

The Introduction, Spread, and Control of Non-Native, Invasive Species in Tennessee Forests: Princess Tree

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PRINCESS TREE (*PAULOWNIA* SPP)

Paulownia, composed of several different species, was introduced to the United States from eastern Asia in the early 1800s. The tree was planted as an ornamental because of its large, showy, pale violet flowers and more recently in plantations for its wood properties primarily for export to Asian markets. The wood is highly desired for its strength and workability with its low density and weight. Paulownia has become naturalized on the landscape and is distinctive with its large, heart-shaped leaves, upright panicles of conspicuous flowers, and numerous seed capsules that persist on the tree throughout the winter. Each capsule contains a thousand or more small, wind-blown seeds. One mature tree can produce millions of seeds each year. Paulownia begins to flower and produce seed after five to seven years.

With its excessive seed production, Paulownia is certainly invasive, but its invasiveness is not as extensive as reported. The small, wind-blown seeds do not germinate and survive unless they fall on sterile soil, which is soil without microbes, pathogens, or living organisms. New germinants of Paulownia have a high rate of mortality from damping-off disease caused by a variety of soil fungi. Paulownia with its prolific seed does not colonize open areas unless sterile soil is present as in construction activities, road cuts, or burned areas where excessive temperatures have eliminated the soil fungi.

Paulownia does not compete well with other trees because it does not maintain a terminal leader with apical dominance. The tree crown typically spreads more horizontally rather than maintaining vertical terminal growth.

Considering the slower terminal growth and requiring full sunlight for continued development, Paulownia is often overtopped by other species and gradually succumbs. Paulownia is usually found on the forest edge where sunlight is more available than in the forest interior.

Paulownia sprouts profusely when the stem is killed. With its large leaves, Paulownia is extremely susceptible to late season frosts after the leaves have emerged, often top killing the tree. The root system will resprout with several stems. If trying to control and kill the tree, herbicides should be applied that are translocated to the roots impacting resprouts and eventually killing the plant. Typically, Paulownia does not form groves of trees.

For control of large trees, stem injections of glyphosate, triclopyr, or imazapyr can be applied via stem injection on cut stem spacings specified on the herbicide label. For felled trees, apply these herbicides via cut stump treatments as soon as possible after the cut.



Leaves and seed capsules of Paulownia. Photo Credit: James R. Allison, Georgia Dept. of Natural Resources, Bugwood.com



*Pale purple flowers of Paulownia Photo Credit: James R. Allison
Georgia Dept. of Natural Resources, Bugwood.com*



*Sprout clump of Paulownia (Princess Tree) Photo Credit: Pennsylvania
Department of Conservation & Natural Resources – Forestry,
Bugwood.org*

For saplings, apply triclopyr ester as a basal spray encircling the stem. For resprouts and seedlings, use a foliar spray of glyphosate or triclopyr (amine). Follow label instructions for herbicide application.

Although Paulownia can be invasive with its excessive seed production, the degree of invasiveness of Paulownia is open to conjecture. Due to the strict sunlight and soil requirements of the tree, the amount of Paulownia colonization has diminished in recent years.

Unless occurring as an open-grown tree, the longevity of Paulownia is short because other trees outgrow and overtop the tree in forested settings. Even with increased rates of land disturbances, the amount of Paulownia colonization has not been augmented unless the exposed soil is sterile without soil fungi. Paulownia typically does not colonize abandoned fields.

FURTHER REFERENCE WEBLINK

Southeast Exotic Pest Plant Council

<https://www.se-eppc.org/manual/princess.html>