GREEN HORIZONS

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# Woodland Economics: A Tale of Two Trees

**Hank Stelzer, MU Forestry Extension**

When a forest is harvested using either the individual tree or group selection method, trees to be cut or retained are commonly selected by a number of factors: species, quality, diameter, distance from other trees, health and vigor, risk of loss before the next harvest, and maturity. Maturity may refer to either biological or financial maturity, depending upon your objectives.

### Biological Maturity

Biological maturity refers to the age when a tree begins to decline in vigor and health, and becomes increasingly susceptible to insects and diseases that will ultimately result in death. This age of biological maturity is usually referred to as the tree's natural life expectancy and it can vary dramatically among species and with site quality. It also is important to note overcrowded trees may express symptoms similar to biological maturity. Foresters refer to the process where a developing forest thins itself as "stem-exclusion." If you desire large, stately trees or wish to have your woodland resemble an old-growth forest, then you want your trees to grow as large and live as long as possible. You will probably only cut "mature" trees that constitute a safety hazard.

### Financial Maturity

In contrast, if you wish to maximize the financial return you receive from your woodland then you should be more concerned with financial maturity. Usually a tree is considered financially mature when its rate of value increase falls below a desired level.

The rate of value increase of a tree can be determined by comparing its future dollar value with its present dollar value. Think of the tree's present value as the principal in a bank account and the increased value as the interest earned on that principal. This value increase can be expressed as an annual compound interest and compared with alternative investments or a desired rate of return.

If the tree's expected rate of value increase exceeds the desired rate, the tree is not financially mature and should be allowed to grow for the specified period of time. If the tree's expected rate of value increase is less than the desired rate, the tree is financially mature and, based on that criterion, should be cut. **(cont. pg. 10)**

# Preserving the Family Forest: Who Owns Your Timberland?

**David Watson, Certified Financial Planner**

As you browse through the pages of your local plat book, you will surely notice a variety of ownership types – individuals, joint ownership, corporations, partnerships, limited liability companies, even trusts. Why is this? What are the pros and cons of each? Who owns your land? Who should own your land?... Let's take a closer look at some of the basic ownership forms and how they differ.

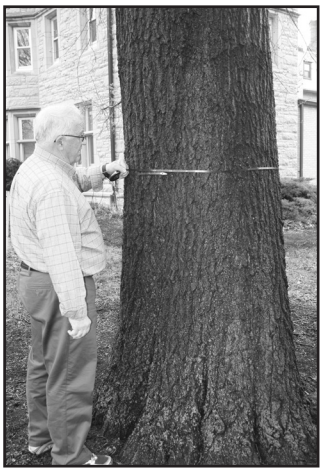
Most of the family timberland in Missouri is owned either individually or in joint names (typically between spouses). The reason for this is simplicity – **(cont. pg. 8)**

**In this issue:**

# The Toolbox: Woodland Terms

**Hank Stelzer, MU Forestry Extension**

Forestry is a specialized field of study and has its own vocabulary. As you become involved with the development and management of your woodland, you will often hear or read terms or phrases that might be unfamiliar. Understanding these terms and phrases will help in talking with a forester, understanding technical forestry publications, and provide a deeper understanding and appreciation of your woodlands. Look for and understand the ***bold italic*** terms below to improve your forestry knowledge.



***Left:*** *"Diameter at Breast Height" (DBH) refers to the measurement of tree diameter at a height of 4.5 feet above the ground. DBH provides a standard to measure diameter which is important because trees are often tapered.* ***Right:*** *"Advance regeneration" refers to tree seedlings and saplings that are developed enough to occupy the site if the overstory trees are removed.*

***Silviculture*** is the practice of growing and culturing or improving forest trees. Practices such as planting trees, marking ***timber stand improvement (TSI)***, or marking harvests to improve or regenerate the woods are all silvicultural practices.

***Basal area (BA)*** describes the amount of surface area taken up by a tree on a per acre basis. If you were to measure the cross-sectional area of a tree (the surface area of the main stem) 14 inches in diameter 4-1/2 feet above the ground (termed ***DBH*** for ***diameter at breast height***), you would have approximately one square foot of land covered by the trees' cut surface – this is a tree's basal area.

The sum total of the trees' cross-sectional measurements on an acre determines stocking based on basal area. A ***well-stocked stand*** will have approximately 80 to 120 square feet of basal area per acre. ***Understocked stands*** would have basal areas lower than this standard. ***Overstocked stands*** will have higher values. All forest management decisions are based on these stocking determinations.

