

Why Plant A Windbreak?

Windbreaks provide many benefits to soil, water, plants, animals and man. They are an important part of the modern day agricultural landscape. Windbreaks come in many different sizes and shapes to serve many different conservation purposes. Here are a few of the examples as to how windbreaks benefit Ohio...

Erosion Control Benefits

Windbreaks prevent wind erosion from causing loss of soil productivity, polluting air and water, obstructing public roads, and generally damaging the environment.

Beautification

Windbreaks beautify the countryside and provide fall and winter color to the landscape.

Crop Yields

Windbreak research substantiates that field windbreaks improve crop yields which offsets the loss of production from the land taken out of cultivation.

Homes and Buildings

Windbreaks control blowing snow, conserve energy, protect livestock and farmsteads during the winter months.

Pesticide Sprays

Windbreaks control pesticide spray drift and provide buffers to delineate property lines and protect neighbors.

Song Birds and Wildlife

Windbreaks provide food, shelter and nesting sites for songbirds and other forms of wildlife and can add viewing enjoyment to a property.



The Five-Star Windbreak Plan



1

Plant multiple rows in order to achieve a variety of different windbreak benefits. Multiple rows provide better benefits and a wider variety of



benefits. Also the trees themselves grow better when protected by an adjoining row. Give yourself one star.



2

Plant a species mixture that are best suited for your soil types. A mixture provides the most benefits and protection against disease and pests. Selecting the right species for your soils means they will grow better and live longer. Give yourself one star.

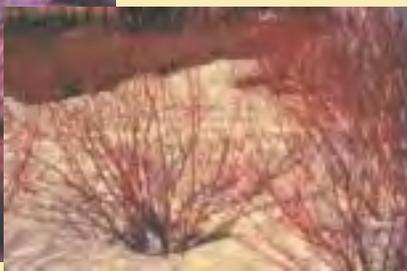
3

Include at least one row of flowering shrubs and/or one nut tree species to provide berries that will attract songbirds and provide food for wildlife. Shrubs grow quickly, are easy to establish and provide density at the base of the windbreak. Give yourself one star.



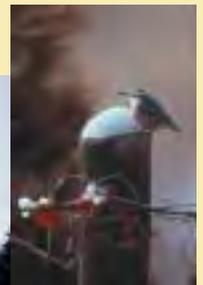
4

Plant at least one species that has vivid fall color or colorful winter twigs to add year round beauty to the landscape. Your windbreak will be more attractive and more interesting. Give yourself one star.



5

Plant at least one evergreen species (conifer) to provide winter color, shelter for songbirds, and density to the windbreak. Give yourself one star.



What Northwest Ohio Landowners Have to Say..

“The birds appreciate it more than we do. In the winter, it’s nothing for us to have 28-30 cardinals at one time. I only wish we had planted more.”

Orville & Maude Duquette - Henry County



“We’re absolutely more convinced each day about the benefits of the windbreak we planted. Don’t put it off. Plant now so you can get the benefits from it.”

Richard Boehr - Allen County

“We’ve lost a lot of crops to sand...We knew we had to do something. We’ve had storms that would

have ripped the plastic and everything off (our green house) had we not had the windbreak...it’s been quite a saver. I think it’s really worthwhile.”

Bill & Virginia Schmidlin - Fulton County



“We started in 1972 and put in a strip we liked the looks of that, so we’ve been expanding ever since. I can see the birds flying around the windbreak and it’s a real protectant for them and a part of nature.”

Lyle Shafer - Wood County



Site and Design

Factors In Designing and Planting a Windbreak

Much of the glaciated region of Ohio is relatively flat with few trees to block winds. Windbreaks can redirect or slow the winds resulting in higher crop yields, snow blocking, wildlife refuges, and many other benefits. Since windbreaks are often meant to be a permanent part of the landscape, you should think carefully over the design of the windbreak before it is planted.

DISCLAIMER: These are general principles that should be used when designing and planting windbreaks. Consult with a forester or local conservation office before making definite plans.

Orientation and Design

The most effective location is perpendicular to prevailing winds. This means that crops, livestock, and structures are best protected when the windbreak is oriented to block these winds. However, field configuration

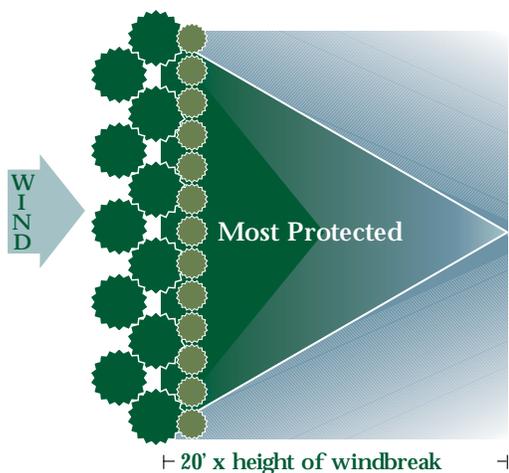
can often require windbreaks to be oriented in different directions. One-legged windbreaks provide protection from winds in one direction. Two-legged windbreaks are the more effective because they protect from winds in two directions.

Row location and spacing of trees between rows will vary depending on species chosen and desired

objectives. A properly planted windbreak will have staggered rows to create a barrier to the wind. This increases the effectiveness of the windbreak. Not staggering the rows can result in a wind tunnel effect. Wind tunnels can scour the soil and reduce the efficiency of the windbreak.

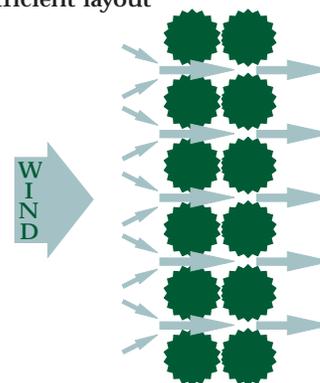


Relative protection from a windbreak oriented in two directions.

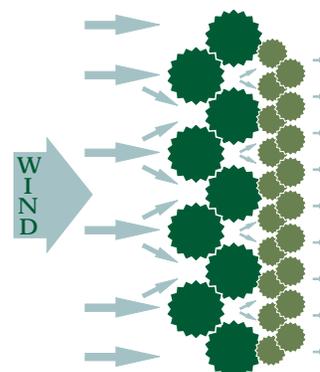


Relative protection from a windbreak oriented in only one direction

Inefficient layout



Properly staggered windbreak



Maintenance

The success and survival of a windbreak depends on how well it is maintained, particularly in the early years after it is planted. There are a number of cultural practices that can help keep a windbreak healthy and growing vigorously, including: the control of competing vegetation, monitoring for insect and disease damage, corrective pruning, fertilizing, replanting of dead trees and renovating the windbreak as necessary.

