

TOLLESBORO LIONS CLUB TO HOST ARBOR DAY TREE GIVEAWAY TO CELEBRATE ARBOR DAY

FREE TREES
TO PLANT
FOR ARBOR



Trees provided by:





PLANT A TREE FOR ARBOR DAY!!!

TREE GIVEAWAY IS A TOLLESBORO LIONS CLUB PROJECT AIMED **TO IMPROVE THE ENVIRONMENT**

The Tollesboro Lions Club has once again partnered with the Kentucky Division of Forestry and with Kentucky State University to provide trees to give-away to the public at large for Arbor Day. Tollesboro Lions Club President Craig Stanfield contacted Michael Carter (Forest Ranger of the KY Division of Forestry), Suzy Knott of the Morgan County Nursery, and Sheri Crabtree (MSc, Horticulture Research and Extension Associate Academic Affairs of Kentucky State University), all of whom were happy to support the Tollesboro Lions Club in their effort to provide trees for the Club to give away to the public to celebrate Arbor Day. This marks the fifth year that the Tollesboro Lions Club has offered free trees to the public in recognition of Arbor Day, having previously offered free trees in 2019, 2022, 2023 and 2024, with the number of trees given away increasing each year (*in 2019, 100 trees were given away; in 2022, 200 trees were given away; in 2023, 214 trees were given away; and last year 312 trees were given away, but the trees were gone in a matter of hours!*). This year's event is the largest yet, with 5 varieties offered (the most varieties we have ever offered) and more than 600 trees offered free to the public (close to doubling what was given away last year!)!!! Trees offered this year include (100 seedlings each of) WHITE OAK, CHINESE CHESTNUT, PLUM and PAW-PAW (with an additional dozen or two of potted PAW-PAW trees) and (200) WHITE PINE seedlings.

Arbor Day is a nationally celebrated event whereby people and organizations are encouraged to plant trees so as to benefit the environment. Nationally, Arbor Day is celebrated the last Friday in April, thus April 25th. However, many states opt to celebrate Arbor Day on dates that coincide with more opportunistic planting times (*although determined by date and climatic region, rather than by "moon signs" which many people prefer to plant in. According to the almanac, the waning moon is the best time to plant trees and seedlings. The closest waning moon to the date that the trees will be available is April 26th and 27th*). Kentucky celebrates Arbor Day the first Friday in April, meaning that this year Arbor Day in Kentucky is April 4th.

Persons wishing to acquire trees may contact Craig Stanfield (Lions Club President) directly to place an order of trees and arrange for pickup by calling him at 606-301-3350 (Mason County number) or 606-798-2009 (Lewis County number).

The Tollesboro Lions Club participates in Arbor Day Tree Giveaways as tree planting is a project recommended by Lions Club International's "Initiative to Improve The Environment". While trees provide natural beauty to the areas in which they are planted, it is not just their inherent beauty that improves the environment. Oaks and Chestnuts produce nuts; Paw Paws and Plum produce fruit, and the White Pine provides for cover, a wind-break, shade, and their pine needles provide for wildlife forage. The nuts and fruits from these trees provide important food sources for wildlife, most of which are also suited to human consumption. Most tree varieties will grow to become large trees, generally in excess of 40 feet in height, often exceeding 100 feet, and leaves scattered throughout the height provide for shady canopies in which many birds nest and as necessary to the survival of many other plants and animals. This shade also acts to cool the earth, providing an important defense against global warming. Also, once trees mature, they sometimes become homes for different wildlife. Oaks and Chestnuts are hardwood trees producing timber which we use for a variety of purposes (fuel, building materials, furniture, manufacture of paper, etc.); Paw Paws and Plums produce edible fruits suited to human (or wildlife) consumption and can be used to make desserts, ice cream, wine, brandy, and other items; White Pines provide shade, cover, and act as a wind-break, as well as providing for wood suited to a number of uses. Trees improve and benefit the environment in many ways (*depending upon the variety, trees may be fruit and nut bearing for wildlife and human consumption; production of timber; provide homes for birds and wildlife; provide shady canopies that cool the Earth and the environment in which they are planted and a defense against global warming, etc.*), however, the most important benefit trees add to the environment is their ability to clean air, taking in carbon dioxide from the air that we exhale and converting it through the process of photosynthesis to produce oxygen which we inhale. Lastly: The trees are free (which is GREAT!), but require planting. By agreeing to pick up and plant the trees, it will require you to "get outside" and do a little exercise (digging to plant the trees), an added benefit to your health (*just don't over-do it!*). Feel free to contact Craig (606-301-3350 or 606-798-2009) to order/arrange pickup of trees, compliments of the Tollesboro Lions Club!



Above, left: Michael Carter, Forest Ranger from the Kentucky Division of Forestry drops off trees at the office of Craig Stanfield Real Estate in 2022 for the Tollesboro Lions Club to giveaway for Arbor Day. Above center: Sheri Crabtree, MSc, Horticulture Research and Extension Associate Kentucky State University presents Paw-Paw trees in 2024 for last year's Tollesboro Lions Club Tree Giveaway Event at the Harold R. Benson Research & Demonstration Farm, Frankfort, KY.





Landowners Guide to:

UNDERSTANDING THE IMPORTANCE OF WHITE OAK

Dr. Jeff Stringer and Darren Morris,
University of Kentucky Department of Forestry and Natural Resources

FOR-147

Introduction

White oak (*Quercus alba*) is considered the most important hardwood tree species in the eastern United States. Most of us, regardless of whether we focus on wildlife, timber, or recreation, agree with this. There are many reasons to hold white oak in such high regard. White oak is long-lived, easily surpassing 200 years or more with some living to 500 years. White oak is one of the most widely distributed of all the oaks growing on a wide range of soils and sites over a very large geographic area. As a result, white oaks are often important landmark trees, having historical or cultural significance. White oaks are also critically important today as a keystone species of the central hardwoods region's green infrastructure. In addition, white oak trees have tremendous potential to help address climate change by sequestering carbon in extensive root systems and through long-lived wood products. The species is seen as a majestic and stable representation of our landscape whether planted in urban areas or found in their natural habitat in rural and secluded forests. This results in many who have a personal association with white oak.

