

Pinus strobus

Pinaceae family

Eastern white pine, northern white pine

Description

Distribution in US

Images

Timing of growth

[Phenophases to be monitored for NPN](#)

Did you know

Bibliography

Notes

Description: *Pinus strobus* is a large, evergreen, fast-growing, long-lived, monoecious, coniferous tree. Seed cones maturing in 2 years. A tree reaches maturity at between 5-10 years of age, although good seed production does not occur until the tree is between 20-30 years old.

Variation: Some taxonomists recognize several varieties. Many cultivars have been developed in the horticultural trade. Hybrids have been noted (*Need info. Could not determine in the writing if these were forced/laboratory hybrids or natural/found on the landscape.).

Size: *Pinus strobus* grows to 100-150 ft. (30-45.7 m) tall, and reportedly, up to 220 ft. (67 m) tall; 25-60 ft. (7.6-18 m) wide; trunk 2-6 ft. (0.6-1.8 m) diameter, and up to 20 ft. (6 m).

Leaves/needles: Leaves alternate, spiral. Leaves filiform (needle-like), 5 per fascicle; persisting 2-3 years. Leaves 2-8 in. (5-20 cm) long; 0.03-0.04 in. (0.7-1 mm) wide; straight, slightly twisted, soft, pliant; deep green to blue-green; pale stomatal lines evident only on upper surfaces (prominent white line along entire length); margins finely serrulate; apex abruptly acute to short-acuminate; sheath 0.4-0.6 in. (1-1.5cm) long.

Strobili (reproductive parts):

Male/microsporangiate: ellipsoid; 0.3-0.6 in. (0.8-1.5 cm) long; yellow; occur mostly on the basal part of new shoots and mostly on older lateral branches in the lower crown.

During pollen shed, turn light brown to brown.

Female/megasporangiate: elliptical to cylindrical; 0.2-3 in. (0.5-7.6 cm) long; at pollination, cones are green to gray-brown sometimes having purple to pink tint; occur most often in the upper crown, primarily at the apical end of the main branches in the position of subterminal or lateral buds. Fertilization occurs about 13 months after pollination; cones mature the second year

Fruit/cones:

Female: seed cones maturing in 2 years, clustered; pendent; symmetric, cylindrical to lance-cylindric or ellipsoid-cylindric before opening, ellipsoid-cylindric to cylindrical or

lance-cylindric when open; slightly curved; 2.8-12 in. (7-30.5 cm) long; 1 in. (2.5 cm) in diameter; turns yellow-green to light brown when ripe; apophyses slightly raised, resinous at tip; umbo terminal, low; peduncle 0.8-1.2 in. (2-3 cm) long.

Seeds: Seeds compressed; broadly obliquely obovoid; body 0.2 in. (0.5-0.6 cm) long; red-brown mottled with black; wing 0.7-1 in. (1.8-2.5 cm) long, pale brown.

Bark: Younger trees greenish-brown, unusually smooth through middle-age, then with age dark gray-brown, becoming deeply furrowed, with long, irregularly rectangular, scaly plates. Branches whorled; spreading-upswept; twigs slender, pale red-brown, glabrous or pale puberulent, aging gray, more or less smooth. Twigs brown to green.

Roots: Its roots are moderately deep without having a distinct taproot, and widespreading, having 3-5 large roots spread outward and downward.

Habitat: Common on mesic to dry sites; it is found on sites from wet bogs and streambottoms to xeric sand plains and rocky ridges. It is found on nearly all soil types within its range. It grows best on moist, sandy sites. Seedlings require a site with at least 20% full light to succeed. It is intermediate in shade tolerance when older; it can reach its maximum height range on a site having 45% full sunlight.

Species distribution in US states: AL, AR, CT, DC, GA, IL, IN, KY, MA, ME, MI, MN, MO, NC, NH, NJ, NY, OH, PA, RI, SC, TN, VA, VT, WI, WV

Species images:

Whole plant:

http://www.uwgb.edu/BIODIVERSITY/herbarium/gymnosperms/pinstr_aspect01_web400gf.jpg

<http://www.forestryimages.org/browse/detail.cfm?imgnum=1400093>

Bark:

younger tree:

<http://www.forestryimages.org/images/768x512/5349059.jpg>

http://plants.usda.gov/java/largeImage?imageID=pist_007_avp.jpg

older tree:

http://www.uwgb.edu/BIODIVERSITY/herbarium/gymnosperms/pinstr_bark01_web400gf.jpg

both stages:

<http://www.duke.edu/~cwcook/trees/pist.html>

<http://www.hort.uconn.edu/Plants/p/pinstr/pinstr1.html>

Leaves/needles:

detail:

