



Exotic Pine Species For Georgia

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Our native pines are wonderful and interesting to have in landscapes, along streets, in yards, and for plantation use. But our native pine species could be enriched by planting selected exotic pine species, both from other parts of the United States and from around the world. Exotic pines are more difficult to grow and sustain here in Georgia than native pines. Some people like to test and experiment with planting exotic pines.

Pride of the Conifers

Pines are in one of six families within the conifers (*Pinales*). The conifers are divided into roughly 50 genera and more than 500 species. Figure 1. Conifer families include pine (*Pinaceae*) and cypress (*Cupressaceae*) of the Northern Hemisphere, and podocarp (*Podocarpaceae*) and araucaria (*Araucariaceae*) of the Southern Hemisphere. The *Cephalotaxaceae* (plum-yew) and *Sciadopityaceae* (umbrella-pine) families are much less common. Members from all these conifer families can be found as ornamental and specimen trees in yards around the world, governed only by climatic and pest constraints.

Family & Friends

The pine family (*Pinaceae*) has many genera (~9) and many species (~211). Most common of the genera includes fir (*Abies*), cedar (*Cedrus*), larch (*Larix*), spruce (*Picea*), pine (*Pinus*), Douglas-fir (*Pseudotsuga*), and hemlock (*Tsuga*). Of these genera, pines and hemlocks are native to Georgia. The pine genus (*Pinus*) contains the true pines.

Pines (*Pinus* species) are found around the world almost entirely in the Northern Hemisphere. They live in many different places under highly variable conditions. Pines have been a historic foundation for industrial development and wealth building. Pines continue to be a valuable renewable natural resource generating paper, cardboard, lumber, plywood, composite products, chemicals, and food. Pines are the centerpiece and back-drop for homes and communities.

Trees generically considered pines were first placed into the *Pinus* genus in 1753. The name of the genus is the Latin word for “pine.” Other historic names for the genus have been *Apinus* (1790), *Strobus* (1854), and *Caryopitys* (1903). The pine genus (*Pinus*) contains ~95 species (ranging from 66-120 species depending upon the taxonomist) from around the Northern Hemisphere. Only one pine species’ range crosses the equator into the Southern Hemisphere in Sumatra -- Merkus pine (*Pinus merkusii*) of Southeast Asia..

Widespread!

Pines range from polar regions into the tropics. Within this huge range, pines, along with oaks, dominate many major forest types. The genus *Pinus*, can be found throughout Central America, Mexico, the United

States, Canada, Japan, China, and stretching down into the highlands of Vietnam, across the Himalaya mountains through South central Asian republics, and across Europe. Relatively little is known about pines found in Central China, Mexico, Honduras, and the Western Himalaya mountains.

Of the 95 species of pine in the world, 60 are found in North America. Nine pines are native in Canada, 36 in the United States, 36 in Mexico, 8 in Central America as far South as Nicaragua, and 4 in the West Indies. The old world has 35 different species of pine including one species in the Canary Islands, 4 in North Africa, 34 in Eurasia, and 27 in Asia.

Non-Tropical

Pines are found primarily in the North temperate region of the globe with a few range extensions leading Southward into the tropics, usually at high elevations. Many pines have been taken away from their native ranges and planted world-wide. A few of these species grow better in their new homes than in their native ranges. Because most pines are temperate region trees, the Southeastern United States holds great promise for growing a large number of different pines (exotics) from around the world.

Divisions

Pines can be divided into three groups: soft pines, hard pines and Vietnamese pine. There is only one member of the Vietnamese group. For the soft and hard pines, appearance of the wood can usually help separate groups. Soft pines have a gradual transition within each annual increment (ring) from earlywood to latewood. Hard pines usually have an abrupt annual increment transition from wood produced early in a year to wood produced later in a year.

The soft pine group contains 31 species subdivided into stone, white, pinyon, foxtail and chilgoza pines. The hard pines, of which many can be found in the Southeast United States, are composed of 62 species world-wide divided into the Chihuahua, Canary Island, Italian stone, Scots, Southern yellow, ponderosa, grey, lodgepole, and Monterey pines.

