

GREEN HORIZONS

A quarterly newsletter from the MU Forestry Extension and The Center for Agroforestry in association with the Forest and Woodland Association of Missouri

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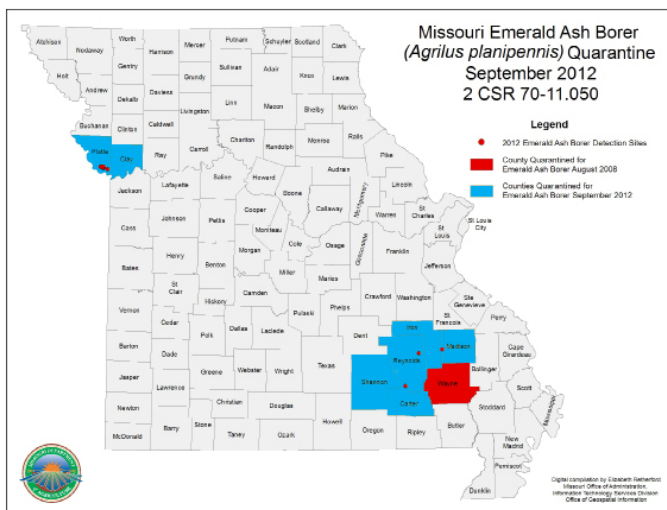
EAB Update: More Borers Found, Quarantine Area Expanded!

Hank Stelzer, MU Forestry Extension

In mid-July, an alert arborist answering a service call to remove a dead ash tree in Platte County near Parkville, discovered the presence of the emerald ash borer (EAB). His finding has been confirmed by the Missouri Department of Agriculture and the USDA.

While not a threat to human or pet health, nor will it damage wooden homes or structures, it is 100 percent fatal to Missouri's ash trees; blue, green, and white ash.

Prior to this find, EAB was thought to be present only in Wayne County, near the town of Greenville in Southeast Missouri. Along with the Kansas City find, adult males have also been captured in routine survey traps in Madison and Reynolds County. **(cont. on page 4)**



EAB is now confirmed in the Missouri Counties of Madison, Reynolds, and Wayne; and also in Metro Kansas City Platte County. Due to the close proximity of these EAB populations are to county lines, the Missouri Department of Agriculture has included the counties of Carter, Clay, Iron, and Shannon to the quarantine area.

Changes Coming to Green Horizons in 2013

Since its inception, Green Horizons has been a free newsletter thanks in large part to a generous grant from the Missouri Department of Conservation and financial contributions from the Missouri Tree Farm Committee, Missouri Consulting Foresters Association, the Missouri Walnut Council, the Missouri Nut Growers Association, and Missouri Christmas Tree Producers Association. However, over the years, rising printing and mailing costs have eroded this support to the point where we are covering only 75 percent of our costs (and this does not count staff time writing articles and layout). In order to put our financial affairs in order, we will be instituting the following changes beginning January 2013:

Green Horizons will be published three times per year: January, May, and September. This single step will bring our income in-line with our expenses. It will also allow us to present you with information more in sync with typical management activities (e.g. planting articles in January, weed control information in May, and timber stand improvement guidelines in September).

Actively encourage our readers to get GH electronically. In every issue published in 2013, we will prominently solicit our snail mail readers to provide us with their email address, so we can send them PDF copies of future issues. All email addresses are stored on secured servers. To receive GH via email, contact Hank at stelzerh@missouri.edu.

We will do our dead level best to keep each issue at our current 12-page, ad-free format. We hope you understand.

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East Perry Lumber Crew Honored as Missouri Loggers of the Year

Candice Davis, Missouri Department of Conservation

A logging crew from East Perry Lumber Company has been recognized by the Missouri Department of Conservation (MDC) as “Missouri Logger of the Year.” This award recognizes a person or crew that practices sustainable forest management. East Perry’s three-man crew consists of Tim Schmidt, Adam Hoehn and Ron Stelling.

