### South Carolina



#### **Planning Education Advisory Committee**

February 27, 2018

Charleston County Zoning & Planning Department c/o Jenny Werking, AICP 4045 Bridge View Drive N. Charleston, SC 29405

Re: Applications for Accreditation of CE credits for New Program

Dear Ms. Werking:

On February 9, 2018, I received the program materials you submitted for "Our Community Forest: Why and How to Protect it?" and "Board of Zoning Appeals: Law and Practice." Upon receipt of the materials, an email was sent to confirm receipt by all Committee members as well as a deadline set for comments.

Under the "no objection policy" adopted July 8, 2009, the request for accreditation of these programs has been approved, and the signed "Notice of Decision" is attached. A formal after-the-fact approval will be handled as part of a Consent Agenda at the regular quarterly meeting of the Committee, scheduled at 10:00 a.m. on Tuesday, May 1, 2018.

Thank you for your efforts to help make this program a success.

Sincerely,

Konter H/Kiley

Stephen G. Rifley, ICMA~CM Chairman

cc: Phillip Lindler, Cliff Ellis, Christopher Witko and Wayne Shuler

Committee Members:

Stephen G. Riley, Chairman Representing MASC Term Expires: 2017

Phillip L. Lindler Representing SCAC Term expires: 2019

Cliff Ellis Representing Clemson University Term expires: 2020

Christopher Witko Representing USC Term expires: 2020

Wayne Shuler Representing SCAPA Term expires: 2018 South Carolina Planning Education Advisory Committee (SCPEAC)

#### **NOTICE OF DECISION**

**Title of Program:** <u>Our Community Forest: Why and How to Protect it?" and "Board of Zoning</u> <u>Appeals: Law and Practice</u>

#### **11.** The following action has been taken by the SCPEAC on this application:

ACCEPTED WITHOUT OBJECTION Date: February 27, 2018

REVIEWED BY FULL COMMITTEE Date: \_\_\_\_\_

- a) <u>X</u> ACCREDITED for: <u>90 min.</u> CE credits: <u>1.5</u>
- **b)** DENIED ACCREDITATION
- c) \_\_\_\_\_ RETURNED for more information

#### 12. If accredited:

- a) Authorized Course No.: <u>2018-02</u>
- **b)** Date of accreditation:  $\frac{02/27/2018}{2}$

Signature of SCPEAC Representative:

Hopen H/Kiley

For further information, contact Mr. Stephen G. Riley, Chairman, 843-341-4701 or <u>stever@hiltonheadislandsc.gov</u>



## Application for Accreditation of a Continuing Education Program

February 9, 2018

South Carolina Planning Education Advisory Committee (SCPEAC)

#### APPLICATION FOR ACCREDITATION OF A CONTINUING EDUCATION PROGRAM

Note: This certification form, together with the required information referenced therein, shall be submitted to the Committee. If no objections are raised by a member of the SCPEAC within 10 working days of receipt, the continuing education program shall be considered accepted. If an objection is raised, a teleconference meeting shall be scheduled, with appropriate public notice, as soon as reasonably possible, to review the application.

Applications are due no later than 30 days prior to the first scheduled presentation of a program or class. The Committee will consider extenuating circumstances where the 30 day deadline cannot be met.

#### 1. Name and address of organization providing or sponsoring the orientation program:

a.	Organization Name:	Charleston	County	Zoning	& Planning	Department
		3				

- b. Address: 4045 Bridge View Drive
- c. City: N. Charleston
- d. State: SC

Zip Code: 29405

e. Telephone: 843-202-7213

f. Email: jwerking@charlestoncounty.org

#### 2. Contact Information:

- a. Name of Contact Person: Jenny J. Werking, AICP
- b. Title: Planner II

c. Telephone: 843-202-7213

d. Email: jwerking@charlestoncounty.org

#### 3. Information on orientation program:

a. Title of Program:

"Our Community Forest: Why and How to Protect it?" and "Board of Zoning Appeals: Law and Practice"

V

b. Date(s) and Location(s) of Program:

Monday, March 5, 2018, Public Services Building, B225 Council Committee Room

c. Brief description of the program and its content:

#### See attachment 7.) a.) for course description and outline

4. Method of presentation (check all that apply. All sessions must have a Coordinator present):

a. Presentor(s) in room with participants

b. L	ive presentation	via close circuit	TV,	video confe	rencing, or	similar;	Coordinator present
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- c. Videotape or CD/DVD presentation; Facilitator present
- d. Webinar or similar; Coordinator present
- e. Other (describe)

#### 5. Description of materials to be distributed (check/fill in all that apply):

a. Powerpoint handout:		number of slides: 93 and 15
b. Other handouts:		total pages:
c. CD/DVD:		
d. Other (describe)		
e. None:		
6. When are materials distributed?		
a. Sent before the program:		
b. Handed out at the program:	V	
c. Other (describe)		

#### 7. Required attachments (5 copies distributed as described below):

- a. Course description and outline including estimated time per section
- b. Brochure, if available
- c. Course Presenter(s) and credentials (include brief resumes and qualifications)
- d. Copies of all handouts and course materials
- e. Evaluation Form and method of evaluation (each program must be evaluated)

#### 8. Instruction Time:

a. Indicate the total minutes of instruction time: 90 minutes (70 minutes 1st presenter and 20 minutes 2nd presenter)

Note: Breaks, meals and introductions should not be counted. A reasonable period of Q and A should be included and counted.

#### 9. Method of Advertisement:

a. Describe the ways in which you intend to let potential attendees know about this orientation program: **Email and in person meetings.** 

#### 10. Certification. By Submitting this application, the applicant agrees to:

a. Allow in-person observation, without charge, of the Program by the SCPEAC Committee members. Any food, travel or lodging costs will be the responsibility of the Committee member(s).

b. The applicant acknowledges that its approval for this Program may be withdrawn for violations of the regulations or failure to comply with the agreements and representations contained herein and as may be required by the SCPEAC.

i.	Name of Organization:	Charleston County Zoning & Planning Department
ii.	Name of Representative:	Jenny J. Werking, AICP
iii.	Title: Planner II	
iv.	Phone: 843-202-	7213
v.	Email: jwerking@	charlestoncounty.org
vi.	Signature:	The
vii	Date: 2/9/18	

#### Application and all Materials may be submitted in one of the following means:

- 1. Electronic submission to each of the committee members listed below via email; or
- 2. Hardcopy via U. S. Mail, 1 copy each to each committee member; or
- 3. Electronic submission of the application via email to all committee members, and submit hardcopy supporting materials via U.S. Mail to each member, if materials not available electronically.
- 4. Please cc all applications to the Chairman's assistant, Krista Wiedmeyer at kristaw@hiltonheadislandsc.gov

To access committee members email and postal addresses visit the link below: http://www.scstatehouse.gov/scpeac/members.htm South Carolina Planning Education Advisory Committee (SCPEAC)

#### **NOTICE OF DECISION**

#### 11. The following action has been taken by the SCPEAC on this application:

ACCREDITED for	CE credits
DENIED ACCREDITATION	
□ RETURNED for more information	
i. Reason:	ş
12. If accredited:	
Accredited Course No:	
a. Date of accreditation:	· · · ·
b. Certification is valid until:	
Signature of SCPEAC Representative:	

For further information, contact Mr. Stephen Riley, Chairman, 843-341-4701 or <u>stever@hiltonheadislandsc.gov</u>



### 7.) Required Attachments a.) Course Description and Outline

#### PATHWAYS FOR ENVIRONMENTALLY RESPONSIBLE URBAN DEVELOPMENT

February 5, 2018



Ms. Betsy LaForce Coastal Conservation League Re: Charleston Board of Zoning Appeals Presentation info

Dear Betsy,

Thanks for contacting us to assist the CCL with their Continuing Education for the Charleston County Board of Zoning Appeals. Below is a summary of the information I will be covering. I plan on making this a 'non technical' presentation capturing the main ideas from each subject and gradually building as we go.

