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Recommended Species for Christmas Tree Planting

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Michigan is a leading producer of plantation-grown Christmas trees. Nearly four million trees are harvested annually. While trees are grown throughout the state, western areas of the lower peninsula tend to have the greatest concentration of producers.

The climate and soils of Michigan are quite variable. Typically, the northern portion of the state has lower minimum temperatures and greater snow accumulation than the southern portion. Soils in both the north and south are mixed, with coarser sandy soils occurring near areas of heavier soils. Due to these variations in climate and soil, different species are suggested for Christmas tree plantings from one part of the state to another. Even within the same species, several varieties often exist, with some being better suited to certain areas than others. Most varieties are derived from seed source differences and generally reflect tolerance to low winter temperatures. Among different species, recommendations usually reflect suitability for different soil types.

Several species have been used for Christmas tree plantings. Advantages and suitability of each have been determined from research studies and the experiences of producers.

Available Species

Under Michigan conditions, the species used for producing Christmas trees are usually from one of four main groups. These are presented in Table 1. Each has been selected because of its desirability for several characteristics. The relative merits of each are compared in Table 2. Consider these characteristics, local growing conditions and

handling-marketing procedure at harvest.

Tree selection should also be influenced by the varieties available. Within a given species, there is con-

siderable variation in growth rate, form, color, needle length, etc. The principal characteristics of each species, and varieties within a species, are discussed in this publication.

TABLE 1. Species Suitable for Use in Christmas Tree Plantations in Michigan.

Pine	Spruce	Fir	Douglas-fir
Scotch pine	White spruce	Balsam fir	Douglas-fir
Austrian pine	Black spruce	White fir	
Eastern white pine	Blue spruce	Fraser fir	
Southwestern white pine	Norway spruce		

Pines

Pine trees have good needle retention, a generally fast rate of growth and are easy to establish. Depending on the species, they are well suited to a variety of soil

types. Among the various species, needles are borne in clusters ranging from two to five. Two- to three-year-old seedlings are usually used for planting.

Scotch Pine

Although not native to North America, this species is the most widely planted of all conifers grown for Christmas trees. It grows well on a variety of soil types, but is particularly well suited to sandy soils. Depending on the variety used, it is hardy throughout the state. It is a highly variable species with considerable varietal differences in needle length and color. Significant differences in growth rate also occur among the many varieties available.

Several varieties are suggested for Michigan, depending on location:

- **Southern Lower Michigan**—Southern France, Turkey (Armenia), East Anglica. (Spanish seed sources have been widely used in the past, but sustained severe injury during the winter of 1976-77.)



Scotch pine, the most widely planted species for Christmas tree production, is well adapted to a variety of soils and planting sites and responds well to plantation production.

• **Northern Lower Michigan**—Southern France, Turkey, Scotch Highland.

• **Upper Peninsula** — Southern France (near lakes), Turkey (Armenia), Scotch Highland.

Austrian Pine

Also a native of Europe, this species is frequently planted for use as a Christmas tree. The needles are rather stiff and strongly attached with a dark green color. Austrian pine is especially well suited for flocking due to its strong branching habit. This species may grow rather slowly early in life, but usually reaches marketable size within 8 to 10 years after planting. It grows well on loamy to heavy soils and appears to be more tolerant of alkaline soil conditions than most other pines. It should be planted south of a line from Bay City to Muskegon.

Yugoslavian and Austrian varieties appear to be the most winter-hardy and disease-resistant selections for Michigan.

Eastern White Pine

This native pine has not been extensively used as a Christmas tree, but properly shaped and sheared, it can develop into an excellent tree. It is characterized by attractive blue-green needles and a fragrant aroma. The species responds well to shearing and a very attractive tree can be produced. It will grow best when planted on well-drained loamy soils but will also survive on slightly wet and organic soils. Local seed sources have performed well under all Michigan conditions.

Southwestern White Pine

Native to the mountainous parts of Arizona and New Mexico, this species is similar to Eastern white pine but has a denser crown. It is relatively new to Michigan. Its soft, five-needled foliage has a distinct bluish cast which contributes to its attractiveness. It grows relatively rapidly on a variety of soils and responds well to shearing.

