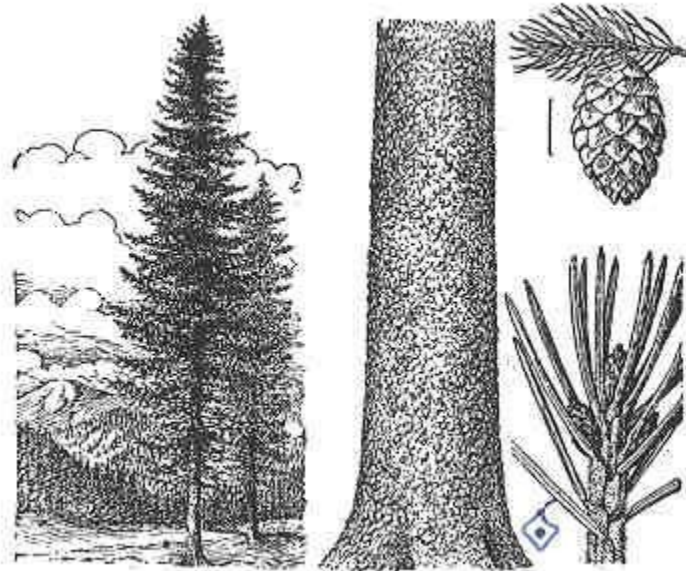


Engelmann Spruce



Engelmann spruce (*Picea Engelmannii*)

The Engelmann spruce is the most widespread kind of spruce tree in America, and is one of the important forest trees of the southern Rocky Mountains. Engelmann spruce grows in areas of considerable moisture, usually above 8400 feet (2560 m). It is most often found in high forests, covering nearly 10 million acres of the southern Rockies, and Subalpine fir is its most common associate. Engelmann spruce also grows in pure stands, or mixed with Lodgepole pine and other evergreens.

Common from 9300 to 11000 feet (2800 to 3400 m) and treeline in Colorado, the uniform spruce-fir woodlands sweep in broad undisturbed belts along many Colorado mountain chains. A climb up almost any peak in the Colorado Rockies will reveal the dark spruce-fir forest wrapping around the sides of all the surrounding mountains. A typical spruce-fir forest is on the western slopes of the Front Range from Berthoud Pass north to Rocky Mountain Park.

Below 9300 feet Engelmann spruce are found in moist locations. Large individuals grow at 8400 feet (2500 m) on the shores of Grand Lake. It can be found in streamside habitats as low as 7700 feet (2300 m). In Colorado and Wyoming it grows to 100 or 120 feet in height (30 to 36 m), to three feet in diameter (1 m), and may attain an age of 500 to 600 years. Trees 16 to 22 inches in diameter (40 to 56 cm) are often 350 to 450 years old. Engelmann spruce does best in rich deep moist soils.

Engelmann spruce lives longer than Subalpine fir. Consequently more of the large older trees in the spruce-fir forest are Engelmann spruce. Engelmann spruce attains the spire-like form typical of spruces, though it is not so slender as the Subalpine fir. Some Engelmann spruce closely resemble the Blue spruce, even possessing the silvered appearance of the foliage.

Seed production begins after about 20 years. Cones with seeds are produced in moderate numbers, and released seeds are carried by the wind. They do better falling on soil than on dry forest litter. Some sun helps the young trees grow. Young Engelmann spruce do not tolerate either full shade, or dry sunny

Engelmann Spruce

spots. Engelmann spruce can recolonize some burned areas.

Engelmann spruce bark beetles, another species of the *Dendroctonus* described under Ponderosa pine, are the chief insect pest. Outbreaks are rare but can be severe. Logging which leaves abundant debris on the forest floor is ideal habitat for the beetles to establish themselves, and later move to nearby living trees. Wind damage can also be very destructive, especially in partially cut old-growth forests, where the trees were originally sheltered from the strong mountain winds.

The needles of the Engelmann spruce, while somewhat stiff, are not so stiff and sharp as those of the Blue spruce, and you can distinguish this tree from the Blue spruce by grasping the needles without a painful result. Other distinguishing features are the cones, and the bark on mature trees.