#### Presentation Summary

- Tree benefits- (10 min) Presenter will cover basic information of how trees benefit our communities with wildlife species, aesthetics, ecosystem function, livability, evaporative cooling and many other benefits of trees.
- Soils Basics- (5-10 min) Presenter will briefly explain soil characteristics, physical properties, chemical properties, structure, negative and positive soil impacts, urban soils vs natural soils, soil and tree interactions, how site changes impact soil health and viability.
- 3) Tree anatomy/physiology- (5-10 min) Presenter will discuss how tree root systems are built below ground and interact with soils.
- 4) Root system impacts- (20 min) Presenter will discuss Tree Protection Zones, grade changes, fill soil, trenching, boring, soil compaction and other common site practices that impact tree health through changes in the soil that reduce root system function.
- 5) Tree root system care/impact mitigation-(20 min) Presenter will discuss and explain common practices that reduce impacts to existing root systems when construction is close. Practices such as root pruning, soil aeration, air spade use, tree wells, plant health care treatments will be covered.

I look forward to working with your agency and the BZA group to have a meaningful and empowering presentation.

Sincerely,

C. David Grant Certified Arborist SO-2481

628 Orangeburg Rd . Summerville, SC 29483 . Office: 843-873-8939 . NaturalDirectionsSC.com

#### **Board of Zoning Appeals**

#### • Authorities

- S.C. Local Government Comprehensive Planning Enabling Act of 1994
- Charleston County ZLDR Ordinance
- o Case Law
- Federal & State Constitutions

#### • Powers

- Zoning Variances;
- Special Exceptions; and
- Appeals of Zoning-Related Administrative Decisions (permits, enforcement, interpretations, *etc.*).

#### • Variance

- Why the need?
  - Base District or Overlay District Dimensional Requirements (density, setbacks, buffers, lot coverage, height, *etc.*)
  - Use Conditions (parking spots, lighting, hours of operation, *etc.*)
- Procedure → Application, Public Notice, Staff Review, Public Hearing, Final Decision, Notice, Appeal
- Criteria:
  - A variance may be granted in an individual case of unnecessary hardship if the board makes and explains in writing the following findings:

(a) there are extraordinary and exceptional conditions pertaining to the particular piece of property;

(b) these conditions do not generally apply to other property in the vicinity;

(c) because of these conditions, the application of the ordinance to the particular piece of property would effectively prohibit or unreasonably restrict the utilization of the property; and

(d) the authorization of a variance will not be of substantial detriment to adjacent property or to the public good, and the character of the district will not be harmed by the granting of the variance.

- Additional factors in the ZLDR (beyond those in the Planning Act)
- Grounds cannot be to make utilization of property more valuable.
- Planning Act allows local governments to let BZA grant *use* variances.
  - Charleston County does not allow (ZLDR § 3.10.1(A) and ZLDR § 3.10.6(B)(5))
- BZA can place conditions on variance "to protect established property values in the surrounding area or to promote the public health, safety, or general welfare."

#### Special Exception

- Why the Need?
- BZA has the power "to permit uses by special exception subject to the terms and conditions for the uses set forth for such uses in the zoning ordinance."
- Trigger Examples
  - Section 6 Table of Uses
  - CAFOs in Resource Management ("RM") District
- Procedure → Application, Public Notice, Staff Review, Public Hearing, Final Decision, Notice, Appeal
- o Criteria
  - Is consistent with the recommendations contained in the Charleston County Comprehensive Plan and the character of the underlying zoning district "Purpose and Intent;"
  - Is compatible with existing uses in the vicinity and will not adversely affect the general welfare or character of the immediate community;

- Adequate provision is made for such items as: setbacks, buffering (including fences and/or landscaping) to protect adjacent properties from the possible adverse influence of the proposed use, such as noise, vibration, dust, glare, odor, traffic congestion and similar factors;
- Where applicable, will be developed in a way that will preserve and incorporate any important natural features;
- Complies with all applicable rules, regulations, laws and standards of this Ordinance, including but not limited to any use conditions, zoning district standards, or Site Plan Review requirements of this Ordinance; and
- Vehicular traffic and pedestrian movement on adjacent roads shall not be hindered or endangered.
- BZA can place conditions on variance "to protect established property values in the surrounding area or to promote the public health, safety, or general welfare."

#### • Appeals from Zoning Decisions

- Why the Need?
- Examples of Staff Decisions
  - Permits;
  - Enforcement Actions; and
  - Official Interpretations.
- **Procedure** 
  - Who Can Appeal?  $\rightarrow$  Person with "substantial interest" in decision.
  - **Timeline for Appeal**  $\rightarrow$  Within 30 days of decision.
  - Where is Appeal Filed? → Planning Director
  - What Happens After Appeal Filed? → Stay (unless emergency), Public Notice, Public Hearing, Vote by BZA or Remand

#### • Final Decisions and Orders

- "All final decisions and orders of the board must be in writing and be permanently filed in the office of the board as a public record. All findings of fact and conclusions of law must be separately stated in final decisions or orders of the board which must be delivered to parties of interest by certified mail."
- Appeals of BZA Decisions (S.C. Code Ann. § 6-29-820)
  - Who Can Appeal? → "A person who may have a substantial interest in any decision of the board of appeals or an officer or agent of the appropriate governing authority ..."
  - **Timeline for Appeal**  $\rightarrow$  "The appeal must be filed within thirty days after the decision of the board is mailed."
  - Where is Appeal Filed?  $\rightarrow$  Charleston County Court of Common Pleas
  - What Happens After Appeal Filed? → "[T]he clerk of the circuit court must give immediate notice of the appeal to the secretary of the board and within thirty days from the time of the notice, the board must file with the clerk a duly certified copy of the proceedings held before the board of appeals, including a transcript of the evidence heard before the board, if any, and the decision of the board including its findings of fact and conclusions."
  - Standard of Review → "The findings of fact by the board of appeals must be treated in the same manner as a finding of fact by a jury, and the court may not take additional evidence. In the event the judge determines that the certified record is insufficient for review, the matter may be remanded to the zoning board of appeals for rehearing. In determining the questions presented by the appeal, the court must determine only whether the decision of the board is correct as a matter of law."
  - "A court will refrain from substituting its judgment for that of the reviewing body, even if it disagrees with the decision." *Restaurant Row Assocs. v. Horry Cnty.*, 335 S.C. 209, 216, 516 S.E.2d 442, 446 (1999).
  - "[A] decision of a city zoning board will be overturned if it is arbitrary, capricious, has no reasonable relation to a lawful purpose, or if the board has abused its discretion." *Clear Channel Outdoor v. City of Myrtle Beach*, 372 S.C. 230, 234, 642 S.E.2d 565, 567 (2007).



# 7.) Required Attachmentsb.) Brochure – there will not be a brochure for this training



# 7.) Required Attachmentsc.) Course Presenters and credentials:

Brief resumes and qualifications are attached for the presenters.

#### **C. David Grant**

Certification: International Society of Arboriculture Certification SO-2481 Qualification: Tree Risk Assessment Qualified Education: B.S. Forest Resource Management, Clemson University, 1996 Minor: Wildlife Biology Professional Affiliations: Trees SC, International Society of Arboriculture Employment History: Davey Tree-Line Clearance Supervision

South Carolina Forestry Commission- Coastal Region Urban Forester Union County, NC- County Arborist/Urban Forester Natural Directions LLC- Arborist Representative/Sales Representative

#### **Relevant Experience:**

David has over 25 years of professional experience in arboriculture, horticulture, and natural resource management work at the private, municipal, state and county level. He has experience in native landscape design, landscape installation, professional tree care, consultation, insect & disease management, project management, tree inventories, tree risk assessment, chainsaw safety, prescribed fire and wildfire management, Incident Command, teaching and continuing education.

Jenny J. Werking, AICP Brief Resume

Jenny J. Werking is a Planner II for the Charleston County Planning Department. Mrs. Werking has been a professional planner since 2000 and is a member of the American Institute of Certified Planners, the American Planning Association and the South Carolina Chapter of the American Planning Association.

