Trees in the Campus Landscape

APPA

Tom Flood, ASLA
Elon University

AIA

AIA Information

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Credit(s) earned on completion of this course will be reported to American Institute of Architects (AIA) Continuing Education Session (CES) for AIA members.

Certificates of Completion for both AIA members and non-AIA members are available upon request.

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

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Course Description

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Many campuses are defined by their landscape, and specifically their trees. This presentation will provide a technical discussion of grounds related issues with an emphasis on trees and other plantings. Topics will include plant selection, native vs non-native species, maintenance techniques, Integrated Pest Management programs, pesticides and herbicides, and sources of technical support.

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Learning Outcomes

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Learning Objective 1:
Discuss how campuses are defined by their landscapes and specifically their trees.

Learning Objective 2:
Technical discussion of grounds related issues with an emphasis on trees and other plantings.

Learning Objective 3:
Learn how to select plants, native versus non-native species.

Learning Objective 4:
Discuss maintenance techniques, integrated pest management programs, pesticides and herbicides, and sources of technical support

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Trees in the Campus Landscape

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Agenda
- Design & Selection
- Purchasing & Planting
- Tree Protection
- Tree Management
- Plans, Programs & Inventories

Campus Trees

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- Create habitat
- Protect & improve soils
- Reduce erosion & storm water run off
- Sequester carbon

Campus Trees

Provides cooling and reduces heat islands.

Shade and evapo-transpiration cool buildings and save energy.

Campus Trees

Did you know - plants improve air quality?
According to one study, in 1991 trees in the Chicago area removed as much as 234 tons of particulate matter, 210 tons of ozone, 93 tons of sulfur dioxide, and 17 tons of carbon monoxide from the air.

Campus Trees

•Create a sense of place

Design & Selection

•Right plant, Right place

Design & Selection

•Site evaluation
  •Soil type
  •Soil moisture
  •Sun exposure
  •Available space
  •Maintenance practices
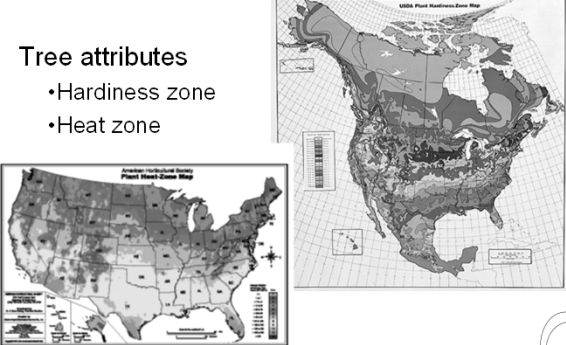
Design & Selection

Tree attributes
  •Hardiness zone
  •Heat zone

1/20/2020

Design & Selection

Tree attributes
- Mature size
- Cultural requirements
  (moisture, light, soil)

Design & Selection

Tree attributes
- Maintenance requirements
- Ornamental qualities

Design & Selection

Design Requirements
- Type
- Form & Texture
- Size & Scale
- Ornamental
  Qualities
- Site Aesthetics
  - views
  - architecture, etc

Design & Selection

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Native vs, Non-Native

Eliminate the use of invasive plants.
An invasive species is defined as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health."

This is not the same as non-native!

Purchasing & Planting

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- ANLA – Standard for Nursery Stock
- Condition – container, B&B or bare root?

Purchasing & Planting

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- Field Tag Trees
- Look for:
  - Branch structure
  - Trunk damage

Purchasing & Planting

•Field Tag Trees
•Look for:

•Proper rooting

Purchasing & Planting

•Field Tag Trees
•Look for:

•Holding & transport
•Nursery management
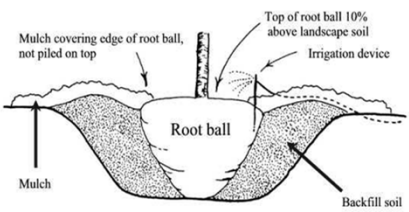
Purchasing & Planting

•Site Prep – Deep Rip
•Planting Hole
  •$10 hole for a $5 tree
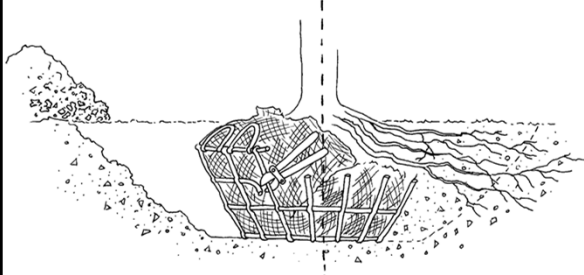
Purchasing & Planting

•Planting depth

Purchasing & Planting

•Establishment period
•Staking
•Pruning
•Watering

Tree Protection

Grass in weeks
     Shrubs in years
          Trees in a lifetime

Tree Protection

Compaction reduces spaces for oxygen and water in the soil, reduces root growth and access to water and nutrients.
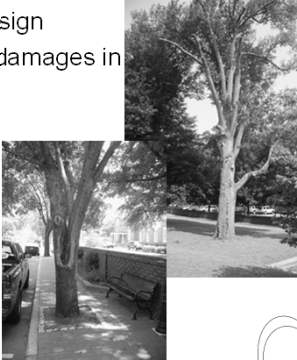
Hurry up and die would ya!