Seed from any part of its natural range is satisfactory but scarce in many years.

TABLE 2. Selected Characteristics of Species Used for Christmas Tree Production.

Species	Fragrance	Color	Stiffness of Twig	Shipping Qualities	Freedom from Pests	Needle Retention
Scotch pine	Good	Excellent to very poor	Excellent	Good	Very poor	Excellent
Austrian pine	Good	Very good	Excellent	Very poor	Fair	Excellent
Southwestern white pine	Excellent	Excellent	Good	Good	Good	Excellent
Eastern white pine	Excellent	Very good	Good	Good	Fair	Excellent
White spruce	Poor	Very good	Very good	Good	Good	Fair
Black spruce	Poor	Good	Good	Poor	Good	Poor
Blue spruce	Good	Excellent	Excellent	Fair	Fair	Good
Norway spruce	Good	Good	Good	Very good	Fair	Poor
Douglas-fir	Very good	Excellent	Fair	Excellent	Very good	Very good
Balsam fir	Very good	Very good	Fair	Excellent	Very good	Very good
White fir	Very good	Very good	Good	Excellent	Very good	Very good
Fraser fir	Very good	Excellent	Fair	Excellent	Very good	Very good

Spruces

In contrast to pines, spruces have short, single-needle foliage that is somewhat stiff. Needle retention is generally not as good as for pines, although several species have particularly attractive foliage and aroma. Spruces respond well to plantation cultural practices and are popular

with many consumers. They are widely planted throughout the state.

Spruces vary considerably in needle retention, but all of them drop their needles if allowed to become dry. Therefore, they should be grown close to markets so they can be marketed fresh.

White Spruce

This native species is the most commonly planted species of spruce in Christmas tree plantations. It is characterized by good natural shape, short stiff needles and excellent foliage color. When growing under natural conditions, it is most common in low wet areas in northern lower Michigan, but it is found on upland sites as well in the upper peninsula. For plantations, loamy soils are best.

Seed source trials have indicated best success when nursery stock from Ontario seed sources is used. How-

Blue spruce, considered desirable because of its attractive blue color and natural shape, is somewhat slower growing than most other species used for Christmas trees.



ever, such stock is not commonly available in most nurseries; thus seed from native Michigan trees is normally used.

Black Spruce

A close relative to white spruce, this species is native to low-lying areas in the northern part of the state. It is similar to white spruce in appearance, with the exception of its very short needles (1/4- to 3/8-inch long). Since needle retention and growth rate are poor in comparison to white spruce, it is not widely planted.

Blue Spruce

This Rocky Mountain species has been widely planted throughout Michigan and the eastern United States for ornamental purposes. In recent years it has gained in popularity as a Christmas tree due to its symmetrical form and attractive blue foliage. This species is characterized by stiff, 1- to 1½-inch long needles which are sharp-pointed. It is a slow growing species, requiring longer rotations than white spruce. It does best on well-drained sandy soils, but will grow on heavier clays as well. Due to its stiff foliage and rigid branching habit it is somewhat bulky and not well suited for long distance transportation. Needle retention is the best of all the spruces.

Norway Spruce

A native of Europe, this species is probably best known for its prominence around farmsteads throughout much of lower Michigan. It has also been extensively planted for wind-breaks around farm buildings. Needles on Norway spruce are dark green ranging in length from ¾ to 1 inch. Needle retention on cut trees is not good, and spraying with a needle holding compound is common. This species grows well on a variety of soil types, although slow growth tends to be characteristic during the first few years following planting. An overall coarse appearance of the tree makes this species less desirable than either white or blue spruce. It is generally not recommended for use in establishing commercial Christmas tree plantations.

Firs

All firs have soft, flattened (in cross section) needles which are borne singly along the sides of twigs and branches. Needles vary in length from ¾ to 2 inches and are usually medium to dark green in color. Firs are characterized by

a pleasing fragrance. With some variation among species, they will do best on loamy soils. Growth rates are much slower than for pines, particularly during the first few years following planting.



Fraser fir, a close relative to the native Balsam fir, has a pleasing natural shape and fragrance.

