Massachusetts Urban & Community Forestry Program

The Citizen Forester

MAY 2018
NO. 214

What Does it Cost to Plant a Tree?

By **Ashley McElhinney**, **Rick Harper**, and **Daniel A. Lass**

In an earlier edition of *The Citizen Forester*, we read about how researchers identified the costs associated with growing and producing trees using differing nursery systems. Researchers continued to build on these studies by developing a scientifically-based understanding of the average cost of planting trees in an urban environment. They believed that this critical information would be useful to urban foresters/tree wardens, municipal arborists, and community foresters, who routinely identify budgetary constraints as a key limiting factor in the management of urban trees.

Figure 3. A row of heeled-in swamp white oak, over-wintering (Amherst Nurseries).

Planting Process

This third study began with 24 research swamp white oak (*Quercus bicolor*) trees from the Woodman Horticultural Research Farm in Durham, NH (courtesy of Dr. Cathy Neal) (Fig. 3). An additional 24 red oak trees (*Q. rubra*) were also acquired from Amherst Nurseries in Amherst, MA. The swamp white oak trees were grown at the Research Farm using three production methods: eight field-grown balled and burlapped (B&B), eight containerized pot-in-pot (PiP) trees, and eight in-ground fabric (IGF). All red oak trees were grown at Amherst Nurseries using three methods: eight field-grown harvested B&B, eight harvested bare root (BR), and eight containerized IGF.

Up Ahead:

Cost of Planting Trees 1-4
Growing on Trees 4-7
Species Spotlight 6
Gleanings 8
News 9
On the Horizon 10

B&B trees were loaded onto landscape trailers using a tractor (Fig. 4) and secured by three individuals (UMass researchers and a nursery employee). PiP and IGF trees were loaded and secured onto the trailer by three individuals. BR trees were loaded and secured by hand in like manner, requiring only two individuals (Fig. 5). The roots of all BR trees were moistened and loosely covered with burlap to help protect against desiccation (Fig. 6).

Figure 4: Loading B&B trees onto landscape trailers using a tractor.

Once the loading was completed, three employees unloaded the B&B trees at the planting location, with the assistance of a utility vehicle (Fig. 7). PiP and IGF trees required two employees: an operator to drive and an employee to walk beside the trailer, unloading each tree at its planting location. BR trees were kept on the trailer under the protection of a tarp and were then carried to their respective planting holes. To minimize the number of external factors affecting planting costs in this study, the same crew, using the same equipment, planted all of the trees in Amherst in three workdays (May 14 – May 16, 2014). All trees were planted by two employees using the same approach, except in the preparation of the root ball, which differed in accordance with the trees' respective production system.

Figure 5: BR trees were loaded by hand, requiring only one individual to lift and another to secure the trees on the trailer.

When the proper planting depth was determined, the sides of the planting hole were scarified to facilitate root penetration, and dead or damaged branches on the tree were removed. Then, the root ball was prepared in accordance with the respective production method. For B&B trees, the wire cage and burlap were removed from the root ball; PiP trees had their container removed from the root ball, and roots were pruned with hand pruners and a saw; IGF trees' fabric bag was removed from the root ball; and, BR trees were root pruned to

(Continued on page 2)

What Does it Cost to Plant a Tree?

(Continued from page 1)

remove dead or damaged roots, if needed.

Each root ball was then placed into its prepared hole, back-filled, watered, and finished with a two-to-three-inch layer of bark mulch applied in the vicinity of the lower trunk.

Figure 6. BR trees awaiting

Planting Time

Planting times and costs varied by tree production system. Planting time is a key factor in determining the costs of planting a tree, as it determines both labor and equipment requirements. Data for the two species of oak were pooled, and statistical tests were conducted to determine if differences in the average planting times across species and production system were significant or purely random. Results showed that planting times varied according to the size of the tree and the production system, but differences between the two tree species were not significant. With these differences across types of trees and differences in tree weights and root ball sizes, variation in the time required to plant the trees was also observed.

The greatest average planting time per tree was for the B&B trees at 902 seconds or just over 15 minutes per tree (Fig. 1). On average, the BR trees were planted in less than half that time at 429 seconds (approx. 7 minutes, 8 seconds). IGF trees averaged 517 seconds per tree (approx. 8 mins, 36 secs), and PiP trees required an average of 675 seconds per tree (11 mins, 15 secs) to plant. The average planting time for the B&B trees was significantly greater than all other tree types – a difference that could not have occurred by chance. The average planting time for BR trees was significantly lower than all other trees, and the average planting time for PiP trees was significantly greater than the mean time for IGF trees. The data provided a confidence level of 95% for these tests of average planting time differences. Figure 1 shows these differences in average planting times by the vertical lines marking the centers of each distribution.