Site index (SI) is a relative measurement of the woodland's site quality which can then be translated into future wood production. Foresters use the height of trees in the dominant crown class. Trees in the dominant crown class are those whose crowns receive sunlight from all sides. Site index, then, is defined as the height that free-growing, dominant trees are expected to reach by age 50.

***Co-dominant crowns*** receive light only from the tops. ***Intermediate crowns*** receive very little direct sunlight. ***Suppressed or overtopped crowns*** receive no direct sunlight. Tree crown classes are heavily evaluated when discussing trees that are removed or retained in future management work.

Many landowners are curious about how specific stands of timber have developed in their woodlands. Foresters have two rather broad methods to define the development of timber stands. ***Even-age stands*** are those where the age difference of the trees is less than 20 percent of the total age of the stand. Sometimes these stands are the result of a harvest that removed all the trees at one time. ***Uneven-age stands*** are common in Missouri's woodlands, and they contain various ages and sizes of trees. Uneven-age stands occur when individual mature trees are removed from time to time.

Other stems in the forest also are evaluated during a stand evaluation. ***Advance regeneration*** are small trees or seedlings that are small but capable of becoming the "next generation" when mature trees are harvested. ***Snags*** are trees that are dead or dying and have few limbs, if any. These stems provide homes and feeding sites for a multitude of wildlife species.

While it may seem there are many forestry terms to learn, most are fairly straightforward. Understanding these terms will help you to get the most from your woodland ownership experience. **GH**

# Readers' Survey Early Results

**Hank Stelzer, MU Forestry Extension**

I work with the Boy Scouts and we have a saying, "Feedback is a gift." We want to thank those of you who have taken the time to give us your gift by answering our online survey at SurveyMonkey **(https://www.surveymonkey.com/s/Green_Horizons_survey)**. The polls are still open, but we wanted to share what we have learned so far.

Everyone seems to agree GH provides a good mix of agroforestry, community forestry and general forestry articles that are unbiased and easy to read. More importantly, respondents have said articles contain at least one piece of information they can put in play immediately.

If anything, our readers say that want more, in-depth information. Covering a broad spectrum of forestry-related topics in a 12-page newsletter makes it a challenge to delve too deeply into any one subject, but we will do our best to provide leads where interested readers can learn more.

Regarding our "regular" series, "Reducing Your Risk" and "The Tool Box" are solid hits. "The Bid Box," "The Carbon Corner" and "Wood Energy" also received positive feedback and will run as the need arises. And while the "Preserving the Family Forest" series has been popular, it has run its course and is slated to be retired this year.

Looking to the future, here is what our readers say they want to see in coming issues:

- *Best Management Practices*
- *Federal/State Forest Policies and Incentive Programs*
- *Information on Native Trees*
- *Missouri Tree Farm System*
- *Tree/Forest Insects and Diseases*
- *Timber Marketing Tips*
- *Agroforestry: Forest Farming*
- *Agroforestry: Riparian Corridors*
- *Wildlife Management Tips*

Of course, as we receive additional feedback from GH readers who answer the survey, these results may change. In the meantime, we will work hard to bring you stories that capture the above interests.

Thanks for the gift! **GH**

# Red Cedar Compound Shows MRSA-fighting Promise

It's been three years since we told you that researchers at the University of Missouri were looking at compounds in Eastern Red Cedar that may help to fight bacteria, fungi, agricultural pests and weeds, malaria, and the production of melanin.

They have been working tirelessly since, and have discovered a compound that does indeed fight bacteria – in fact, it appears to be effective against staph "superbug" MRSA.

Chung-Ho Lin, research assistant professor, The Center for Agroforestry; George Stewart, professor and department chair of Pathobiology in the College of Veterinary Medicine; and Brian Thompson, postdoctoral fellow in the Bond Life Sciences Center, identified, isolated and tested 17 bioactive compounds and have plans to analyze more compounds.