Wildlife Value

The value of white oak is not solely related to how long it lives or its widespread occurrence. White oak has special characteristics which make it ecologically and economically important. White oak provides significant food and shelter for both game and non-game wildlife species. Let's first consider the acorn. White oak acorns are one of the most palatable of all the oaks. This is due to their relatively low concentration of tannic acid that makes other acorns bitter. While we would find white oak acorns distasteful, they are a highly digestible source of food and many species of wildlife thrive on them. This is obvious from September through November, when acorns are falling from the trees. Deer, turkeys, and squirrels, to name only a few, can often be found under white oaks scratching, raking, pawing, and digging through the leaves to get to the nutritious acorns that are an important staple during the winter months. However, acorns are not the only source of food provided by white oak. The tender buds and new shoots of seedlings and saplings in the spring, are perfect for browsing by deer. Even rabbits can be found eating young bark and twigs.



Forestry and Natural Resources Extension
College of Agriculture, Food and Environment

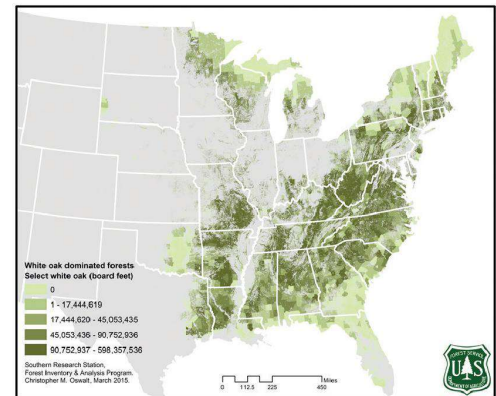


Figure 1: White oak is widely distributed across a large geographic area. Photo courtesy: USDA Forest Service

This publication is part of the White Oak Initiative's (www.whiteoakinitiative.org) **Landowners for Oaks Series** designed to provide foundational information necessary for sustainable management of white oak and upland oak forests.

The **Landowners for Oaks Series** is produced by the Cooperative Extension Service, University of Kentucky, Department of Forestry and Natural Resources (<http://ukforestry.org>) in support of the White Oak Initiative.

Authors: Dr. Jeff Stringer and Darren Morris, UK Forestry and Natural Resources. Published as University of Kentucky's Cooperative Extension publication FOR-147.

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Along with food, white oak also provides significant habitat and shelter for a host of wildlife species. Mature trees develop cavities which can be used by a wide range of wildlife including birds, squirrels, and raccoons. Many birds nest in white oak, such as the near threatened cerulean warbler that spends much of its time hopping around from branch to branch feeding on insects in the canopy of mature white oaks. The cavities and flaky bark of white oaks are also used as hiding places in the summer by a number of forest dwelling bats, some of which are federally protected. Oaks, including white oak, are also home to more species of Lepidoptera (moths and butterflies) than any other tree species, making them an important food destination for many species of wildlife. White oak provides significant food and shelter to many different species of wildlife and is critical to the overall health of the ecosystem.



Figure 2: Newly emerging white oak leaves provide browse for deer.

Commercial Value

Most oaks are important providers of forest products and white oak is no exception. White oak provides a wider range of products to the forest product industry than most other oaks. Lower quality white oak, possessing knots or other blemishes, is harvested for a number of lower valued products such as pulpwood for paper production, logs for manufacturing pallets, crossties for railroads, and the sawing of lower quality lumber.



Figure 3: These white oak logs have been laid out on the log yard to be sorted based on quality and hauled to the appropriate markets.

On the opposite end of the spectrum, high quality white oak trees, with no branches, knots or other signs of degrade are harvested for highly valued wood products. The pattern of the grain and color of white oak wood make it sought after in manufacturing veneer, the highest valued forest product. Along with veneer, these trees yield wood used in the production of highly valued lumber for furniture, cabinets, and flooring. White oak also has wood properties that make it uniquely suited for manufacturing barrels used by the wine and whiskey industries. Logs used in the manufacture of barrels are called stave logs (staves being the vertical pieces of wood in a barrel). White oak wood cells are naturally occluded with a growth called tyloses which greatly reduces leakage, a highly useful trait if you are aging whiskey, wine, or other spirits for several years. Few other species have this characteristic. Further, the charred white oak wood in a barrel, contributes all of the color and seventy percent of the flavor to bourbon whiskey. All of these characteristics result in white oak being used by a large number of wood product industries which creates steady competition for white oak timber and logs and is the reason for its place as one of the most historically sought after commercial hardwood species.

How White Oak Regenerates

Unfortunately, not everything about white oak is ideal, especially when it comes to regenerating white oak in existing forests where there are some hurdles to overcome. White oak happens to be one of the slower growing upland oaks, often slower growing than many of the tree species they compete with. Because white oaks are slow growers, they are at a disadvantage when it comes to keeping pace with competing species after a timber harvest or a storm that opens up the canopy.

In order to ensure that white oak has a good chance of becoming a part of the next forest stand, white oak seedlings need a head start. This means making sure white oak seedlings are growing in the understory prior to harvesting timber. This "advance regeneration" is a key component of upland oak forest management.

