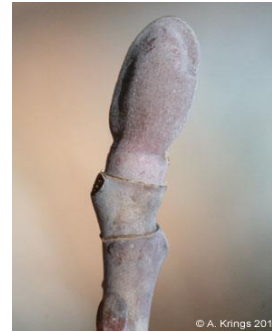


Native Tree Identification in Winter



Extension Gardener Workshop Series
23 January 2019

Matt Jones

Extension Agent, Horticulture
NCCE Chatham County Center

Workshop Outline

- 1) The importance of Native Trees
- 2) Plant Morphology
- 3) Dichotomous Keys
- 4) Tools of the Trade
- 5) Break
- 6) Guided Hands-on ID
- 7) Independent Hands-on ID
- 8) Wrap-up and Evaluations



Upcoming Workshops

Many more Extension Gardener workshops to come!

<https://go.ncsu.edu/chathamgardening>

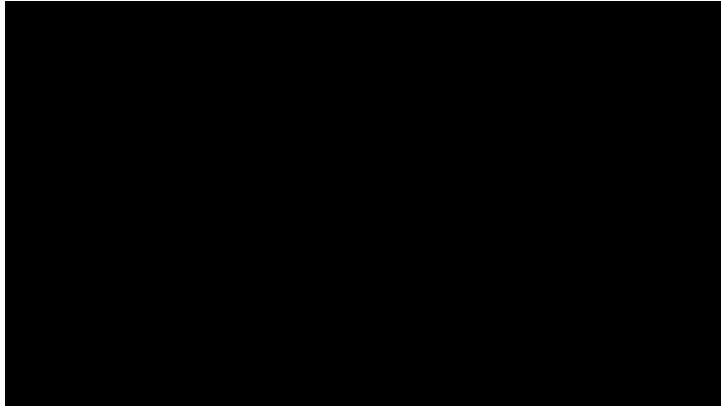


Workshop	Date (2020)	Time	Cost
Tree Identification in Winter	Jan. 21	9:30 a.m.-noon	\$10
Tree Identification in Winter	Jan. 22	6-8:30 p.m.	\$10
Growing Vegetables from Seed	Feb. 5	6-8:30 p.m.	\$10
Growing Vegetables from Seed	Feb. 6	9:30 a.m.-noon	\$10
Soil & Nutrient Management in Vegetable Gardens	Mar. 18	9:30 a.m.-noon	\$6
Soil & Nutrient Management in Vegetable Gardens	Mar. 19	6-8:30 p.m.	\$6
Warm Season Crops for Vegetable Gardens	Apr. 7	9:30 a.m.-noon	\$6
Warm Season Crops for Vegetable Gardens	Apr. 8	6-8:30 p.m.	\$6
Pest, Disease, & Weed Management in Vegetable Gardens	Jun. 2	9:30 a.m.-noon	\$6
Pest, Disease, & Weed Management in Vegetable Gardens	Jun. 4	6-8:30 p.m.	\$6
Carolina Lawn Care	Jun. 9	6-8:30 p.m.	\$6
Carolina Lawn Care	Jun. 10	9:30 a.m.-noon	\$6
What's the Matter with my 'Mater?	Jul. 7	9:30 a.m.-noon	\$6
What's the Matter with my 'Mater?	Jul. 9	6-8:30 p.m.	\$6
Cool Season Crops for Vegetable Gardens	Aug. 11	9:30 a.m.-noon	\$6
Cool Season Crops for Vegetable Gardens	Aug. 12	6-8:30 p.m.	\$6
Native Tree Identification	Sep. 1	9:30 a.m.-noon	\$10
Native Tree Identification	Sep. 3	6-8:30 p.m.	\$10
Fundamentals of Composting	Nov. 5	9:30 a.m.-noon	\$6

What is Cooperative Extension?

World's largest **non-formal education** network

- Established 1914 by the Smith-Lever Act



Practical, non-degree programs

What is Cooperative Extension?

A nationwide network of

- Educators
- Researchers
- Volunteers



How Cooperative Extension Works

- Training Courses and Educational Classes
- Events: meetings, workshops, field days, tours
- Publications and Newsletters
- Personal Consultations
 - By phone, email, and office
- Websites and Online Resources
- Social Media



Need help? Contact:

NC STATE

EXTENSION

Master Gardener | Chatham County

Plant Clinic: MW 1:00-4:00, F 9:00-12:00

chathamemgv@gmail.com

919-545-2715

Extension Master Gardener Volunteer Chatham County Training

NC STATE

EXTENSION

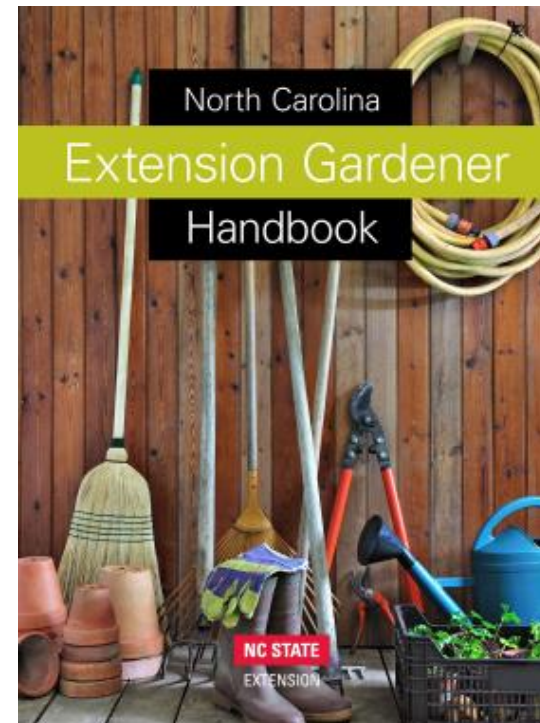
Master Gardener | Chatham County

Subscribe to the Chatham Gardener Newsletter

- **Chatham Gardener** email list
 - Sustainable gardening information
 - Monthly email updates
 - What to plant, pest alerts, timely tips
 - Upcoming classes and events
- **To subscribe:**
 - <http://go.ncsu.edu/subscribeCG>