MRSA is an evolving bacterium resistant to most medications. For most people, the infection is isolated to the skin. However, it can spread to vital organs causing toxic shock syndrome and pneumonia, especially in people with weakened immune systems. The incidence of disease caused by MRSA bacteria is increasing worldwide. In 2005, more than 94,000 people developed life-threatening MRSA infections in the United States, according to a Center for Disease Control report. Nearly 19,000 people died during hospital stays related to these infections

In addition to its potential use in fighting MRSA, researchers found that some chemical compounds in the tree are able to fight and kill skin cancer cells present in mice. It also might be effective as a topical acne treatment. Stewart said the compounds are years away from commercial use, as they must go through clinical trials.

The team's research was presented recently at the International Conference on Gram-Positive Pathogens. **GH**

*–CAFNR Communications and MU News Bureau*

# Reducing Your Risk: Lyme Disease

**Hank Stelzer, MU Forestry Extension**

According to the U.S. Center for Disease Control and the American Lyme Diseases Foundation, the chance of contracting Lyme disease (LD) in Missouri is rare. It's also rare in Florida. But, back in the summer of 2000, I beat those odds and ran into that rare tick carrying the disease. It was not fun.

*Developmental stages of the deer tick. Nymph on the left; adult on the right.*

My symptoms were a panoply of ailments that ranged from pedestrian joint pains to unexplainable migraines and chest pains; the latter of which landed me in cardiac unit at Sacred Heart in Pensacola, Fla. Perplexed by my sudden run of bad medical luck, my doctor and I started retracing my steps.

In the course of our discussion, I mentioned a hypersensitive reaction to a bug bite I sustained on my right shin about a month before my medical maladies began. It was a small red spot with a distinct red ring around it; about the size of a quarter. At the time I did have the passing thought that it might be Lyme disease. But, since it did not "look" like posted, textbook images and since I could not find a tick, I did not give it another thought. Besides, who gets a tick bite on their shin?

Having just encountered his first case of Lyme disease less than a month earlier, he ordered the serological test. In the meantime, he put me on a course of four weeks of antibiotics as a precaution. The test result was inconclusive, but after the treatment I was free of symptoms and have had no problems since. I was lucky we figured it out and was treated early. Some people are not so lucky and experience chronic lifelong health issues.

## How is Lyme Disease Contracted?

The spirochetal agent of Lyme disease, *Borreliaburgdorferi*, is transmitted to humans through a bite of a nymphal stage deer tick (Ixodesscapularis). Many kinds of ticks will bite people, but only *Iscapularis* (*I pacificus* on the West Coast) carries the disease. Adult stage ticks are about the size of an apple seed. Nymphs are tiny, about the size of the head of a pin.

Your chances of contracting LD are greatly reduced if you remove a tick within the first 48 hours. Generally, if you discover a deer tick attached to your skin that has not become engorged, it has not been there long enough to transmit the LD spirochete.

## Is Lyme Disease in Your Area?

LD is spreading slowly along and inland from the upper east coast, as well as in the upper Midwest. LD has been found in every state, so if you spend time outdoors it is best to take precautions.

## Take These Precautions

- Do a systematic, whole-body exam each night before going to bed. Performed consistently, this ritual is the single most effective current method of prevention of LD. Keep in mind that nymphal deer ticks are the size of poppy seeds; adult deer ticks are the size of apple seeds.
- Wear enclosed shoes and light-colored clothing with a tight weave.
- Clothes can be sprayed with either DEET or permethrin. Only DEET can be used on exposed skin, but never in high concentrations; follow the manufacturer's directions.
- Avoid sitting directly on the ground.

## Symptoms

The early symptoms of LD can be mild and easily overlooked. The first symptom is usually an expanding rash (called erythema migrans, or EM) which is thought to occur in 70-90 percent of all cases. An EM rash appears either as a solid red blotch or a bulls-eye and appears 3 to 30 days after disease transmission.

Ticks prefer body crease such as the armpit, groin, back of the knee, and nape of the neck. Rashes will therefore often appear in (but not restricted to) these areas. **(cont. pg. 9)**

# Elderberry Financial Decision Support Tool Now Online

**Larry Godsey, The Center for Agroforestry**

The Center for Agroforestry at the University of Missouri offers various support tools to help prospective producers make decisions about establishment and management techniques for different alternative crops. The newest tool, available online at http://www.centerforagroforestry.org/profit/elderberryfinance.php, is the Elderberry Financial Decision Support Tool (EFDST). Elderberry *(Sambucus canadensis)* is a versatile, easily-grown native shrub for the Midwest. It could become an important component of a variety of agroforestry practices and is well-suited to riparian forest buffers and alley cropping.

