Native Trees and Shrubs for Wildlife

David Apsley- Natural Resources Specialist, Ohio State University Extension
Marne Titchenell- Wildlife Program Specialist, Ohio State University Extension
Ryan Boyer- District Biologist, National Wild Turkey Federation

1

What is "Mast"?

- "The fruit and seeds of trees and shrubs that are consumed by wildlife."

2

Hard Mast Vs. Soft Mast

- Hard Mast includes acorns, nuts, and seeds
  - Available in Fall and winter months
  - Long "shelf life"
  - High in fat and carbohydrates
- Soft Mast includes berries, drupes, pomes (e.g., fleshy fruits)
  - Available in Summer through Fall
  - Shorter "shelf life"
  - High in sugars and carbohydrates and higher in fat in the Fall

3

Go to this link to participate in the poll:

https://www.menti.com/w38wb3ycwv

4

Important Mast for Game Species

- Hard and Soft Mast are Vital
- White-tailed Deer and Wild Turkeys

www.bowhunt360.com

www.chelseaupdate.com

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Annual Cycles of Game Species

- Needs change as the seasons change
  - Forage Abundance
  - Quality of Forage
  - Metabolic Needs

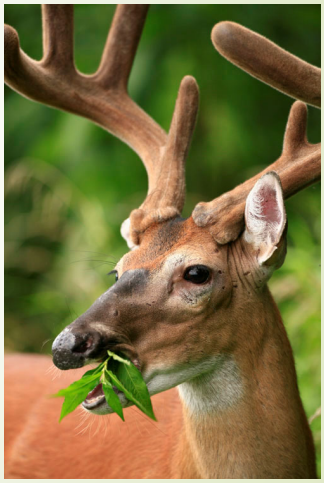

Photo Credit: Field and Stream and Mississippi State University

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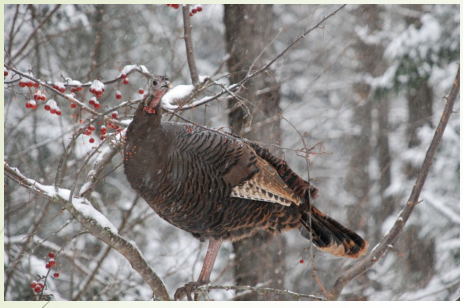


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Eastern Wild Turkey Diet

- Diet = 90% plant matter; 10% animal matter
- Hens consume > 2 lbs/ week
- Adult gobblers consume 3.5-7 lbs/ week
- 4 Main Food categories
  1. Hard and Soft Mast (Fruits and nuts)
  2. Vegetation
  3. Seeds
  4. Insects

Photo Credit: Tes Randle Jolly

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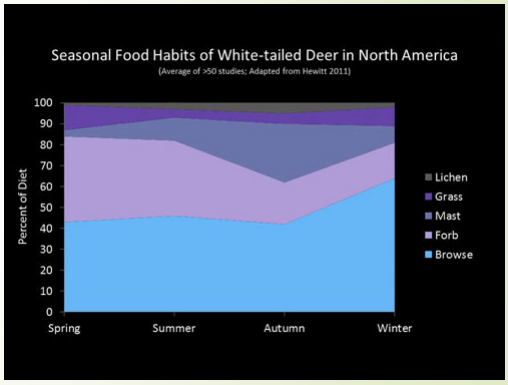
White-tailed Deer Diet

1. Browse (Tree and Leaf parts)
2. Forbs (Herbaceous broad leaved plants, including Agriculture)
3. Hard and Soft Mast (Tree and Shrub Seed and Fruit)
4. Grass, Lichens, and Mushrooms

- 85% of diet consists of browse, hard and soft mast, and forbs.
- Percent of Mast in Diet increase dramatically in Fall and Winter Months



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Consider All of Factors

Habitat Component	Availability/Quality			
	High	Medium	Low	Absent
Food				
Nesting cover				
Brood-rearing cover				
Forest cover				
Roosting cover				
Water				
Interspersion of habitat components				

10

Hard Mast- White Oak Species

11

Hard Mast- Red Oak Species

12

Oaks and Songbirds

75% of the birds that breed in Ohio depend on caterpillars.

13

Hard Mast- American Beech

14

Hard Mast- Hickory spp.

15

Soft Mast- Grapes

16

Soft Mast- Crabapples



17

Soft Mast- Dogwood



18

Soft Mast- Sumac spp.