Extension Gardener Handbook

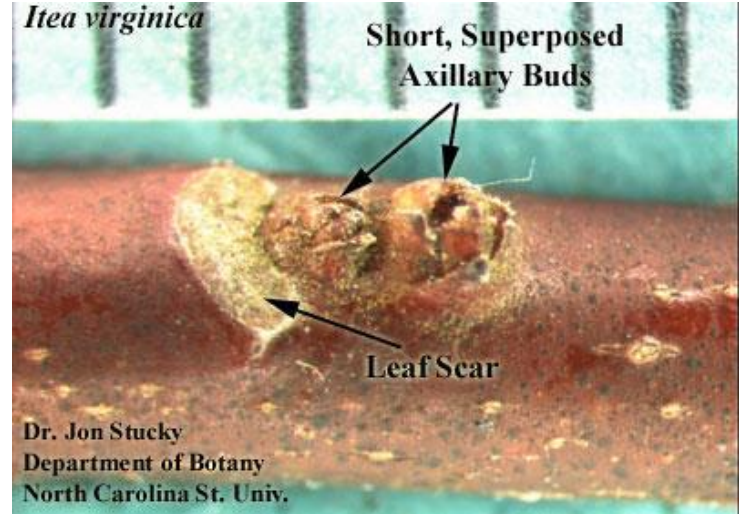
- Available online for FREE
<https://content.ces.ncsu.edu/extension-gardener-handbook>
- Full-color, hardback copy available from UNC Press (\$60)



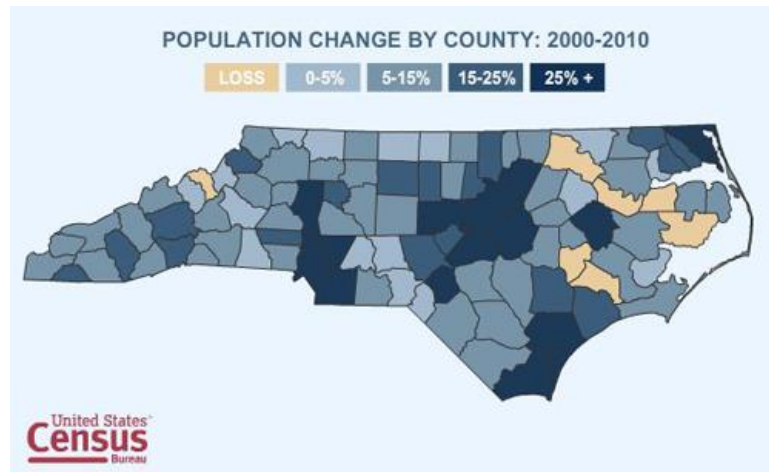
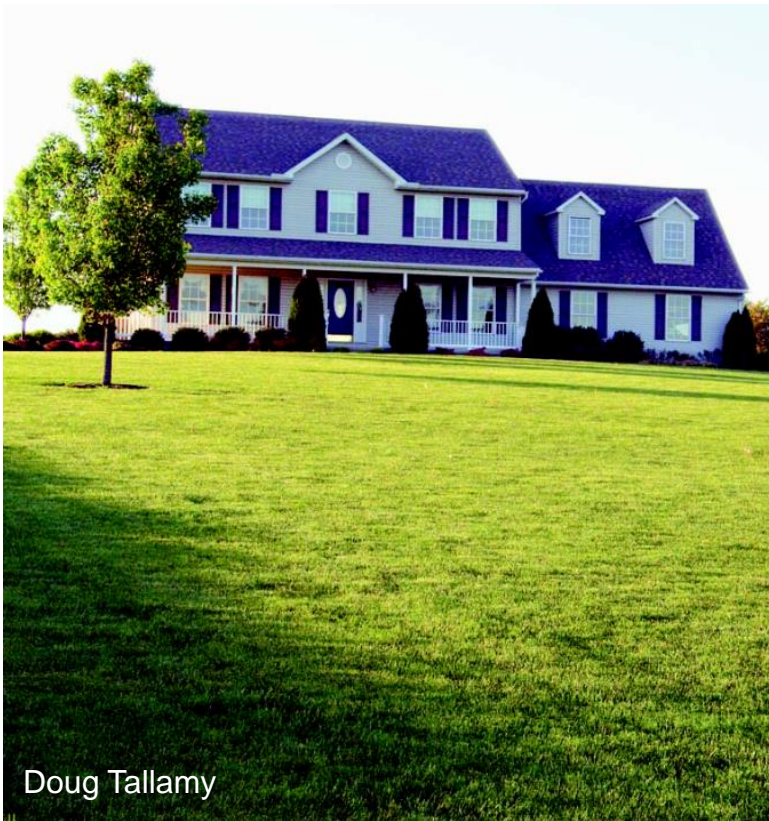
Why identify trees?



Why use winter features?



Habit Loss and Fragmentation



Traditional Landscapes Less Biodiverse

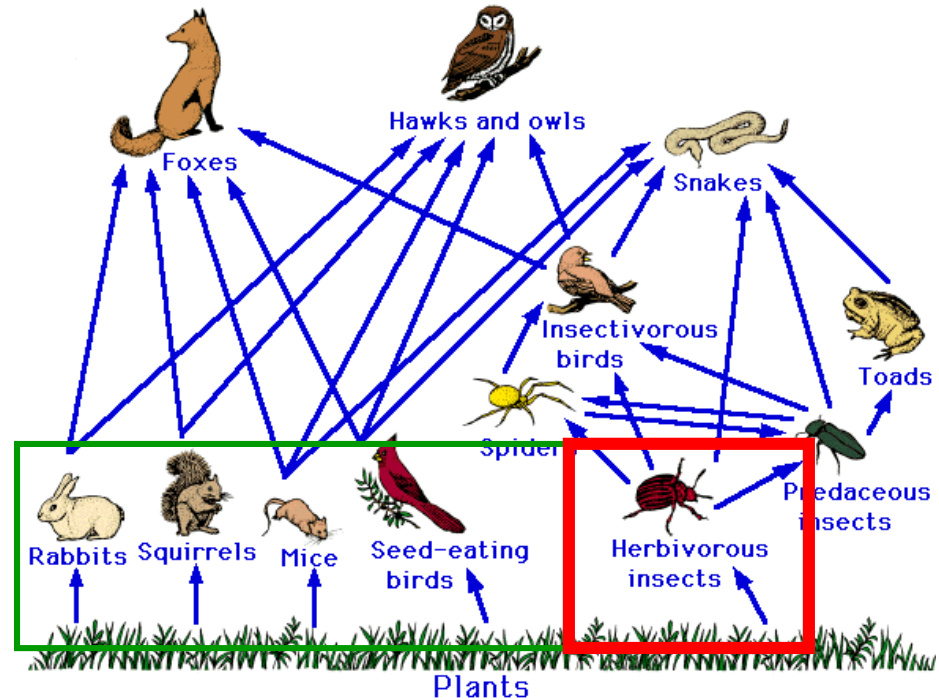


Dominated by Non-Native Plants



Plants are the Foundation of Food Webs

Plants capture and convert the sun's energy into a form that can be consumed by other organisms



