# Landscape Diagnostics

Not Everything is a bug…

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We are going to look at the diagnostic arena more than individual diagnostic problems.

1. Knowing what a healthy plant looks like requires Education

2. Knowing how to spot cultural problems requires Experience

3. Knowing when to ask others for help requires Wisdom

Nearly every cultivated landscape has some problems related to soil, mismatch of plant and site, Irrigation installation, use and management, and ongoing landscape maintenance.

# Are you a landscape manager?

(Or is the landscape managing you?)

1. What is your greatest landscape challenge?
2. Have you puzzled out the cause?
3. Do you have a proposed course of action?
4. What will you do it that does not work?
5. What if your greatest challenge IS a bug?

# If you manage trees in the NY area…

Here are two bugs you should be familiar with – If you don't have them yet, you will


## Emerald Ash Borer

(Identified in NYC Parks in 2017)

# Blonding – Not from your hair stylist

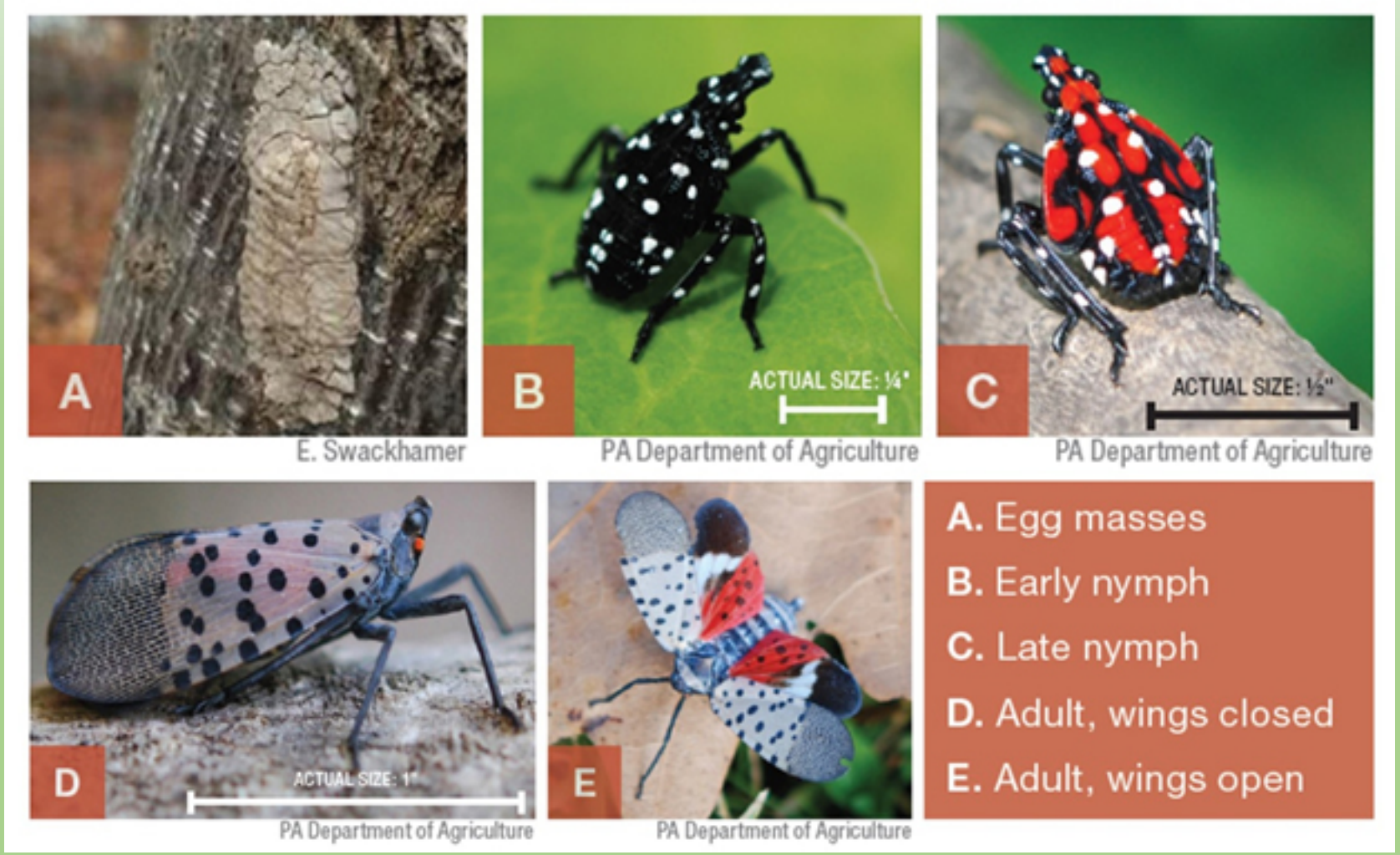
Results from Wood-peckers stripping bark to reach the EAB larvae under the bark.

