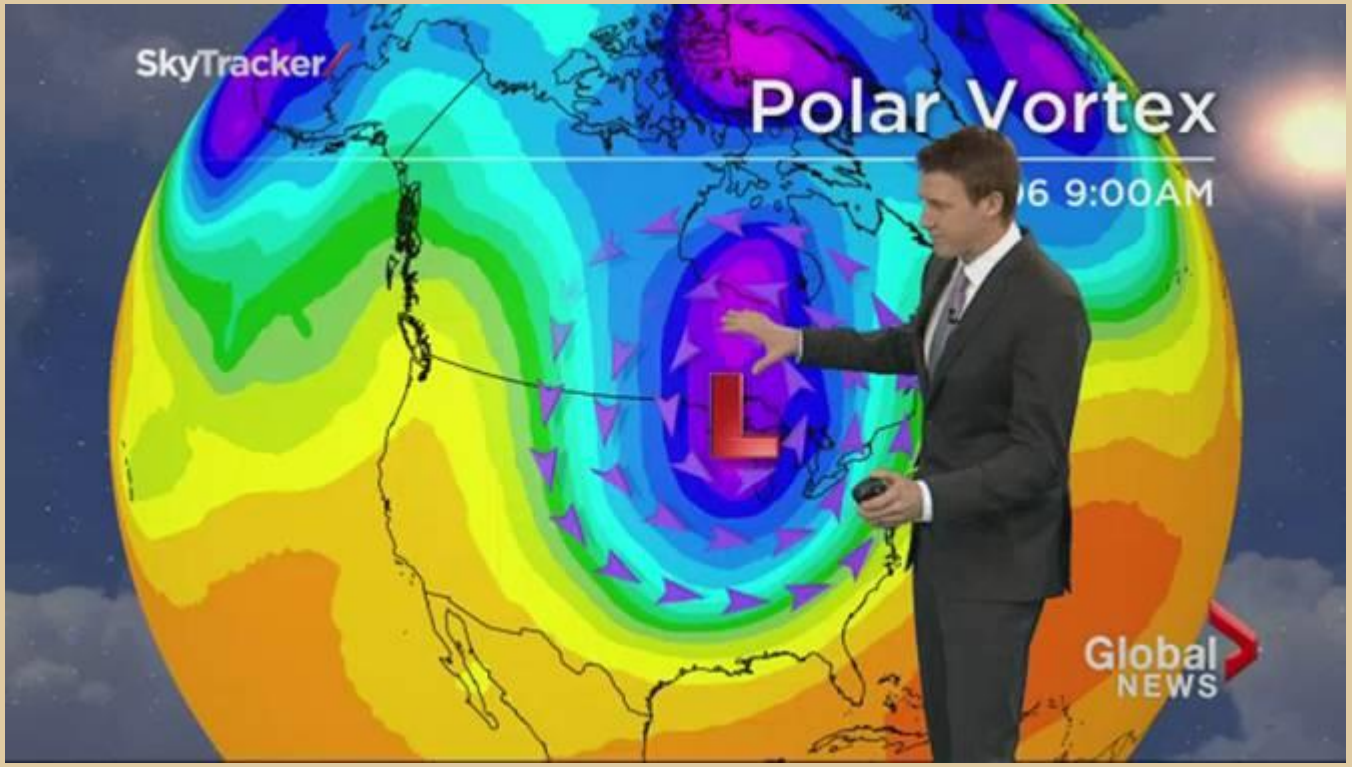
- Low temperatures are different above ground vs. below ground
- Container plants must be protected

Provenance

- Provenance is the geographical source of the plant
- Bringing a Yank down South
- Many plants are not grown where they are sold

Historic Lows

- Hardiness Maps are based on average annual low temperatures
- Remember the "Polar Vortex?"

