Betulaceae—Birch family

Ostrya virginiana (P. Mill.) K. Koch

eastern hophornbeam

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Other common names. hophornbeam, American hophornbeam, hornbeam, leverwood, ironwood.

Growth habit, occurrence, and uses. Three of the 8 species of the hophornbeam genus—*Ostrya*—are native to the United States; of these, eastern hophornbeam is the most common (Little 1979). It is a small deciduous tree that attains a maximum height of about 18 m and occurs throughout the eastern half of North America, ranging from Nova Scotia and southeastern Manitoba in Canada south to eastern Texas and northern Florida. It also occurs in the mountains of Mexico, El Salvador, and Honduras (Little 1979). Small trees often occur in the understory on a wide variety of sites ranging from deep, moist soils to dry and gravelly or rocky slopes (Metzger 1990).

The heavy, hard, durable wood has been used for fence posts, tool handles, and other specialty items (Schopmeyer and Leak 1974). Eastern hophornbeam also provides food and cover for many birds and some mammals. The seeds are a preferred food for sharp-tailed grouse (*Pedioecetes phasianellus*) and wild turkey (*Meleagris gallopavo*), and the buds and catkins are important winter foods for ruffed grouse (*Bonasa umbellus*) (Metzger 1990). This tree is sometimes planted as ornamental because of its attractive foliage and fruit clusters (Brown and Kirkman 1990), but it does not grow very rapidly. It was first cultivated in 1690 (Rehder 1940).

Flowering and fruiting. The flowers are monoecious. Staminate catkins, 2.5 to 4 cm in length, develop on the branch tips in late summer and overwinter in a dormant state. Pistillate catkins are small, inconspicuous, and 6 mm long; they appear with the leaves in the spring. Both flowers mature and open in March and April in the South and May and June in the North (Brown and Kirkman 1990; Metzger 1990). The fruit is a strobile, usually 2.5 to 7.5 cm long (figure 1), consisting of involucres that each enclose a single nut (figure 2) about 7 mm long and 4 mm in diameter (Brown and Kirkman 1990; Sargent 1965). The fruits ripen from the end of August in Michigan to October in the South. Nuts are dispersed after ripening when the strobiles fall apart. The buoyancy of the papery sacs aids dispersal by wind (Metzger 1990). Trees do not produce seeds abundantly until they are about 25 years old (Schopmeyer and Leak 1974). Seed production in the northern part of the range has averaged 124,000 seeds/ha (50,200/ac) (Metzger 1990).

Collection, extraction, storage. The strobiles may be hand-picked from the trees when

they are a pale greenish brown in color. At this stage, they are not yet dry enough to fall apart. When completely ripe, they are light gray to greenish brown (Schopmeyer and Leak 1974). The fruits should be thoroughly dried before seeds are extracted by thrashing or rubbing the dried fruits over screens. Seeds can be separated from the chaff with air-screen cleaners or fractionating aspirators or by fanning. One hectoliter of fruit will yield about 2.5 kg of seed (1 bu yields 2 lb). The number of seeds per weight (5 samples) ranged from 55,100 to 77,200/kg (25,000 to 35,000/lb), with an average of 66,100/kg (30,000/lb). Purities (percentages) in the high 90's are easily obtained with good cleaning. The proportion of sound seeds will vary widely, especially due to insect damage, but 80% has been reported (Schopmeyer and Leak 1974). There are no storage test data for eastern hophornbeam, but the seeds have the ability to survive at least 1 year in the soil and should have good storage potential.

Pregermination treatments and germination tests. Seeds have a hard seedcoat and an internal dormancy that is difficult to overcome. Warm incubation, followed by cold stratification may be best. Three months of warm, followed by 3 to 5 months of cold produced germination of 81 to 92% (Dirr and Heuser 1987). Germination is epigeal (figure 3). Tetrazolium staining can be used to estimate viability. Official seed testing organizations do not include eastern hophornbeam in their recommendations.

Nursery practice. Either fall- or spring-sowing is feasible, but fall-sowing should take place soon after seeds are collected. In Iowa, seeds collected when they were slightly immature (August) and sown immediately germinated 100% the following spring (Titus 1940). Seeds should be covered with 6 mm (¼ in) of firmed soil. Fall-sown beds should be covered with burlap, straw, or other suitable mulch, and uncovered when germination begins. Stratified seeds may be sown in the spring as soon as the soil can be worked, and the beds should be mulched or watered to keep them moist until germination starts (Schopmeyer and Leak 1974).

References

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Figure 1—*Ostrya virginiana*, eastern hophornbeam: strobile, H 1.

Figure 2—*Ostrya virginiana*, eastern hophornbeam: longitudinal section through a seed (**left**) and intact seed (**right**), H 6.

Figure 3—*Ostrya virginiana*, eastern hophornbeam: seedling development at 2, 4, 23, and 27 days after germination.