

# In Praise of Noble Trees

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Many reasons for praising and planting Noble Trees including aesthetics, CO<sub>2</sub> sequestration, particulate matter interception, shade (cooling), ad infinitum. In Minneapolis-St. Paul, large elms (American) represent one percent of tree population yet capture 30% of storm water. Reason: leaf surface area, trunk, and root system distribution. Considerable quantitative data that support the economic benefits of Noble Trees.

## Noble Tree Traits

- Immense in stature
- Span generations
- Architecturally elegant
- Inspiring
- Spiritual
- Skyway to the Heavens
- Support tree house construction and tire swings
- Offer climbing challenge
- Bird roost
- Squirrel highway
- Feed more caterpillars: oaks – 534 species

## The Rationales for Tree Planting

- Aesthetics
- CO<sub>2</sub> sequestration\* and O<sub>2</sub> evolution
- Particulate matter interception
- Screening
- Wind abatement
- Shade (cooling)/energy reduction
- Storm water mitigation\* (Chicago & New York, USA Today 8-16-11)
- Property value enhancement\*
- Health/psychological benefits
- Discourage criminals (<http://bit.ly/dfqFUN>)
- Snacks for wildlife

How do new tree introductions arise? Testing and evaluation leading to introduction: how much?; how little? Propagation and production criteria. Marketing. Does the general public care or understand the value of Noble Trees? A terrific web site with all manner of information (many great links) on noble trees from selection to care and into the spiritual realm is available at [www.jfrankschmidt.com/treesaretheanswer/](http://www.jfrankschmidt.com/treesaretheanswer/). Hopefully this handout will inspire the audience to consider several new trees.

Too many red maples...and still coming, with Redpointe® ('Frank Jr.') from J. Frank Schmidt & Son, among the best of the new. Currently, Schmidt's is evaluating ~ 150 *Acer rubrum* selections. Where to turn for new selections within the widely adaptable urban tree genera? Ash sales are down 90 to 95% because of emerald ash borer. The people of Michigan and the upper Midwest are too familiar with this biological devastation. Little to no resistance resides in *Fraxinus*. Bradford pear and similar ilk are proving to be invasive, particularly in the South. Although, I observed "runaway" seedling pears from Long Island, NY, to Birmingham, AL. Norway maple sales are crashing because of invasive issues. Amazingly, elms are on the rebound. Great need to develop superior cultivars within the palette of North American trees. *Nyssa sylvatica*, *Alnus* species, *Catalpa* species, *Gymnocladus dioica*, *Celtis* species, *Liriodendron tulipifera*, and *Quercus* species are prime candidates. I work closely with J. Frank Schmidt & Son Nursery, Boring, OR with new introductions. During the Farwest Show (August), I spend time with Keith Warren, horticulturist (retired but still active), and Guy Meecham (Keith's replacement) and we discuss the future of US tree breeding/selection, evaluation, and introduction).

Great book (2009) on tree species introductions over the past 20 years by Grimshaw and Bayton. See [www.kew.org.uk](http://www.kew.org.uk) or [www.rhs.org.uk](http://www.rhs.org.uk) for information. Title is *New Trees: Recent Introductions to Cultivation*. Outstanding descriptions, botanical and horticultural, often with accompanying photographs, of little-known species that, to my way of thinking and observing, have great landscape merit. *The Manual of Woody Landscape Plants* (2009) treats most of the new cultivar introductions since 1998. The iPhone/iPod Touch/iPad APP, *Dirr's Tree and Shrub Finder*, based on *The Manual of Woody Landscape Plants*, includes ~10,000 woody plants, 7,600 photos, and the ability to search across 72 unique criteria. Available from the Mac App Store for \$15.00. *Dirr's Encyclopedia of Trees and Shrubs* featuring the new species, cultivars, 3600 photos, and 951 pages is available from Timber Press (2011).

Bonnie and I visited Redwood National Park in 2013 and were AWED by the nobility of these great trees. This trip was on the bucket list since redwood entered my vocabulary. To stand in the presence of such noble giants is a feeling that cannot be explained. As humans, we pale by comparison. The first five traits listed under noble trees capture the essence. Trees reach maturity at 500 years; live 1200 to 1800 years and longer. They are among the tallest biological organisms on earth, ascending to over 350'. I now know the true meaning on NOBILITY.

The following represent some of the new tree introductions. Note: not all are noble and include smaller flowering trees designated as noblette. There is a pressing need for smaller trees (height and width) as urban planting spaces shrink. Bailey Nursery, St. Paul, MN is developing a **20 under 20™** program to breed/select and provide smaller trees to serve utility companies, urban landscapes and homeowners.

Did you know? Three trillion trees on the planet Earth. At dawn of civilization there were six trillion. The United States is fourth (228 billion) with Russia, Canada and Brazil ahead. The United States lags many countries in tree density. There are 420 trees for every living person. Yale research; published in *Nature*. Take home lesson...great opportunities to **Plant America** and the **World!**

### **Acer—Maple**

Need smaller versions for red and sugar; I see Autumn Blaze® falling apart; Redpointe® is 75% red maple: 25% silver maple with excellent red fall color and heat tolerance; plant in new Dirr garden developed excellent orange-red fall color in mid-October; 'Sun Valley' ('Brandywine' and 'Somerset' are the others) has been the best of Dr. Townsend's seedless introductions; October Glory® and Red Sunset® are two of the most popular red maple cultivars but both have minor Achilles Heels; Autumn Flame® based on 30 years of Dirr evaluation continues to impress for red fall color, seedless nature, strong branch structure; Scarlet Jewell™ ('Bailcraig') is northern Minnesota selection for deep crimson fall color and resistance to frost cracking, 70' by 30', zone 3 to 7, Bailey Nursery; new hybrid, Crimson Sunset™ ('JFS-KW202'), between 'Crimson King' and *Acer truncatum* with lustrous red-purple foliage, smaller stature and heat tolerance; Keith Warren's Urban Sunset™ ('JFS-KW187') with narrow-pyramidal habit, glossy dark green