An important factor in establishing regeneration is acorn production. This brings up another characteristic that makes managing white oak difficult. It turns out that most white oaks only have good acorn producing crops every few years. These bumper crops are necessary to ensure that enough acorns are present so wildlife does not consume all of them before they have a chance to germinate and become seedlings. Further, if an acorn is to have a good chance at germinating and growing into a seedling, it is necessary for them to be in direct contact with the soil. White oak acorns germinate in the fall, sending out a small root from the acorn. If the acorn is not lying on the soil, covered with newly shed leaves, it is susceptible to drying out. Animals also can help white oak by burying acorns, further helping to protect them from drying out. Keeping the acorns out of sight, also helps

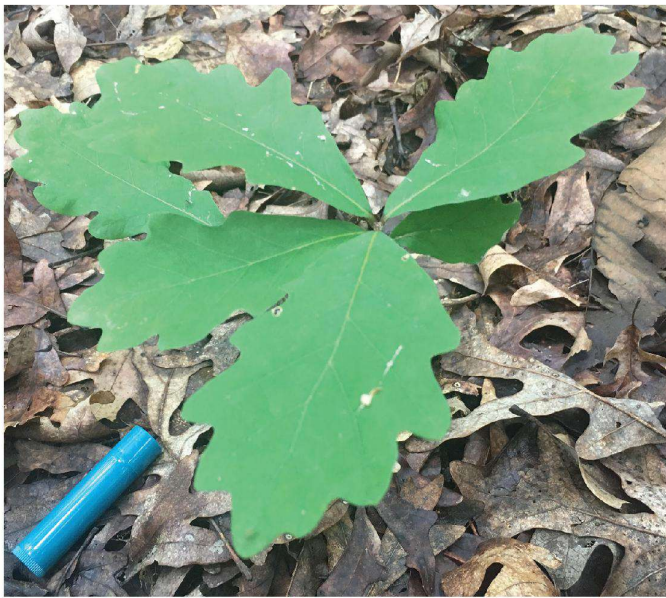


Figure 4: This white oak seedling is currently too small and will not survive to become a mature tree unless it is developed into a larger (advance regeneration) oak.

some of them avoid being eaten. The contact with the soil helps firmly establish a root that can successfully live over the winter. This is required so that when the top emerges in the spring it is provided with abundant water and nutrients. Without a vigorous root the top will soon wither and die.

To successfully regenerate white oak an abundance of seedlings and saplings, advance regeneration, must become established in the understory. This is required so when a complete or partial opening in the forest canopy occurs and increases the amount of light to the forest floor, white oak seedlings and saplings can outgrow competition, eventually maturing to become a dominate tree of the forest. It is important to note that this canopy disturbance can be a result of a timber harvest or naturally caused by wind or ice storms. Regardless, when this occurs, vigorous white oak seedlings and saplings must be present in advance, because a newly emerging one-year-old seedling does not have enough vigor to compete and will soon

be overgrown. Specific management techniques have been developed to provide the conditions described above. Some have been developed to increase the number of seedlings, some to improve the vigor of seedlings, and some to ensure that small-and medium-size oaks continue to grow well.

Important to All

White oak is clearly an important component of our forests. Not only is white oak an important timber resource, but it is also one of the most highly valued wildlife trees in the eastern United States. All of these reasons compel us to work towards sustaining this important resource. The use of oak-friendly management practices is a key element in ensuring that white oak forests continue to successfully regenerate and thrive.

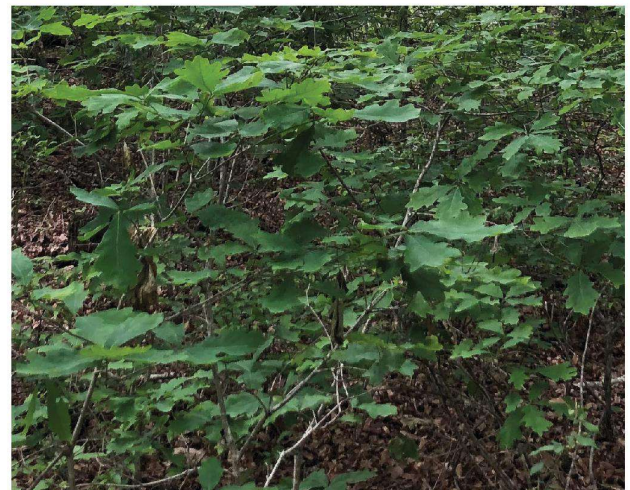


Figure 5: This oak regeneration is approximately 4 feet tall and contains vigorous white oaks capable of outgrowing competition.

The photos at the top of page one represent a few of the many benefits and uses of white oak, making it one of the most important tree species in the Eastern United States. Photos and images courtesy of the authors or the University of Kentucky Department of Forestry and Natural Resources unless otherwise noted.

For more information about white oak and white oak management, refer to other White Oak Initiative - Landowners for Oaks Series publications. Landowners Guide to: Identification and Characteristics of Upland Oaks provides information about the characteristics and identification of eight important upland oaks (including white oak) that are commonly found in upland oak forests. Landowners Guide to: Challenges Of Upland Oak Regeneration delves deeper into the complex processes necessary for successful oak regeneration. Landowners Guide to: Sustainable Oak Management Practices provides a basic overview of oak management practices that are necessary management tools for growth, development, and maturity of healthy upland oak forests.

Stringer, J., and Morris, D. 2022. Landowners Guide to: Understanding the Importance of White Oak. Cooperative Extension Service, University of Kentucky, Department of Forestry and Natural Resources, FOR-147. 3pp.

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***Quercus alba* (White Oak)**
Beech Family (Fagaceae)

Introduction:

Quercus alba, the “white oak,” is a member of the white oak group with lobed leaves. *Quercus alba*, one of the most majestic of all grand oaks, is prominent throughout the eastern deciduous forest. In spring, its unfurling leaves are rose-colored and mature into a dark green. This oak has fine fall color and its leaves persist into winter. It draws its name from its ash-colored bark.

Culture:

White oak prefers full sun and moist, well-drained, acidic soil (pH 5.5 to 6.5). It is tolerant of drought once established, but will not tolerate alkaline or poorly drained soil. Most white oaks develop chlorosis, or yellowing of leaves, when grown under high pH conditions.

White oak will decline slowly if subjected to root disturbances such as soil compaction, cutting surface roots, decreases in leaf litter, or changes in soil drainage conditions. As little as 1 inch of fill soil can kill an oak.