Tree Protection

•Starts at preliminary design
•Include protection and damages in general conditions
•Locations on plans

•Be realistic about what should be saved

Tree Protection

•Fencing
  •Minimum location
    1. At drip line
    2. 1.5 x drip line
    3. 1 foot radius / 1inch diameter

Tree Protection

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•Fencing
  •Installation & maintenance by _____?

Tree Protection

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•Root protection
  •Trenching vs. boring

Tree Protection

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•Reduce compaction
  •Mulch mats
  •Versa-mats

Tree Protection

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- Relocations – *to move or not to move*
  - Species
  - Size 4"-6"
  - Schedule
  - Cost

Tree Protection

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- Relocations
  - Hand dig

Tree Protection

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- Relocations
  - Tree spade
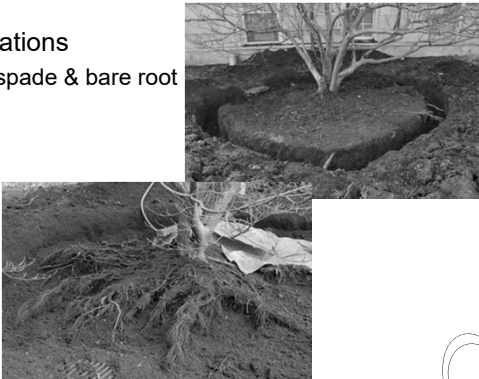
Tree Protection

- Relocations
  - Air spade & bare root

Tree Protection

- Relocations

Tree Protection

- Relocations

Tree Management

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•Tree Biology – Quiz
1. Trees grow from the bottom up. T/F
2. Trees shed only leaves and bark. T/F
3. When pruning make a smooth flush cut. T/F
4. Roots grow farther than the drip line. T/F
5. Most trees have tap roots. T/F
6. Its better to bore deep than dig shallow. T/F
7. Counting the tree's growth rings tell the trees age. T/F
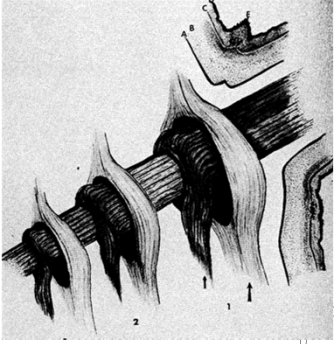
Tree Management

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•Tree Biology
  plant growth

Tree Management

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•Tree Biology
  •Compartmentalization

Tree Management

•Why Prune?
•Eliminate dead, diseased or damaged wood.

Tree Management

•Why Prune?
•Correct structural problems

Tree Management

•Why Prune?
•Clearance for vehicles, people, views, shade.

Tree Management

- How to Prune?
  - Flush cut vs.
    natural target pruning

Tree Management

- How & What to Prune?
  - Young trees 2 years
  - Mid-sized 3-5 years
  - Mature trees 5+ years

  - When's the best time to prune?

Tree Management

- Pruning for wind & storm management

Tree Management
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•Don't Pollard Trees
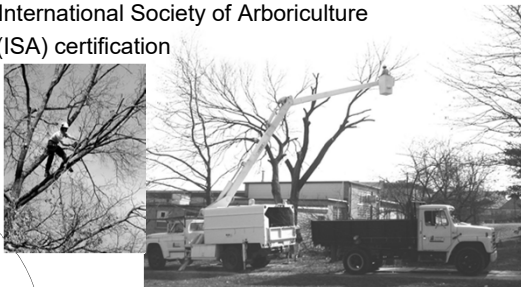
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•Arborist Staffing
  •Contract vs. in-house
  •International Society of Arboriculture
   (ISA) certification

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•Mulching
  •Why?
    •Weed suppression
    •Moisture infiltration & retention
    •Soil improvement
    •Nutrients
    •Trunk & root protection

Tree Management

•Mulching
•Mulch materials

Tree Management

•Mulching
•How & how much?

