



PRO
Green EXPO
Colorado Convention Center
Denver, CO | February 13- 16

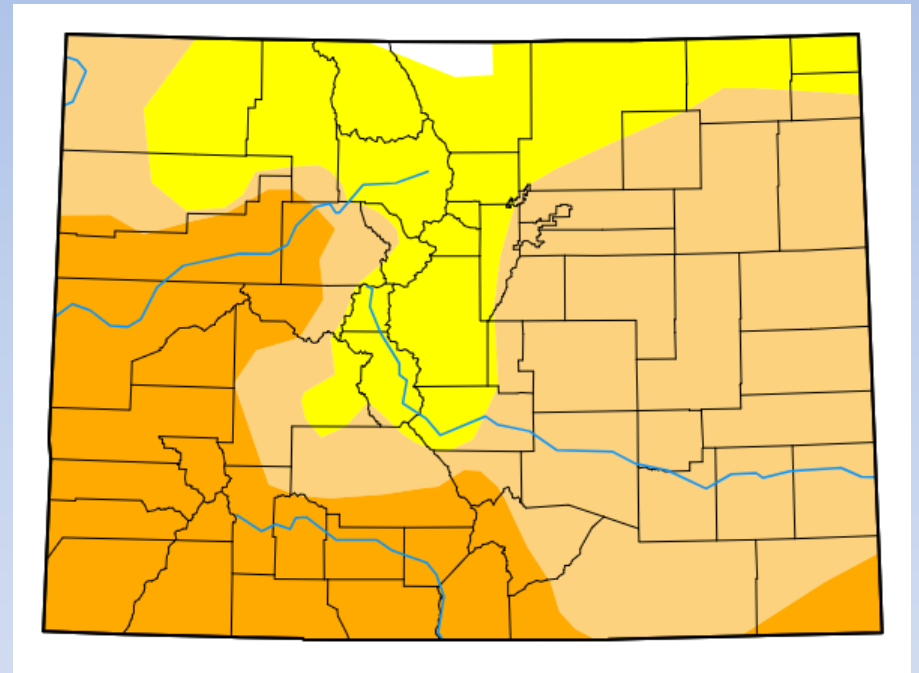
Tree Diversity for Urban Applications

Dr. James Klett - Colorado State University

Eric Hammond- Colorado State University Extension, Adams County

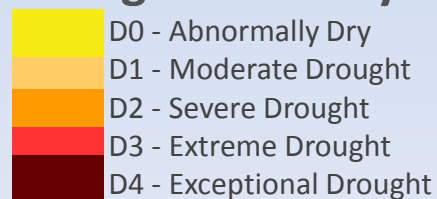
Consideration for Tree Selection

- **Water needs**
- Growth rate
- Tolerant of our soils
- Cold Hardiness
- Mature size