White oak may be bothered by bacterial leaf scorch and two-lined chestnut borer. Other potential problems for oaks in general include obscure scale, oak horn gall and gypsy moth.

Additional comments:

Although white oak has wide, outspread limbs, its strong wood prevents storm or ice damage. Its well-developed tap root makes white oak somewhat difficult to transplant and for this reason, it is not widely available in the nursery industry. White oak can produce an abundant number of acorns.

White oak is not only the namesake for this group of oaks, it is a superior landscape and natural oak species. It is not as common in the nursery trade as the red oaks, but is well worth including in cultivated landscapes where space permits.

Quercus is the Latin name for the oak tree; the specific epithet, *alba*, is Latin for white, referring to this tree’s beautiful light-colored bark. Fall color in white oak is variable, but some white oaks have a brown to red color in autumn.

White oak wood has been traditionally used to make baskets and is widely used for making barrels for aging bourbon. The former national champion white oak (pictured above) located in Wye Mills State Park in Maryland, was 96 feet tall until it died in a storm in 2003.



Botanical Characteristics:

Native habitat: Central and eastern North America; Kentucky native.

Growth habit: Characteristic huge, wide-spreading crown.

Tree size: Can attain a height of 60 to 100 feet over its potentially long life of 800 years.

Flower and fruit: Female flowers are inconspicuous; however the pendulous male catkins look like a cloud of green smoke. The 1-inch long acorn has the top 1/4 covered by a scaly cap.

Leaf: Glossy green above and pale below, the large leaves are deeply lobed and have a tapered base. Fall color ranges from brown to rich red.

Hardiness: Winter hardy to USDA zone 3.



Chinese Chestnuts

Cheryl Kaiser¹ and Matt Ernst²

Introduction

American chestnuts (*Castanea dentata*), once prominent in the eastern U.S. landscape, all but disappeared in the mid-1900s when chestnut blight eradicated nearly all of these popular trees. Blight-resistant varieties of Chinese chestnut (*Castanea mollissima*) and their hybrids are viable alternatives for commercial chestnut production.

Chestnuts are low in fat compared with other nuts and are receiving attention from the health food industry. These nuts are eaten roasted, boiled, or sautéed. Chestnuts may be incorporated into various recipes, such as stuffing, vegetable dishes, casseroles, and desserts. Dried chestnuts can be ground into flour as a substitute for wheat flour or corn meal.

Marketing

The most promising outlets for chestnuts include the domestic fresh (roasting) markets, upscale restaurants, and ethnic/specialty food groceries. Chestnuts can also be used to make gluten-free chestnut flour for sale as a specialty food. Specific fresh chestnut markets include restaurants, roadside stands, on-farm markets, farmers markets, retail groceries, and specialty food retailers. The University of Missouri Center for Agroforestry reported selling direct to consumers from on-farm stands and farmers markets, and selling direct to restaurants, as the most common marketing methods. Chestnut growers in the Eastern U.S. have also sold chestnut value-added products online.

Chestnuts are often considered a holiday food item, so growers could take advantage of this potential market by timing sales accordingly. Demand for chest-



nuts peaks from September through December, then declines dramatically. Proper post-harvest handling, including cold storage and marketing the chestnuts from refrigerated containers at retail, is essential for maintaining market quality. Because consumers are relatively unfamiliar with chestnuts, the producer will want to provide recipes and instructions for use and handling at the point of sale.

Market Outlook

Chestnuts have potential for production on marginal land in Kentucky. Local growers who can consistently supply high quality, good tasting, and weevil-free chestnuts have the advantage of freshness over imported chestnuts, which may be viewed by consumers as expensive or of lesser quality. However, many U.S. consumers are unfamiliar with chestnuts, and chestnut growers will need to be willing to educate and promote their crop to a new generation of consumers.

Michigan is the leading chestnut state with 360 bearing acres in 2017. California and Florida also have around



¹Cheryl Kaiser is a former Extension Associate with the Center for Crop Diversification.

²Matt Ernst is an independent contractor with the Center for Crop Diversification.

300 bearing acres, with larger acreages per farm than Michigan. The number of states reporting 100 or more acres of chestnut trees for nuts increased from eight in 2012 to 13 in 2017, according to the 2017 Census of Agriculture. Iowa, Missouri, Ohio and Virginia tallied substantial new plantings since 2012.

Marketing channels for U.S.-grown chestnuts have mainly focused on niche, upscale foodservice and specialty food markets. Production for local sales, such as at farm festivals, is a possible way to add value to small-scale production. The agricultural cooperative Chestnut Growers, Inc., developed as a processing and marketing outlet in Michigan, as has the Route 9 Cooperative in Ohio, where its members could access a commercial-scale chestnut peeler for processing.

Production Considerations

Planting material and cultivar selection

Chestnut trees may be established from seeds, seedlings, or grafted trees. Planting grafted trees is preferred for consistency in yield, ripening, size, and quality of the nuts produced. While seedling trees are generally more readily available and less expensive to purchase, grafted trees come into bearing sooner than seedlings. Grafted trees should have a genetically similar rootstock to avoid delayed graft incompatibility several years after planting. Grafted tree survival is more likely when the rootstock is a seedling of the scion cultivar.

There are a number of Chinese chestnut cultivars and hybrids that are well adapted to Kentucky conditions. Nut characteristics, such as size, flavor, cracking quality, and storage life can vary among varieties. It is particularly important to choose selections resistant to chestnut blight, and cultivars that produce the largest nuts such as Qing. Most markets require large chestnuts. Chinese chestnuts are self-sterile, so two or more different cultivars are required for good pollination. Refer to Nut Tree Growing in Kentucky (ID-77) for recommended varieties. Custom grafted trees may have to be ordered a year in advance.

