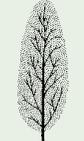
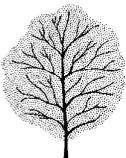
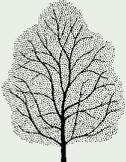
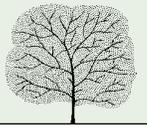
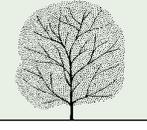
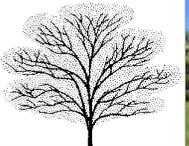
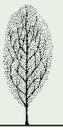


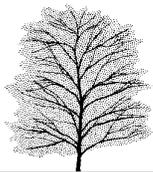
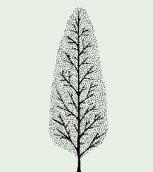
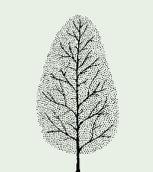
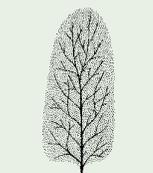
New Deciduous Tree Cultivars and Suggestions for Denver - Keith Warren

NAME			SIZE			SHAPE	FOLIAGE	FALL COLOR	FLOWER	FRUIT	BARK
			H	W	ZONE						
<p><i>Acer griseum</i> 'JFS KW8AGRI' Fireburst® Paperbark Maple</p> <p>Superior branch structure, upright and uniform shape, predictable performance and speedy growth are among attributes of this Paperbark Maple cultivar. Bark coloration and exfoliating character are outstanding, as is the quality of dark green foliage that turns brilliant red in autumn.</p>			25'	18'	5	Upright oval	Dark green, trifoliolate	Deep pink buds open to pink blooms, single	N/A	N/A	Reddish-brown, smooth with exfoliating papery curls
<p><i>Acer griseum</i> 'JFS KW22AGRI' Copper Rocket™ Paperbark Maple</p> <p>Predictably narrow form and upright branch structure make this tough and adaptable cultivar a perfect choice for space challenged landscapes. An all-season beauty that delivers winter interest with satin smooth bark that exfoliates in coppery curls.</p>			25'	12'	5	Narrow columnar	Dark green, trifoliolate	Brilliant red	N/A	N/A	Coppery brown, smooth with exfoliating papery curls
<p><i>Acer truncatum</i> × <i>A. plat.</i> 'JFS-KW249' PP 27985 Ruby Sunset® Maple</p> <p>Elegant foliage stays fresh and glossy throughout the growing season. Hybrid origin adds cold hardiness and adaptability to this selection that most resembles <i>A. truncatum</i> in appearance, growth habit and size. A great choice for smaller sites requiring a more compact tree.</p>			25'	20'	4b	Broadly oval to rounded	Dark green, glossy	Deep red	N/A	N/A	N/A
<p><i>Aesculus hippocastanum</i> 'Baumannii' Baumann Double Horsechestnut</p> <p>Profuse, showy blooms that outlast those of the species are sterile. Large panicles of double white flowers show slight tints of red and yellow. Seedless character makes it the favorite horsechestnut for street planting.</p>			50'	40'	4	Broadly oval	Dark green, palmately compound	Yellow	Large double white upright panicles	Seedless	N/A
<p><i>Carpinus caroliniana</i> 'JFS-KW6' Native Flame® American Hornbeam</p> <p>This versatile native species is ripe for cultivar development, and Native Flame® leads the pack into bright fall colors. Selected for good upright growth and form, and especially for its bright red fall color. It combines the graceful informality of a native with the brilliant colors of a modern cultivar.</p>			30'	20'	5	Upright oval	Green	Red	N/A	N/A	N/A
<p><i>Carpinus caroliniana</i> 'Uxbridge' Rising Fire® American Hornbeam</p> <p>A lively mix of bright red and orange fall colors and distinctive columnar shape combine to offer a new look for a popular and widely adaptable North American native tree. Growers appreciate its vigorous yet mannerly growth habit and ease of care in the nursery. Ontario, Canada origin promises good cold hardiness.</p>			30'	15'	4	Upright, narrow	Medium green	Red to orange	N/A	N/A	N/A