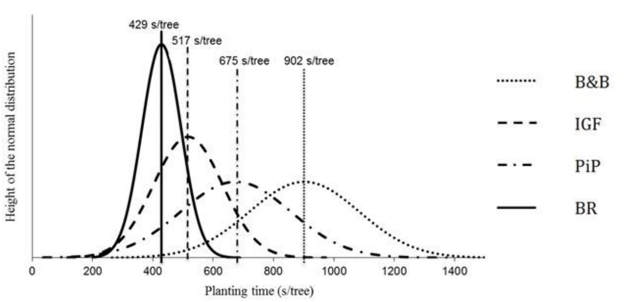


Fig. 1. Comparison of average planting times and planting time distributions for oak trees from B&B, IGF, PiP and BR production systems. Taller distributions indicate less variation in planting times per tree for that production system.

Planting time variances were also compared for the B&B, PiP, IGF, and BR trees. B&B trees had planting time variances that were significantly greater than IGF and BR trees. Variances for B&B and PiP trees were not statistically different; both standard deviations were virtually equivalent at 182 seconds, or three minutes, two seconds. Although the variance for PiP was much greater than that of the IGF trees, the difference was not significant. Similarly, the variance for IGF trees was greater than the variance for BR trees, but not significantly greater. While these statistical results seem odd, they reflect the effects of having smaller samples of PiP and BR trees (only eight trees for each).

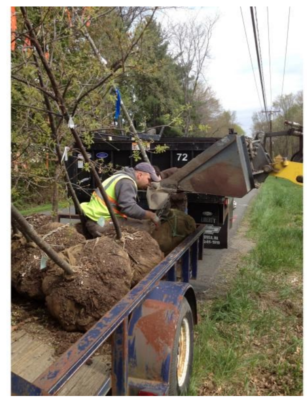


Figure 7. Three employees unloaded the B&B trees, requiring a utility vehicle to lift and move the trees.

These differences are reflected in the planting time distributions in Fig. 1 for the four types of trees. The distributions for the B&B and PiP trees had the same variances and are identically shaped. The location along the horizontal axis of the center of the distribution for PiP trees shows they were planted much faster, on average. The distribution for the IGF trees is much more compact (taller and skinnier) than the B&B and PiP trees, illustrating less variance and a shorter mean planting time per tree. Finally, the distribution for BR trees features the shortest mean planting time and the least amount of variance.

The estimated planting time distributions in Fig. 1 illustrate how much variation there was around the average planting time for each tree production system. Using these distributions, probabilities can be calculated that help form expectations about time requirements for various planting projects. For example, a manager with a crew of two employees and 20 oak trees to plant might ask: “What are the chances these trees can be planted in a four-hour block of time?” To complete the task, they’ll

(Continued on page 3)

What Does it Cost to Plant a Tree?

Table 1. Summary of planting costs for red oak and white oak trees from balled and burlap (B&B), pot-in-pot container (PiP), in-ground fabric container (IGF), and bare root (BR) production systems.

Activity	B&B	PiP	IGF	BR
	Costs per tree			
Preparation - dig holes				
Mean time (s/tree)	63	63	63	63
Preparation costs ($/tree)	$ 1.06	$ 1.06	$ 1.06	$ 1.06
Unloading at site - move trees to holes				
Mean time (s/tree) [z]	142	40	40	15
Unloading costs ($/tree)	3.43	0.58	0.58	0.22
Planting - position tree, root prune, and backfill				
Mean time (s/tree)	902	675	517	429
Planting costs ($/tree)	$ 6.51	$ 4.88	$ 3.73	$ 3.10
Total preparation, unloading and planting costs ($/tree)	$ 11.01	$ 6.52	$ 5.38	$ 4.38

[z] Machinery and equipment costs are based on daily rental: skid-steer loader with auger - $35/hour; pick-up truck with trailer hitch - $10/hour; and 6 x 12 ft. trailer - $3/hour.
[y] Wages for the machinery operator and laborers were $26/hour and $13/hour, respectively.
[x] Hole positions were along a suburban road and trees were not placed randomly. PiP, IGF and BR trees carried by hand to holes, B&B trees placed at most easily reached holes using the skid-steer with auger.
[w] Equipment costs include the allocated costs of a skid-steer auger, pickup truck and trailer for the time required to move the tree to the prepared hole.
[v] The operator is assumed to drive the truck and trailer and skid-steer auger.
[u] The laborer is assumed to assist with unloading, positioning trees and back-filling holes.

