



We're not all built for them.



Key Plant Identification Features

- Bud characteristics
- •Bud/leaf Arrangement
- Leaf characteristics
- •Bark
- Flower structure
- Fruit structure/type
- •Habit



Bud/Stem Morphology

- <u>Buds</u>: size, color, shape and texture
- <u>Bud Scales:</u> size, color and shape
- <u>Terminal Bud Scales:</u> determine amount of annual growth
- <u>Leaf Scar</u>: shape and arrangement of vascular bundles
- <u>Lenticels</u>: gas exchange





NC Tree Stewards





• Sub-opposite









Leaf Morphology



Leaf characteristics

- Deciduous or evergreen
- Simple
- •Compound
 - Pinnately+Bipinnately
 - Palmately
- Margins
- Lobed
- Venation





- <u>Deciduous</u>- loses leaves every year
- <u>Evergreen</u>- holds needles (leaves) for 2-3 years; all do not shed at once
- <u>Conifer</u>- seed is naked; typically borne in cone, not all evergreens are conifers



rachis	
petiolule	
Pinnately Compound Leaf	Even Pinna

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Aesculus parviflora, bottlebrush buckeye

palmately compound





Japanese maple, Acer japonicum







GYMNOSPERM LEAF TYPES

AWL-LIKE LEAVES





SCALE-LIKE LEAVES





NEEDLE-LIKE LEAVES







NEEDLES PER FASCICLE











Flower Morphology

SIMPLE FLOWER STRUCTURE Pistil - Throat Stamen Overview Corolla Lobe Corolla Tube Perianth - Calyx Lobe Calyx Anther Stigma Stamen Filament Pistil Style Longitudinal Section Ovule (forerunner of a seed) Ovary Petal Sepal N Bract Pedicel



Flowers in Id



• Number of petals

- Number of reproductive parts
- Monoecious or dioecious plant











- <u>Monoecious</u>- "one house"; flowers of both sexes on same plant
- <u>Dioecious</u>- "two houses"; flowers of each sex on different plants







Fruit Structure



Seed Endocarp Mesocarp Exocarp

DRUPE (Prunus, Viburnum, Celtis, Sassafras)





VOLUNTEER



MULTIPLE FRUIT OF SMALL DRUPES (*Morus*)

















Bark

- RidgedExfoliating
- Smooth
- FurrowedFlaky







Cephalanthus occidentalis Buttonbush

Acer spicatum, striped maple





Habit

Rounded
Upright
Vase-like
Fastigiate











PLANTSELECTION



Plant Design/Selection Basics

- 1. Determine FUNCTIONAL Benefits
 - Screening, Shading, Wildlife food/habitat, Food production
 - Pollution abatement, Erosion control
- 2. Determine ECOLOGICAL AND CONTEXTUAL Benefits
 - Ecosystems-riparian, temperate, desert, tropical, tundra
 - People and Cities-various site requirements, mental and social health and well-being
- 3. Determine HORTICULTURAL/CULTURAL Requirements
 Soil texture, pH, fertility, aggregation/structure
 Light full sun, part sun, dry shade, full shade, dappled shade

 - Moisture group plants into hydro zones



Plant Design/Selection Basics continued

4. Consider MAINTENANCE Requirements

- Maintenance provider should be included early in design process
- No one asks for a high maintenance landscape ;-)
- May need to provide a maintenance plan to client





1. Functional Uses for Plants



- Functional Uses of Plants
 - Architectural
 - Walls, roofs, canopies, ground covers
 - Engineering/Climate Control
 - Green roofs and walls, ecosystem restoration, rain gardens, shade, cooling, screening, stormwater mitigation
- Aesthetic Uses of Plants
 - Visual design qualities of plants (it's pretty!)
 - Form, habit, texture, color



Architectural Uses of Plants

Very simply: Creating and Defining Space





Think Garden Rooms, Borders and Movement



Engineering use: Climate control (adapted from anne spafford, mla)

Wind control

DENSE PLANTINGS CAN RE-DUCE WIND SPEED 75% TO 85%





PLANTS CONTROL SOLAR RADATION 3-36



MORE SOLAR RADIATION IS WANTED IN WINTER





Engineering/environmental uses

- Atmospheric Purification
- Erosion Control
- Runoff Control









2. Ecological & Contextual Requirements a.k.a. Site restrictions

From Site Assessment

- •Utilities
- Mature plant size allowable
 Current and Future Usage
 Easements and Buffers
 Buildings & Structures







Shade





Aesthetic Functions

Specimen/Accent







Aesthetic Functions











Wildlife Attraction & Resources

Certified Wildlife Habitat by National Wildlife Federation

Audubon at Home

http://www.ces.ncsu.edu/nreos/wild/wildlife/index.html









Food production

Amelanchier laevis, Allegheny serviceberry

http://www.ces.ncsu.edu/depts/hort/cons umer/

http://www.ediblelandscaping.com/

http://ncblueberryjournal.blogspot.com/

<u>http://cals.ncsu.edu/hort_sci/extension/d</u> <u>ocuments/ContainerGardening_final.pdf</u>

http://www.usefulplants.org/







Some Plant selection resources

- <u>http://www.ces.ncsu.edu/depts/hort/con</u> <u>sumer/</u>
- <u>http://plants.usda.gov/java/</u>
- Professional Associations
- Books





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Done

Cultural Requirements



- Soil (pH, etc.)
- Hardiness zone
- Moisture levels
- Light levels
- Maintenance requirements



Soil pH—Acidic Soils









Soil pH—Alkaline Soils











Drought Tolerant









Tolerant of Wet Soils











Hardiness Zone







Hardiness Zone Change Issues

- Pro
 - Expanded plant palette
 - Longer growing season
- •Con
 - Potential for more invasive plants
 - Fewer freezes may increase disease and insect pressure
 - Loss of some marginal plants (zone 6b & 7a)
 - Change of dormancy, flowering and fruiting patterns



Light Levels

- Full sun: ≥ 6 hrs
- Partial sun: 4-6 hrs
- Partial shade: 2-4 hrs
- Shade: < 2 hrs





Maintenance Requirements





Pruning
Method
Time of year
Insects and disease
Abiotic issues

Aesthetics—Scale

• Size of an object *in relation to* objects around it

• Consider human use of landscape

Plant Type

Ball and Burlap

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NC Tree Stewards VOLUNTEER

Plant Species

Origin
Native
Non-native
Growth habit
Invasive tendencies?

Creepies and crawlies...

Leafspots

Bacterial leaf scorch (*Xylella fastidiosa*)

"Trees are the most exquisite and the most sparingly apportioned raw material of urban design."

• Henry F. Arnold