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Soft Mast- Brambles (Blackberries, Briars, Raspberry, etc.)

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Soft Mast-Cherries

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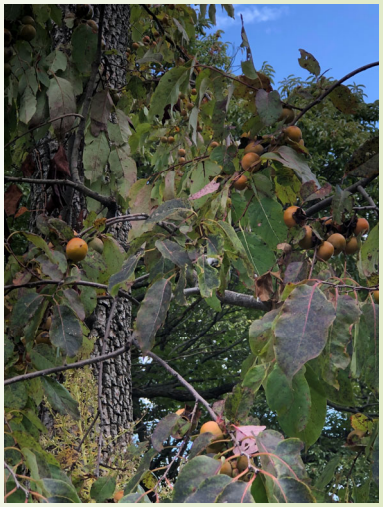
Soft Mast- Persimmon



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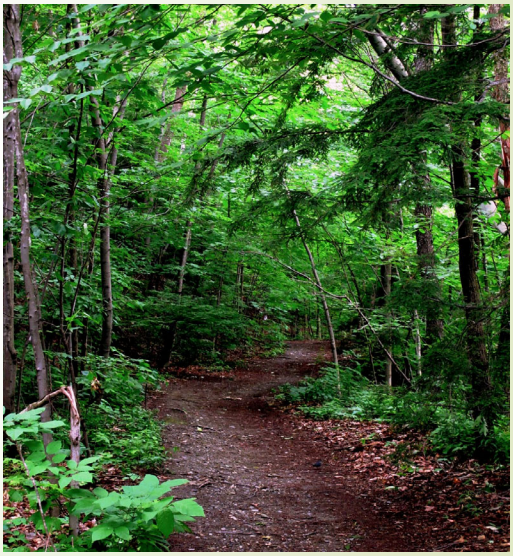
Which is Pollinator Habitat?



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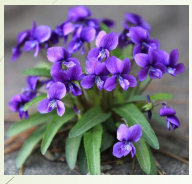
Butterfly Host Plants



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Woody Plants for Lepidopterans

Common Name	Family	Plant Genus	Species Supported
Oak	Fagaceae	Quercus	557
Willow	Salicaceae	Salix	456
Cherry, plum	Rosaceae	Prunus	455
Birch	Betulaceae	Betula	411
Poplar, cottonwood	Salicaceae	Populus	367
Crabapple	Rosaceae	Malus	308

Tallamy, Douglas. Bringing Nature Home: How You Can Sustain Wildlife with Native Plants. Timber Press, London. 2007.

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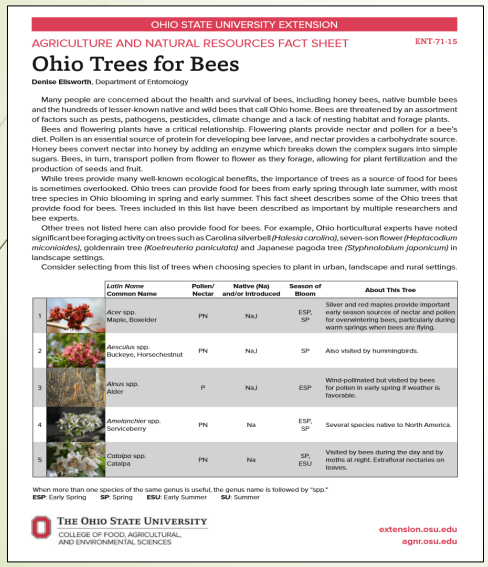
Trees & Shrubs for bees – Nectar & Pollen



OHIO STATE UNIVERSITY EXTENSION

AGRICULTURE AND NATURAL RESOURCES FACT SHEET ENT-71-15

Ohio Trees for Bees

Denise Ellsworth, Department of Entomology

Many people are concerned about the health and survival of bees, including honey bees, native bumble bees and the hundreds of lesser-known native and wild bees that call Ohio home. Bees are threatened by an assortment of factors such as pests, pathogens, pesticides, climate change and a lack of nesting habitat and forage plants.

Bees and flowering plants have a critical relationship. Flowering plants provide nectar and pollen for a bee's diet. Pollen is an essential source of protein for developing bee larvae, and nectar provides a carbohydrate source. Honey bees convert nectar into honey by adding an enzyme which breaks down the complex sugars into simple sugars. Bees, in turn, transport pollen from flower to flower as they forage, allowing for plant fertilization and the production of seeds and fruit.