need to plant five trees per hour or one every 12 minutes. The probability they can plant 20 B&B oak trees in that amount of time, assuming they are all the same size and weight, is 0.16 – they have a 16% chance of completing the task. If they had PiP trees to plant, the probability improves to a 60% chance of completing the job within four hours. If the oak trees were grown at the nursery using an IGF container system, the probability increases to 96%, and they could be virtually certain (100% chance) they would be about to plant 20 BR trees. These probabilities are useful in forming expectations about planting time requirements for the different types of trees considered in this study.

Planting Costs

To compute planting costs, all holes were assumed to be in a line along the road with equivalent minimal travel time between holes. The time to dig the holes varied, depending on the soil and amount of sod. To focus on how costs differ across types of trees, all trees were assigned the same mean costs for digging holes. On average, the cost of digging a planting hole with the 36-inch-wide auger was $1.06 and included 63 seconds of equipment and operator time. Because planting sites for towns may be widespread, travel time was not considered in this study, nor was the purchase price of the trees relative to the differing production systems.

Planting costs per tree were estimated using the data collected for time unloading, digging holes, and planting. This included the labor and equipment required to dig holes, to place the tree at the site, and to complete the planting process. The costs to dig all holes included the rental costs for a $35/hour machine with an auger attachment and a $26/hour equipment operator. These rental and labor costs reflect rates and wages around Amherst, Massachusetts.

The costs of unloading and placing each tree at the planting site included the costs of a pickup truck at $10/hour, trailer at $3/hour, and operator labor ($26/hour), and an employee at a wage of $13/hour.

The costs of unloading the trees and moving them to the holes differed by tree production type. The costs of the pickup truck and trailer were included for all trees. The B&B trees also required a machine to move them to the holes. The costs for all trees included operator labor and an additional employee to help move the trees – a machine was not needed to carry the trees to the holes. The unloading cost per tree for B&B trees was $3.43, the cost of the IGF and PiP trees was $0.58/tree, and the BR trees cost $0.22/tree.

The final component of costs was planting the trees. The planting times for B&B trees were greater than the times for all other types of trees because of the time required to remove the basket and burlap and to position the relatively heavy tree in the hole. That time is reflected in the average planting cost per tree of $6.51. The average planting cost for PiP trees was $1.64 lower at $4.88 per tree. PiP trees were found to require more time for root

(Continued on page 4)

What Does it Cost to Plant a Tree?

(Continued from page 3)

pruning. IGF trees cost $3.73 per tree on average to plant, and the BR trees cost the least, at $3.10 per tree, on average.

Total average total costs per tree (Table 1) included the cost of digging the holes ($1.06 per tree for all trees), the costs of unloading, and the planting costs. These costs do not include the price paid per tree or the transportation costs to the site; the focus of this study was on differences in planting the trees once they were at the site. Combining these three costs gives an average total cost per B&B tree of $11.01. The PiP trees were the next most expensive at $6.52 per tree, on average. The average total cost of IGF trees was $5.38 per tree, and the BR trees had the lowest total costs at $4.38 per tree, on average. Results of the study indicate substantial differences in costs per tree. B&B trees costs more than IGF trees by $5.50 per tree and more than PiP trees by $4.50 per tree. There was a $6.63 difference in total costs of planting B&B versus BR trees.

Total planting costs per tree varied due to the variation in planting times. The relative amounts of variation in total costs are shown in Fig. 2. The average costs are shown by the vertical lines and variation in costs by the spread of each distribution. As with the planting time distributions, B&B and PiP have distributions with virtually the same variation but different average costs. IGF trees have lower average costs and less variation, that B&B and PiP trees. BR trees had the lowest average costs and the least amount of variation.

Given the cost distributions that were estimated in this study, we ask, for example, "What is the chance (probability) that trees can be planted for less than, say, $6.00 per tree?" A two-person crew would be virtually assured of planting BR trees at a cost per tree of less than $6.00. The same crew would have a 75% chance of planting IGF trees at less than $6.00 per tree. For PiP trees, the probability falls to just over 35%, and there is virtually no chance of planting B&B trees for less than $6.00 per tree. The probability of planting a B&B tree exceeds zero at $7.00/tree and above, and reaches a probability of 0.763 at $12.00/tree. At costs per tree of $9.00 or less, virtually all BR, IGF, and PiP trees can be successfully planted; 7.2% of the B&B trees could be planted for less than $9.00.