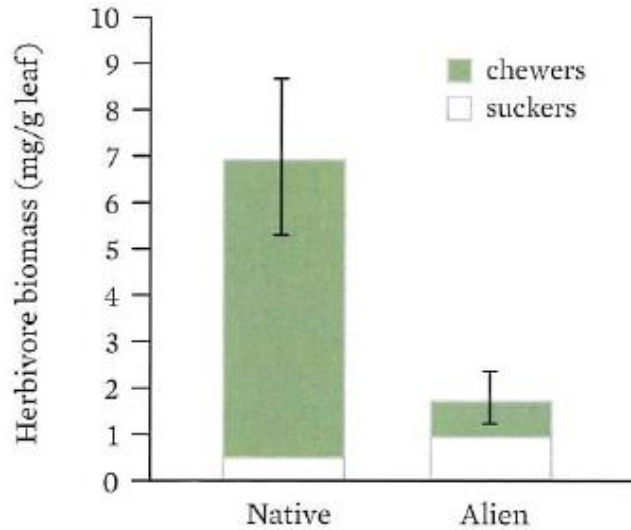
Herbivorous Insects are Host-specific

- Only feed on certain species
 - 90% are specialists
- Biochemical co-evolution
- **Native insects need native plants**

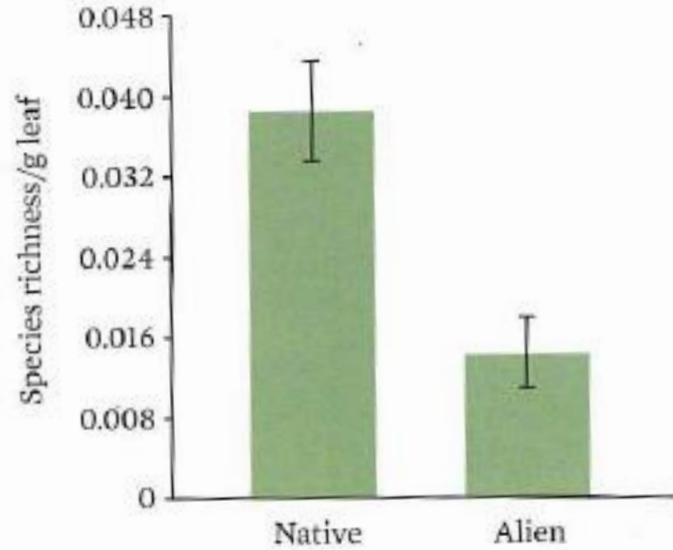


**Monarchs aren't the
only pick eaters!**

Native Plants Support More Insects



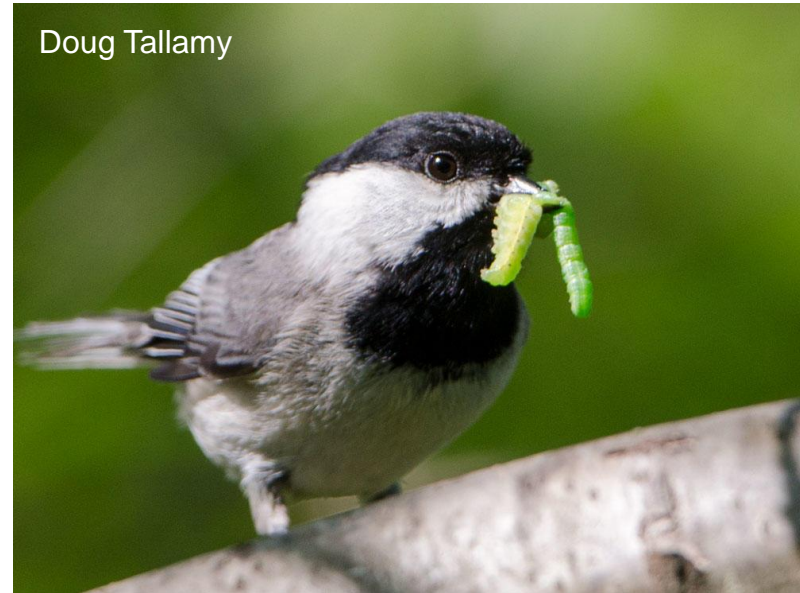
Herbivore Biomass



Species Richness

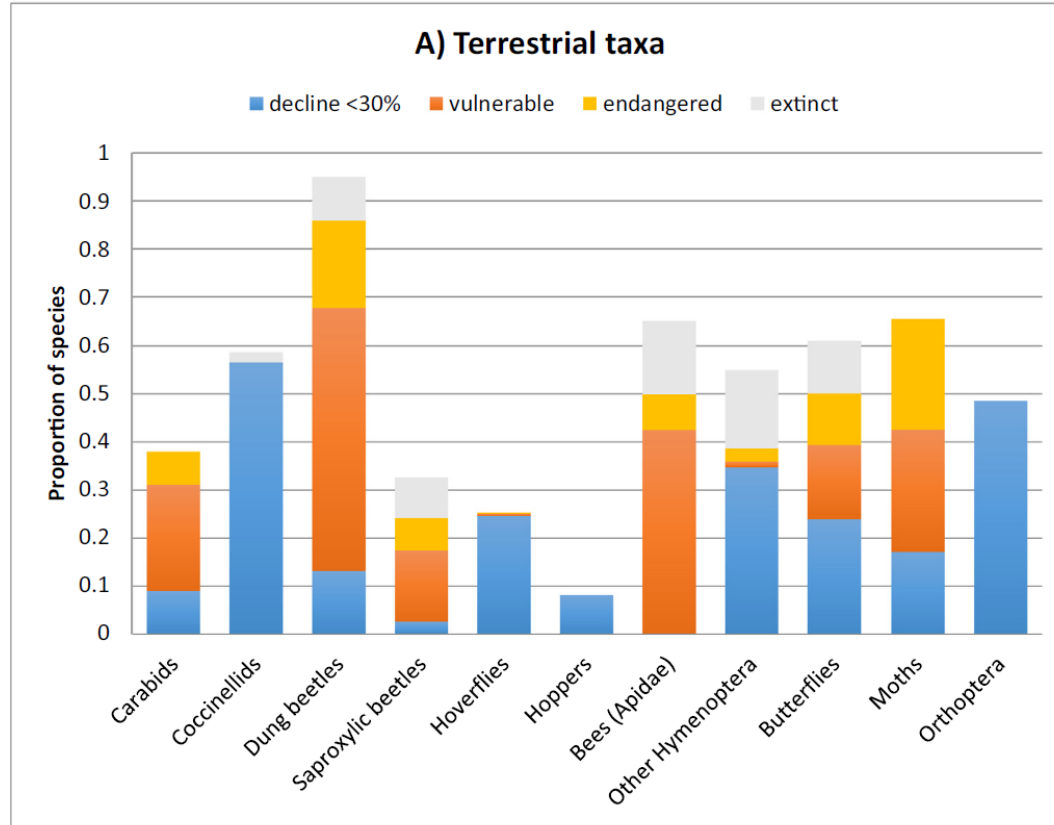
Fewer Insects = Less Wildlife

- Nearly all songbirds rear their young on insects
- Non-native trees do not support caterpillar populations birds need to rear their young