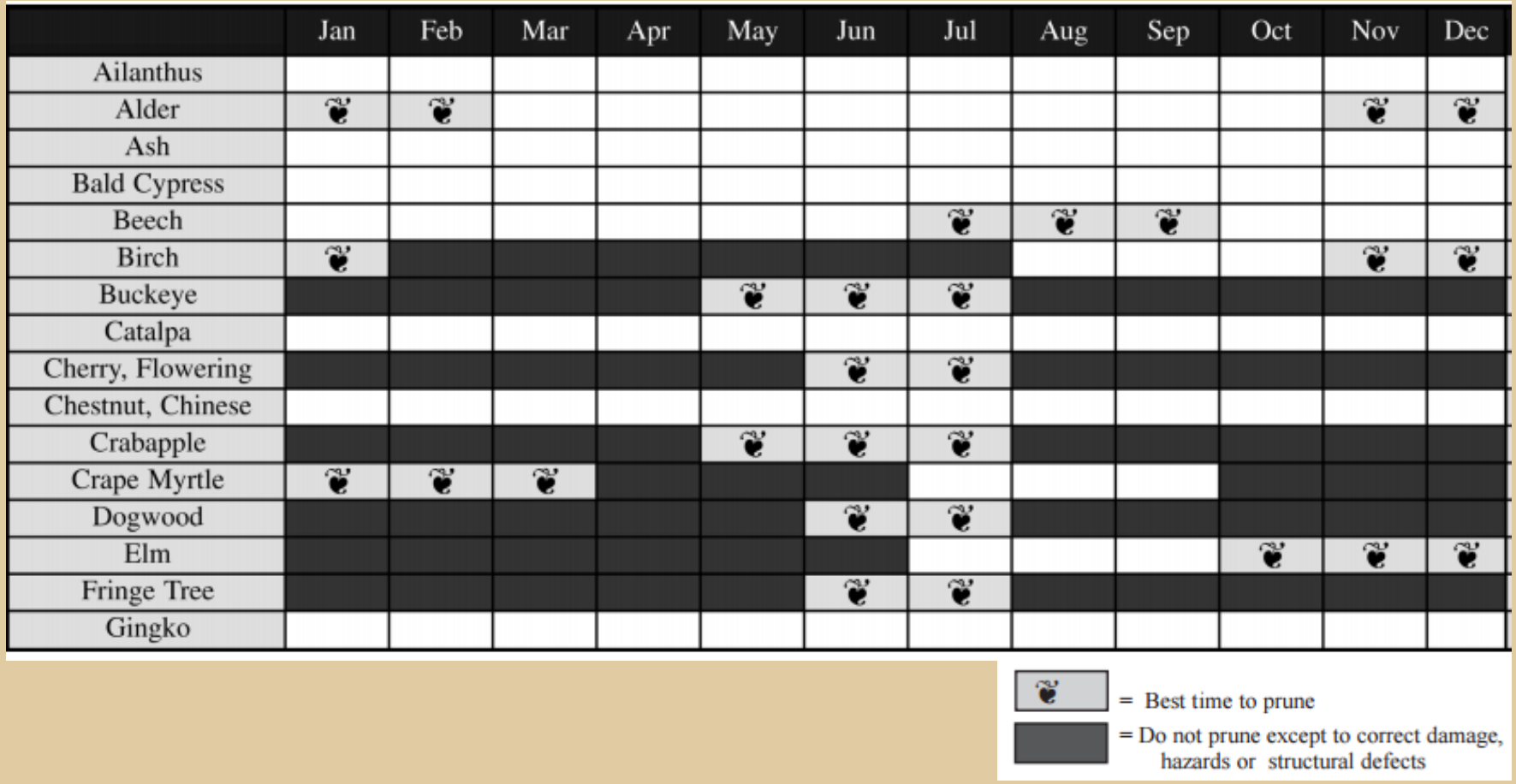


Flower Buds and Pruning

- Timing for pruning can be very important for flowering woody plants
- Pruning can remove all flower buds
- Must determine if plants flower on old or new wood

Pruning Calendars

- Utilize the Virginia Cooperative Extension Pruning Calendar for Trees & Shrubs



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ailanthus												
Alder	❦	❦									❦	❦
Ash												
Bald Cypress												
Beech							❦	❦	❦			
Birch	❦										❦	❦
Buckeye					❦	❦	❦					
Catalpa												
Cherry, Flowering						❦	❦					
Chestnut, Chinese												
Crabapple					❦	❦	❦					
Crape Myrtle	❦	❦	❦									
Dogwood						❦	❦					
Elm										❦	❦	❦
Fringe Tree						❦	❦					
Gingko												