She holds a Bachelor of Arts degree in Urban Studies, Planning and Administration from the College of Charleston.

She is certified facilitator for the Municipal Association of South Carolina and has conducted orientation training and continuing education for local government planning and zoning officials and staff in Charleston County including the Towns of Kiawah, Rockville and Meggett. She is a graduate of the Charleston County Supervisory training program.

She has staffed Board of Zoning Appeals and Planning Commissions and worked with various municipal governments in the preparation and administration of comprehensive plans and zoning and land development regulations in North Carolina, Ohio and South Carolina.



### 7.) Required Attachments e.) Evaluation Form and Method of Evaluation

#### TRAINING EVALUATION FORM

#### Charleston County Planning and Zoning Continuing Education (1.5 CE) Training

#### Presenters: David Grant, Certified Arborist and Jenny J. Werking, AICP Date: <u>3/5/18</u>

#### Facilitator: Jenny J. Werking, AICP

	<b>Evaluation Items</b>	Ratings					
		(For ratings of 1-3, please comment below how we can improve)					
		Very Poor	Poor	Fair	Good	Very Good	
1.	The value/relevance of this session.	1	2	3	4	5	
2.	Quality of instructional materials and handouts.	1	2	3	4	5	
3.	Use of time.	1	2	3	4	5	
4.	Quality of participation and discussion.	1	2	3	4	5	
5.	Quality of presenters.	1	2	3	4	5	
6.	Quality of the overall session.	1	2	3	4	5	

7. What did you find **MOST valuable** in this session?

8. What did you find the LEAST valuable in this session?

9. Other comments (including suggestions of topics for future training sessions):

Name (optional): \_\_\_\_\_



# 7.) Required Attachmentsd.) Handout – PowerPointPresentation

"The nation that destroys its soil, destroys itself." - Franklin Delano Roosevelt

## TREES & SOIL

### MANAGING DAMAGED SOILS

S. Cory Tanner Horticulture Agent



### WHAT IS SOIL?

It depends...

- Geologist Earth's surface, composed of weathered bedrock.
- Hydrologist filters and purifies water.
- Engineer foundation for structures.
- Horticulturist medium in which plants grow.

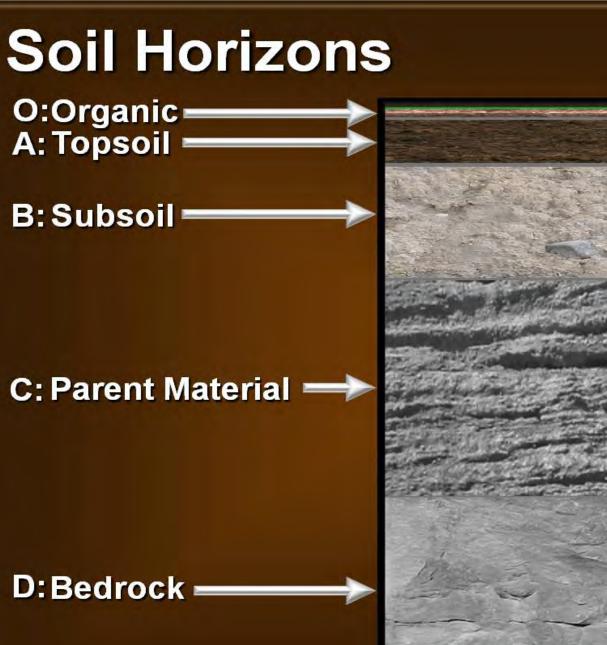
Most urban/suburban soils are damaged and need repairing for optimal plant growth.

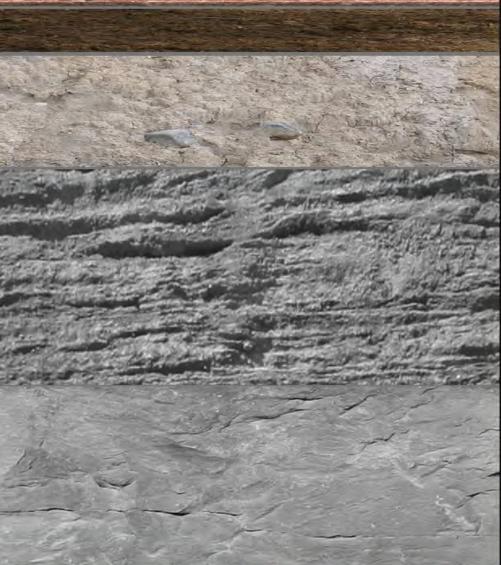
### SOIL PROPERTIES

- Physical
  - Layers (horizons)
  - Texture
  - Structure
- Chemical
  - pH
  - Cation Exchange Capacity (CEC)
- Biological
  - micro- and macro- organisms
    - bacteria, fungi, nematodes, worms, insects, etc.

All of these properties work together and influence each other, making soil an incredibly complex, dynamic, and living substance.







#### Graphic by Joe Boggs

### WHAT IS TOPSOIL?

- No official definition
- The soil on top (A horizon).
- Typically removed during construction.
- Damaged topsoil can be repaired.
- Subsoil cannot be turned into topsoil. (It can be improved)
- Topsoil should be replaced with topsoil similar to that removed.



### Physical Components of an Ideal Soil

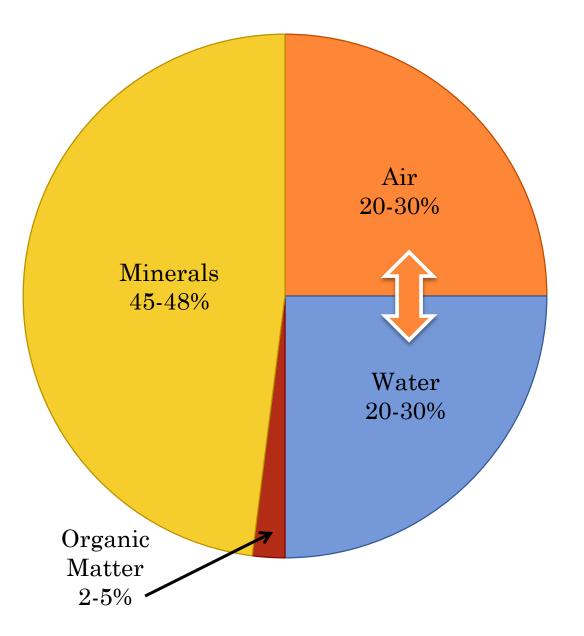




Photo by Susan D. Day

### SOIL MINERALS

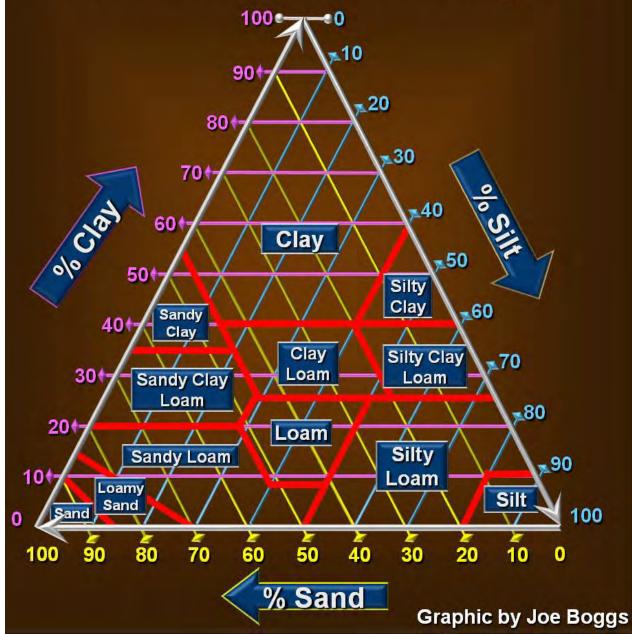
### • Consist of:

- Sand largest
- Silt
- Clay smallest

### • Relative % determines soil texture.

• Affects soil drainage

# **Soil Textural Triangle**



### SOIL INCOMPATIBILITY

- Water movement is disrupted in soils of drastically different textures (particle sizes).
- For instance, adding a sandy soil on top of a clay soil will create a situation where water can't easily flow from the sand into the clay.
- Forms a "perched water table". I.e. it *creates* a drainage problem instead of correcting it.
- This is also why we don't amend backfill soil when planting. (Amend planting <u>sites</u>, not planting holes.)