foliage, that turns deep red in autumn, grows 35' by 20' and is zone 4b hardy is an exciting 2015/16 introduction from Schmidt nursery; Ruby Sunset™ ('JFS-KW249') is a compact, 25' by 30', 2016 introduction with glossy dark green leaves that turn deep red in autumn, hardy to zone 4b; watched Morton Arboretum's *A. miyabei* State Street® ('Morton') perform well in Chicago, Louisville, St. Louis, and Spartanburg, SC. Rugged Ridge™ is a new cork-bark *A. miyabei* from Schmidt; *Acer truncatum* Main Street™ ('WFAT-1') with oval-rounded outline, dense branching and magnificent orange-red fall color. Has performed well in Dirr garden with excellent orange-red fall color in 2012. Selected from seedling population in North Carolina by Mike Worthington. Schmidt's Flashfire™ ('JFS-Caddo-2'), a Caddo type, develops outstanding red fall color and superior heat tolerance. Autumn Fest® (JFS-KW8) has dark green leaves, outstanding orange-red fall color and dense oval-rounded habit as a young nursery tree. Superior heat tolerance and is being successfully grown ~100 miles south of Atlanta in Hawkinsville, Georgia. Harvest Moon® ('Sandersville') from Sandersville, GA, displays heat tolerance, faster growth, orange-red fall color, introduced by Bold Spring Nursery. New upright selections of *A. rubrum* from Schmidt are close to release. Superior to 'Armstrong', 'Bowhall', 'Columnare', et al. The first (2015) is Armstrong Gold™ ('JFS-KW78'), a tight columnar-pyramidal selection with superb yellow-gold-orange fall color, 40' by 12', zone 4. *Acer henryi* (*A. cissifolium* subsp. *henryi*) offers red-purple new growth, small stature (20 to 30'), heat (Georgia), and cold (-24°F) tolerance. A selection is close to release from Schmidt's. A sleeper in the wide world of maples. A 20' tall tree in the University's botanical garden is thriving with yellow-orange, tinge of red fall color in 2012. Northern Glow™ ('Hasselkus'), a new (introduced 2010) hybrid of *Acer pseudosieboldianum* and *A. palmatum* with increased cold tolerance from Schmidt's. Also, the late Landscape Plant Development Center had many colorful foliage (yellow, red-purple) hybrids of these two parental types. An unsung tree introducer is Dr. Dale Herman, North Dakota State University, who has selected many trees for cold (zone 3) and drought tolerances for the plains states. His 2010 sugar maple introduction is Northern Flare™ ('Sisseton'). From Bailey Nursery comes *Acer ×freemanii* Matador™ ('Bailston'), a 2010 introduction with late, deep red fall color. *Acer buergerianum* 'Raising Blaze' ('EOAB1') is a new heat tolerant, low seed producing, lustrous dark green, superior orange-red fall coloring selection from Rusty Allen, Athens, GA. The best clonal trident maple I have experienced. Parent tree is 20 feet by 15 feet and uniformly branched. Observed Asian/ granular ambrosia beetle damage.

### ***Betula lenta* subsp. *uber*—Virginia Roundleaf Birch**

A genuine worthy addition to the world of garden birches. Found in a restricted area in southwest Virginia this taxon has received minimal interest from horticulturists and nursery producers. Small two-inch-diameter, rounded, shiny dark green leaves turn glowing yellow-gold in autumn. Habit is loosely pyramidal with gracefully arching secondary branches. From my observations, this taxon is both cold and heat tolerant. Trees grow in Chicago, Boston, Asheville, NC, and Athens, Georgia with equal facility. Tree in the University's botanical garden was golden yellow in early November, 2012. National Champion is 45 feet by 15 feet. The bruised stems have the distinct wintergreen odor. Definitely worth considering where white bark birches have no chance of survival. Considered a *forma* by taxonomists, as it does

not come totally true-to-type from seed. A report noted about 1% of the seedlings are similar to subsp. *uber*; the rest are akin to *B. lenta*. Now (2011) have a seedling population at PII from seed collected in North Carolina. Excited about adding a plant or three to the Dirr garden. Grows in a small area along Cherry Creek, Smyth County, Virginia. I grew ~50 seedlings and all were similar to *B. lenta*.

### ***Betula nigra*—River Birch**

Resistant to borer, wide adaptability; Heritage® ('Cully') was first, then Dura Heat® ('BNMTF'), now City Slicker® ('Whit XXV') (more heat tolerant) and Northern Tribute™ ('Dickinson') from Bailey (via Dr. Dale Herman) with Zone 3 hardiness. Dura Heat® is more broad-upright than Heritage® as I viewed the tree at the Schmidt arboretum. Worth noting that in Maine and Minnesota, *B. nigra* is the most commonly planted birch in new landscapes, superseding even the native *B. papyrifera*. Dr. Whitcomb's web site, [www.lacebarkinc.com](http://www.lacebarkinc.com), shows Heritage®, Dura Heat® and City Slicker® ('Whit XXV') side-by-side in Oklahoma, with the latter having the cleanest, darkest green foliage. I am impressed with City Slicker® and expect it to become more common in American landscapes. Grows 35' by 25', displays increased tolerance of heat and drought, from a native stand in Oklahoma, zone 5, new in 2016 from Schmidt. Also, cream-margined 'Shiloh Splash', weeping 'Summer Cascade', compact Fox Valley® ('Little King') and Tecumseh Compact™ (arching-semi-pendulous). The Renaissance *B. papyrifera* collection, Compact™ ('Cenci'), Oasis® ('Oenci'), Reflection® ('Renci') and Upright™ ('Uenci'), appears worthy. Also have been impressed with Dr. Dale Herman's Dakota Pinnacle® ('Fargo'), a 10-year-old tree was 30' high, 8.5' wide, uniform tight pyramidal habit with good borer resistance. Prairie Vision® ('VerDale') from same introducer is semi-pyramidal, widening with age. Mature trees of Dura Heat® and Heritage®, side by side in the Schmidt Arboretum, display upright oval to rounded and broad-rounded, semi-arching branching, respectively. Based on my observations, a smaller, 20-25' size river birch would be a terrific addition to the small tree lineup because of zone 4 to 9 adaptability and borer resistance. Fox Valley® is small but has the appearance of a lumpy mushroom. Parkland Pillar® ('Jefpark') is an upright columnar 2016 introduction from Bailey Nursery, 40' by 6 to 7', zone 3 to 7, originated as a sport of Dakota Pinnacle® in Alberta, Canada in 2006.

### ***Carpinus betulus*—European Hornbeam**

Several new heat tolerant selections with the habit of *Tilia cordata*; have observed in nursery production and they carry the wow factor as young trees. The Schmidt introduction was probably collected in Turkey. Originally listed as *C. cordata* but certainly a *C. betulus* type. Introduced in 2010 as Emerald Avenue™ ('JFS-KW6'). Uniform pyramidal habit, dark green leaves and yellow fall color. I first witnessed this years past and it was the darkest green tree in the trial area at Schmidt's. Asked Keith about identity and he noted the above. I think this has ubiquitous landscape potential. Hybrid, *C. x schuschaensis* (*C. betulus* x *C. orientalis*), develops a *Tilia cordata* habit. Have grown for over 10 years in Georgia and am impressed with the heat and drought tolerance. Superior dark green summer foliage. Considered unreliably cold hardy in zone 4 yet I observed wild collected

accessions at the university of Minnesota Landscape Arboretum, zone 4, that were thriving.