While trees provide many well-known ecological benefits, the importance of trees as a source of food for bees is sometimes overlooked. Ohio trees can provide food for bees from early spring through late summer, with most tree species in Ohio blooming in spring and early summer. This fact sheet describes some of the Ohio trees that provide food for bees. Trees included in this list have been described as important by multiple researchers and bee experts.

Other trees not listed here can also provide food for bees. For example, Ohio horticultural experts have noted significant bee foraging activity on trees such as Carolina silverbell *(Halesia carolina)*, seven-son flower *(Heptacodium miconioides)*, goldenrain tree *(Koelreuteria paniculata)* and Japanese pagoda tree *(Styphnolobium japonicum)* in landscape settings.

Consider selecting from this list of trees when choosing species to plant in urban, landscape and rural settings.

		Latin Name Common Name	Pollen/ Nectar	Native (Na) and/or Introduced	Season of Bloom	About This Tree
1		*Acer* spp. Maple, Boxelder	PN	NaI	ESP, SP	Silver and red maples provide important early season sources of nectar and pollen for overwintering bees, particularly during warm springs when bees are flying.
2		*Aesculus* spp. Buckeye, Horsechestnut	PN	NaI	SP	Also visited by hummingbirds.
3		*Alnus* spp. Alder	P	NaI	ESP	Wind-pollinated but visited by bees for pollen in early spring if weather is favorable.
4		*Amelanchier* spp. Serviceberry	PN	Na	ESP, SP	Several species native to North America.
5		*Catalpa* spp. Catalpa	PN	Na	SP, ESU	Visited by bees during the day and by moths at night. Extrafloral nectaries on leaves.

When more than one species of the same genus is useful, the genus name is followed by "spp."
ESP: Early Spring **SP**: Spring **ESU**: Early Summer **SU**: Summer

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extension.osu.edu
agnr.osu.edu

- ~25% or 700+ native bees in eastern U.S. are pollen specialists

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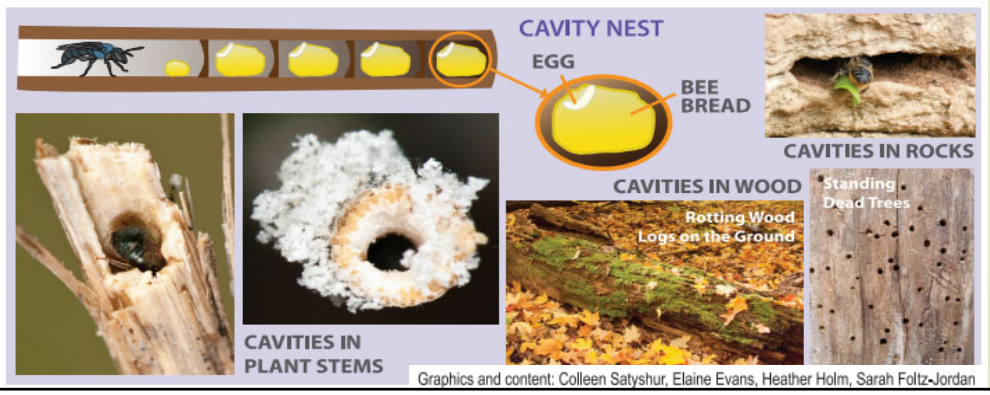
CAVITY-NESTING NATIVE BEES

Small Carpenter Bees, *Ceratina* spp. Mason Bees, *Osmia* spp.

- Mason bees and leaf cutter bees use hollow or pithy stems to construct nests
  - **Blackberry, raspberry, elderberry, sumac**



Graphics and content: Colleen Satyshur, Elaine Evans, Heather Holm, Sarah Foltz-Jordan

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Native Plant & Diversity BONUS

Soldier beetle

Seven-spotted lady beetle

Landscapes with high native plant diversity are more stable (i.e. less pest outbreaks).