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			H	W	ZONE						
<p><i>Catalpa speciosa</i> 'Hiawatha 2'</p> <p>Heartland® Catalpa</p> <p>Narrow form, upright growth habit, uniform branching, and darker green foliage recommend this improved selection of our native Northern Catalpa. Easier to grow in the nursery, it is more suitable for most landscape and street uses than seedling-grown trees of the species.</p>			50'	25'	5	Upright narrow oval	Dark green, large leaved	Yellow-green	White, in large clusters	N/A	N/A
<p><i>Cercis canadensis</i> 'Morton'</p> <p>Joy's Pride™ Redbud</p> <p>Bright blooms bring joy to Morton Arboretum visitors, where Joy's Pride™ was discovered and named for the arboretum's founder, Joy Sterling Morton. Proven reliably cold hardy by Chicagoland winters in which temperatures have plunged as low as -34 °F.</p>			15'	20'	5	Oval to spreading	Green, heart-shaped	Yellow	Bright lavender pink	N/A	N/A
<p><i>Cercis canadensis</i> 'UMN7101'</p> <p>Heart's Desire™ Redbud</p> <p>Blooming beautifully for more than 40 years in the Minnesota Landscape Arboretum, this time-tested, exceptionally hardy introduction of the University of Minnesota welcomes spring with a profusion of lavender pink blooms. The stunning display of flowers is a welcome sight after the long, dark days of winter.</p>			15'	20'	4	Rounded, spreading	Medium green	Yellow	Lavender pink	N/A	N/A
<p><i>Cercis canadensis</i> 'Pink Trim'</p> <p>Northern Herald® Redbud</p> <p>This extremely cold hardy selection discovered in central South Dakota brings bright pink blooms to prairie and mountain landscapes. Introduced by North Dakota State University, its dark green, leathery leaves are heat resistant and wind tolerant.</p>			20'	20'	4	Rounded	Dark green, leathery	Yellow	Bright magenta pink, profuse	Sparse	N/A
<p><i>Cornus controversa</i> 'June Snow-JFS'</p> <p>June Snow™ Dogwood</p> <p>Fast growing and wide spreading, with branches developing a horizontally tiered appearance. Flat topped clusters of white flowers often exceed 6" in diameter. Outstanding fall color; mottled orange-yellow, red, and purple-red.</p>			30'	40'	5	Horizontally layered, spreading	Dark green	Orange to red	White, in flat-topped clusters	Blue-black, ¼", clustered	N/A
<p><i>Cornus mas</i> 'JFS PN4Legacy'</p> <p>Saffron Sentinel® Cornelian Cherry</p> <p>Bright yellow flowers emerge along winter-bare branches of this vigorous, symmetrical, columnar tree. Dark green foliage follows, remaining clean through the summer months before turning deep crimson in autumn. Tart and tasty bright red fruit ripens in late summer to early fall. Attractive dark brown bark exfoliates with age.</p>			22'	12'	4	Columnar	Dark green	Dark reddish purple	Bright yellow	Bright red, ½", oblong	N/A