Unique Pines

There are many interesting pine species. One of these interesting exotic pines is Vietnamese pine (*Pinus krempfii*) found in the highlands of Vietnam. This rare pine has needles that are flat and broad. It has no other close relatives within the pine genus.

Another exotic pine of interest is found isolated on the Canary Islands in the Atlantic ocean. Canary Island pine (*Pinus canariensis*) has only one close relative. This relative, the chir pine (*Pinus roxburghii*), lives in the Himalaya mountains 5,000 miles away. Imagine what natural changes must have occurred in the landscape to divide these closely related pines by so much distance.

Each Mountain

Some pines have very limited ranges, occupying only a small island, a hill top, or a mountain side. Because of mountain formation, drought conditions, and other types of short- and long-term environmental changes, some pines become isolated from each other and develop into new species. For example, the mountains of Mexico are filled with many different species of pine isolated from each other. The Southwestern United States has many types of pinyon pine found only on a few isolated mountains.

Along the coastal areas of California are found a number of rare pines surviving on scattered hillsides like the Torrey pine (*Pinus torreyana*) or Monterey pine (*Pinus radiata*). Monterey pine is now grown in plantations in Australia, New Zealand, Brazil, and South Africa, and is almost gone from its tiny native range.

Will It Grow Here?

To be sure a pine will grow in a specific area, intensive testing is required over a number of years. Pines listed here were included if their native range had similar climates as do portions of Georgia, or if any of these pines were presently growing successfully in Georgia. Pines listed here could potentially grow somewhere in Georgia.

Figure 2 presents native and naturalized Georgia pines which could be planted out of their normal range elsewhere within the State. Figure 3 shows the area of the state where our native and naturalized pines are found.

Figure 4 lists exotic (non-native in Georgia) pines from other places within the United States which share some ecological attributes which may allow them to grow in Georgia. Figure 5 lists exotic pines from places outside the United States from around the world which have native home ranges with climatic attributes close to selected Georgia sites, or survive in planted collections in the Southeast United States.

Gambling On Success

Remember, the preceding figures list selected pines which usually share site characteristics with areas in Georgia. Pines other than those listed might also grow here under the right conditions. Some of the listed pines may not survive long, especially with changing site and climatic conditions, and most especially with extreme fluctuations from average weather events. In addition, there are many pests which can destroy new pines planted off-site or away from native pests and home ranges.

Southwestern and Mexican pine species tend to have problems in North Georgia but may grow better in South Georgia. Pines from Japan tend to survive well and grow in central and North Georgia. All white pine group trees should only be planted in sheltered areas. Always monitor for pine pests / stress problems, do not over-water, or overdose young pines with nitrogen fertilizers.

Conclusions

Pines are strange and fascinating trees. When you live in Georgia surrounded by many native and naturalized pines, you might not care about the other 84 pine species of the world. But, because pines can be shipped around the world and made to form hybrids, you might plant and care for a tree someday developed from Himalayan or Yugoslavian pines.

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Conifers (*Pinales*)

(~50 genera / >500 species)

Conifer Families:

araucaria	(<i>Araucariaceae</i>)
plum-yew	(<i>Cephalotaxaceae</i>)
cypress	(<i>Cupressaceae</i>)
podocarp	(<i>Podocarpaceae</i>)
umbrella-pine	(<i>Sciadopityaceae</i>)
pine	(<i>Pinaceae</i>)

Pine Family: (~9 genera / ~211 spp.)

fir	(<i>Abies</i>)
cedar	(<i>Cedrus</i>)
larch	(<i>Larix</i>)
spruce	(<i>Picea</i>)
Douglas-fir	(<i>Pseudotsuga</i>)
hemlock	(<i>Tsuga</i>)
pine	(<i>Pinus</i>)

Figure 1: Conifer and pine family relatives.

