Virginia Cooperative Extension

PUBLICATION 420-082

Species for Christmas Tree Planting in Virginia*

James E. Johnson, Extension Forester, Virginia Tech

Introduction

Christmas tree production in Virginia has steadily increased over the last several years. Favorable climate, soils, and proximity to markets place Virginia growers in a highly desirable marketing situation.

Christmas trees can be grown throughout the state, and growers are located in all regions. Selection of the proper species, however, is important. Soil conditions and general climate are the primary considerations influencing species selection, but other characteristics, such as consumer preference, species characteristics and requirements, condition of the planting site, and the presence or absence of pests, also play an important role.

Several species are normally planted for Christmas trees in Virginia. Table 1 lists the most commonly planted species by geographic region, while Table 2 lists characteristics for these and other species.

When selecting a species to plant for Christmas trees, it is important to consider characteristics, local growing conditions, handling/marketing requirements at harvest, seedling cost and availability, and market potential. Variation for many traits within a given species exists, particularly with color, needle length, growth rate, and form. Thus, seed or seedling source can be an important consideration, and many species are divided into recognized varieties based on seed collected from different geographic areas. For instance, there are at least 15 different seed sources for Scotch pine used in Christmas tree production, each exhibiting different characteristics.

Table 1. Species suitable and most commonly used for Christmas tree plantations in Virginia.*

Coastal Plain	Piedmont	Mountains
White pine	White pine	White pine
Scotch pine	Scotch pine	Scotch pine
Virginia pine	Virginia pine	Virginia pine
Norway spruce		Norway spruce
		Fraser fir

**White pine, Scotch pine, Virginia pine, and Norway spruce are available through the Virginia Department of Forestry.*

Pines

In general, pine species have good needle retention, are fast-growing, and are easy to establish. Most are suited to a variety of soil types. Site requirements are generally lower and less specific than for other conifers. Needles are borne in clusters of two to five, depending on the species. One-, two-, or three-year-old seedlings are normally planted.

White Pine (*Pinus strobus)*

A native of the mountains of Virginia, white pine (Figure 1) is also found east of the mountains at lower elevations. It has a pleasing silver-green color, soft needles, and good needle retention. It is a fast-growing tree on average to good sites, requiring heavy pruning to produce a compact, symmetrical tree. White pine grows best on moist, well-drained sandy loam soils, preferably on northeast, east, or southeast slopes, and can be planted throughout the state. On the average, approximately six to eight years are required to produce a 6-foot tree.

White pine is the most widely planted Christmas tree species in Virginia. Seedlings can be obtained from commercial nurseries, primarily in the Lake and New England states, or from the Virginia Department of Forestry. The VDOF obtains its seed from Floyd and Carroll Counties, and in recent years has produced a special Christmas tree grade of white pine seedlings.

*This publication is a revision of VCE Publication 420-082, *Recommended Species for Christmas Tree Planting in Virginia (1983)*, by former Extension Forester Thomas J. Nichols.

www.ext.vt.edu

Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2009

VirginiaTech Invent the Future

VIRGINIA STATE UNIVERSITY

Table 2. Selected characteristics of species used for Christmas tree production.*

Species	Fragrance	Color	Twig Stiffness	Shipping Qualities	Freedom from Pests	Needle Retention
White pine	Very good	Very good	Good	Excellent	Fair	Excellent
Scotch pine	Good	Excellent to very poor	Excellent	Good	Very Poor	Excellent
Virginia pine	Good	Very good to very poor	Excellent	Good	Poor	Fair to very poor
Austrian pine	Good	Very good	Excellent	Very poor	Fair	Excellent
Fraser fir	Excellent	Excellent	Fair	Excellent	Very good	Very good
White fir	Very good	Very good	Good	Excellent	Very good	Very good
Douglas fir	Very good	Excellent	Fair	Excellent	Very good	Very good
Norway spruce	Good	Good	Good	Very good	Fair	Poor
Blue spruce	Good	Excellent	Excellent	Fair	Fair	Good
White spruce	Poor	Very good	Very good	Very good	Good	Fair

**Partially adapted from* Recommended Species for Christmas Tree Planting, *Ext. Bull. E-1155, Michigan State Cooperative Extension Service.*