1. Positive indicator of infestation.

2. Too late to salvage the tree.

# Spotted Lanternfly

Currently in Eight NJ Counties, Staten Island NY, New Canaan, Southbury, Greenwich, and West Haven, CT.



# SLF does not come one at a time – they bring friends!

# Enough of dastardly bugs!

Why do woody plants not succeed in our landscape?

1. Incompatible soil conditions
2. Right Place – Wrong Plant
3. Poor Planting Practices
4. Poor Maintenance Practices

# Evaluating the plants physiological condition

How old is the plant? How old is the plant acting?

Physiological age is not the same as age in years

Leaf size

Leaf color

Annual twig elongation

Presence of dead, dying, or stressed twigs and foliage

# Evaluating the plants physiological condition

Be systematic about your investigation

- Begin with evaluating the site, exposure, and soil conditions
- Examine the rooting environment
- Examine major stems for defects
- How has the plant responded since planting?
- How has the plant responded to previous pruning?

# Site Conditions
(It's all about roots and soil)

1. The roots are the engine that drive the plant.

2. If the roots aren't happy, the plant's not happy.

3. If the plant's not happy, the Client isn't happy.

The most important course you took in horticulture school was (drum roll please…)

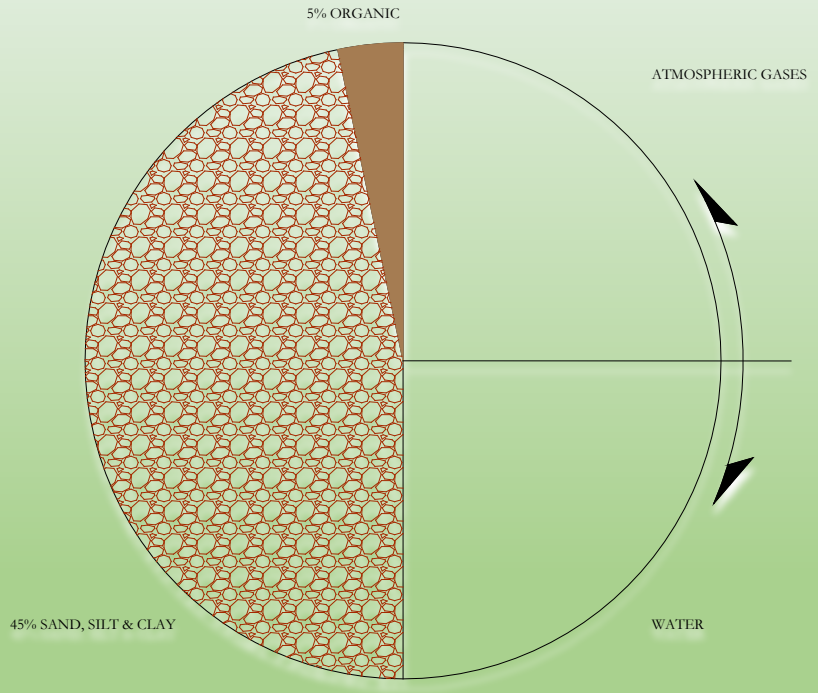
Soil Science!

