Taxodiaceae—Redwood family

Taxodium L.C. Rich.

baldcypress

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Growth habit, occurrence, and use. Baldcypresses are large deciduous conifers that occur naturally in wetlands of the Southeastern and Gulf Coastal Plains. Two species, once classified as varieties of a single species, are now recognized (table 1). The ranges of these species overlap in the Southeast and Gulf South; baldcypress extends much further north and west, however. They are often difficult to identify where mixed (Wilhite and Toliver 1990). Baldcypress may be encountered in almost all temperate regions of the world, as it has been planted extensively as an ornamental. It was introduced in Europe as early as 1640 (Bonner 1974). Baldcypress wood is well-known for its use in boat construction, pilings, interior trim, flooring, paneling, and many other items. It is an important source of wildlife food and habitat and a valuable component of wetland hydrology (Wilhite and Toliver 1990).

Flowering and fruiting. The monoecious flowers of baldcypress appear in March to April, before the leaves. The male catkins are about 2 mm in diameter and are borne at the end of the previous year's growth in slender, purplish, tassel-like clusters 7 to 13 cm long. Female conelets are found singly or in clusters of 2 or 3 in leaf axils near the ends of the branchlets (Vines 1960; Wilhite and Toliver 1990). The globose cones turn from green to brownish purple as they mature in October to December. Flowering and fruiting of pondcypress is essentially the same as for baldcypress (Wilhite and Toliver 1990). Baldcypress cones are 13 to 36 mm in diameter (figure 1), and consist of a few 4-sided scales that break away irregularly after maturity. Each scale bears 2 irregularly shaped seeds that have thick, horny, warty coats and projecting flanges (figures 2 and 3). Collections from 45 families of baldcypress from Mississippi to Texas found that cones contained anywhere from 2 to 34 seeds, with an average of 16 (Faulkner and Toliver 1983). The proportion of seeds with embryos is frequently less than 50%, however. Some seeds are borne every year, and good crops occur at 3- to 5-year intervals.

Two insect pests destroy significant amounts of the seeds of baldcypress and pondcypress—southern pine coneworm (*Dioryctria amatella* (Hulst)) and baldcypress coneworm (*D. pygmaeella* Ragonot). The baldcypress seed midge (*Taxodiomyia cupressi* Schweinitz) forms small round galls inside the cones of baldcypress (Hedlin and others 1980; Merkel 1984). The seed midge apparently does little damage to seeds, but the galls are difficult to separate from the seeds and become a quarantine problem for seed exporters.

Collection, extraction, and storage. Mature, dry cones can be picked by hand from standing or felled trees and spread in a thin layer for air-drying. The dried cones should be broken apart by flailing or dry maceration. The resin in the cones presents a major problem in separation and cleaning because it causes seeds and cone fragments to stick together. The resin also gums up mechanical macerators. One possible solution is to place the dried seeds and cone

fragments in a freezer to harden the resin, then run them through a macerator again while the resin is still in a solid state. Resin can be removed from equipment with alcohol or other organic solvents.

The number of seeds per cone volume for baldcypress averages about 58 kg/hl (45 lb/bu) of fresh cones. About 50 kg of seeds can be obtained from 100 kg (110 lb/220 lb) of fresh cones, and there are 7,300 to 10,000 cones/hl (2,600 to 3,550 cones/bu) (Bonner 1974). For baldcypress, the average number of cleaned seeds per weight determined from 26 samples was 11,500/kg (5,200/lb) with a range of 5,600 to 18,500/kb (2,540 to 8,400/lb). One sample of pondcypress from Florida contained about 9,000 seeds/kg 4,100 seeds/lb) (Bonner 1974). Baldcypress seeds keep well in dry storage at 2 to 5 EC for at least 3 years. Because they appear to be orthodox in storage behavior, longer storage under the same conditions will probably succeed.

Germination. Baldcypress seeds exhibit a moderate amount of dormancy that can be overcome by cold stratification (table 2). For germination testing, moist stratification for 30 days at 3 to 5 EC is recommended, followed by a 28-day test at alternating temperatures of 20 ^{o} for 16 hours (dark) and 30 EC for 8 hours (light) (ISTA 1993). Studies with collections from the Gulf Coast region suggested that dormancy in both species is regulated by the seedcoat, and any treatment that softens or weakens the coats will increase rate of germination. A 4-hour soak in concentrated sulfuric acid was recommended as the easiest treatment (Murphy and Stanley 1975). An alternative method for nursery use has been to soak the seeds in water at 4 EC for 90 days or until ready to plant in the spring. Pondcypress seeds respond well to 60 to 90 days of stratification at 4 EC in peat moss, preceded by a 24- to 48-hour soak in 0.01% citric acid (Bonner 1974). In addition to the test conditions recommended in table 2, tetrazolium staining can be used to determine viability (ISTA 1993).

Nursery practice. Spring-sowing of pretreated seeds and fall-sowing of untreated seeds (December) are both practiced. The latter method has proved successful in northern nurseries. Seeds and cone scales can be broadcast or drilled together and should be covered 6 to 12 mm (¼ to ½ in) deep with sand, soil, or peat moss. Beds should then be mulched with leaves or other material, especially when fall sowing is used. Shade may be needed in the South from June to September, and beds must always be well watered. The resinous seeds are not eaten to any extent by rodents or birds (Bonner 1974). Germination is epigeal (figure 4). Rooting of cuttings is difficult but possible, as is grafting (Dirr and Heuser 1987).

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Table 1—*Taxodium,* baldcypress: nomenclature and occurrence

Scientific name & synonyms	Common names	Occurrence
T. ascendens Brongn. *T. distichum* var. *imbricarium* (Nutt.) Croom *T. distichum* var. *nutans* (Ait.) Sweet	**pondcypress**, pond baldcypress, cypress	Coastal plain from Virginia to Florida & Louisiana
T. distichum (L.) Rich.	**baldcypress,** common bald cypress, gulf cypress, red cypress, tidewater red cypress, white cypress, yellow cypress, Massachusetts	Coastal plain from Delaware & Florida W to Texas & N to Illinois in Mississippi River Valley; planted from Michigan to cypress

Sources: Little (1979), Wilhite and Toliver (1990).

Table 2—*Taxodium,* baldcypress: germination test conditions and results on stratified seedlots

	Germination test conditions								
	Daily		Temp (EC)		Germ. energy		Germ.capacity		
Species	light (hr)	Medium	Day	Night	Days	(%)	Days	(%)	Samples
T. ascendens	8	Kimpak	30	20	30	76	8	93	4
T. distichum	8	Kimpak	30	20	30	67	17	74	7

Sources: Bonner (1974), ISTA (1996).
Note: Germ. = germinitive.
***** Percentages are based on full seeds only.