GEORGIA NATIVE PINES

(<i>Pinus</i>) species	common name	sites in Georgia
<i>clausa</i>	sand pine	South
<i>echinata</i>	shortleaf pine	Statewide
<i>elliottii</i>	slash pine	South
<i>glabra</i>	spruce pine	South
<i>palustris</i>	longleaf pine	South
<i>pungens</i>	table mountain	North
<i>rigida</i>	pitch pine	North
<i>serotina</i>	pond pine	South
<i>strobus</i>	Eastern white	North
<i>taeda</i>	loblolly pine	Statewide
<i>virginiana</i>	Virginia pine	North

Figure 2: Selected native or naturalized pines (*Pinus*) with potential for planting and growth outside their normal range in other parts of Georgia.

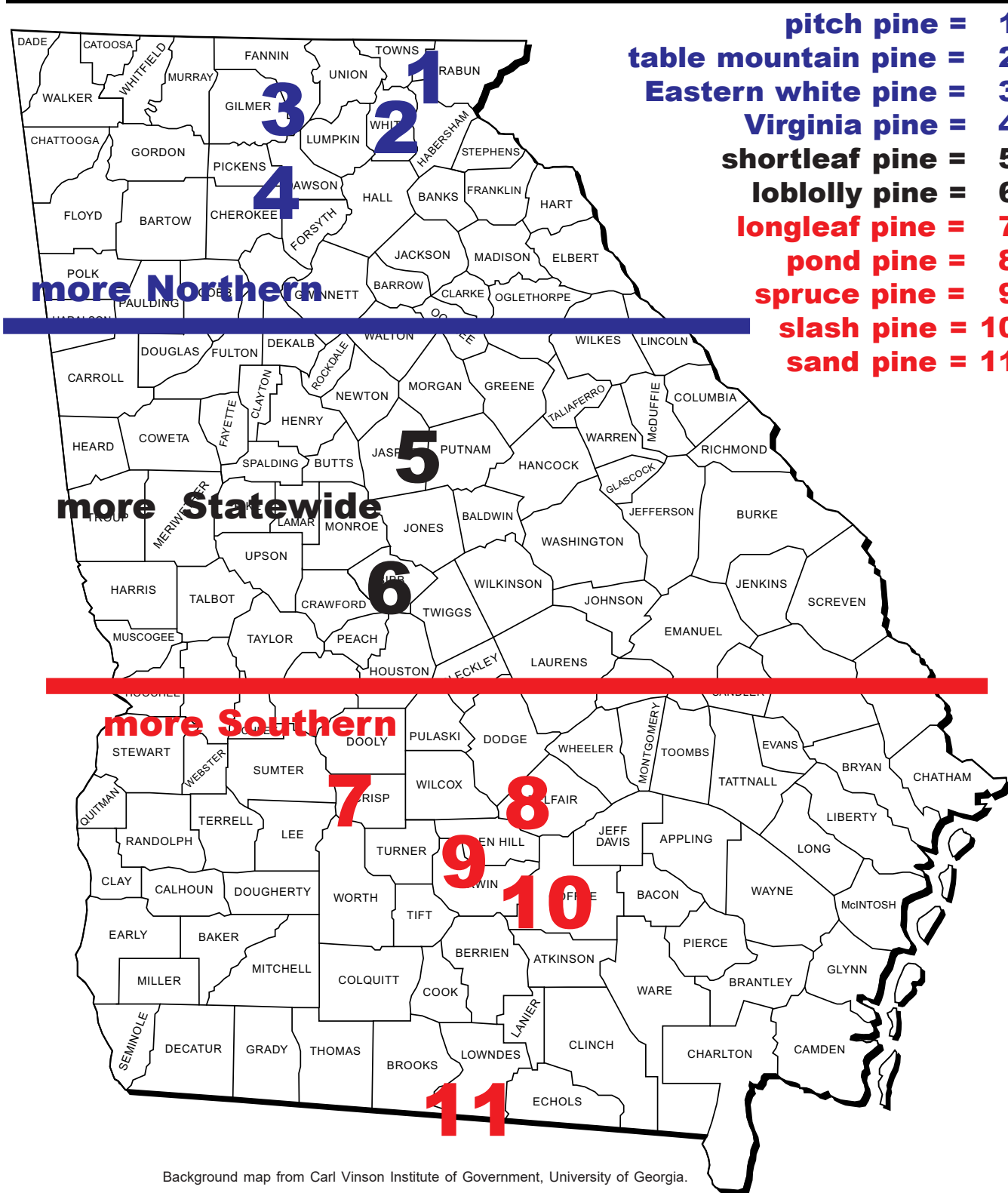


Figure 3: Center of native ranges for Georgia pines.
 Numbers represent common names of pines and are placed in an idealized center of their native range within Georgia.

UNITED STATES PINES

(<i>Pinus</i>) species	common name	sites in Georgia	home range
<i>aristata</i>	bristlecone pine	North dry	COLORADO
<i>attenuata</i>	knobcone pine		CALIFORNIA
<i>balfouriana</i>	foxtail pine	North	CALIFORNIA
<i>clausa</i>	sand pine	South	FLORIDA
<i>contorta</i>	lodgepole pine		Northwest US
<i>coulteri</i>	Coulter pine		CALIFORNIA
<i>edulis</i>	pinyon pine	dry	NEW MEXICO
<i>elliottii</i>			
var. <i>densa</i>	Southern slash pine	South	South FLORIDA
<i>monophylla</i>	singleleaf pinyon	dry	NEVADA
<i>monticola</i>	Western white pine		Northwest US
<i>ponderosa</i>	ponderosa pine		Northwest US
<i>radiata</i>	Monterey pine		CALIFORNIA
<i>strobiformis</i>	Southwest white pine	dry	NEW MEXICO
<i>washoensis</i>	Washoe pine	North	CALIFORNIA