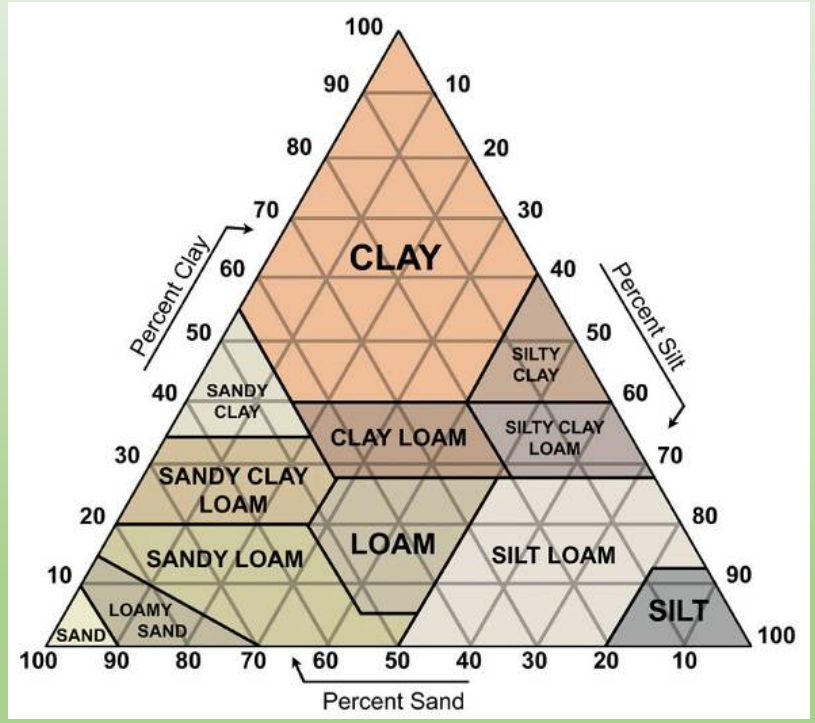
# Roots are dependent on the soil structure and soil chemistry for life

1. Soil Structure determines porosity and permeability
    1. Porosity is the quantity of open space in the soil expressed as a percentage.
    2. Permeability is the capacity for the soil to permit the passage of water and gas.

Field analysis of soil is key to understanding the environment in which plant roots exist.

# Yep, I know you can't read the small writing…




## Ideal Soil

45% Mineral

5% Organic

50% Pore Space

## Soil Texture

Sand

Silt

Clay

# Field Assessment - Structure

- Laboratory Bulk Density testing – g/cm²
- Field density testing – Lbs. per square inch
- Soil Moisture (and pH)

<200 Lbs. is good
200-300 Limiting
300+ Roots can not penetrate


# Field Assessment – Chemistry & Content

Soil Testing:

- Chemical Testing Morgan or Modified Morgan – Not Melich 3
  - Take samples annually based on growing degree days

  Request

  - pH Organic Material CEC Nutrients Metals
  - Mark where samples were taken on a site-map. This provides a reference for future sampling and helps with decision making.

Mason Jar test is an effective means of determining soil texture, and it costs nothing…

Consider Foliar Testing to compare to soil nutrient content – what is actually being taken up by the plant?

# Right Plant – Wrong Place


How tall does a Norway Spruce get?

Give plants adequate space!


*Sequoiadendron* on a 10’ wide median strip in the middle of the main artery from Sea-Tac Airport into downtown Seattle

It was probably cute when it was planted – it was 12-stories tall when this picture was taken.

# Considerations when planting or when diagnosing cultural problems

1. What are the plants water requirements?
    1. Too much, Downspouts, lateral flow on site, Ephemeral ponding
    2. Too little, Excessive drainage, steep slopes
    3. Clay Once wet always wet/once dry always dry…
    4. Too shallow (Turf Irrigation)

2. What are the plants sunlight requirements?
    1. < 6 hours per day
    2. > 6 hours per day
    3. Needs afternoon protection (*Stewartia*)

# Poor Planting Practices


Planting hole should be twice the diameter of the root ball.

No amount of follow-up care will compensate for bad planting.

If you need to determine ball size that was used, hole size, and native soil, dig (or air-spade) a radial trench from within the ball outward to native soil.

# Poor Planting Practices

Too-deep planting is a stressor that eventually kills many plants.


Soil that will not drain leads to rotted roots.