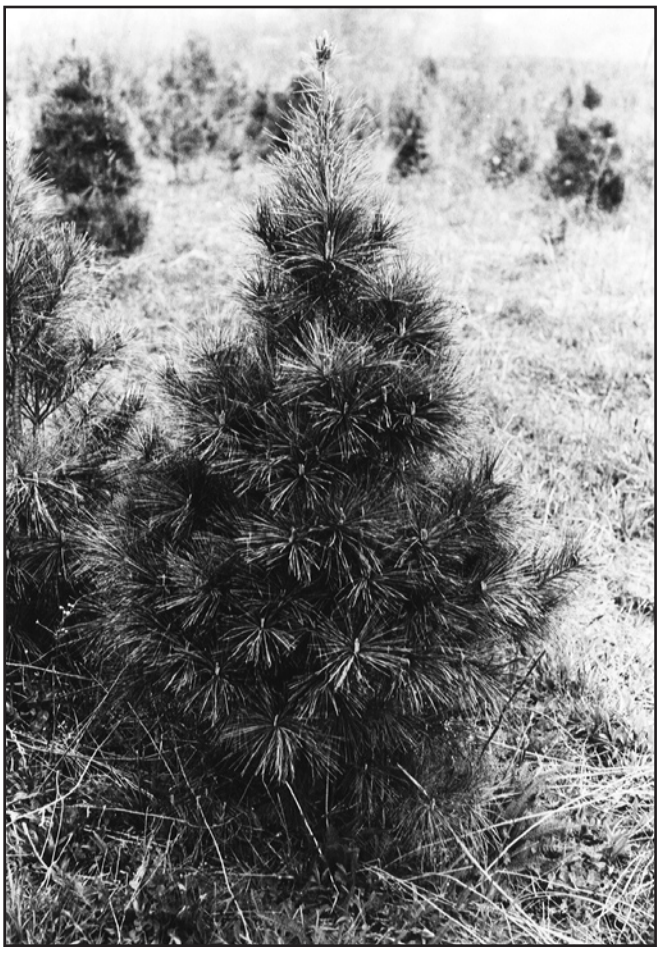

*Figure 1. White pine (*Pinus strobus*).*

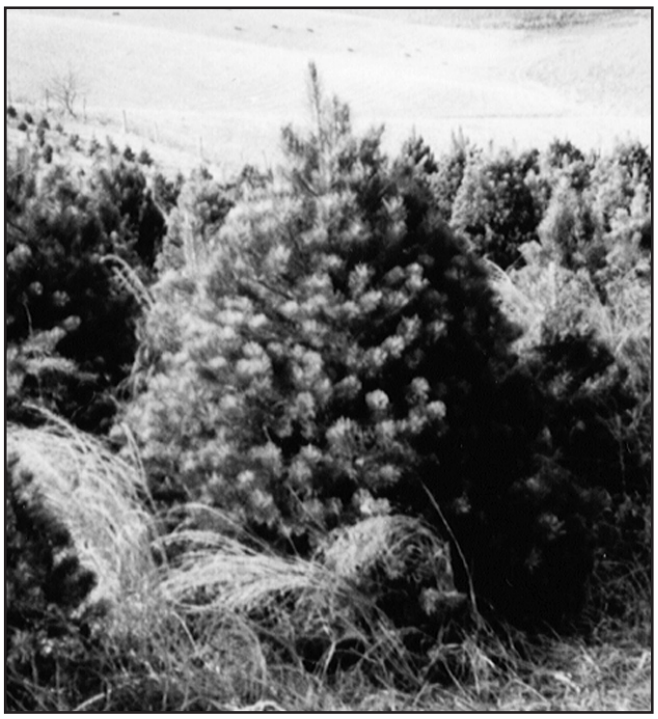

*Figure 2. Scotch pine (*Pinus sylvestris*).*

Scotch Pine (*Pinus sylvestris)*

Although native to Europe, Scotch pine (Figure 2) is the most widely planted Christmas tree species in the United States. It is hardy and grows well over a wide range of soil and moisture conditions, preferring moist, well-drained soils, but it is also well suited to sandy soils. The needles of Scotch pine are mostly blue-green, 1 1/2 inches to 3 inches long, and slightly twisted. It is a highly variable species, however, and the many varieties differ in length, color, and stiffness of needles. Many commercial nurseries have developed varieties with distinctive characteristics and sell seedlings specifically as Christmas tree stock. Sources from northern Spain and southern France are widely used. Scotch pine usually requires six to eight years after planting to produce a 6-foot Christmas tree. The tree is subject to crooked stems and fast growth, and it requires heavy pruning. Scotch pine also has inherent problems with needle cast, gall-cankers, tip moths, and sawflies.

