



Underutilized Windbreak Trees

Deciduous trees

The eventual loss of green ash in windbreaks due to the presence of emerald ash borer has heightened the concern of relying on a limited number of species as replacements and new plantings. The following are some underutilized trees that may be suitable on some windbreak sites.

Basswood (*Tilia americana*)

Plant Hardiness Zone: 3b
Windbreak Suitability Groups: 1, 2, 3
Soils: well-drained, moist.
Soil pH: slightly alkaline, up to 7..
Minimum precipitation: 22 inches
Height: 50 to 60 feet. Spread: 30 feet
Growth rate: 18 to 25 feet in 20 years
Suitable region: east of 281 to 14, then east of 25 to ND border

Black cherry (*Prunus serotina*)

Plant Hardiness Zone: 4a
Windbreak Suitability Group: 1, 3, 4, 5
Soils: demands well-drained soils, drought tolerant once established.
Soil pH: neutral, up to 7.3
Minimum precipitation: 20 inches
Height: 30 to 40 feet. Spread: 15 to 25 feet
Growth rate: 18 to 25 feet in 20 years
Suitable region: east of 183 to 190 then east 281 to 12.

Boxelder (*Acer negundo*)

Plant Hardiness Zone: 3a
Windbreak Suitability Groups: 1, 1K, 3, 5
Soils: performs well on a wide range of soils from wet to dry, though more adapted to moist sites than dry.
Soil pH: slightly alkaline, up to 7.8
Minimum precipitation: 18 inches
Height: 30 to 50 feet. Spread 20 to 40 feet
Growth rate: 24 to 36 feet in 20 years
Suitable region: entire state but best east of 83
Note: sensitive to growth-regulator herbicides.

Honeylocust (*Gleditsia triacanthos*)

Plant Hardiness Zone: 4b
Windbreak Suitability Groups: 1, 1K, 3, 5
Soils: well-drained but drought tolerant once established.
Soil pH, slightly alkaline, up to 7.8
Minimum precipitation: 18 inches
Height: 30 to 60 feet. Spread: 30 feet
Growth rate: 20 to 35 feet in 20 years
Suitable region: east of 83 to 12

Ironwood, American hophornbeam (*Ostrya virginiana*)

Plant Hardiness Zone: 4
Windbreak Suitability Groups 1, 3, 4, 4C
Soil: moist, well-drained but moderately drought tolerant once established.
Soil pH: neutral, up to 7.3
Minimum precipitation: 20-22 inches
Height: 15 to 25 feet. Spread: 12 to 18 feet
Growth rate: 13 to 18 feet in 20 years
Suitable region: east of 83 to 12
Note: requires sweating when planting bare-root.

Shagbark hickory (*Carya ovata*)

Plant Hardiness Zone: 4b
Windbreak Suitability Groups: 1, 3, 4
Soils: well-drained, moist.
Soil pH: neutral, up to 7.3.
Minimum precipitation: 20 to 22 inches.
Height: 30 to 40 feet. Spread: 15 to 25 feet.
Growth rate: 18 to 20 feet in 20 years.
Suitable region: east of 281 to 14



Japanese elm (*Ulmus davidiana* var. *japonica*)

Plant Hardiness Zone: 3b
Windbreak Suitability Groups: 1, 1K, 3, 4, 4C, 5
Soils: tolerant of droughty soils.
Soil pH: slightly alkaline, up to 7.8
Minimum precipitation: 18 inches
Height: 35 to 50 feet. Spread: 25 to 35 feet
Growth rate: 30 feet in 20 years
Suitable region: east of 183 to 190 then east 281 to ND border
Note: tolerant of Dutch elm disease.

Kentucky coffeetree (*Gymnocladus dioica*)

Plant Hardiness Zone: 4b
Windbreak Suitability Groups: 1, 3, 5
Soils: well-drained, moist but drought tolerant once established.
Soil pH: neutral, up to 7.3
Minimum precipitation: 18 inches
Height: 30 to 40 feet. Spread: 20 to 30 feet
Growth rate: 22 to 26 feet in 20 years
Suitable region: east of 183 to 190 then east 281 to ND border
Note: growth is slow for the first five years after planting. Young trees can suffer browsing damage by rabbits

Northern catalpa (*Catalpa speciosa*)

Plant Hardiness Zone: 4b
Windbreak Suitability Groups: 1, 3, 5
Soils: Moist, well-drained soils with adequate soil moisture. Drought tolerant once established.
Soil pH: slightly alkaline, up to 7.8
Minimum precipitation: 20 to 22 inches
Height: 40 to 60 feet. Spread: 20 to 30 feet
Growth rate: 18 to 28 feet in 20 years
Suitable region: east 183 to 190, then 281 to 14



Conifers

The loss of Austrian pine (*Pinus nigra*) and Scotch pine (*P. sylvestris*) to the lethal pine wilt disease has eliminated these trees from use. The needlecast and canker disease challenges of Colorado spruce (*Picea pungens*) has reduced its long-term value as a windbreak species. The following conifers are some other options.

Meyer spruce (*Picea meyeri*)

Plant Hardiness Zone: 4a
Windbreak Suitability Groups: 1, 3, 4, 5
Soil: best development on moist loam
Soil pH: slightly alkaline, up to 7.8
Minimum precipitation: 18 inches
Height: 35 to 40 feet. Spread 18 to 20 feet
Growth rate: 16 to 20 feet in 20 years
Suitable region: east of 83
Note: this spruce may be browsed by deer.

Norway spruce (*Picea abies*)

Plant Hardiness Zone: 4b
Windbreak Suitability Groups: 1, 3, 4, 5
Soils: well-drained, moist
Soil pH: neutral, up to 7.3
Minimum precipitation: 20 inches
Height: 40 to 50 feet. Spread 20 to 25 feet
Growth rate: 18 to 20 feet in 20 years
Suitable region: east 281 to 14
Note: not as tolerant of drought as Black Hills spruce, but better growth than other spruce on favorable sites.

Rocky Mountain Douglas-fir (*Pseudotsuga menziesii* var *glauca*)

Plant Hardiness Zone: 4a
Windbreak Suitability Groups: 1, 3
Soils: well-drained, moist
Soil pH: slightly alkaline, up to 7.8
Minimum precipitation: 18 inches
Height: 40 to 60 feet, Spread: 20 to 30 feet
Growth rate: 15 to 20 feet in 20 years
Suitable region: east of 83

Rocky Mountain lodgepole pine (*Pinus contorta* var. *latifolia*)

Plant Hardiness Zone: 2b
Windbreak Suitability Groups: 1, 3, 4, 5
Soils: moist, well-drained sites best, but drought tolerant once established.
Soil pH: neutral, up to 7.3
Minimum precipitation: 18 inches
Height: 25 to 40 feet. Spread: 15 to 20 feet
Growth rate: 20 to 22 feet in 20 years
Suitable region: east of 83
Note: possible substitute for eastern redcedar. Very similar to Jack pine (*P. banksiana*) in growth and appearance.

Siberian larch (*Larix sibirica*)

Plant Hardiness Zone: 2
Windbreak Suitability Groups: 1, 3, 5
Soils: well-drained, does not tolerate poorly drained clay soils.
Soil pH: slightly alkaline, up to 7.8.
Minimum precipitation: 16 inches.
Height: 40 feet, Spread 20 feet or less
Growth rate: 18 to 25 feet in 20 years
Suitable region: east of 83
Note: better success if planted from small pots rather than bare-root