Urban Tree Selection for Sustainability

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- One of the founders of 1000 Friends of Florida
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- Please keep your questions succinct!
- Staff will ask the presenters questions, as time permits
Presenters
Timothee Sallin

- Actively involved in water conservation, sustainable landscaping and responsible agriculture in Florida over the past 15 years through role as President of Cherrylake.
- Cherrylake is a vertically integrated landscape company providing commercial landscape and irrigation construction and maintenance services and is the largest grower of ornamental trees, palms and shrubs in the State of Florida.
- Cherrylake and sister company IMG Citrus manage over 6,000 acres of land in Florida and have a long track record of sustainable land management and stewardship.
- Passionate about connecting people to plants and promoting healthy ecosystems within our urban environments.
- Actively involved in promoting environmental best practices across diverse industries through collaboration with industry associations such as ULI, ASLA and FNGLA as well as through research and development partnerships with UF IFAS and the SJRWMD.
- A graduate of New College in Sarasota Florida earning a degree in Economics and International Studies.
- Lives in Clermont with wife Ellen and daughter Aria; son Tristan is an undergraduate student at Georgia Institute of Technology.
Urban Tree Selection for Sustainability

Timothee Sallin
President, Cherrylake
PROMOTING SUSTAINABLE URBAN FORESTS

Timothee Sallin
How Many Trees Are There?
MAPPING TREE DENSITY AT A GLOBAL SCALE

3,040,000,000
THREE TRILLION AND COUNTING
Mapping tree density at a global scale
15 Billion Trees Cut Down Annually
MAPPING TREE DENSITY AT A GLOBAL SCALE

422 Trees Per Person On Earth
MAPPING TREE DENSITY AT A GLOBAL SCALE

1.4

Fewer Trees Per Person Per Year
What is the value of a tree?
i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and rural forestry analysis and benefits assessment tools. The i-Tree tools can help strengthen forest management and advocacy efforts by quantifying forest structure and the environmental benefits that trees provide.

https://www.itreetools.org/
Structural values:
- Compensatory value
- Carbon storage

Annual functional values:
- Carbon sequestration
- Stormwater Capture
- Air Pollution removal
- Water Pollution Removal
- Lower energy costs
- Reduced carbon emissions
$505 Million
AVERAGE ANNUAL VALUE OF URBAN FOREST TO MEGA-CITIES

$1.2 Million

Per Square Kilometer of Trees
$35

Per Resident

AVERAGE ANNUAL VALUE OF URBAN FOREST TO MEGA-CITIES
What is the life expectancy of an urban tree?
MEAN LIFE EXPECTANCY OF AN URBAN TREE:

7-13 YEARS


MEAN LIFE EXPECTANCY OF AN URBAN TREE:

19-28 YEARS

Street tree survival rates: Meta-analysis of previous studies and application to a field survey in Philadelphia, PA, USA Lara A. Romana,*, Frederick N. Scatena b; 2011
POPULATION HALF LIFE OF AN URBAN TREE:

13-20 YEARS

Street tree survival rates: Meta-analysis of previous studies and application to a field survey in Philadelphia, PA, USA Lara A. Romana, Frederick N. Scatena; 2011
Figure 5. Size-class mortality curve for West Oakland street trees. Total $n = 940$.
Adapted from Roman et. al. (in press) [28].
### Biophysical Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Total Studies Citing Factor</th>
<th>Studies Finding Factor Significant</th>
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<td>Taxa <em>genus, species, cultivar</em></td>
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<td>11</td>
</tr>
<tr>
<td>Planting Space Characteristics</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Tree Characteristics <em>size, age, condition</em></td>
<td>13</td>
<td>11</td>
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<tr>
<td>Planting Season</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Nursery <em>source, stock, type size</em></td>
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<td>2</td>
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Deborah Hilbert UF ISA Research Committee
<table>
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<th>FACTOR</th>
<th>TOTAL STUDIES CITING FACTOR</th>
<th>STUDIES FINDING FACTOR SIGNIFICANT</th>
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<tr>
<td>Stewardship &amp; Maintenance</td>
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<td>Socioeconomic Measures</td>
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<td>Unstable Homeownership</td>
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<td>3</td>
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<tr>
<td>Construction and Redevelopment Activity</td>
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<tr>
<td>Traffic and Transportation</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Group Characteristics (<em>city, town, neighborhood</em>)</td>
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<td>1</td>
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<td>Landscaping Norms and Behavior</td>
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</table>
SPECIES SELECTION FOR SUSTAINABILITY FACTORS