❦ = Best time to prune

= Do not prune except to correct damage, hazards or structural defects

Old Vs. New Wood

- Plants that flower on wood from last year are “old wood” species, with flower buds being set the previous year
- Plants that flower on new vegetative growth are “new wood” species that develop their flower buds on tissue grown in the current year
- Old Wood = spring and early summer flowering
- New Wood = summer and fall flowering

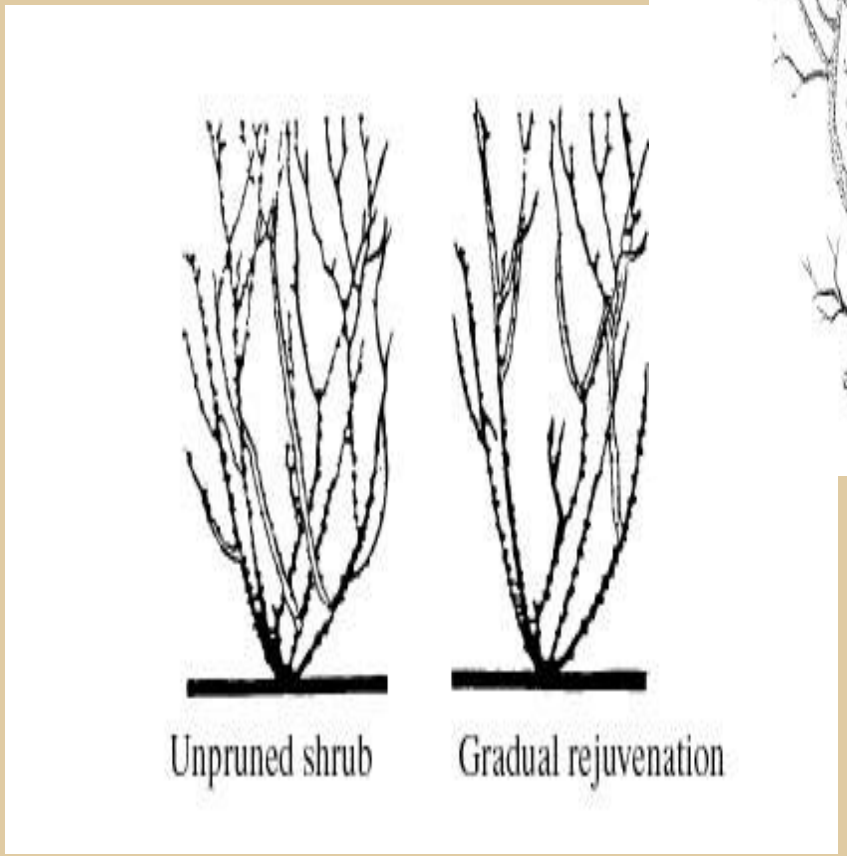
Old Vs. New Wood

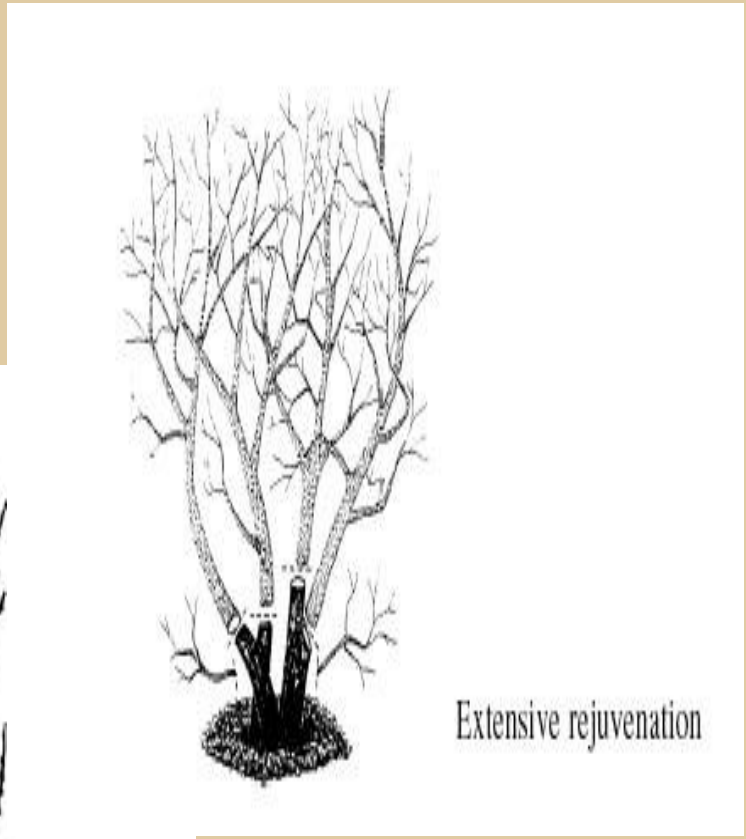
- Crape Myrtles – Old or New?