Figure 4: Selected exotic pines (*Pinus*) from elsewhere in the United States with potential for planting and growth in Georgia.

WORLD PINE SPECIES

(Pinus) species	common name	sites in Georgia	home range
<i>ayacahuite</i>			
var. <i>brachyptera</i>	Mexican white pine		MEXICO
<i>banksiana</i>	jack pine		CANADA
<i>brutia</i>	Turkish pine		TURKEY
<i>bungeana</i>	lacebark pine		CHINA
<i>cembroides</i>	Mexican pinyon	dry	MEXICO
<i>cooperi</i>	Cooper pine		MEXICO
<i>densiflora</i>	Japanese red pine		JAPAN
<i>engelmannii</i>	Apache pine		MEXICO
<i>griffithii</i>	Himalayon blue pine		HIMALAYAS
<i>hartwegii</i>	Hartweg pine		MEXICO
<i>heldreichii</i>	Heldreich pine	North	YUGOSLAVIA
<i>koraiensis</i>	Korean pine	North	North CHINA
<i>leiophylla</i>	Chihuahua pine	South dry	MEXICO
<i>massoniana</i>	Masson pine		CHINA
<i>monophylla</i>	singleleaf pinyon	dry	NEVADA
<i>montezumae</i>	Montezuma pine	North	MEXICO
<i>morrisonicola</i>	Taiwan white pine		TAIWAN
<i>mugo</i>	Swiss mountain pine	North	SWITZERLAND
<i>nigra</i>	Austrian pine		YUGOSLAVIA
<i>parviflora</i>	Japanese white pine		JAPAN
<i>patula</i>	Mexican weeping pine	South	MEXICO
<i>peuce</i>	Balkan pine	North	YUGOSLAVIA
<i>pinaster</i>	maritime pine		SPAIN
<i>pinea</i>	Italian stone pine		SPAIN
<i>quadrifolia</i>	Parry pinyon	dry	BAJA, MEXICO
<i>sibirica</i>	Siberian stone pine		Central SIBERIA
<i>sylvestris</i>	Scot pine (Scotch)		North EUROPE
<i>tabulaeformis</i>	Chinese pine		CHINA
<i>thunbergii</i>	Japanese black pine		JAPAN

Figure 5: Selected non-United States exotic pines (*Pinus*) with potential for planting and growth in Georgia.