Virginia Pine (*Pinus virginiana)*

While used extensively for Christmas tree production further south, Virginia pine (Figure 3) is somewhat of a newcomer for Christmas tree production in Virginia. It does offer promise and potential. A native of Virginia, Virginia pine has fair color and needle retention, and it grows well on poor as well as good sites. Virginia pine is a very drought-tolerant species and can grow on dry south- and west-facing slopes. It commonly grows irregularly with a crooked stem and requires heavy shearing. Two shearings per season are necessary. Virginia pine may reach merchantable size one to three years sooner than the other pines. Like Scotch pine, Virginia pine exhibits much variation within the species and also is subject to several pests, particularly tip moth. Pine voles prefer it to white pine. Varieties grown in the Deep South apparently do not thrive as far north as Virginia.

*Figure 3. Virginia pine (*Pinus virginiana*).*

Austrian pine (*Pinus nigra)*

A native of Europe, Austrian pine is frequently planted further north for Christmas trees, but has been planted and marketed in Virginia on a limited basis. It is more difficult to shape into high-quality trees than some other species. The needles are dark to yellow-green, very stiff, and strongly attached. Branching habit is quite strong, making the species well suited to hanging ornaments. As with Scotch pine, different varieties are available. Austrian pine grows well on loamy to heavy soils and appears more tolerant of alkaline soils than most other pines. It grows more slowly than the other pines initially, but it usually reaches merchantable size six to nine years after planting.

Firs

All firs have soft, flattened needles borne singly along the twigs and branches. Depending on species, the needles vary from 3/4 inch to 2 inches in length and are usually medium to dark green in color. Firs are characterized by a pleasing fragrance. They do best on loamy soils and are unsuited for heavy clay soils. Firs grown for Christmas trees commonly require fertilizer. Growth rates are much slower than for pines, particularly during the first few years. Three- to five-year-old transplants are used for planting to reduce field production time.

Fraser fir (*Abies fraseri)*

Fraser fir (Figure 4) is very similar in form and appearance to balsam fir, a widely distributed northern species. Needles are flat, 1/2 inch to 1 inch long, green above and silver beneath. Fraser fir is native to the Appalachian Mountains at elevations of 4,000 to 6,000 feet in western North Carolina, eastern Tennessee, and southwestern Virginia. At lower elevations, planting sites for Fraser fir should be carefully selected. The recommended minimum elevation in Virginia for planting Fraser fir is 2,000 feet, although vigorous plantations have been established as low as 1,500 to 1,700 feet. Lower elevations can be partly compensated for by such factors as frequent summer showers, northern exposure, and moist sites. The soil for this species should be mod-

*Figure 4. Fraser fir (*Abies fraseri*).*

*Figure 5. White fir (*Abies concolor*).*

erately acid (pH of about 5.3 to 5.8), have some organic matter, and have a moderate water-holding capacity.

Fraser fir has excellent color and needle retention, pleasing fragrance, and strong branches with a slight turn-up which gives the tree a compact appearance.

Fraser fir is recommended for the mountain counties at higher elevations on northern to northeast slopes in areas of high rainfall. There is some evidence of susceptibility to late spring frosts. No significant growth differences due to seed origin have been observed. Large transplant stock should be used if available. On good sites, Fraser fir should reach a height of 6 feet in seven to ten years after planting.

Of the pests attacking Fraser fir, Phytophthora root rot can be particularly damaging, but can be avoided by not planting on poorly drained soils and sites.

White or Concolor Fir (*Abies concolor)*

White fir (Figure 5) is native to the western United States and could have potential as an alternative species for Virginia growers. Needles are long, 1 1/2 inches to 2 1/2 inches, silvery-blue in color, and curve upwards along the twig. White fir grows more slowly than the pines or some of the other fir species, requiring nine to twelve or more years to produce 7-foot Christmas trees.

Stock from several different sources is available, but experienced growers in Michigan prefer stock originating from central Arizona because of faster growth, lower susceptibility to cold damage, and bluer color than stock from other sources. White fir is apparently susceptible to late spring frosts, and therefore it requires sites with good air drainage.

Spruces

Like firs and unlike pines, spruces have short, sharp-pointed single-needle foliage that is somewhat stiff. While the foliage and aroma are particularly attractive for several species, needle retention is generally not as good as for the pines or the firs. All spruces will drop their needles if allowed to become dry, and therefore they should be grown close to markets to permit marketing fresh trees. On a national basis, various spruce species have long been popular with customers.

