



UNIVERSITY OF
GEORGIA

Warnell School of Forestry
& Natural Resources

Publication WSFNR-21-27C

April 2021

***Pinus rigida* pitch pine**

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Pinus rigida (pitch pine) grows from Quebec to Georgia primarily in mountains and foothills. *Pinus rigida* was first described as a species in 1768. The scientific name means a “pine with stiff cone scale.” The common name comes from early colonists use of *Pinus rigida* for producing turpentine and pitch for sailing vessels.

The native range of *Pinus rigida* stretches from coastal and Eastern inland areas of Maine, South to Delaware, and then inland covering large portions of Southern 2/3s of Pennsylvania, West Virginia, Western Virginia, Southern Ohio, Eastern Kentucky, and the Tennessee / North Carolina border area. It grows into the far Northeast corner of Georgia. See the Georgia range map figure.

It grows in Hardiness Zone 4a - 6b and Heat Zone 3-6. The lowest number of Hardiness Zone tends to delineate the Northern range limit and the largest Heat Zone number tends to define the Southern edge of the range. This native Georgia pine grows in Coder Tree Grow Zone (CTGZ) A (a multiple climatic attribute based map), and in the temperature and precipitation cluster based Coder Tree Planting Zone 2. Figure 2.

Pinus rigida grows on dry rocky slopes, lower ridge tops, and well drained slopes along middle elevations of the Appalachians mountains and their foot hills at the Southern end of its range. It has been found on swampy areas and floodplain areas in the Northern part of its range. *Pinus rigida* occupies and competes well on good sites, but is usually found growing on sites which are dryer and more infertile. *Pinus rigida* has medium growth rate and a medium life span of 100 years (maximum = 450).

A unique feature of *Pinus rigida* growth is its ability to sprout back after site and tree disturbance even into middle age. *Pinus rigida* is fire resistant with relatively thick and flaky periderm. It generates sprouts from the stem base after fire has killed upper portions of a young tree. *Pinus rigida* usually reproduces abundantly after site disturbance (like fire) which exposes mineral soil. Pitch pine does not tolerant interference well, and usually is most successful on more stressful sites where competing hardwoods are more limited.

Pinus rigida is a medium sized tree with a height range between 50 and 65 feet (maximum of 100 feet). *Pinus rigida* is usually found with a mature diameter of 1 - 2 feet (maximum of 3 feet). Crown form is highly variable, depending upon light competition, pest problems, and site stress levels. *Pinus rigida* crowns are usually composed of a number of large horizontal branches forming an open irregular crown. Stem and larger branches have a number of short shoots or tufts of needle bundles growing from their surfaces. Pitch pine is considered reasonably wind firm and tends to handle wind, ice and snow well.

Pinus rigida needles occur in bundles of 3. Rarely needles can be found on a tree in bundles of 4 or 5, and even more rarely in bundles of 2, but the predominant needle count per bundle is 3. Needle bundle count

differences can be due in some areas to hybridization with shortleaf pine *Pinus echinata*. Needles are 2.2 - 5.3 inches long, thick, stiff, gently twisted, and dark yellow-green in color. Needles are held on a tree for 2 -3 years. An often cited characteristic is how needle bundles grow out perpendicular from twig and branch surfaces.

Pinus rigida becomes sexually mature early by 4 years of age. Mature female cones have a very short stalk. Cones are 1.4 - 3.2 inches long and are broadly egg-shaped. Cones are mostly open at maturity with some remaining closed for many years. Closed cones are opened by fire which releases seeds. Cones are a light yellowish brown to a creamy brown in color with a reddish tint. The end of cone scales have a dark reddish brown border. Cone scales have a short, rigid, slender, sharp, curved prickly. Good seed crops occur every 5-7 years with seeds being released over many months across Fall and into late Winter. Moist mineral soil is needed for successful seed germination and seedling growth.

Pinus rigida twigs are thick, stiff, rough, and grayish-green to grayish-brown in color with a touch of purple. Twigs age to a dark orange brown color. Branches are rough with flaky, resinous, brown colored periderm. *Pinus rigida* is a poor self-pruner, keeping living and dead branches on a stem for years which gives the crown an untidy appearance.

