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MESSIAH COLLEGE

TREE CAMPUS USA

I. Campus Tree Advisory Committee (CTA)

A. The Campus Tree Advisory committee (CTA) is a subgroup of Messiah College's Sustainability Committee. The CTA, in addition to meeting institutional sustainability goals of conserving and increasing campus biodiversity, comprises the governing body for Tree Campus USA program administered through the Arbor Day Foundation.

B. The CTA is mainly comprised of members of the Sustainability Committee, including faculty, staff, and students, but also includes the Manger of Grounds and external community member involvement.

C. The CTA will be responsible for the creation, implementation and oversight of the campus tree care plan for Messiah College.

CTA members:

Staff:

- Pete Ramsey – Messiah College Grounds Services Manager (updated in 2015 from initial plan)
- Brandon Hoover – Director of Sustainability (updated in 2015 from initial plan)

Student:

- Lyndsay Feather – Undergraduate, Biology, B.S.; Sustainability, B.A. (updated in 2015 from initial plan)

Faculty:

- David Foster – Professor of Biology & Environmental Science
- Erik Lindquist – Associate Professor of Biology & Environmental Science

Community:

- Tomlinson Bomberger Lawn Care representative
- Landscape Architect

See Appendix A for contact information.

Date of Establishment: 12/7/2010

Date of Meeting the Past Year: 10/30/2015; 12/14/205

II. Campus Tree Care Plan

A. Purpose

1. The Messiah College Campus Tree Care plan is to promote the health, safety and beauty of Messiah College trees. The Messiah College Campus Tree Care plan works in concert with various on-campus departments to steward natural resources and increase campus biodiversity. The purpose of the Messiah College Campus Tree Care Plan is to:

    a. Develop policies and procedures that protect and promote the flourishing of the trees on campus
    b. Increase the number of trees on campus
    c. Communicate and educate the campus community about the value campus trees.

2. Secondary objectives would be:

    a. Maintain campus trees according to an annual preventative maintenance schedule.
    b. Develop a list of preferred trees contractors need to pick from when designing, building and/or altering the natural landscape.
    c. Provide guidelines that protect trees around construction sites on campus.
    d. Advocate that trees be replaced when removed for whatever reason.

B. Goals and Targets:

The Campus Tree Care plans:

1. To identify key areas of campus that are in need of new plantings.
    a. Replacing trees that needed to come down as part of campus construction projects
    b. Increasing tree coverage as part of the master landscape plan
2. To identify specific old growth trees (over 20 years old) in the center of campus that will be protected.
    a. Work with the campus master planning team to ensure that campus trees are protected in the process of campus building and landscape renovations

C. Responsible Department

1. The Messiah College Grounds Services Department and the Grounds Manager are responsible for the campus tree plan administration with input from the Messiah College Sustainability Committee and consultants external to Messiah College.

D. Campus Tree Care Policies

1. Tree Planting
    a. Trees must be selected for the approved tree list set forth by the committee. *See Appendix B for Preferred Tree List.*

b. Installation guidelines
   1) Peel back the burlap and cut the rope protecting the root ball. Find the root flare by pushing the soil away from the base of the trunk.
   2) Measure the distance from the trunk flare to the bottom of the root ball. This is the exact depth of the planting hole. Also measure the width of the root ball to help determine the width of the hole.
   3) Dig a hole that measures as wide and as deep as the root ball. Working from the center of the hole, increase its width to three times the width of the tree's root ball, sloping the sides to create a saucer-shaped hole.
   4) Place the root ball in the hole. The base of the trunk flare should be level with the soil surface. Place soil around the bottom of root ball to hold it in place. Remove as much of the burlap, rope, and wire basket as possible.
   5) Fill the hole halfway using the soil taken from the hole. Unless the soil is of poor quality it is not necessary to add soil amendments. Water the soil to remove large air pockets and allow it to drain. Continue replacing the soil until the hole is filled to ground level. Do not cover the root flare. Water deeply with 4-5 gallons of water per inch of tree trunk caliper.
   6) Apply 2 to 3 inches of organic mulch over the planting area.

c. Staking
   1) Staking trees after planting is not normally needed or recommended unless planting in a windy area.