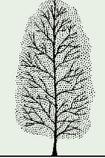
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NAME			SIZE			SHAPE	FOLIAGE	FALL COLOR	FLOWER	FRUIT	BARK
			H	W	ZONE						
<p><i>Fagus sylvatica</i> 'Asplenifolia' Fernleaf Beech</p> <p>A large growing cultivar with crisp, dark green, cutleaf foliage. The branching gives the tree the appearance of closely layered, fan like sprays.</p>			50'	40'	5	Broadly oval	Cutleaf, green	Golden brown	N/A	N/A	N/A
<p><i>Ginkgo biloba</i> 'Blagon' Goldspire Ginkgo</p> <p>Introduced from France, this densely branched, tightly fastigiate cultivar forms a narrow, symmetrical spire at a younger age than is typical of other columnar selections. Leathery, fan-like foliage turns golden yellow in autumn.</p>			45'	12'	4	Narrowly columnar	Green	Bright golden yellow	N/A	Seedless	N/A
<p><i>Ginkgo biloba</i> 'The President' Presidential Gold® Ginkgo</p> <p>Pure gold in autumn, its distinctive, fan-shaped green leaves and upright branches form an unusually dense, symmetrical canopy at a young age. This seedless and pest-free tree is tough and adaptable to a wide range of soils and growing conditions.</p>			50'	40'	4	Broadly pyramidal to oval	Medium green	Bright yellow	N/A	Seedless	N/A
<p><i>Gleditsia triacanthos</i> 'JFS GMorgenson1' Northern Sentinel™ Honeylocust</p> <p>Narrowly upright growth habit makes this storm resistant Honeylocust a great fit for street tree plantings. The parent tree has never been observed to have suffered ice or snow damage. Nor has it produced seed, although we can make no claim of its being seedless under all growing conditions.</p>			45'	25'	4	Upright vase to upright oval	Fine textured, medium green	Yellow	N/A	Sparse	N/A
<p><i>Gymnocladus dioica</i> 'Espresso-JFS' Espresso™ Kentucky Coffee Tree</p> <p>The huge doubly compound leaves give this tree a tropical feel, and the arching branches present an elm-like form. This is a seedless selection. Good tolerance of heat, drought, and cold.</p>			50'	35'	4	Oval to vase with upright arching branches	Fronde-like fans of delicate bluish green leaves	Yellow	N/A	Seedless	N/A
<p><i>Gymnocladus dioica</i> 'Morton' Skinny Latte™ Kentucky Coffee Tree</p> <p>Stiffly upright structural branches ascend vertically to form a remarkably narrow canopy and unique winter silhouette. Originating from a seedling acquired by the Morton Arboretum in 1958, the unique selection is an introduction of ChicagolandGrows®.</p>			50'	18'	4	Narrow vase, nearly columnar	Green leaflets form large, frond-like fans	Yellow	N/A	Seedless	N/A

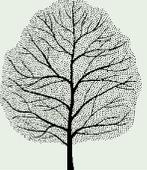
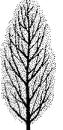
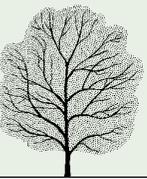
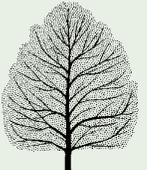
New Deciduous Tree Cultivars and Suggestions for Denver - Keith Warren

NAME	SIZE			SHAPE	FOLIAGE	FALL COLOR	FLOWER	FRUIT	BARK		
	H	W	ZONE								
<p><i>Liriodendron tulipifera</i> 'JFS-Oz' Emerald City® Tulip Tree</p> <p>A refined cultivar of our familiar native tulip tree, this uniform growing selection is straighter and more upright, with a dominant central leader and deeper green, slightly glossy foliage.</p>			55'	25'	4b	Upright oval, slightly compact	Deep green, glossy	Bright, clear yellow	Yellow to greenish yellow with orange center	N/A	N/A
<p><i>Magnolia</i> 'NCMX1' PP 29218 Mercury® Magnolia</p> <p>Deep pink buds open to very large lavender pink blooms. Flowering up to a month later than other <i>M. soulangeana</i> cultivars greatly reduces risk of frost damage to blooms. A strong central leader and upright branching result in a tree with excellent pyramidal form. Developed by Dr. Tom Ranney of North Carolina State University.</p>			25'	15'	5	Upright pyramidal	Dark green	Yellow	Bright lavender pink, fragrant	N/A	N/A
<p><i>Magnolia</i> × <i>loebneri</i> 'Ruth' P.A.F. Spring Welcome® Magnolia</p> <p>Pink buds unfurl to large, white, multi-petaled blooms that are followed by clean, dark green, heat tolerant leaves. Tested and introduced by North Dakota State University, this pest free, pH adaptable, winter hardy selection blooms reliably even after early spring frosts and winter lows of -35 °F.</p>			20'	20'	3	Dense oval to rounded	Dark green	Yellow green to bronze	Pale pink in bud, opening to white	N/A	N/A
<p><i>Malus</i> 'Jarmin' PP 14337 Marilee® Crabapple</p> <p>Pink buds open to unusually large, white, double blooms. Unique for its stiffly upright, narrow form and virtually fruitless nature, it is an excellent choice for courtyard settings and streetscapes, and for use near utility lines.</p>			24'	10'	4	Narrow upright, inverted cone	Medium green	N/A	Double, large white	Virtually fruitless	N/A
<p><i>Malus</i> 'JFS KW214MX' PP 31076 Ivory Spear® Crabapple</p> <p>Deep pink buds open to white flowers on this densely upright, narrow crabapple. Leaves stay clean and disease free throughout the growing season, forming a uniform column of dark green foliage in the landscape. Bright cherry red fruits contrast well with the leaves and persist into late autumn.</p>			18'	7'	4	Narrow, tightly columnar	Dark green	N/A	White	Bright red, ½"	N/A
<p><i>Malus</i> 'JFS KW213MX' PP 31008. Raspberry Spear® Crabapple</p> <p>Deep pink buds open to bright magenta flowers on this tightly columnar crabapple. Clean and disease-free summer foliage holds its dark purple color; bronzing on the older leaves in late summer and early fall, when orange tints appear. Purple-red fruits ripen to deep bright red and persist into late autumn or early winter.</p>			20'	8'	4	Narrow upright column	Purple	Orange	Magenta pink	Maroon to deep red, ½", persistent	