Summary

There are substantial differences in the costs of planting

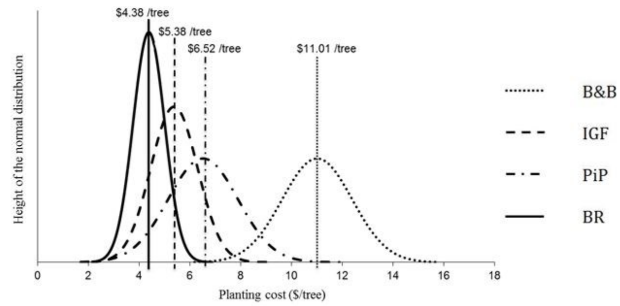


Fig. 2. Comparison of total planting cost distributions for oak trees from balled and burlap (B&B), in-ground fabric container (IGF), pot-in-pot container (PiP), and bare root (BR) production systems. Taller distributions indicate less variation in cost per tree for that production system.

trees, and, in this third study, it was shown that these costs can differ significantly due to nursery production methods. Mean or average comparison showed that when hole preparation was complete and all trees were placed next to the holes, the mean planting time for B&B trees was significantly longer than mean times for PiP, IGF, and BR trees, and the mean BR planting time was significantly shorter than all other treatments. The mean cost per tree for B&B trees was also estimated to be the most expensive, followed by PiP and IGF, with BR being the least expensive.

Although it has been the long-reigning method of nursery production, the B&B method may not necessarily be considered the most cost-effective or most efficient approach. Although the precedent research of nursery production methods suggested that field grown trees' harvests using the B&B method produces the highest quality tree, and that the IGF method featured the lowest overall cost and risk, it is important to also consider that the BR method was not included in either of these first two studies; findings of this study suggest that BR trees are the fastest and most cost-effective trees to select for planting. Further research that would include the relative survival rates and long-term maintenance costs (e.g., watering, mulching, pruning, weed management, etc.) would be worthy of consideration. To view research specimen trees and compare root systems from the different nursery production methods, visit www.urbanforestrytoday.org and click "Publications."

The authors wish to thank Benjamin Green, Alan Snow (Dept. of Public Works, Town of Amherst), John Kinchla (Amherst Nurseries), Cathy Neal, Ph.D., (University of New Hampshire).

Ashley M. McElhinney is an urban forestry graduate student; **Rick Harper** is Extension Assistant Professor of Urban & Community Forestry; **Daniel A. Lass**, Ph.D., is Chair of the Department of Resource Eco nomics. All are at UMass-Amherst.

A version of this 2-part article series appeared in the December 2017 issue of Arborist News.

Growing on Trees

Urban Forestry Today Webcast

All Those Urban Trees We Plant...How Are They Doing?
May 3, 2018 | 12:00 - 1:00 p.m. (Eastern)
Lara Roman, PhD, USDA Forest Service

Attend live and receive free ISA/MCA CEUs by visiting **www.joinwebinar.com** and entering the code**:** 442-333-731

The Urban Forestry Today Webcast Series is sponsored by the University of Massachusetts Department of Environmental Conservation, in cooperation with the USDA Forest Service, Massachusetts Department of Conservation and Recreation, University of Massachusetts Extension, and Massachusetts Tree Wardens' & Foresters' Association.

Urban Forest Connections

The USDA Forest Service's Urban Forest Connections webinar series brings experts together to discuss the latest science, practice, and policy on urban forestry and the environment. These webinars are open to all. Past webinar presentations and recordings are available here.
Emerald Ash Borer Cooperative Management: Ideal and in-practice
May 9, 2018 | 1:00 - 2:15 p.m. (Eastern)

Future webinars:
June 13, 2018 | 1:00pm-2:15pm ET
July 11, 2018 | 1:00pm-2:15pm ET
August 8, 2018 | 1:00pm-2:15pm ET

To access the webinar, go to https://www.fs.fed.us/research/urban-webinars/.

New England Botanical Club Lecture

Patterns and Changes in the Flora of Franklin County, Massachusetts
May 4, 2018, 6:45 p.m.
Dr. Robert Bertin
Garden in the Woods, Framingham, MA
http://www.rhodora.org/meetings/upcomingmeetings.html

UMass-Amherst is Hiring!