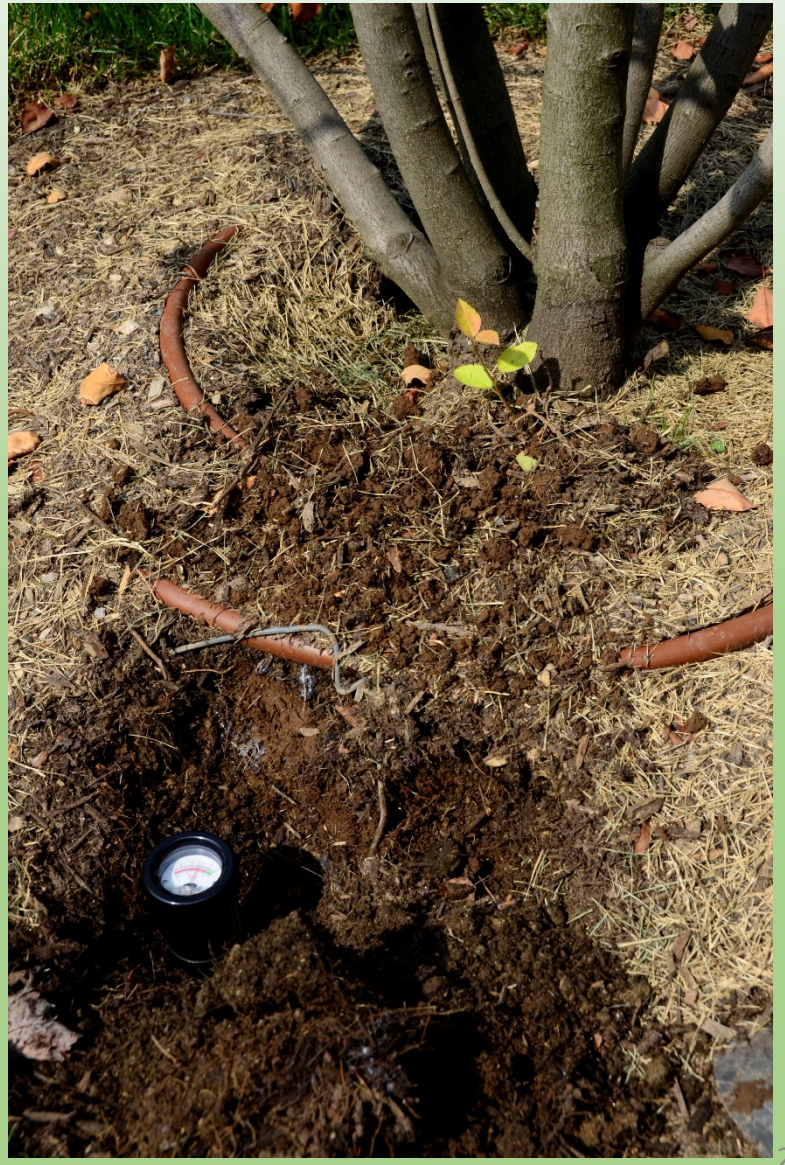
# Poor Planting Practices


Planting evergreens too late in the fall may lead to desiccation

# Poor Planting Practices


Do not rely on lawn irrigation to provide adequate water to newly planted woody plants.

# Poor Planting Practices



# Poor Planting Practices

# Poor Maintenance Practices

Whatever you do to your turf, you do to your trees.

# Poor Maintenance Practices


Roots damaged by mowing and edging

# Poor Maintenance Practices

# Poor Maintenance Practices

Poor Maintenance Practices

# Mowing when the soil is wet results in COMPACTION

Dr. Kim Coder, UGA, says

“Consider compaction to be permanent; you will not live long enough to fix it”

~Perhaps I should aerate!~

# Poor Maintenance Practices

Root damage from core aeration

# Poor Maintenance Practices

# Poor Maintenance Practices


Cercospora Leaf Spot is a classic example of a disease distributed by splashing irrigation water and excess, frequent wetting of the plant foliage.

The cure is to adjust the irrigation system!!