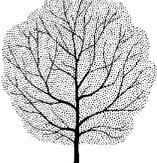
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			H	W	ZONE						
<p><i>Malus</i> 'JFS-KW207' PP27954 Sparkling Sprite® Crabapple</p> <p>Pink buds opening to white flowers smother the dense, rounded head of this top-grafted, compact dwarf. Summer foliage is especially clean and bright green. An abundant fruit crop persists well into winter, slowly turning from golden yellow to orange.</p>			12'	12'	4	Compact, dense, round	Bright green	N/A	White opening from pink buds	Yellow to golden orange, ¼"	N/A
<p><i>Malus</i> 'JFS KW218MX' Snow Crystal™ Crabapple</p> <p>Bright white flowers smother the branches of this densely branched, symmetrical tree in spring. Blooms are followed by dark green leaves that accentuate its distinctively compact, pyramidal form. Yellow to golden orange fruits take the four-season show into the winter months.</p>			15'	12'	4	Pyramidal, compact	Dark green	N/A	Single bright white, opening from pink buds	Yellow to golden orange, ¼"	N/A
<p><i>Malus</i> 'JFS KW139MX' PP 31232 Ruby Dayze® Crabapple</p> <p>Perhaps the first purple leaf flowering crab to challenge the purple leaf flowering plums. Flowers are almost the same color as the leaves.</p>			22'	16'	4	Upright, tightly oval	Purple red, becoming bronze	N/A	Bright magenta pink	Deep red, ¼"	N/A
<p><i>Ostrya virginiana</i> 'JFS-KW5' Autumn Treasure® Hophornbeam</p> <p>At last, a hophornbeam suited for city living. Predictably upright narrow form facilitates uniform street tree plantings. Unlike many trees of seedling origin that hold brown leaves throughout the winter, fall leaf drop is clean and complete.</p>			40'	20'	4	Upright pyramidal to oval	Dark green	Golden yellow	N/A	N/A	N/A
<p><i>Parrotia persica</i> 'Vanessa' Vanessa Parrotia</p> <p>Tighter, with greater density, and more upright than the species, Vanessa is a better choice for smaller landscapes or for use near streets. Fall color varies from orange to red and is always impressive.</p>			28'	14'	5	Upright, tight vase	Green, textured	Orange-red	Showy red stamens	N/A	N/A
<p><i>Parrotia persica</i> 'JLColumnar' PP 24951 Persian Spire™ Parrotia</p> <p>Unique for both its form and fine texture, this strongly upright tree is a colorful choice for hedges, screens and formal street plantings. Refined foliage emerges purple and matures to green with purple tinted margins that linger into the summer months. Fall color is bright and long lasting.</p>			25'	10'	5	Columnar to upright oval	Green, fine textured	Orange, red yellow and burgundy	Showy red stamens	N/A	N/A

