

## RED SPRUCE

*Picea rubens* Sargent  
Plant Symbol = PIRU

Contributed by: USDA NRCS Plant Materials Program



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### Uses

Red spruce is one of the most important forest trees in the northeast. The wood is light, soft, narrow-ringed and faintly tinged with red. It is the most common species of eastern spruce lumber. Because of its resonance, it is especially adapted to sounding boards in musical instruments. It makes up a large percentage of spruce pulpwood produced in the northeast. It is used as a Christmas tree also.

Red spruce provides food and cover for various mammals and birds. The spruce grouse feeds on the buds and foliage; red squirrels eat buds and seeds; varying hare browse twigs and foliage; porcupines feed upon the bark. Red spruce seeds make up 25 to 50 percent of the diet of white-winged crossbills. Red spruce can be an important cover tree in northern New England deer yards.

### Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

### Description

Red spruce reaches heights of 60 to 80 feet with trunk diameters of nearly two feet. Larger sizes are attained in the southern Appalachians. Needles are four sided, dark, shiny, yellow-green, and about 1/2 inch long, growing singly from all sides of the twigs and branches. The slender new twigs have a reddish coat of down through the first year. This, together with the short incurved needles, help distinguish red spruce from most other spruces. There are about 139,000 seeds per pound.

### Adaptation and Distribution

In northern New England it is found mainly on shallow till soils that average about 18 inches deep to a compact layer. At higher elevations it often grows in organic soils overlying rocks. On poorly drained soils, lack of aeration limits its growth. In the northern part of its range, red spruce grows at elevations from near sea level to about 4,500 feet. In the southern Appalachians it is limited to slopes and mountain tops above 3,500 feet in West Virginia and above 4,500 feet in Tennessee and North Carolina.

Unfortunately, red spruce is showing damage from air pollution throughout its range, particularly at the higher elevations.

For a current distribution map, please consult the Plant Profile page for this species on the PLANTS Website.

### Establishment

Good seed production of red spruce usually begins after the tree is 30 years old. Heavy seed crops occur every three to eight years. Spruce seedlings have exceptionally slow growing, fibrous, shallow roots. Consequently, a critical survival factor in natural establishment is the depth of the organic layers on which the seed germinates. If the thickness of the layer exceeds two inches, the roots of spruce seedlings may not reach mineral soil and the moisture needed to carry them through dry periods. Red spruce is very shade tolerant, but requires nearly full sun light for optimum development.

Red spruce can be established in nurseries as easily as any of the other spruces. It is used some for reforestation in the northeast.

## **Management**

Red spruce has not generally received intensive management in the northeast. It can be harvested by partial cutting or clear cutting depending upon local markets and silvicultural conditions. Weeding and releasing, if needed, should be done at an early age, 10 to 15 years.

## **Pests and Potential Problems**

Red spruce has several insect enemies, the most important being spruce budworm. Budworm damage may be heavy in stands that contain a large percentage of balsam fir. Some stands of red spruce may be susceptible to damage by the eastern spruce beetle, European spruce sawfly and yellow-headed spruce sawfly. Disease problems are minor in management of red spruce.

The overall health of red spruce stands seems to be declining due to pollution factors. Weakened trees are more susceptible to insects and disease.

## **Prepared By & Species Coordinator:**

*USDA NRCS Plant Materials Program*

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