2. Preventive Maintenance
   a. Grounds Services and local tree companies work systematically on a 5-year tree pruning program.
   b. The maintenance pruning schedule shall be dictated by tree species, age, function, and placement.
      1) Trees less than 10 years old should receive structural pruning on an annual or biennial basis.
      2) Trees 10-20 years old should receive structural pruning every five years.
      3) Trees 20 years old and older receive maintenance pruning every five to seven years to clean dead, diseased, dying, and defective branches from the crown.
      4) Trees adjacent to roadways, walkways, signs, and street lights should be annually inspected for safety and clearance issues and maintenance pruned as necessary.
   c. Pruning
      1) To encourage the development of a strong, healthy tree, the following guidelines shall be followed when pruning.
      2) Pruning shall not be conducted without a clear objective or outcome and in consultation with the manager of grounds.
      3) Prune first for safety, next for health, and finally for aesthetics.
      4) When removing branches, the pruning cut shall not damage the branches bark ridge and branch collar.

5) Thinning shall be performed to remove dead, diseased, dying, and defective branches, which reduces hazards, promotes, health, and improves appearance.
6) Thinning shall be performed to reduce the density of branches, which increases light penetration, improves visibility, and decreases wind load.
7) Assess how a tree will be pruned from the top down.
8) Ideally, lateral branches should be evenly spaced on the main stem of young trees.
9) Remove any branches that rub or cross another branch.
10) Do not remove more than one-quarter of the living crown of a tree at one time. If it is necessary to remove more, do it over successive years.
11) Elevate tree branches to provide vertical clearance from thoroughfares, signs, street lights, mowers and structures.
12) Always maintain live branches on at least two- thirds of a tree's total height. Removing too many lower branches will hinder the development of a strong main stem.

3. Landscaping
    1) Depending upon scope of project or time restrictions, landscape designs maybe provided via in-house or per landscape architect/contractor.
    2) Messiah College's Grounds Services Manager reserves the right to review all landscape design plans when an outside contractor is utilized, and to make suggestions, refuse species and request substitutions as needed in order to address maintenance or species issues.
    3) When utilizing an outside contractor, the Grounds Manager needs to be on site upon delivery of plant material and Messiah College reserves the right to refuse any plant material that does not meet specifications, is damaged, or has signs of disease, insects, or poor cultural traits.
    4) Soil preparation in regards to seeding, installation of sod, or planting trees and shrubs also need to meet college specifications under the consultation of the manager of grounds.

4. Soil Preparation
    1) Contractor shall eliminate uneven and depressed areas. Remove any debris, roots, branches, stones and gravel in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.
    2) Contractor shall scarify sub grade to a depth of 8 inches where topsoil is scheduled. Scarify all areas where equipment has compacted subsoil.
    3) The Grounds Manager must approve all scarified areas prior to the application of topsoil.

5. Topsoil
    1) Contractor shall provide topsoil level to grade and place in areas where seeding or sodding is scheduled.
    2) Contractor shall install topsoil during favorable weather conditions. Topsoil and installation area must be dry.

3) Topsoil shall be placed over all backfilled trenches, excavations and disturbed areas that are not scheduled for paving.
4) Topsoil shall be placed to a depth of 8 inches where possible.

6. Finish Grading
    1) Contractor shall mechanically cultivate to a minimum 4" (four inch) depth and fine grade topsoil eliminating rough, uneven or depressed areas. Maintain levels, profiles and contours of sub grade. All vegetation shall be removed.
    2) Finished grade shall provide positive drainage away from buildings at all times and shall prevent pooling or puddling of water at all locations.
    3) Finished grade top or topsoil tolerance shall be plus or minus one inch.
    4) Finished grade to be level, firm and sufficient to prevent areas from settling when irrigation is applied.
    5) Cultivate mechanically inaccessible areas by hand. Rake until surface is smooth.
    6) Grade to perimeter contours to allow for proper drainage.
    7) Contractor shall remove stones, roots, grass, weeds, debris, and foreign materials while grading. Do not bury foreign materials.

7. Tree Removal
    1) Live trees are removed when the Grounds department and/or the campus tree committee determine a tree is hazardous to a building, vehicle, and/ or pedestrians.
    2) If the tree is unhealthy, diseased, and/or in decline that detracts from the quality of the landscape.
    3) Or the tree is part of the forest restoration plan.
    4) Removed trees and limbs will be composted (or wood chipped) for campus use and/or milled for use as lumber, when appropriate.