Balsam Fir

The only fir native to Michigan, this species is found in natural stands throughout the northern part of the state either in low-lying areas or mixed with white spruce on some upland sites. It has high traditional value for use as a Christmas tree, although it is not widely grown in plantations in Michigan. Initial growth rate is often slow and tends to be irregular, thus adding to the length of the rotation. In some areas of northern Michigan, "wild" balsam fir trees are cultured to produce Christmas trees.

If establishing a plantation, large transplant stock (3-2) should be used. Well-drained, sandy loam soils are preferred. Chemical weed control is essential for greatest success. For maximum growth rate and resistance to late spring frosts, use seed from Michigan's lower peninsula.

White (concolor) Fir

Native to the western United States, white fir will survive and grow when planted in Michigan. Growth rates are slower than for pines or native spruces, requiring 9 or more years to produce 7-foot Christmas trees. White fir has long silvery-

blue needles (1½ to 2½ inches) which are curved upwards along the twigs.

For planting in Michigan, seedlings or transplants produced from seed collected from certain native stands in central Arizona give the best results. Such trees are faster growing than trees from farther north, not as susceptible to cold damage as white fir from extreme southern Arizona and bluer than trees from New Mexico. White fir is susceptible to late spring frost and, therefore, should be planted on sites with good air drainage.

Fraser Fir

Fraser fir grows naturally in the southern Appalachian Mountains at elevations of 4,000 to 6,500 feet. In form and overall appearance it is very similar to balsam fir. Needles are flat, from ½- to 1-inch long, dark green above and silver beneath. Its growth rate is more rapid than balsam, and it is usually easier to establish in plantations. Also, it has a more pleasing general appearance than balsam.

It has not been widely planted as a Christmas tree in Michigan due to its slower rate of growth than Scotch pine and its susceptibility to late

spring frosts. This species is not adapted to northern Michigan but should be satisfactory for upland areas in the southern lower peninsula. No significant differences in tree growth as a result of seed origin have been observed. Large transplant stock should be used if available.

Douglas-Fir

While not a true fir, this species is commonly planted on upland sites in the lower peninsula where it may be developed into an excellent tree. Native to the Pacific Northwest and Rocky Mountain region of the United States, it is similar in growth form and appearance to the spruces. The $\frac{3}{4}$ - to $1\frac{1}{4}$ -inch long, flattened needles are borne singly along the slender twigs. Needles tend to be darker green above with a paler green underside. Prominent reddish-brown terminal buds assist in rapid identification.

Douglas-fir can be developed into a Christmas tree of excellent quality when grown under proper conditions. It will do best on well-drained loam or sandy loam soils. Due to its sensitivity to injury from late spring frosts, it should be planted on upland sites with good air drainage. "Orchard-type" sites are ideal with north- and east-facing slopes preferred, especially in the northern portion of the lower peninsula.

Seed origin is especially important in Douglas-fir. Trees from the West Coast are totally unsuited to Michigan. Among the interior varieties, there are 3 to 1 differences in growth rate and large differences in susceptibility to frost. Trees from Arizona and New Mexico grow fastest and have dark blue-green foliage. Trees from northern Idaho and the adjacent British Columbia grow almost as fast and are less susceptible to frost injury. With trees established from seed from either of these sources, rotations of seven to nine years are possible, whereas rotations may be as long as 20 years for trees from northern Colorado and central Montana.

With stock from the slow-growing sources widely planted as has been true in the past, it is necessary to use 2-1 stock. If seedlings from Arizona-New Mexico are grown in uncrowded seedbeds, they are ready for field planting at age 2. Whatever the type of planting stock, good weed control for 2 years is essential.

Other Species

These suggestions for species selection do not preclude the use of other species. In fact, with few exceptions, nearly every conifer can be developed into an attractive Christmas tree, although not necessarily on a commercial level. The species recom-



Douglas-fir, considered by many to be the premium Christmas tree species, is characterized by short, flexible needles which remain strongly attached to the twigs following cutting.

mended have been demonstrated as suitable for commercial plantation culture. Furthermore, markets are established and available for these species. Large-scale production of plantation trees will be most successful and profitable if species are selected from those recommended in this bulletin.

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