### ***Carpinus caroliniana*—American Hornbeam**

Wonderful native from Wisconsin to Nova Scotia to Florida with Palisade™ ('CCSQU'), an upright form; at least two new red-fall-coloring selections from Michael Yanney, Johnson's Nursery, Wisconsin and Schmidt Nursery. Ball O'Fire™ ('J.N. Globe') is a dense globe 6' by 5 ½' after 11 years; Firespire™ ('J.N. Upright') is narrow in outline, 7' by 3 ½' after 10 years, with outstanding orange-red fall color. These growth rates are based on Wisconsin conditions. Native Flame™ ('JFS-KW6') has a habit like species, dark green summer leaves and red fall color. Have the Johnson selections and to date minimal fall color in Athens. In fact, no fall color. Habits are wild and unkempt, certainly not as described by the introducer.

### ***Cercidiphyllum japonicum*—Katsura**

A Dirr favorite. Better adapted to Zone 4 to 6 but grows in 7/8. Observed on the Maine campus. Orono, where trees have withstood -30 degrees F. Large tree in the public garden in Halifax, Nova Scotia. Requires moisture to perform up to its genetic capabilities. Beautiful blue-green leaves turn yellow-apricot-orange in fall. Senescing leaves with brown-sugar, cotton candy aroma. 'Rotfuchs' ('Red Fox') produces red-purple, more frost resistant leaves, losing color in heat. Three weeping forms: 'Amazing Grace', 'Morioka Weeping' and 'Tidal Wave'; all are males. 'Morioka Weeping' is more tree-like in stature. Magnificent 30' specimens behind Museum of Fine Arts, Boston. 'Rotfuchs' is female and is purportedly being crossed with the weepers to produce a purple leaf weeper.

### ***Cercis canadensis*—Redbud**

Remarkable breeding by Dr. Denny Werner, NCSU, for exciting foliage and habit traits. 'Ruby Falls' (PP22,097) is a hybrid between Lavender Twist™ x 'Forest Pansy' with purple leaves and weeping habit. 'Merlot' ('Texas White' x 'Forest Pansy') has more lustrous purple tinted leaves. 'Hearts of Gold' was the first yellow foliage introduction; now have The Rising Sun™ with orange-yellow emerging foliage as well as 'High Country Gold', 'Melon Beauty', and 'Solar Eclipse'. 'Solar Eclipse' has a yellow-gold center and one-inch wide green margins. Should mention that Greenleaf Nursery told me it is stable and does not revert. Have heard otherwise from different sources. 'Ruby Falls', 'Merlot', 'The Rising Sun' and 'Hearts of Gold' have ALL turned green in the Dirr garden during the summer of 2011. Cold hardy introductions include 'Columbus', Joy's Pride™ ('Morton'), 'Northland Strain' ('Minnesota Hardy'), and 'Royal White' (most cold hardy white-flowered form). 'Northland Strain' is performing admirably at Coastal Maine Botanical Garden, Boothbay, ME. Northern Herald™ ('Pink Trim') may be the hardiest redbud, derived from a 40-year-old tree in central South Dakota. Quality pink flowers, low fruit set, and leathery textured clean foliage are additional attributes. 'Cascading Hearts' is a weeper with denser foliage than Lavender Twist™. 'Pink Heartbreaker' is a strong-growing weeping form with pink flowers introduced in 2010. A new (2012) green leaf, white-flowered weeping selection is Vanilla Twist™ from Tim Brotzman. White spotted and splashed leaf selections include 'Silver Cloud', 'Alley Cat', and 'Floating Clouds'. The latter two have the most pronounced variegation

and heat tolerance. 'Alley Cat' is superior according to Alex Neubauer who grows the three side by side in Tennessee. 'Mardi Gras' has pink and white emerging leaves that turn green at maturity. This is a 2011 introduction from Alex and Harald Neubauer, Hidden Hollow Nursery, Belvidere, TN. Additionally, 'White Water' ('Whitewater') from Dr. Werner is a new weeping, pink, cream, green variegated leaf form. Have observed a pink-rose-purple-white spotted and streaked leaf hybrid of 'Silver Cloud' and 'Forest Pansy', now named Carolina Sweetheart™. This was bred by Dr. Ranney at NC State. Hidden hollow Nursery and Dr. Werner are co-introducing a double-flowered, deep rose pink selection called 'Pink Pom-poms'. I have a small plant and the flowers are truly spectacular and do not produce fruits. Also, the thick-textured foliage is lustrous dark green and holds well into fall. Ray and Cindy Jackson, Tennessee, in addition to The Rising Sun™ ('JN2' PP21,451) have introduced Summer Towers™ ('JN7'), with an upright, vase-shaped habit, 20-25' by 7-10', pink flowers. Burgundy Hearts® ('Greswan' PP19,654) has shimmering red-purple new growth, the leaves remaining burgundy through most of the growing season, pink-lavender flowers, 20-25' by 25-35', from Greenleaf Nursery. Would love to have a NATIONAL TREE OF THE YEAR promotion and redbud would be my first candidate. Now over 35 cultivars and the list continues to grow.

### ***Corylus fargesii*—Farges Filbert**

Medium tree with River Birch-like exfoliating bark; supposedly 70' in wild; noted reference to a 100' tall tree in China; largest I have observed was ~35' at Arnold Arboretum (2013); growing in Chapel Hill, NC. A visit to Longwood Gardens Nursery area provided glimpses of two, ~20' high magnificent specimens with bark sheathing in salmon-cream papery sheets. Several trees are performing admirably at the US National Arboretum. Morris Arboretum, Chestnut Hill, PA has a splendid sampling of the species from wild collected material. Witnessed these in early March of 2013. Without question, an exciting new introduction. Dark green foliage with soft yellow fall color. Unless I am missing some serious pests, this species, with selection, could be a major contributor to gardens and perhaps more difficult urban sites. Resistant to eastern filbert blight (recently confirmed). Grows in Morton Arboretum, Lisle, Illinois, Zone (4)5 and on West Coast. New research data from the University of Minnesota estimated cold hardiness between -17 to -22 degrees F. Was given a small tree by Mark Krautmann, Heritage Seedlings, Salem, OR. Rare Chinese species that will become a popular ornamental and shade tree. Possibly could be hybridized with the purple leaf filbert to produce a red leaf tree type with the beautiful bark. 'Te Terra Red' (*Corylus x colurnoides*) is a purple leaf tree hybrid of *Corylus colurna* and *C. maxima* 'Purpurea'.

*Corylus* species have, for too long, been overlooked/dismissed as viable shade and ornamental trees (shrubs, also). About 10 species worldwide with *C. chinensis*, *C. jacquemontii*, large trees, similar to *C. colurna*. Observed all in Europe and/or at Oregon State. Impressive, pyramidal to broad pyramidal-oval habits. *Corylus fargesii* (♂) was hybridized with *C. colurna* (♀) with resultant 10-year-old, 25-30' high trees of great beauty. Dark green foliage, uniform pyramidal habit, exfoliating tan bark. The *C. fargesii* parent was derived from wild-collected Chinese seed of a 100 foot tall tree growing at 5,000 feet elevation where rainfall averages 21-22

inches. The USDA Germplasm Repository at Oregon State University houses the largest collection of species and hybrids in the world. Unbelievable opportunities for a thoughtful, forward-thinking, patient, plant breeder. Rutgers University has a *Corylus* breeding program that was initiated in 1996. Many unique crosses have been consummated and the progeny appear promising. See *Proceedings International Plant Propagator's Society* 60:424-434 (2010). To date, no introductions have been released.