Controlling Competing Vegetation



Controlling the competing vegetation around newly planted seedlings is one of the most important management activities a landowner can do to enhance the growth of the trees in the first few years after planting. Reducing the competition of weeds and grasses for water and nutrients in the soil can be accomplished through the use of herbicides, or cultivation. Mowing can be done for aesthetic purposes, but does not reduce the competition for water and nutrients.

Chemical control of competing vegetation using a pre-emergent or post-emergent herbicide can be effective and relatively inexpensive. Pre-emergent herbicides (e.g. simazine) are effective ways to control weed

and grass competition and must be applied to bare soil in early Spring before the weed and grass seeds begin to germinate. A post-emergent herbicide, (e.g. glyphosate) is used on actively growing weeds and grasses. Care must be taken to avoid spraying a post-emergent herbicide on the seedlings.

This guide is not intended as a chemical reference. Herbicide labels often change and for this reason we have not included a list of common pre-emergent and post-emergent chemicals. Inquire about appropriate chemicals through your local USDA-NRCS, SWCD, ODNR-Forestry, or OSU extension office. Always follow label instructions when using any chemical.

Mulch, including commercially made mulch mats, can be an effective method to reduce competition from around seedlings. The material used as mulch (wood chips, straw, sawdust, etc..) should be aged for at least one year before applying around seedlings. A word of caution about using mulch, however, is that it may create favorable conditions for field mice to nest. Care must be taken to keep the mulch from being in direct contact with the stem of the tree.

Cultivation around the seedlings is also an option for controlling weed and grass competition. This is labor intensive and should not occur more than 2-3 inches below the ground surface to prevent damage to the feeder roots.

Mowing is not considered a substitute for weed and grass control. Mowing next to the seedlings will reduce the competition for sunlight, but will not eliminate competition for water and nutrients. Mowing too close to the tree can also cause damage if the bark is broken.



Maintenance, continued

Insect And Disease Control

As with all tree plantings, insects and diseases can create major problems for windbreaks. Insects or diseases do not usually attack a healthy, vigorously growing windbreak, but trees under stress are very vulnerable. It is important to regularly inspect your windbreak for signs of insect or disease damage.

Watering & Fertilization

Watering is generally needed only during dry spells for newly planted windbreaks to get them established. Using a trickle irrigation system with a perforated hose along the tree row works well.

Fertilization is generally not necessary in tree plantings. Most soils already have good fertility levels from previous farming practices. A soil test should be taken prior to applying any fertilizers to determine their need. Unnecessary use of common agricultural fertilizers can actually harm seedlings.

Corrective Pruning

At times it might be necessary to prune trees that develop multiple stems. Corrective pruning works best on younger trees that have a diameter of two inches or less. When multiple leaders occur, the straightest stem should be favored and all others pruned off. Broken branches or branches with large wounds should be removed.



Replanting

Even with the best intentions, there will be some trees in a windbreak that die. It is important to replant open gaps in your windbreak, especially in single row windbreaks where needed. A landowner may want to plant a few extra seedlings in a nearby garden area. Then if some trees die out, the landowner will have replacement trees that are approximately the same height and age of the original ones that were planted. The effective life for windbreaks will vary greatly depending on the species and health of the trees, but in general can be expected to last at least 40 to 50 years



Wildlife Damage

Controlling wildlife damage in windbreaks can be very challenging. Oftentimes, on the sites where they are planted, windbreaks offer the only wildlife habitat in the area.

Mice and rabbits often damage young seedlings. Mice will chew the bark around the stem and girdle the seedling. Rabbit damage is evident from the stem being cleanly cut off at an angle, with the top of the seedling laying nearby. Protection from mice and rabbit damage can be done by placing a short (1 foot tall) tree shelter made of a stiff mesh fabric or solid material over each seedling.

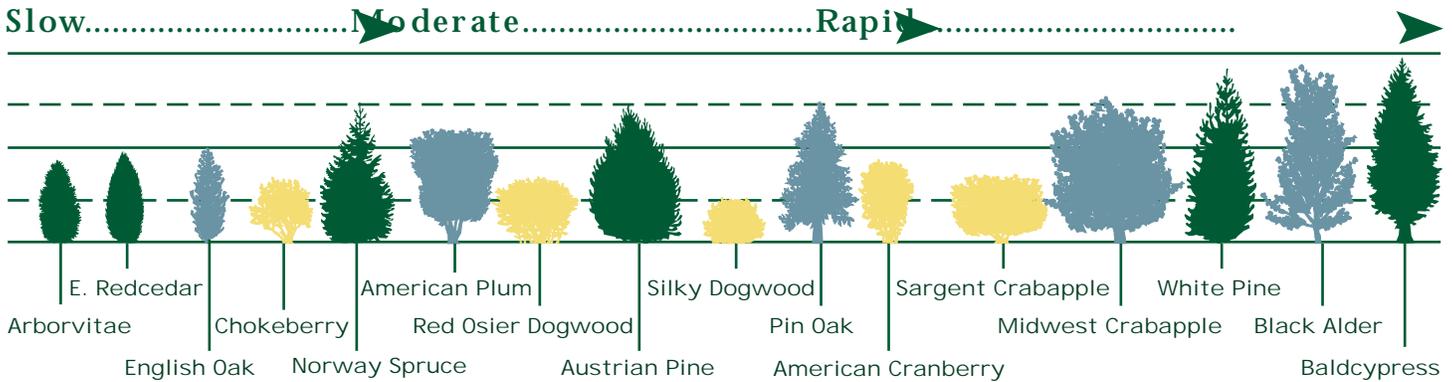
Deer will tend to damage sapling sized trees in a windbreak by nipping off the soft tissue at the ends of the branches or using the trees as a rub for their antlers in the late summer or early fall. In areas where deer populations are high, the Ohio Division of Wildlife encourages landowners experiencing deer damage problems to allow hunters to harvest deer from their lands during Ohio's deer seasons.