### SOIL STRUCTURE

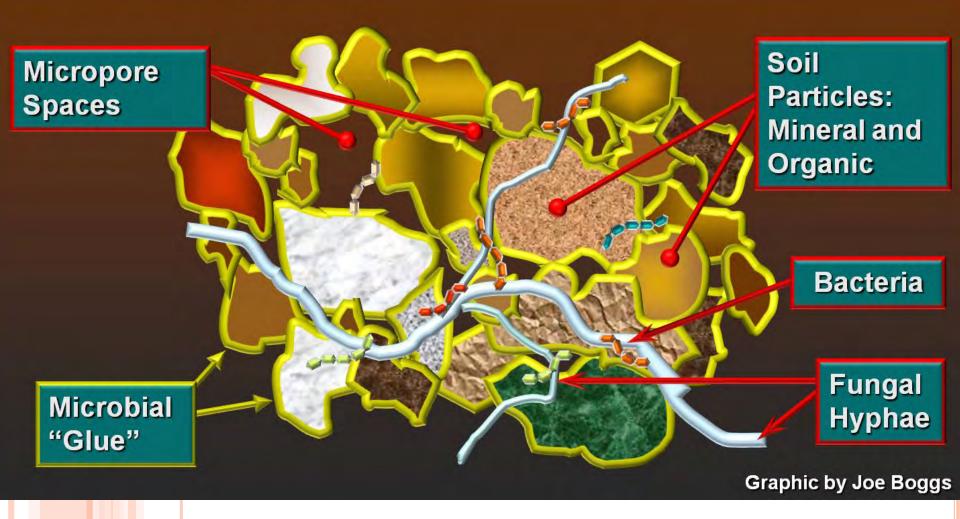
- Built from the actions of soil organisms on soil particles.
- "Microbial glue" creates soil aggregates.
- Easily destroyed by compaction or tilling; esp. when soil is wet.
- OM feeds microbes



Good structured soil has:

- Micropores pores within aggregates (nutrient retention and exchange)
- Macropores pores between aggregates (plant available air and water)

# A Soil Aggregate





### Macropores

## Aggregates

### Micropores are within the Aggregates

Graphic by Joe Boggs

# Water Infiltration Through an Aggregated Clay Soil

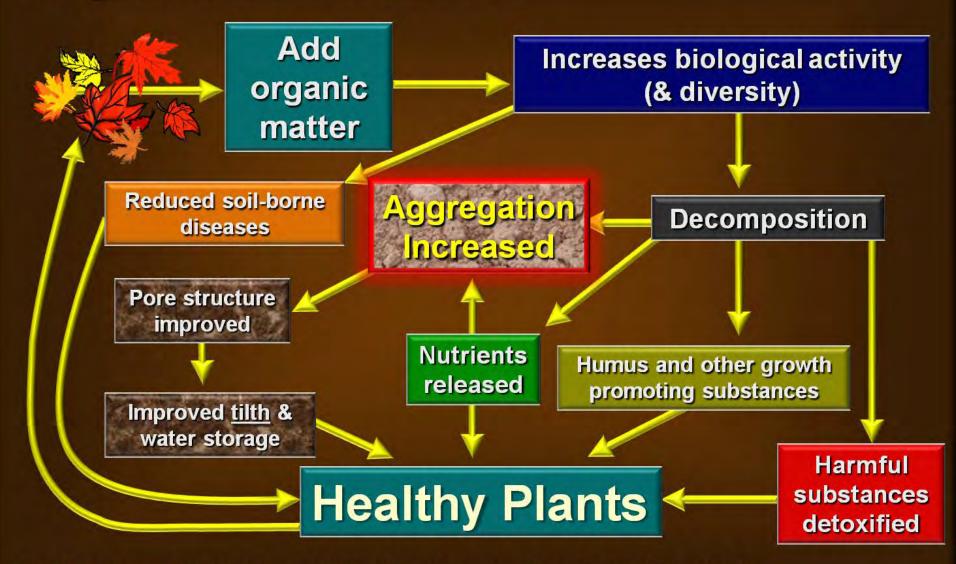
Water



### Moist, Well-Drained Soil

Graphic by Joe Boggs

# **Organic ... Matters!**



Modified from C. Oshins, 1999, "An Introduction to Soil Health"

### NOT ALL COMPOST IS CREATED EQUAL

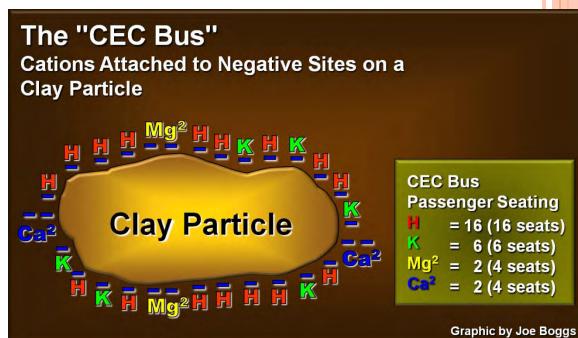


Quality Compost

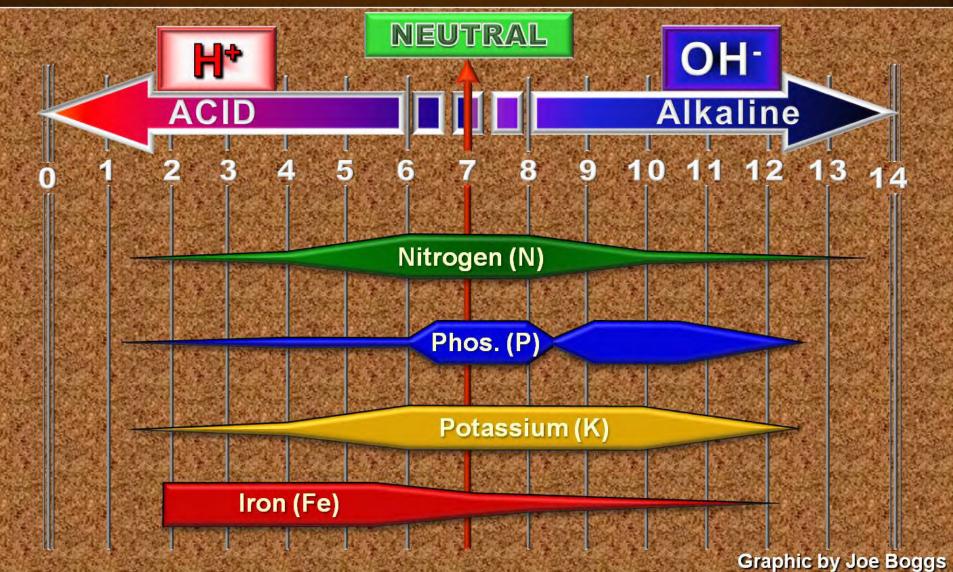
- C/N Ratio <20
- pH of 6 to 7.8
- Low salts (EC < 4 mmhos/cm)
- Appropriate N & P levels
- Low phytotoxicity
- Mature & stable
- Free of weeds & pathogens
- Supplied by a professional composting operation

#### CHEMICAL PROPERTIES

- Soil pH
  - 5.5 to 6.5 best
- CEC
  - Measures the soil's ability to hold nutrients.
  - Based on clay and OM content.
  - Higher is better