- Azaleas – Old or New?
- Hydrangeas – Old or New?
  - **An enigma**

NO

Rejuvenation Pruning

- Some plants require periodic pruning of older stems to promote growth new younger flowering wood





So When Should I Prune?

- Utilize the Pruning Calendar
- Prune ‘Old Wood’ plants directly after they finish flowering (one month grace period)
- Prune ‘New Wood’ plants during Fall, Winter, or early Spring

Plant Sex

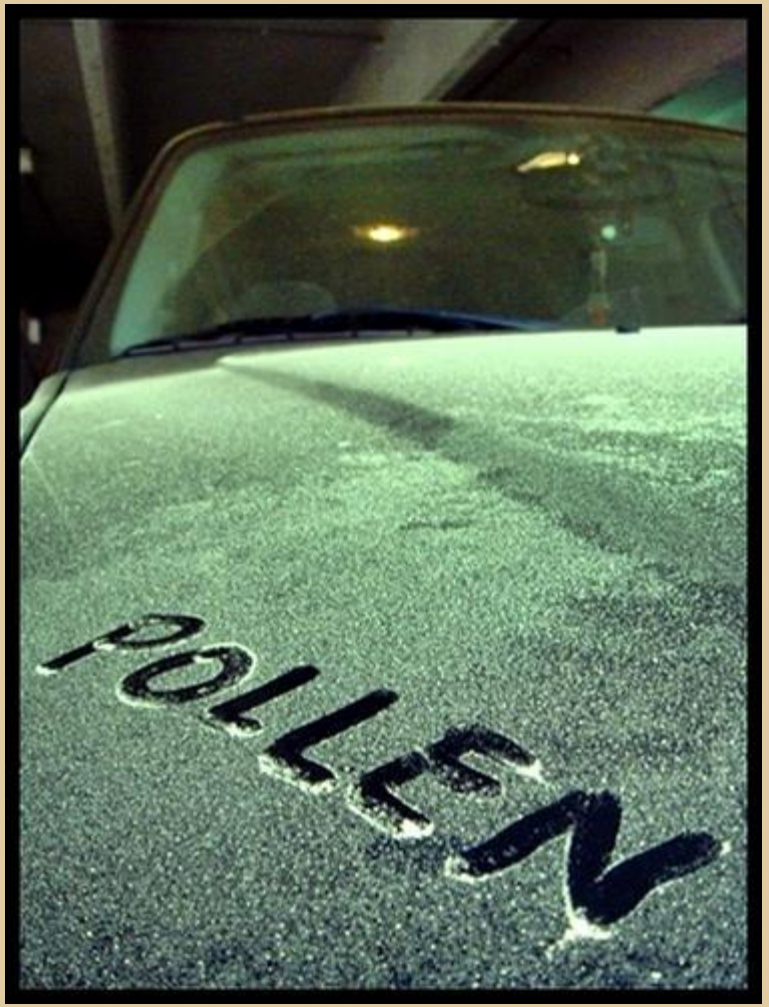
- Sexual Vs. Asexual Reproduction
- Monoecious Vs. Dioecious
- Natural Breeding Vs. Human Directed