Pinus rigida periderm is thick, very scaly, and dark reddish brown in color on young trees. Periderm on older tissue is rough and made of flat yellow-brown colored plates with brown inner layers separated by deep furrows.

Pinus rigida wood is knotty and the stem is usually of poor form. Pitch pine tend to easily form false rings (growth increments) on stressful sites, and so tree aging can be a problem. Traditional and historic uses of *Pinus rigida* were lumber, cross-ties, fuelwood, posts, resin products (naval stores), mixed pulp, charcoal, canoe building, and pine knot torches. Its heartwood resists decay somewhat because of its resin content. Shorter needled trees have been used for Christmas tree culture. Historic medicinal uses of the tree were for internal consumption of resins to treat rheumatism and constipation, and for external use applied to burns, cuts, and boils. The resin-rich heartwood and branch knots were burned and the smoke used as an insecticide.

Pinus rigida grows with several other pines which can lead to confusion in identification. Shortleaf pine *Pinus echinata* needles are not stiff or twisted, occur in a mix of 2 and 3 needles per bundle, have weak small cone scale prickles, a white colored coating on young twigs, and bark with small pitch pockets visible. Pitch pine tends to grow at higher elevations than shortleaf pine. *Pinus serotina* pond pine has been considered a Coastal Plain variety or subspecies of pitch pine. Pond pine has longer needles (4.8 - 8 inches long) which are held on a tree 3-4 years and have tightly closed cones. Table mountain pine *Pinus pungens* has much shorter needles with heavy cones having cone scales with long, thick, curved, sharp prickles.

Pinus rigida hybridizes with shortleaf pine *Pinus echinata* (the hybrid showing intermediate characteristics), pond pine *Pinus serotina*, loblolly pine *Pinus taeda* (hybrid sometimes called *Pinus x rigitaeda* which is a commercial species in Korea), and table mountain pine *Pinus pungens*.

Citation:

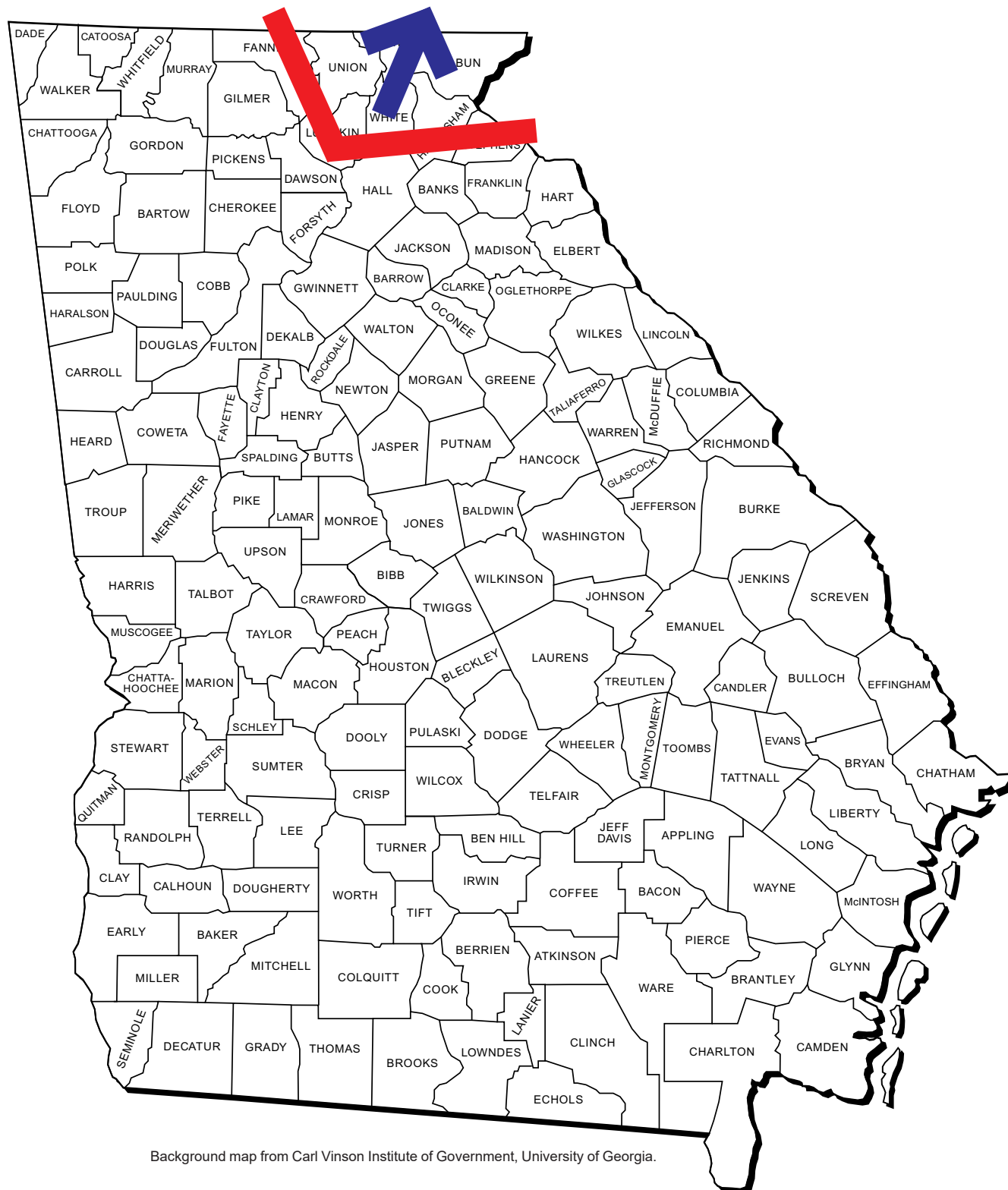
Coder, Kim D. 2021. *Pinus rigida* pitch pine. University of Georgia, Warnell School of Forestry & Natural Resources Outreach Factsheet WSFNR21-27C. Pp.4.