Lecturer in Arboriculture & Urban Forestry - University of Massachusetts-Amherst
The Department of Environmental Conservation invites applications for a full-time (9-month academic-year) non-tenure-track appointment. Application review will begin accepted through May 11, 2018.

For more position details, click here.

ISA Tree Risk Assessment Qualification Course

July 30-August 1, 2018 | Northampton
The ISA Tree Risk Assessment Qualification (TRAQ) program provides an opportunity for professionals in the arboriculture industry to expand their knowledge through education and training in the fundamentals of tree risk assessment. This qualification promotes the safety of people and property by providing a standardized and systematic process for assessing tree risk. The results of a tree risk assessment can provide tree owners and risk managers with the information to make informed decisions to enhance tree benefits, health, and longevity. Find out more about the class: www.newenglandisa.org.

Advanced Tree Risk Assessment - Level 3 Course

August 2-3, 2018 | Northampton
Find out more: www.newenglandisa.org.

Nature Groupie

Nature Groupie empowers generations of outdoor enthusiasts to volunteer for nature in New England. What Nature Groupie does **for volunteers**: Nature Groupie makes it easy to volunteer for nature through Nature Groupie Events. Over 200 organizations in New England post their outdoor volunteer opportunities on our calendar!
For partners: Nature Groupie can help with volunteer recruitment, training materials, tools, citizen science resources, and technical assistance.

Looking for volunteers for a tree planting or other activity in the urban forest? Looking for an opportunity to volunteer? Check out the event calendar!

Nature Groupie started as a collaborative project between the University of New Hampshire Cooperative Extension and The Stewardship Network (TSN) in the Great Lakes. Launched as "The Stewardship Network: New England" in 2013, we successfully partnered with TSN to adapt their model of collaborative stewardship, volunteer networking, and enhanced technology to the unique needs of New England partners and volunteers. Find out more at naturegroupie.org.

Species Spotlight—*Cotinus obovatus,* American smoketree

By **Mollie Freilicher**

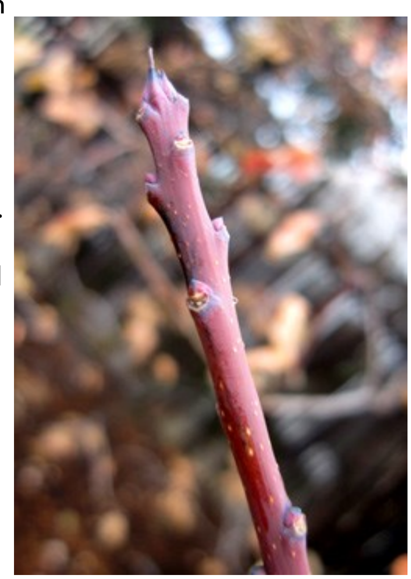
American smoketree is a small tree or large shrub, native to a few scattered locations in the southeastern United States, including parts of Texas, Oklahoma, Kansas, Missouri, Alabama, Kentucky, and Tennessee. In the wild, it can be found on dry alkaline sites and limestone soils of rocky slopes and outcrops, up to about 3,200 feet. (More commonly found in the landscape is the non-native smokebush, *Cotinus coggyria*, which has more of a shrub form.) The common name, smoketree, comes from hairs that grow on the flower stalks that give the appearance of smoke—not the flowers themselves. In the landscape, American smoketree reaches heights of 30 to 40 feet, with an open crown and a nearly equal spread. It is hardy in USDA zones four to eight.

Leaves of American smoketree are two-to-five inches long, alternate, simple, entire, and obovate. When they emerge from the buds, the leaves are burgundy, but they transition to a bluish green. Fall color of American smoketree is spectacular, with showy yellows, reds, purples, oranges, and russets. Michael Dirr writes that "it may be the best of all American shrub/trees for intensity of color."

The bark of American smoketree is gray-brown and becomes flaky with age. Twigs are reddish-green and become gray or gray-brown with age, with the base of the flakes pulling away from the trunk, creating a fish scale effect.

American smoketree is dioecious, with male and female flowers on separate plants. Flowers bloom in early spring and are inconspicuous, yellow-green in color, occurring in panicles, six-to-ten inches long. The fruits are also inconspicuous, small, 1/8-inch long, and shaped like kidney beans. The hairs on the pedicels and peduncles of the inflorescences are what provide the "smoke." The color of the hairs may vary from brown to pale purple. The literature says that male plants are showier than female plants. Either way, American smoketree puts on a show!