8. Catastrophic Event or Storm Management
    1) All trees will be inspected for defects after major storms.
    2) Storm response and recovery are generally accomplished in-house. In a crisis, the first priority is to remove tree debris that blocks campus thoroughfares, disrupts campus operations, or poses hazards to the campus community.
    3) Once these critical needs are addressed, a prioritized recovery plan is implemented during which unsalvageable trees are systematically removed and salvageable, and trees are pruned to restore their health and structure.
    4) As the tree planting budget permits, lost trees are strategically replaced to restore the structure and function of the campus.
    5) Trees requiring specialized equipment not available in the Grounds Department are addressed by outside contractors.

E. Tree Protection and Preservation

1. Preservation during new construction design

a. On the site survey map, all trees will be identified whose:

1) Root systems are likely to be impacted by construction equipment.
2) Cut and fill activities.
3) Utility corridors.
4) Proposed walks and roads.
5) Potential construction staging areas.

b. These trees will be placed in one of three categories: unsalvageable, low priority, and high priority.

2. The campus tree committee will determine the category of each tree in the area.

a. Unsalvageable trees
1) All trees that are within the footprint, or in close proximity to the footprint of a proposed building. (Note: alternative footprints to save large, valuable trees should be considered, provided that the alternatives maintain the desired features and costs of the proposed building).
2) Trees of undesirable species or in very poor health. Examples include, but are not limited to species that have low landscape and educational value, and heavily diseased or damaged trees that have little chance of recovering desirable form and function, even if protected from construction damage.

b. Protecting low priority trees
1) Small trees (less than 10 inches DBH) that fall outside of the building footprint, but are likely to be impacted by construction activities.
2) Larger trees outside of the building footprint with relatively low landscape value. Examples include but are not limited to, trees with poor form, species of relatively low landscape and educational value.

c. Protecting high priority trees
1) Medium (> 10 inches DBH) to large (> 24 inches DBH) trees of desirable species with good form, good health, and sufficient room for continued growth.
2) High priority trees should receive more consideration than low priority trees in planning corridors, staging areas, walks, and roads.

d. Avoid locating the general construction site around low and high priority trees when possible by:
1) Planning all construction activities including new utility corridors, staging areas, new sidewalks and new roads for a minimum clearance of 15 feet away from the base of trees, and not within the edge of the canopy drip line. Greater distances are desirable.

e. Tree protection zones
   1) All trees being preserved in a construction site should be protected by a construction fence to reduce damage from heavy equipment and trucks.
   2) The fence should be wood, plastic or chain link 4' fencing and Installing a foot diameter for every inch diameter of that tree's diameter breast height (DBH), provided that in no case shall the protection zone be less than a radius of 2.5 feet.
   3) No root raking shall be allowed within any tree protection zone at any time during clearing, grading or construction of a project.
   4) No equipment or vehicle shall be parked or construction material stored, or substances poured or disposed of or placed within any tree protection zone at any time during clearing or construction of a project.
   5) If possible, all site work shall be planned and conducted in a manner that will minimize damage to protected trees from environmental changes such as altered site drainage or any other land disturbance within or immediately adjacent to the critical root zone of the tree.

F. Tree Damage Assessment
1. Assessments on trees are performed by the Grounds Manager and if needed a contracted arborist.
2. Assessments are widely disseminated to the Campus Tree Advisory Committee (CTA).
3. In the event that the campus tree plan is not followed, the CTA will determine appropriate actions.

G. Prohibited Practices
1. *Site access:* This is to be agreed on the basis of minimizing landscape damage while providing convenient access. Where heavy or special vehicle access is required (cranes, trucks, etc.) suitable damage minimization measures are to be undertaken (timber boards positioned in wheel traverse areas over 'soft' landscape).
2. *Grade change:* There should be no grade change within a minimum of ten feet of the trunk of existing trees, and preferably none within the entire root zone. Oaks are particularly sensitive to grade changes.
3. *Contractor vehicle parking:* Contractor vehicles are subject to Messiah College parking regulations unless the Grounds Department and Safety Office, has approved other arrangements. Where parking in areas, other than official parking spots is unavoidable, a special area will be fenced off and designated 'Construction Parking Only'.
   Where this area encompasses landscaping and/or trees, strategies to minimize damage/compaction will be practiced, replacements budgeted, and remediation budgeted.
4. *Storage of Materials:* All building materials will be stored in a manner that does not compromise the safety of the public or impact negatively on the landscape. It is strictly prohibited to use tree protection zones, gardens, or shrub beds to store

or place materials (or waste). Turf areas or parking lots must be used as storage areas; the area will be fenced off and reinstated following completion of the project.