Other control methods that have been documented include scare devices such as loud noises, tin pans fluttering in the wind, odor repellants such as human hair, bars of soap or egg spray, and taste repellants by applying hot sauce to the susceptible plant parts. Commercial deer repellents are also available.

Physical exclusion of the deer by fencing is another option a landowner may choose depending on how extensive the windbreak is.

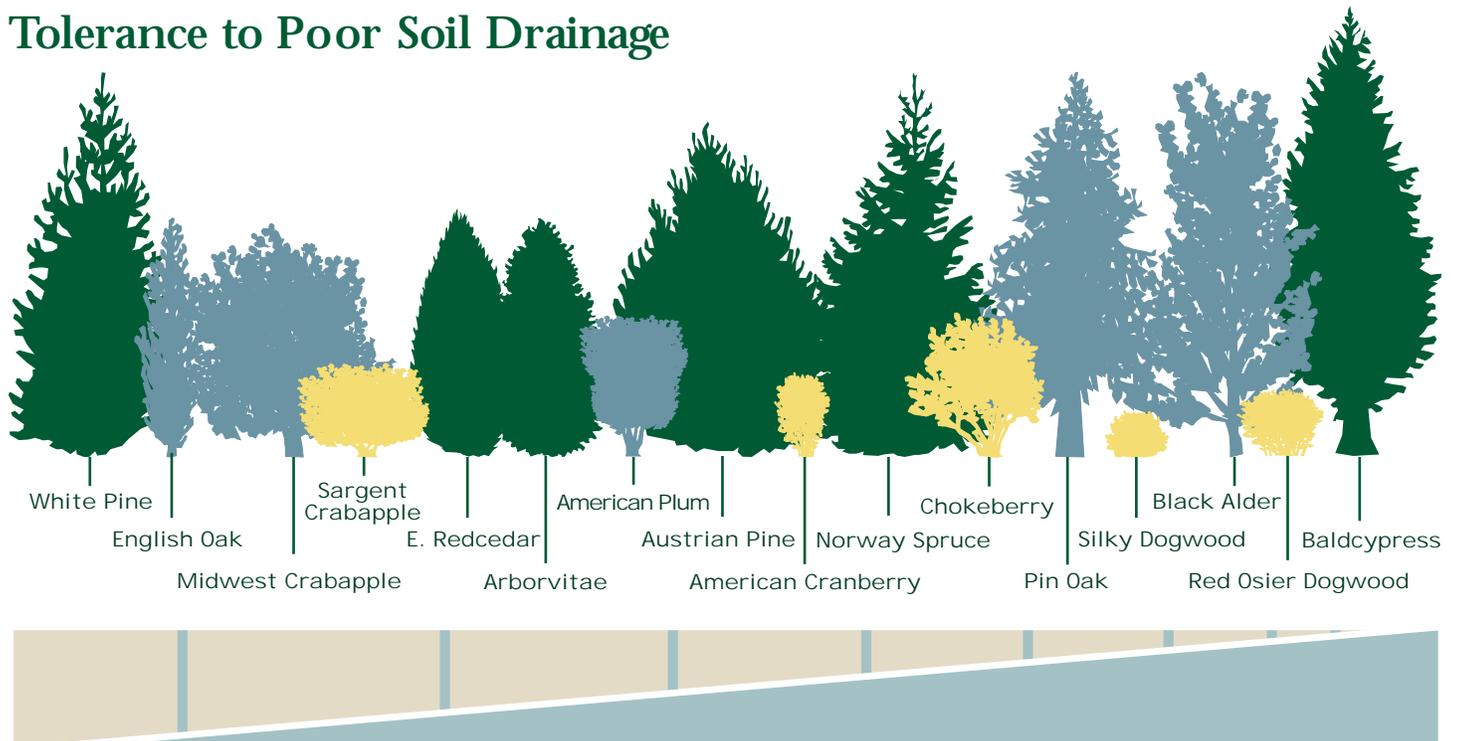
Selecting the Right Species

Relative Growth Rate



This chart represents comparable growth rates between selected species. Growth rates will vary considerably depending on soil types and weed control measures. This figure assumes that species are planted on suitable sites and appropriate weed control measures have been taken. Data was extrapolated from various sources including USDA-NRCS research, various publications, and the authors' field experiences in northwest Ohio. This chart is qualitative and only references species growth in their designated classes (conifer, hardwood tree, or shrub).