American smoketree could be used as a specimen or as part of a border or mass planting. It is deer-resistant and can tolerate poor soil conditions and drought and is generally not bothered by pests. For best results, plant American smoketree in full sun.



During the Civil War, an extract from the wood of American smoketree provided a source of yellow to orange dye, and the tree was nearly utilized out of existence. The wood is also strong and in the past was used for handles and fence posts.

References

Dirr. M.A. 1998. *Manual of Woody Landscape Plants*. 5th Edition. Champaign, IL: Stipes.

Gilman, Edward F. and Dennis G. Watson. 1994. *Cotinus obovatus*. American Smoketree. 1994. Factsheet ST-208.

Koller, Gary L., and Don O. Shadow. 1984. "In Praise of the American Smoke Tree." *Arnoldia.* 44:2.

Tripp, Kim E. 1994. "Considering *Cotinus*." *Arnoldia.* 54:2.

Photos (Clockwise from top-left): Form, Leaf, twig, flowers, bark, fruit, Virginia Tech.)

Growing on Trees

Urban Wood: Are We Making the Most of What's Hidden in Plain Sight?

By **The Massachusetts Statewide Wood Energy Team**

Massachusetts is lucky to have so many trees – lots of kinds and lots of them – in forests, parks, patches of woodland, along highways and streets, and in yards. One consequence of living in such close proximity to so many trees is that many thousands of tons of wood fiber need to be moved or removed every year due to storm damage, utility operations, street tree and park maintenance, and hazard reduction. Cities, towns, and contractors often pay for this material to be trucked some distance away, where it might be used or simply dumped to rot. While everybody is familiar with firewood, many people are probably less aware of the homegrown opportunity to turn a "waste disposal" problem into an asset – available in just about every city and town in the Commonwealth.

Thanks to a revolution in wood-burning technology and a new Massachusetts renewable energy incentives program, there might be a way to use some of this wood fiber locally, adding value to it and turning a liability into an asset. The recently-adopted Department of Energy Resources (DOER) Alternative Portfolio Standard regulations and guidelines provide Alternative Energy Credits (AECs) to qualifying owners and appliances. AECs work like Renewable Energy Credits (RECs) that have been around for a while in the electricity market, but fill a corresponding need for alternative heating and cooling technologies. These AECs can increase the affordability of heating a home, business, or municipal building with eligible wood fuel. The amount of the credit ranges from about $40 to $80 per ton, depending on the technology and fuel characteristics.

The scarcity of markets for "low-grade" wood and issues of forest management have gotten most of the attention, as this incentive program has been under development; far less attention has been paid to wood that ends up on the ground in other ways. History is full of examples of "waste material" becoming valuable. If you are paying to dispose of wood residue, heating locally with that wood is an alternative worth investigating!

At $2.50/ gallon of #2 fuel oil, a ton of green wood chips will produce the same amount of heat as $150 worth of oil. Seventy-one cents of every oil dollar leaves the local economy. If "available wood" can be burned locally, efficiently, and cleanly, far more of that dollar stays local and recirculates. Development of a local wood fuel supply chain can save money for cities and towns, strengthen the local economy, and create jobs.

In addition to AECs, DOER and the Massachusetts Clean Energy Center (CEC) offer a variety of incentive and rebate programs for qualifying systems. "Alternative generation units," or modern wood-heating systems, must be automatically fed boilers or furnaces and use an eligible wood fuel (chips or pellets). These systems need to meet efficiency, performance, and emissions criteria to qualify for AECs.

Realizing the potential for local use of renewable fuels depends not only on incentives and good technology, but also on supply infrastructure (storage yard, chipping, drying), local champions (municipal officials, businesses, town committees), and building public awareness. DOER is currently seeking proposals for projects that will build "renewable thermal infrastructure supply" – to address the chicken-and-egg problem of fuel supply security that could hinder the adoption of new technology.