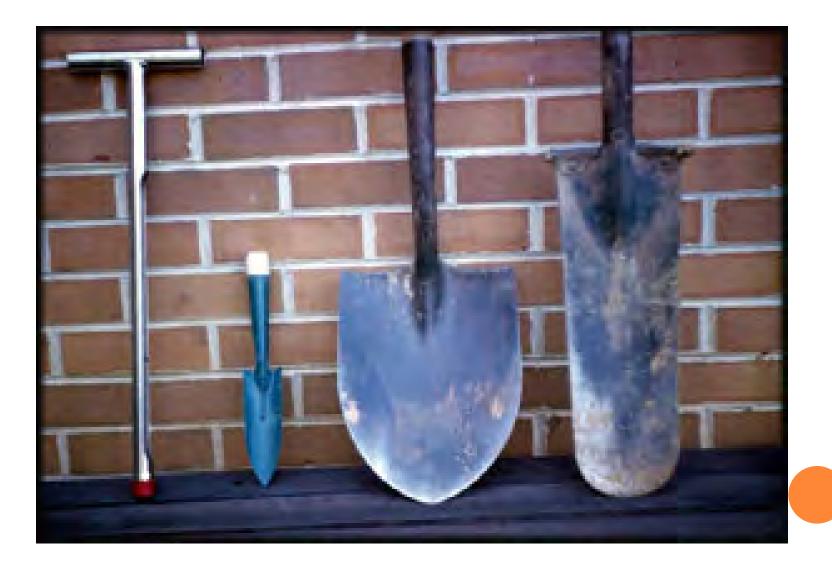
# Relationship Between Soil pH and Nutrients Available to Plants



#### TREE FERTILIZATION

- 1. Correct major deficiencies (based on soil test) before planting.
- 2. Don't fertilize for a year after planting.
- 3. Most trees will perform adequately without fertilization.

## SOIL TESTING TOOLS





Agricultural Service Laboratory 171 Old Cherry Road, Clemson, SC 29634 Phone: 864-656-2068 Fax: 864-656-2069

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Date: 3/9/2009 Lab 123456 Number: Soil Report for: Account: COGRNVL DOE, Doe, John Farm Id: JANE 555 Garden Way Sample Id: BACK GREENVILLE SC, 29601 Soil Code: 4 Analysis Results Soil pH 5.2 7.40 Buffer pH Low Medium Sufficient High Excessive Phosphorus (P) lbs/acre 33 196 Potassium (K) lbs/acre Calcium (Ca) 1250 lbs/acre Magnesium 126 Ibs/acre (Mg) Zinc (Zn) 12.4 lbs/acre Manganese 33 Ibs/acre (Mn) Boron (B) 1.4 Ibs/acre Copper (Cu) 5.8 lbs/acre 35 Sodium (Na) lbs/acre Sulfur (S) lbs/acre mmhos/ Soluble Salts cm Nitrate ppm Nitrogen % Organic Matter (LOI)

Calculations		Base Saturation				
Cation Exchange Capacity (CEC)	Acidity	Ca	Mg	K	Na	Total
8.8 meg/100g	4.8 meg/100g	36%	6%	3%	1%	45%
Recommendations					Lime	
Crop						
Centipedegrass(sq ft)					87 lbs/10	00sq ft
See Comments: 321,436,43	7,535,654,700					
WarmSeasonGrsMaint(sq ft)			103 lbs/1000sq ft			
	5,654,700					

#### Comments

- 321 Do not over-fertilize with nitrogen or apply nitrogen fertilizer after August 15. To achieve darker green color, broadcast iron containing product or foliar apply on the turf a liquid solution of iron sulfate (dissolve 2 ounces iron sulfate in 4 gallons of water) including a surfactant (5 drops of a dishwasher detergent) per 1,000 square feet, or foliar apply a chelated iron source following label instructions. An iron solution treatment should be made as needed for green turf color between regular fertilizer applications in April and July for locations in the Piedmont and in March, July and September for the Coastal Plains (consider turf fertilizers that contain iron). Foliar apply the iron-containing solution in the late afternoon only when the air temperature is greater than 800F and soil moisture is adequate for good turf growth.
- 428 When growth begins in the spring, broadcast 3 lbs 34-0-0 per 1,000 square feet. In July, broadcast 3 lbs 34-0-0 per 1,000 square feet.
- 429 The extent of growth can be controlled by the amount of nitrogen fertilizer applied, low maintenance at a rate between 1 to 2 lbs nitrogen per 1,000 square feet per year, high maintenance, between 3 to 5 lbs nitrogen per 1,000 square feet per year. If the grass clippings are removed, the amount of fertilizer applied should be increased by 25% and the turf soil tested every other fall to determine what levels of phosphate and/or potash will be needed to sustain vigorous growth.
- 436 When growth begins in the spring, broadcast 1 lb 34-0-0 or equivalent fertilizer per 1,000 square feet, and repeat the application in July.
- 437 The extent of growth can be controlled by the amount of nitrogen fertilizer applied, low maintenance at a rate less than 1 lb nitrogen per 1,000 square feet per year, high maintenance, between 1 and 2 lbs nitrogen per 1,000 square feet per year. If the grass clippings are removed, the amount of fertilizer applied should be increased by 25% and the turf soil tested every other fall to determine what addition of phosphate and/or potash fertilizer will be needed to sustain vigorous growth.
- 535 Broadcast dolomitic limestone as recommended, either in the fall or early spring.
- 654 Soil test again next year if either phosphorus (P) or potassium (K) is high or excessive to monitor levels.
- 700 The phosphorus and/or potassium results(s) were high, however, the recommendation given above is needed for maintenance or to compensate for crop removal.

\*\*\*This lab is a participant in the North American Proficiency Testing Program\*\*\*



The Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, sex, religion, national origin, or disability and is an equal opportunity employer. Clemson University cooperating with U.S. Department of Agriculture

- 1. Protect the soil!
  - Work with contractor to protect, stockpile and replace native topsoil
  - Setup Tree Protection Zones (TPZ)





- 2. Repair damaged soil
  - Decompact rototilling, air spading, radial trenching, etc.
  - Correct soil pH and nutrient deficiencies
  - Amend planting *area* (not planting hole) with organic matter.
  - Mulch appropriately





3. Soil Replacement (extreme amending?)

- Remove existing soil
- Replace with "better" soil or structural soils
- May create soil texture conflicts
- May not support healthy soil biology



- 4. Soil Profile Rebuilding
  - Pre-plant soil treatment
  - Use on degraded urban soils
    - Extreme, deep compaction
    - Low organic matter
  - Applied to the entire planting <u>site</u>

#### Has been shown to:

- Reduce soil bulk density
- Increase establishment rate, canopy growth and trunk diameter
- Increase water infiltration

# SOIL PROFILE REBUILDING

URBANFORESTRY.FREC.VT.EDU/SRES/

# Soil Profile Rebuilding

#### A technique for rehabilitating compacted urban soils in place.

DOWNLOAD THE SPECIFICATION

#### Land development and soils

Urban development often results in stripped and compacted soils that cannot sustainably support trees and landscapes and provide little in terms of environmental benefits. Soil Profile Rebuilding is a cost-effective technique that can help rehabilitate these soils to provide documented increases in tree growth and ecosystem services such as carbon sequestration and stormwater management.



## SOIL PROFILE REBUILDING

## **Basic Process**

- 1. Apply 4 inches of compost
- 2. Incorporate it to 24 inch depth with a backhoe

"Scoop, lift, and drop"

- 3. Apply 4-8 inches of quality top soil and rototill
- 4. Plant
- 5. Mulch

# **THANK YOU!**

#### S. CORY TANNER SHANNT@CLEMSON.EDU

Graphics used with permission from Joe Boggs, Ohio State University Extension.

The mention of specific products does not imply their endorsement by Clemson University, nor does the omission of products imply that they are not satisfactory.



