



CENTRAL HARDWOOD NOTES

Mast Importance, Production, And Management

Mast is a broad term that refers to the various nuts and fruits produced by woody plants. It is usually subdivided into hard mast (nuts) and soft mast (fleshy fruits). Forest tree and shrub mast is an important seasonal food for many forest wildlife species.

In the central hardwood region, the hard mast producers tend to be canopy trees while soft mast producers grow principally in the understory. The mast species in this region that are most important to wildlife include:

Hard Mast

Oaks
Hickories
American beech
Black walnut
Hazel

Soft Mast

Flowering dogwood
Bush dogwoods
Viburnums
Hawthorns
Persimmon
Black cherry
Other cherries
Mulberry
Sumac
Wild grape
Virginia creeper
Greenbriar
Spice bush
Blackgum
Poison ivy
Sassafras

Most woodland game animals, including tree squirrels, white-tailed deer, wild turkey, and ruffed grouse use substantial amounts of mast. Productivity and body condition in several of these species have been linked to size of the acorn crop in a given year. A multitude of other mammals and birds also use hard and soft mast. The length of time an animal can utilize a particular kind of mast depends on the abundance of the mast-producing species, the size of the annual crop, and the feeding habits of the animal. Several species, such as tree squirrels and eastern chipmunks, gather and store hard mast so it is an important food source for longer periods for them than for non-storers such as white-tailed deer. It is important to know that there is intense competition among mast feeders for the mast crop in most years.

Production

Forest Types

Compared to the oak-hickory and oak-pine types, the mixed hardwoods and elm-ash-cottonwood types have significantly fewer mast-producing species. For wildlife it is especially important to modify stand prescriptions to retain mast-producing canopy trees and to encourage understory soft-mast production when thinning or making intermediate cuts. In a given stand, the aggregate production of all soft-mast species frequently exceeds that of hard-mast species.

Production Variables

In general, mast production--especially hard mast--is unreliable. It varies greatly from year to year with little predictability. The black oak group (oaks with sharp-pointed leaf lobes), hickories, and black walnut are generally more reliable producers than the white oak group (oaks with rounded leaf lobes) and American beech. White oak, American beech, and northern red oak are very sporadic producers, tending to produce bumper crops some years and then to fail almost completely for the next several years.

In addition, insects generally damage or destroy more than 50 percent of the hard-mast crop; in some years it is 90 percent or more. The remaining sound nuts are often completely utilized by various mast feeders. This leads to concerns regarding regeneration of mast-producing species.

Several factors inherent in the individual tree strongly affect its ability to produce mast:

- . Genetics--Some individuals are inherently better mast producers than others; some fail to produce any mast.
- . Dominance and crown size--Dominant trees with large, well-developed crowns and edge or open-grown trees are better producers.
- . Recent fruiting history--A bumper crop in one year reduces chances of significant production in years that immediately follow.
- . Age--Hard mast production generally begins between 20 and 40 years of age, is greatest at mid age and size, and tapers off between 100 and 200 years, depending on species.

Certain physical or environmental factors also affect mast production:

- . Light intensity--Production in almost all species increases with more light.
- . Site--Better sites and soils produce larger mast crops.
- . Rainfall--Lack of moisture reduces production.
- . Frost--Freezing temperatures may destroy total annual production if they occur during flowering.
- . Temperature--Warm early spring temperatures followed by cooler summer temperatures produce the best crops.

Recommendations For Management

1. Strive for as wide a mix of hard-mast producing species as possible to insure against total hard mast failure in any year. It is especially important to retain a good mix of white oak group and black oak group species.
2. Retain soft-mast species in the understory during thinning, selection harvesting, or clearcutting.
3. Maintain soft-mast producing vines during timber stand improvement and other release operations if they are not hindering timber crop trees.
4. Use thinnings that allow fullest crown development on mast-producing crop trees and that create maximum light penetration to the understory.
5. Create or retain wildlife openings in which mast-producing shrubs may be selectively maintained. Many soft-mast species are early successional. Rights-of-way should be similarly selectively maintained, with mast-producing shrubs encouraged on the right-of-way and mast-producing trees retained on the perimeters.
6. Extend rotation length (i.e., from 80 to 120 years) so that a higher proportion of the stands in a large forest property would be producing hard mast.
7. Under uneven-age management use group selection rather than single-tree selection for better light penetration for understory development.
8. Do not cut a hard-mast producing stand unless and until an adjacent stand of suitable composition is of mast-bearing age.
9. Exclude fire and grazing from mast-producing stands.
10. Make maximum effort to retain and release mast-producing trees, shrubs, and vines in intermediate treatments in areas having few mast-producing species. This applies especially to mixed hardwoods and elm-ash-cottonwood types.

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