Interested in pursuing this in your city or town? You can learn more at:

Department of Energy Resources (DOER)
https://www.mass.gov/service-details/alternative-portfolio-standard-rulemaking

Massachusetts Clean Energy Center (CEC)
http://www.masscec.com/modern-wood-heating-1

Massachusetts Forest Alliance
http://www.massforestalliance.net/modern-wood-heat/

Gleanings

Avoid Spreading Oak Wilt during High-Risk Period

St. Paul, MN–The onset of the "high risk period" for overland transmission of oak wilt (*Ceratocystis fagacearum*) disease will arrive soon. Oak wilt is a fungal disease that can kill most species of oak, though oak trees in the red/black oak group are most susceptible. ***Oak wilt is not yet known to occur in Massachusetts; it is present in in the Albany area.***

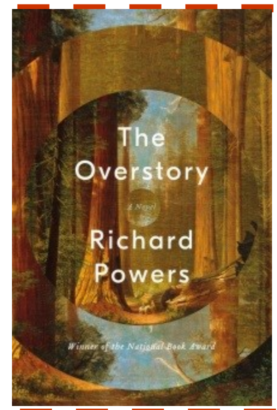
Red oaks are very susceptible to oak wilt. New infections occur in spring, and symptoms develop in summer. (Photo: Joseph O'Brien, retired U.S. Forest Service)

Oak trees are at high risk when oak wilt fungal mats are present on trees killed the previous year by the disease, and when nitidulids (sap-feeding beetles) are active. Nitidulids carry spores of the fungus. The beetles can be attracted to fresh pruning cuts or wounds on oaks and transfer the spores, initiating infection. To avoid infection, all wounds to oak in spring should be treated immediately with wound dressing or paint.

The onset of the high-risk period occurs earlier as you go farther south and varies with weather conditions. The New York Department of Environmental Conservation recommends avoiding pruning or wounding oak trees during the spring and summer. New symptoms of oak wilt disease usually are apparent in July and August.

More information can be found in the publication How to Identify, Prevent, and Control Oak Wilt on the Northeastern Area Web site. (Adapted from the USDA Forest Service.)

The Most Exciting Novel about Trees You'll Ever Read



By Ron Charles
April 3, 2018—[…] This ambitious novel soars up through the canopy of American literature and remakes the landscape of environmental fiction. Long celebrated for his compelling, cerebral books, Powers demonstrates a remarkable ability to tell dramatic, emotionally involving stories while delving into subjects many readers would otherwise find arcane. He's written about genetics, pharmaceuticals, artificial intelligence, music and photography. In 2006, his novel about neurology, "The Echo Maker," won a National Book Award. And now he's turned his attention, more fully than ever before, to our imperiled biome and particularly to the world's oldest, grandest life forms: trees. Read the full review at the Washington Post.

Good News about Winter Moth and Gypsy Moth

Winter moth populations are at a record low in Massachusetts, and Rhode Island reports far fewer egg masses at monitored sites. Also, the wet spring of 2017 resulted in a reduction of the gypsy moth population by *Entomophaga maimaiga* fungus. Check out the Landscape Message for more.

Landscape Message

Produced by UMass Extension, Landscape, Nursery, & Urban Forestry Program, the Landscape Message is an educational newsletter and update intended to inform and guide horticultural professionals in the management of our collective landscape. Sign up today!

Does Spending Time Outdoors Reduce Stress? A Review of Real-Time Stress Response to Outdoor Environments

A USDA Forest Service review explores the influence on human stress of outdoor activities such as nature viewing, outdoor walks, outdoor exercise, and gardening. The report provides convincing evidence that spending time outside--especially in places with green space--improves both heart rate and blood pressure, helping to reduce stress and boost overall health. (From the U.S. Forest Service R&D Newsletter)

News

Baker-Polito Administration Celebrates Arbor Day by Awarding 2018 Urban and Community Forestry Challenge Grants

April 27, 2018—Boston –The Baker-Polito Administration today awarded $90,827 in 2018 Urban and Community Forestry Challenge Grants to eight municipalities in celebration of Arbor Day. The grants will assist the Cities of Framingham, Newburyport, and Somerville, and the Towns of Harvard, Longmeadow, Milford, Montague, and Sandwich, as local officials seek to maximize the social, economic, and environmental benefits of increased tree canopies within their communities.