5. *Activities within the Tree Protection Zone:* Undertaking any activity inside the tree protection zone is considered a serious breach of these guidelines. If during the course of a project, it becomes unavoidable for activities to take place inside the protection zone, then consent should first be gained from the Messiah College Grounds Manager. Such activities may include the erection of scaffolding, vehicle movement, trenching or excavation. The Manager will determine whether it is appropriate to undertake that activity and advise of the most appropriate way to undertake such activities or suggest possible alternatives. Pruning of branches and/or roots may be required; if so these activities should be undertaken under the direction of the Grounds Manager.
6. *Trenching and Excavation:* When trenching or excavation is to be undertaken within the root zone of any tree, roots will be severed cleanly rather than torn with a backhoe or other excavation equipment. All roots are to be exposed first and then cut cleanly with a sharp saw or loppers. Exposed roots are to be kept moist and covered with burlap for the duration of the exposure.
7. *Vehicle and Pedestrian Movements:* Continuous vehicle and pedestrian movement can be particularly damaging to trees, causing soil compaction and subsequent death of roots. A thick layer of mulch or woodchips spread over the soil to a depth of 6”-12” is mandatory in order to reduce the effects of soil compaction within the root zone of any tree.

H. Communication Strategy

1. The Office of Sustainability will work with the department of Grounds to disseminate the campus tree plan.
2. The campus tree plan will be publicly accessible on the messiah.edu/sustainability website, the official sustainability site for the college
3. The Office of Sustainability will work with the Department of Grounds and pertinent academic offices to integrate the campus tree plan and its goals into pertinent academic courses and student project through the vehicle of service-learning.
4. The campus tree plan (or appropriate version) will be attached to outgoing requests for proposals.
5. Facility Services will determine additional needs for dissemination of the campus tree plan.

I. Definitions

1. *Arborist:* A specialist in the care and cultivation of trees. Note that Messiah College currently uses local Arborists who are to be involved in matters pertaining to campus trees in association with the Grounds Manager.
2. *Branch Collar:* A "shoulder" or bulge formed at the base of a branch by the annual production of overlapping layers of branch and stem tissues.

3. *Caliper:* The diameter or thickness of the main stem of a young tree or sapling as measured at six (6") inches aboveground level. This measurement is used for nursery-grown trees having a diameter of four inches or less.
4. *Diameter, breast height (DBH)*: The diameter or width of the main stem of a tree as measured 4.5 feet above the natural grade at its base. Whenever a branch, limb, defect or abnormal swelling of the trunk occurs at this height, the DBH shall be measured at the nearest point above or below 4.5 feet at which a normal diameter occurs.
5. *Root zone*: The space within the soil occupied by the root system of a tree. Unless otherwise defined by the Arborist, the root zone will be assumed to be equivalent, in plan, with the Tree Protection Zone.
6. *Trunk Flare:* The trunk flare is where the roots spread at the base of the tree. This point should be partially visible after the tree has been planted.
7. *Tree Canopy:* The space that is occupied by the branches and leaves.
8. *Tree Protection Zone:* A defined area of ground where no activity is to be undertaken. Unless defined otherwise by the Arborist, this zone will comprise a circular area, with its center the trunk of the tree, and its outer edge two yards further out from the Drip Line.

III. Dedicated Annual Expenditures for the Campus Tree Care Program

TOTAL CAMPUS TREE CARE PROGRAM EXPENDURES: $27,152.00

Tree Planting and Initial Care:	Tree purchases: $4,000.00 Labor and consulting: $2,500.00 Equipment and materials: $3,000.00 Subtotal: $9,000.00
Campus Tree Management:	Tree care: $9,862.00 Pest management: $3,600.00 Professional training: $450.00 Tree fertilizer: $1,000.00 Subtotal: $14,912.00
Volunteer Time:	Service Day: 30 people x 6 hours= $3,240.00
Free Services:	• Walkthroughs/ Mentoring of the campus trees monthly • Constants working with Grounds Manager on tree inventory.