### ***Fagus grandifolia*—American Beech**

Maine to Minnesota to Florida native; why not more widely utilized? Reputation as difficult to transplant; not true as I have never lost one in all my work; often difficult to locate in commerce; one of America's most Noble trees. Recently, collected scion-wood from a pyramidal-columnar-form with uniform upright branching. Schmidt's will test. Added an American beech to our new garden. One hundred dollars per inch and worth every penny. Only a few cultivars, a yellow leaf form and a weeping type, neither common. *Fagus sylvatica*, European beech, displays great genetic plasticity and numerous cultivars have been introduced. Unfortunately, the heat and high night temperatures of zone 7 and 8 are anathema to reliable performance.

### ***Ginkgo biloba*—Ginkgo**

200 million years (?) and still going strong; over 50 cultivars, many oddities; Presidential Gold™ ('The President') and Golden Colonnade™ ('JFS-UGA2') are two introductions from my Georgia program and are available from Schmidt's. The former more spreading; latter columnar-upright. Keith Warren said Presidential Gold™ was one of the best *Ginkgo* selections because of the full canopy at a young age. Sky Tower™ ('JN9') is slow growing, reaching 15-20' by 8-12', from Greenleaf Nursery. Numerous *Ginkgo* introductions. See the *Dirr Manual* (2009) for a large laundry list.

### ***Gymnocladus dioica*—Kentucky Coffeetree**

Zone 4 to 7 adaptability, i.e., Minnesota to Atlanta, and performing well; extremely variable, need additional male selections; have several male clones like Espresso™ ('Espresso-JFS'), Prairie Titan® ('J.C. McDaniel'), and 'Stately Manor'; the latter appears to be the best. Excellent performance at Milliken Arboretum, Spartanburg, SC, over the past 15-20 years; Also several trees on the Georgia campus were doing well. Not the easiest tree to propagate by grafting/budding. Also appears gangly in youth but matures into a handsome Prince. Bark is beautiful and provides great winter effect. Performs well in alkaline soils and a 2010 discussion during Schmidt Arboretum tour with Wayne Holland, nursery owner, Lubbock, Texas, corroborated its adaptability to the high plains of Texas. Missouri nursery growers are putting three plants in a container or planting hole to generate a fuller canopy on small trees. Just learned this in January, 2011. Why didn't I think of this? Cold hardy into North Dakota according to Dr. Dale Herman. Observed a large tree in Stockholm, Wisconsin where the garden center operator said temperature dips to -30 degrees F. *Gymnocladus chinensis*, Chinese coffeetree, is worth pursuing for its delicate foliage. Young seedlings with purple suffusion to the leaf, then purple on underside, finally green. Larger trees have smooth gray bark. Large pods are light

golden brown. Seed available from F. W. Schumacher, Sandwich, Massachusetts. Currently have seedlings in abundance at Plant Introductions and have yet to have a visitor guess identity. Dr. Richard Olsen, US National, showed me several trees at the Arboretum. Plants have been successful in Tifton, GA, Zone 8. Several small trees in the Dirr garden and yet to have a visitor ID them.

### ***Liriodendron tulipifera*—Tuliptree**

Grows almost too fast! Refrain I hear from nursery producers. Growing successfully in Minnesota Landscape Arboretum (-30°F). Washington and Jefferson's favorite trees. Two planted in 1785 are extant at Mt. Vernon. A 9-foot-diameter tree was removed from Monticello (2008). 'Ardis' is small-statured; 'Little Volunteer' mid-size, from Harald Neubauer, Hidden Hollow Nursery; and 'Tennessee Gold', a heat tolerant, yellow-gold foliage selection, from Don Shadow, Winchester, TN. Emerald City™ ('JFS-Oz') represents the species but offers lustrous dark green leaves compared to species and uniform habit with central leader. Introduced by Schmidt Nursery and truly a worthy cultivar where consistent uniform habit is desired. Replanted Biltmore house with tuliptrees after the originals regressed. First trees were planted in late 1900s and trees were replaced within last ten years, so excellent longevity. Display drought stress by dropping interior leaves. Aphids and sooty mold may infect. Among Bonnie and Mike Dirr's favorite natives as we save every seedling that appears in our garden.

### ***Magnolia stellata* 'Centennial Blush'**

Seedling selection from Georgia, average of 56 tepals per flower, flower buds are formed at almost every node, spectacular in flower, outstanding foliage; much more heat and drought tolerant than given credit, also cold tolerant to zone 4. . Flower buds are rich pink, open to pink and fade to white. Flowers are lightly fragrant. Habit is pyramidal-conical, the original plant about 12' high and 6' wide. Tested, with glowing accolades, by Bailey Nurseries, Minnesota, and licensed to them by the University of Georgia. Might also put in a plug for *Magnolia acuminata*. Latter a noble magnolia; national champion is 79' by 88'. Splendid large area tree. The large leaf, *Magnolia macrophylla* along with *M. tripetala*, umbrella magnolia, are two sleepers for exotic leaf texture and certainly perform well in Georgia to Maine. Numerous yellow-flowered hybrids with *M. acuminata* as a parent. Over 100 selections. The best . . . ? The early yellow introduction, 'Elizabeth', was 35-40' high at the Arnold Arboretum, 2014.

### ***Magnolia zenii* and others**

Was pigeon-holed as a "collector status" plant, but is garden worthy from Zone 4 to 7. 'Pink Parchment', a superior selection, has 9 tepals, pink on outside, white inside, with exceptional fragrance. Flowers open in late January-February. Original tree was 35' by 15' in 13-years. Remarkable heat and drought tolerance in Georgia trials. Introduced by author and named by Bonnie.

Magnolias have been short-sheeted by the urban tree planters, but are among the most resilient of noble and noble trees. I "see" *M. acuminata*, *M. denudata*, *M. kobus*, *M. ×loebneri*, *M. salicifolia*, and *M. ×soulangeana* persisting "beyond infinity." Take a walk along Boylston Street in Boston in spring where the magnolias continue

to thrive. *Magnolia virginiana* is more cold hardy than credited with native populations north of Boston, in Magnolia, Massachusetts. Emerald Tower™ ('JN8') develops a tight-upright habit, 15-20' by 6-8', glossy green foliage, and sweetly scented white summer flowers, from Greenleaf Nursery.