Norway Spruce (*Picea abies)*

Norway spruce (Figure 6) is native to Europe, but has been widely planted in the United States as an ornamental. Needles range in length from 3/4 inch to 1 inch and are dark green in color. While the overall color of Norway spruce is fair to excellent, needle re-

*Figure 6. Norway spruce (*Picea abies*).*

tention is poor. Commercial Christmas tree growers have routinely sprayed cut trees with a needle-holding compound in the past, but if trees are cut fresh and kept properly watered, needle drop is usually not a problem. The tree has an attractive appearance, though perhaps a less desirable one than white or blue spruce. It is not widely recommended for commercial plantations. Norway spruce does grow well on a variety of soil types, although slow growth is characteristic during the first few years following planting. Eight to eleven years are needed to produce 6- to 7-foot trees. It grows best on cool, moist sites, and considerable pruning is necessary to form a compact tree.

Other Spruces

The following spruces have proven successful on the national market, but have been grown in Virginia only on a limited or trial basis.

White Spruce (*Picea glauca)*

White spruce is another species with possible potential for Christmas tree production in Virginia. It is native

*Figure 7. Blue spruce (*Picea pungens*).*

to the northern United States and is widely planted for Christmas trees in that region. White spruce has excellent foliage color, short stiff needles, and a good, natural shape. Needle retention is better than that of Norway spruce. Loamy soils have been found to be the most desirable for best production.

Blue Spruce (*Picea pungens)*

Blue spruce (Figure 7) has not been grown or marketed very widely in Virginia. It is native to the Rocky Mountain region of the United States, but has been widely planted for ornamental purposes throughout the East. The needles are stiff, 1 inch to 1 1/2 inches long, and sharp-pointed. Its increasing popularity as a Christmas tree is due to its symmetrical form and attractive blue foliage. As in other species, color varies from tree to tree; only about one-third of all seedlings planted will exhibit good to excellent blue color. The remainder will be off-shades of blue to green. Blue spruce does best on well-drained sandy soils, but it will grow on heavier clays. It is a slow-growing species, however—slower than white spruce—requiring nine to twelve years to reach 6 feet. Its sharp needles can make the tree difficult to decorate, and its stiff foliage and rigid branching habit make it somewhat bulky and not well suited for long-distance transportation. Blue spruce has the best needle retention of the spruces.

*Figure 8. Douglas fir (*Pseudotsuga menziesii*).*

Douglas Fir (*Pseudotsuga menziesii)*

Douglas fir (Figure 8) is not a true fir, nor has it been widely tried or marketed as a Christmas tree by Virginia growers. Native to the Pacific Northwest and Rocky Mountain regions of the United States, it is considered by many in the west and north to be a premium Christmas tree species and has been widely planted in those regions. Douglas fir is similar in growth form and appearance to the spruces. The needles are short (3/4 inch to 1 1/4 inches) and flattened, dark green above and paler green on the underside, are borne singly along slender twigs, and remain strongly attached after cutting. Terminal buds are a very prominent reddish brown.

Northern and western growers have found that Douglas fir can be developed into a high-quality Christmas tree on the proper site using proper seed or seed origin. For best growth, upland sites with well-drained loam or sandy loam soils are recommended on north- and east-facing slopes with good air drainage to avoid late spring frost injury. Stock from sources in Arizona and New Mexico are reported to grow the fastest and have dark green foliage, while sources in northern Idaho and adjacent British Columbia supposedly grow as fast with less frost susceptibility. Rotations with stock from these sources have been reported to be seven to nine years.

Douglas fir needs to be studied more closely in Virginia before it can be widely recommended to Virginia growers for Christmas tree production. Strains need to be evaluated for variability, frost susceptibility, and growth. With Virginia's climate and the proper seedling stock, a five-year rotation should be possible.

Conclusion

The recommendations or discussions of species in this publication for selecting species for Christmas tree production do not preclude the use of other species. In fact, almost every conifer can be developed into a reasonably attractive Christmas tree, though not necessarily on a commercial level. Large-scale production of Christmas trees, however, will be most successful and profitable if species with proven track records for production and marketing are selected. The species discussed in this publication either have been successfully marketed as Christmas trees in Virginia or are being examined for potential use in Virginia.

White pine and Scotch pine are the two most widely planted species in Virginia because of their wide adaptability and marketability. Growers considering species that have not been widely planted or tested for Christmas tree production in Virginia should seek advice concerning the species and site before planting.

Reviewed by Kyle Peer, superintendent, Reynolds Homestead Forest Resources Research Center