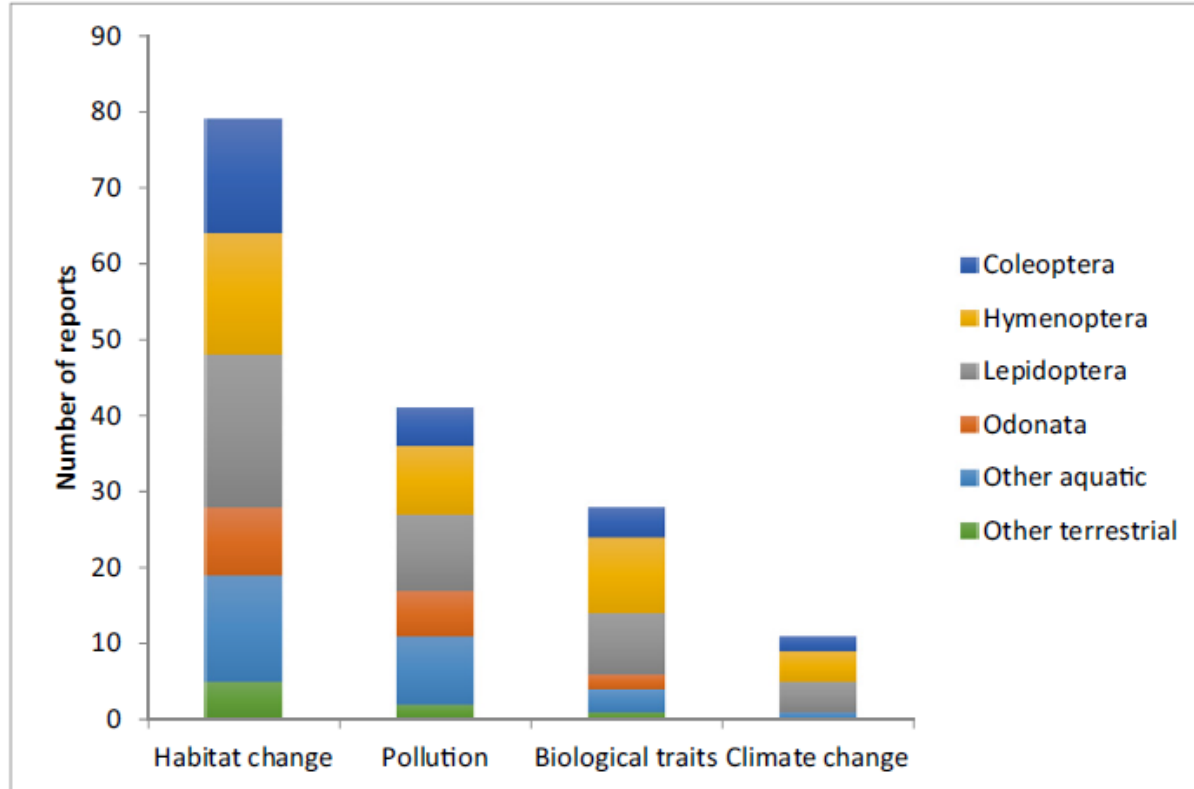


Proportion of Insect Taxa in Decline

Sanchez-Bayo & Wyckhuys 2019
Biological Conservation 232 (8-27)



Major Drivers of Decline by Taxa



Sanchez-Bayo & Wyckhuys 2019
Biological Conservation 232 (8-27)

Want to learn more about natives?

The screenshot shows the NC Cooperative Extension website. At the top left is the logo. Below it is the Chatham County Center information: 1192 US 64W Business, Suite 400, Pittsboro, NC 27312. Hours are listed as MON-FRI Closed Today, with a phone number (919) 542-9202. A message encourages community members to reach out for technical assistance. A search bar is visible in the top right. The main content area features a large image of a wooden cabin with a red roof. Below the image is a navigation menu with categories like Events, Meet Our Staff, Wildlife Resources, Growing Small Farms, Gardening in Chatham: Newcomer's Guide, 4-H Youth Development, Agriculture & Food, and Animal Agriculture. The 'Native Plant Resources' article is highlighted, with a sub-header 'Gardening with North Carolina native plants'. The article includes a list of resources and a photo of a Tiger swallowtail butterfly nectaring on Joe Pye Weed.

Chatham County Center

1192 US 64W Business, Suite 400, Pittsboro, NC 27312

HOURS: MON-FRI Closed Today (919) 542-9202

Community members are encouraged to continue to reach out to Extension professionals for technical assistance via email and phone.

Search

Home » Native Plant Resources

Native Plant Resources

Review slides:

- [Landscaping for Wildlife with Native Perennials](#)
- [Landscaping for Wildlife with Native Trees and Shrubs](#)

[List of local native plant nurseries](#)

Gardening with North Carolina native plants

- [Extension Gardener Handbook: Chapter 12 is Native Plants!](#)
- [Going Native: Urban Landscaping for Wildlife with Native Plants](#) - Extensive

Tiger swallowtail nectaring on Joe Pye Weed.

