**Common Name:** Princess Tree

**Scientific Name:** *Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud.

Princess tree, also known as royal paulownia or empress tree, is a showy, aggressive ornamental introduced from East Asia. It grows rapidly in disturbed areas, including steep rocky slopes that may also be habitats for rare plants. Recently it has also been grown in plantations and harvested for export to Japan where its wood is highly valued.

**Height:** Paulownia grows 9-19 m (30-60 ft) tall.

**Bark:** Trunk has rough, gray-brown bark with interlaced smooth areas that are often shiny. The smooth brown bark of young branches has prominent white lenticels.

**Twigs:** Stout, brittle twigs are markedly flattened at nodes, and olive brown to dark brown in color. They are mostly glabrous except at the tip, around buds and along upper edges of leaf scars. Lenticels are pale, prominent, and elongated longitudinally. Pith can be chambered or hollow. Terminal leaf buds are absent. Lateral leaf buds are superimposed. Leaf scars are circular.

**Leaves:** Deciduous leaves are opposite and broadly ovate, acuminate and cordate in shape. Leaf margins are entire or shallowly lobed, and may be toothed on small plants. Leaves of adult trees are 15-40 cm (6-16 in) long and 10-30 cm (4-8 in) wide, though leaves of stump sprouts may be twice as large. Surfaces are pubescent and dull, light-green above, and pale-green and tomentose beneath.

**Flowers:** Large , showy , fragrant blossoms are borne in upright clusters 15-30 cm (6- 12 in) long at the ends of stout, hairy twigs. Corolla is 5 cm (2 in) long, bell-shaped, and pale violet with yellow stripes inside, ending with five round, unequal lobes. Blooms in April-May before the leaves emerge from round, brown, hairy buds formed during the previous summer.

Photo by James H. Miller

**Fruit:** Brown, woody, beaked, ovoid capsules are 4 cm (1.5 in) long, borne in terminal clusters. The seed pod has four compartments that contain as many as 2,000 tiny winged seeds. The capsules mature in autumn, open to release the seeds and then remain attached all winter. One tree is capable of producing twenty million seeds that are easily transported in water or wind.

**Life History**

Paulownia can reproduce from seed or from root sprouts; the latter can grow to over 5m (15 ft) in a single season. The root branches are shallow and horizontal without a strong taproot. Seed-forming pollen is fully developed before the onset of winter, and in spring the flowers are pollinated by insects. Seeds germinate within a few days on suitable substrate; seedlings grow quickly and flower in 8-10 years. Mature trees are often structurally unsound and rarely live more than 70 years.


Photo by James H. Miller

**Origin and Distribution**

Paulownia is native to western and central China where historical records describe its medicinal, ornamental, and timber uses as early as the third century B.C. It has been cultivated for centuries in Japan where it is valued in many traditions. It was imported to Europe in the 1830s by the Dutch East India Company and brought to North America a few years later. Paulownia has been naturalized in the eastern U.S. for more than 150 years and is also grown on the west coast. USDA hardiness zones 7-10 are most favorable.


Photo by James R. Allison

**Similar Species**

Paulownia belongs to the Scrophulariaceae (Figwort) family, which in North America is otherwise composed of herbaceous species. It resembles the native catalpa tree (*Catalpa speciosa* [Warder ex Barney]) in size, leaf and flower structure. Notable differences are found in pith, leaves, and seed pods. Paulownia has a hollowed or chambered pith, while that of the catalpa is solid and whitish. Catalpa leaves are whorled and more distinctly pointed at the tip than paulownia leaves, which are not whorled and have a less elongated tip. Catalpa fruits are long, slender pods measuring 20-46 cm (8-18 in). Fruits of the princess tree measure only 3-8 mm (1.5 in) and appear in clusters of round capsules. Catalpa flowers have a two-lipped calyx and appear on the current year's growth; paulownia has a five-lobed calyx and flowers on the second year's growth.


Photo by James H. Miller

**Habitat**

Paulownia trees are often found on roadsides, stream banks, and disturbed habitats, including fire sites, forests defoliated by pests (such as gypsy moths) and landslides. Its ability to sprout prolifically from adventitious buds on stems and roots allows it to survive fire, cutting, and even bulldozing in construction areas. Paulownia can also colonize rocky cliffs and scoured riparian zones where it may compete with rare plants in these marginal habitats. It tolerates high soil acidity, drought, and low soil fertility.

**Management Recommendations**

**Mechanical Controls**

**Cutting:** Cut trees at ground level with power or manual saws. Cutting is most effective when trees have begun to flower to prevent seed production. Because paulownia spreads by suckering, resprouts are common after treatment. Cutting is an initial control measure and will require either an herbicidal control or repeated cutting for resprouts.

**Girdling:** Use this method on large trees where the use of herbicides is impractical. Using a hand-axe, make a cut through the bark encircling the base of the tree, approximately 15 cm (6 in) above the ground. Be sure that the cut goes well into or below the cambium layer. This method will kill the top of the tree but resprouts are common and may require a follow-up treatment with a foliar herbicide.

**Hand Pulling:** Paulownia is effectively controlled by manual removal of young seedlings. Plants should be pulled as soon as they are large enough to grasp but before they produce seeds. Seedlings are best pulled after a rain when the soil is loose. The entire root must be removed since broken fragments may resprout.

**Herbicidal Controls**

**Foliar Spray Method:** This method should be considered for large thickets of paulownia seedlings where risk to non-target species is minimal. Air temperature should be above 65Â°F to ensure absorption of herbicides.

***Glyphosate:*** Apply a 2% solution of glyphosate and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Glyphosate is a non-selective systemic herbicide that may kill non-target partially-sprayed plants.

***Triclopyr:*** Apply a 2% solution of triclopyr and water plus a 0.5% non-ionic sur-factant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Triclopyr is a selective herbicide for broadleaf species. In areas where desirable grasses are growing under or around paulownia, triclopyr can be used without non-target damage.

**Cut Stump Method:** This control method should be considered when treating individual trees or where the presence of desirable species preclude foliar application. Stump treatments can be used as long as the ground is not frozen.

***Glyphosate:*** Horizontally cut stems at or near ground level. Immediately apply a 25% solution of glyphosate and water to the cut stump making sure to cover the outer 50% of the stump.

***Triclopyr:*** Horizontally cut stems at or near ground level. Immediately apply a 50% solution of triclopyr and water to the cut stump making sure to cover the outer 20% of the stump.

**Basal Bark Method:** This method is effective throughout the year as long as the ground is not frozen. Apply a mixture of 25% triclopyr and 75% horticultural oil to the basal parts of the tree to a height of 30-38 cm (12-15 in) from the ground. Thorough wetting is necessary for good control; spray until run-off is noticeable at the ground line.

**Hack and Squirt Method:** Using a hand-axe, make cuts at 6.5 cm (3 in) intervals around the trunk of the tree between 15-45 cm (6-18 in) above the ground. Be sure that each cut goes well into or below the cambium layer. Immediately treat the cut with a 50% glyphosate or triclopyr and water herbicide solution.

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