# PESTS, DISEASES & OTHER PROBLEMS OF TREES

S. Cory Tanner Area Horticulture Agent



#### TREE PROBLEMS

#### Generally caused by stress due to:

- Stressful environments (wrong plant, wrong place)
  - Too little or too much sun
  - Too hot or too cold
- Improper planting/mulching
- Poor management practices
  - Improper pruning
  - Improper irrigation
  - Over- or under-fertilization
- Physical damage

#### MANAGING TREE PROBLEMS

#### • Cultural practices

- Selection of pest/disease resistant trees
- Proper planting, irrigation & fertilization
- Mulching
- Mechanical practices
  - Hand-pulling weeds
  - Pest exclusion

• Encourage biological controls – beneficial insects

• Use of pesticides only <u>when needed</u>

• Last Resort!

o Call an ISA Certified Arborist

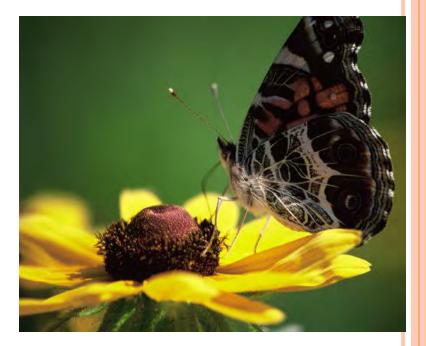
#### Pest Monitoring

- Early detection is essential
- Frequent, systematic monitoring
  - Scouting or Inspecting
- Learn your problem-prone plants/sites
- Look for beneficial as well as pest species
- Keep notes!



# PEST IDENTIFICATION All landscapes are inhabited by a diverse array of organisms

- insects
- spiders
- mites
- nematodes
- other small animals
- weeds
- bacterial, fungal and viral pathogens



## **COMMON INSECT PESTS**

#### INSECTS: GOOD OR BAD??

- ~ 1 Million species of insects known.
- ~ 150 may be pests in the US
- Many are beneficial
  - Parasites
  - Predators
  - Pollinators
- All others cause **no damage**



#### WHAT IS IT???

#### • You must be able to tell the difference between:

- Primary pests
  - Scale
  - Bagworm
- Incidental pests
  - Planthoppers
- Beneficials
  - Lady Beetles
  - Parasitic Wasps



## INSECT SIGNS IN THE LANDSCAPE

- Skeletonized leaves Chewing Insects (Beetles, Caterpillars)
- Frass Insect Fecal Matter
- Sawdust-like debris (Borers)
- Stem tunneling (Borers)
- Webbing Caterpillars, Spiders, or Mites



#### CATERPILLARS



#### Eastern Tent Caterpillars

Most common in the spring thru summer.

Web or bag in tree crotches.

Frequent trees in the Prunus genus.



#### Fall Webworm

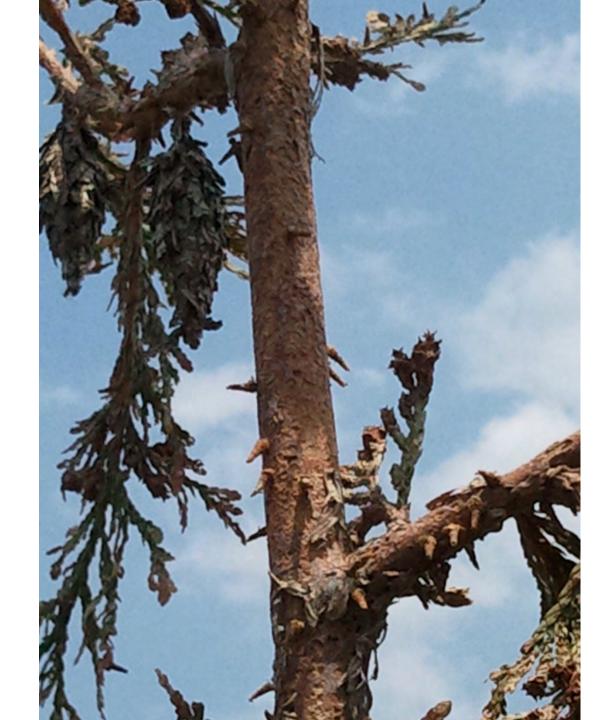
Most common from summer to fall. Big web/bag at the end of a branch. Many trees, often pecans.

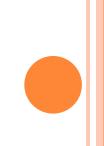
#### BAGWORMS



Common ir - junipers a Use silk and Adults eme Not effectiv bags.







#### MANAGEMENT OF CATERPILLARS

• Caterpillars are easy to kill if treated when young.

- How to determine when the caterpillars hatch?
  - Take the bags or egg sacs
  - Put in a plastic bag or mason jar close loosely
  - Keep in outdoor in the shad
  - Check regularly
  - Treat when tiny caterpillars
- Or... when Southern Magn



Joey Williamson, ©2014 HGIC, Clemson Extension

MANAGEMENT OF CATERPILLARS

• Cultural/Mechanical:

Remove the bags; remove the debris.

• Biological:

Conserve natural enemies by avoiding broadspectrum insecticides.

• Chemical Insecticides

• Difficult on large trees

## Scale Insects

- Can reduce the vigor of trees and shrubs.
- Heavy infestations can also kill trees.



Willow oaks in landscape at a local attraction.

Wax myrtles in a golf-residential community.

# THE SUPERFAMILY COCCOIDEA: THE SCALE INSECTS







Armored scales 324 species in USA

> 3,000 species in the world

Soft scales

106 species in USA

> 1,400 species in the world

Mealybugs 358 species in USA > 2,000 species in the world

## How do we distinguish soft scales from armored scales?

Based on the following characteristics:

- 1. Appearance of protective covers or shells;
- 2. Separation of body and protective cover; and
- 3. Production of honeydew.

# HANDLENS – THE MOST ESSENTIAL PEST MANAGEMENT TOOL



## Soft vs Armored: Appearance of protective covers



#### **Armored scales**

Hard covers present, often in concentric rings or overlapping layers.

#### **Soft scales**

Hard covers present, smooth or with ridges, but no overlapping layers.

# Soft vs Armored: Separation of body and cover



#### **Armored scales**

Body and cover can be separated by flipping open with a pin.

#### **Soft scales**

Body and cover cannot be separated.



# Soft vs Armored: Production of honeydew



#### **Armored scales**

Do not produce honeydew

#### **Soft scales**

Produce plenty of honeydew

# CULTURAL CONTROL

- Inspect all plant materials received from suppliers and reject infested materials.
- If infestation is not extensive, prune out the infested branches and isolate and keep monitoring these plants for reinfestation.
- In infestation is extensive, thrown away the infested plants.
- Discarded materials should be removed and destroyed immediately. Infested materials left in the ground can let the insect move back onto the plants.
- Remove weeds that may serve as alternative hosts of insects.
- KEEP PLANTS HEALTHY.

# BIOLOGICAL CONTROL: SCALE AND NATURAL ENEMIES

- An array of predators (lady beetles, etc.) and parasitoids (tiny wasps, etc.) feed on scale insects.
- Ideally natural enemies keep scale populations in check.
- Widespread use of broad-spectrum insecticide kills natural enemies.
- Urban environment (heat, landscape fragmentation) may also disrupt natural enemy impact.
- These issues lead to a surge of scale infestations in urban landscapes.

### BORERS

• Usually talk about 4 groups of insects:



Emerald ash borer

#### Flat-head borers

- Beautiful metallic beetle of various sizes, but the shape is often spindleshaped, tapper to the end.
- Larvae feed under the bark of trees; often girdle the trees until death.









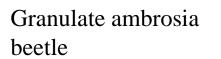
#### Clear-wing moths

- Wounds on the base of trunk often provide entrance for the adult to lay eggs.
- Larvae feed under bark, often leave 'saw-dust' at the base of trunk.



# Borers Bark beetles or Scolytids

- The most well-known borers.
- Adults do not feed on the trees; larvae feed on the ambrosia fungus, which is what really kill the trees.
- Many species and many seasons.