RIGHT TREE, RIGHT PLACE

BIODIVERSITY

NURSERY STOCK QUALITY

NATIVE + FLORIDA FRIENDLY

MARKET AVAILABILITY
SPECIES SELECTION FOR SUSTAINABILITY FACTORS

RIGHT TREE RIGHT PLACE

- Hardiness
- Hydrology
- Soils
- Environmental Conditions
- Planting Space Characteristics
- Mature Habit
SPECIES SELECTION FOR SUSTAINABILITY FACTORS

BIODIVERSITY:

- ECOSYSTEMS
- SPECIES
- GENES
Species Selection for Sustainability Factors

Biodiversity:

SPECIES SELECTION FOR SUSTAINABILITY FACTORS

FLORIDA FRIENDLY LANDSCAPING
“The Smart Way to Grow”
SPECIES SELECTION FOR SUSTAINABILITY FACTORS

NURSERY STOCK QUALITY
The Florida Grades and Standards was developed for more accurate communication between buyers and sellers.

It is an excellent resource for growers, clients, homeowners and extension agents to agree on what constitutes quality in trees.

The quality or grade of a tree at planting can have a large impact on longevity in the landscape.

Higher grades require less pruning after planting and are likely to establish more quickly.

4 GRADES FOR NURSERY PLANTS IN FLORIDA

- Florida Fancy
- Florida #1
- Florida #2
- Cull
7 STEPS FOR DETERMINING GRADE OF TREE

Step 1. Choose the appropriate tree matrix type.
(Matrix 1 – p. 13; Matrix 2 – p. 14; 
Matrix 3 – p. 15.)

Appropriate matrix type: ____________

a) For multi-trunked small maturing trees 
such as crape-myrtle and wax privet (Index 
of Small-Maturing Trees, p. 26), 
measure the container size or root ball 
diameter of the tree you are grading 
and ignore the caliper. For standard small 
maturing trees, measure the caliper of 
the tree. For all small maturing trees, skip 
Step 2.

b) For all other trees, measure the caliper of 
the tree.

Caliper: ____________

Step 2. Grade the tree according to trunk structure 
(see Fig. 1, p. 10). Trees with one dominant 
trunk are graded Florida Fancy. Those with 
double or multiple trunks are given a lesser 
grade depending on the size and location of the 
defect. Circle the appropriate grade below based 
on trunk structure only. This step is skipped if 
grading a small-maturing tree (Index of Small-
Maturing Trees, p. 26).

Florida  Florida  Florida  Cull
Fancy  No. 1  No. 2

Step 3. Grade the tree according to crown uniformity 
(see Fig. 2, p. 11). Circle the appropriate grade 
below based on crown uniformity only.

Note: For crown uniformity there is no Florida No. 1 
or cull grade.

Florida  Florida
Fancy  No. 2

Step 4. Record the lowest grade determined 
in Step 2 or 3.

Grade: ____________
7 STEPS FOR DETERMINING GRADE OF TREE

Step 5. If one of the following statements is true, reduce the grade determined in Step 4 by one. If two or more are true, reduce the grade by two.

Reference tree caliper and appropriate matrix for 5a, 5b, and 5d. For multi-trunked small-maturing trees, use container size or root ball diameter (not caliper) for 5b and skip 5a and 5d.

<table>
<thead>
<tr>
<th>T</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Tree does not meet height requirement.</td>
<td></td>
</tr>
<tr>
<td>b) Crown does not meet diameter requirement.</td>
<td></td>
</tr>
<tr>
<td>c) Root ball is not secure enough to successfully transplant.</td>
<td></td>
</tr>
<tr>
<td>d) Root ball or container is undersized. If two or more sizes, reduce grade by two.</td>
<td></td>
</tr>
<tr>
<td>e) Tree with a trunk caliper larger than two inches requires a stake to hold the trunk erect. For multi-trunked trees, this applies to each trunk individually.</td>
<td></td>
</tr>
</tbody>
</table>

Grade: __________

Step 6. If two of the following statements are true, reduce the grade determined in Step 5 by one. If three or more of the statements are true, reduce the grade by two. It takes only one true statement to reduce Florida Fancy to Florida No. 1.