“The Missouri Logger of the Year award is our way of recognizing the great work of Missouri’s best loggers,” said MDC Forest Products Program Supervisor Jason Jensen. “Forests require management just like a garden, farm or herd of cattle. The key is to manage the forest in a way that ensures its future health and productivity. Adam, Ron and Tim have demonstrated their ability to manage our forests while ensuring the forest’s future health.”



2012 Loggers of the Year (l to r): Ron Stelling, Adam Hoehn, and Tim Schmidt

The East Perry Lumber Company has been a family owned business since 1945.

“Providing high quality, professional logging services has always been a high priority for East Perry Lumber Company,” said East Perry Procurement Manager Tommy Petzoldt. “The award really validates our commitment to hard work and quality that we’ve always practiced.”

Petzoldt said quality, professional logging is in the best interest of the landowners the company works with, Missouri’s future forests and the wildlife that live there.

MDC Resource Forester Mike Keeley, said this ethic, combined with safe harvesting methods is what gained the crew the statewide honor. “I have witnessed this work first hand as East Perry’s crew has worked on several MDC timber sales,” Keeley said.

Award winners are chosen by professionals representing MDC, the Missouri Consulting Foresters Association and Missouri Forest Products Association (MFPA). Criteria includes good working relationships with landowners and foresters, minimal damage to remaining trees and resources, prevention of soil erosion, aesthetics of the site after harvesting, safe work performance and use of equipment, utilization of harvested trees, desire to address wildlife management concerns, and use of proper forest management techniques. The logger must have completed the Professional Timber Harvester’s Training Program sponsored by MFPA and MDC.

Crader Distributing Company, headquartered in Marble Hill, the exclusive distributor of STIHL Outdoor Power Equipment in Missouri, Kansas, Nebraska and Southern Illinois, sponsored the 2012 Logger Award program. STIHL donated a protective kit to each Regional Logger Award recipient and a new chainsaw to the State Logger of the Year.

For more information on this program, visit www.mdc.mo.gov.

Collaborating for the Greater Good: Agroforestry Scientist Develops Novel Technique to Remediate Munitions Sites

Adapted from Randy Mertens' article *Sticking to It* that appeared in the September issue of CAFNR News

The MU College of Agriculture, Food and Natural Resources (CAFNR) motto is, "Collaborating for the Greater Good." And that is exactly what Chung-Ho Lin, in the School of Natural Resource's Center for Agroforestry, and George Stewart in the Department of Veterinary Pathobiology have done.

Dangerous wartime chemicals pollute the soil and groundwater around thousands of armaments plants around the U.S. Cleaning up these inactive sites is difficult and expensive. But, Drs. Lin and Stewart have developed a novel and inexpensive process to apply pollution-eating enzymes to these contaminants.

Initial testing indicates that the process works in groundwater. Lab testing has just begun to determine how well the delivery system works in soil.

The abilities of these enzymes to degrade the nitrogen-rich explosive compounds left over from TNT, HMX and RDX manufacture have been well documented. Lin said the challenge in using them is that they are fragile and are easily inactivated in any harsh environment or washed away by rain before they can finish degrading the pollutants.

Lin and Stewart's process uses bacterial endospores as the vehicle to deliver these enzymes to the pollution and allow the tethered enzymes to persist there over time. Endospores don't break down easily as they are naturally resistant to harmful environments, such as acidic soil, heat and desiccation. They also have size and charge properties that permit them to remain in place in soil environments.

The process could replace current remediation techniques that are expensive and can be destructive to the environment, Lin said. Incineration, composting and detonation of contaminated sites are among the most common current methods now being used. The financial cost is high – ranging from \$100,000 to \$1 million per acre.

National Problem – No Easy Solutions

The Department of Defense has identified 2,307 sites that are potentially contaminated with military munitions. Of these, 25 were located in Missouri, 62 in Kansas, 29 in Nebraska, 35 in Illinois, 15 in Tennessee, 15 in Arkansas and 38 in Oklahoma. The state with the largest number of sites is California with 376 known areas of contamination.



Most of the contaminated U.S. sites are World War II era munitions plants. During their operation, they generated industrial wastes that were disposed of using accepted practices of the times, which included on-site dumping, burial and open burning. Manufacturing processes and disposal caused contamination of soil and groundwater.

