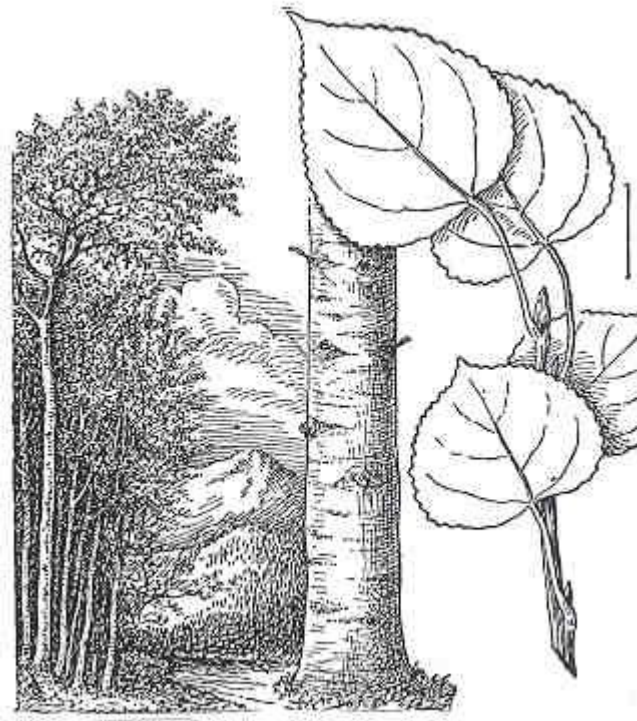


Quaking Aspen



Aspen (*Populus tremuloides*)

Aspen is the slender tree of the Rocky Mountain mountain forests renowned for its golden autumn foliage and its white trunks. It grows in forests from 6500 to 11000 feet (1950 to 3400 m) in elevation, and up to treeline, usually in groves, and often in moist sites. It commonly grows to 20 to 60 feet (6 to 20 m) in height and less than 20 inches (50 cm) in diameter, but a few aspen attain 100 feet (30 m) in height and 3 feet (1 m) in diameter. Individual Aspen trees are comparatively short-lived for trees, rarely exceeding 100 years, and are easily damaged by fire, wind, and many kinds of insects, fungi, and animals. While individual trees are short-lived, groves of Aspen are persistent since young aspen trees are constantly appearing.

Aspen is one of the most widely distributed trees of North America. It is found right across the North American continent from western Alaska to St. John's Newfoundland, and south to Mexico. The North American aspen is very closely related to the aspen of northern Europe and Asia, if not exactly the same tree. The aspen of the Rockies is noted for its bright golden-

yellow fall foliage, not typical of other aspen. The bright yellow leaf color of fall, which appears sometime from mid-September to early October, is a distinctive hallmark of the Rockies.

Aspen sprouts shoot up quickly and vigorously from roots, in cut or burned areas, and aspen is an important pioneer species in the Rocky Mountains. Aspen groves provide shelter where young seedlings of other kinds of trees can survive, protected them from the hot drying sun. Engelmann spruce, subalpine fir, and lodgepole pine all can get a start in aspen groves.

Aspen is the sole widespread broad-leaf tree of the mountain forests. Other broad-leaf trees grow in the mountains, but only along streams. For other trees the short growing seasons and harsh conditions of the high forests seem to provide too little chance for recovery of the loss of growth associated with the long winter, or the loss of resources due to the fall of leaves in the autumn.

Aspen tends to grow in sunny areas, with *comparatively* moderate climates and long growing seasons, for the altitude where it grows. It builds up soil nutrition by shedding leaves. It prefers moist fertile soil but can grow in many kinds of soil and in many degrees of moisture. Aspen can grow in cool moist valleys or on open dry sunny hillsides in rocky soil. This allows aspen groves to persist in places where other kinds of trees can not do well.



Seeds are produced, with "cotton" much like cottonwoods, but the seeds hardly ever germinate and grow. Aspen mainly reproduces by sprouts growing up from the roots. The new sprouts may appear up to 25 feet (8 m) from the parent tree. Each "tree" in a grove may be one stem of a much larger organism. Entire groves of aspen actually may be the same single organism.

Some aspen groves appear to be the largest and oldest living organisms on Earth, easily reaching several thousand years in age. Colorado University biologists Jeffrey Mitton, Michael Grant, and Yan Linhart have described an aspen grove in Utah with some 47,000 trunks from a single root system. It covers 106 acres and weighs over 6000 tons. If aspens can shoot up new stems from old roots, and make new roots from the new stems, there is no obvious limit to their existence. Even a fire which destroys all aspen growth above ground will not kill the plant.

Aspen bark contains salicin, a chemical closely related to aspirin, and the bark was used by Indians and pioneers to treat fevers. Beavers love to eat the bark, and use stems and trunks for lodges and dams. The seeds are eaten by grouse. The twigs, bark, and buds are eaten by pika, beaver, deer, elk, mountain sheep, moose, bear, squirrel, rabbits, and porcupine. Mountain men - early fur trappers and explorers who preceded the miners and settlers by decades - fed aspen leaves and bark to their horses when other forage was lacking. Bark damage by browsing animals, especially elk, makes an entry point for disease.



A hillside in Fall with green aspen, yellow trees, and bare trees.

Aspen leaves turning color in Fall depends on a number of factors. Day length, the number of hours of sunlight, certainly is a factor. Temperature is a factor; degree-days, long term temperature trends, appear to be more important than single daily highs or lows. And aspen trees have natural genetic variation in how they respond. This last factor explains why single trees and adjacent groves can have quite different colors in Fall, even where exposure to sun and temperature is the same.

Aspen can photosynthesize in winter, without leaves. Aspen twigs appear to absorb some of the leaves' nutrients before leaf fall, and there is chlorophyll in aspen bark. At midwinter an "evergreen" subalpine fir in shade is dormant, while across the trail a bare aspen in full sun may be doing a bit of photosynthesis.

The scientific name is "*Populus tremuloides* Michaux," meaning trembling poplar. This tree does not grow well in warm to hot climates, so it does not grow naturally in lower elevations, even in Colorado cities on the plains or in the lowermost foothills. Aspen does best in upper montane and subalpine forests.

Identifying Aspen

The groves of trees with slender trunks and smooth pale bark, the leaf shape and color, and the leaf fluttering motion, are distinctive.

Aspen leaves are nearly round, a broad oval, or heart-shaped; 1 ½ to 3 ½ inches (3.8 to 9 cm) long and wide; sometimes larger especially on young shoots. Pale green to pale yellow green in color; bright yellow in autumn and sometimes yellow-orange or red-orange. 20 to 40 small teeth per side of the leaf blade. Leaf stalk is 1 to 3 inches (2.5 to 7.5 cm) long and flattened. The flat leaf stalks allows the leaves to flutter back and forth in the slightest breeze.

The bark is usually smooth and very pale green to pale white with a dusty look, or cream, or pale to dark yellow-green, or a whitish green. Near the base of the trunk, in the lower few feet, aspen trees may have gray to very dark gray slashed or fissured bark, usually caused by winter feeding of animals especially elk. Most bark damage will cause rough black scar tissue.





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