J. Date Campus Tree Care Plan established: 12/31/2011 by Manager of Grounds (Pete Ramsey) and Director of Sustainability (Craig Dalen)

Appendix A - Campus Tree Advisory Committee (CTA)
Contact Information (updated for 2015 from initial committee)

Committee Member	Group	E-mail
Lyndsay Feather	Student	Lf1219@messiah.edu
Brandon Hoover	Staff/Faculty	bhoover@messiah.edu
David Foster	Faculty	dfoster@messiah.edu
Erik Lindquist	Faculty	quist@messiah.edu
Pete Ramsey	Facility Management	pramsey@messiah.edu
Bob Kandratavich	Arborist	bobk@tbll.com

Appendix B – Preferred Trees List

1. Bald Cypress (Taxodium distichum)
2. **Beech Group (Fagus spp.)**
   a. American Beech / F. grandifolia
   b. European Beech / F. sylvatica
   c. Atropunicea ('Purpurea') / F. sylvatica 'Atropunicea'
   d. Riversii / F. sylvatica 'Riversii'
   e. Rohanii / F. sylvatica 'Rohanii'
3. **Birch Group (Betula spp.)**
   a. Species River Birch / B. nigra
   b. Heritage River Birch / B. nigra 'Heritage'
   c. Gray Birch/B. populifolia
4. Black Gum (Nyssa sylvatica)
5. **Buckeye Group (Aesculus)**
   a. Bottlebrush buckeye / A. parviflora (natural settings)
6. Butternut / Juglans cinerea
7. Carolina Silverbell (Halesia carolina)
8. **Crabapple Group (Malus spp.) These are the crabapples preferred for good to excellent disease resistance or persistant fruit:**
   a. 'Coralburst'
   b. 'David'
   c. 'Donald Wyman' (persistant fruit)
   d. 'Firebird' (persistant fruit)
   e. 'Golden Raindrops'
   f. 'Harvest Gold' (persistant fruit into spring)
   g. 'Lollipop'
   h. 'Lousa'
   i. 'Prairie Fire'
   j. 'Molten Lava'
   k. 'Pink princess'
   l. 'Purple Prince'
   m. 'Red Jewel'(persistant fruit)
   n. 'Sargent'
   o. 'Strawberry Parfait'
   p. 'Sugar Tyme'(persistant fruit)
   q. 'Tina'
9. Dawn Redwood (Metasequoia glyptostroboides)
10. **Dogwood Group (Cornus spp.)**
    a. Species Flowering Dogwood / C. florida
    b. Cherokee Princess Dogwood / C. florida 'Cherokee Princess'
    c. Cherokee Brave Dogwwod / C. florida 'Cherokee Brave'
    d. Cloud 9 Dogwood / C. florida 'Cloud 9'
    e. Kousa Dogwood / C. kousa
    f. Pagoda Dogwood/C. alternifolia

11. Douglas Fir (Pseudostuga taxifolia)
12. **Elm Group**
    a. Lacebark Elm (Ulmus parvifolia)
    b. Elm/ Ulmus seratina
    c. Other Ulmus hybrids
13. Ginkgo (Ginkgo biloba – male trees only)
14. Green Vase Zelkova serrate
15. **Hawthorne Group (Crataegus spp.)**
    a. Washington Hawthorne / C. phaenopyrum
    b. Lavalle Hawthorne / C. x lavallei
    c. Thornless Cockspur Hawthorne / Crataegus crusgalli inermis
    d. Winter King Green Hawthorne / Crataegus viridis 'Winter King'
16. Hemlock (Tsuga Canadensis)
17. **Hickory Group (Carya spp.)**
    a. Shagbark Hickory/ C. ovata
    b. Shellbark Hickory/ C. laciniosa
    c. Yellowbud (Bitternut) Hickory/C. cordiformis
18. Hophornbeam / Ostrya virginiana
19. **Hornbeam Group (Carpinus spp.)**
    a. American Hornbeam / C. caroliniana
    b. European Hornbeam / C. betulus (and weeping or columnar varieties – 'pendula' or 'fastigiata')
20. Ivory Silk / S. reticulate 'Ivory Silk'
21. **Japanese Flowering Cherry (Prunus serrulata)**
22. Kwanzan / P. serrulata 'Kwanzan'
23. Japanese Pagoda Tree (Sophora japonica)
24. Japanese Tree Lilac (Syringa reticulata)
25. Katsura Tree (Cercidiphyllum japonica)
26. Kentucky Coffee Tree (Gymnocladus dioicus)
27. **Linden Group (Tilia spp.)**
    a. American Linden / Tilia americana
    b. Legend Linden / T. Americana 'Legend'
    c. Littleleaf Linden / Tilia cordata
    d. Greenspire Linden / T. cordata 'Greenspire'
    e. Silver Linden (Tilia tomentosa)
    f. Green Mountain / T. tomentosa 'Green Mountain'
    g. Sterling Silver / T. tomentosa 'Sterling Silver'
28. **London Plane Tree (Platanus x acerifolia 'Bloodgood')**
29. **Magnolia Group (Magnolia spp.)**
    a. Cucumber Magnolia / M. acuminataSaucer
    b. Magnolia / M. soulangeanaStar
    c. Magnolia / M. stellata
    d. Sweetbay Magnolia / M. virginiana
30. **Other Maples (Acer spp.)**
    f. Hedge Maple / A. campestre
    g. Paperback Maple / A. griseum