The Government Accounting Office reported to Congress that more than 15 million acres in the United States are contaminated with unexploded ordnance, discarded military munitions and munitions constituents such as propellants and other chemicals. Much of this land has been or will be converted to non-military uses such as farming, recreational or residential and commercial development.

The Sunflower Army Ammunition Plant in DeSoto, Kansas is typical of these sites. It opened in 1942 to manufacture smokeless powder for small arms and canons. During its operation, the Army generated industrial wastes that were disposed of using accepted practices of the times, which included on-site dumping, burial and open burning. Manufacturing processes and disposal caused contamination of soil and groundwater.

The Environmental Protection Agency reports that the health effects of exposure to contamination from TNT include cataracts and cancers that target the liver. RDX, a related explosive, is also a potential human carcinogen, and can also cause prostate problems and nervous system diseases. Animal studies of the explosive HMX suggest potential liver and central nervous system damage. Exposure to the propellant perchlorate may cause metabolic disorders of the thyroid. White phosphorus, used in incendiary munitions, can trigger reproductive disorders, and fatal liver, heart and kidney damage. **(cont. on page 10)**

EAB Update (cont. from front page)

Hank Stelzer, MU Forestry Extension

But, the Kansas City discovery is more troubling because while ash trees account for only four trees out of every hundred in native forests of the Show-Me State, in urban areas they can account for up to one out of every four trees. In St. Louis, ash trees make up 40 percent of the tree canopy on the Gateway Arch grounds.

Researchers have been unable to determine exactly how, or even when, EAB came into Missouri. But, it is believed the insect hitch-hiked into the state in a load of firewood carried by a vacationer from another area as signs of the insect were first found in a campground in Wayne County on Lake Wappapello.

Early indications are that the insect set up shop in Platte County several years ago. Efforts are now underway to determine the extent of this killer bug.

EAB is not a “business as usual” tree pest. It kills quickly and thoroughly. If left unchecked, EAB will destroy Missouri’s ash trees and the many benefits they provide: shade, wildlife habitat, and contributing to a city’s air and water quality.

While EAB is a serious threat, stop, take a deep breath, and consider these points before reaching for the insecticides or calling an arborist:

- Do you have ash trees on your property? Can you identify an ash tree? Several tree species look like an ash to the untrained botanist.
- Are your ash trees in good health? Ash trees with structural or pest problems unrelated to EAB or with a weak canopy (less than 50 percent exhibiting healthy, dark-green, leafy foliage) probably will not respond to any insecticides.

- If they are in good health, are they high-value trees? By this, do they provide shade on the west and south sides of your home? Were they planted by a child or grandchild, or in memory of someone? If so, then you will probably want to think about protecting them.
- Are you willing to be in this for the long haul? Once EAB arrives, insecticides are the only thing that will keep you ash tree alive. So, insecticide use could become a 20- to 30-year commitment until a replacement tree you plant nearby today can take its place.
- Use of insecticides is not recommended until an EAB infestation has been found within 15 miles of your location. Otherwise their use is a waste of money and an unnecessary chemical load on the environment.
- Once you decide to use insecticides, seriously consider calling a professional arborist. The arsenal of insecticides that have proven to be effective against EAB is limited and some chemicals can only be legally applied by licensed professionals.

Do not become a victim of a scam artist saying you have to protect every ash tree on your property. Remember to consider the points above. And if someone calls or knocks on your door saying EAB has been found in your area, check with the Missouri Department of Agriculture or the Missouri Department of Conservation first to find out exactly where EAB is. Then, if the bug is within 15 miles of your location, again work through the points above.

Go to www.eab.missouri.edu for more information on EAB and the latest developments. This website is linked to the national EAB website www.emeraldashborer.info where you access webinars and video clips to help you help your ash trees.