TWEET THIS PAGE

SHARE ON FACEBOOK

EMAIL THIS ARTICLE

PRINT THIS ARTICLE

<https://go.ncsu.edu/nativeplants>

Chatham County Native Plant Nurseries



<http://www.curenursery.com/>

GROWING
WILD
NURSERY

<https://www.growingwildnursery.com/>



Mellow Marsh Farm, Inc.
Wholesale Native Plants

<https://mellowmarshfarm.com/>

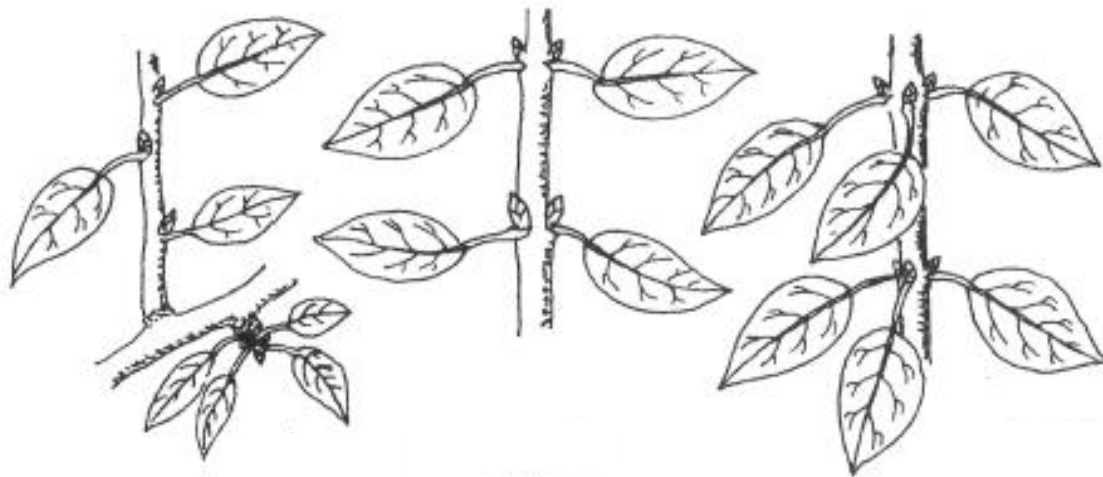
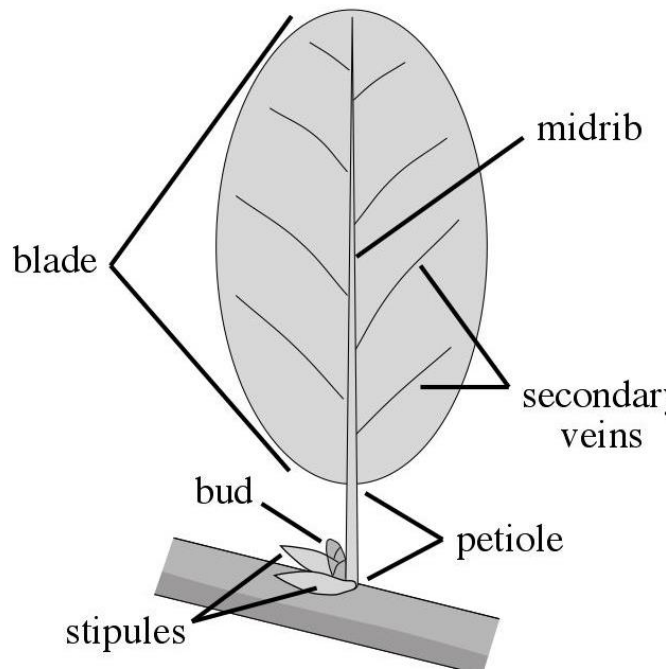
Woody Plant Morphology

Or How You'll Learn to Stop Worrying
and Love Botany



Dr. Strangelove

Leaf Arrangement



Alternate

Opposite

Whorled

Bud Arrangement



Alternate



Sub-opposite



Opposite

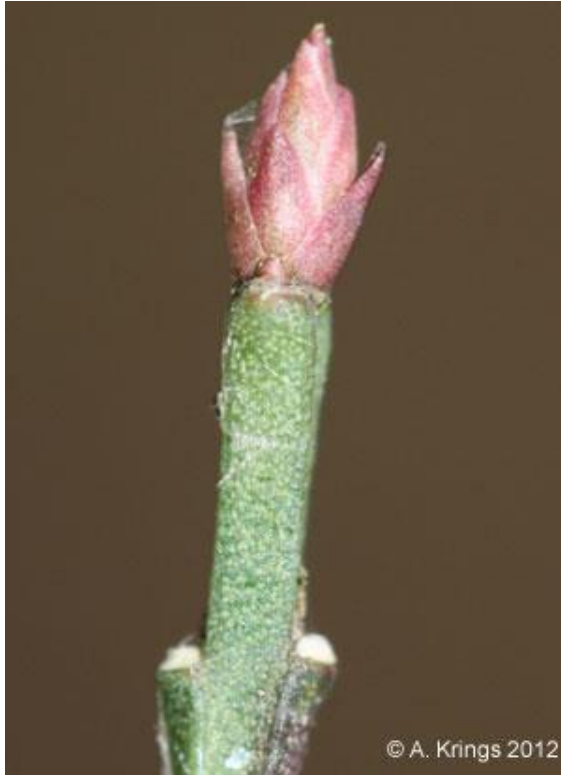


Whorled

Leaf Scars



Leaf (Scar) Arrangement



© A. Krings 2012

Opposite



Alternate

Bud Position



Terminal



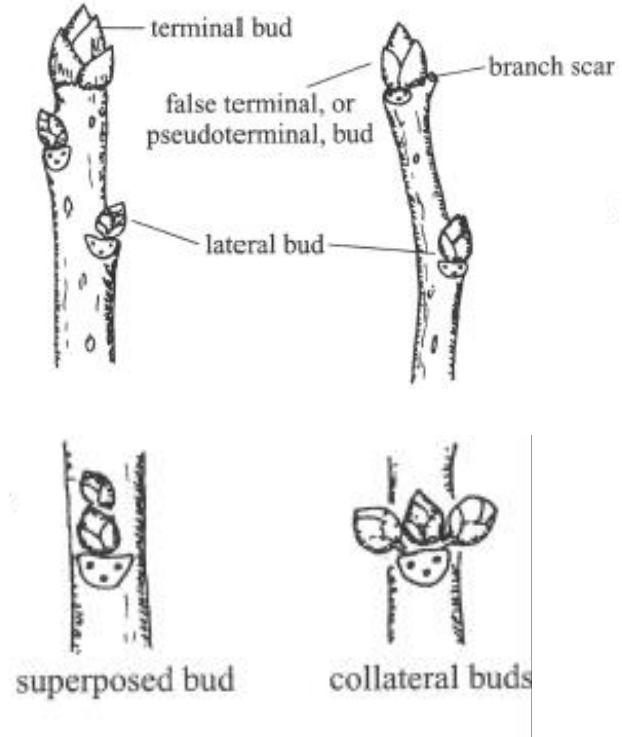
Pseudo-terminal



Lateral



Superposed



Bud Scales



Naked!