- Species diversity



January 25th 2017

Drought Intensity:



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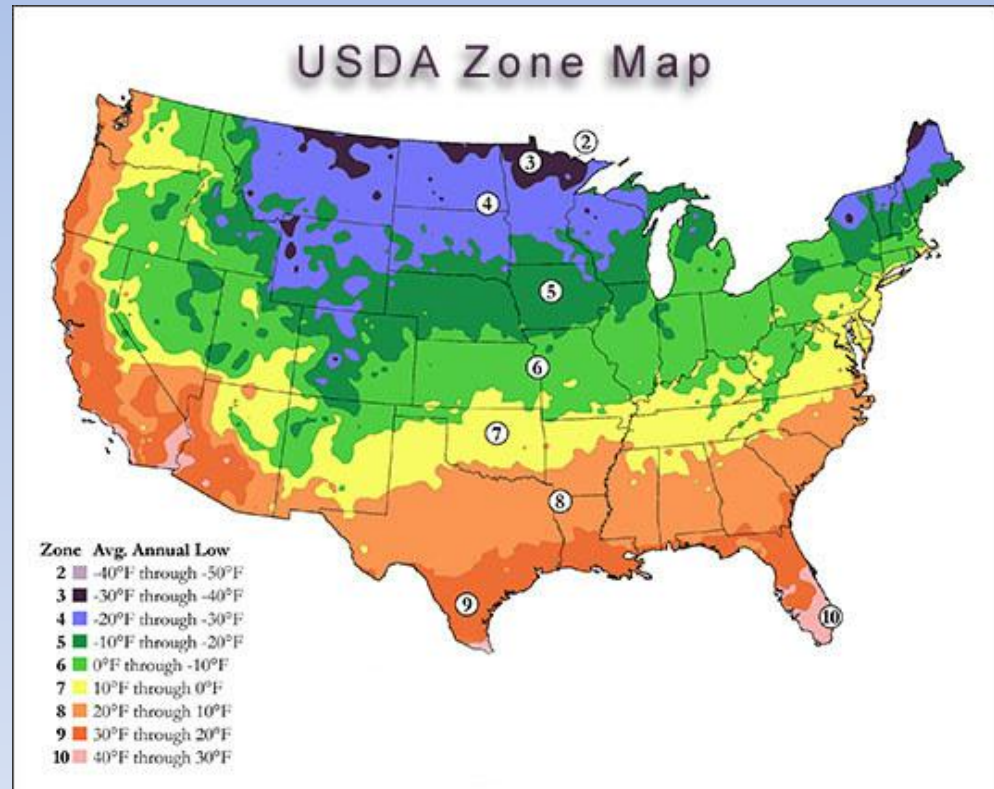
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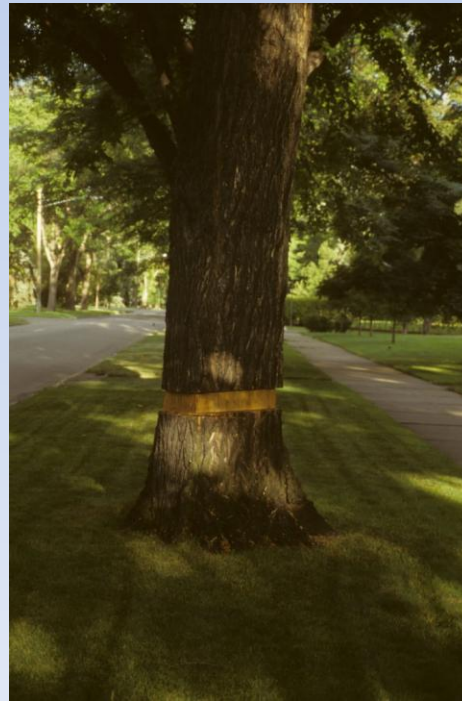
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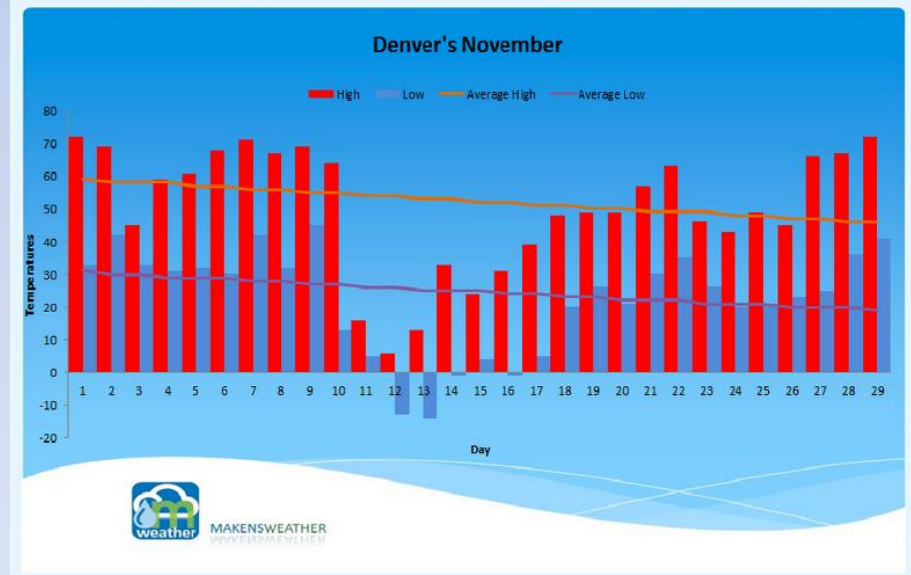
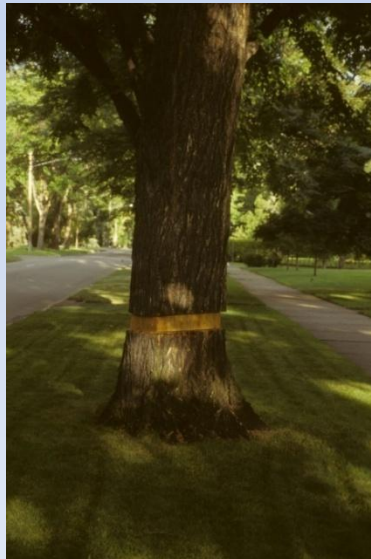
Considerations for Tree Selection

