

Scrophulariaceae—Figwort family

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

royal paulownia

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**Other common names.** paulownia, empress tree, princess tree.

**Growth habit, occurrence, and use.** Royal paulownia—*Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud.—is a common sight along the sides of roads and railroad tracks, as well as near old house sites in the East and South. A native of eastern Asia, it has been widely planted in North America from Montreal to Florida and west to Missouri and Texas, as well as in some western states (Bonner 1990). It was introduced for its ornamental value in the 19th century and has escaped from cultivation in many localities. This deciduous tree reaches heights of 9 to 21 m at maturity. It has been planted extensively in the South for specialty wood products and for mine spoil reclamation in surface mine areas (Tang and others 1980).

**Flowering and fruiting.** The showy, violet or blue, perfect flowers appear in terminal panicles up to 25 cm long in April to May before the leaves emerge. The fruits are ovoid, pointed, woody capsules about 3 to 4 cm long (figure 1). They turn brown when mature in September and October and persist on the tree through the winter (Vines 1960). The trees start bearing seed at 8 to 10 years of age and are very prolific (Bonner 1990).

**Collection, extraction, and storage of seed.** The dry fruits can be collected and opened by hand anytime before they disperse their seeds. They can also be collected when still a little green but must be dried completely for seed extraction. One proven extraction method is to place dried capsules in burlap bags and then crush them. Seeds and capsule fragments can then be separated by air (Carpenter and Smith 1979). The tiny, winged, flat seeds are about 1.5 to 3 mm long (figures 2 and 3) and are easily disseminated by wind when the capsules break open on the trees. Fruits collected in southeast Arkansas yielded the following data that appear to be typical for princess tree (Bonner and Burton 1974):

|   |            |            |
|---|------------|------------|
| Fruits per volume                       | 8,800/hl   | 3,100/bu   |
| Seeds per fruit                         | 2,033      | —          |
| Seeds per volume of fruit               | 2.8 kg /hl | 2.2 lb/bu  |
| Seeds per weight                        | 6,200/g    | 175,770/oz |
| Percent moisture content (fresh weight) | 7%         | —          |

Royal paulownia seeds are orthodox in storage behavior. Carpenter and Smith (1979)

reported that samples stored dry at 4 EC germinated 85% or more after 3 years but the rate of germination declined somewhat. Long-term storage performance has not been studied and is therefore unknown.

**Germination.** Royal paulownia seeds exhibit little or no dormancy, but light is necessary for timely germination of fresh seeds (Borthwick and others 1964; Toda and Isikawa 1952). Moist stratification at 3 or 4 EC for up to 8 weeks effectively removes the light requirement (Barnhill and others 1982; Carpenter and Smith 1981). Fresh seedlots from the 1974 Arkansas collection mentioned above had a germinative capacity of 90% in 19 days (4 samples) when tested on moist Kimpak with alternating temperatures of 20 and 30 EC. Eight hours of light were supplied during the 30 EC cycle. Germination rate was 86% in 9 days (Bonner and Burton 1974). Excellent germination in the laboratory has also been obtained at a constant 20 EC (Carpenter and Smith 1979) and at alternating temperatures of 10/20 EC (Barnhill and others 1982). Stratification is beneficial at these lower temperatures.

**Nursery practice.** Royal paulownia seeds should be broadcast on the surface of nursery beds or planted at a depth of about 3 mm (1/8 in) with mechanical drills. A desirable bed density is approximately 100 seedlings/m<sup>2</sup> (9/ft<sup>2</sup>). Unstratified seeds sown in the fall should be mulched; seeds sown in the spring should have been stratified (Williams and Hanks 1976). Container production systems have also been developed for this species (Beckjord 1982; Immel and others 1980).

Vegetative propagation is relatively easy with lateral root cuttings, and successful tissue culture techniques are also available (Tang and others 1980; Dirr and Heuser 1987).

## References

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**Figure 1**—*Paulownia tomentosa*, royal paulownia: capsule, H 1.

**Figure 2**—*Paulownia tomentosa*, royal paulownia: winged seed, H 12.

**Figure 3**—*Paulownia tomentosa*, royal paulownia: longitudinal section through a seed, H 50.