- **Single**
- **Capitate**
- **Capped**

Valvate

Imbricate

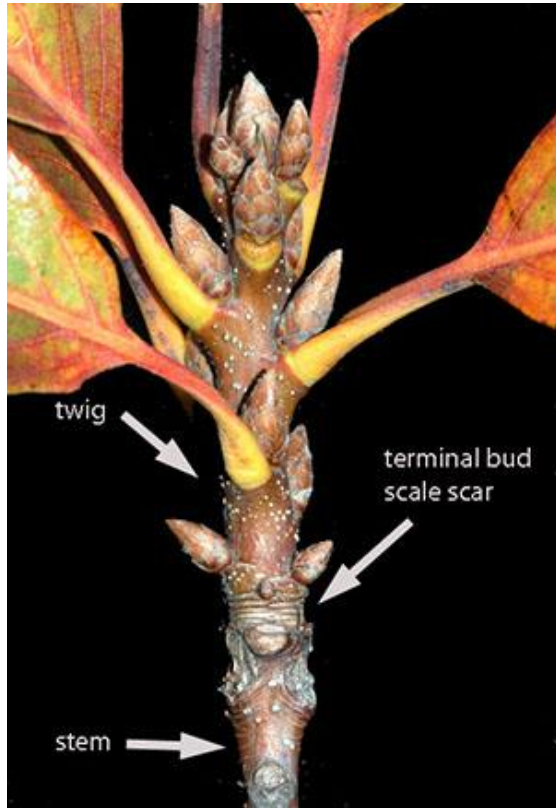
Images:

Prof. Bob Klips, OSU ohioplants.org

Prof. Alexander Krings, NCSU

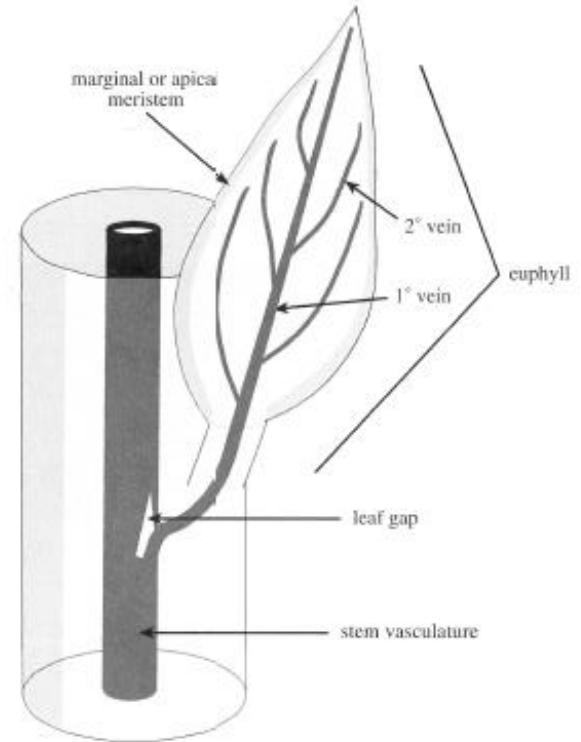
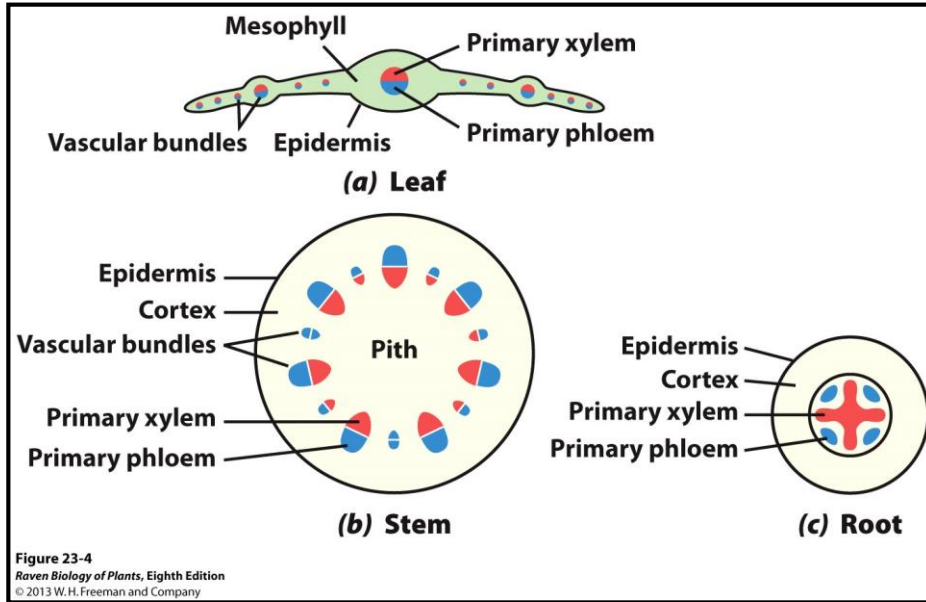
Ron Lance, *Woody Plants of the Southeastern US*

Bud Scars



Concentric rings formed by bud scales from the previous year's terminal bud

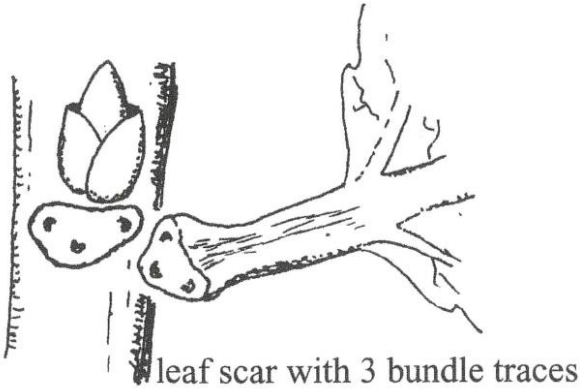
Vascular Bundle Scars



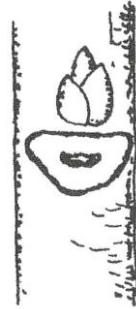
Images:

Raven et al., *Biology of Plants*, (8th Ed.)
 Ron Lance, *Woody Plants of the Southeastern US*
 Michael G. Simpson *Plant Systematics* (1st. Ed.)