The Birds and the Bees

- Most woody plants reproduce sexually
- Pollen is the male gamete and the ovule in the pistil is the female gamete
- Some is wind driven and some through pollinators

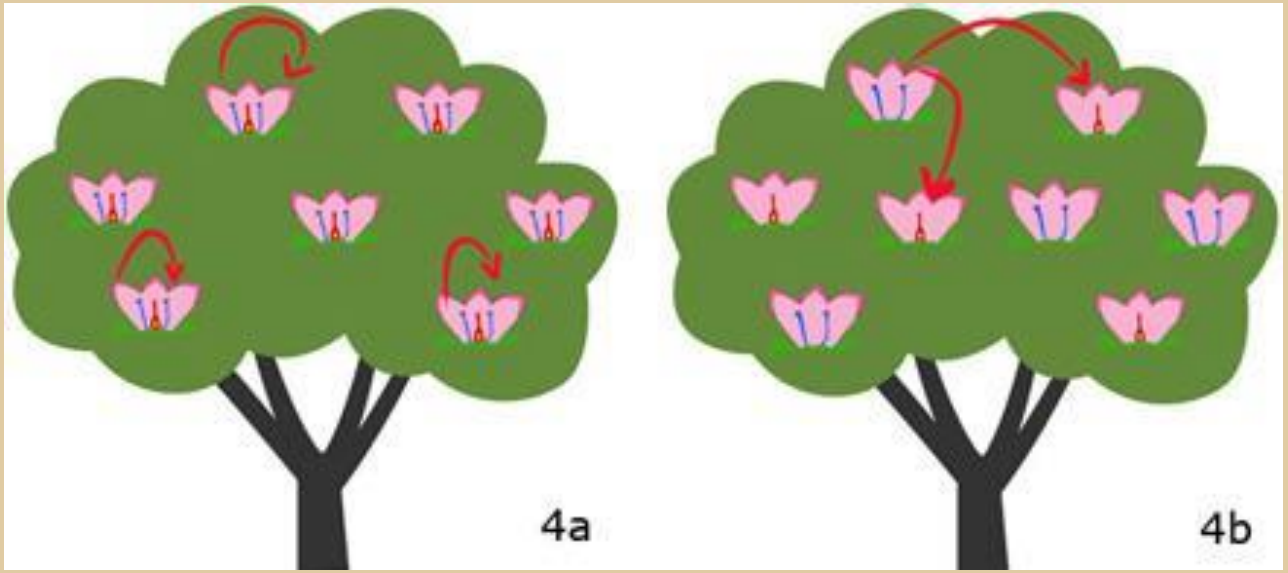
Pollen, Pollen, Everywhere

- Many large woody plants are wind pollinated
- Oaks are an example and can only reproduce sexually
- Different outlook on spring…