The Elderberry Financial Decision Support Tool is an Excel (©Microsoft Corporation)-based model designed to assist with elderberry establishment and management decisions. This model allows the user to select multiple options from a list of the most common establishment, management, harvesting and marketing techniques to determine the methods that will generate the best economic returns. Default methods and costs are based on current elderberry production methods; however, they may be modified by the user.

The EFDST includes an internal yield model that covers a 25-year rotation. In other words, the model assumes the elderberry plants will be removed or replanted after 25 years. The cost of removal and replant at that time is not included in this model. The model also includes a random variable that reflects the potential yield risks from year to year. More specifically, the random risk variable attempts to model the fluctuations in yield caused by annual weather conditions and other unpredictable events.

For most users of the model, the Management Input tab is the main interface. All decision variables and financial results are displayed on this page. The Cost Budgets tab provides a printable financial cost budget that can be used as part of a business plan. The Financial Analysis tab provides the cashflow framework for the model. This tab shows the annual yield, revenue and cost predictions from which the financial indicators are calculated.

The Input Tables tab lists all the default decision variables for the model. Any values listed in yellow may be modified by the user of the model. As an example, if a landowner would like to consider a site preparation method that is not listed in the default menu, they may enter the cost on the “User Defined” line of the Site Prep table. This cost will then be incorporated throughout the analysis of the model. For management decisions, such as mulching and weed control, it is possible to adjust when those events will occur by changing the frequency of occurrence and length of occurrence.

The final section of the model is the Growth Models tab. This tab is locked, but is visible to the user of the model. The purpose of this tab is to show the user of the model a graphical representation of the expected yield for the elderberry plants over the 25-year rotation. Across the top of the worksheet are three lines, representing the years and two recommended spacing options. The top line is the year after planting, the second line represents a 4-foot x 12-foot spacing and the third line represents a 2-foot x 12-foot spacing. Below that data there are two charts that show the predicted annual yields with a plotted trendline. The equation of the plotted trendline is programmed into the model as the yield prediction equation for the Financial Analysis tab. These yield equations are based on the best understanding of elderberry production at this time and are considered to be on the “conservative” side.

The EFDST uses the financial indicators of net present value (NPV), present value of costs and revenues (PV), annual equivalent value (AEV), modified internal rate of return (MIRR), internal rate of return (IRR), and years to break even. It is important to note the financial returns of the model represent returns to land and labor. In other words, most of the establishment labor is contracted as part of the cost; the management and harvesting labor is not included in the cost structure. It is also important to note that this model is based on the best information available at this time. It is intended as a guide, but not as a crystal ball. The purpose of this model is to identify how different establishment, management, harvesting and marketing decisions impact the financial outcome of the system. The model is accurate in predicting whether or not a decision will increase or decrease returns. However, it is not intended to provide a “promised” level of income. **GH**

# Canaan Fir: A New Species for Missouri's Christmas Tree Growers?

**Vern Spaunhorst, Missouri Christmas Tree Association**

Fir trees are not new to the Christmas tree industry. But, they are new to tree farms of the Midwest, including Missouri.

If you grew up in the 1950s and early '60s, you probably awoke on Christmas morning to the wonderful smell of a balsam or Douglas fir Christmas tree in your home. The spaces between limbs enabled large ornaments and long strands of tinsel to hang naturally. They were beautiful and had the wonderful aroma we associate with Christmas.

*Canaan fir tree*

The popularity of natural Christmas trees then enticed people with empty land in Missouri to try growing these fir trees for extra income. Unfortunately, Missouri's weather conditions were not favorable for growing fir trees. But, Scotch pine and eastern white pine could grow here and they soon became king and queen.

Scotch pine is a beautiful tree if properly cared for in its early years and pruned correctly. It seems to thrive in the hills of Missouri. It likes clay soils, tolerates hot and cold temperatures, handles dry summers with ease and grows 6-8 feet in 7-8 years.

However, after many years of planting, insect and disease problems began to appear. The increased cost to combat these problems combined with the glut of trees and associated low prices led to the demise of many Christmas tree farms. Our tree farm, Heritage Valley Tree Farm, located near Washington, Mo., was one of those farms about to close up shop. After 12 years of planting Scotch pine, we decided it was time to quit.

But, that same year, we read a small article in the Christmas Tree Grower's magazine praising a "new" fir tree that grew well on a farm in Indiana. The name of the fir was the Canaan fir.