The deciduous and evergreen magnolias have been consolidated into 200 plus species with *Michelia*, *Manglietia* and others. Breeders have produced hybrids among the above genera, some with magnificent floral characteristics. Unfortunately, the evergreen types are not hardy much below zone 7. I have a *Magnolia sieboldii* 'Colossus' x *Manglietia insignis* seedling in the garden. It flowered in late May with the most beautiful pink flower in 2013. In 2014, there were no flowers as temperatures descended to 6 degrees F. There are flower buds in abundance heading into spring 2015. One of the attributes is the late flower time imparted by the *M. insignis*. Cold hardiness will need to be addressed in future breeding.

### ***Nyssa sylvatica*—Blackgum, Tupelo**

A Dirr favorite; Keith Warren is evaluating many selections; has several slated for introduction; great early fall color; ranges from Maine to Texas; Red Rage® ('Hayman Red') with lustrous dark green leaves and red fall color offers consistency of performance; 'Carolyn' from Wisconsin via New Hampshire provenance could be a worthy northern type. 'Wildfire' with bronze-red new growth and yellow to red-purple fall color is worthy. Three plants in the new Dirr garden have performed admirably. Green Gable™ ('NSUHH' PP22,951) with upswept branches, lustrous dark green foliage, and red fall color is the newest from Athena Trees, Inc. ([www.athenatrees.com](http://www.athenatrees.com)). Shows increased resistance to *Mycosphaerella nyssicola* that induces blackish lesions and premature defoliation. Will contract the spot but not to the degree of the typical species. Have a small tree in the garden and fall color is beautiful glistening red. From John Barbour and Alex Neubauer; the best *Nyssa* introduction to date. Snow Flurries™ ('Grechrist'), a cream-margined, green-centered introduction from Greenleaf; Fire Master™ ('PRP1'), also from Greenleaf, with bright red new growth and fiery red fall color, 50-60' by 25'; and Gum Drop® ('JFS-PN Legacy 1') from Schmidt's, more compact habit, glossy green leaves, bright red fall color, are new for 2010-2011. Deep maroon fall color on tree in Dirr garden 2012. Afterburner™ ('David Odum') is another Schmidt introduction for 2012. Not as colorful as previous in fall and with more leaf spot as observed in the Dirr garden. Firestarte® ('JFS-red') has symmetrical, upswept branches and a narrow-oval to upright oval habit, dark green leaves, intense bright red fall color, 35' by 18', zone 5. Schmidt 2015 introduction. 'Salem Weeper' and 'White Chapel' are two additional selections that may be introduced in the future. Both names are tentative. Bill Hendricks, Klyn Nursery, Ohio, has a new upright tupelo, appropriately named 'Tupelo Tower'. Dr. Richard Olsen, USNA, continues to evaluate Dr. Santamour's *Nyssa* hybrids as well as developing new. Witnessed the northeastern most native population of *Nyssa sylvatica* on the campus of the Coastal Maine Botanical Garden, Boothbay, Maine. Scion wood was sent to Schmidt nursery for increase, evaluation and possible introduction. I continue to survey the genetic

diversity in this species and have selected two clones with long persistent leaves into November and excellent red fall color.

### ***Pistacia chinensis*—Chinese Pistache**

Every autumn in the Southeast, the disease resistant foliage turns magnificent yellow, orange, and red. Guaranteed performance! The variation in habit, fall color, and fruit production is maddening, making clonal selection an absolute must. Unfortunately, propagation by grafting/budding and cuttings is inconsistent. The tenacity to thrive in hostile streetscapes and under urban rowdiness is the major attribute. Summer foliage remains glistening, healthy dark green. Tends toward a rounded habit, 30 to 35' by 25 to 35', but will grow larger. Small light blue fruits on female trees. 'Keith Davey', 'Pearl Street', and Sarah's Radiance™ are listed, but seldom available. Western Son® ('Pair's Choice') is a 2015 a Schmidt introduction with spreading to rounded habit, dark green foliage, orange to red in fall, 30' by 30', seedless, zone 6. The cultivar name honors the late John Pair of Kansas State University who dedicated his career to introducing superior trees for the Plains States.

### ***Platanus xacerifolia*—Planetree**

Love the trees; can't stand the mess. Experiencing greater bacterial leaf scorch in recent years. New introductions with Exclamation™ ('Thornhill') and Ovation™ ('Morton Euclid') resistant to anthracnose and powdery mildew; bred by the late Dr. George Ware, Morton Arboretum, utilizing *P. orientalis* (naturally resistant) and anthracnose resistant *P. occidentalis*; Exclamation!(r) is considered better than Ovation™; in production by west coast tree growers; foliage of Exclamation is healthy dark green, 55' by 35', expected hardiness zone 4/5, noted report of mildew on Exclamation. 'Yarwood' had a good run in the southeast. Bacterial leaf scorch has reared its ugly head. Northern Advance™ ('Bismarck') is a Zone 3, adapted sycamore (*P. occidentalis*) from Dr. Herman's NDSU program in 2009. Greenleaf nursery, Oklahoma introduced *P. occidentalis* Silverwood™ ('Grenickel') with white bark to the ground. Fast growing, large foliage, and good branching structure. No mention of anthracnose resistance. 75-100'. Their other introduction is Rockford Road™ ('GREJTN'), again with good white bark. Other features similar to the above.

### ***Prunus*—Flowering Cherries**

*Prunus sargentii* and *P. subhirtella* are considered the most cold hardy flowering cherries. Neither are hardy in Zone 3(4) but Pink Flair® ('JFS KW58' ) proved hardy in Absaroka, ND (Zone 3) over 7 years. Habit is upright, narrow-vase-shape, 25' by 15', semi-glossy dark green leaves, orange-red to red-purple fall color, single pink flowers before the leaves, about 1 to 2 weeks later than species. Truly remarkable is the zone 7 heat tolerance as Pink Flair® maintained healthy foliage into late summer at Milliken Arboretum, Spartanburg, SC, while 'First Lady' and 'Dream Catcher' were miserably distraught. Pink Flair® could be a great breeding parent to increase hardiness. Schmidt Nursery introduction. New cherry introductions include Emerald Charm™ ('Morgenson'), Pink Snow Showers™ ('Pisnshzam'), Spring Wonder™ ('Hokkaido Normandale'), Weeping

Extraordinaire™ ('Extrazam') and Pink Cascade™ ('NCPH1'), a pink weeper with dark green foliage, 12' by 12', developed by Dr. Tom Ranney, North Carolina State University and introduced by Schmidt in 2015. Pretty small weeping cherry that is an alternative to Snow Fountains™. *Prunus* First Blush™ ('JFS-KW14'), a 2016 Schmidt introduction, offers double pink flowers, disease resistant dark green foliage, orange to red fall color, upright narrow oval habit, 25' by 12', zone 5.

### **Pyrus- Pear**

Almost passé or should be as the numerous Callery pear cultivars have become one of the most invasive trees observed in my time on earth. I was once a proponent but am now sickened by what I see in the eastern and southeastern United States. Where birds and animals roam, there are seedlings. Almost un-eradicateable. Until sterile cultivars are developed, I would not plant a pear. As I write this, another pear, Javelin™ ('NCPX1'), will be introduced. Habit is fastigate-columnar, 35' by 10', with purple to bronze-green foliage, pink flower buds open white, fireblight resistant. Nothing mentioned about fruit. From Dr. Ranney's North Carolina State University program.