<table>
<thead>
<tr>
<th>T</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Flush cuts were made when pruning branches from the trunk (Fig. 3, p. 12).</td>
<td></td>
</tr>
<tr>
<td>b) Branch stubs were left beyond the collar (Fig. 3, p. 12). A branch stub can be removed and not reduce the grade.</td>
<td></td>
</tr>
<tr>
<td>c) Open trunk wounds are evident. Wounds are considered open when they are greater than 10% of trunk circumference and/or more than two inches tall. Open or closed proper pruning cuts, surface abrasions or scratches to the bark should not be downgraded. See Glossary: Trunk wound.</td>
<td></td>
</tr>
<tr>
<td>d) More than 10% of the crown exhibits necrosis, chlorosis or damage from pests, diseases or tip dieback.</td>
<td></td>
</tr>
<tr>
<td>e) The crown is thin and sparsely foliated. Some species are thin and sparsely foliated in fall through early spring. Recently harvested field grown trees might also be thin and should not be downgraded.</td>
<td></td>
</tr>
<tr>
<td>f) There is included bark between the trunk and a major lateral branch or between main trunks (Appendix B, p. 37).</td>
<td></td>
</tr>
<tr>
<td>g) Trunks and/or major branches are touching.</td>
<td></td>
</tr>
</tbody>
</table>

Step 7. The tree is a Cull if one of the following conditions is true:

a) The top-most structural root (roots among largest on the tree) emerges from trunk (root collar) more than two inches below the top of the root ball surface. Soil, substrate and/or roots can be removed from the top ¼ of the root ball to conform to this depth requirement. For example, see Appendix A, Part 2, p. 30-31.

b) One or more roots greater than ⅛ the trunk caliper, circle more than ⅓ of trunk in the top ½ of the root ball. All three conditions (> ⅛ trunk caliper, ⅓ around, top ½ of the root ball) must be true to grade as a Cull. One or more circling roots less than ⅛ the trunk diameter can be cut at the point just inside where they begin to circle. For multi-trunked trees, caliper equals the sum of the three largest trunks. Following cutting, the tree is no longer a Cull. For example, see Appendix A, Part 2, p. 30-31).

Note: Grades and Standards do not apply to specialty trees like braided stems, poodles, espalier, topiary and bonsai.

Final Grade: __________
Reason 7 has adopted a series of certified processes to give you the peace of mind that you are purchasing the best possible tree on the market – from the tip of its roots, to the top of its canopy.

What is essential is invisible to the eye
INNOVATIONS IN THE INDUSTRY

1. Start with R7 approved plant
2. Innovative container technology
3. Root shaving
4. Identify defects
5. Correct defects
6. Proper planting depth
7. Audit
INNOVATIONS IN THE INDUSTRY
Florida Housing Starts

2005: 300
2006: 200
2007: 100
2008: 50
2009: 20
2010: 10
2011: 10
2012: 20
2013: 30
2014: 40
2015: 50
2016: 60
2017: 70
2018: 80
2019: 90
2020: 100
MARKET CONDITIONS

Months Supply of Housing Inventory

- Months Supply of Inventory
- Balanced Market

<table>
<thead>
<tr>
<th>Months</th>
<th>2012-Jan-</th>
<th>2013-Jan-</th>
<th>2014-Jan-</th>
<th>2015-Jan-</th>
<th>2016-Jan-</th>
<th>2017-Jan-</th>
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</thead>
<tbody>
<tr>
<td>Months Supply</td>
<td>9.0</td>
<td>6.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
MARKET CONDITIONS

**Monthly Housing Starts VS Housing Inventory**

- Active Listings
- Housing Starts

Housing Starts:
- 2012-Jan: 5,000
- 2013-Jan: 7,500
- 2014-Jan: 10,000
- 2015-Jan: 12,500
- 2016-Jan: 15,000
- 2017-Jan: 17,500

Active Listings:
- 2012-Jan: 140,000
- 2013-Jan: 120,000
- 2014-Jan: 100,000
- 2015-Jan: 90,000
- 2016-Jan: 80,000
- 2017-Jan: 70,000

Graph showing trends in housing starts and inventory from January 2012 to January 2018.
FEDERAL CROP INSURANCE LIABILITIES

US Federal Crop Insurance Liabilities

$1,500,000,000
$1,200,000,000
$900,000,000
$600,000,000
$300,000,000
$0


Year
MARKET CONDITIONS

Overage / Shortage of Nursery Supply

- Overage/Shortage
- Equilibrium

Year

RECOMMENDATIONS FOR CODES & ORDINANCES

1. Caliper v. DBH

2. Hedge Material Heights
RECOMMENDATIONS FOR CODES & ORDINANCES

Caliper:
For trees < 4” Caliper measure 6” from ground;
For trees > 4” measure 12” from ground.