Canaan fir, also called West Virginia balsam fir, is a little-known tree native to isolated pockets in the mountains of West Virginia and Virginia. The tree takes its common name from the Canaan Valley northeast of Elkins, W.V.

Canaan fir has many similarities to both Fraser and balsam fir in growth and appearance. Unfortunately, this similarity has led to a great deal of taxonomic confusion. Today, Canaan fir is considered a variety of balsam fir, whereas Fraser fir is considered a separate species.

While growing Canaan fir eliminates many of the problems associated with Scotch pine, it has introduced a whole new set of issues. But, we feel they are worth the effort because of strong customer demand and higher prices people are willing to pay. People love the aroma, good shape, ease of decorating, and non-prickly needles.

Take it from us, anyone thinking about fir trees might want to keep the following points in mind:

- Canaan firs grow best in good soil that drains well. That essentially means don't plant in heavy clay soils. Even trees planted in good soil that does not have good drainage perform poorly. We have begun planting on ridges to improve drainage.
- When temperatures reach 100 degrees, newly planted seedlings begin to die. Mulching the area around the seedling appears to help, but mulch may increase the risk of keeping the soil too wet.
- Drip irrigation is a big plus for the first two years after planting.
- The only pest problem we have encountered to date is bagworms, and we have found one spray at the correct time controls this insect.
- New spring growth is very tender and easily damaged by perching birds. Placing artificial perches among the trees has almost eliminated this problem.
- Fir trees do not require heavy pruning. We cut our tops at 15 to 16 inches, which results in very little trimming of the side branches and an open tree that is easy to decorate.

**(cont. pg. 7)**

# Come Join Missouri Tree Farmers

*as we celebrate*

## National Walk in the Woods Day

Saturday, May 21

*at*

Dave and Gunilla Murphy's Tree Farm

5.1 miles northwest of Williamstown, Mo., on Clark Co. Road A

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*Schedule of Events*

**8:30** *Coffee/donuts*
**9:15** *Welcoming remarks*
**10:00** *Mule-drawn wagon tours*
*Tour 1: Thinning Your Woods for Wildlife*
*Quail Management*
*Tour 2: Selling Your Timber*
*Turkey Management*
**Noon** *Hot lunch and award presentations*
**2:00** *Tours repeat*
**4:00** *The day concludes*

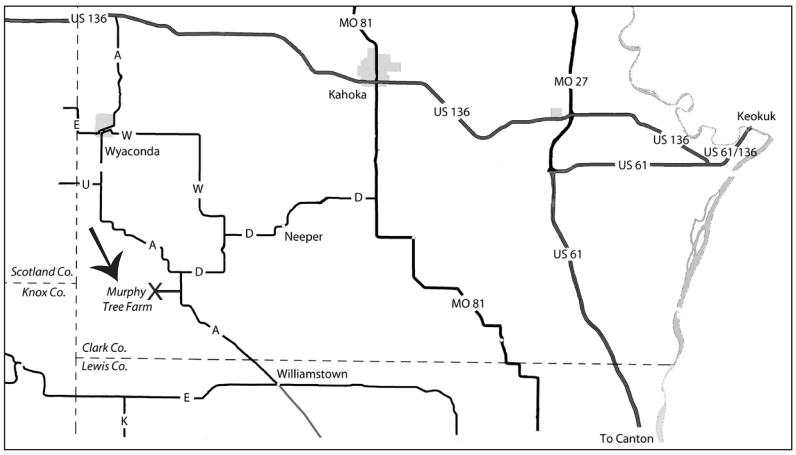
**Informational Booths**

- MU Center for Agroforestry
- MO Consulting Foresters
- National Turkey Federation
- MO Walnut Council
- Dadant
- MO Forest & Woodland Association

**Live Demonstrations**

- Portable sawmill
- Air-drying lumber
- Beekeeping

Registration fee is $20 per person
Register online at moforest.org or call 573-634-3252





## Canaan Fir (cont. from page 6)

We have been growing Canaan fir for the past 15 years and have never regretted it come Christmas time. Even though I get a bit nervous when it rains excessively or the weather gets too hot, I believe growing fir in Missouri is worth the effort. **GH**