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- **Species diversity**



Considerations for Tree Selection

- **Species diversity**
 - Plant no more than:
 - 10% of any species
 - 20 % of any genus
 - 30 % of any family



Key

- Narrow\Upright: U
- Pollution tolerant: P
- Tolerant of poor soils: S
- Tolerant of confined rooting area: R
- Drought tolerant: W
- At least some tolerance of soil salts: Na

Acer grandidentatum 'Manzano'

Manzano Bigtooth maple

Ornamental features:

- Reliable red-orange-yellow fall color

Comments/Culture:

- Selected from Manzano Mtns. of NM
- Better-adapted to alkaline soil
- More tree-like than Bigtooth maple
- Good tolerance to drought and cold (Zone 4)
- Slower-growing to about 25' high and 20' wide
- Limited availability

W, Small Tree





E. Hammond

Acer negundo 'Sensation'
Sensation Boxelder

Ornamental Features

- Reds, oranges and yellows in fall
- Better branching

Comments/Culture

- Height: 25-30', width: 20-25'
- Male- less issue if boxelder bugs
- Tolerates poor soils and salts





Acer saccharum ssp. *caddo*

Caddo Sugar Maple

Ornamental features:

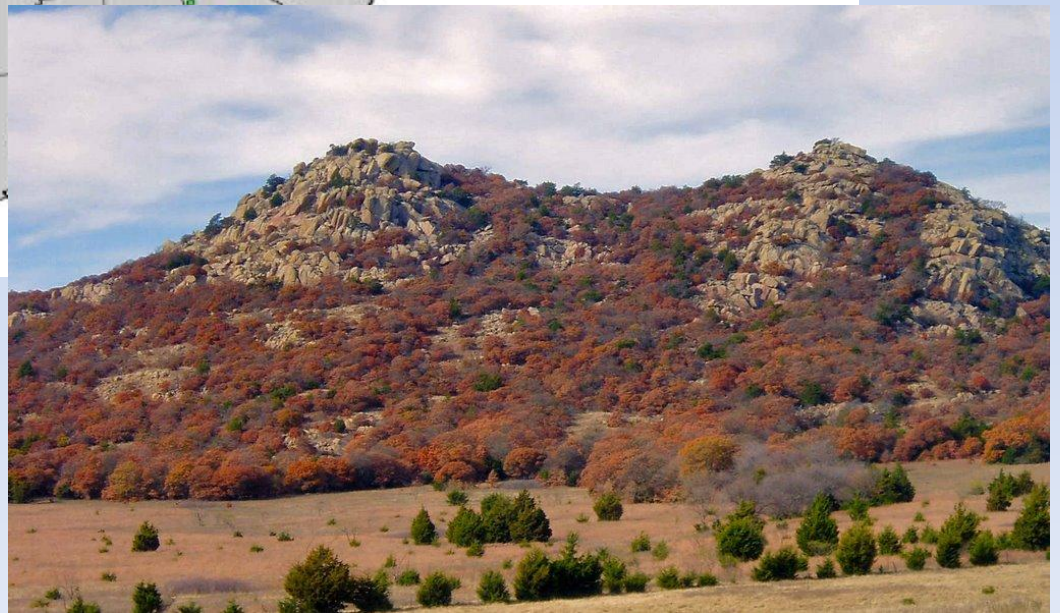
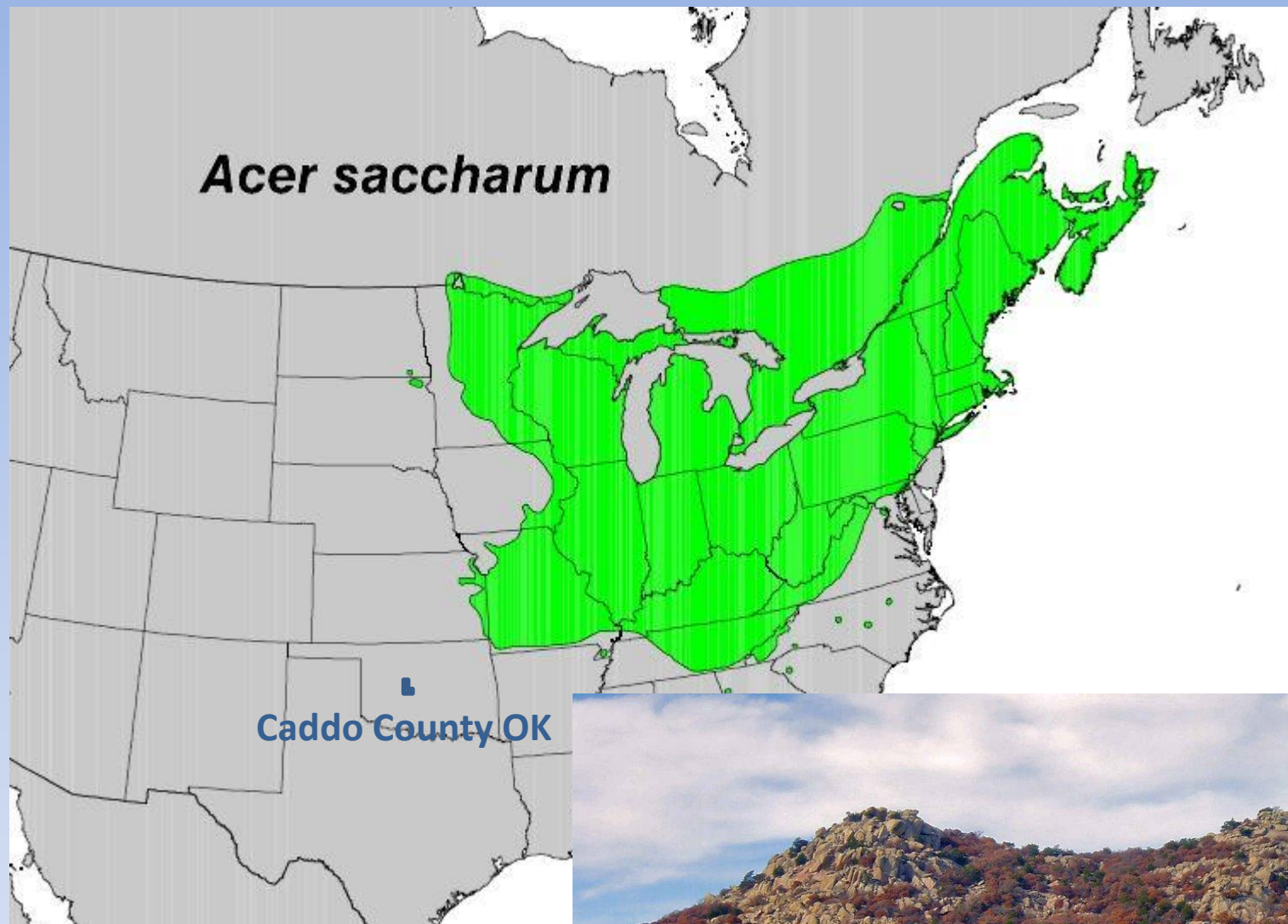
- Red-orange-yellow fall color

Comments/culture:

- Caddo County, OK origin
- Leaves dark green, leathery, thicker – less tatter
- Increased heat and drought tolerance
- Tolerates part shade
- Little/no chlorosis observed to date
- Growth habit/size/fall color varies; Zone 4-5
- Cultivars include **'Autumn Splendor'**, **'Flashfire'** and **'John Pair'**

D, Na

Acer saccharum



Acer saccharum caddo 'Autumn Splendor'
Autumn Splendor Caddo Sugar Maple

- Bright red-orange fall color
- To about 35-40 feet tall and wide
- Broad oval-rounded growth habit
- Selection from Kansas State University
- Zone 5

Acer saccharum caddo 'JFS-Caddo2'
Flashfire[®] Caddo Sugar Maple

- Dark green leaves develop bright red-orange fall color
- Broad oval-rounded growth habit
- Strong central leader
- To about 35-40 feet tall and wide
- Good powdery mildew resistance
- Selection from J. Frank Schmidt and Son Nsy.
- Zone 4