New MU Wildlife Extension Publication

Robert Pierce, MU Wildlife Extension

MU Extension Publication MP907, “Establishing and managing early successional habitats for wildlife on agricultural lands” features the process that has been used to implement wildlife habitat management practices and educational demonstrations at the MU Bradford Research Center (BREC) in Columbia. Missouri landowners should find the publication very helpful for planning and implementing habitat management practices that benefit a variety of wildlife, including bobwhite quail, on their private lands.

At the present time this publication is available as a “web-only” publication on the MU Extension website at <http://www.extension.missouri.edu/explorepdf/miscpubs/mp0907.pdf>

Appreciation is extended to the Missouri Department of Conservation Private Lands Services Division and to USDA NRCS for the continued collaboration that has helped to make this educational program at the MU BREC a success.

Forestry 101: Soft Hardwood, Hard Softwood (and vice versa)

Chuck Ray, Penn State Extension (edited slightly from Chuck's original blog)

Softwood is soft...hardwood is hard. Right?

No, not really. This is by far the most common misconception non-woodites have about wood when they browse the aisles at the Big Box. And you have to ask "Well, why do they call them that, anyway?"

The most likely reason has to do with logging back in the old days. Farmers clearing their land in the east back in the 18th and 19th centuries would have encountered a great range of deciduous trees, scientifically categorized as angiosperms, those that have broad leaves, true flowers, have their seeds enclosed in a fruit, and shed their leaves in the fall (they are deciduous). The soil of the northeastern part of North America was typically thick and rich in the valleys, because of the ancient age of the Appalachian Mountains and the temperate climate that inhibited frequent and large wildfires. The result was a widely ranging deciduous forest, and the varied species that made them up consisted of a large percentage of oak, hickory, and maple.

Now, the folks that were out there clearing all these oak, hickories, and maples with axes and two-man saws, and shaping them for utensils with draw knives, found them pretty tough customers. The oaks and hickories, in particular, are heavy woods, going from about 80 to 90 pounds per cubic foot when green. And the folks down south, who were harvesting live oaks for ship timbers and bows, really had a chore...live oak is the heaviest hardwood in North America, running well over 100 pounds per cubic foot when green.

Apparently, these "heavy" species (technically, the ones with the highest "density") left enough of an impression on these early pioneers that they generally thought of these deciduous angiosperms as "hard" wood, even though other species, such as cottonwood, aspen, American elm, and American chestnut, which were common back in those days, were quite a bit lighter. The aptly named cottonwood weighs less than 40 pounds per cubic foot when green, and whittles easily with a dull pocket knife, as I found out a long time ago.

Now, those old-timers generally didn't talk about different woods like scientists. They didn't have time or mental energy to waste thinking about the relative variability of wood properties expressed in different angiosperms at different moisture contents or growth rates. They just knew that the deciduous trees really wore out their saws and axes, and their muscles...so they got in the habit of calling them "hardwoods".

As opposed to the gymnosperms, which are those cone-bearing (coniferous) trees that have needles and retain them in the winter. Most of the coniferous trees in the Northeast are fairly light species; the famous eastern white pine, which was the favorite of the King's navy back in colonial days for its straight, light, yet strong wood, and made perfect masts for their ships, is only slightly heavier than cottonwood at about 40-45 pounds per cubic foot when green. Eastern hemlock (the state tree of Pennsylvania), is just a tad heavier, at 45-50 pounds. Eastern redcedar would have been the heaviest coniferous tree the settlers of the Northeast typically wrestled with, at about 55-60 pounds per cubic foot. Naturally, then, when they compared the heaviest Northeastern conifers with hickories or oaks, the conifers seemed light by comparison, and so became "softwoods" in the local vernacular.

But as we spread out into the rest of the country, our common man's classification system started to break down. As we harvested the Lake States to build Chicago, Milwaukee, and Detroit, we found that aspen was a pretty "soft" hardwood. And early settlers out west found abundant red alder, a light-weight hardwood that has somewhat the look, weight, and feel of western redcedar.