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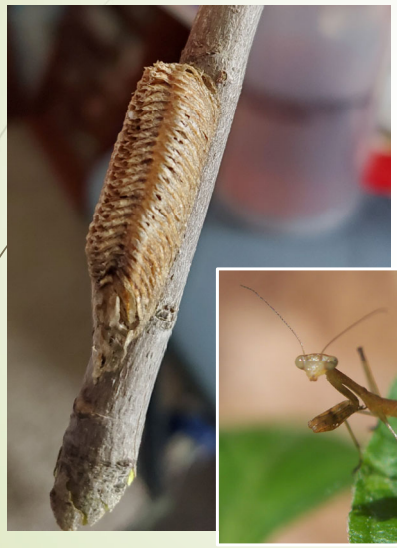
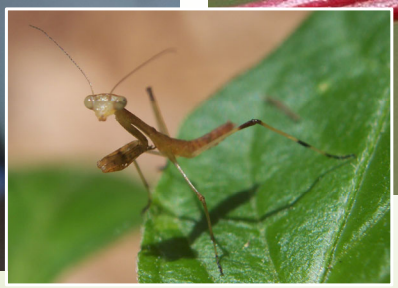
You give some, you get some…





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Plants for Insects

BIRD-FRIENDLY, TOO!!

Nectar/Pollen for Bees

- Maple (*Acer*)
- Cherries (*Prunus*)
- **Crapapple (*Malus*)**
- Red bud (*Cercis*)
- Willow (*Salix*)
- Basswood (*Tilia*)
- Dogwood (*Cornus*)
- Hawthorn (*Crataegus*)

Host Plants for Lepidopterans

- Oak (*Quercus*)
- Cherry (*Prunus*)
- Willow (*Salix*)
- Birch (*Betula*)
- **Yellow Poplar (*Lirodendron tulipifera*)**

Pollen Specialist Bees

- Holly (*Ilex*)
- Willow (*Salix*)
- Dogwood (*Cornus*)
- *Viburnum*
- Redbud (*Cercis*)
- Blueberries (*Vaccinium*)

Insect Predators

- Apple *(Malus)*
- Plum, cherry *(Prunus)*
- Hawthorn *(Crataegus)*
- Willow *(Salix)*
- **Elderberry *(Sambucus)***
- Viburnum *(Viburnum)*

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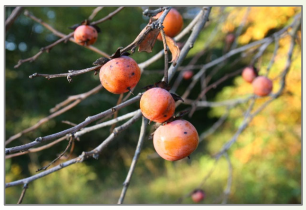
Management of Mast Producing Trees and Shrubs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What is The Ohio Buckeye?

A
"**Mast**cot"


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Extension FactSheet

F-59-06

School of Environment and Natural Resources, 2021 Coffey Road, Columbus, Ohio 43210

Enhancing Food (Mast) Production for Woodland Wildlife in Ohio

Dave Apsley
Natural Resources Specialist

Stan Gehrt
Wildlife Specialist

The term "mast" was probably first used to describe a food source for domestic livestock. Webster defines mast as "the fruit of oak or beech or other forest trees used as food for hogs and other animals." When foresters and wildlife biologists use the term, they are referring to the woody plant (trees, shrubs, or vines) fruit used by wildlife for food. All tree and shrub species produce some type of fruit. The type of fruit varies greatly, but for many forest wildlife species, mast is an important source of food. In fact, the diets of squirrels and many other wildlife species consist almost entirely of mast throughout the year.

Figure 2. Black cherry fruits—A common soft mast in Ohio forests.

Hard and Soft Mast

Mast is often categorized as either soft or hard. Hard mast consists of hard shelled seeds that have a relatively long "shelf life" and are typically high in fat, carbohydrates, and protein. These characteristics make them a food source that is both high in energy content and available well into the winter months. For many Ohio wildlife species, hard mast is a key food source for survival during the winter months when other sources of nutrition are most limiting. Examples of hard mast include acorns, hazelnuts, hickory nuts, beechnuts, and walnuts. Table 1 provides a list of numerous Ohio hard-mast producers and wildlife that consume them.

Figure 1. Shagbark hickory nuts—A common hard mast found in Ohio forests.

Soft mast is fleshy, perishable fruit that is often high in sugar, vitamins, and carbohydrates. It is usually not available in great quantities in winter months. During drought years, soft mast may be a crucial source of moisture for some wildlife and their young.

Soft mast may also be a crucial energy source for some wildlife species during migration. Examples of soft mast include black cherries, persimmons, pawpaws, and blackberries. See Table 2 for a more comprehensive listing of soft-mast producers in Ohio.