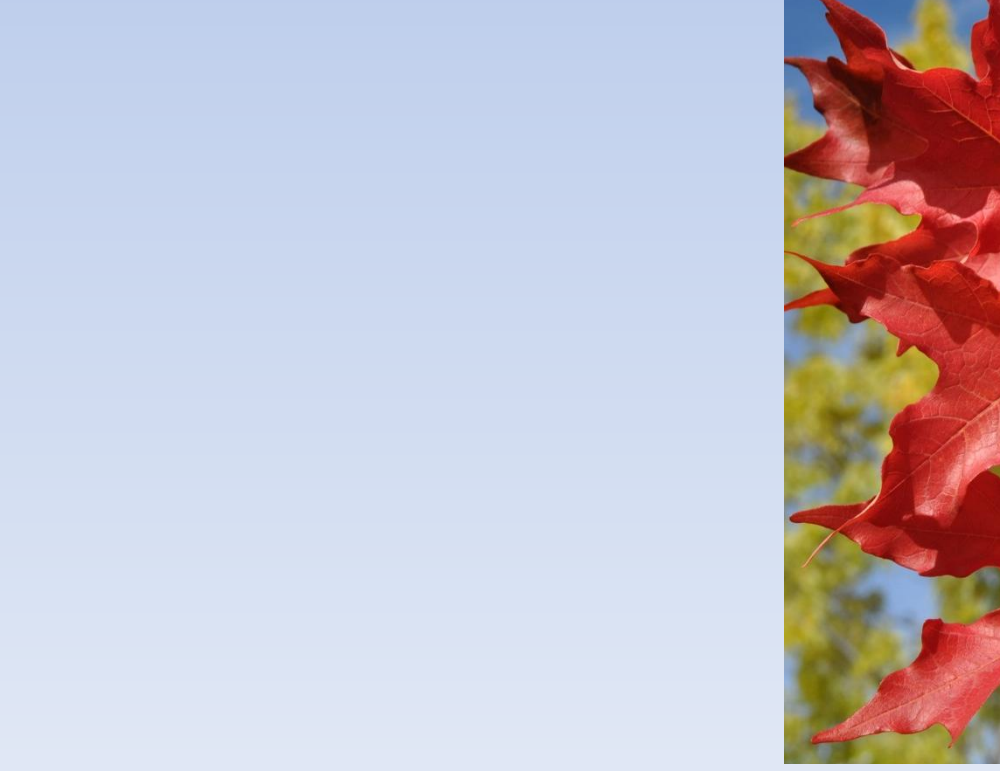
Acer saccharum caddo 'John Pair'

John Pair Caddo Sugar maple

- Glossy green leaves develop red fall color
- Rounded growth habit
- To about 30 feet tall and wide
- Selection from Kansas State University
- Zone 5







Carpinus betulus 'Frans Fontaine'
Frans Fontaine Hornbeam

Ornamental Features

- Dark green foliage turns yellow in fall
- Narrow, columnar shape is maintained with maturity

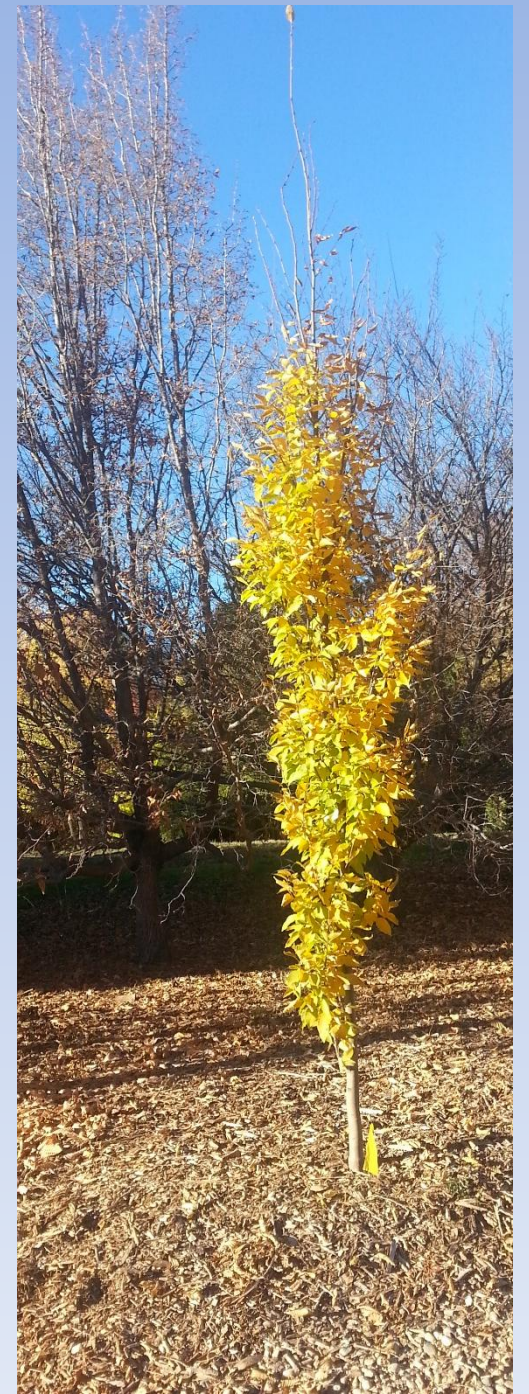
Comments/Culture

- Height: 20-30', width: 10-15'
- Exposure – prefers sun but will tolerate light to moderate shade
- Current season's growth curves inward toward the central leader

U, P









'Frans Fontaine'



'Fastigiata'

Celtis occidentalis 'JFS-KSU1'

Prairie Sentinel[®] Common Hackberry

Ornamental Features

- Tightly fastigate, columnar growth habit
- Foliage medium green, turns yellow in fall