Vascular Bundle Scars



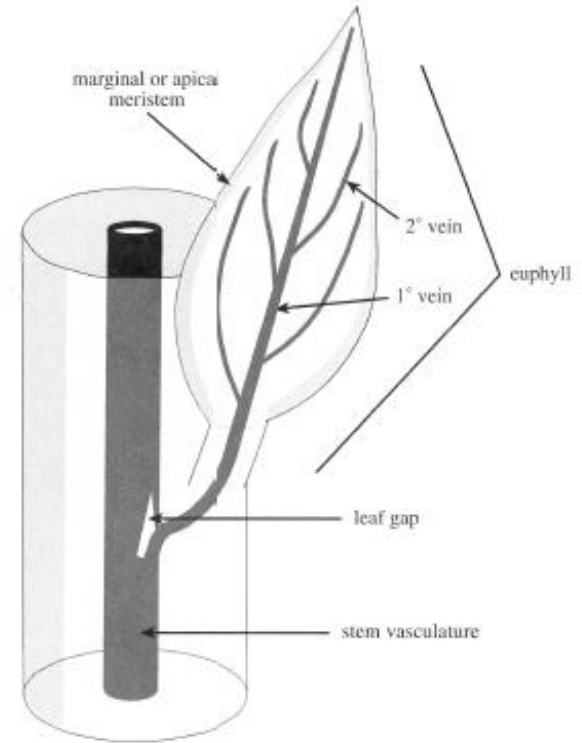
leaf scar with 3 bundle traces



1 bundle scar



several
bundle scars



Images:

Raven et al., *Biology of Plants* (8th Ed.)
 Ron Lance, *Woody Plants of the Southeastern US*
 Michael G. Simpson *Plant Systematics* (1st Ed.)

Vascular Bundle Scars



© A. Krings 2012



© A. Krings 2012



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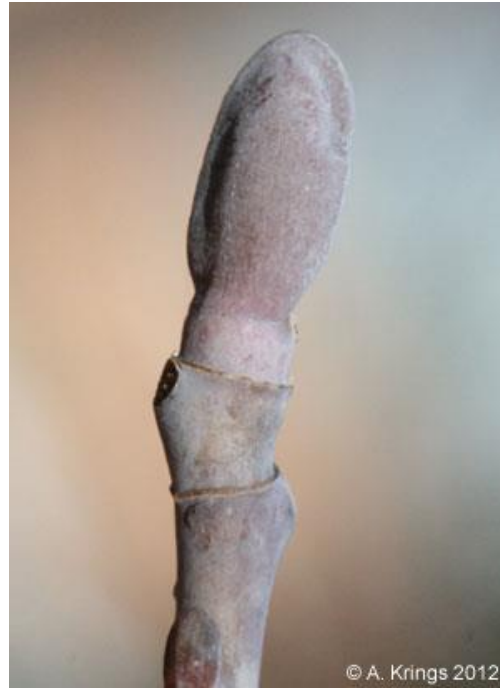
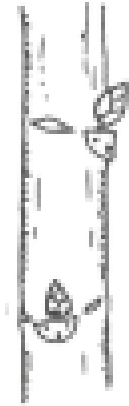
© A. Krings 2012

Stipular Scars



© Paul G. Davison

Slit-like



© A. Krings 2012

Ring-like



ohioplants.org

Images:

Prof. Bob Klips, OSU ohioplants.org

Prof. Alexander Krings, NCSU

Paul G. Davison

Ron Lance, *Woody Plants of the Southeastern US*

Pith Anatomy



Homogenous



Diaphragmed



Chambered



Excavated

Armament (“thorns”)

Spines



Thorns



Prickles



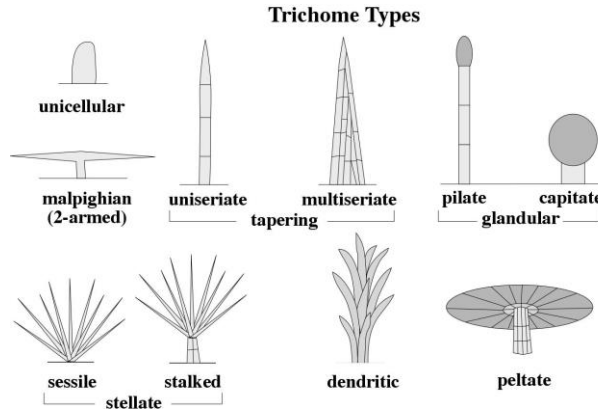
Leaves/Stipules

Stems

Epidermis

Other Characters

- Presence/absence of trichomes (hairs)
- Presence/absence of a scent
- Position, number, color, & shape of parts
- Habitat
- Growth habit



Dichotomous Keys

Decision 'tree' for identification

1. Given a *couplet* of two *leads* with contrasting, mutually exclusive characters (qualitative and/or quantitative)
2. Choose characters that better match your specimen
3. Proceed to the next couplet based on your selection
4. Repeat until final *lead* is a species name

Simple Dichotomous Key

1. Leaves usually without teeth or lobes: 2
1. Leaves usually with teeth or lobes: 5
 2. Leaves evergreen: 3
 2. Leaves not evergreen: 4
3. Mature plant a large tree — **Southern live oak** *Quercus virginiana*
3. Mature plant a small shrub — **Dwarf live oak** *Quercus minima*
 4. Leaf narrow, about 4-6 times as long as broad — **Willow oak** *Quercus phellos*
 4. Leaf broad, about 2-3 times as long as broad — **Shingle oak** *Quercus imbricaria*
5. Lobes or teeth bristle-tipped: 6
5. Lobes or teeth rounded or blunt-pointed, no bristles: 7
 6. Leaves mostly with 3 lobes — **Blackjack oak** *Quercus marilandica*
 6. Leaves mostly with 7-9 lobes — **Northern red oak** *Quercus rubra*
7. Leaves with 5-9 deep lobes — **White oak** *Quercus alba*
7. Leaves with 21-27 shallow lobes — **Swamp chestnut oak** *Quercus prinus*

NCSU Dichotomous Keys

Google: **NCSU Botanist's Little Helper**



Dr. Alexander Krings

Assoc. Prof. of Plant Biology

Director, NC State University Vascular Plant Herbarium

<https://projects.ncsu.edu/cals/plantbiology/ncsc/>

Online resources

By type



Ferns



Nursery weeds



Poisonous plants



Rare plants



Trees



Winter twigs

By taxon



Dichanthelium



Pitcher plants

go.ncsu.edu/wintertwigid

Using the NCSU Key

go.ncsu.edu/wintertwigid

- 1) Click **'keys'**
- 2) Choose Structural Group
 - Leaf scars **opposite**? Click **Group 1**
 - Leaf scars alternate?
 - Pith **chambered** or **diaphragmed**? Click **Group 2**
 - Pith **homogenous**? Click **Group 3**
- 3) Follow dichotomous key for selected group

Confused by terminology?