Site selection and planting

Chestnuts can be grown on land that is considered unsuitable for other crops, such as sandy or gravelly soils. Heavy, poorly drained sites should be avoided, as chestnuts are very susceptible to *Phytophthora* root rot. Chestnuts prefer soils that are somewhat acidic

(pH 5.5 to 6.5) and will not tolerate high pH soils. While trees are cold hardy when dormant, swelling buds are susceptible to frost damage in the spring. Do not plant in frost pockets or locations with poor air drainage.

Mature chestnuts require a final 40 feet by 50 feet spacing; however, it may take 20 or more years before trees actually fill this space. Some growers interplant chestnut seedlings at a closer spacing among grafted chestnuts. As the permanent grafted trees mature and come into full production, these filler trees are removed.

Trees are trained to a modified central leader shape, with only limited pruning needed on bearing trees. Young trees require protection against sunscald injury to their smooth bark with white spiral trunk guards. Supplemental watering helps promote tree growth and to reduce stress, especially in the first year. Once established, trees are relatively drought tolerant; however, irrigation will help bearing trees to produce larger nuts and improve nut fill.

Pest management

Eliminating undesirable vegetation prior to planting is essential for tree establishment. Weeds should be controlled within 3 feet of young trees. Weed control strategies include the use of herbicides and mowing between tree rows. Chestnut blight is still present in the U.S., but using blight-resistant varieties may reduce disease incidence. Potential insect problems include aphids, Japanese beetles, potato leafhoppers and chestnut weevil. Insecticide applications will be required annually for weevil control and as needed to control Japanese beetles. The Asian chestnut gall wasp (ACGW) is also present in Kentucky. Biological control through parasitoids is showing some control. There are no insecticides cleared for ACGW, but adult wasps are easily killed with sprays applied for Japanese beetle.

Young trees are very prone to damage by animal pests, such as rabbits, mice, squirrels and deer. These pests will need to be controlled to reduce nut losses. Placing plastic guards around each tree soon after planting will help deter feeding damage from voles or rabbits when population pressure is low. Deer fencing and tree shelters should be used until trees are large.

Harvest and storage

The first harvest for seedling chestnuts can be expected in five to six years. Grafted trees will begin to bear within three to five years, with larger yields beginning six to nine years after planting. Soil moisture is important prior to harvest because half the kernel growth takes place during the last two weeks before ripening.

Chestnuts are hand-picked off the ground once they have fallen from the tree. Daily harvesting is necessary to prevent the fallen nuts from drying out and to ensure that area wildlife does not steal or damage the crop. Alternatively, where deer or squirrel losses are severe, nuts in burs may be shaken from the tree once the burs begin to split. Chestnuts harvested too early will be smaller, softer in texture and hard to remove from burrs.

Harvested nuts are separated from any debris gathered at harvest and cleaned so they are free of dirt. Promptly refrigerate (32° F or slightly above) in ventilated plastic bags. Nuts should not be allowed to dry out. Curing and storing chestnuts is a fairly involved process, and interested individuals should consult the harvesting and storage article from Michigan State University listed in the Selected Resources at the end of this document.

Labor requirements

Based on 1,000 to 2,000 pounds produced per acre, labor needs are approximately 80 hours for establishment in the first two years, 25 hours for production, 70 hours per ton for hand harvest, and 16 hours per ton for packaging and grading.

Economic Considerations

Chestnuts require three to six years for establishment before any nuts may be harvested, and 10 years before yields are significant. This delay will mean a period without any cash income, presenting a significant financial and production risk. For this reason, many chestnut growers start with the crop as a hobby or source of generating farm income from underutilized land.

Initial investments for chestnuts include land preparation, the purchase of trees, deer fence installation and the installation of an irrigation system. Other costs may include a sprayer, a nut shaker, cleaning equipment, a grader, and cold storage. Significant costs may



be incurred protecting seedlings from animal pests. Substantial losses due to graft incompatibility may also occur if grafted trees are not selected carefully.

Establishment costs will vary depending on production systems and tree costs. Total establishment costs for 1 acre of chestnuts in Kentucky would likely range from \$4,500 to \$8,000 per acre for the first five years of grafted tree production. Estimates from Michigan calculate a five-year establishment cost at \$7,797, including a \$1,187 deer fence cost. Estimates for Kentucky production (2019), based on a price of \$2.50 per pound, show establishment costs recouped after seven to nine years. Annual returns to labor, land and management of \$1,000 to \$1,450 per acre of chestnuts could be realized after year 7.

Financial returns may increase as trees mature and produce substantially greater yields of nuts per acre. Higher prices will also generate greater profitability from chestnuts. Product quality (particularly, weevil-free) and market development are essential for profitable chestnut production. Potential chestnut producers can utilize a detailed financial projection tool, developed by the University of Missouri Center for Agroforestry, to estimate long term profitability.

Selected Resources

- Nut Tree Growing in Kentucky, ID-77 (University of Kentucky, 2007) <http://www2.ca.uky.edu/agcomm/pubs/id/id77/id77.pdf>
- Chestnuts (Michigan State University Extension) <http://msue.anr.msu.edu/topic/info/chestnuts>
- Chestnut Growers, Inc. <http://www.chestnutgrowersinc.com/>

- Chestnut Decision Support Tool (University of Missouri Center for Agroforestry, 2012) <http://www.centerforagroforestry.org/profit/> (under Specialty Crops: Chestnuts)
- Chestnuts (Agricultural Marketing Resource Center, 2018) <http://www.agmrc.org/commodities-products/nuts/chestnuts/>
- Commercial Chestnut Costs of Production and Comparative Analysis with Tart Cherry Production (Michigan State University, 2013) <https://www.canr.msu.edu/chestnuts/establishing-orchards/cost-of-production>
- Chestnut: American Chestnut (Northern Nut Growers Association, Inc., 2009) <https://nutgrowing.org/research-and-resources/types-of-nut-trees/chestnut-american-chestnut/>
- Growing Chinese Chestnuts in Missouri (University of Missouri Center for Agroforestry, 2012) 6.74 MB <http://www.centerforagroforestry.org/pubs/chestnut.pdf>
- Commercial Chinese Chestnut Production in Virginia (Virginia Tech, 2017) https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/ANR/ANR-279/ANR-279.pdf
- “Harvesting and Storage” (Michigan State University) https://www.canr.msu.edu/chestnuts/harvest_storage/
- Asian Chestnut Gall Wasp (ACGW) in Kentucky (UK Entomology) <https://entomology.ca.uky.edu/entfact/asian-chestnut-gall-wasp-acgw-kentucky>
- Route 9 Cooperative <http://www.route9cooperative.com>