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Fact Sheet Focuses on Three Ways to Enhance Mast

- Crop Tree Release
- Planting
- Mowing or Cutting

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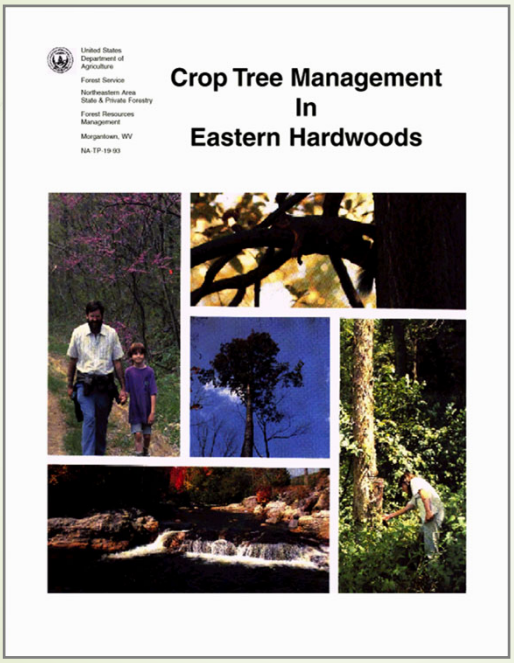

Arlyn W. Perkey, Brenda L. Wilkins and H. Clay Smith

USDA FOREST SERVICE; Morgantown, WV

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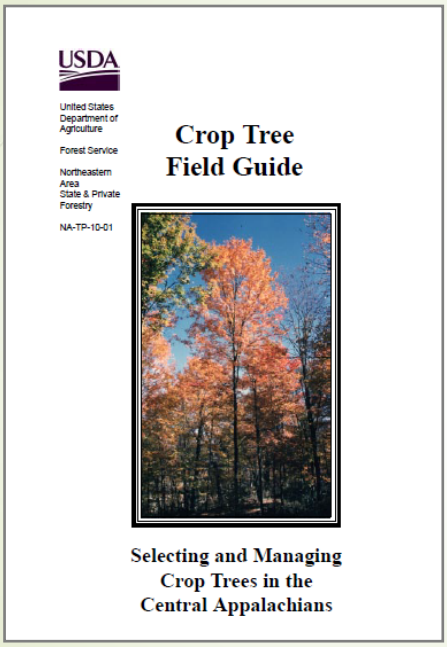

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Extension FactSheet

F-50-02

School of Natural Resources, 2021 Coffey Road, Columbus, Ohio 43210

Crop Tree Management: A New Tool to Help You Achieve Your Woodland Goals

David K. Apsley
District Extension Specialist, Natural Resources

Randall Heiligmann
State Extension Specialist, Forestry

Ohio woodland owners have many different reasons for owning and managing their woodlands. Some desire woodlands that provide habitat for a variety of wildlife. Others want a woodland that supports particular types of recreation such as hiking, hunting, and bird watching. Still others want to harvest timber and non-timber products from their woods for home and farm use or to provide periodic income. Most aspire to maintain or improve the health, vigor, and attractiveness of their forest. For many private woodland owners, the ability of their woodlands to provide these and many other values can be enhanced through crop tree management.

Crop trees are trees that produce or have the potential to produce the desired landowner benefits. If, for example, improved squirrel habitat is desired, a large-crowned white oak that produces abundant acorns would be a valuable crop tree. If increased economic value is an important ownership objective, a 14-inch-diameter black walnut tree with a straight and relatively defect-free trunk and a fairly small crown would be a valuable crop tree. On the other hand, if fall color was important, a group of black gum trees, which turn brilliant red in the fall, might all be potential crop trees.

In an unmanaged woodland, competition among trees for light, water, and nutrients is often severe and can result in slow growth or even the death of the more desirable trees. In a woodland under crop-tree management, these crop trees are freed from excessive competition by reducing or eliminating some of the less desirable competing trees. The released[1] crop trees are healthier and more vigorous, more insect and disease resistant, grow faster, and produce additional landowner benefits.

[1] Released trees are those that have had crown touching competitors removed.