#### Saw dust – Bark beetles





#### Oozy wound at the base of trunk – clear-winged borers

#### Dead leaves do not fall off

### BORERS?

# Nope!

# Yellow-bellied sapsucker damage



#### MANAGEMENT OF BORERS

- No control once the adults enter the bark or trees.
- Monitoring the flight activity of adults is therefore the most important factor in deciding the success of the management program. Pheromone traps are available for many species of all 4 groups of borers. Ambrosia beetle can be easily monitored using a soda bottle baited with ethanol.
- All products are only preventive or deterrent to attack by adults:

Pyrethroids (bifenthrin, permethrin, lambda-cyhalothrin, deltamethrin, cyfluthrin)

# COMMON DISEASES

### LEAF SPOTS

Caused by fungi primarily
Survive in plant debris
Warm, humid, wet conditions
Spread by wind and water

### LEAF SPOTS

- Yellow spots
- o Turn dark brown
- Red to purple margins
- Centers may fall out
- Leaf drop if severe

# SPOT ANTHRACNOSE OF DOGWOOD





#### FUNGAL SHOTHOLE DISEASE ON CHERRY



### BACTERIAL SHOT HOLE OF CHERRY LAUREL



### LEAF SPOT MANAGEMENT

• Avoid overhead irrigation • Good air circulation • Minimize Pruning (shearing) • Rake up fallen leaves • Resistant varieties • Fungicides/bactericides

POWDERY MILDEW

• Caused by fungi • White powdery growth on upper leaf surfaces • Warm dry days, cool damp nights • Spread by wind

### POWDERY MILDEW

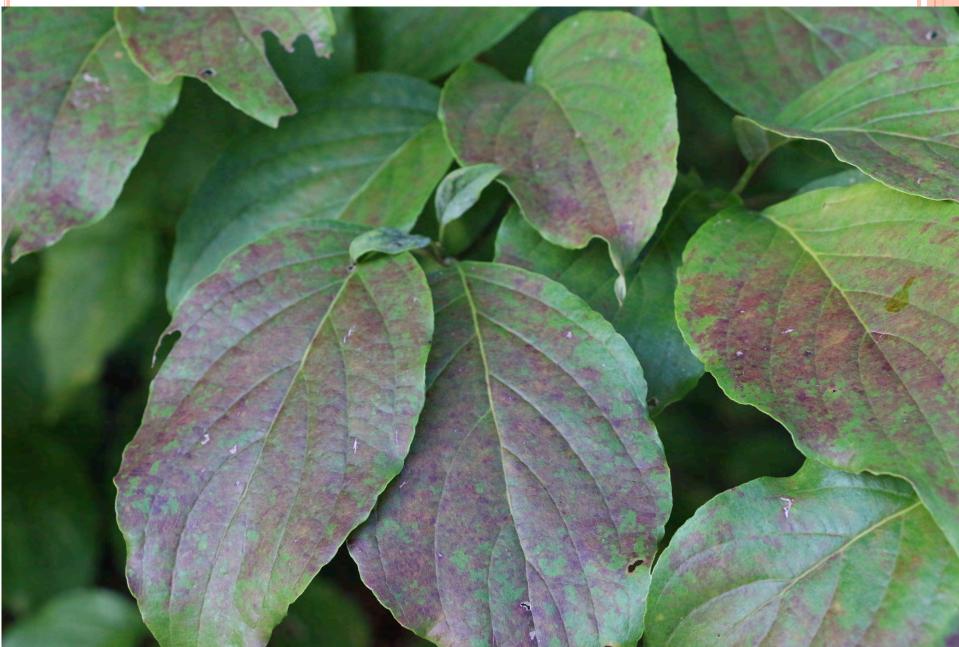
Other possible symptoms:

- Marginal leaf scorch
- Dead patches
- Reddish/purplish discoloration
- Yellowing
- Premature defoliation

#### POWDERY MILDEW OF DOGWOOD



### POWDERY MILDEW OF DOGWOOD



### POWDERY MILDEW OF CRAPE MYRTLE



### POWDERY MILDEW MANAGEMENT

- Rake up leaves
- Prune out infected twigs
- Increase air and light penetration
- Resistant varieties
- Fungicides



Vol 3, Issue 1

#### UT Extension

April 10, 2009

### ROOT ROTS

- Often misdiagnosed
  - 1. "needs fertilizer"
  - 2. "leaf disease"
  - 3. "has a bug"

#### • Proliferate in wet soils

- 1. Poor drainage
- 2. Excessive irrigation

#### Fungal Root Rots – Overlooked, Misidentified

Ornamental Pest and Disease Update

Why are root rot diseases so prevalent in the green industry? That's a question I often ask myself when visiting garden centers. I think this question has multiple answers. First, mild to moderate symptoms are often overlooked. Second, symptoms of root rot mimic those caused by other, more benign problems such as pH or nutritional deficiencies. Third, people get fixated on foliar symptoms and never think to look at the roots. In a recent Hort,Lawn, Turf Licensing class for persons preparing to take the Category 3 pesticide license exam, I asked the class to tell me why a juniper had a chlorotic, discolored branch (Figure 1). Reasons given were: spider



Figure 1. 'Blue Pacific' juniper with branch dieback due to phytophthora root rot.

mites and phomopsis blight. Only one person suggested root rot as a cause for the branch dieback. Those responses are typical. No one asked to see the roots, to evaluate their health even though 90% of the root system was dead (Figure 2).



Figure 2. Phytophthora has destroyed 90% of this root system. Live roots make up a small percentage of the root system (arrows).

Fourth, root rot diseases such as black root rot don't kill the plant while in production or on the sales yard. Root tips are blackened; foliage is chlorotic (Figure 3), but the plant doesn't die. After planting in the landscape Japanese holly and/or inkberry infected with Thielaviopsis, the causal fungus of black root rot, will become more chlorotic, lose branches and decline.

In the end, we depend on wholesale nurseries to produce healthy plants, discard those that aren't, so that consumers have a reasonable assurance that plants they are purchasing will be healthy and productive for years to come.

### Phytophthora Root & Crown Rot

#### • Caused by *Phytophthora* spp.

- "water mold fungi"
- not really fungi = oomycetes
- One of the most common and serious diseases of woody landscape plants
- Affects **many** different plants
  - *for example:* aucuba, azalea, boxwood, camellia, holly, junipers, Leyland cypress, etc.
- Also a common problem in nurseries

## Phytophthora Root & Crown Rot SYMPTOMS

- Symptoms on most plants are similar
- Below ground:
  - occur first but usually go un-noticed
  - few & rotted roots; red-brown in color
  - cankers move up lower trunk
- Above ground:
  - chlorosis, wilting, decline, death
  - plant dead/dying when finally noticed

## Phytophthora root rot: Deodar Cedar



# Phytophthora Root Rot MANAGEMENT

- Usually too late to save plant by the time symptoms are noticed !!
- Inspect plants thoroughly before buying
  - check both foliage **and** roots
- Plant at the proper depth
- Soil moisture conditions are critical
  - plant only in well-drained locations
  - plant on raised beds or berms
  - install drainage tile
  - avoid over-watering
- Fungicides offer some protection
  - only suppress disease development
  - do not cure plants or kill pathogen in soil