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Reviewed by John Strang, UK Extension Specialist, and Daniel Becker, UK Extension Associate

Photos courtesy of Pixabay.com

April 2020

For additional information, contact your local **County Extension agent**

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***Asimina triloba* (Pawpaw)**
Custard Apple Family (Annonaceae)

Introduction:

Pawpaw, found from New York to Florida and west to Texas, has a semi-tropical appearance and is known for its fruit, the largest berry (up to 5 inches long) produced by any tree native to the United States. The fruit is nutritious and has been used in cancer therapy. Its twigs and bark contain a natural insecticide.

Culture:

Pawpaw prefers fertile, moist soil that is slightly acidic, and will sometimes tolerate wet soil. It can be grown in sun or shade, exhibiting dense growth in sun and open growth in shade. Pawpaw grows quickly if mulched and watered during droughts; it is drought-sensitive when grown in sun. Seedlings should be planted in shade for the first year as they are sensitive to ultraviolet light.

Pawpaw is pest-free and hardy in zones 5 through 8. It can be trained to grow with multiple trunks and its limbs are break-resistant. Some pruning is needed to create clearance because of drooping branches. Mowing or pruning the suckers that emerge from the root system encourages sprouting, so they should be hand-pulled while still small.

Cultivars:

There are at least 45 cultivars of pawpaw selected for their fruit characteristics. The national germplasm repository for pawpaw is at Kentucky State University in Frankfort, KY. Selected cultivars include:

- **'Convis'** - Large (up to 1 pound) fruits with yellow flesh.
- **'Davis'** - An older, popular plant from Michigan introduced in 1961. The fruit are less than ½-pound with yellow flesh.
- **'Overleese'** - Heavy producing plant with clusters of 1-pound fruits. Selected in Indiana.
- **'Sunflower'** - Produces 8-ounce fruit with a butter-yellow flesh. Said to be self-fertile. Selected in Kansas.
- **'Wells'** - This cultivar has fruit with green skin and orange flesh. Fruit are a little less than a pound. Collected in Indiana.



Botanical Characteristics:

Native habitat: Northern Florida to Western New York, northern shores of Lake Ontario, Southern Michigan to Southwestern Iowa, and west to Southeastern Nebraska, and eastern parts of Kansas, Oklahoma and Texas.

Growth habit: Round, upright pyramid, with moderate density and coarse texture.

Tree size: 15 to 20 feet tall, 15 to 20 feet wide; can grow to 30 to 40 feet tall in ideal locations. Growth rate is moderate.

Flower and fruit: Flowers are nearly 2 inches across, pale green before turning brown, then maroon or purple. Pawpaw blooms in spring before leafout. Fruit is a 3- to 5-inch-long berry that is green when young then becomes dark and wrinkled when ripe in October or November. Ripe fruit has a flesh like custard and tastes a lot like bananas.

Leaf: Alternate, simple, 4 to 10 in+ches long and 4 to 6 inches wide. Light green, turning yellow in fall.

Hardiness: Winter hardy to USDA Zone 5.

***Asimina triloba* (Pawpaw)**
Custard Apple Family (Annonaceae)
Page 2

Additional information:

There has been great demand for pawpaw recently, not only because of its appealing ornamental characteristics and tasty fruit, but also because of its potential as a source of organic insecticide and for use in cancer therapy. An insecticide can be made from the tree's ground-up bark and twigs. Extract from pawpaw can overcome the ability of some cancer cells to reject chemotherapy.

On dormant stems, pointed buds are vegetative while flower buds are round and fuzzy.

Cross-pollination is needed to get good fruit set in pawpaw. Pawpaw fruit develops in clusters. Fruit with orange flesh is considered the tastiest.

The fruit attracts wildlife (especially raccoons, opossums, gray squirrels and birds). It also attracts the beautiful zebra swallowtail butterfly, giving added incentive for wildlife lovers to obtain the tree. It is an excellent source of vitamins A and C, and is high in unsaturated fats, proteins and carbohydrates. Pawpaws contain more potassium, phosphorus, magnesium and sulfur than apples, grapes or peaches.

The first reference to pawpaw came in writings of Hernando DeSoto's expedition to the Mississippi Valley in 1541. The fruit, a favorite food of American Indians, was used to feed DeSoto's conquistadors. Early North American settlers used the fruit to make jelly, and the tree's inner bark to string fish. Indians in Louisiana used the inner bark to weave a fiber cloth.

Although pawpaw is in great demand, it does have a disadvantage. Its fruit and foliage produce a great deal of litter. Planting only one tree can help alleviate the problem, as lack of cross-pollination leads to production of less fruit. Because they are broader at the tip than at the base the leaves droop, giving pawpaw a "sleepy" or tropical appearance. The genus *Asimina* includes the only temperate members of this family.

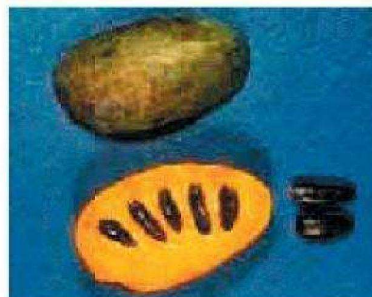
The tree, which is hard to transplant because of its wide root system, should be balled-and-burlapped and moved when it is less than 6 feet tall.



Leaf in autumn color



Flower



Ripe fruit with seeds

WILD PLUM

Prunus americana Marsh.

