

The Pines

text and photos by Dr. Bert Cregg

Pines are the largest and most diverse genus within the *Pinaceae* family. The genus *Pinus* includes over 100 species distributed throughout the northern hemisphere. Although pines have a variety of habits, most are large trees that form pyramidal crowns. Taxonomically, pines are divided into three groups: hard (or yellow) pines, soft (or white) pines, and pinyon (or foxtail) pines. While the division between hard and soft pines is based on a number of characteristics including cone scales, arrangement of vascular bundles and stomatal arrangement, they are most commonly differentiated by number of needles per fascicle. Hard pines typically have needles in fascicles of twos or threes and comprise the largest group with about 73 species. In Michigan we have two native hard pine species: red pine (*Pinus resinosa*) and jack pine (*Pinus banksiana*). Soft pines, in contrast, mostly have needles in fascicles of five. Michigan's native soft pine is our state tree, eastern white pine (*Pinus strobus*).

Ecology

Fire plays an important role in the ecology of many pine species. These species have evolved fire adaptive traits that enable them to colonize sites after a fire. For example, jack pine and closely related lodgepole pine (*Pinus contorta*) have a serotinous cone. When the cones are heated in a fire, the resins that hold the cone scale together melt and the pine seeds are released. Jack pine stands are critical habitat for the threatened Kirtland's warbler, which is found only in Michigan. Forest managers in Michigan

are managing jack pine to restore the warbler's habitat. Longleaf pine (*Pinus palustris*), a fire adapted species in the South, has a serotinous bud. When a longleaf pine seed germinates the trees may spend 10 or more years in a "grass" stage. The tree does not grow in height, producing only a clump of needles resembling a clump of grass. When a fire moves through a serotinous bud is released and the stem begins to develop.

Economic Importance

Pines have long been important trees in the economy of the United States. In colonial times, exceptionally large and straight eastern white pine trees were prized for ship's masts. The English crown marked selected trees with a broad arrow to indicate they were reserved for harvest for the King's navy. The "broad arrow" policy, like the Tea Tax, added to the unrest in the

Michigan's State Tree, the Eastern White Pine



colonies that lead to the American Revolution.

Eastern White Pine played a key role in the economic development of Michigan. In the mid- to late 19th Century, lumbering was a principle activity in much of Michigan and white pine was the most valued species. Much of the wealth of Michigan's "Timber Barons" such as Charles Hackley of Muskegon, Louis Sands of Manistee, and Perry Hannah of Traverse City was built on white pine, the prized timber of the Northwoods. Today only remnants of the vast stands of white pine remain. At Hartwick Pines State Park near Grayling, visitors can walk through an 85-acre grove of virgin white pines that was spared when logging ceased during the economic panic of 1893. When the economy recovered, the logging company decided the tract was too small to resume logging.

Worldwide, pines continue to be a leading source of timber and pulp production. In the South, loblolly pine (*Pinus taeda*) is planted extensively in forestry plantations and is harvested in as little as 25 years. Monterey pine (*Pinus radiata*), native to a small area (less than 20,000 acres) on the coast of California, is the most widely planted pine in the world. Monterey pine has been planted in approximately 10 million acres of plantations, primarily in Chile, South Africa, Australia and New Zealand. The success of these plantations is not without controversy, however, and concerns of forest fragmentation and loss of native habitat is increasing.

Several pine species are major Christmas tree species throughout the United States including Virginia pine (*Pinus*



Dwarf White Pine



Japanese Red Pine bark



Pyramidal Scots Pine

virginiana), Scots pine, Austrian pine, and white pine. Historically, Scots pine was the mainstay of the Christmas tree industry in Michigan. Dr. Jonathan Wright, geneticist at Michigan State University and an international leader in the forest genetics, identified seed sources of Scots pine from Europe that were adapted for Christmas trees plantations in Michigan. More recently, production of Fraser fir has eclipsed Scots pine as Michigan's leading Christmas tree. However pines continue to have a role as Christmas trees in part due to tradition and because they are typically adapted to a wider range of sites than firs.

Pines in Landscaping

Pines are among the most important conifers for landscaping in Michigan and the Upper Midwest. Eastern white pine, Scots pine, and Austrian pine have been the bread-and-butter species for landscaping for many years. These trees were widely planted and accepted in the trade for obvious responses: they were easy to

grow. Scots and Austrian pine, in particular, were especially well suited for landscaping because they were extremely stress tolerant. However, just as our native tree species are vulnerable to exotic pests, these introduced trees are increasingly vulnerable to native pests. Dr. Deb McCullough, MSU Forest Entomologist, determined that Scot pine is attacked by over 30 different insect pests. Like Scots pine, Austrian pine is a remarkably tough tree that can withstand severe drought and is also highly tolerant of road salt. Unfortunately, Austrian pine is highly susceptible to *Sphaeropsis* (formerly *Diplodia*) tip blight and trees begin to show characteristic shoot die-back at age 15 to 20 years.