Leyland Cypress: Seiridium & Botryosphaeria Cankers









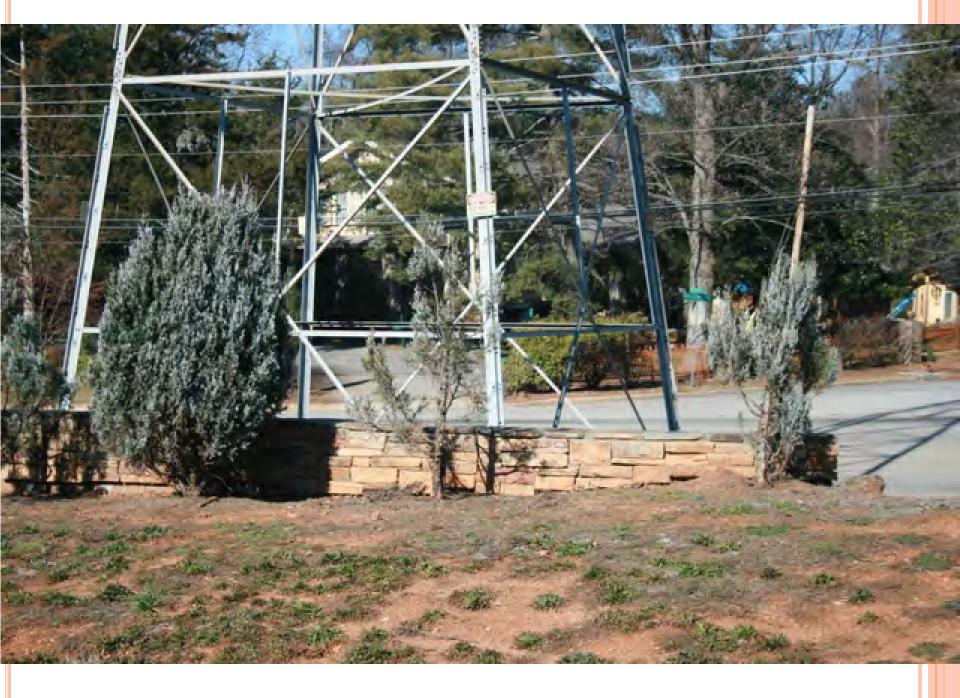






Credit: Jimmy Walters

# **NON-DISEASES**



# Planting Problem!

#### Phytotoxicity – Chemical Burn



### 2,4-D INJURY ON ASH



## Metsulfuron injury on Oak





## GLYPHOSATE INJURY





# **THANK YOU!**

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The mention of specific products does not imply their endorsement by Clemson University, nor does the omission of products imply that they are not satisfactory.



## Board of Zoning Appeals: Law and Practice

Presented by Jenny J. Werking, AICP

## Authorities

- S.C. Local Government Comprehensive Planning Enabling Act of 1994 ("Planning Act")
- Charleston County Zoning & Land Development Regulations Ordinance ("ZLDR")
- Case Law
- Federal & State Constitutions

## **BZA Powers**

- Zoning Variances;
- Special Exceptions;
- Appeals of Zoning-Related Administrative Decisions (permits, enforcement, interpretations, etc.); and

## Variance (Background)

## • Why the Need?

- Base District or Overlay District Dimensional Requirements (density, setbacks, buffers, lot coverage, height, *etc*.)
- Conditions (parking spots, lighting, hours of operation, *etc*.)
- Procedure → Application, Public Notice, Staff Review & Report, Public Hearing, Final Decision, Notice, Appeal

## Variance (Criteria)

#### • Statutory

 A variance may be granted in an individual case of <u>unnecessary</u> <u>hardship</u> if the board makes and explains in writing the following findings:

(a) there are extraordinary and exceptional conditions pertaining to the particular piece of property;

(b) these conditions do not generally apply to other property in the vicinity;

(c) because of these conditions, the application of the ordinance to the particular piece of property would effectively prohibit or unreasonably restrict the utilization of the property; and

(d) the authorization of a variance will not be of substantial detriment to adjacent property or to the public good, and the character of the district will not be harmed by the granting of the variance.

• Additional factors in the ZLDR (Section 3.10.6)

## Zoning Variances (Limitations)

#### • Use Variances

- Planning Act allows local government to extend this authority to BZA. Charleston County has not done so.
- Physical Extension of Non-Conforming Uses
   But, Change in Use → OK
- BZA can place conditions on variance "to protect established property values in the surrounding area or to promote the public health, safety, or general welfare."

## Special Exceptions (Background)

#### • Why the Need?

 Permitted by Right vs. Permitted Under the Circumstances

#### • Triggers $\rightarrow$ Look to the ZLDR

- Section 6 Table of Uses
- Examples: CAFOs in Resource Management ("RM" District
- Procedure → Application, Public Notice, Staff Review & Report, Public Hearing, Final Decision, Notice, Appeal

# Special Exception (Criteria)

#### • Statutory

• BZA has the power "to permit uses by special exception subject to the terms and conditions for the uses set forth for such uses in the zoning ordinance."

#### • General Factors in the ZLDR (Section 3.6.5)

- Consistent with the recommendations contained in the **Charleston County Comprehensive Plan** and the character of the underlying zoning district "Purpose and Intent;"
- Compatible with existing uses in the vicinity and will not adversely affect the general welfare or character of the immediate community;
- Adequate provision is made for such items as: setbacks, buffering (including fences and/or landscaping) to protect adjacent properties from the possible adverse influence of the proposed use, such as noise, vibration, dust, glare, odor, traffic congestion and similar factors;
- Where applicable, will be developed in a way that will preserve and incorporate any important natural features;
- Complies with all applicable rules, regulations, laws and standards of this Ordinance, including but not limited to any use conditions, zoning district standards, or Site Plan Review requirements of this Ordinance; and
- Vehicular traffic and pedestrian movement on adjacent roads shall not be hindered or endangered

## Appeals to BZA (Zoning-Related Administrative Decisions)

- Why the Need?
  - Planning Staff as referee & judge.
- Examples of Staff Decisions
  - Permits;
  - Enforcement Actions; and
  - Official Interpretations.
- Procedure → Application, Public Notice, Staff Review & Report, Public Hearing, Final Decision, Notice, Appeal

## Appeals to BZA (Procedure)

- Who Can Appeal? → Person with "substantial interest" in decision or Govt. department/officer.
- **Timeline for Appeal** → Within <u>**30 days**</u> of decision.
- Where is Appeal Filed? → Planning Director
- What Happens After Appeal Filed? → Stay (unless emergency), Public Notice, Public Hearing, Vote by BZA or Remand
- Standard of Review → De Novo

## **BZA Final Decisions**

- State law requires "[a]ll final decisions and orders of the board must be in writing and be permanently filed in the office of the board as a public record. All findings of fact and conclusions of law must be separately stated in final decisions or orders of the board which must be delivered to parties of interest by certified mail."
- ZLDR has additional, requirements (re: notice, mailing, etc.)

## Appeals of BZA Decisions

- Who Can Appeal? → "A person who may have a substantial interest in any decision of the board of appeals or an officer or agent of the appropriate governing authority …"
- **Timeline for Appeal** → "The appeal must be filed within <u>thirty</u> <u>days</u> after the decision of the board is mailed."
- Where is Appeal Filed? → Charleston County Court of Common Pleas
- What Happens After Appeal Filed? → "[T]he clerk of the circuit court must give immediate notice of the appeal to the secretary of the board and within thirty days from the time of the notice, the board must file with the clerk a duly certified copy of the proceedings held before the board of appeals, including a transcript of the evidence heard before the board, if any, and the decision of the board including its findings of fact and conclusions."

## Appeals of BZA Decisions

- **Standard of Review** → "The findings of fact by the board of appeals must be treated in the same manner as a finding of fact by a jury, and the court may not take additional evidence. In the event the judge determines that the certified record is insufficient for review, the matter may be remanded to the zoning board of appeals for rehearing. In determining the questions presented by the appeal, the court must determine only whether the decision of the board is correct as a matter of law." (S.C. Code Ann. § 6-29-820)
- "A court will refrain from substituting its judgment for that of the reviewing body, even if it disagrees with the decision." *Restaurant Row Assocs. v. Horry Cnty.*, 335 S.C. 209, 216, 516 S.E.2d 442, 446 (1999).
- "[A] decision of a city zoning board will be overturned if it is arbitrary, capricious, has no reasonable relation to a lawful purpose, or if the board has abused its discretion." *Clear Channel Outdoor v. City of Myrtle Beach*, 372 S.C. 230, 234, 642 S.E.2d 565, 567 (2007).

## Case Study

# Galvani v. City of Charleston (C/A No. 2013-CP-10-1322)

Background

#### • Extension of Non-Conforming Use

- BZA Role in Process
- Differences between City of Charleston and Charleston County
  - (Physical Extension vs. Change in Use)
- Relevance of Restrictive Covenants (S.C. Code Ann. § 6-29- 1145)
  - Inquiry Requirement
  - Definition of "Permit"
  - Uses vs. Permits to Build

## Board of Zoning Appeals: Law and Practice

**QUESTIONS?**