Tolerance to Poor Soil Drainage

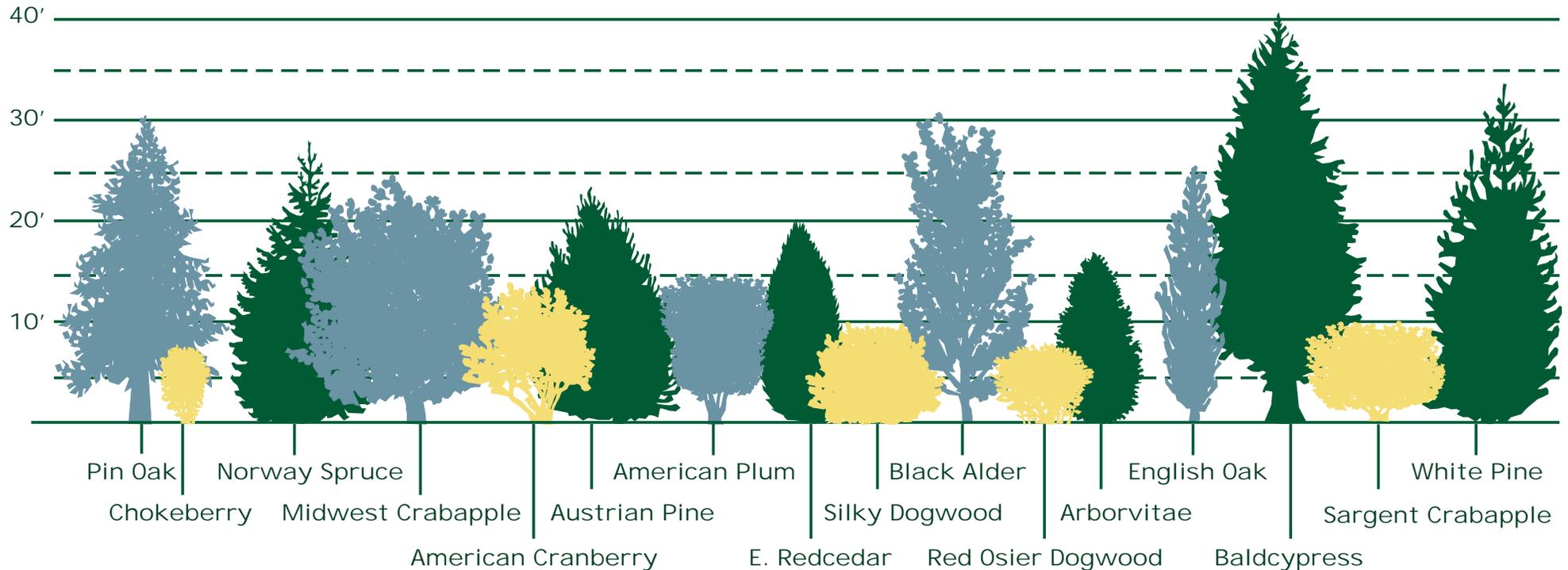


Low Tolerance to Soil Wetness..... Moderate Tolerance..... Best Tolerance to Soil Wetness

Not all trees are suitable for every site and purpose. In particular, soil drainage is an important factor to consider when planning a windbreak. Soils in northwest Ohio vary from very poorly drained to very well drained, depending on soil texture and slope. Lake Plain soils, such as Toledo and Roselms are naturally poorly drained soils. Trees that grow on these types of soils must be tolerant of standing water and heavy clay content. In contrast, old beach ridges consisting of sandy soils, like Ostemq are well-drained soils. Trees that grow in these soils must be more tolerant of droughty conditions.

This chart is not meant to be quantitative; it is only to be used as a general comparison between selected species.

Relative 20 Year Growth (Height with Optimal Conditions)



This chart gives expected height growth for selected species in 20 years. These figures assume that the species is appropriate for the site and that proper weed control measures have been taken. The height growth is estimated through various sources including USDA-NRCS research, various publications, and the authors' field experiences in northwest Ohio.

Larger trees will continue growing after 20 years. Many shrubs will die out or stop growing around this time. This chart is meant to give a reference for what species in a planned windbreak will look like in 20 years. Consult species selection pages for maximum height values.

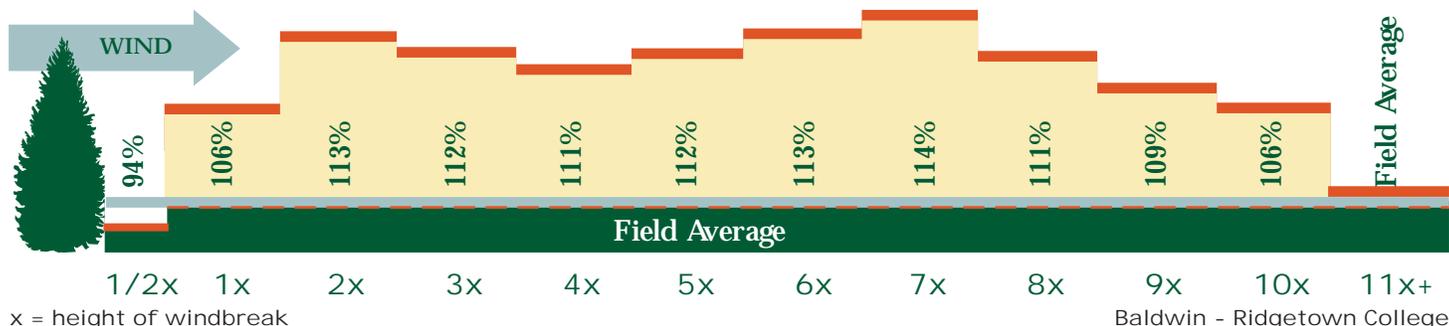


Species Quick Reference Chart

	Species	Mature Height (ft)	Growth Rate	20 Year Height (ft)	Tolerance to Soil Wetness
Conifer	Baldcypress	100	Rapid	40	High
	White Pine	100	Rapid	34	Low
	Norway Spruce	80	Moderate	28	Moderate
	Austrian Pine	70	Moderate	24	Moderate
	Eastern Redcedar	60	Slow	20	Moderate
	Arborvitae	60	Slow	17	Moderate
Hardwood	Pin Oak	100	Moderate	30	Moderate
	Black Alder	50	Rapid	30	High
	English Oak	50	Moderate/Slow	25	Low
	Midwest Crabapple	25	Rapid	25	Low
	American Plum	15	Moderate	15	Moderate
Shrub	American Cranberry	10	Moderate	15	Moderate
	Red Osier Dogwood	10	Moderate	8	High
	Sargent Crabapple	10	Moderate/Rapid	10	Low
	Silky Dogwood	8	Moderate	10	High
	Black Chokeberry	6	Moderate/Slow	6	Moderate

Benefits

Productivity (Leeward Side)

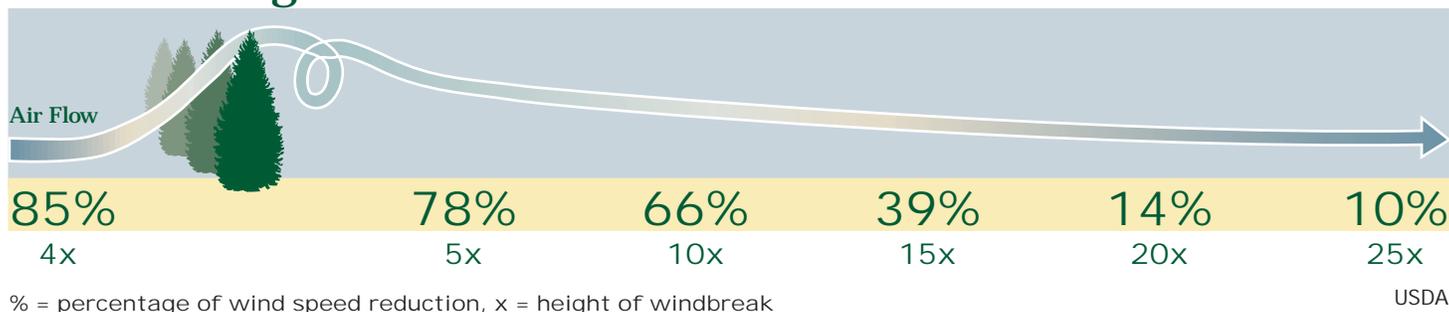


Windbreaks improve crop growth and are “consistently reported in the literature to increase crop yields” (Kort, Windbreak Technology, 1986). These effects are documented in over 676 field year studies, done in 14 different countries. Yield increases range from 5-50%, with 200 studies on corn and soybeans showing a weighted average gain of 12-13%. Windbreaks improve soil moisture, soil & air temperatures, relative humidity, and CO₂ levels. Windbreaks improve crop quality, promoting earlier crop flowering, maturity, and improve pollination. This is especially important for vegetable and specialty crops.