Applicant: City of Framingham, Community & Economic Development Division
Brief Description: South Framingham Urban Forest Inventory & Management Plan
Amount Awarded: $16,000 (USDA Forest Service)

Applicant: Town of Harvard
Brief Description: Tree Planting within the town
Amount Awarded: $5,000 (funded by the Mass ReLeaf Trust Fund through a donation from National Grid)

Applicant: Town of Longmeadow
Brief Description: Longmeadow Urban Forest Enhancement
Amount Awarded: $10,950 (USDA Forest Service)

Applicant: Town of Milford
Brief Description: Tree planting
Amount Awarded: $3,000 (funded by the Mass ReLeaf Trust Fund)

Applicant: Montague Tree Advisory Committee
Brief Description: Strategic Tree Planting in Millers Falls
Amount Awarded: $6,777 (USDA Forest Service)

Applicant: Newburyport Tree Commission
Brief Description: Newburyport Tree Inventory Project
Amount Awarded: $13,000 (USDA Forest Service)

Applicant: Town of Sandwich
Brief Description: Glass Town District Tree Inventory and Management Plan
Amount Awarded: $16,100 (USDA Forest Service)

Ap1plicant: City of Somerville
Brief Description: New Urban Forestry Management Plan
Amount Awarded: $20,000 (USDA Forest Service)

Currently, the Department of Conservation and Recreation is accepting project grant proposals for calendar year 2019. Please visit the agency's Urban and Community Forestry Challenge Grants webpage for additional details. Read the full press release here.

Lessons Learned from the Emerald Ash Borer Western Conference

By **Tawny Simisky**

The Massachusetts Department of Agricultural Resources (MDAR) and the MA Department of Conservation and Recreation (DCR) co-hosted a daylong conference in Pittsfield, MA on 4/24/2018. What was the featured insect? Why, the emerald ash borer (Agrilus planipennis), of course! The emerald ash borer, or EAB for short, is a non-native insect (from Asia) that was first detected in the United States in Michigan in 2002. The day-long conference on Tuesday was a combination of class-room style education and in-the-field demonstrations. Read the full piece on the conference in the Landscape Message.

News Headlines in Brief

Fall River's Tree Lady Will Live on After Death

A Plan for New York City's Forests. Yes, Forests.

Climate Change Gives Invasive Trees An Even Greater Advantage

Predicting Which Trees are at Greatest Risk of Beetle Invasion

Lack of Water Is Key Stressor for Urban Trees

Want to Build a New Home in St. John's (Newfoundland)? You'll Have to Plant a Tree

On the Horizon

May 2 TREE Fund Webinar, 2:00 p.m. (Eastern), www.treefund.org

May 3 Urban Forestry Today Webcast, 12:00 p.m. (Eastern), www.joinwebinar.com, code: 442-333-731.

May 5 National Wildfire Community Preparedness Day, https://www.nfpa.org/Public-Education/Campaigns/National-Wildfire-Community-Preparedness-Day

May 16 Landscape Pests and Problems Walkabout-Diseases and Weeds, UMass Extension, Westfield, www.umassgreeninfo.org

May 30 Tree City, Tree Line, and Tree Campus USA Recognition event, Northampton

Jun 2 ISA Certification Exam, (Registration deadline: May 16), Dighton, www.newenglandisa.org

Jun 6 Landscape Pests and Problems Walkabout: Insects and Cultural Problems, Sandwich, www.umassgreeninfo.org

Jun 9 New England Tree Climbing Championship, New London, CT, www.newenglandisa.org

Jul 12 Plant Health Care Workshop**,** Tree Care Industry Association, Elm Bank, Wellesley

Jul 18 Tree Load in Risk Assessment, Arnold Arboretum, http://my.arboretum.harvard.edu/

Jul 19 Tree Health Assessment, Arnold Arboretum, http://my.arboretum.harvard.edu/

Jul 30-Aug 2 ISA Tree Risk Assessment Qualification, New England ISA, Northampton, www.newenglandisa.org

Aug 2-3 Advanced Tree Risk Assessment - Level 3, Northampton, www.newenglandisa.org

***The Citizen Forester* is made possible through a grant from the USDA Forest Service Urban and Community Forestry Program and the Massachusetts Department of Conservation and Recreation, Bureau of Forestry.**

Bureau of Forestry
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114

Julie Coop, Urban and Community Forester
julie.coop@state.ma.us, 617-626-1468

Mollie Freilicher, Community Action Forester
mollie.freilicher@state.ma.us, (413) 577-2966

www.mass.gov/dcr/urban-and-community-forestry

If you have a topic you'd like to see covered or want to submit an item to *The Citizen Forester* (article, photo, event listing, etc.), contact Mollie Freilicher or click here.

Subscribe? Unsubscribe? You are receiving this because you have requested to receive *The Citizen Forester*. If this is an error or you do not wish to receive this newsletter, please email mollie.freilicher@state.ma.us. To sign up, click here.

dcr
Massachusetts