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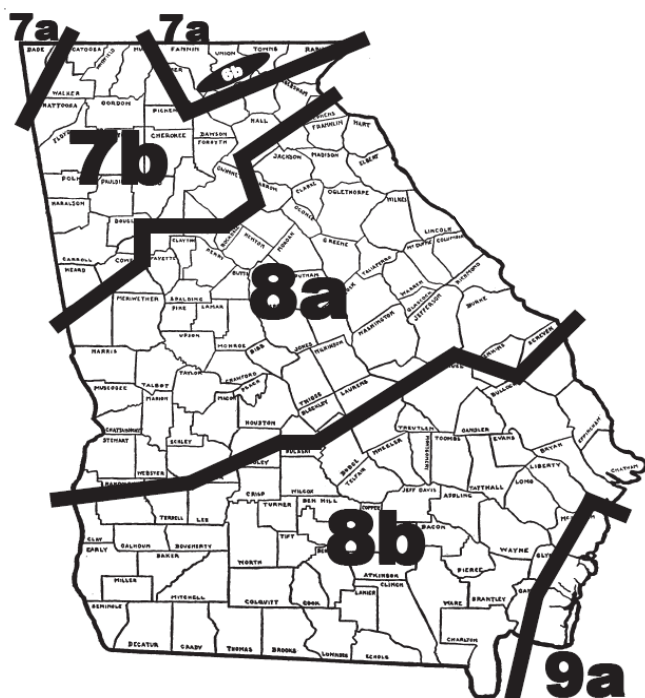
Figure 1: Native range for *Pinus rigida* -- pitch pine in Georgia.

Native range from federal and state maps, herbarium samples and personal observations.