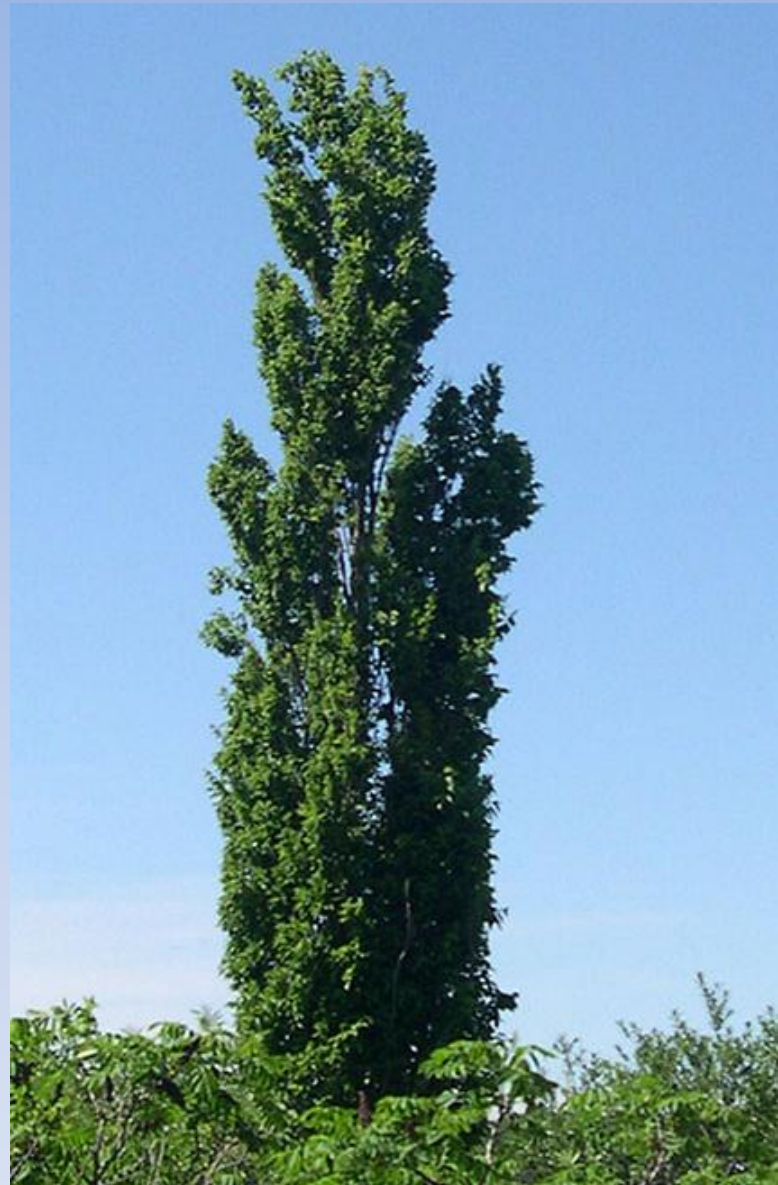
Comments/Culture

- Discovered in the rugged high plains of western Kansas
- Great adaptability to heat, drought and cold of the prairie
- A columnar tree for narrow city streets in toughest conditions
- Probable susceptibility to the same insects as hackberry
- Height: 45', width: 12'

U, P, W







J Frank Schmidt Nsy

Koelreuteria paniculata

Goldenrain Tree

Ornamental Features

- Yellow flowers in July/August
- Fruits/seedpods
- Some possible yellow fall color

Comments/Culture

- Weak wooded+ Poor structure
- Performs well in most soils
- Tolerates heat and some drought
- Possible insect problem: Red-shouldered bugs



Koelreuteria paniculata 'GoCanzam'
Golden Candle™ Goldenrain Tree

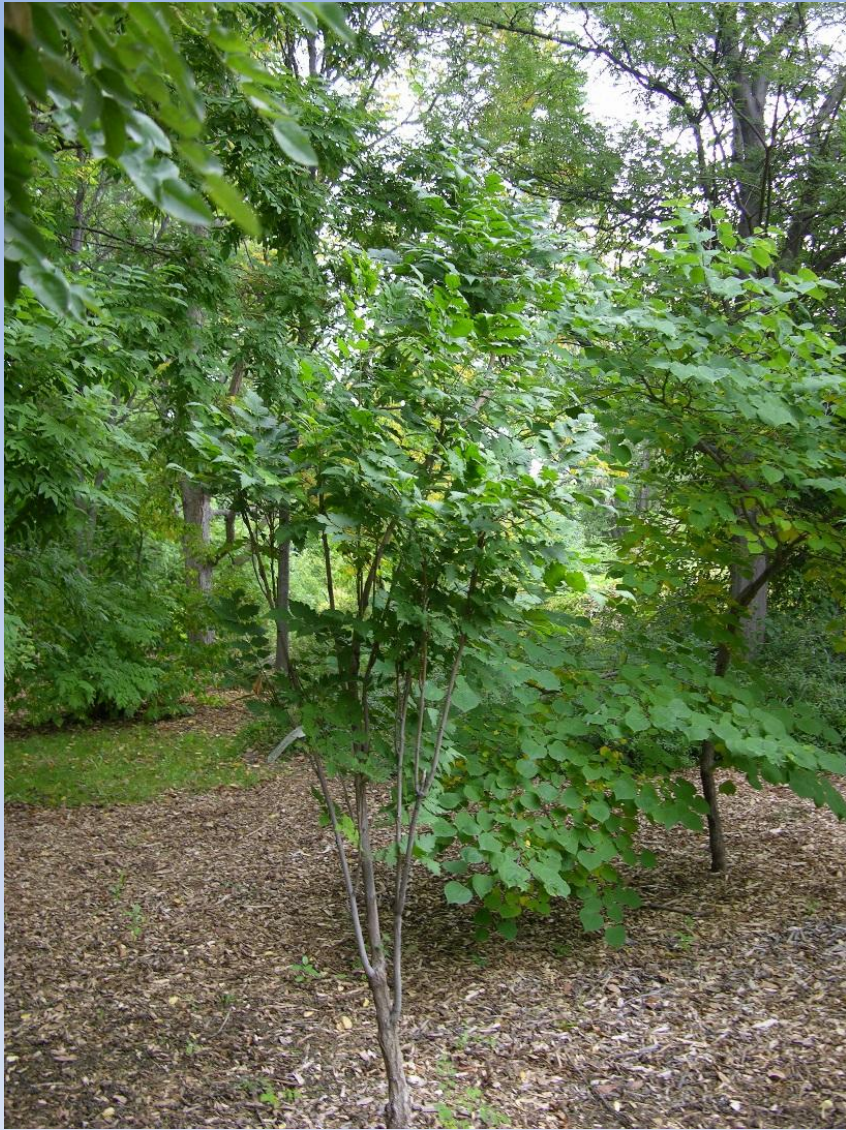
Ornamental Features

- Yellow flowers in July/August
- Fruits/seedpods
- Some possible yellow fall color

Comments/Culture

- Fastigiate - columnar to about 30 x 5 feet
- Performs well in most soils
- Tolerates heat and some drought
- Possible insect problem: Red-shouldered bugs

U, P, W



Lake County Nsy photo



Juniperus scopulorum 'Woodward'
Woodward Rocky Mountain Juniper

Ornamental features

- Narrow/columnar growth habit
- Blue-green needles

Comments/Culture

- Good tall screening juniper
- Appears less prone to snow load damage
- Well-adapted, drought tolerant after establishment
- Appears to be male – no fruit observed
- Limited availability

U, W, Salt









Liriodendron tulipifera 'JFS-Oz'