DBH:
Diameter at Breast Height - 54” from ground
Forestry measurement not appropriate for nursery trees.
RECOMMENDATIONS FOR CODES & ORDINANCES

1. Caliper v. DBH

2. Hedge Material Heights
TAXODIUM DISTICHUM
Bald Cypress

Common Names: Southern Cypress, Swamp Cypress, Red Cypress, White Cypress, Gulf Cypress

Hardy Range: 4 to 10 (mature)

DESCRIPTION

Mature Height: 50 - 70’
Growth Rate: medium
Persistence: evergreen
Exposure: full sun
Soil: Acidic; drought tolerant; loamy; moist; sandy, well drained soils; wet clay soils

Mature Spread: 25’
Form: pyramidal, upright, erect
Salt tolerance: medium
ACER RUBRUM ‘FLAME’
Red Flame Maple

Common Names: Autumn Flame, Red Flame

Hardy Range: 6 to 10

DESCRIPTION

Mature Height: 50 - 60’

Growth Rate: medium

Persistence: deciduous

Exposure: partial to full sun

Soil: moist sites are best; well-drained if irrigated

Mature Spread: 25 - 35’

Form: upright, oval with age

Salt tolerance: medium
ILEX CASSINE ‘NATIVA’ PPAF
Dahoon Nativa Holly

Common Names:  Dahoon Holly, Nativa

Hardy Range:  7A to 11

DESCRIPTION

Mature Height: 30 - 40’

Growth Rate: medium

Persistence: evergreen

Exposure: partial to full sun

Soil: Clay, sand, loam; slightly alkaline, acidic; extended flooding; well-drained

Mature Spread: 15 - 20’

Form: oval, pyramidal

Salt tolerance: medium
COCCOLOBA DIVERSIFOLIA
Pigeon Plum

Common Names: Pigeon Plum

Hardy Range: 10B to 11

DESCRIPTION

Mature Height: 15 - 25’
Growth Rate: moderate
Persistence: evergreen
Exposure: full sun; partial shade

Mature Spread: 20 - 30’
Form: round, upright, vase
Salt tolerance: high
Soil: clay; loam; sand; acidic; alkaline; well-drained
ULMUS ALATA
Winged Elm

Common Names: Winged Elm

Hardy Range: 6A to 9B

DESCRIPTION

Mature Height: 45 - 70’
Mature Spread: 30 - 40’

Growth Rate: fast
Form: pyramidal, vase, oval, upright/erect

Persistence: deciduous
Salt tolerance: moderate

Exposure: partial to full sun

Soil: clay; sand; loam; alkaline; acidic; extended flooding; well-drained
PINUS ELLIOTTI VAR. DENSA
Densa Slash Pine

Common Names: South Florida Slash Pine, Yellow Pine, Dade County Pine

Hardy Range: 7A – 11

DESCRIPTION

Mature Height: 75 - 100’

Growth Rate: fast

Persistence: evergreen

Mature Spread: 35 - 50’

Exposure: partial to full sun

Soil: wet to moist, well drained, sandy, limestone
JUNIPERUS SILICICOLA
Southern Red Cedar

Common Names: Red Cedar, Eastern Red Cedar, Coast Juniper

Hardy Range: 8A to 10B

DESCRIPTION

Mature Height: 25 - 40’
Mature Spread: 20 - 30’

Growth Rate: fast
Form: pyramidal

Persistence: evergreen
Salt tolerance: medium

Exposure: partial to full sun

Soil: Well-drained; loamy, sandy or clay
**ILEX VOMITORIA**

**Weeping Yaupon Holly**

**Common Names:**  
Weeping Yaupon Holly

**Hardy Range:**  
7A to 9B

**DESCRIPTION**

<table>
<thead>
<tr>
<th>Mature Height: 15 - 30’</th>
<th>Mature Spread: 6-12’</th>
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<tbody>
<tr>
<td>Growth Rate: moderate</td>
<td>Form: weeping, upright/erect</td>
</tr>
<tr>
<td>Persistence: evergreen</td>
<td>Salt tolerance: high</td>
</tr>
<tr>
<td>Exposure: full sun, partial sun or partial shade</td>
<td></td>
</tr>
<tr>
<td>Soil: clay; loam; sand; acidic; alkaline; well-drained, extended flooding</td>
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</table>
BETULA NEGRA ‘ BNMTF’ DURA-HEAT®
Dura-heat River Birch