Figure 1. Crop tree after release.

http://go.osu.edu/croptree

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Crop Tree

- Tree which has the potential to produce desired landowner benefits
- A wildlife crop tree is a tree that is capable of producing mast or cover for desired wildlife species

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Things to look for in mast producing trees

- Prefer trees in the main canopy
  Healthy large crown
  Few dead branches in upper crown
- Hard-mast producers preferred over Soft-mast
- Species Variety
- Favor trees that have produced in past years
- Expected longevity of 20+ years
- Cavities and large, broken branches acceptable, provide shelter

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Diversity is Key

- Mast is consumed in all seasons
- Mast crops are cyclic
- Nutritional content varies by mast species
- Wildlife species favor different food sources
- Disease and insect impacts lessened by diversity

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Crop Tree Management

- System that provides a means for accomplishing single or multiple stewardship goals
- Focuses on release of individual trees to produce benefits consistent with specific objectives
- Based on crown touching release

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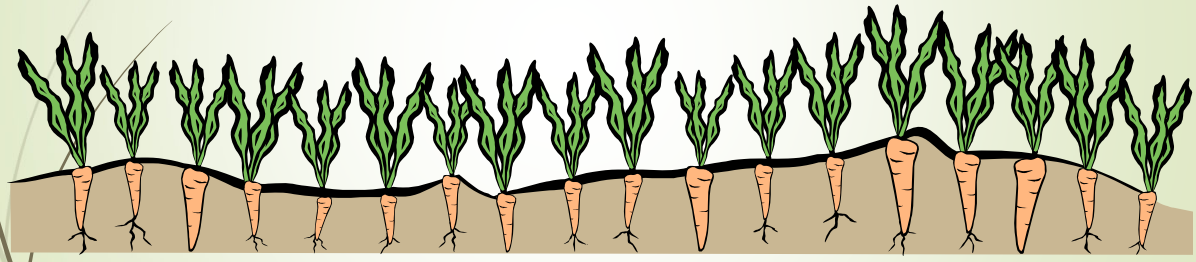
Carrot Analogy



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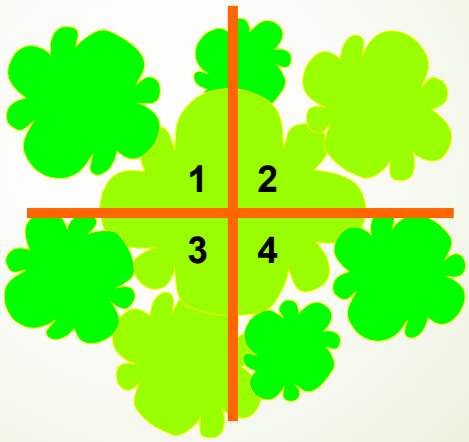
Free-to-Grow = "0"



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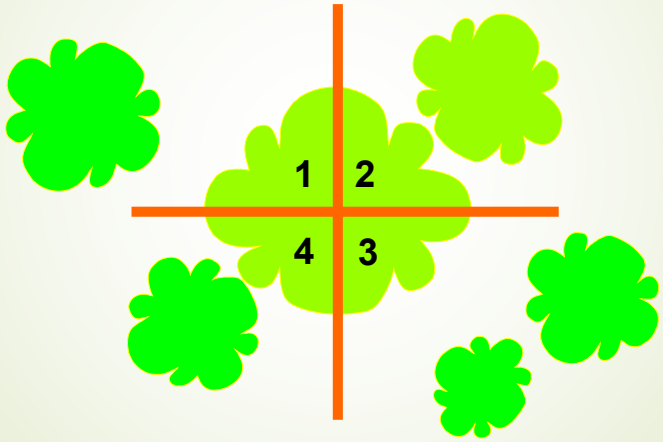
Free-to-Grow = "2"



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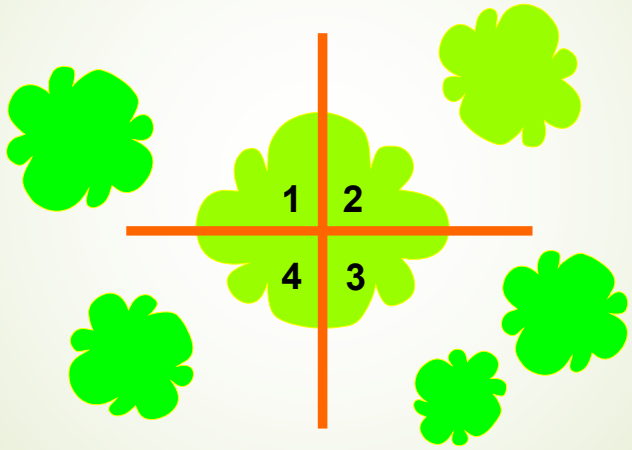
Free-to-Grow = "4"