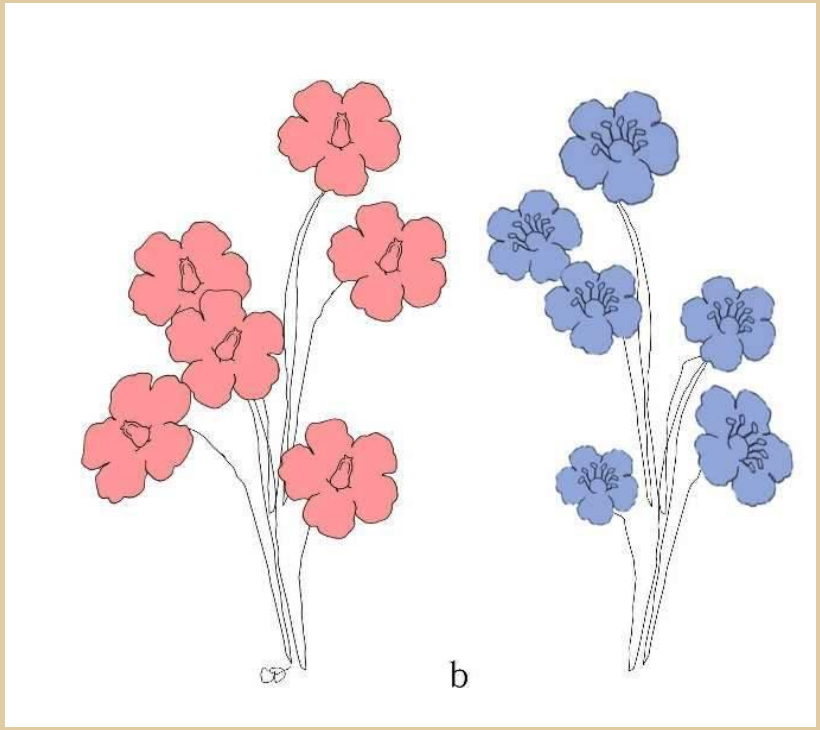
Monoecious Vs. Dioecious

- Monoecious – A single plant that produces male and female sexual organs
- Most woody plants are Monoecious (one house) everything is made in "one house"



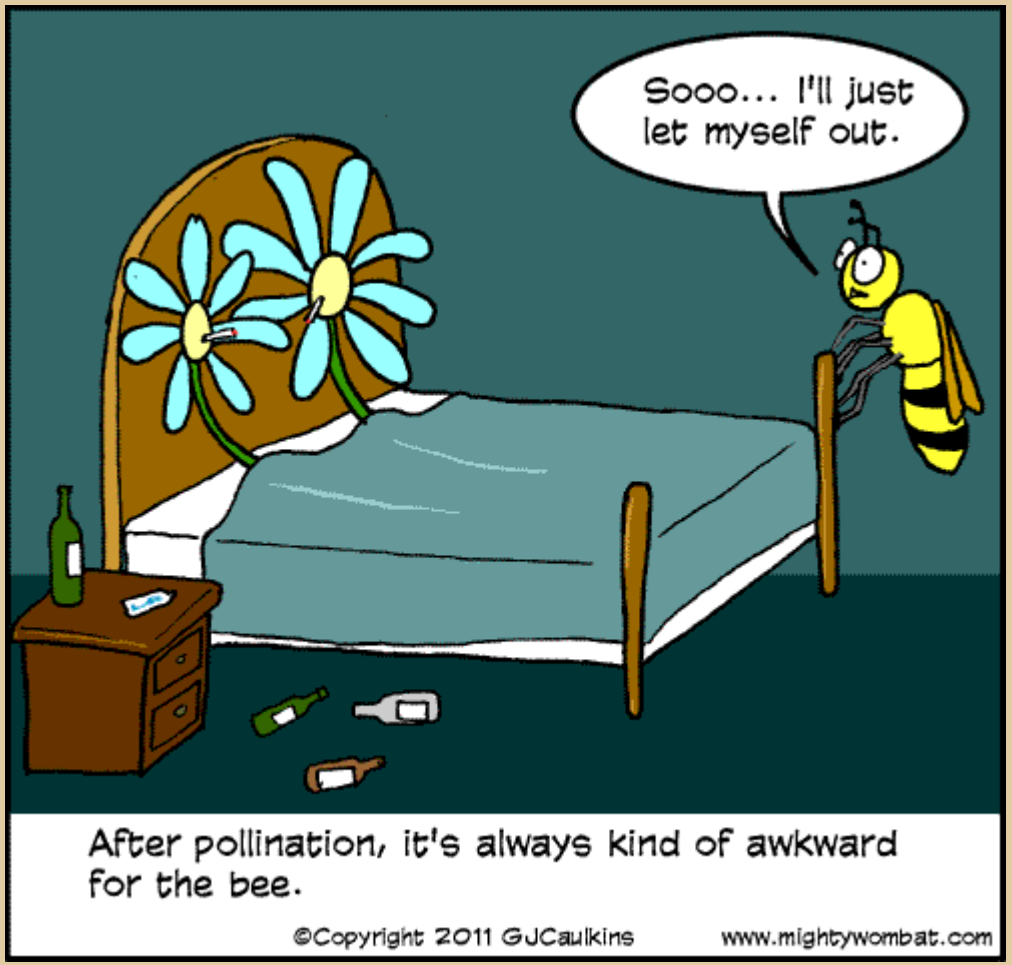
Monoecious Vs. Dioecious

- Dioecious – A single plant that produces only male or female sexual organs
- Both a male and female plant of the same species must be in close proximity for sexual reproduction