Plant Symbol = PRAM

Contributed by: USDA NRCS National Plant Data Center & Missouri State Office



Mike Clayton
@ Imhoff (2000)

Alternative Names

American plum, American wild plum, sandhill plum, Osage plum, river plum, sand cherry, thorn plum, wild yellow plum, red plum, August plum, goose plum, hog plum, and sloe

Uses

Ethnobotanic: Wild plum fruit was and still is extensively consumed by the Indians of the prairies, either fresh or made into a sauce (Kindscher 1987). The Pawnee, Kiowa, Comanche, Omaha, Teton Dakota, Lakota, Comanche, Crow, Assiniboin, and Kiowa ate the wild plums or chickasaw plums (*Prunus angustifolia*) fresh or dried. Plums were also pitted and dried, although the Pawnee reportedly often dried them without removing the pits (Gilmore 1977). Early explorers and travelers of the Prairie Bioregion often mentioned wild plums in their journals and diaries and also appreciated them as food (Kindscher 1987). Today wild plums are eaten fresh, canned, preserved in jams and jellies, baked, and made into fruit roll-ups.

The Omaha scraped and boiled the bark from the roots of the wild plum and applied it to abrasions

(Gilmore 1977, Kindscher 1992). They bound together the twigs of the wild plum and made them into a broom. The Cheyenne mixed the crushed

fruits of the wild plum with salt to treat mouth disease (Hart 1981). They also crushed and boiled the small rootlets and the bark of older wild plum with the roots of the scarlet thorn (*Crataegus chrysoarpa*) as a diarrhea remedy (Youngken 1925). The Mesquakies used the root bark of the wild plum to cure canker sores around the mouth (Smith 1928).

The Teton Dakota used the sprouts or young growth of the wild plum as a wand in the “waunyampi” ceremony (Gilmore 1977). This is an offering or form of prayer, consisting of a wand made from a peeled and painted wild plum sprout. The “waunyampi” ceremony is usually offered with prayers for the sick.

The various species of wild plum are astringent and sedative, and the bark is a tonic (Smythe 1901). The roots and bark contain a bitter substance as well as a substance called phloretin, which is an active agent against gram positive and negative bacteria (Lewis and Elvin-Lewis 1977).

Wildlife: Wild plums are eaten by turkey, black bear, and wolves (Thwaites 1904). Foxes, black-headed grosbeaks, and ring-tailed cats utilize wild plums (Martin et al. 1951). Plum thickets often furnish valuable protective shelter.

Conservation: Wild plums have been recommended for their drought resistance and widely planted in shelter belts in the western Great Plains (Jerry Kaiser pers. comm. 1999). They also make good wildlife habitat and are effective in erosion control because their roots hold the soil. Their thorny branches catch tumbleweeds, leaves, and other plant materials, which, when windstorms occur during times of drought, provide an effective means of slowing wind erosion of soil.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant’s current status, such as, state noxious status, and wetland indicator values.

Plant Materials <<http://plant-materials.nrcs.usda.gov/>>

Plant Fact Sheet/Guide Coordination Page <<http://plant-materials.nrcs.usda.gov/intranet/pfs.html>>

National Plant Data Center <<http://npdc.usda.gov>>

Description

General: Rose Family (Rosaceae). Wild plum (*Prunus americana*) is a shrub or small tree 3-8 m (3-24 ft) tall, and are usually forming thickets. The small branches are sometimes spiny. The leaves are alternate, egg-shaped to oval, 6-10 cm (2-4 in) long. The upper leaf surface is shiny green and the lower surface is slightly hairy; leaf margins are sharply toothed. The white roseaceous flowers are in-groups of 2-5 at the ends of branchlets. Flowers usually appear before the leaves in April and May. There are five separate, oval petals 8-12 mm (5/16-1/2 in) long. The reddish-purple plums are fleshy, oval, 2.0-2.7 cm (0.75-1.25 in) long; each fruit contains one seed. Wild plum flowers are insect pollinated.

Distribution

For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site. The range is from Massachusetts west to Manitoba and Montana, south to Utah, Colorado, and Oklahoma, east to Florida, and north to New York (Stephens 1975).

Establishment

Adaptation: Wild plum grows in prairies, woodlands, pastures, and along roadsides and riverbanks.

Wild plums can be planted from seed and they are relatively easy to transplant. Plant in well drained soil; wild plum tolerates shade. Flowering occurs in April and May and fruit ripens from August to September. The plant has fruit every year.

Propagation from Cuttings: *Prunus americana* cuttings are not easy to root. Hardwood cuttings taken in late January have been rooted. Hardwood cuttings are those made of matured, dormant hardwood after leaves have abscised and before new shoots emerge in the spring. Material should be taken from healthy, moderately vigorous stock plants grown in full sunlight. Central and basal portions (not the tip) of a shoot make the best cuttings. Cuttings vary from 10 to 76 cm (4 to 30 in). Ensure that at least two nodes are included in the cutting; the basal cut is just below a node and the top cut is 1.3 to 2.5 cm (0.5-1 in) above a node.

It is important that hardwood cuttings not dry out during handling and storage. Dip bases of hardwood cuttings with IBA at 20,000 ppm liquid formulation to promote rooting. Alternatively, treat with 2% IBA talc. This will promote rooting on both suckers and stem cuttings. Dip the cuttings into root promoting hormone, IBA at 2000 ppm, for a few seconds, then keep in the dark at temperatures of 10° (50°F). Plant

the cuttings in open ground in prepared holes with good potting soil. Firm the soil around the cuttings and water. To ensure survival of cuttings through the following winter in cold climates, the potted cuttings should be kept in heated cold frames or poly-houses to hold the temperature between 0-7°C (32-45°F). Rooted cuttings that had shoot growth in the fall, but were not given nitrogen, had the best over-winter survival in a cold frame with microfoam.