### **Quercus—Oak**

Still among the best for everyday use; not without problems and in South (and North), bacterial leaf scorch, particularly the Red Oak group, with the recent heat and drought, has been debilitating; I see more hybrids in production like Crimson Spire™ (*Q. alba* × *Q. robur* 'Fastigiata'); Heritage® ('Clemons') (*Q. robur* × *Q. macrocarpa* = *Q. x macdaniellii*); and Regal Prince® ('Long') (*Q. robur* 'Fastigiata' × *Q. bicolor*). Also, the more I observe *Q. bicolor*, the better it looks from Maine to Minnesota to Georgia. Favorites in the white oak group include *Q. alba*, *Q. bicolor*, *Q. macrocarpa*, *Q. montana*, *Q. michauxii*, *Q. muehlenbergii*, *Q. lyrata*, and *Q. virginiana*. Currently, several southern growers (Select Trees, Athens, GA, was a pioneer) are producing own-root (via cuttings) cultivars with excellent uniformity and none of the problems associated with graft incompatibilities. They are marketed under the High-prefix. Hightower® is a superb selection with notable vigor, lustrous dark green foliage, uniform habit. Will outgrow row-run seedlings by 30 to 50%. See [www.treeintroductions.com](http://www.treeintroductions.com) for more information. Also, John Barbour, Bold Spring Nursery, Hawkinsville, Georgia ([www.boldspring.com](http://www.boldspring.com)) has several own-root clonal oak introductions including *Q. nuttallii* Big Boy™, ('QNJB'), Ruby Spring™ ('BSN #5'), and Solshine™ ('QNSR'); *Q. phellos* King Pin™ ('QPSR') produces larger, darker green leaves and more upswept branches than typical *Q. phellos*. In addition, John grows clonal *Q. phellos* Wynstar® ('QPMTF') and Upperton® ('RT3'). *Quercus nuttallii* typically produces red to purple new growth and reasonably good fall color, traits not common to most oaks. Ruby Spring™ has the most intense ruby red young foliage of any *Q. nuttallii* I have observed.

Bonnie and I discovered an upright-columnar swamp white oak (actually *Q. bicolor* × *Q. robur* 'Fastigiata') in Virginia that Schmidt tested and introduced as Beacon™ ('Bonnie and Mike'). Bronze new growth, maturing lustrous dark green, turning beautiful yellow in autumn. Other relatively new clonal oak introductions include: Jordan Street® ('Atwood') – upright spreading habit with rounded crown, parent tree 90' by 75', *Q. macrocarpa* × *Q. alba*; Kindred Spirit® ('Nadler') - upright-pyramidal,

*Q. r.* 'Fastigiata' × *Q. bicolor*; Prairie Stature™ ('Midwest') - broad, pyramidal habit, *Q. robur* × *Q. alba*; Forest Knight® ('Tabor')- oval-rounded habit, 50' by 40', *Q. robur* × *Q. alba*; Walkenbach™ ('Adeline'), upright tight-pyramidal habit, *Q. robur* 'Fastigiata' × *Q. bicolor*. Most of these hybrids oak introductions are grafted and from my observations do not develop incompatibility problems. *Quercus ellipsoidalis* Majestic Skies™ ('Bailskies'), *Q. nuttallii* Charisma™ ('MonPowe'), *Q. ×bimundorum* Prairie Stature® ('Midwest'), and *Q. macrocarpa* Urban Pinnacle™ ('JFS-KW3') – pyramidal with central leader, glossy dark green leaves, anthracnose, and mildew resistant are new introductions for 2010 and 2011. Schmidt introduced American Dream™ ('JFA-KW12'), a *Q. bicolor* with glossy bright bronze-green emerging leaves, lustrous dark green at maturity, anthracnose and powdery mildew resistance, has been an outstanding performer in the heat of Georgia; Cobblestone® ('JFS-KW14'), a *Q. macrocarpa* form, with corky branches, anthracnose and mildew resistance, broad-oval habit, 50' by 40'; and Streetspire™ ('JFS-KW1QX'), *Q. robur* × *Q. alba*, with narrow columnar form, red fall color, and complete leaf drop, 45' by 14'. Skinny Genes™ ('JFS-KW2QX'), *Q. robur* × *Q. alba*, is narrow columnar, 45' by 10', with glossy dark green leaves, yellow fall color. Schmidt introduction.

*Quercus virginiana*, live oak, the essential native shade and street tree in the coastal southeast into Texas has been upgraded by the introduction of new cultivars, including Boardwalk® ('FBQV22'), Cathedral® ('SDLN'), Highrise® ('QVTIA'), Millenium® ('CLTF2'), and Park Side® ('FBQV1'). All are clonally propagated and thus are uniform in characteristics, unlike seed-grown trees.

Anyone enthused about oaks should own *Field Guide to Oaks of Eastern North America*, 2003, Diane Publishing Co., Darby, PA.

### ***Syringa reticulata* / *Syringa reticulata* subsp. *pekinensis*—Lilac**

Great cold hardy, small flowering trees with many newer cultivars. 'Chantilly Lace', 'China Gold', 'Golden Eclipse', 'Ivory Silk', 'Regent', Signature™ ('Sigzam'), Snow Cap™ ('Elliott'), Snow Dance™ ('Bailnce'), (fruitless or almost so, pretty tree, graces the entrance to Bailey Nursery offices) 'Summer Snow' from *S. reticulata*; Beijing Gold® ('Zhang Zhiming'), China Snow® ('Morton'), Copper Curls™ ('SunDak'), Summer Charm® from *S. pekinensis* (now *S. reticulata* subsp. *pekinensis*). China Snow® develops early exfoliating copper-amber bark. Tend to leaf out early in the Southeast and not particularly heat tolerant. Best performance in Zone 3 to 6. Subspecies *pekinensis* is more heat tolerant than the *S. reticulata*. Large trees at Raulston and Coker Arboreta, North Carolina, reflect increased heat tolerance. Bill Hendrick's, Klyn Nurseries, Inc. introduced subsp. *pekinensis* Great Wall™ ('WFH2' PPAF) with uniform upswept branches resulting in an upright-oval habit, grows 20-25' by 12-15', dark green glossy foliage turns shades of gold in autumn, cherry-like, exfoliating bark, white flowers in June. Typical *S. reticulata* and subsp. *pekinensis* are not very uniform from seed. Variation is phenomenal. At Plant Introductions, seedlings of both were exceptionally ugly except for one, a *reticulata*, with central leader and uniform branching. Has been easy to graft and root from cuttings. Now in 4<sup>th</sup> year and waiting for the first flowers.