Pollinators

- Regardless of Monoecious or Dioecious, pollinators are needed for sexual reproduction in most woody plants
- Sexual reproduction creates genetic diversity



Asexual Reproduction

- Also know as cloning
- Can happen naturally or can be manmade
- Results in zero genetic diversity
- Maintains cultivars
- Media rooting Vs. tissue culture
- Allows for pests to spread easily

Types of Plant

- Woody plants consist of trees, shrubs, vines, and groundcovers
- All of these come in various sizes, growth rates, and have a tremendous number of positive traits

Trees

- Trees come in many sizes which can range from several feet to hundreds of feet tall
- Small trees 15’-25’ tall
- Medium trees 25’-45’
- Large trees 45’ and up
- Size is determined by genetics and environment
- Size can vary widely in the same species

Shrubs

- Woody shrubs can range from several inches high to about 15 feet before being considered a tree
- Thousands of species and varieties/cultivars
- Deciduous and Evergreen

Shrubs

Cephalotaxus harringtonia ‘Prostrata’

Viburnum xburkwoodii ‘Mowhawk’

Groundcover

- There are fewer groundcovers that are considered to be woody plants
- Most are in the same Genus as shrubs have a prostrate and spreading habit

Juniperus horizontalis 'Wiltonii'

Vines

- Vines are plants that climb other vegetation or structures
- Examples include Ivy, Trumpet Vine, and Wisteria
- If kept from ground vertically, vines can be kept as groundcovers

Wisteria sinensis

Vines

- Vines climb by three methods

Rootlets

Hedera helix

Twining

Wisteria sinensis

Tendrils

Vitus riparia

Using Woody Plants in the Landscape

Understanding Plant Growth Rate

- Growth rate determines use in landscape
- Slow – less than 12” per year
- Moderate – 13”-24” per year
- Fast – greater than 25” per year
- Japanese Maple vs. Tulip Poplar

Woody Plants in the Landscape

- Don't use plants that get too large
- Pruning will only get you so far

Using Woody Plants to Create a Room

- Using all size ranges of woody plants will allow for the creation of outdoor rooms and spaces

Environmental Benefits

- Shade, cooling, windbreaks, noise and light pollution, and improved air quality.
- Studies show increase in healing and reduction in crime.

How to use Woody Plants

- Accent Plants
- Barriers/Screening
- Borders to separate plants from one another
- Foundation Plants (Choose the right plants!)
- Hedge
- Mass Grouping
- Specimen Plant!

Buying Woody Plants

- Balled and Burlap
- Potted
- Which is better
- Special considerations for each
- Bare Root?

Selecting the Right Plant

- What are the themes of the landscape?
  - Recreation, Vegetable Gardening, Relaxation, Entertaining
  - Natural Vs. Formal
  - Maintenance needs as plants grow
- What are the functions of the woody plants?
  - Shade, Screening, Specimen Plants
  - This is where landscape design comes in to play
- What are the existing environment conditions?
  - Sun, Shade, Wind, Slope, pH, Moisture
  - Proximity to structures and pavement