*Editor's Note: Want to learn more about growing Canaan firs for your Christmas tree farm? Better yet, want to learn how you can become a member of the Missouri Christmas Tree Association and learn even more about growing Christmas trees in general? Then visit the MCTA website http://missourichristmastrees.org/ or contact MCTA President, Leroy Rood at pearidge@socket.net or 636-932-4687 to learn more.*

# Who Owns Your Timberland? (cont. from front page)

it is easier, and less expensive, to title property in our names. It mirrors how we may own most of our other property (i.e. autos, furniture, homes). The problem with this is that farms and timberland are different than most of our other stuff. They can generate taxable income and taxable gains, activities conducted on the property can create significant liability (i.e. farming, hunting, timber harvesting, etc.), and these properties are often "heirloom assets" to our families (meaning they have value beyond just the monetary worth). Simply owning these properties in our names (singly or jointly), may not take advantage of the benefits associated with having a "business entity" own the property. The potential advantages of business entity ownership can be categorized as follows:

- *Tax advantages associated with income and/or gains*
- *Limited liability for certain risks*
- *An entity "life" beyond the length of our human lives*
- *Creative division of ownership, income and expenses*

The main types of business entities are partnerships, corporations, "sub-chapter" S-corporations, and limited liabilities companies. Each type provides different advantages (and drawbacks) to the family. The attached grid summarizes the key features of each entity type.

Each family situation is different, so there is no single "best answer" for everyone. Close work with your succession planning team members (attorney, accountant and financial advisor) is essential to design the best possible solution. Often, there may be more than one ownership structure that could potentially fit. Weighing the trade-offs between them, and selecting the best business entity, requires a team approach. It also requires a sharp focus on your specific family goals throughout the process.

In past Green Horizons issues, we have discussed the benefits of using trusts for timberland succession planning. Trusts, especially revocable living **(cont. pg. 9)**

**Analysis of Types of Timberland Ownership**

| | Simplicity | Entity Pays Income Taxes | Limited Liability for Owners | Revenues/ Losses Flow to Owners | Entity Files a Tax Return | (3) Capital Gains Treatment Available | Annual Meetings & Record-keeping Required | Limits on Number/ Types of Owners | (5) Estate/ Succession Flexibility |
|---|---|---|---|---|---|---|---|---|---|
| Individual/ Joint (Sole Proprietorship) | ✓ | | | ✓ | | ✓ | | | |
| Partnership (General or Limited) | | | (1) It depends | ✓ | ✓ (informational) | ✓ | ✓ | | ✓ |
| Corporation (C-Corp) | | ✓ | ✓ | | ✓ | | ✓ | | ✓ |
| Sub-Chapter S Corporation (S-Corp) | | | ✓ | ✓ | ✓ (informational) | ✓ | ✓ | ✓ (4) | ✓ |
| Limited Liability Company (LLC) | | ✓ (optional) | ✓ | ✓ (2) (optional) | ✓ (informational) | ✓ | ✓ | | ✓ |

(1) "General" partners do **not** have liability limitations (i.e. personal assets are exposed to partnership obligations). However, "limited partners" in limited partnerships **do** have limitations on their personal liability.
(2) In addition, Limited Liability Companies can be designed to assign "income" and "losses" differently, to different members (owners). In other words, the allocation of income and loss does **not** have to follow the proportion of ownership.
(3) "Capital Gains" treatment for sales of land and timber is **not** available for C-Corporations. The revenue from those transactions would be taxed at corporate income tax rates.
(4) S-Corporation rules limit the number of shareholders to 100 or less, and prohibit some types of trusts from owning the shares.
(5) Different flexibilities exist for each of the different entity structures – consult your legal advisor.

**- This should be used as a general reference only -**
**This is a complex area of law, and competent legal counsel should be consulted.**

## Who Owns Your Timberland? (cont. from page 8)

trusts, may have a place in your planning, as well. Often, the best solution for families may be to have a revocable living trust own the business entity interests (i.e. the S-corporation shares or limited liability company membership interests). While more complex, this layered structure often provides the highest level of tax benefits, liability management and succession planning flexibility. (Sounds like a topic for another article...) In the meantime, talk to your advisors about your situation and whether your present ownership structure is the most appropriate for your situation. **GH**

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*All investing involves risk including the potential loss of principal. Specifically, investing in timberland is subject to substantial price fluctuations of short periods of time and may be affected by unpredictable property and timber valuations and supplies. The market for timberland is widely unregulated and concentrated investing may lead to higher price volatility and there may not be a secondary market available for this product.*

*Material discussed herewith is meant for general illustration and/or informational purposes only, please note that individual situations can vary. This information is not intended to be a substitute for specific individual tax, legal or investment planning advice. Please consult a qualified professional for legal advice/services.*

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## Reducing Your Risk (cont. from page 4)

Around the time the rash appears, other symptoms such as joint pains, fever, and fatigue are common, but they may not seem serious enough to require medical attention. These symptoms may be brief, only to recur as a broader spectrum of symptoms as the disease progresses.