Michigan landscapers continue to plant large numbers of Eastern White Pine. White pine is probably the fastest growing conifer in landscapes in Michigan. An unfortunate characteristic of pines, especially white pines, is that after pruning or shearing, vigorous terminal growth resumes but lateral growth remains suppressed resulting in "carrot-top syndrome". The



Swiss Stone Pine



Korean Pine



Japanese Red Pine (*Pinus densiflora*)

Zone 3b to 7

Needles: in twos, three- to five inches long, bright green to dark green, Height: 40-60 feet tall

The key ornamental feature of Japanese Red Pine is its orange exfoliating bark. When mature this tree can be an attractive specimen that provides year-round interest.

‘Pendula’ - A strong weeper, this cultivar needs training or grafting to maintain it as an upright tree. Otherwise, it can creep over the ground as a prostrate creeper. The needles are deep green and the bark becomes reddish. ‘Umbraculifera’ (also known as ‘Tanyosho’) - This is a popular form. It forms a multi-trunked tree or large shrub to approximately 20 feet tall and wide. The habit is vase shaped with an umbrella-like head that becomes flat-topped with age. The bark shows good orange color. It is often employed as a specimen or accent plant, though it can suffer severe damage from heavy snow or ice loading.

Swiss Stone Pine (*Pinus cembra*)

Zone 3b to 7

Needles: in fives, Height: 30-40 feet

This is a fairly dense and handsome ornamental. Somewhat slow growing and prefers full sun.

Chub notes: *I never met a cembra I didn't like. Lots of forms, dwarf, compact, all great.*

‘Nana’ - A slow-growing form, this plant features a pyramidal habit to 20 feet tall. Otherwise it is similar to the species. ‘Pygmaea’ is an even smaller form with needles tufted in congested growths.

‘Columnaris’ (perhaps the same as ‘Chalet’) - The most common form of the species, this plant has blue-green needles and a dense, narrow fastigiate form. More than one form may reside under this name.

Mugo Pine (*Pinus mugo*)

Needles: in twos, one- to two inches

Chub Notes

As part of the Conifer Corner feature I will add comments on landscape conifers from Justin “Chub” Harper. Chub is widely known as one of the leading experts on garden conifers in the United States. The Harper Collection of Dwarf and Rare Conifers at MSU’s Hidden Lake Gardens is nationally recognized. Each *Conifer Corner* will include Chub’s note on his favorite (and not so favorite) conifers.

long, curved, dark to medium green
Mugo pine is one *Pinus* that is usually more of shrub than a tree.

A versatile garden conifer. Well adapted and always seem to grow well. There is a wide range of growth habits, some actually grow fairly upright. The only issue with Mugo’s is that pine sawflies really go for them.

Chub notes: *I’ve always had a soft spot in my heart for Mugo Pine.*

var. ‘pumilio’ - A prostrate, open growing plant, this form can reach 10 feet wide and only a few feet tall. Small plants purchased under this name can be expected to grow large in time.

‘Amber Gold’ (perhaps the same as ‘Pot O’ Gold’) - A mounding selection that is compact and slow-growing, this plant truly shines in winter. The needles turn orange-yellow in the cold months, fading to green once again as spring commences. This novel habit adds interest to the winter landscape.

‘Tannenbaum’ - A larger grower, this plant forms a nicely pyramidal “Christmas tree” shape with dense habit and deep green needles. It grows 10 feet tall with a spread of six feet. Its extreme hardiness, to USDA Zone 2, makes it a good choice for a dwarf pine in cold areas.

Macedonia Pine (*Pinus peuce*)

Zone 4 to 7

Needles: in fives, three- to four inches long, Height: 30-60 feet

Chub notes: *An ace conifer, wonderful fine texture.*

Normal fall needle-drop in Eastern White Pine.

resolution of this problem will require planning by growers (we need different pruning practices for trees destined for landscapes versus Christmas trees) and educating consumers (a less heavily sheared tree will work better in the landscape in the long run). Despite their flaws, homeowners and landscapers will continue to plant white and Austrian pines. However, there are other pines that are well adapted to Michigan landscapes that are worthy of consideration.

Korean Pine (*Pinus koraiensis*)

Zone 4 to 7

Needles: in fives, two- to four-inches long, dark green, Height: 30-40 feet tall

Very adaptable and extremely cold hardy.

Chub notes: *One of my favorite pines, just an all around great tree.*

‘Glauca’ - This form bears long, soft needles of a pronounced blue color.

‘Silveray’ - This is a fastigiate, columnar form with bluish needles.

‘Winton’ - A low, spreading plant with blue-green needles, grows much wider than tall.