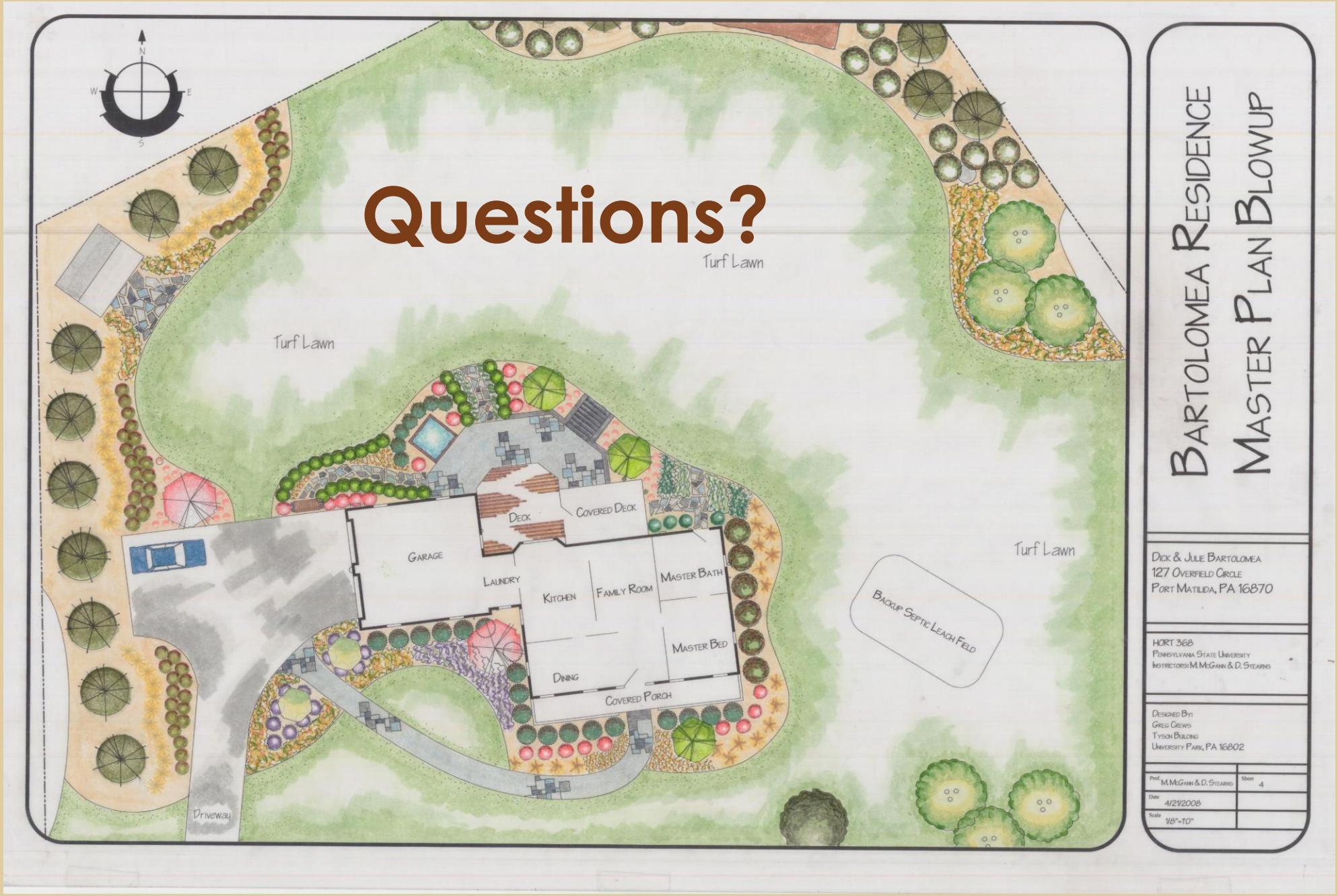
Selecting the Right Plant

- Choose plants that offer a diversity of textures, colors, bloom times, sizes
- Embrace species diversity to prevent pest issues
- Look for plants with year round interest
- Explore cultivars and varieties when choosing plant material

Year Round Interest

- *Stewartia pseudocamellia*

Questions?


Turf Lawn
Turf Lawn
Turf Lawn
Deck
Covered Deck
Garage
Laundry
Kitchen
Family Room
Master Bath
Master Bed
Dining
Covered Porch
Backup Septic Leach Field
Driveway
Bartolomea Residence
Master Plan Blowup
Dick & Julie Bartolomea
127 Overfield Circle
Port Matilda, PA 16870
HORT 368
Pennsylvania State University
Instructors: M. McGann & D. Stearns
Designed By:
Greg Crews
Tyson Building
University Park, PA 16802
Prof. M. McGann & D. Stearns
Sheet 4
Date 4/21/2008
Scale 1/8"=1'0"