Emerald City[®] Tuliptree

Ornamental features

- Glossy, dark green leaves are tulip-shaped
- Yellow-green flowers with an orange center
- Bright yellow fall color
- Upright-oval growth habit

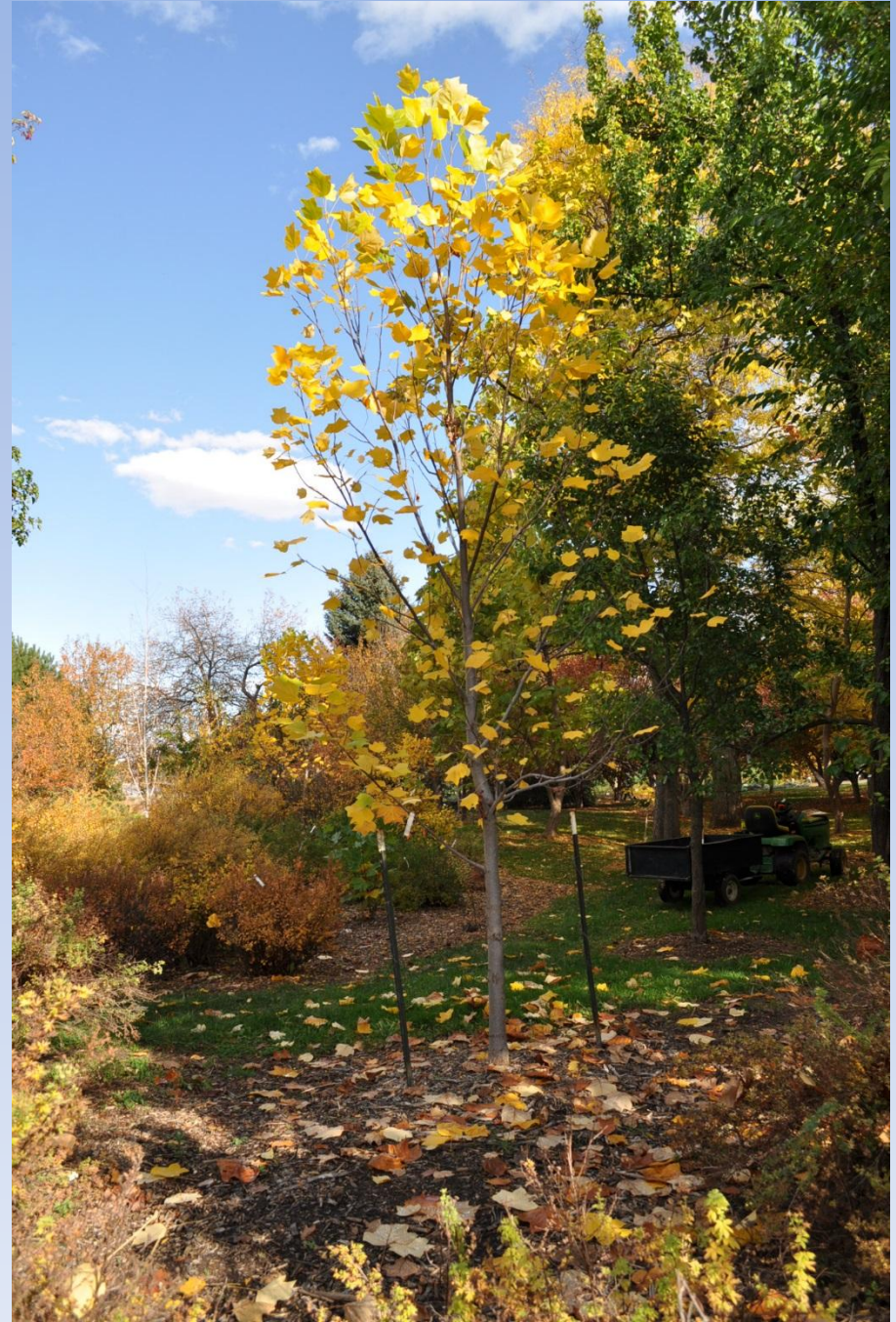
Comments/Culture

- Chlorosis possible...depending on soil pH and lime content
- Sturdy branching with strong open angles
- Street or shade tree; screening
- To about 45' x 20'
- Zone 5

Na, Diversity







Malus 'Adirondack'
Adirondack Crabapple

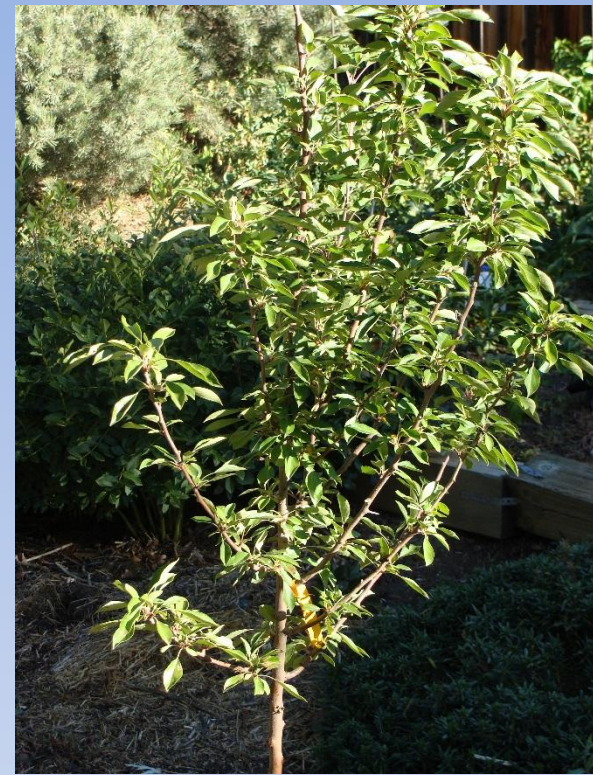
Ornamental features

- Red buds open to white, single flowers
- Dark green leaves
- Unusual narrow vase shape/habit to about 18 x 10'
- Light red to orange fruits, 3/8", not long-persistent
- Some yellow fall color