Common Names: Birch, River Birch

Hardy Range: 4 to 9

DESCRIPTION

Mature Height: 20 - 25’
Growth Rate: medium
Persistence: deciduous

Mature Spread: 15 - 20’
Exposure: partial to full sun
Soil: acidic, well drained
**MAGNOLIA GRANDIFLORA**

‘BLANCHARD’

D.D. Blanchard Magnolia

**Common Names:**  
D.D. Blanchard, DD

**Hardy Range:**  
7A to 10B

**DESCRIPTION**

**Mature Height:**  50 - 70’

**Growth Rate:**  slow

**Persistence:**  evergreen

**Exposure:**  partial to full sun

**Salt tolerance:**  high

**Form:**  columnar, oval, upright or erect

**Mature Spread:**  20 - 35’

**Soil:**  rich; loamy; moist soils
MAGNOLIA GRANDIFLORA
‘BRACKEN’S BROWN BEAUTY’

Bracken’s Brown Beauty Magnolia

Common Names:  Bracken, Bracken’s Brown Beauty

Hardy Range:    5B to 10A

DESCRIPTION

Mature Height:  30 - 50’

Growth Rate:  medium

Persistence:  evergreen

Exposure:  partial to full sun

Soil:  well-drained, slightly acidic

Mature Spread:  15 - 30’

Form:  slightly pyramidal, upright oval

Salt tolerance:  medium
QUERCUS VIRGINIANA
Southern Shade Live Oak

Common Names:  Live oak, Virginia oak, southern live oak, sand live oak, scrub live oak, Texas live oak, seedling

Hardy Range:  7B to 10B

DESCRIPTION

Mature Height:  50 - 75’

Growth Rate:  medium

Persistance:  semi-evergreen

Exposure:  partial to full sun

Soil:  clay, sand, loam, alkaline, acidic, well-drained, occasionally wet

Mature Spread:  60 - 100’

Form:  rounded, spreading

Salt tolerance:  medium
TABEBUIA IMPETIGINOSA
Purple Tabebuia

Common Names: Purple Tabebuia

Hardy Range: 10 to 11

DESCRIPTION

Mature Height: 12 - 18’
Growth Rate: moderate
Persistence: deciduous
Exposure: full sun
Soil: clay; loam; sand; acidic; alkaline; well-drained

Mature Spread: 10 - 15’
Form: round
Salt tolerance: moderate
ELAEOCARPUS DECIPIENS
Japanese Blueberry

Common Names:  Japanese Blueberry, Elaeocarpus

Hardy Range:  9A to 11

DESCRIPTION

Mature Height: 25 - 35’

Growth Rate:  medium

Persistence:  evergreen

Exposure:  partial to full sun

Soil:  sandy, loamy, clay, acidic, neutral and basic alkaline soils
JUNIPERUS CHINENSIS
‘SPARTAN’
Spartan Juniper

Common Names:  Chinese juniper, Spartan

Hardy Range:  4A to 10A

DESCRIPTION

Mature Height:  15 - 20’
Growth Rate:  medium
Persistence:  evergreen
Exposure:  partial to full sun
Soil:  well-drained; loamy, sandy or clay

Mature Spread:  4 - 6’
Form:  columnar, upright, erect
Salt tolerance:  medium
LAGERSTOEMIA (INDICA x FAURIEI) ‘MUSKOGEE’
Muskogee Crape Myrtle

Common Names:  ‘Muskogee’ Crape Myrtle

Hardy Range:  7A to 10A

DESCRIPTION

Mature Height:  25 - 35’

Growth Rate:  medium

Persistence:  deciduous

Exposure:  full sun

Soil:  sand, loam, clay; acidic, alkaline; well-drained

Mature Spread:  15 - 25’

Form:  vase shaped, standard or multi-trunk

Salt tolerance:  medium
THANK YOU

Timothee Sallin
timothee@cherrylake.com
352.516.5992
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Check out our Legislative Webpage!

Available at: www.1000friendsofflorida.org/2018-florida-legislative-session-custom/

This site is:
- Includes what passed and failed
- Includes Growth Management, Transportation and Conservation Legislation
- Includes links to the bills
This webinar has been approved for:

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