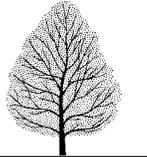
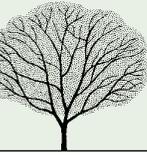
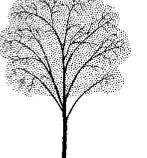
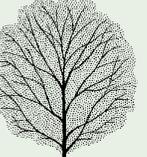
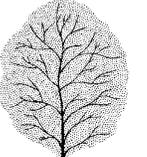
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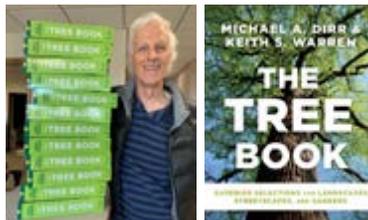
NAME			SIZE			SHAPE	FOLIAGE	FALL COLOR	FLOWER	FRUIT	BARK
			H	W	ZONE						
<p><i>Prunus sargentii</i> 'JFS-KW58' Pink Flair® Cherry</p> <p>Narrow and upright in form, but compact in height, this flowering cherry is well suited for urban landscapes. It avoids frost damage by flowering a week or two later than is typical of the species and has proven to be the hardiest of the flowering cherries. Fall color is consistently bright orange-red.</p>			25'	15'	3b	Upright narrow vase	Dark green	Orange-red	Single pink, in clusters	N/A	N/A
<p><i>Quercus bicolor</i> 'JFS-KW12' PP 23632 American Dream® Oak</p> <p>Vigorous growing and broadly pyramidal with excellent density, this tree shines with bright green, glossy foliage. Selected for strong resistance to anthracnose and powdery mildew, the broad, handsome leaves turn yellow and then tawny brown as they hold into early winter.</p>			50'	40'	4	Broadly pyramidal	Bright green, glossy	Yellow	N/A	N/A	N/A
<p><i>Quercus bicolor</i> 'Bonnie and Mike' Beacon® Oak</p> <p>Tightly columnar and urban adaptable, this oak was discovered by famed plantsman Dr. Michael Dirr. The stout upright branching structure and dense green foliage makes this an ideal street tree and provide a strong visual statement. Nice yellow fall color.</p>			40'	15'	4	Narrowly columnar	Green	Yellow	N/A	N/A	N/A
<p><i>Quercus macrocarpa</i> 'JFS-KW14' Cobblestone® Oak</p> <p>A traditional form of bur oak with the corkiest bark we have observed in the nursery. With bur oak's rugged form and unusually corky branches, it has an "ancient tree" look at a young age. The handsome foliage is dark green and the tree was selected for mildew and anthracnose resistance.</p>			55'	45'	3	Broadly oval	Dark green	Yellow	N/A	N/A	N/A
<p><i>Quercus macrocarpa</i> 'JFS-KW3' PP 22815 Urban Pinnacle® Oak</p> <p>Narrow and upright with a strong central leader, this cultivar also features attractive glossy foliage and resistance to both mildew and anthracnose. Acorns of about 1/2" diameter are extremely small for a bur oak, making it a more suitable tree for landscape and street tree use.</p>			55'	25'	3	Narrow, pyramidal to oval	Dark green, glossy	Yellow	N/A	Small acorn	N/A
<p><i>Quercus x macdanielii</i> 'Clemons' Heritage® Oak</p> <p>Handsome dark green foliage, a broadly pyramidal form, and mildew resistance combine to make this an excellent street tree. An English x bur oak hybrid, it has better cold tolerance than English oak.</p>			50'	40'	4	Broadly pyramidal to oval	Dark green, glossy	Yellow	N/A	N/A	N/A