Culture/comments

- Possible snow load damage
- Excellent disease resistance
- US National Arboretum selection

U, W, Salt





Malus 'Coralcole'
Coralburst[®] Crabapple

Ornamental features

- Rose-pink buds open to pink flowers
 - “two-tone” appearance
- Few fruits develop – good small patio tree
- Some yellow fall color

Comments/Culture

- Available as a low graft (shrub-like) or 4' high graft (small tree)
- Rounded habit to 12-15 x 12-15'
- Good disease resistance
- Adaptable to alkaline clay soils
- Zone 4-7













Ostrya virginiana
American Hophornbeam

Ornamental Features

- Graceful small tree with drooping branches, maturing more rounded
- Dark green leaves turn yellow in fall
- Male catkin flowers; fruit resembles hops
- Gray/brown bark in long, narrow strips

Comments/Culture

- Somewhat slow to reestablish after transplanting
- An understory plant that tolerates full sun
- Zone 4







Platanus x acerifolia 'Morton Circle' **Exclamation!® London Planetree**

Ornamental Features

- Medium green, maple-like leaves turn yellowish in fall
- Upright-pyramidal dense growth habit; uniform
- Exfoliating bark

Comments/Culture

- Hybrid of Oriental planetree and American planetree
- Resistant to anthracnose and powdery mildew - but still best sited in full sun with good air circulation
- Bears light/sparse fruit
- To about 45' x 30'
- Zone 5

S, P, U





Pyrus ussuriensis 'MorDak'
Prairie Gem[®] Ussurian Pear

Ornamental Features

- White flowers prior/with leafing in April
- Dark green leaves turn golden yellow in fall
- Dense, oval-rounded-globe habit

Comments/Culture

- Adaptable to local soils
- Sparse fruit
- To approx. 20' tall and wide
 - Good choice under power lines or in smaller spaces
- Selection from North Dakota State University
- Very cold-hardy, to Zone 3

D, S, Na, Small Tree





North Dakota State University



Maackia amurensis

Amur Maackia

Ornamental Features

- Silvery-green new leaves
- Flowers white, fragrant, June/July
- Olive-brown bark; may peel with maturity

Comments/Culture

- Easily transplanted, adaptable, grows in alkaline soil
- Legume that can use atmospheric nitrogen
- Fruit is a green-to-brown legume pod; 2 to 3"
- Little or no fall color
- Cultivars 'Starburst', 'Summertime'
- Zone 4; to approx. 25'

D, Pollution, Small Tree









Quercus robur x alba 'Crimschmidt'
Crimson Spire™ Oak

Ornamental features:

- Columnar/fastigate growth habit
- Blue-green foliage
- Rusty-red fall color lasts 2 weeks

Comments/Culture

- Hybrid of white oak and columnar English oak
- **Resistant** to powdery mildew
- Appears adapted to local soils
- Great choice where a tall narrow tree is needed
- To about 45' x 15'
- brown leaves persist through winter
- Zone 4

U, W



J Frank Schmidt Nsy









Quercus robur x bicolor 'Long'

Regal Prince[®] Oak

Ornamental Features

- Glossy dark green leaves
- Upright, broadly columnar growth habit
- Yellow fall color

Comments/Culture

- Tolerant of clay soils but may not thrive if too alkaline
 - iron chlorosis possible
 - Resistant to powdery mildew
 - Possible aphids and sooty mold problems
- Hybrid of Columnar English oak and Swamp White Oak
- Columnar, widening with age to about 40 x 20'
- Zone 4

U, W







Upright Quercus Hybrids and Cultivars



Regal Prince
Q. alba x bicolor



Upright English Oak
Q. robur 'Fastigiata'



Crimson Spire Oak
Q. robur x
Q. alba 'Crimschmidt'

Quercus muehlenbergii

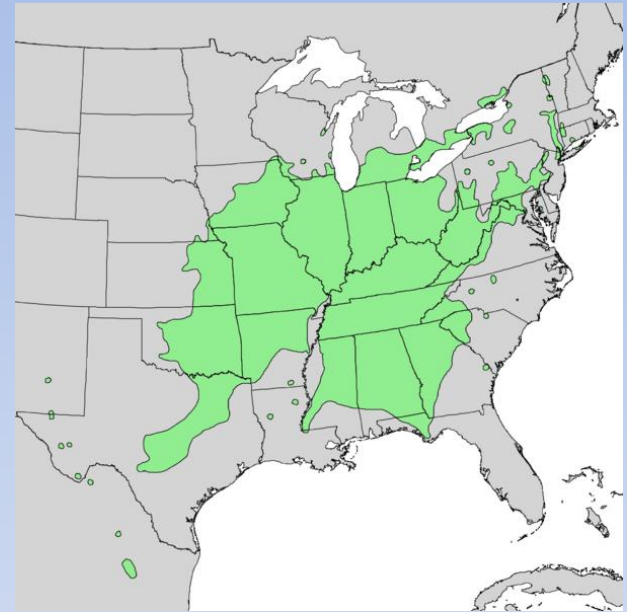
Chinkapin oak

Ornamental Features

- Oblong, lobed leaves
- Reddish-rust fall color

Comments/Culture

- Has performed well at several sites in CO
- Adapted to alkaline soils; chlorosis not yet observed
- faster-growing than many oaks, to about 45'
- Zone 5



D, S- Adaptable







Syringa reticulata subsp. *Pekinensis*

Pekin Lilac

Ornamental Features

- Showy yellowish-white flowers in May/June
- Bark exfoliates - brown flakes or sheets
- Upright arching habit, often more open

Comments/Culture

- Adaptable to alkaline clay soils
- Usually grown as a multi-stem large shrub to about 15 feet
- Full sun
- Zone 4-7
- Summer Charm™, China Snow™ and others

D, S, Small Tree











Tilia cordata 'Corzam'
Corinthian[®] Littleleaf Linden

Ornamental features:

- White fragrant flowers loved by bees, June
- Light green bracts contrast with dark green leaves
- Fall color may be good yellow

Comments/Culture:

- Adaptable to local soils
- Possible aphid problems; leaf scorch
- Japanese beetle
- To about 45 x 15'
- Zone 4

