Dendrology
(or the least amount of stuff a landowner needs to know about trees and their identification)

John Peterson
Virginia Tech Forest Resources and Environmental Conservation
Virginia Diversity
• 4 floristic regions
• 300 tree species
• 300 shrub species
Virginia Diversity

Why so many species?
- geology and soils
- elevation 0 to 5729 feet
- varied land use
- disturbance
- mild climate
- introduced species
<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Plantae – Plants</th>
<th>Plantae – Plants</th>
<th>Plantae – Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division</td>
<td>Magnoliophyta – Flowering plants</td>
<td>Coniferophyta – Conifers</td>
<td>Lycopodiophyta – Lycopods</td>
</tr>
<tr>
<td>Class</td>
<td>Magnoliopsida – Dicotyledons</td>
<td>Pinopsida –</td>
<td>Lycopodiopsida –</td>
</tr>
<tr>
<td>Order</td>
<td>Sapindales –</td>
<td>Pinales –</td>
<td>Lycopodiales –</td>
</tr>
<tr>
<td>Family</td>
<td>Aceraceae – Maple family</td>
<td>Pinaceae – Pine family</td>
<td>Lycopodiaceae – Clubmoss family</td>
</tr>
<tr>
<td>Species</td>
<td>Acer rubrum L. – red maple</td>
<td>Pinus strobus L. – eastern white pine</td>
<td>Lycopodium obscurum L. – rare clubmoss</td>
</tr>
</tbody>
</table>
There might be 100 woody species in this photo.

We’re going to need some tools.
Several Types of Tools
• Go To Class
• Dichotomous Keys
• Databases
• Other Clues
• Dr. Dendro

http://dendro.cnre.vt.edu/dendrology/idit.htm
Dichotomous Keys
Dichotomous Keys

1
a. Leaves are needle or scale-like, go to 2.
b. Leaves are broad and flat, go to 14.
Dichotomous Keys

14
a. Leaves opposite, go to 15.
b. Leaves alternate, go to 25.
Dichotomous Keys

15
a. Leaves compound, go to 16.
b. Leaves simple, go to 19.
Dichotomous Keys

16
a. Leaves are pinnately compound, go to 17.
b. Leaves are palmately compound – Yellow Buckeye pg. 91.
17

a. Leaflets with large teeth, twig covered with whitish wax, bud covered with soft white hairs – Boxelder pg. 86.
b. Leaflets with small teeth, twig not covered with wax, bud not covered with hairs, go to 18.
Dichotomous Keys

1
a. Leaves are needle or scale-like, go to 2.
b. Leaves are broad and flat, go to 14.
Dichotomous Keys

2
a. Needles at least 1 inch long, go to 3.
b. Needles less than 1 inch long or scale-like, go to 10.
3
b. Needles in groups of 2 or 3, go to 4.
Dichotomous Keys

4
a. Needles mostly in groups of 3, go to 5.
b. Needles mostly in groups of 2, go to 8.
Dichotomous Keys

8
a. Needles 3 to 5 inches, dark yellow green, cones 1½ to 2½ inches long – Shortleaf Pine, pg. 23.
b. Needles less than 3 inches, go to 9.
Dichotomous Keys

9

a. Needles 1½ to 3 inches, yellow-green and twisted, cones 1½ to 3 inches long. Scaly bark on older trees, may be orange-brown on upper trunk and large limbs – Virginia Pine, pg. 27.

b. Needles 1½ to 2½ inches, dark green, and somewhat twisted, cones 2 to 3½ inches – Table Mountain Pine, pg. 29.
Dichotomous Keys

1
  a. Leaves are needle or scale-like, go to 2.
  b. Leaves are broad and flat, go to 14.
Dichotomous Keys

14
a. Leaves opposite, go to 15.
b. Leaves alternate, go to 25.
Dichotomous Keys

25
a. Leaves compound, go to 26.
b. Leaves simple, go to 36.
Dichotomous Keys

36
a. Leaves have lobes with or without teeth, or large rounded teeth appearing like a wavy margin, go to 37.
b. Leaves do not have lobes or margins as above, and may or may not be toothed or spined, go to 53.
Dichotomous Keys

53
No more help...
See what you get!
Twig Keys

http://dendro.cnre.vt.edu/dendrology/idit.htm
Twig Keys
• phyllotaxy

*Phyllotaxy (fil-oh-taxi)* is a useful identification characteristic.

Twigs can have either alternate or opposite phyllotaxy.

This twig has alternate phyllotaxy: the buds are arranged alternately.

This twig has opposite phyllotaxy: the buds are arranged opposite each other.

MAD Cap Horse

Whorled
Twig Keys

- terminal buds

- naked - you can clearly see tiny leaves
- Just one or two apparent bud scales
- scaly
- fuzzy
Twig Keys
• leaf scars

1 bundle scar
3 bundle scars
more than 3 bundle scars
broad and shield-shaped
narrow
Twig Keys
• pith
Twig Keys
• miscellaneous
Database Keys

http://dendro.cnre.vt.edu/dendrology/idit.htm
Database Keys

**Virginia Tech Tree Identification**

- **Obtain Location**
  Once your location is obtained you can display local trees.