# Poor Maintenance Practices


Deer Damage…

John Deere Damage

There is no one more important person to train in landscape maintenance than the kid with the weed whip

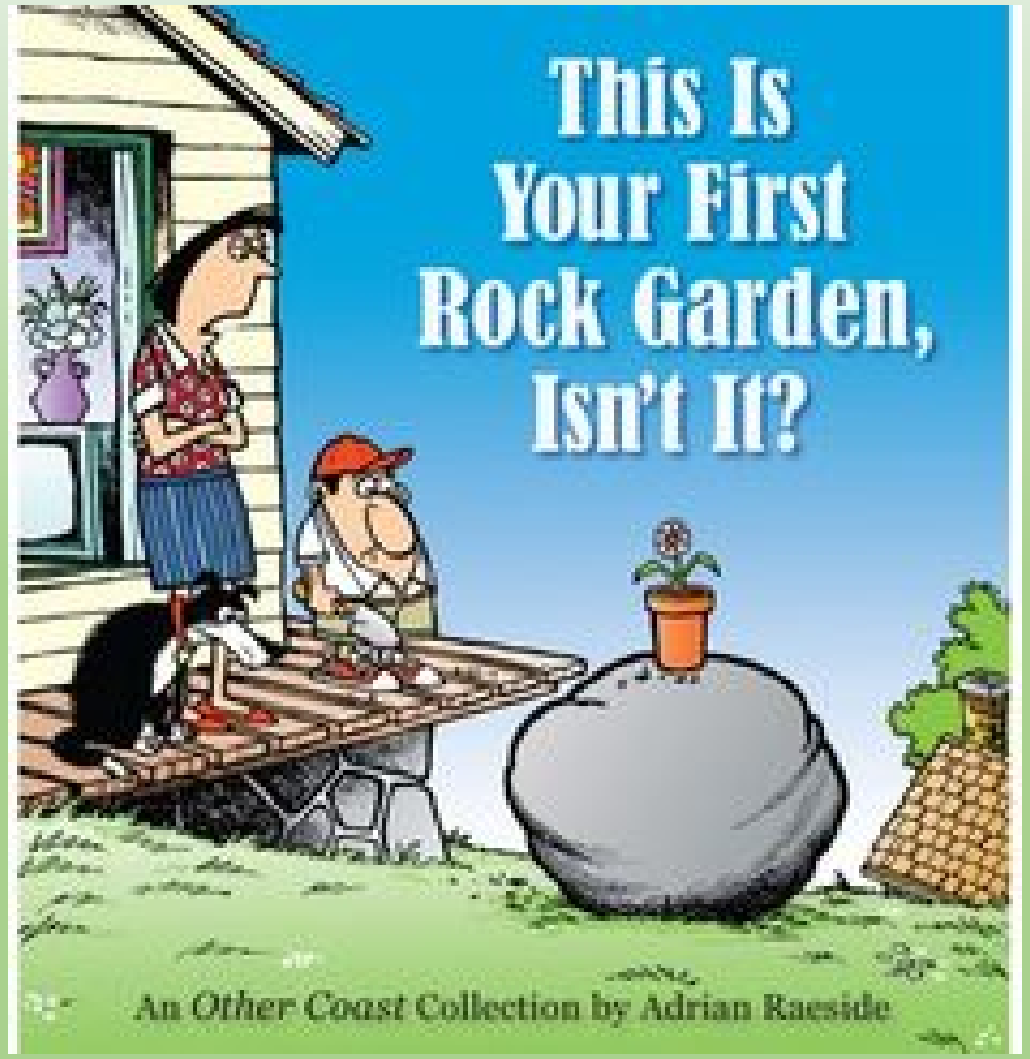
# The Goals

1. Identify problems before they get out of hand.
2. Investigate and identify the causes of plant problems
3. Determine if the sources are biotic, abiotic, or cultural
4. Select a course of action and pursue it immediately
5. Keep Notes

In the immortal words of Thomas H. Everett;

"Do you keep a diary? You should. You only get 35 chances to get it right…"

# And Lastly




It's more important to know who to ask, than it is to know everything.

Gardeners are generous with what they know. Make friends with your local nurseryman, arborist, irrigation professional, soil scientist, and pathologist.

"There is nothing wrong with making a mistake but try to make a new mistake every time."

Michael A. Ruggiero

# Questions?


Do you have further questions?
You can email me at chstrees@yahoo.com
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