But the folks harvesting the southern U.S. were really confused, because not only did they find the super-light "hardwood" species basswood and cottonwood, but they found some of the continent's heaviest softwood, of which four species, longleaf, slash, shortleaf, and loblolly, are now marketed under the unifying moniker of southern yellow pine. Southern pine not only has a relatively high density when dry (try driving a nail into a southern pine stud with ten or more growth rings per inch, and you'll bend a few nails) but it also has a resinous "pine tar" that served navies well in the wooden ship days (naval stores were buckets of pine tar and turpentine that were used to caulk seams and cracks in hulls, and seal wood from moisture), and this pine tar, or "pitch" retained moisture in the stem and added even more weight to the wood. Resultantly, old southern pine trees could yield pitch-filled logs that could weigh 90 to 100 pounds per cubic foot green even though the "specific gravity", the weight of a wood species relative to the weight of water, is quite a bit lower than those tough old oaks and hickories. **(cont. on page 8)**

Prolonged Drought Elevates Forest Fire Danger to Record Levels

Hank Stelzer, MU Forestry Extension



Forest fire in Vernon County, 2012 (Photo contributed by John Tuttle, MDC)

Normally, each year about 3,000 wildfires burn 30,000 acres or more of forest and grassland across the Show-Me State. **Normally**, Missouri's wildfire season is in the spring and fall, unlike the Western states that have a summer fire season. Dead vegetation, combined with the low humidities and high winds typical of these seasons, makes wildfire risk greater at these times.

Like I really need to tell you, 2012 has **not** been a **normal** year. Here's some sobering statistics for you; 2,826 fires across all 114 Missouri counties totaling 32,794 acres. These numbers do not include the Mark Twain National Forest (MTNF). And this is just year to date with the "normal" fall fire season to go!

When I contacted colleagues with the Missouri Department of Conservation (MDC) to get these statistics and ask what effect the drought was having on this year's wildfire season, their responses were unlike anything I have heard in years.

John Tuttle, MDC Forest Management Chief for the Missouri River Unit said, "Staff at Clinton, Warsaw, Camden-ton, Lebanon and Bolivar have really been running hard on wildfire. In July we surpassed the annual amount of fire acreage for an entire normal year. We've had enough of this wildfire thing." My long-time friend, Joe Garvey, MDC Southeast Regional Forestry Supervisor, told me they have recorded more wildfires caused by lightning this summer than he has logged during his entire time with the Department. Lastly, Mike Hoffmann, MDC Forest Management Chief for the Ozark Unit said, "We've been experiencing nearly complete combustion with such low fuel moistures; 1,000-hour fuels averaging 11-14%. That's at or below kiln dried lumber!"

The Perfect Storm

A combination of factors has led to this year's perfect storm of intense fire conditions.

A warm, dry winter; followed by a warm, dry spring; followed by an insanely hot, dry summer yielding relative humidities rivaling the desert Southwest means that even the tiniest spark from something as simple as a mower blade striking a piece of Ozark chert can grow into a raging grass fire that can then race into the woods.

And across southern Missouri, the threat of wildfire is even greater. Tons of fallen limbs scattered in the woods are a grim reminder of the disastrous ice storm of 2007 and the windstorm of 2009. As all that fallen timber has dried, it becomes fuel for future fires.

Couple all this with an increasing population and extensive home construction throughout the Ozarks, and you have the recipe for disaster. Perhaps not on the scale we saw in Colorado Springs this summer, but try telling that to a fellow Missourian who just lost their home.

What can you do?

Most of Missouri wildfires are caused by human negligence or malicious arson. In days gone by, people often set fires to convert woodlands to pasture for cattle. Today, improper or unsafe debris burning is the leading cause of wildfire in Missouri. Most residents who burn debris never intend for their fire to get out of control.

You can help reduce the threat of wildfire by using simple alternatives to burning.

Compost twigs and small limbs to produce great organic matter for your vegetable and flower gardens. Chip larger branches into mulch for gardens, trees and landscaped areas. Use wood chippers to eliminate tree branches and other debris. Haul debris to designated dump sites in your area. Cut fallen limbs for use or sale as firewood. Build brush piles; they make great wildlife habitat and will naturally decay in two to five years.

If you must burn, do it safely!