Tree Management

Integrated Pest Management

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to **manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.**

Tree Management

Integrated Pest Management

Safe storage

Accurate application

Minimize products

Plans, Programs & Inventories

- Tree Management Plans
  - *WFU Campus Tree Care Plan*

Plans, Programs & Inventories

- Tree Management Plans
  - *WFU Campus Tree Care Plan*
    - Arboriculture Practices
      - *Planting*
      - *Maintenance*
      - *Cultural Practices*
      - *Protection & Preservation*
      - *Construction*
      - *Hazards & Removals*
      - *Special Trees & programs*
        - *Jim Coffey coffeyjb@wfu.edu*

Plans, Programs & Inventories APPA

•Tree Campus USA – Arbor Day Foundation
  Requirements
  1.Campus Tree Advisory Committee
  2.Campus Tree Care Plan
  3.Campus Tree Program with Dedication
  Annual Expenditures
  4.Arbor Day Observance
  5.Service Learning Project

Plans, Programs & Inventories APPA

•Tree Inventories
  •GIS based
  •Contract or In-house

Plans, Programs & Inventories APPA

- Develop Management Plans

  Based on Stated Goals

  Should be a Plan of Action

  Clearly Define Work Priorities

Colby Sawyer College
Tree Inventory and Management Plan
2010

Inventoried & Prepared by:

Patrick Anderson, ISA Board Certified Master Arborist & Municipal Specialist, RCA #475

Michael Sherwood, ISA Board Certified Master Arborist & Municipal Specialist

Bartlett GreenScape Technologies
by

BARTLETT TREE EXPERTS

Plans, Programs & Inventories APPA

- Automated

- Counsel of Landscape & Tree Appraisers

- Established value baseline

Diameter	Genus	Species	Condition	Location Value	Estimated ...
32	Quercus	phellos	Good	Good	$25,007
30	Betula	nigra	Good	Good	$18,694
26	Quercus	alba	Good	Good	$17,786
36	Acer	saccharinum	Fair	Good	$13,495
22	Quercus	phellos	Good	Good	$12,064
19	Quercus	phellos	Good	Good	$8,998
19	Quercus	phellos	Good	Good	$8,998
14	Quercus	alba	Good	Good	$5,157
14	Magnolia	grandiflora	Good	Good	$3,800
12	Acer	rubrum	Good	Good	$2,991
12	Magnolia	grandiflora	Good	Good	$2,792
10	Acer	rubrum	Good	Good	$2,077
10	Acer	rubrum	Good	Good	$2,077
8	Acer	saccharum	Good	Good	$1,507
16	Pyrus	calleryana	Poor	Good	$1,367
16	Pyrus	calleryana	Poor	Good	$1,367
8	Magnolia	grandiflora	Good	Good	$1,241
8	Magnolia	grandiflora	Good	Good	$1,241
7	Magnolia	grandiflora	Good	Good	$950
10	Pyrus	calleryana	Fair	Good	$890
8	Magnolia	grandiflora	Fair	Good	$886
6	Acer	saccharum	Good	Good	$847
5	Acer	saccharum	Good	Good	$589
4	Acer	saccharum	Good	Good	$377
4	Acer	saccharum	Good	Good	$377
3	Nyssa	sylvatica	Good	Good	$237
3	Quercus	nuttalli	Good	Good	$212
Avg: 10.7					Total: $137,095

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Tree Inventories
Carbon Sequestration

Durham

Stored CO2 Benefits of All Trees by Species

3/2/2010

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Willow oak	1,984,470	14,884	(N/A)	27.6	50.1	112.75
White oak	1,250,320	9,377	(N/A)	18.0	31.6	109.04
Shumard oak	14,367	108	(N/A)	16.1	0.4	1.40
Red maple	28,996	217	(N/A)	11.7	0.7	3.88
Southern red oak	265,508	1,991	(N/A)	8.1	6.7	51.06
Green ash	106,287	797	(N/A)	3.1	2.7	53.14
Water oak	158,111	1,186	(N/A)	2.9	4.0	84.70
Pignut hickory	36,454	273	(N/A)	2.7	0.9	21.03
Sweetgum	23,410	176	(N/A)	2.3	0.6	15.96
Winged elm	20,332	152	(N/A)	1.7	0.5	19.06
Tulip tree	39,069	293	(N/A)	1.0	1.0	58.60
OTHER STREET 1	16,087	266	(N/A)	4.8	0.9	11.57
Citywide total	3,962,790	29,721	(N/A)	100.0	100.0	62.05

i-Tree

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•Arboretums &
  Botanical Gardens

The Trees of Elon

Hosta
Hosta 'Regal Splendor'

THE ELON UNIVERSITY
BOTANICAL GARDEN

Plans, Programs & Inventories APPA

•Arboretums & Botanical Gardens

Plans, Programs & Inventories APPA

Tree Replacement Program

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- Memorial Trees
- Protected Forests
- Conservation Trusts

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This concludes The American Institute of Architects Continuing Education Systems Course.

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Questions?
Tom Flood, ASLA
tflood2@elon.edu
336-6845-5540
Elon University