U- Street Tree







Tilia tomentosa 'Sterling'

Sterling Silver Linden

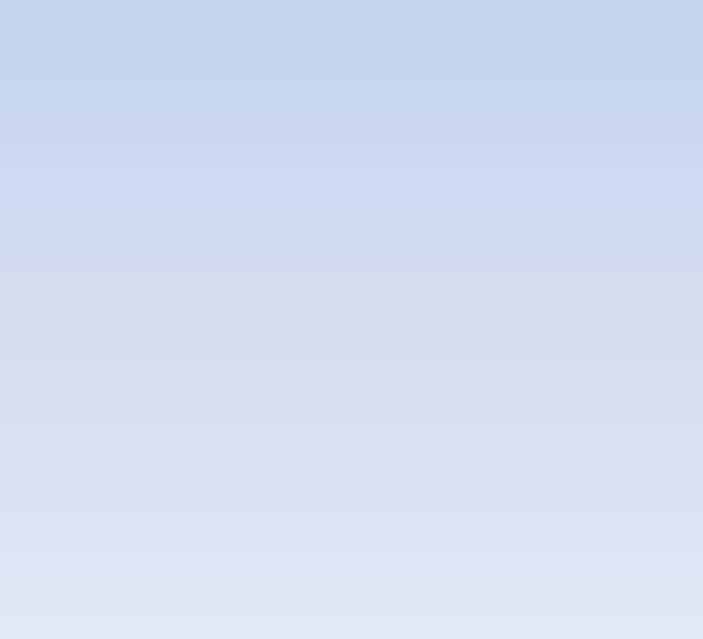
Ornamental features

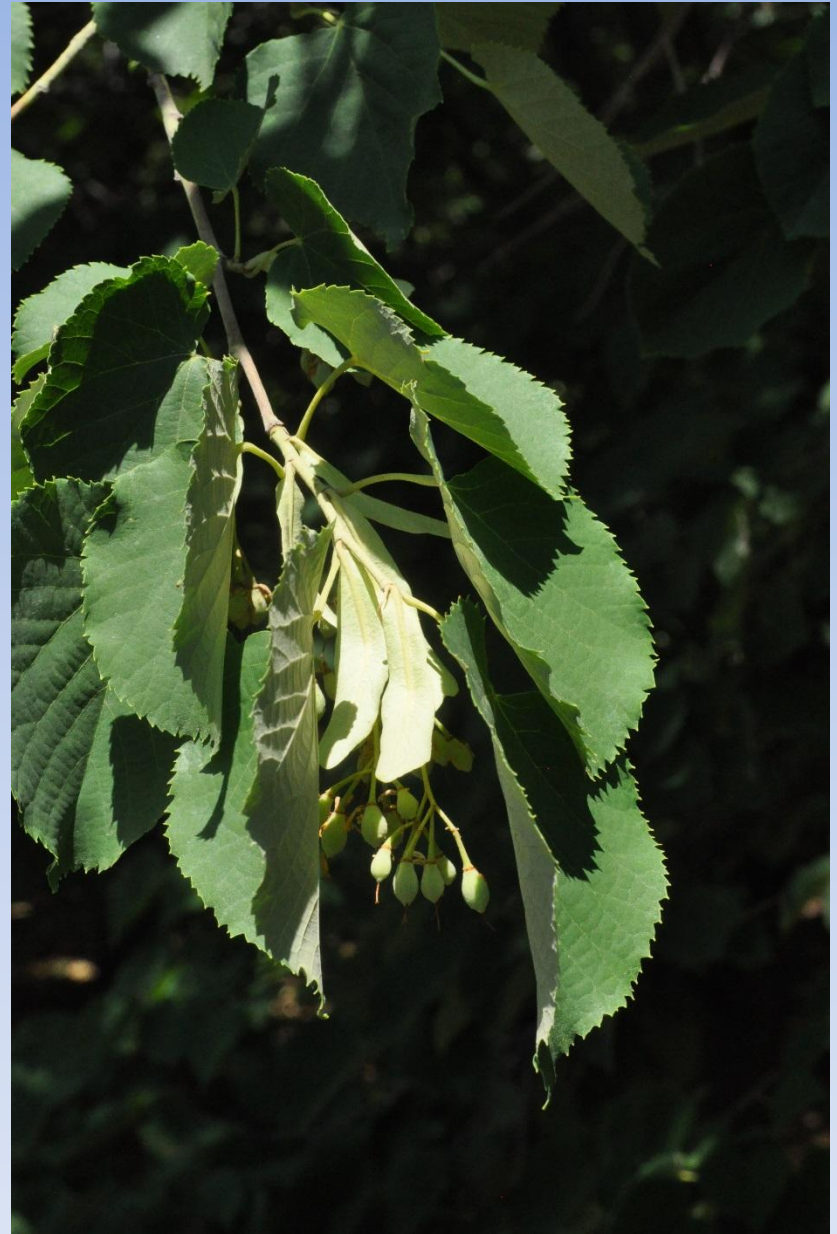
- Fragrant yellowish-white flowers, July
- “two-tone” leaves - dark green above, silver underside
 - yellow fall color

Comments/Culture

- Adapted to local soils and climate
- Broadly pyramidal growth habit
- To approx. 40 x 30'
- More resistant to Japanese Beetle
- Less leaf scorch than other lindens
- Some reports of toxic or narcotic effects of flowers on bees
- Zone 5

Diversity









Other Trees to Try



© J. Frank Schmidt & Son Co.

White Shield Osage Orange



Katsura tree

Other Trees to Try



Chinese Catalpa



Russian Hawthorn

Other Trees to Try- Less common Aesculus



Yellow buckeye



Homestead buckeye

Other Trees to Try- Elms



U. parvifolia-
Cold hardy cultivars



Accolade

Hybrid Elms



Valley Forge

DED resistant American elms



U. davidiana

More Common Urban Trees for Colorado

- Honey Locust
- Kentucky Coffee Tree
- Bur Oak
- English Oak
- Many Crabapples
- Chanticleer Pear
- Hackberry
- Catalpa
- Ginkgo

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Thank you!

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