Check with your local fire department to see if open burning is permitted or if you need a burn permit. Prior to the burn, contact your local forestry office or rural fire department and tell them your plans; what time you plan to start burning, how long you plan to burn and what (brush piles, leaves, etc.) you will burn. **(cont. on next page)**

Check the weather. Avoid burning on dry, windy days. Pick an overcast day when winds are calm and humidity is high. Try to burn before 10 a.m. or after 3 p.m. This is when winds are usually calmest and humidity is highest.

Keep brush piles small (about 5 feet by 5 feet), and burn them in open fields when snow is on the ground or in the late spring after the grass has greened up. Avoid burning piles under overhanging tree limbs, utility lines or close to buildings. Cover your debris pile with a waterproof tarp. After a rain, when the surrounding vegetation is wet, remove the plastic and you'll be ready to burn. This helps reduce the chance of your fire spreading to surrounding vegetation.

Before you burn, gather rakes, wet burlap sacks and other firefighting tools. Have a source of water close by. This will help you take quick action should your fire start to get out of control. Stay with your burn pile until it is completely extinguished. Call the fire department immediately should a fire escape. Drown ashes with water and stir them with a shovel or rake to make sure there are no hot embers left smoldering. Check your fire the next day . . . just to be sure.

Attention All Fall Campers and Hunters!!!

Wildfires can start when fine, dry fuel, such as grass, comes in contact with catalytic converters. So, think twice before driving into and across a grassy field. Never park over tall, dry grass or piles of leaves that can touch the underside of a vehicle. When driving vehicles off road, regularly inspect the undercarriage to ensure that fuel and brake lines are intact and no oil leaks are apparent. Always carry an approved fire extinguisher on vehicles that are used off road.

While the remnants of Hurricane Isaac brought some relief to Missouri over the Labor Day weekend and both the MDC and MTNF have lifted their burn ban across the state, it will take only a few dry, windy days to place our forests back in the crosshairs.

Even when the fire danger is reduced, you should follow these guidelines to ensure a safe campfire. Clear a generous zone, preferably a 10-foot radius circle, around the fire pit. This will help ensure that when humidity is low and wind is high, any stray ember lands on bare ground. Store your unused firewood a good distance from the fire. Never use gasoline, kerosene or other flammable liquid to start a fire. Keep campfires small and controllable. Preferably flame height should not extend above the knees. Keep fire-extinguishing materials, such as a rake, shovel and bucket of water, close by in case you need to quench your fire in a hurry. Never leave a campfire unattended! Extinguish campfires each night and before leaving camp (even if it's just for a few moments).

Practice extra caution in the field. If you smoke, put out your cigarettes completely. Burn them in your campfire or pack them out.

Protect Your Home from Wildfire

Many homes, especially newer ones, are situated in what firefighters call the wildland/urban interface. This is the area where potentially dangerous natural fuels, such as forests, old fields and grasslands, are found next to man-made fuels such as homes and other buildings. Because of their location, these structures are extremely vulnerable to wildfire.

To protect your home from wildfire, reduce the fuels around your home and in your yard. To do this, create a well irrigated, open space at least 30 feet out from all sides of your house. Keep this space obstacle-free to allow fire suppression equipment room to maneuver should an emergency occur. In the areas closest to your house, keep mulch moist and ornamental shrubs pruned below 18 inches. Use non-combustible building materials (stone, concrete or brick) for patios and decks. And, stack firewood at least 30 feet away.

In your yard, plant fire-resistant species – such as oak, hickory, maple, dogwood and redbud – and remove flammable plants, such as junipers, pines and cedars. Space trees and shrubs at least twice as wide as their height and prune trees so their lowest branches are 6 to 10 feet above the ground. Keep your grass green and mowed, and move dead vegetation (branches, leaves, needles, etc.) at least 30 feet away from your home or any other building.

For more information, visit <http://mdc.mo.gov/landwater-care/fire-management/wildfires/wildfire-prevention>.