- **Identify Trees**
  Provide more information to restrict the list of possible trees.

- **Ask Dr. Dendro**

- **About This App**
Database Keys

Select Location Method

- Location from GPS
- Location from Network
- Location from Address or Destination
- Ignore Location Display All Species
Database Keys

239 species normally found at Lat: 35.896 Lng: -84.254 Elevation: 865.

Show me only... e.g. oak or quercus

Press to narrow species list

** Acer negundo **
box elder

** Acer nigrum **
black maple

** Acer platanoides **
Norway maple **Exotic**

** Acer pseudoplatanus **
sycamore maple **Exotic**

** Acer rubrum **
red maple

** Acer saccharinum **
Interview

To remove, Press image or text:
tree

3) What best describes your leaves?

- needles or scaly leaves
- broadleaves
Database Keys

**vTree**  
Florida maple (*Acer barbatum* Michx.) *Aceraceae* family

**Leaf:** Opposite, simple, orbicular in shape, 1 1/2 to 3 1/2 inches in length and width, entire margin with 3 or 5 somewhat rounded lobes, green above, paler and often fuzzy below.  
**Flower:** Yellow-green, small, hanging from a long (1 to 2 inches) stalk in clusters of a few flowers, appearing with the leaves.  
**Fruit:** Samara, about 3/4 inch long, spreading at about 65 degrees (wider than sugar maple), mature in the mid-summer.  
**Trunk:** Slender and shiny, reddish brown, terminal buds sharp pointed, brown and fuzzy.  
**Bark:** Light gray, with thick irregular curling ridges, becoming plated.  
**Form:** Medium sized tree to 60 feet, elliptical crown.
Database Keys

Virginia Tech
Tree Identification

Send an e-mail with any tree question to a tree expert at Virginia Tech’s Department of Forest Resources and Environmental Conservation
Touch Here
Database Keys

Factsheets

Search the database:
- You can search for all or part of a name.
- No fields are required.
- If you return no matches, try a more general search (i.e. "maple" instead of "ashleaf maple").

View trees at any North American location:
(Click the map to select your location)

Possible Matches

Back to Search

There are 7 ID Fact Sheet matches at Latitude: 38.473030, Longitude: -77.998123, Elevation: 392.

You can narrow the list of possibilities with additional information:
- Growth Habit:
  - shrub
  - tree
- Fruit Type:
  - dry
  - puffy
- Flower Color:
  - purple
  - yellow
- Leaf Type:
  - broadleaf
  - deciduous
- Conifer Leaves:
  - not needle
  - needle
- Broadleaves (Hardwoods) Arrangement
- Leaf:
  - simple or compound
  - lobes
  - edges
  - shape
  - thickness
- Twig:
  - bundle scars
  - leaf scars
  - end buds
  - special features

Reset

= nonnative, planted and a wildland component, commonly "escapes" cultivation
= a North American native, may naturalize outside its native range

*Celastrus orbiculatus* Oriental bittersweet
*Celastrus scandens* American bittersweet
*Parthenocissus tricuspidata* wintercreeper
Identification Tools and Vocabulary

- Flower – color, shape, number of petals

- catkin
- spike
- raceme

- panicle
- umbel
- cyme
Identification Tools and Vocabulary

- Fruit
Identification Tools and Vocabulary

• Bark
Identification Tools and Vocabulary

• Form
Identification Tools and Vocabulary

- Location (locally, topography is biggest influence)

Some common trees of local landforms...
Identification Tools and Vocabulary

- Location
  - Rivers

- sycamore
- silver maple
- willows
- boxelder
- hackberry
- green ash
- red maple
Identification Tools and Vocabulary

• Location
  • Coves
    • **dead hemlock**
    • **yellow-poplar**
    • **sugar maple**
    • **white oak**
    • **northern red oak**
    • **basswood**
    • **beech**
    • **white ash**
    • **blackgum**
    • **red maple**
Identification Tools and Vocabulary

• Location
  • Hillsides
    • pignut hickory
    • mockernut hickory
    • white oak
    • black oak
    • chestnut oak
    • scarlet oak
    • blackgum
    • sassafras
    • sourwood
    • white pine
    • Virginia pine
    • red maple

(aspect dependent)
Identification Tools and Vocabulary

• Location
  • Dry Ridges
    • Virginia pine
    • pitch pine
    • table mtn pine
    • scarlet oak
    • blackgum
    • sourwood
    • tree nerds
    • red maple
If you really get into plant ID:

http://www.herbarium.unc.edu/flora.htm
Doctor Dendro

Dr. Dendro will entertain any of your tree-related questions.

Dr. Dendro checking for flowers in a subalpine larch in northern Idaho

Dr. Dendro (on right) with former graduate students John Bannor (left, now with USDA Forest Service) and Dr. Chris Gough (center, now a Professor at Virginia Commonwealth University).

Ask Dr. Dendro a question.
For tree identification questions please feel free to attach digital photos. Be sure and indicate what region of the country the plant is from, whether it is wild or in a yard, and any other information you noticed about the plant.

Last Updated: April 2011
Contact Us
Photo Use

Or email John Peterson directly jopeters@vt.edu