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			H	W	ZONE						
<p><i>Quercus robur</i> × <i>alba</i> 'JFS-KW2QX' PP 24442 Skinny Genes® Oak</p> <p>Columnar and fastigate in form, it is the narrowest yet of the English x White Oak hybrids. The glossy, very dark green summer foliage is mildew resistant and gives a clean summer appearance, then turns yellow in autumn. Selected from second-generation seedlings of a sister of Crimson Spire™.</p>			45'	10'	4	Columnar, tightly fastigate	Dark green, glossy, mildew resistant	Yellow to tawny yellow	N/A	N/A	N/A
<p><i>Quercus robur</i> × <i>alba</i> 'JFS-KW1QX' Streetspire® Oak</p> <p>Dark green leaves of this narrowly columnar tree are mildew resistant. Turning red in autumn, they fall to reveal stiffly upright branches. Similar to Crimson Spire™, but does not hold brown foliage through the winter. Wide crotch angles and short upsweeping branches create a storm resistant structure.</p>			45'	14'	4	Narrow, columnar	Dark green	Rusty red	N/A	N/A	N/A
<p><i>Quercus velutina</i> Northern Black Oak</p> <p>Very similar in appearance to Red Oak, differences include its ability to thrive on poor and varied soils. Naturally occurring trees are often found on poor sandy sites or heavy clay hillsides. Deeply furrowed bark on mature trees is nearly black.</p>			50'	45'	4	Oval to rounded	Dark green	Rusty red	N/A	N/A	N/A
<p><i>Syringa pekinensis</i> 'WFH2' P.A.F. Great Wall™ Tree Lilac</p> <p>Sparkling white flower clusters in late spring, glossy green foliage, and cherry-like, exfoliating bark recommend this compact beauty as an all-season ornamental. Pest and disease resistance, adaptability and small stature merit its inclusion in our UtiliTrees™ program.</p>			20'	12'	3	Upright oval	Dark green, glossy	Golden yellow	Bright white, in clusters	N/A	N/A
<p><i>Taxodium distichum</i> 'Cascade Falls' Cascade Falls Bald Cypress</p> <p>As its name implies, soft green foliage cascades from gracefully weeping branches. This deciduous conifer grows to the height to which it is staked, then weeps to the ground.</p>			10'	12'	5	Weeping	Fine textured, green	Rusty orange	N/A	N/A	N/A
<p><i>Taxodium distichum</i> 'Mickelson' Shawnee Brave™ Bald Cypress</p> <p>A deciduous conifer which has proven to be widely adaptable to city conditions, it will grow in standing water or in well drained soils.</p>			55'	20'	5	Narrowly pyramidal	Green, deciduous needles	Rusty orange	N/A	N/A	N/A

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			H	W	ZONE						
<p><i>Tilia cordata</i> × <i>mongolica</i> 'Harvest Gold' Harvest Gold Linden</p> <p>Very hardy and faster growing in the nursery than <i>T. cordata</i> cultivars, this Linden sports deep green, glossy foliage through the summer months. Its name is inspired by a mantle of bright golden yellow leaves in autumn.</p>			40	30'	3	Pyramidal	Deep green	Bright golden yellow	N/A	N/A	N/A
<p><i>Ulmus americana</i> 'Lewis & Clark' Prairie Expedition® Elm</p> <p>Extremely cold hardy, this Plains-tough American native descends from a lone survivor of Dutch elm disease found near Fargo, ND. Fast growth of the broad spreading, vase shaped canopy delivers quick shade in cold prairies and harsh urban environments.</p>			55'	60'	2b	Broad, rounded to spreading vase	Dark green	Yellow	N/A	N/A	N/A
<p><i>Ulmus japonica</i> × <i>wilsoniana</i> 'Morton' Accolade™ Elm</p> <p>Arching limbs and a graceful vase shape characterize this outstanding hybrid elm selected and tested at Morton Arboretum. Glossy dark green foliage changes to yellow in the fall and is resistant to elm leaf beetle feeding. Growth habit gives good form in the nursery and an ultimate form like the American Elm.</p>			70'	60'	4	Vase with arching limbs	Glossy, dark green	Yellow	N/A	N/A	N/A
<p><i>Ulmus</i> 'Morton Glossy' Triumph™ Elm</p> <p>Remarkably dark green and glossy foliage and a sturdy, symmetrical growth habit distinguish this Morton Arboretum introduction. Hybrid parentage is <i>Ulmus wilsoniana</i>, <i>U. japonica</i>, and <i>U. pumila</i>.</p>			55'	45'	4	Upright oval to vase	Glossy dark green	Yellow	N/A	N/A	N/A
<p><i>Ulmus davidiana</i> 'JFS KW2UD' Greenstone™ Elm</p> <p>Through years of testing, this vigorous grower has proven to be the top performer among trees grown from seed collected at the Northern edge of its native range in China. Its strong branches with open angles develop into an upright vase shape resembling that of the classic American elm.</p>			60'	40'	4	Upright vase	Medium green	Yellow	N/A	N/A	N/A



For more information, see:
Michael A. Dirr and Keith S. Warren,
The Tree Book: Superior Selections for Landscapes, Streetscapes, and Gardens, Timber Press, 2019.
Purchase now on Amazon: <http://jfs.co/tb2021-03>