The economic benefits of windbreaks are well documented. In 1991, Dr James Brandle, of Nebraska developed a model quantifying that the economic benefits of properly designed windbreaks offset the land removed from production (Windbreak Symposium Proceedings, Ridgeway College, 1991).

Wind Management



Windbreaks direct winds over or around protected areas. This reduction in wind speed results in many benefits. The amount of wind speed reduction and the area affected depend on the height, density, width, and shape of the windbreak. The continuity of the windbreak is important. Holes or gaps in the windbreak may result in increased wind speed and reduced protection.

Windbreak height (x) is the most important factor used to determine the distance downwind that is protected by a windbreak. Wind speed is reduced most nearest the windbreak; at distances of 25 to 30x wind speed is reduced less than 10 percent. In addition there is a small reduction in wind speed up to one to 4x on the upwind side of a windbreak. The taller the windbreak, the greater the zone of protection. The percent of reduction in wind speed is relatively constant and is mostly independent of wind velocity. The density of a windbreak also affects the reduction of wind speed. Density is the ratio of the solid portion of a windbreak to the total area of the barrier. Very dense windbreaks reduce wind speed in the zero to 10x zone more than do less dense windbreaks. Moderately dense windbreaks reduce wind speed over a greater distance than very dense windbreaks. A windbreak density of 55 to 85 percent provides the greatest combination of benefits. For some specialty functions such as snow capture, a density of 30 to 40 percent may be ideal.



Species Selection Guide

The species description guide contains photographs and information for the most common species planted in windbreaks in northwest Ohio. For each species a general description is given as well as fruit and flower characteristics, natural habitat, native status, planting range, shade tolerance, plant spacing, soil suitability, and special comments. Photos were chosen that highlight each species individual characteristics. Exclusion of a species does not necessarily imply that the plant is unsuitable for windbreaks.

Species Guide Icon Legend

Spring Flowers



Wildlife Food - Berries



Wildlife Food - Nuts



Fall Color



Winter Visual Interest



Wildlife Food - Cones



Wildlife Cover



Songbird Nesting Habitat



Potential Wood Products



Ohio Native



Arborvitae

Thuja occidentalis



specimen



leaf detail



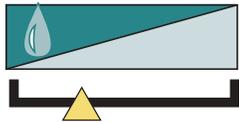
fruit



row

Plant Information

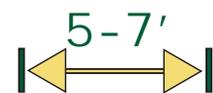
drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Medium-sized tree with columnar shape reaching 40 - 60 feet at maturity. Branches rarely self-prune, and grow near the ground

Fruit: A cone, 1/2 inch long, oblong, borne upright on the branches, scales are leathery, red brown and rounded with a small spine on the tip.

Natural habitat: Wet bogs and rocky outcrops.

Native to Ohio?: Only in glaciated bog regions.

Shade tolerance: Intermediate

Planting range: Statewide

Spacing: 5-7 feet

Soil suitability: Suitable for many poorly drained sites but is not drought tolerant. Capable of growing on heavy soils.

Wildlife use: Some browse use by deer, but used mainly as a cover for a variety of wildlife.

Special comments: This species has a tight narrow crown making it an ideal choice for maximizing protection with minimum space. Also, its flexible branches make it an excellent selection for the windward side of a windbreak.

Arborvitae

The most

popular

windbreak

species

planted in

Ohio.

Austrian Pine

Pinus nigra



row



leaf detail



fruit



specimen

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Medium-sized evergreen with a dense crown reaching 70 feet at maturity.

Fruit: Cones are ovoid, 2 to 3 inches long, yellow-brown in color. The umbo is armed with a very short prickle. Maturing September to November.

Natural habitat: Mountains of Central and Eastern Europe.

Native to Ohio?: No

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 10-12 feet

Soil suitability: Hardy tree that grows well on a broad variety of soil conditions.

Wildlife use: Used primarily for cover. Some browse use by deer and rabbits.

Special Comments: Due to the susceptibility to *Sphaeropsis* tip blight fungus, it is recommended that landowners plant *Sphaeropsis* resistant stock

Austrian Pine

Suitable for

almost all

soil types.

Baldcypress

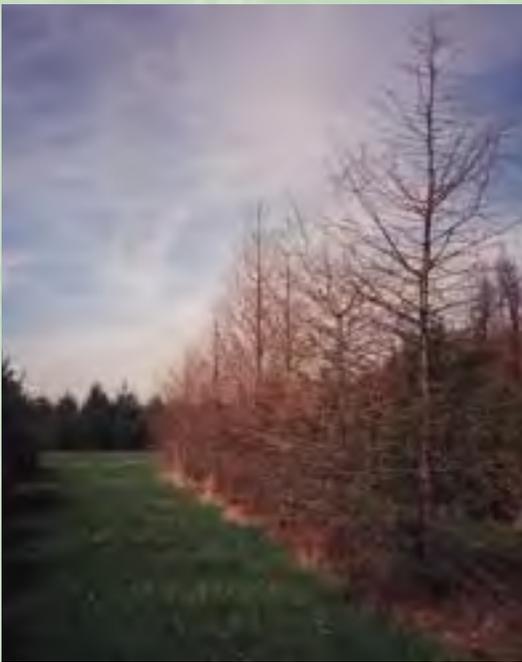
Taxodium distichum



leaf



specimen



winter interest



fruit detail



row

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Large deciduous softwood reaching up to 100 feet in height with a pyramidal crown.

Fruit: Cones are composed of peltate scales forming a woody, brown sphere with rough surfaces, 3/4 to 1 inch in diameter. Cones disintegrate into irregular-shaped seeds.

Natural habitat: Swamps of the southeastern US.

Native to Ohio?: No

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 10-12 feet

Soil suitability: Will grow in a wide variety of soils but does best in wet conditions.

Wildlife use: Seeds are eaten by wild turkey, squirrels, and wood ducks.