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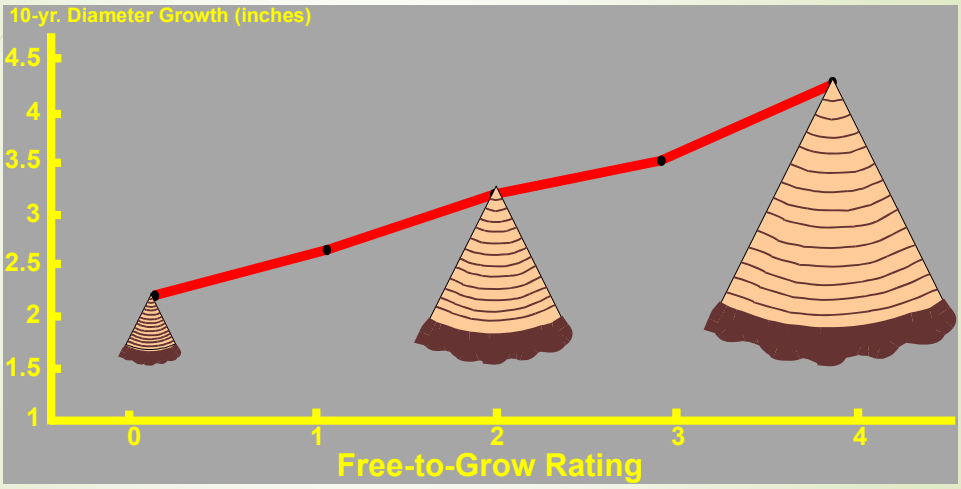
Influence of Free-To-Grow on Growth



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Vigor and Light Effect Flowering and Seed Production

Vigorous, dominant trees often produce more seed

- Trees have sufficient energy reserves to reproduce
- Light is sufficient to stimulate flowers and fruit
- Vigorous trees have larger crowns with more surface to produce fruit

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Vigor and Light Effect Flowering and Seed Production

When competition is severe, trees may not produce any flowers or seed

- Barely enough food reserves to survive
- Not enough light to stimulate flower production
- Small crowns little surface area for flower and fruit production

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Shading and Flower Production

Light Intensity of Outer Crown	Number of Flower Buds
100	150
37	96
25	69
11	33

From Apple Research Kramer and Koslowski, 1979

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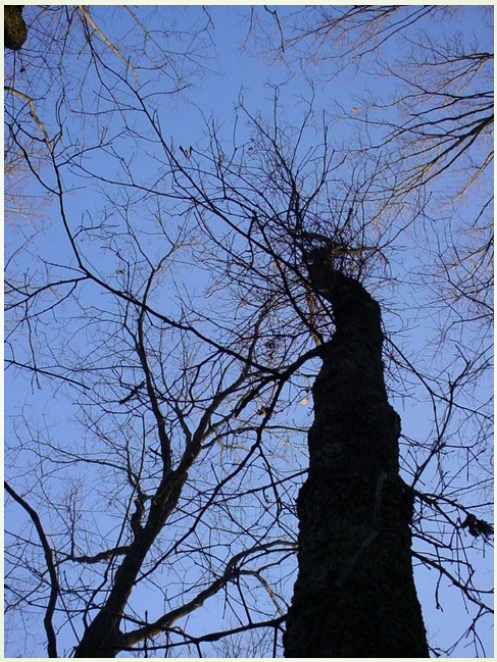

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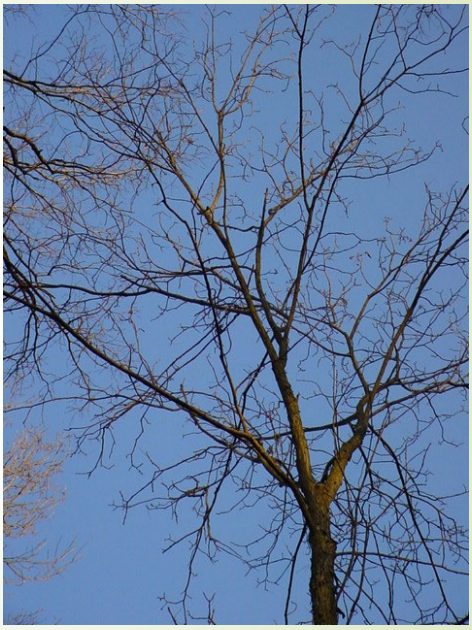