Propagation from Seed: Harvest the fruit in the summer when ripe (the fruit turns dark purple), usually in August. Remove the pulp or fruit from the seed. Seeds can be extracted by maceration and recovered by flotation. Put the seed in a 50°F cooler over the winter. For prolonged storage, seeds must be air dried and stored in sealed containers at cold temperatures. The seeds can also be planted outdoors in the fall so they are naturally "cold stratified." Natural germination occurs predominantly in the first or second year after seedfall, depending on the year.

If sowing seed in the fall, it is important to sow early enough so seeds can pre-chill before seedbeds freeze. This can be overcome by mulching the seedbeds. Seedlings reach suitable size for transplanting in one to two years. Cold stratifying up to 6 months in a moist environment can break seed dormancy. Wild plum seeds have fairly low germination. There are 6.5 seeds per gram.

Management

Wild plum grows on the edges of prairies and woodlands. Traditional resource managers burned this community regularly, thus maintaining the patchwork mosaic of prairie and woods on the landscape (Thwaites 1906). Burning provided habitat for wild plum to become established, and the nutrient enrichment increased fruit production. The branches of wild plum were often pruned or cut back to increase production.

Cultivars, Improved and Selected Materials (and area of origin)

'Blackhawk', 'Hawkeye', and 'De Soto' cultivars are descendents of the wild species (Kindscher 1987). There are many different cultivars of *Prunus* species developed for both ornamental flowers and edible fruits. Consult your local nurseries to choose the right cultivar for your specific landscape.

Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under "United States Government." The Natural Resources Conservation Service will be listed under the subheading "Department of Agriculture."

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Edited 04dec00 jsp; 29may03 ahv; 060808 jsp

For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site <<http://plants.usda.gov>> or the Plant Materials Program Web site <<http://Plant-Materials.nrcs.usda.gov>>

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EASTERN WHITE PINE

Pinus strobus L.
Plant Symbol = PIST

Contributed by: USDA NRCS New York State Office



Robert H. Mohlenbrock
USDA NRCS 1995
Northeast Wetland Flora
@ USDA NRCS PLANTS

Uses

Timber: The wood of white pine is light, durable, and easy to work. It is good lumber for toys, boxes, cabinet work, and similar items.

Christmas tree and ornamental: White pine is used occasionally in Christmas tree plantations and as ornamental planting in landscaping around homes and office buildings. It can also be sheared as a hedge.

Wildlife: It has fair wildlife value. Gray and red squirrels, deer, mice and 16 species of songbirds have been known to eat the seed.

Erosion control: White pine is frequently used for windbreaks and screens along fields new right-of-ways and around campsites.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Description

Pinus strobus L., eastern white pine, is the largest conifer of the eastern and upper Midwest forests, reaching 150 feet in height and up to 40 inches in diameter. In dense stands, trees produce tall, cylindrical stems with pyramidal shaped crowns, characterized by distinctive, plate like branching, especially noticeable as the trees become older. On young growth, the bark remains rather thin, smooth, and greenish-brown in color. On older trees the bark becomes deeply fissured and dark grayish-brown in color. Its evergreen needles are in clusters of 5, soft, flexible, 2 1/2 to 5 inches long, and bluish-green in appearance. Its cones are about 4 to 8 inches long and 1 inch thick. These remain attached for 1 to several months after ripening in the autumn of the second season.

Adaptation and Distribution

Eastern white pine grows on a variety of soils ranging from light, sandy to heavy textured soils. White pine ranges across southern Canada from Manitoba to Newfoundland, throughout the northern and eastern states from Minnesota and northern Iowa to the Atlantic coast, and southward along the Appalachian mountains to northern Georgia and Alabama.

For a current distribution map, please consult the Plant Profile page for this species on the PLANTS Website.

Establishment

Seedlings of white pine are grown in nursery beds for field planting. They may either be left in the nursery for 2 to 3 years and directly planted into the field, or they may be transplanted after the second year and left in a transplant bed for 1 or 2 years before field plantings. This will produce a seedling approximately 12 to 16 inches in height with 1/4 to 1/2 inch caliper. Field establishment of seedlings is accomplished with tree planting procedures, using machine transplanters or hand planting.

Plant Materials <<http://plant-materials.nrcs.usda.gov/>>

Plant Fact Sheet/Guide Coordination Page <<http://plant-materials.nrcs.usda.gov/intranet/pfs.html>>

National Plant Data Center <<http://npdc.usda.gov>>

Management

White pine seedlings require weed control for the first few years after outplanting. Chemical and/or mechanical control can be used, preferably starting the year before planting.

Management of white pine should focus on thwarting the white pine weevil where straight trunks and tree form is desired. Growing white pine where there will be partial shade on the developing saplings and pole-sized trees (especially on the terminal leader) seems to reduce infestation by the weevil. Thus growing white pine in mixed uneven aged stands is a good idea to avoid this pest and those described below.

Pests and Potential Problems

The white pine weevil is the tree's greatest insect pest affecting both timber quality and volume. Terminal leaders may be killed repeatedly and result in such serious stem crooks that the tree has reduced merchantable saw timber value.

The pales weevil is an insect that often attacks white pine seedlings in areas where white pine timber has been cut recently. Cone crops may be destroyed by the pine cone beetle. This insect compounds the problem of infrequent seed years and is a serious threat to white pine management.

Diseases, including white pine blister rust, red ring rot, root rot, wood decay, and certain needle fungi, cause losses in white pine stands. Such natural elements as snow, ice, and wind may also cause damage to white pine.

Cultivars, Improved, and Selected Materials (and area of origin)

There are no documented varieties for reforestation purposes. Local or regional ecotypes are typically utilized for this purpose. There are several varieties available for ornamental applications. Seeds and seedlings are available from most eastern conifer nurseries.

Prepared By & Species Coordinator:

John Dickerson (retired), USDA NRCS New York State Office, Syracuse, New York

Edited: 05Feb2002 JLK: 060809 jsp

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