Special Comments: Baldcypress will thrive in wet areas where other species cannot survive. The dense horizontal branches form an effective wind barrier and provides unique visual interest in the winter landscape.

Baldcypress

One of the few deciduous conifers.

Eastern Redcedar

Juniperus virginiana



leaf detail



fruit



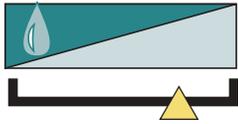
specimen



row

Plant Information

drainage preference



exposure requirement



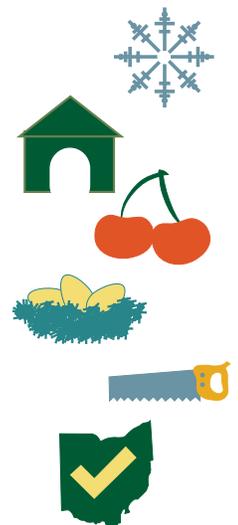
minimal planting distance



optimal condition mature height



specific features



Description: Medium sized tree reaching 60 feet in height at maturity.

Fruit: Small bluish berry-like cones 1/2 inch in size.

Natural habitat: Typical of old fields and dry sites throughout the eastern US.

Native to Ohio?: Yes

Shade tolerance: Intolerant to Intermediate

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Grows well on calcareous soils. Best growth on sites with adequate drainage, but also has good growth in heavy soil

Wildlife use: A variety of birds use eastern redcedar both for cover and for eating the fruit.

Special Comments: Grows well in conjunction with other species. Redcedar self-prunes its lower branches more so than arborvitae or the spruces. A shrub row grown with redcedar would help form a more effective wind barrier.

Redcedar is a host for the cedar-apple rust fungus. Therefore the species should not be planted near an apple orchard

Eastern Redcedar

A good

narrow

evergreen

tree with

high wildlife

value.

Eastern White Pine

Pinus strobus



fruit detail



specimen



row planting



flower detail



mature planting

Plant Information

drainage preference



exposure requirement



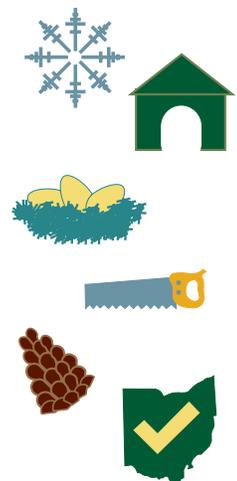
minimal planting distance



optimal condition mature height



specific features



Description: Fast-growing evergreen capable of reaching 100+ feet but typically shorter.

Fruit: Cones are 4 to 7 inches long, cylindrical, with thin, rounded cone scales very resinous. Cones are borne on a long stalk. Maturing August to September.

Natural habitat: Common tree in the Northeastern US and throughout the Appalachian mountains.

Native to Ohio?: Yes, but mainly restricted to the northeastern part of the state.

Shade tolerance: Intermediate

Planting range: Statewide

Spacing: 10-12 feet

Soil suitability: Will grow on many soils except heavy soils common in northwest Ohio and soils with a high pH. White pine makes its best growth on sandy, loamy soils with good drainage.

Wildlife use: Squirrels, yellow-bellied sapsuckers, black-capped chickadees, white-breasted nuthatches, pine warblers, pine grosbeaks, and the red crossbills all eat white pine seed. White pine shoots are also a favorite of deer and rabbits, particularly in the winter months.

Special comments: White pine does well on suitable soils, but often suffers from stunted growth in heavy soils. It is very intolerant of salt, so it should not be planted near a salted road. It can suffer from windburn and is best used in a middle or leeward row of a windbreak.

Eastern
White Pine

Tallest

Ohio

conifer

species.

Norway Spruce

Picea abies



fruit detail



row



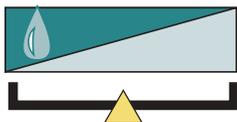
specimen



leaf detail

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Tall evergreen with characteristic upward sweeping branches. Capable of reaching 80+ feet in height.

Fruit: Cones are very large, cylindrical, 4 to 6 inches long, with stiff scales that are irregularly toothed. Turning brown and maturing September to November.

Natural habitat: Mountains of Central and Eastern Europe

Native to Ohio?: No

Shade tolerance: Intolerant to intermediate

Planting range: Statewide

Spacing: 10-12 feet

Soil suitability: Tolerant of most soils but does not do well in droughty conditions or on very wet soils.

Wildlife use: Used by deer, squirrels and a wide variety of songbirds.

Special comments: Norway spruce usually grows branches tight to the ground which makes it a good choice for a windbreak. Norway spruce is the most drought tolerant spruce but can suffer dieback in heavy drought years.

Norway Spruce

Excellent

songbird

nesting

habitat.

American Plum

Prunus americana



row



specimen



leaf detail



flower detail



fruit detail

Plant Information

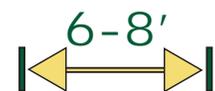
drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Deciduous small tree reaching a height of 15 feet.

Flower: White showy clusters appearing before leaves in spring.

Fruit: A red to yellow plum prized by many species of wildlife.

Natural habitat: Old fields and open woodlots

Native to Ohio?: Yes

Shade tolerance: Intolerant to Intermediate

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Suitable for all soils.

Wildlife use: Fruits are eaten by a wide variety of mammals and birds.

Suitability for windbreaks: High wildlife use makes American plum an excellent choice for a windbreak in conjunction with taller species.

American Plum

Hardy

species

native to

Ohio.

English Oak

Quercus robur 'Fastigiata'



row



specimen



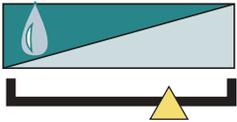
winter interest



leaf and fruit detail

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Medium-sized deciduous tree with a maximum height of 50 feet and a crown width of 10-15 feet.

Fruit: Acorn about 1 inch long, half enclosed by the cap. Ripen in one year.

Natural habitat: Cultivar developed from a tree native to western European woodlots.

Native to Ohio?: No

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Suitable for light or medium density soils. Does not grow well on very heavy clays.

Wildlife use: Acorns are a preferred food of many species and are eaten by deer, squirrels, quail, turkey, pheasants, wood ducks, rabbits, and many other birds. Oaks do not usually bear fruit until age 15-20. Large mast producing years do not occur until much later.

Special comments: The form of this tree makes it ideal for windbreaks. The crown will never spread over 10-15 feet in width. The lack of lateral branching means this tree puts most of its energy into upward growth and grows much faster than most native oaks.