### ***Taxodium distichum*—Common Baldcypress**

Earl Cully, Jacksonville, Illinois, recognized the inherent greatness within the genus and introduced five cultivars with Shawnee Brave® ('Michelson') still among the best. Autumn Gold™ ('Sofine') is another improved selection. Grows about anywhere except calcareous soils. Several growers consider this the best. Trees in Minnesota, New York, and Ohio have withstood -20 to -30°F. 'Peve Minaret' is a columnar-pyramidal form, 10' by 3' with dark green needles closely spaced along the stems. 'Cascade Falls' and 'Falling Water' ('Fallingwater') are weeping selections, the first irregular but artistic; the second with more of a central leader and secondary branches uniformly weeping. Green Whisper™ ('JFS-SGPN') is a fine-textured, soft green needled selection from Orangeburg, SC. Schmidt's considers this one of the best of the recent introductions. Lindsey's Skyward™ ('Skyward', PP22,812) forms a symmetrical column, 25-30' by 5-10'. New from Schmidt's in 2013. Augusta, Georgia, Asheville, North Carolina, and San Antonio, Texas have splendid plantings attesting to the species widespread adaptability. Earl Cully's *T. d. var. imbricarium* 'Prairie Sentinel' is the feathery, columnar, 60' by 10', standard that survived -24°F. Additionally, *var. imbricarium* 'Carolyn Malone' and 'Homer', with good russet fall colors and tight habits, are under evaluation. Latter two from John Malone, Summer Shade Nursery, Good Hope, Georgia. Greenfeather™ ('Carolyn Malone'), soft bright green foliage, rusty orange fall color, 50' by 20', was introduced by Schmidt in 2015/16. Hybrids of *Taxodium distichum* and *T. mucronatum* have been introduced from China by Dr. David Creech, Stephen F. Austin University, Texas. I have grown several and they are faster than typical *T. distichum*. Cold hardiness is unknown.

### ***Tilia*—Linden**

Almost gave up on lindens (too many *T. cordata* clones) but continue to witness wonderful specimens. Summer Sprite® ('Halka') from Halka is a compact, broad-pyramidal form that performs well in Zone 7; 20' by 18', at Schmidt's, Chancellor® ('Chancole'), Corinthian® ('Corzam') and 'Olympic' continue to impress for habit and foliage. Corinthian® doing well at Milliken Arboretum and maintaining glossy dark green foliage into autumn. This is a more compact selection with smaller glossy dark green leaves. My field notes state that 'Olympic' with symmetrical form, uniform branching and glossy dark green leaves at Schmidt Arboretum puts Greenspire® to shame. 'Harvest Gold' (*T. cordata* × *T. mongolica*) was superior in foliage to all *T. cordata* at Schmidt Arboretum, 2010; suffered in heat and drought of 2008 at Milliken Arboretum. *Tilia kiusiana* is a small-statured linden with elegant foliage and exfoliating bark. This could be a sleeper. From southern Japan (Kyushu) and may prove heat tolerant. Also, *Tilia americana* ranges from Maine to Florida and offers numerous opportunities for superior selections. An enterprising breeder could make hay with a *Tilia* hybridization program. Worth noting that the taxonomy of *Tilia* species is not absolute and species' estimates range from 20 to 40. Chinese species offer exciting opportunities for increasing the landscape diversity of this most beautiful genus.

### ***Ulmus*—Elm**

Used to be simply the mention of the name was akin to swearing. Does not appear the situation today with *U. americana* being reestablished, especially the selections

'Princeton', 'Jefferson', 'Valley Forge', and 'New Harmony'; also newer selections 'Creole Queen' from Louisiana and Prairie Expedition™ ('Lewis and Clark') from North Dakota. Colonial Spirit® ('JFS-Prince II') grows 65' by 60', resistant to Dutch elm disease (tested via inoculations), typical American elm habit, 2015/16 Schmidt introduction, zone 4. 'St. Croix' is a Bailey nursery 2015/16 introduction from Minnesota. Controlled inoculations have proven it resistant to Dutch elm disease. Selected from a native stand of DED-infected elms. 60-75' by 70-90'. Important to utilize DED-resistant American elms that have been propagated by cuttings (own-root propagation). Hybrids (largely) from Morton Arboretum have not impressed with exception of Triumph™ ('Morton Glossy'); Accolade™ ('Morton'), Commendation™ ('Morton Stalwart'), Danada Charm™ ('Morton Redtip') and Vanguard™ ('Morton Plainsman') are wild and woolly. New selection, Emerald Sunshine® ('JFS-Bieberich'), from *U. propinqua* (now *U. davidiana* var. *japonica*), with a thick leaf and heavy pubescence on lower surface that minimizes elm leaf beetle damage. New *Ulmus parvifolia* 'Small Frye' with broad-rounded head, dark green foliage, exfoliating bark, and small stature is in the introduction process. Classic lacebark elms include: Allée® ('Emer II'), Athena® Classic ('Emer I'), Bosque® ('UPMTF'), and Everclear® ('BSNUPF'), all from Georgia growers. A 2011 introduction, Emerald Flair™ ('JFS-Barrett'), has excellent deep green foliage, red fall color, and upright-spreading, vase-shaped habit, 40' × 35', according to Schmidt's. From George Barrett, Augusta, Georgia.

Dr. George Ware, Morton Arboretum, sourced 12 Chinese species including: *U. gausseii* (Anhui), *U. bergmanniana* (Bergman), *U. chenmoui* (Chenmou), *U. castaneifolia* (Chestnut), *U. propinqua* var. *suberosa* (Corkbark), *U. davidiana* var. *mandshurica* (Father David), *U. glaucescens* var. *lasiocarpa* (Gansu), *U. harbinensis* (Harbin), *U. lamellosa* (Hebei), *U. prunifolia* (Plum-leaved), *U. taihangshanensis* (Taihang Mountain), and *U. microcarpa* (Tibetan). Dr. Ware was intrigued by the Anhui elm as it thrives in streamside habitats and thus may tolerate low soil oxygen levels.

Have observed American elm devastation from Georgia to Prince Edward Island, Canada. On the University of Massachusetts campus, Amherst, ~every American elm was lost. The *Ulmus japonica* trees are still extant. In fact, a venerable old specimen was planted by South College in 1890 and is still beautiful. A testimonial to Dutch elm disease resistance. I grafted it in March, 2012 with 6' trees by the end of the growing season. Also, rooted cuttings from the grafted trees. Possible introduction? I hope so.

Another little known elm is *Ulmus laciniata* var. *nikoense* with a vase-shape habit and a leaf with three lobes toward the apex. There is a planting at the Arnold Arboretum that has withstood the ravages of the Dutch elm disease. The trees were extant and healthy as of May, 2013.

