

Monterey pine

Pinus radiata D. Don

Pine family (Pinaceae)

Post-Cook introduction

Large introduced narrow-leaf evergreen tree of forest plantations. Trunk straight, with irregular branches in 2 or more tiers or rings annually and growing angled slightly to strongly upward. To 150 ft (46 m) in height and 4 ft (1.2 m) in diameter. Bark gray, when young with prominent horizontal lines (lenticels); furrowed into flat ridges, the branches smoothish. Inner bark with reddish-brown and light brown layers, resinous. Twigs hairless. Winter buds $\frac{1}{2}$ – $\frac{3}{4}$ inch (13–19 mm) long, short-pointed, brown, resinous, with closely pressed scales.

Leaves or needles three in cluster, crowded, slender, 4–6 inches (10–15 cm) long, shiny green, with many fine whitish lines on each surface, finely toothed edges, sharp-pointed. Sheath at base of leaves $\frac{3}{8}$ – $\frac{1}{2}$ inch (10–13 mm) long.

Cones usually three to five around branch in one or more clusters annually, egg-shaped, pointed at apex, very one-sided or oblique at base, almost stalkless, turned back, 3–5½ inches (7.5–14 cm) long, shiny light brown, maturing in 2 years and remaining attached and usually closed on tree many years. Cone-scales with exposed end thick, hard, raised and rounded, those on outer side very large, bearing minute prickle. Seeds paired and exposed at base of cone-scales, with elliptical blackish body $\frac{1}{4}$ inch (6 mm) long and wing about 1 inch (2.5 cm).

The wood is pale brown, slightly hard, and resinous, usually with very indistinct growth rings. The specific gravity based on an increment core survey was 0.46, the same as that of trees grown in California. This density indicates that the wood should be suitable for most structural purposes. The generally steep branch angle and poor form would produce low lumber grade yield if the species were sawn.

This subtropical Pine has been used in many forest plantations on all the islands of Hawaii except Oahu. Planted at 5200 ft (1585 m) at Kulani Honor Camp southwest of Hilo, Hawaii, it has done quite poorly because of frequent defoliation from volcanic sulfur fumes. Near Waikii, Hawaii, it is doing well except for occasional damage by the Eurasian pine adelgid. At the Kula Forest Reserve at 6000 ft (1829 m) on Maui, it is presently

doing well after being set back by the Eurasian pine adelgid, which is now believed to be controlled by an introduced insect parasite. On Molokai, most of the Monterey pine has been killed by a fungus (*Diplodia pinea*). Because of its high susceptibility to this disease, to wind damage, and to adelgid damage, it has been deleted from future planting plans. These problems are unfortunate because the tree grows better over a wider elevational range than any other pine planted in Hawaii, 1500–7500 ft (457–2286 m). It also has a tendency to foxtail or form very long unbranched leaders that have slow diameter growth. In at least one area, Kalialinui, Maui, growth equal to the best in New Zealand was measured in 14-year-old trees (Skolmen 1963).

Special areas

Waihou, Kula

Range

Very rare and local at three localities on coast of central California (San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties). Also a variety on Guadalupe Island, Mexico.

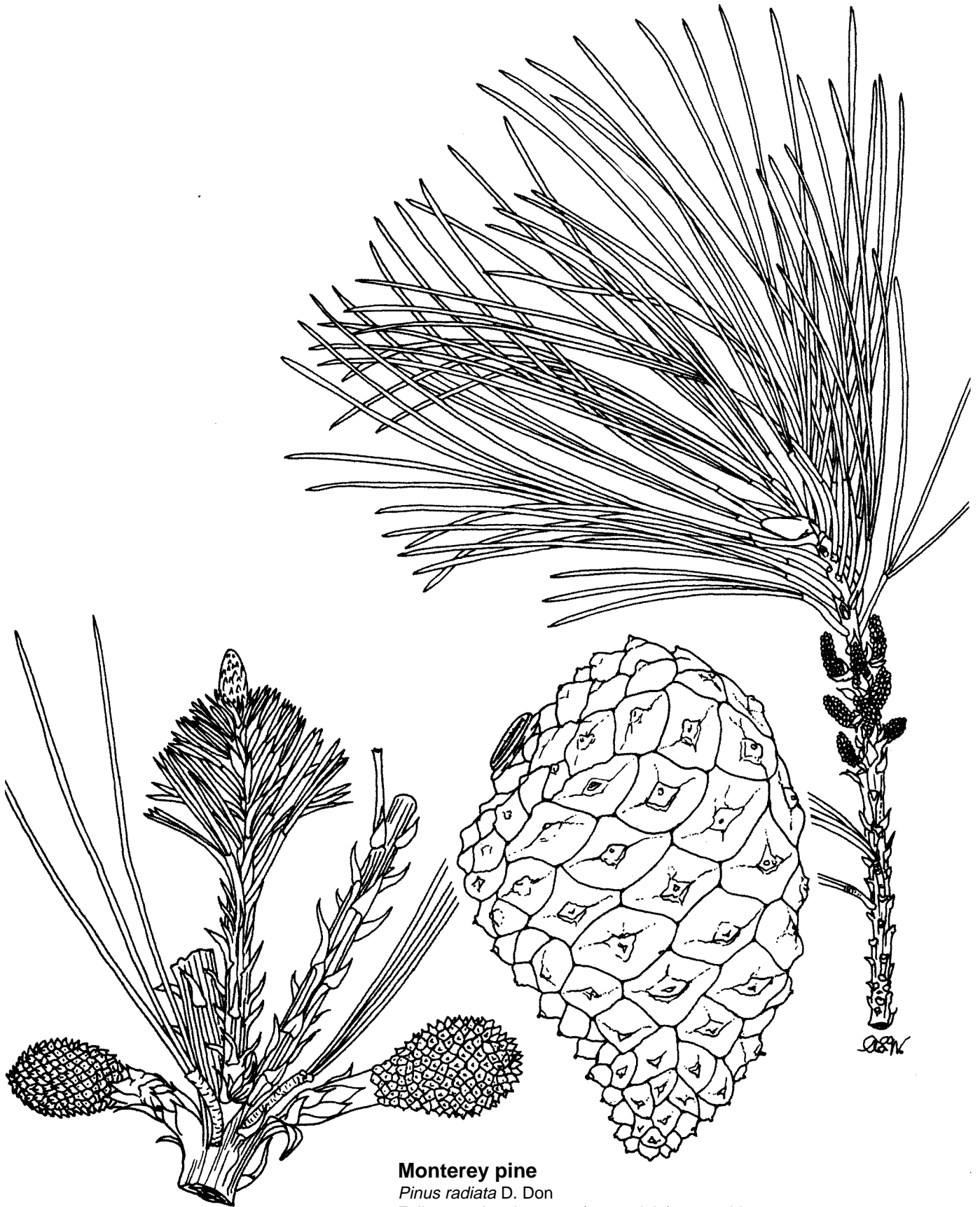
Other common name

insignis pine

Botanical synonym

Pinus insignis Dougl. ex Loud.

The most common pine in forest plantations through the southern hemisphere for pulpwood and lumber, particularly in Australia, New Zealand, and South Africa. Grown also for shade and ornament.



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Foliage and male cones (upper right), year-old cones (lower left), and mature cone (lower right), 1 X.