English Oak

A narrow
growing oak
with good
wildlife
value.

European Black Alder

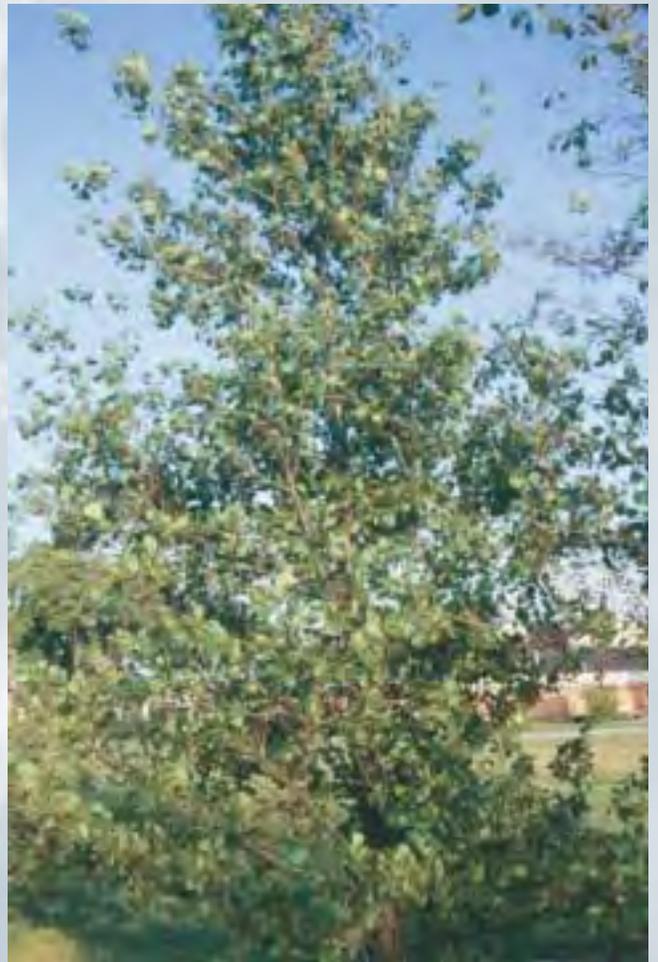
Alnus glutinosa



fruit detail



leaf detail



specimen



row

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Deciduous medium-sized tree capable of reaching 50 feet in height. Exceptionally quick growth habit.

Flower: Monoecious, males slender; reddish-brown catkins (1 to 1 1/2 inch long), much longer when shedding pollen; females small (1/6 inch) reddish-brown, cone-like catkins in clusters near branch tips.

Fruit: cone-like catkin, initially green, turning brown when ripe, 3/4 inch long, egg-shaped, contain many small winged nutlets, persistent through winter.

Natural habitat: Streambanks in Europe

Native to Ohio?: No

Shade tolerance: Intolerant to intermediate

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: European black alder will grow in nearly every soil type except the most droughty soils. It is a nitrogen-fixing plant and is therefore particularly suitable for nitrogen poor soils.

Wildlife use: Fruit provides excellent wildlife and songbird food.

Special comments: Black alder's quick growth habit makes it ideal for quickly establishing a windbreak.

European Black Alder

Fast growth

gives a

quick

windbreak.

Pin Oak

Quercus palustris



specimen



leaf detail



fruit detail



row

Plant Information

drainage preference



exposure requirement



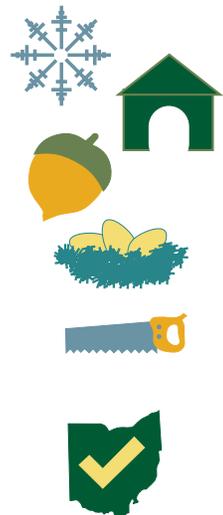
minimal planting distance



optimal condition mature height



specific features



Description: Large size tree growing with a distinct pyramidal branching pattern. Lower branches grow toward the ground while middle branches grow at right angles.

Fruit: Acorns are 1/2 inch long, striated, round but flattened at the cap, thin and saucer-like cap covered with red-brown appressed scales. Matures after 2 years, dispersed September to December.

Natural habitat: Moist sites, commonly on heavy soils.

Native to Ohio?: Yes

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 10-12 feet

Soil suitability: Pin oak will grow well on most soils in northwest Ohio. Should be used on medium to heavy soils.

Wildlife use: Acorns are a preferred food of many species and are eaten by deer, squirrels, quail, turkey, pheasants, wood ducks, rabbits, and many other birds and rodents. This tree also provides habitat to certain species of birds that would not nest in pine or spruce. Oaks do not usually bear fruit until age 15-20. Large mast producing years do not occur until much later.

Special comments: Pin oak is the fastest growing native oak and is well suited to the soils of northwest Ohio. This tree provides an important hardwood component to a windbreak and is a long-lived species.

Pin Oak

The

fastest

growing

native

oak.

Midwest Crabapple

Malus baccata var. *Mandshurica*



fruit



leaf detail



flower detail



specimen

Plant Information

drainage preference



exposure requirement



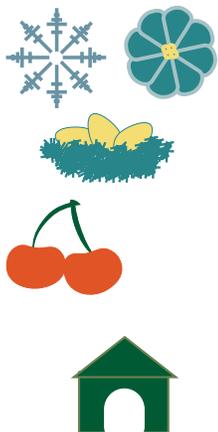
minimal planting distance



optimal condition mature height



specific features



Description: Medium-sized tree growing 25 feet in height.

Flower: White clusters of flowers 3/4 inch in diameter

Fruit: Small apples 1/4 to 1/2 inch in diameter

Natural habitat: Old fields in northeast China

Native to Ohio?: No

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Hardy tree capable of growing on most soil types.

Wildlife use: Used by a variety of songbirds and mammals.

Special comments: Good tree for wildlife. Apple-cedar rust often kills the tree when used near eastern redcedar. USDA-NRCS plant materials cultivar developed especially for conservation use.