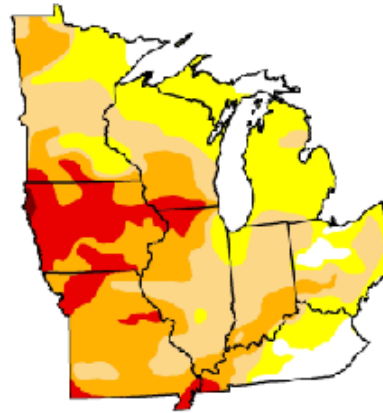


It was in Shannon County near the Thomasville fire tower. Complete combustion. This was a 378-acre wildfire near the Thomasville fire tower in Shannon County. It burned in heavy logging slash from a severely high-graded forest on private land. MDC had three dozers on the fire.

Track the Drought

Visit <http://droughtmonitor.unl.edu/monitor.html> to check on the status of the drought in your area and see what forecasters are calling for down the road.

Also, University of Missouri Extension has created an open community page on Facebook for organizations and individuals to share information related to drought, extreme heat and wildfires in Missouri. That link is <http://www.facebook.com/MissouriDrought-Info>.



Released Thursday, September 20, 2012
David Simeral, Western Regional Climate Center

Extended Drought can put Fish Ponds at Risk

Robert Pierce, MU Wildlife Extension

Resources threatened by this year's drought include ponds that depend on surface runoff for water. Fish are at risk from high water temperatures, oxygen depletion, increased disease potential and other problems as water levels drop in ponds through lack of runoff and evaporation.

Ponds potentially most at risk are those that depend on water from surface runoff within a watershed that may be too small to maintain a pond's water level even during years of average rainfall. They typically need a surrounding watershed that is about 15 times larger than the area of the pond.

A new MU Extension publication, developed in collaboration with Lincoln University, explains how to monitor your pond and respond to problems. The four-page guide, "Managing Fish Ponds During an Extended Drought", is available online and as a PDF download at www.extension.missouri.edu/p/G9401.

During an extended drought, watershed ponds can lose a lot of water to evaporation and seepage, reducing both the oxygen supply and the amount of living space for fish populations. Long stretches of scorching temperatures make the problem worse. Warmer water can't hold as much oxygen as cool water. A combination of drought and extreme heat can leave ponds with dangerously low levels of dissolved oxygen.

The MU Extension guide, co-written by Charles Hicks, an aquaculture specialist at Lincoln University, describes warning signs of oxygen depletion and discusses how to put more oxygen into a pond with aerators, pumps or, in an emergency, an outboard motor.

"The simplest solution is to use an electric aerator that provides about 3/4 horsepower of aeration per acre of pond area," Hicks said.

Falling water levels also leave a pond's fish with less and less living space. Crowding makes fish more vulnerable to stress and disease. Nutrients and waste products become more concentrated as the pond shrinks, further increasing the risk of oxygen depletion, disease outbreaks and other problems, said Hicks.

Landowners can reduce the chance of fish kills by keeping livestock out of the pond and avoiding the overuse of fertilizer in the watershed. Wise watershed management and proper design and construction of the pond can lessen the impact of drought, said Pierce.

Although the summer drought has taken its toll, there may be some upsides to these conditions that have lowered pond and lake levels, particularly in ponds deep enough for fish to survive. The low water conditions this fall will provide optimal conditions for pond owners to make improvements, such as deepening pond edges to discourage unwanted vegetation and repairing pond dams to prevent water seepage.

For more information, contact your local MU Extension center. Detailed information on pond management is available from the Missouri Department of Conservation at www.mdc.mo.gov/node/3311.

Know the Fire Danger Levels

Fire danger is based upon the burning index (BI). The burning index takes into account the fuel moisture, relative humidity, wind speed, temperature and recent precipitation. The burning index is the basis for fire suppression crew staffing levels.

Low Fire Danger: Burning index < 20

Open burning is usually safe with proper containers and precautions under low fire danger conditions. However, residents should always check on local ordinances that prohibit open burning under any conditions. Escaped fires are easy to extinguish. No fire crew staffing is planned for low fire danger conditions.