As LD progresses, a number of other symptoms including severe fatigue, a stiff aching neck, and tingling/numbness in the extremities or facial paralysis can occur. The more severe, potentially debilitating symptoms of later-stage LD may occur weeks/months or in a few cases, years after a tick bite. These can include severe headaches, painful arthritis and swelling of joints, cardiac abnormalities and central nervous system disorders.

### Diagnosis

If you think you have LD symptoms, you should see your doctor immediately. LD is difficult to diagnose because the disease mimics many other diseases and there is no definitive test for it at this time. The EM rash is a specific feature of LD, and treatment should begin immediately. If you have symptoms consistent with early LD and suspect recent exposure to a tick, present your suspicion to your doctor so he or she may make a more informed diagnosis. **GH**

*Information for this article from the American Lyme Disease Foundation Web site, www.aldf.com, and the Tick Management Handbook, Bulletin 1010, CT Agricultural Experiment Station.*

A Lyme disease application for iPhones has been developed by ALDF in collaboration with Yale School of Public Health and U.S. CDC. “Lyme Disease Tick Map” includes information on the abundance of infected ticks at the location of the user (within the U.S.) as determined by GPS, among other features. It is available through the Apple iTunes Store for $1.99. Proceeds will be used for support of the research and education mission of ADLF.

# A Tale of Two Trees (cont. from front page)

## A Tale of Two Trees

Let's consider two white oak trees growing in a typical Missouri woodland.

Our first tree is 18 inches in diameter at breast height (4.5 feet above ground line) and contains two merchantable logs (32 feet). According to a Doyle volume table (the volume table commonly used), the volume of an 18-inch tree containing two merchantable logs is 160 board feet. With a lumber grade stumpage price of $295 per thousand board feet (as reported quarterly in the Missouri Timber Price Trends published by the Missouri Department of Conservation), today this tree is worth $47.20.

For the past few years, we have measured its diameter in the dormant season and have determined it is growing in diameter at the rate of four-tenths inches each year. At this rate, the tree is expected to grow four inches in diameter over the next 10 years; the earliest time we will consider harvesting trees in this patch of woods. This tree also has good form, so we also expect it to increase one-half log in merchantable height.

This results in a 22-inch tree containing 2-1/2 merchantable logs and 340 board feet. Excluding inflation, if the quality remained essentially the same, the stumpage value of this white oak in 10 years will be $100.30. The tree has increased in value $53.10. Using the basic compound interest formula, PV(1+i)n=FV (PV=present value; i=rate of value increase; n=number of years; FV=future value), the expected rate of value increase is 7.8 percent. Say we desire for the trees in this woodland to increase in value at an annual rate of at least 5 percent (real rate excluding inflation), then this white oak is anticipated to exceed our expectation and should not be cut, but allowed to grow for at least the next 10 years.

Our second tree is also a 18-inch white oak and contains two merchantable logs. But, this tree is growing in diameter at the rate of two-tenths inches per year. Unlike the first tree, this tree has poorer form due to a fork just above the second log and will therefore not increase in merchantable height.

The present value of this tree is $47.20. In 10 years, this tree is expected to be only 20 inches in diameter, and with two merchantable logs containing 220 board feet. Excluding inflation, the value after 10 years of growth is expected to be $64.90; and the annual compound interest increase in value of the tree over the 10-year period is 3.2 percent.

Based upon our 5 percent benchmark, this tree is financially mature and should be cut.

## Quality Does Matter

Notice we have not discussed quality… until now. Oftentimes, the simple act of pruning can greatly improve the quality of the butt log so it is worth substantially more. What happens to our financial maturity analysis if this occurs? Let's revisit our first tree.