Midwest
Crabapple

Massive

amounts of

white

spring

flowers

American Cranberry

Viburnum opulus, var. *americanus*



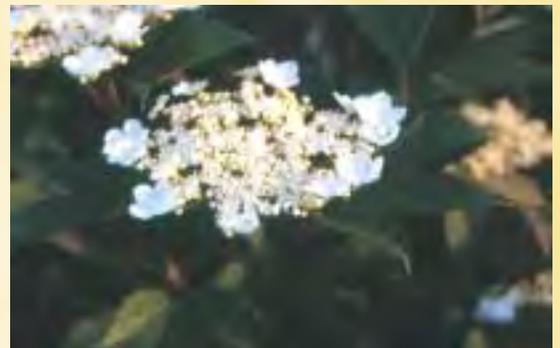
specimen



fruit detail



row



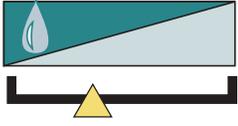
flower detail



fall leaf color

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Large, dense shrub obtaining a height of 15 feet at maturity.

Flower: Creamy, white showy flower clusters measuring 3-4 inches across and appearing in late May and early June

Fruit: The fruit, which ripens to a deep red fall color resembles the true cranberry in size and color. The fruit hangs on the branches all winter.

Natural habitat: Disturbed woods and fields throughout the northeast

Native to Ohio?: Yes

Shade tolerance: Intolerant to intermediate

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Grows in all but the most droughty soils. Best growth is on reasonably fertile sites.

Wildlife use: American cranberry is a good wildlife food and cover plant for small mammals and birds. Twigs are eaten by deer and rabbits. Fruits are a staple winter food for ruffed grouse and are eaten sparingly by pheasants and many species of songbirds. This plant is known for attracting flocks of cedar waxwings in the spring

Special comments: Dense growth and value to wildlife make this plant a good choice for a shrub row of a windbreak. Its showy flowers brighten the landscape. American cranberry also provides a good red fall color.

American Cranberry

Brilliant red

fall color

and bright

red winter

berries.

Black Chokeberry

Aronia melanocarpa



flower detail



row



specimen



leaf and fruit detail

Plant Information

drainage preference



exposure requirement



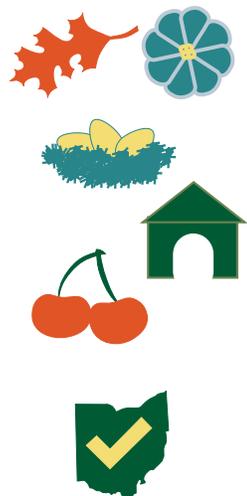
minimal planting distance



optimal condition mature height



specific features



Description: Small deciduous shrub growing 5 feet in height.

Flower: Whitish-pink flowers born in clusters containing 5-8 flowers approximately 3/8 inch diameter opening in mid-May.

Fruit: Produces black-purple berries in fall.

Natural habitat: Open areas in the eastern US.

Native to Ohio?: Yes

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 4-6 feet

Soil suitability: All

Wildlife use: Fruit is eaten by grouse, chickadees, and other songbirds.

Special comments: Because this species is very drought tolerant it is particularly useful for drought-prone soils. However, it can be planted in wet soils. Its only weakness is that it is easily shaded out; therefore it is best used on the outside row of a windbreak.

Black
Chokeberry

Versatile

windbreak

shrub

Red Osier Dogwood

Cornus stolonifera



fruit



fall leaf color



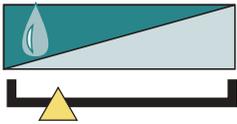
specimen



winter interest

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Small deciduous shrub growing 8 feet in height. This plant has a dark red stem and foliage that turns purple-red in the fall.

Flower: Small greenish-white flowers in clusters that appear in spring. Not as showy or distinctive as flowering dogwood.

Fruit: Berry-like white drupes (1/4 inch diameter) that grow in clusters and usually appear in September.

Natural habitat: Moist sites in the eastern US.

Native to Ohio?: Yes

Shade tolerance: Tolerant but grows best in full sunlight.

Planting range: Statewide

Spacing: 4-6 feet

Soil suitability: Suitable for many poorly drained sites but is not drought tolerant. Capable of growing on heavy soils.

Wildlife use: Fruit is a favorite food of turkey, grouse, quail, and many songbirds.

Special comments: Brilliant foliage and twig color makes this shrub popular for hedge row plantings and exterior windbreak rows.

Red Osier
Dogwood

Showy

red stems

brighten

up the

winter

landscape

Sargent Crabapple

Malus sargentii



row



flower detail



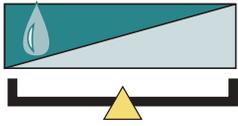
fruit detail



specimen

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Small deciduous tree/shrub growing 10-12 feet in height.

Flower: Showy white flowers in clusters appearing in mid May.

Fruit: Very small red apple, up to 1/4 inch in diameter

Natural habitat: Old fields and open areas in Asia

Native to Ohio?: No

Shade tolerance: Intolerant

Planting range: Statewide

Spacing: 6-8 feet

Soil suitability: Grows best on moderately well drained soils but will tolerate heavy soils.

Wildlife use: The fruit of Sargent crabapple is eaten by songbirds, deer, and squirrels. The branches are often eaten by deer and rabbits.

Special comments: Sargent crabapple's growing habit often makes it appear more like a shrub than a tree. This gives it dense lower growth making it good for a shrub row of a windbreak.

Sargent
Crabapple

Broad

growing

shrub good

for wildlife

Silky Dogwood

Cornus amomum



fall color specimen



flower



leaf detail



fruit



flower detail

Plant Information

drainage preference



exposure requirement



minimal planting distance



optimal condition mature height



specific features



Description: Small deciduous shrub growing 10 feet in height.

Flower: Small greenish-white flowers in clusters that appear in spring. Not as showy or distinctive as flowering dogwood.

Fruit: Berry-like bluish drupes (1/4 inch diameter) that grow in clusters.

Natural habitat: Moist sites in the eastern US.

Native to Ohio?: Yes

Shade tolerance: Tolerant but grows best in full sunlight.

Planting range: Statewide

Spacing: 4-6 feet

Soil suitability: Suitable for many poorly drained sites but is not drought tolerant. Capable of growing on heavy soils.

Wildlife use: Fruit is a favorite food of turkey, grouse, quail, and many songbirds.

Special comments: A great choice for windbreaks. Branches of this tree often bend down and root in wet soils. This can create a thicket of silky dogwood and form an effective wind barrier although the plant never gets tall. Silky dogwood is a hardy shrub that makes a good shrub row of a windbreak. Also provides deep red fall color.

Silky Dogwood

Most

popular

windbreak

shrub in

northwest

Ohio