NC STATE UNIVERSITY

home | list | keys

Group 1: Leaf scars opposite



1. Twigs angled, surfaces nearly flat; twigs and stems green to ground level or nearly to ground level...*Euonymus americanus* (+)
- 1'. Twigs round, surfaces not flat; twigs and stems often brown, gray, or maroon to ground level (*Acer negundo* saplings usually have green stems nearly to ground level but their stems are round)...2.
2. Stipular scars prominent...*Staphylea trifolia* (+)
- 2'. Stipular scars inconspicuous or lacking (transverse lines joining adjacent leaf scars may resemble stipular scars)...3.
3. Vascular bundle scars > 6...4.
4. Buds with about 6 pairs of scales...*Aesculus sylvatica* (+)
- 4'. Buds with 2-3 pairs of scales...5.
5. Upper edge of largest leaf scars deeply notched; twigs glabrous; plant of dry soils...*Fraxinus americana* (+)
- 5'. Upper edge of all leaf scars straight or only slightly notched; twigs glabrous or pubescent; plant of wet or inundated soil...*Fraxinus pennsylvanica* or *F. caroliniana* (+)

NC STATE UNIVERSITY

home | list | keys

Group 1: Leaf scars opposite

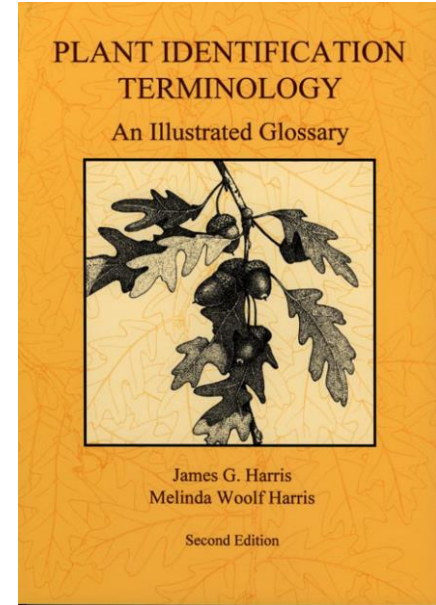
1. Twigs angled, surfaces nearly flat; twigs and stems green to ground level or nearly to ground level...*Euonymus americanus* (+)
- 1'. Twigs round, surfaces not flat; twigs and stems often brown, gray, or maroon to ground level (*Acer negundo* saplings usually have green stems nearly to ground level but their stems are round)...2.
2. Stipular scars prominent...*Staphylea trifolia* (-)

© Paul G. Davison

Staphylea trifolia (Photo: Paul G. Davison)

- 2'. Stipular scars inconspicuous or lacking (transverse lines joining adjacent leaf scars may resemble stipular scars)...3.
3. Vascular bundle scars > 6...4.
4. Buds with about 6 pairs of scales...*Aesculus sylvatica* (+)



1) Click (+) to reveal an example image

2) Use this book

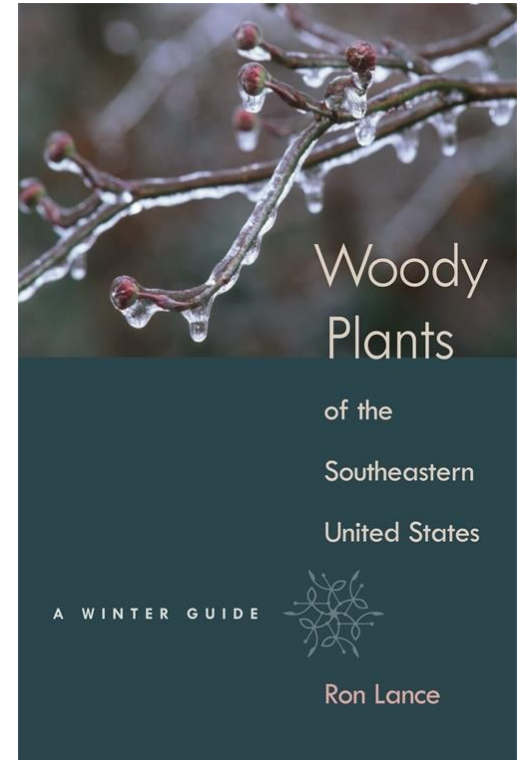
3) Ask me or the MGVs

Want something more advanced?

***Woody Plants of the Southeastern
United States: A Winter Guide***

Ron Lance

University of Georgia Press



Dichotomous Key Tips

- Know what species your key covers!
- Look at several specimens or parts of specimens.
- Look carefully, but don't 'see' something that isn't there!
- Know your path to backtrack if needed
- This will be a learning process:
 - Getting frustrated and making mistakes is part of learning!

Using a Hand Lens

Also know as...

- Hasting's Triplet
- Jeweler's Loupe

High magnification

- Short focal length
- Hold close to subject and your eye



Want to learn more about a tree?

NCSU Plant Toolbox

- <https://plants.ces.ncsu.edu/>
- Enter Latin or Common Name in the search bar

The North Carolina Extension Gardener Plant Toolbox contains detailed descriptions and photographs of 3,561 plants that grow in and around North Carolina.

Here are some tips to get you started

Search by scientific or common name:

Search

Use to select the perfect plant for a specific location.

Use to determine the name of a plant based on leaf and flower characteristics.

Looking for help?

Have a look at the page to get tips on using the Plant Toolbox, and be sure to check the for plant identification terms.

We are diligently working to populate all the data in this new plant database. Please be patient with us as not all features will be fully functional and accurate until this work is complete.

The NC State Extension Gardener Plant Toolbox is based on evaluation of plant databases around the world, surveys of Extension agents, Extension Master Gardener volunteers (EMGVs) and plant database users, and focus groups. Based on themes gathered from this data we have created an innovative tool for gardeners, EMGVs, extension staff, landscape professionals, university staff and students. The mission goal of the plant database is to help

Our Partners

NC State Partners

- College of Natural Resources
- Forestry & Environmental Resources
- Herbarium
- Horticultural Science
- JC Raulston Arboretum
- Master Gardener Volunteers
- The Natural Learning Initiative
- NC Sea Grant
- NC State Extension
- Plant Disease and Insect Clinic

Additional Partners

- NC's Champion Big Tree Database
- NC Forest Service
- Southern Region IPM Center

Questions?

Matt Jones

919-542-8243

matt_jones@ncsu.edu

NC Cooperative Extension – Chatham County Center

1192 US 64W Business, Suite 400

Pittsboro, NC 27312

<http://chatham.ces.ncsu.edu>

Communication Award Judges

- This is the end of the lecture portion of the workshop. Following the lecture, I worked through two specimens with the class together. Participants used their hand lenses and provided twigs to follow along as I proceeded through the key on one screen, and projected my specimen on a document camera to another screen. After these specimens were identified, participants worked on their own or in pairs to identify four more provided specimens.