<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--lfmicro54826.jpg>
<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--lfmicro54828.jpg>

general:

<http://www.forestryimages.org/images/768x512/0008531.jpg>
<http://www.forestryimages.org/images/768x512/0008416.jpg>

Buds:

<http://www.forestryimages.org/images/768x512/1218050.jpg>
http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0105+0795

Strobili (reproductive parts):

Male/microsporangiate:

<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--comale34219.JPG>
<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--comale11091.JPG>

Female/megasporangiate:

<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--cofemale-recept34222.JPG>
<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus/factsheet.cfm?ID=111>

Fruit (cones):

Female:

before maturity:

<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--codevel-female13417.JPG>

maturity:

http://www.uwgb.edu/BIODIVERSITY/herbarium/gymnosperms/pinstr_cone01_web400gf.jpg
<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus/factsheet.cfm?ID=111>
<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--cofemale15225.JPG>

Seeds:

http://plants.usda.gov/java/largeImage?imageID=pist_010_ahp.tif
<http://www.forestryimages.org/images/768x512/1379009.jpg> (definitions:
<http://www.forestryimages.org/browse/detail.cfm?imgnum=1379009>)

Expected timing of growth and reproduction:

Germination: Spring.

Growth: Terminal shoot growth usually completed by late-June.

Emergence of male and female strobili: Male strobili develop from 1-several weeks before the female.

Pollination: Sheds pollen in April-June, depending on location. Fertilization occurs 13 months following pollination.

Cone development: *Need info (Male strobili develop from 1-several weeks before the female).

Cones ripen, begin to open: August-September. Seed cones maturing in 2 years, shedding seeds and falling soon thereafter.

Seed dispersal: August-September. Seed cones mature in 2 years; shedding seeds mostly within the month following cone maturity.

Phenophases to be monitored for NPN:

Budburst

- *Budburst*
In at least 3 locations on the plant, a bud has broken and the newly developing stem (candle) has begun to push through the bud scales.

Leaf out

- *First needles*
In at least 3 locations on the plant, the young needles have begun to visibly emerge or unfold along the developing stem. In *Pinus strobus*, this occurs when the needles emerge from the papery fascicle sheath (now about 1 cm long).

Stem elongation

- *50% stem elongation [Intensive only]*
The majority of developing stems are 50% of the length of the stems from the previous year. The length of stems from the previous year is determined by measuring the distance between nodes that mark the beginning and end of the stem growth on that branch in the previous year.
- *Full stem elongation [Intensive only]*
The majority of developing stems are 100% of the length of the stems from the previous year (determined as described above).

Leaf elongation

- *75% needle elongation [Intensive only]*

The majority of developing stems have elongating needles that are three-quarters (75%) as long as the length of the needles on the previous year's growth.

Cone development

- *First male cone*
In at least 3 locations on the plant, a male cone (strobilus) has emerged. A few to many individual pollen sacs (which look tiny balloons) have visibly emerged from the bud (though they may be quite small). In *Pinus strobus*, male cones may not be present every year.

Pollen release

- *First pollen released*
In at least 3 locations on the plant, the pollen sacs on a male cone (strobilus) have broken and pollen is released when the cone is gently shaken or blown.

Leaf fall

Note: *If drought seems to be the cause of leaf fall for a plant, please make a comment about it for that plant.*

- *First needles fallen*
In at least 3 locations on the plant, needles from previous years' growth have yellowed and fallen or fall from the stem upon gentle handling. Leaf fall may also be indicated by the presence of at least 3 needles or needle clusters on the ground below the plant and appear to have newly fallen from it.

Did you know? *Pinus strobus* is a valuable timber species in the eastern U.S., used for furnishings and furniture, pulp, resins, and Christmas trees. In colonial times, it was often used for ship masts due to its tall, straight trunks. Due to its fast-growth it is often used for revegetation/reforestation projects. The plant also has been used medicinally. Animals use the plant for browse, along with its seeds being important food. It also is valuable habitat for many animals.

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accessed 3/5/08

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<http://www.cas.vanderbilt.edu/bioimages/biohires/p/hpist--cofemale15225.JPG>

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Notes

The USDA PLANTS symbol for this plant is PIST.

The ITIS Taxonomic Serial No. for this species is 183385.

BBCH codes for phenophases used for this plant are available from the USA-NPN office upon request.

Proposed modifications, updates or corrections to this protocol are welcome; please direct correspondence to the USA-NPN National Coordinating Office.

Prior versions of this species protocol will be made available in a documents library on USA-NPN webpage.

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