This tree was growing well and had good form. So, let us assume that on top of the increased volume, after 10 years the butt log has become a veneer-quality log. At the end of the 10-year period, the oak is again expected to contain 340 board feet. But, with 170 board feet in the butt log worth $1,111 per 1,000 board feet (veneer stumpage price) and the remaining 170 board feet in the top logs worth $295 per 1,000 board feet, the total expected future value of the oak in ten years is $238.85, and it is increasing at the rate of 17.6 percent per year. Between trees of similar volume, higher quality equals greater value!

## Closing Thoughts

Obviously, calculating the financial maturity of a tree is a complex process that involves estimating many variables, including stumpage value, diameter, merchantable height, growth rate, possible changes in tree quality, and future stumpage value. Because of these complexities, financial maturity calculations are not often undertaken by forest landowners. But, it is important for anyone managing uneven-aged stands to have an understanding of the concept and some grasp of the rate of return being earned by trees of different species and different sizes.

It is also important to remember that financial maturity is only one evaluation criterion in the tool box. As mentioned in the beginning of this article, other factors including species, quality, diameter, distance from other trees, health and vigor, wildlife habitat, aesthetics, and risk of loss or damage must also be considered. **GH**

## TCD Early Alert

Thousand Cankers Disease Webinar

- Thursday, May 26
- 1-2 p.m.
- Learn the latest on the Thousand Cankers Disease from Simeon Wright (MDC) and Doug LeDoux (MDA)
- Contact stelzerh@missouri.edu to register

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## Deadlines for Newsletter Submissions

| | |
|---|---|
| Spring Issue: | March 15 |
| Summer Issue: | June 15 |
| Fall Issue: | September 15 |
| Winter Issue: | December 15 |

## E-mail or Snail Mail?

Would you rather receive Green Horizons electronically? E-mail us at hallmich@missouri.edu or stelzerh@missouri.edu and we will add you to our listserv. Be sure and send your full name and address so we can take you off the snail mail list.

***GH Online:*** *Find Green Horizons on the Internet at http://agebb.missouri.edu/agforest/index.htm or http://snr.missouri.edu/forestry/extension/*

## Tree Farm for Sale

Eighty-acre Tree Farm for sale in Hartville (Wright County), Mo. White, black and post oak. Buyer has access to four stocked ponds and 160 acres to hunt. Asking price is $1,350/ac and can be divided into two payments in two joining tax years. Contact Melissa Zeitz, 636-922-1695 or lzrx@charter.net.

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GREEN HORIZONS

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## Calendar of Events

**May 17-19, 2011: 4th Fire in Eastern Oak Forests Conference, University Plaza Hotel, Springfield, Mo.** The symposium will emphasize topics relevant to management of oak-dominated forests, woodlands and savannas and will be of great interest to managers, scientists, landowners, consultants and students. For more information, go to http://muconf.missouri.edu/easternfire/index.html

**May 20-21, 2011: Missouri Tree Farm Conference, LaPlata, Mo.** The conference will showcase the property of the 2010 Missouri Tree Farmer of the Year, Dave Murphy. For more information, go to www.moforest.org

**June 10-11, 2011: Tree Planting Demonstration, Managing Timber Sales, Black Walnut Plantation for Quality Nut Production, Nussbaum and Martin Tree Farms, Cape Girardeau, Mo.** Tour demonstrations will cover tree planting, managed timber sale, managing selected cultivars of quality black walnut for nut production and an update on the threat of Thousand Cankers Disease hitting Missouri black walnut. For pre-registration and more details of the tour, contact Harlan Palm, palmh@missouri.edu, or Dennis Potter, 573-808-0837, after May 1. Sponsored by the Missouri Chapter of the Walnut Council.

**June 24-26, 2011: Chestnut Growers of America Annual Meeting, Elsberry, Mo.** For more information about this national meeting, go to http://www.chestnutgrowers.com/

**July 17-21, 2011: 102th Annual Meeting of the Northern Nut Growers Association, Utah State University, Logan, Utah.** Details will be posted on the http://www.nutgrowing.org/ Web site, or can be requested by email from icomserve@aol.com using the subject line “NNGA meeting updates.”

**July 31-Aug. 3, 2011: Walnut Council Annual Meeting and Walnut Research Symposium, Middleton, Wis.** More information available at http://www.walnutcouncil.org/annualmtg.htm in May 2011.

**Oct. 8, 2011: 9th Annual Missouri Chestnut Roast, New Franklin, Mo.** Save the date! More information, as it becomes available, is at http://www.centerforagroforestry.org/events/chestnut/index.php