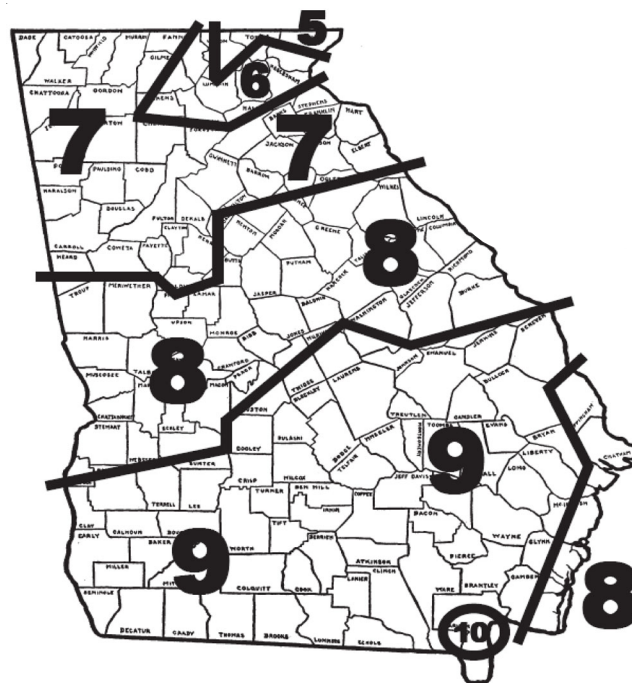
Native range includes all areas North and East of line on the side with arrow.



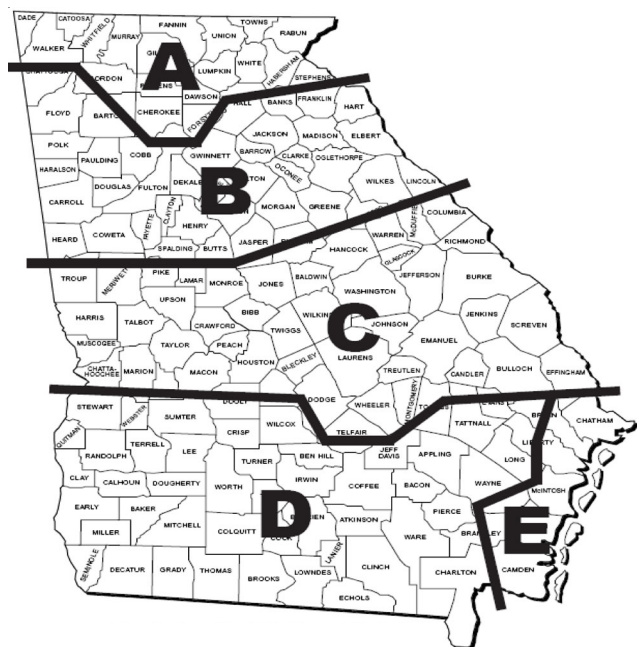
Background map from Carl Vinson Institute of Government, University of Georgia.



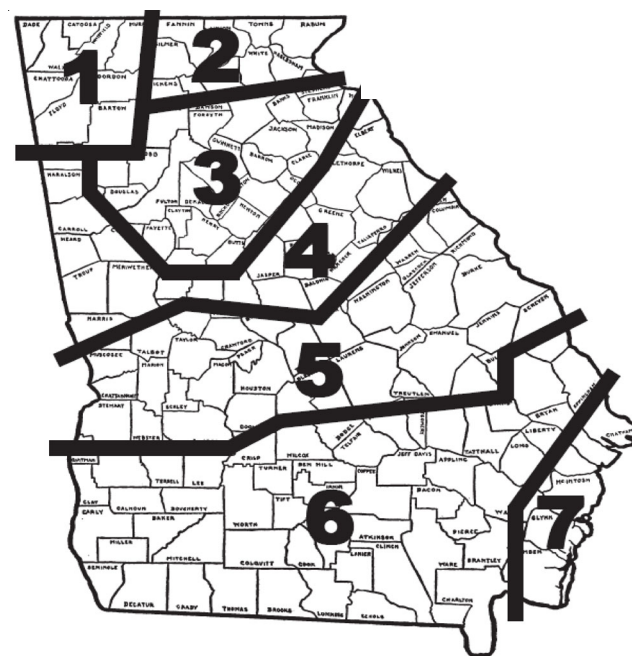
Georgia Hardiness Zones
(cold temperatures)



Georgia Heat Zones
(number of hot days)



Coder Tree Grow Zones
(multiple climatic attributes)



Coder Tree Planting Zones
(temperature & precipitation clusters)

Figure 2: Four types of tree growth zone maps for Georgia.