h. Trident Maple / A. buergeranum
i. Japanese Maple / A. palmatum varieties
j. Tatarian Maple / A. tataricum

31. **Red Maple Group (Acer rubrum spp.)**
    a. Species Red Maple / A. rubrum
    b. October Glory Red Maple / A. rubrum 'October Glory'
    c. Red Sunset Maple / A. rubrum 'Red Sunset'
    d. Autumn Flame Maple / A. rubrum 'Autumn Flame'
    e. Brandywine / A. rubrum 'Brandywine'
32. **Sugar Maple Group (Acer saccharum spp.)**
    a. Species Sugar Maple / A. saccharum
    b. Green Mountain Sugar Maple / A. saccharum 'Green Mountain'
    c. Fall Fiesta / A. saccharum 'Fall Fiesta'
    d. Commemoration Maple / A. saccharum 'Commemoration'
    e. Majesty / A. saccharum 'Majesty'
33. **Oak Group (Quercus spp.)**
    a. Sawtooth Oak / Q. acutissima
    b. Swamp White Oak / Q. bicolor
    c. White Oak / Q. alba
    d. Bur Oak / Q. macrocarpa
    e. Scarlet Oak / Q. coccinea
    f. Chinquapin Oak / Q. muhlenbergii
    g. Northern Red Oak / Q. borealis (rubra)
    h. Red Oak/ Q. rubra
    i. Post Oak/ Q. stellata
    j. Black Oak/ Q. velutina
    k. Shingle Oak / Q. imbricaria
    l. Shumard Oak/ Q. shumardii
    m. English Oak / Q. robur
    n. Skyrocket / Q. robur 'Skyrocket'
35. Pawpaw / Asimina triloba
36. Common Persimmon / Diospyros virginiana
37. **Pine Group (Pinus spp.)**
    a. Japanese Black Pine / P. thunbergi
    b. Eastern White Pine / P. strobus
    c. Limber Pine/ P. flexilis
    d. Red Pine/ P. resinosa
    e. Shortleaf Pine/ P. echinata
38. **Redbud Group (Cercis spp.)**
    a. Species Redbud / C. canadensis
       Oklahoma / C. Canadensis 'Oklahoma'
    b. Forest Pansy Redbud / C. canadensis 'Forest Pansy'
    c. White Redbud / C. canadensis 'alba'
39. **Sargent Cherry (Prunus sargentii)**
    a. Accolade / P. sargentii x P. subhirtella 'Accolade"
40. Sassafras / Sassafras albidum

41. **Serviceberry Group (Amelanchier spp.)**
    a. Serviceberry / A. canadensis
    b. Autumn Brilliance Serviceberry/ A. x grandiflora ‘Autumn Brilliance’
    c. Ballerina / A.x grandiflora ‘Ballerina’
    d. Cumulus / A. x laevis ‘Cumulus’(use where lateral branching is restricted)
    e. Robin Hill / A. x grandiflora ‘Robin Hill’(tree form)
42. **Spruce Group (Picea spp.)**
    a. Norway Spruce / P. abies
    b. White Spruce / P. glauca
    c. Colorado Blue Spruce / P. pungens
    d. Fat Albert / P. pungens ‘Fat Alber”
    e. Hoopsii / P. pungens ‘Hoopsii’
    f. Serbian Spruce / P. omorika
43. Tulip tree (Liriodendron tulipifera)
44. **White Fir/ Abies concolor**
45. White Fringe Tree (Chionanthus viginicus)
46. **Witchhazel Group (Hamamelis spp.)**
    a. Common Witchhazel / H. virginiana
    b. Vernal Witchhazel / H. vernalis