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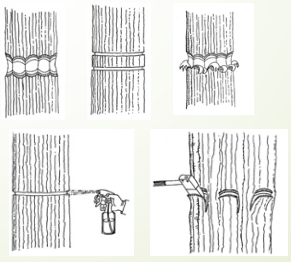
How Do I Release a Crop Tree?

- Directional felling with a chainsaw
- Girdling
- Girdling and herbicides
  Use caution: Herbicides can move through root systems



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Crop Tree Management -Keys to Points

- Start on your most productive sites
- Releasing crop trees will increase undergrowth
  Browse
  Shrub fruit production
  Invasive species
- **Species Diversity** is very important
- Standing dead and downed trees also have wildlife value
- Be realistic about what you can accomplish
- Each tree that you release can make a difference!!!!

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Other Things that You Can Do to Enhance Food Production

- Inventory your woodlands to determine number, diversity and productivity of mast producers
- Strive to maintain as many hard-mast producers as practical

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Other Things that You Can Do to Enhance Food Production

Maintain 2-3 Fruit-producing wild grape vines per acre

- Keep vines on edges on trees that are less desirable
- Grape vines also provide great nesting sites for squirrels and nesting materials for many species of wildlife

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Other Things that You Can Do to Enhance Food Production

- Plant a variety of native mast-producing shrubs and trees in areas where natural regeneration is not likely to occur where diversity is lacking
- Consult with a professional forester on wildlife biologist
- Select tree or shrub species adapted to soil and light conditions on your site
- Select the tree or shrub species fulfill the biggest needs
- Tend to your newly planted trees and shrubs, weed competition is the biggest reason for mortality

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Other Things that You Can Do to Enhance Food Production

- Mow or cut Approximately 1/4 to 1/5 of shrubby vegetation along woodland edges annually
- This helps to maintain a health population of species like blackberry, raspberry, sumac, and other species that provide valuable soft mast and cover for wildlife

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Other Things that You Can Do to Enhance Food Production

Control non-native Invasive Plants.

Non-native species:

- Decrease diversity of native plants
- Often provide mast that is often consumed by wildlife, but it is usually not nearly as nutritious as native species

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Finally!

Consult with a professional for specific recommendations for your woodlot:

- State Division of Forestry - Service Forester
- Consulting Forester
- State Division of Wildlife - Private Lands Biologist
- Cooperative Extension Natural Resources Educators and Specialists

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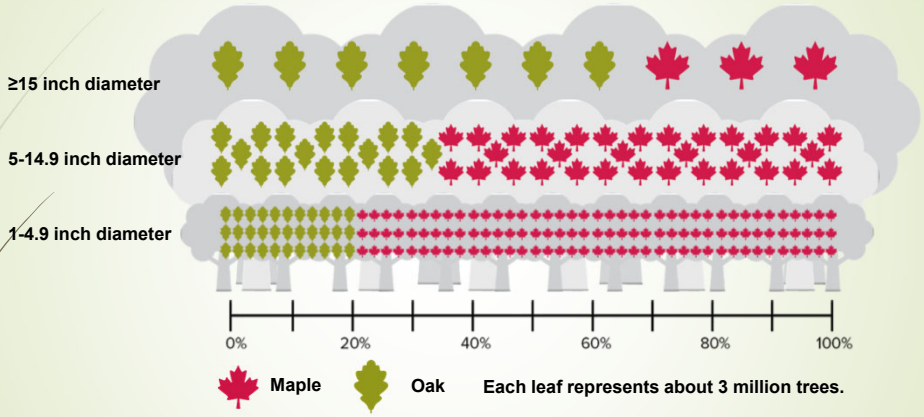
Oaks were here in the past, are here now, but what about the future?



Source: Thomas Albright. 2018. U.S.D.A. Forest Service, Northern Research Station, Forest Inventory and Analysis. From 2017 FIA Ohio Data

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The Future of OAK is in Our Hands!

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CFAES

The Ohio State University
College of Food, Agricultural, and Environmental Sciences

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