

Meliaceae—Mahogany family

Toona ciliata Roemer

Australian toon

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Synonyms. *Toona australis* Harms, *Cedrela toona* var. *australis* (Roxb.) C. DC.

Other common names. toona, Australian redcedar, Burma-cedar.

Growth habit, occurrence, and use. Distributed in a natural range from India to Queensland, Australia (Francis 1951; Webb and others 1984), Australian toon—*Toona ciliata* Roemer—is the only species of *Toona* important in Hawaii and Puerto Rico. It was introduced into Hawaii from coastal rain forest areas of Australia in 1914 (Carlson and Bryan 1959; Streets 1962). Several small plantings of toon of an Indian provenance have reached sawlog size in Puerto Rico. Australian toon is a deciduous timber tree that attains heights of 30 to 43 m. It keeps its leaves longer on moist sites than on drier sites, and sometimes trees are said to be evergreen. Toon has been widely planted because the wood is valued for cabinets, furniture, decorative veneer, boats, and musical instruments (Chudnoff 1984). The red, often highly figured, wood is durable and seasons rapidly (Carlson and Bryan 1959; Francis 1951).

Flowering and fruiting. In Hawaii, Australian toon flowers from April to June. The flowers are bisexual. The 5-valved, teardrop-shaped capsules are 18 to 25 mm long (figures 1 and 2), in pendulous clusters, ripening during July to September. Seeds are disbursed during August to October (Walters 1974). Trees begin to produce seeds as early as 5 years of age, but generally do not do so with regularity or in quantity until they are 10 to 15 years old (Carlson and Bryan 1959).

Collection, extraction, and storage. The capsule turns from green to brown or reddish brown when ripe. When the first capsule in a cluster dehisces, the whole cluster should be picked. Clipping fruited branches using a pruning pole or cherry picker is recommended for seed orchards or open-grown trees. Climbing or felling will be necessary to collect capsules from mature trees in stands. The harvested fruit should be spread on trays in the sun to dry. The light brown, membranous winged seeds (figures 1 and 2) fall from the capsule as the fruit dehisces. Agitation aids the separation of seeds from the fruits. Various seed cleaners can be used to separate the seeds from chaff. Ten samples showed from 293,000 to 375,000 cleaned seeds/kg (133,000 to 174,000/lb) (Walters 1974). Seed purity was about 84% (Walters 1974). Toon seeds can be stored dry in sealed polyethylene bags at about 1 EC (Walters 1974). Even with this apparent orthodox storage behavior, however, storage life is reported to be only from 6 to 12 months (Webb and others 1984).

Germination. Australian toon seeds germinate without special treatment, but stratification for 30 days at 3 EC in plastic bags greatly increases the speed of germination. A water soak also may speed up germination (Walters 1974). Full germination of 90% of

unstratified seedlots occurred in 2 weeks; full germination of 96% of stratified seedlots occurred in 1 week (Walters 1974). Another source (Webb and others 1984) cites 40 to 60% germination of fresh seeds. Germination is epigeal.

Nursery practice. Australian toon seeds can be sown in Hawaii and Puerto Rico during any month of the year, but best results in Hawaii are obtained from March to November sowings and in Puerto Rico from April and May sowings. Seeds for bareroot seedling production are broadcast into precut lines. The lines are about 12 mm deep and about 15 cm apart. Most of the seeds that fall away from the lines are put in place as the lines are covered with soil. The beds are made level to prevent washing. The soil is kept by frequent watering. No mulch or shade is used. Seedling density in the beds is about 160 to 270 seedlings/m² (15 to 25/ft²). Seedlings are outplanted as 1+0 or 1½+0 stock (Walters 1974). Seedlings are now more frequently grown containerized in plastic nursery bags. Seeds are germinated in germination trays or beds and transplanted to the containers after they have developed 2 or 3 leaves. Seedlings can also be planted as striplings or stumps (Webb and others 1984). Australian toon seedlings grow slowly at first and should be given shade for 2 months. Potted stock reaches plantable size in 18 to 24 months (Webb and others 1984). Attacks of the shootborer *Hypsipyla grandella* (Zeller), which usually prohibits planting *Cedrela* species in the Neotropics, are absent or unimportant in toon plantations (Viga 1976; Whitmore and Medina Gaud 1974).

References

- Carlson NK, Bryan, LW. 1959. Hawaiian timber for coming generations. Honolulu: Trustees of the Bernice P. Bishop Estate. 112 p.
- Chudnoff M. 1984. Tropical timbers of the world. Agric. Handbk. 607. Washington, DC: USDA Forest Service. 464 p.
- Francis WD. 1951. Australian rain-forest trees. Sydney: Commonwealth of Australia, Forestry and Timber Bureau. 469 p.
- Streets RJ. 1962. Exotic forest trees in the British Commonwealth. Oxford: Clarendon Press. 765 p.
- Viga WM. 1976. Comportamento do 'cedro australiano', *Toona ciliata* M. Roem. var. *australis* (F. & M.) D. DC., face a susceptibilidade do ataque de *Hypsipyla grandella* (Zeller). Silvicultura em São Paulo 10: 109-118.
- Walters GA. 1974. *Toona australis*, Australian toon. In: Schopmeyer CS, tech. coord. Seeds of woody plants in the United States. Agric. Handbk. 450. Washington, DC: USDA Forest Service: 813-814.
- Webb DB, Wood PJ, Smith JP, Henman GS. 1984. A guide to species selection for tropical and sub-tropical plantations. Trop. For. Pap. 15. Oxford: Oxford University, Commonwealth Forestry Institute, Unit of Tropical Silviculture. 256 p.
- Whitmore, JL, Medina Gaud S. 1974. White peach scale attack on toon in Puerto Rico. Journal of Agriculture of the University of Puerto Rico 58(2): 276-278.

Figure 1—*Toona ciliata*, Australian toon: seed, H2.

Figure 2—*Toona ciliata*, Australian toon: longitudinal section through a seed with wing attached, H8.