The scientific name of Engelmann spruce is “*Picea engelmannii* Parry ex Engelmann .” The genus name *Picea* for the spruces is from the Latin *piceis* for pitch. The species name honors George Engelmann, a notable nineteenth-century German-born physician and botanist, resident of Saint Louis and an authority on the conifers, cacti, vines, and wine grapes.

The seeds are eaten by many species of birds and the foliage is heavily browsed by bighorn sheep, deer, and porcupine. Spruce provides important cover for animals in the winter. Spruce is used for lumber, plywood, pulp, and musical stringed instruments though little or no Colorado wood finds its way into such exotic uses.

The Mystery of the Twisted Trunks

Bare trunks of Engelmann spruce, dead and stripped of bark, often show a rather remarkable feature: the grain twisted along the entire trunk, in the same pattern as a candy cane. A twist may be noted in some living trees. Trunks with both right-handed and left handed twist can be found. I believe this is not caused by a biological growth characteristic, but is caused by a torque or twisting force imparted by wind. Clearly a tree fully exposed to wind is not twisted so much as bent and shaken. What happens in the spruce-fir forest is this. Most strong mountain winds are from one direction, usually from due west in the Colorado high country (except where surface topographic relief steers winds from purely westerlies). Due to some kind of shelter – other trees or a rock outcrop for example – one side of a particular tree is more exposed to the perennial strong winds from one direction. (The other side of the tree may be exposed to the same wind, but less so.) The net force of the wind, stronger on one side of the tree than the other, makes a twisting force which constantly tries to rotate the tree as it grows. The direction of the twist depends on which side of the tree was most exposed to the wind, and on which way the wind blows. Twisted trunks are found in other species as well.

Identifying features of Engelmann Spruce

Needles

Single (not in bundles); square in cross-section (four sided); you can roll them between thumb and forefinger, unlike fir needles which are also single but flat.

Each needle stands on a small woody peg which separates it from the twig. The woody peg-like bases of both Engelmann spruce and Blue spruce remain on the tree after the needles have fallen, so the twigs are rough.

Engelmann Spruce

Needles are one-half to 1 1/8 inch long, blunt or sharp pointed, and grow on all sides of twig; usually less than 1 inch long. Usually flexible enough that you can grasp a twig of needles without discomfort, unlike the Blue spruce, but much stiffer than Subalpine fir needles. On new growth white lines on each of the four sides give the needles a pale blue-green color very similar to Blue Spruce. Needles otherwise usually dark green or dark bluish-green.

Cones

Mature cones are 1.0 to 2.5 inches long; usually 1.5 to 2.0 inches (blue spruce cones are over 2 inches long.) The cones hang down from the branch, whereas fir cones stand upright. After reaching maturity in August to September, the seeds are shed in October and the cone may fall during the winter. Scales of the mature cone are pale brown or red-brown, thin, stiff but flexible, and are diamond-shaped or pointed and have a ragged outer margin. Cones cluster in the upper half or near the top of large trees. Once you know the Engelmann spruce cone, recognizing it is one of the easy ways to identify the tree. Spruce cones lack the papery tongues or bracts of the Douglas-fir tree, though otherwise the cones are somewhat similar.

Bark

Typically in thin scales of pale gray, sometimes showing reddish underneath or turning entirely reddish or orange-brown.

The bark begins smooth and gray with small horizontal scars, not unlike the bark of Subalpine fir with which Engelmann spruce coexists. At diameter 6 inches or more the bark begins to break up into small thin scales which curl off the tree, sometimes orange-brown in color. Sometimes the bark remains entirely gray after scaling up. Often large trees of one or more feet in diameter have bark composed largely of cinnamon-red or orange-brown scales, especially on the sunny side. Such a tree may be gray to black on the other side. This characteristic is similar to the bark of the Lodgepole pine of similar size, which may be a neighboring tree. On the very oldest trees the bark can become deeply ridged or furrowed.

Judging by the bark alone, Engelmann spruce might be confused with Subalpine fir when young, or with Lodgepole pine when mature. The thin scaly bark of mature Engelmann spruce, especially when orange-brown, distinguishes it from Blue spruce, though as always other features are better identifiers than bark.

Text Copyright © 1998 - 2011 S. K. Wier

Reproduction reuse or retransmission prohibited without prior written permission from the author. Individuals may print one copy for their personal use.