### **Zelkova serrata—Japanese Zelkova**

Some of the luster has faded from the species. Still common with new selections like City Sprite™ ('JFS-KW1'), Myrimar® ('ZSFKF'), and Wireless® ('Schmidtlow') surfacing. Considered an American elm substitute but I have yet to witness a

*Zelkova serrata* that measures up. Notable exception is the 60' by 80' specimen in Centerville, Cape Cod. Would love to bring this into cultivation. Perhaps a vestige from a ship captain's adventures. 'Green Vase' and 'Village Green' are still the standards. 'Musashino' is an upright columnar selection useful for limited growing spaces. It is the first *Zelkova* to leaf out in spring. Also, 'Ogon' ('Bright Park') has soft yellow-gold leaves that turn green in summer. Winter stems and bark are orange-amber. 'Green Veil' is a graceful weeping form. A 30-40' high specimen resides in the Arnold. Was planted during my first sabbatical, 1978-79. The current size estimate is from May, 2013.

Little-known *Zelkova schneideriana* may prove a sleeper among *Zelkova* taxa as it develops beautiful red fall color with a slightly more graceful vase-shaped habit than *Zelkova serrata*. Not the easiest species to separate from *Z. serrata*, but I have observed outstanding fall color on a specimen at the Morris Arboretum near Philadelphia, PA, that is certainly worthy of clonal status. A single plant in the Georgia trials has grown vigorously but produces yellow fall color.

Also, *Zelkova sinica*, Chinese zelkova, is adapted to Zone (6)7 and 9 and is probably preferable to *Z. serrata* in hot climates. Successfully grown in Athens and Savannah, Georgia. A venerable specimen at the Arnold Arboretum reflects a measure of cold hardiness, at least zone 6. This accession was received as wild collected seed from China in 1920.

Certainly, there are additional genera that can be manipulated to produce improved urban and suburban trees. The major liner producers are searching for cultivars that can be sold in adequate numbers to justify introduction. Think adaptability and long-term performance when assessing whether a selection has any hope in the market. A few Dirr sleeping generic (and species) giants are *Carya*, *Catalpa*, *Celtis*, *Cladrastis*, *Halesia*, *Maackia* ('Starburst,' MaacNificent® ('JFS-Schichtel1'), and 'Summertime' are improvements on the species) *Liquidambar* (sterile), *Maclura*, *Magnolia (acuminata)*, *Ostrya virginiana*, *Parrotia*, *Planera aquatica*, *Pterocarya*, *Styrax*, *Pteroceltis*, and *Viburnum* (tree species like *V. sieboldii*, *V. lentago*). There are a number of *Catalpa* cultivars, with yellow leaf 'Aurea' from *C. bignonioides*, the most common. Heartland™ ('Hiawatha 2') from Schmidt is to my knowledge the first large tree introduction from *C. speciosa*. Grows 50' by 25', dark green leaves, more uniform branching, zone 5. In my travels I observe *Catalpa speciosa* in old abandon fields and homesteads from Canada to Georgia. Remarkably adaptable tree that deserves more respect. A sterile cultivar would be a welcome addition to our shade tree palette. *Celtis occidentalis* Prairie Sentinel® ('JFS-KSU1') is a tight columnar selection, 45' by 12', zone 4, discovered on a barren rocky plateau in western Kansas. New 2016 *Ostrya virginiana* Autumn Treasure™ ('JFS-KW5') from Schmidt, 40' by 20', upright pyramidal to oval, dark green summer foliage, yellow fall color and clean leaf drop in fall, first cultivar of hophornbeam to my knowledge.

*Halesia carolina* Crushed Velvet™ ('JFS-PN2Legacy') has thickish textured, rugose, blue-green leaves, white flowers, and more compact habit. New in 2011-2012 from Schmidt's. I am enamored with the species and this selection, with its smaller size, 20' by 15', should find a home in many gardens. Have grown in the Dirr garden but

has not demonstrated great vigor. Another beauty is 'Rosy Ridge' from Hawksridge Nursery, Hickory, North Carolina, and Schmidt's. Large pink flowers on a 30' by 20' tree. I have observed the parent tree. This may be the best of the pink-flowered forms of *Halesia* and is superior to 'Arnold Pink'. Beautiful in the Dirr garden, Spring, 2013. Currently, ~12 cultivars of *Halesia carolina* including a weeping selection, 'Lady Catherine'. *Halesia diptera* var. *magniflora*, two-winged silverbell, has large white flowers with a split corolla and a two-winged fruit. Produces beautiful yellow fall color in the south. Has survived greater than -20 F in Cincinnati.

*Parrotia subaequalis*, Chinese parrotia, with vibrant orange-red fall color and superb heat tolerance is on the horizon. Cold hardy in Boston and remarkably heat tolerant in Athens, Georgia. Easy to root from cuttings and I believe could be a great new species addition to North American gardens. Tremendous fall color in Dirr garden 2012-14. Initiated maroon in late October, then orange-red-purple, and on November 12 back to maroon. Leaves exceptionally frost resistant. I grow this and *P. persica* and the Chinese species has superior fall color. *Parrotia persica* is cold [Zones (4)5], heat, and drought tolerant. Plants in a traffic island on the Georgia campus continue to thrive 30 years after planting with no supplemental water. Need superior fall coloring selections. 'Persian Spire' from JPLN Nursery, Oregon is distinctly upright in habit with smaller, brilliantly fall-colored orange-red leaves. Emerging leaves with a purple-haloed margin. Fall color in 2011 at Plant Introductions was striking fluorescent pink-rose-red. 'Red Bull' is a new red fall colored selection from Azerbaijan. Fall color is spectacular orange-red-purple, habit is loose and spreading. Extremely fast growing in Dirr garden trial. I discovered a beautiful red fall colored, upright habit seedling in Massachusetts. Am working on getting this into commerce. Much more compact, uniform and densely branched than 'Red Bull'.

*Styrax japonicus*, Japanese snowbell, and *S. obassia*, fragrant snowbell, are necessities in any garden. Unfortunately, the former has yielded many cultivars, most without staying power. 'Spring Showers' from Dr. Sandra Reed's USNA breeding program, is certainly one of the best for the South (Zones 5 to 8). Tight conical outline, 15 to 20' by 8 to 12', lustrous dark green, heat and drought resistant leaves, and abundant, 3/4" diameter, white fragrant flowers add to the festivities. Evaluated for eight years in Georgia trials and it has yet to flinch. Snow Charm® ('JFS-E') and Snowcone® ('JFS-D') are improvements over the species. Both tree-like with uniform habits. 'Evening Light' ('Kolster's Purple') has deep maroon (purple) foliage (young leaves), lustrous dark green with purple suffusion in heat of summer, white flowers and compact upright oval habit, 15' by 10', zone 5. New in 2016 from Schmidt's. A stunner! A small tree in the Dirr garden has proved exceptional in its first four years (since 2012). Several weeping types include 'Fragrant Fountains' with white flowers and 'Marley's Pink Parasol' with pink flowers and lustrous dark green foliage. Observed the latter at JPLN Nursery in Oregon. Attractive new introduction, now in Dirr garden and performing well. Asian/granular ambrosia beetles love *Styrax* so be vigilant.

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