Moderate Fire Danger: Burning index = 21 - 30

Open burning is usually safe with the proper precautions under moderate fire danger conditions. Burning should be done in the early morning and late evening to avoid windier conditions at midday. Escaped fires can be contained with proper fire-fighting equipment. Partial fire crew staffing is planned for moderate fire danger.

High Fire Danger: Burning index = 31 - 45

Any open burning is discouraged during high fire danger. Windy conditions, low humidity and dry fuels contribute to high fire danger. Fires escape control easily and containment is difficult, endangering human safety and property. Partial or full fire staffing is planned, depending on local burning conditions.

Extreme Fire Danger: Burning index > 45

Open burning should not be attempted during extreme fire danger. Local authorities may impose burning bans. High winds and extended dry periods lead to extreme burning conditions. Open fires can quickly escape and are very difficult to control. Spot fires occur ahead of the main fire, and erratic burning conditions make fires difficult to control even for experienced fire fighters. Full fire crew staffing is planned for extreme burning conditions.

Forestry 101 (cont. from page 5)

Chuck Ray, Penn State Extension



Microscopic view of southern pine.

Koch, P. 1972a. Utilization of the southern pines. I. The raw material. USDA Forest Service Agricultural Handbook No. 420. 733 pp.

As you can see in the above picture of southern pine cell structure, softwoods are comprised of long, thin tubular cells, and it is these that carry the water through the stem of the tree. It is this uniformity, in addition to the density of the wood that makes softwoods seem relatively soft when being sawn or machined.

On the other hand, the moisture is transported in hardwoods through larger diameter pores, or vessels. These come in different shapes, sizes, and locations in the different hardwood species, and this variation contributes to the woodworkers sense that certain hardwoods are rough, or “hard” to machine.

Nowadays, wood “hardness” is complicated (or, depending on your point of view, simplified) further by hardness standards developed and adopted for wood grading for different products. The most commonly used hardness metric used in the various wood industries is the “Janka-ball” hardness test, which measures the resistance of the surface of a wood

species to depression when a metal ball is dropped from a specified distance onto the surface of the wood. These standardized results are then used as a relative measure of the hardness of a wood, the results of which are fairly easy to find, such as at this Wikipedia page. If you browse the Janka hardness table, you’ll see that the hardest woods are tropical hardwood species, but then below that, softwoods and hardwoods are relatively randomly mixed.



Microscopic view of white oak.

http://classes.mst.edu/ide120/lessons/wood/cell_structure/index.html

So, now you know the rest of the story...that hardwoods aren’t necessarily hard, and softwoods aren’t necessarily soft, and why. So next time, don’t go wandering into Home Depot and start asking questions that make you look like a wood neophyte; do what I do, and pretend to actually know what you’re talking about.

Collaborating for the Greater Good (cont. from page 3)

Adapted from Randy Mertens' article *Sticking to It* that appeared in the September issue of CAFNR News

Decade-Long Project

Lin has been studying ways to remediate polluted armaments sites for more than a decade. When he first came to MU, he tested ways to use Missouri native grasses to absorb and degrade the nitrogen-rich explosive compounds in soil left over from TNT and RDX manufacture and disposal. He then considered introducing living microorganisms into this system to further enhance the breakdown of the compounds, but these microorganisms stopped utilizing munitions residue as food sources when they found other nitrogen sources in the soils.

Lin and Stewart, along with Brian Thompson and Hsin-Yeh Hsieh, postdoctoral fellows in the lab, hit upon the idea of using endospores when they heard the technique was already being successfully used in agriculture to get certain herbicides to stay in contact with plant roots.

To make sure the spores do nothing to the soil on their own, the spores are killed after the enzymes are attached. This effectively turns the spores into inert particles with enzymes attached.

Because the endospores are relatively large, about one micron in diameter, they are stable and tough enough to stay intact in harsh environmental conditions. Lin said these bioremediation agents can be mass produced at low cost.

Lin is pleased with the initial research results. He found that the spore-enzyme system degrades the pollution by 20 to 50 times more effectively than applying the enzymes to the pollution alone. In an early test, TNT compounds began to be significantly degraded within 10 minutes.

New Website for Woodland Owners: MyLandPlan.org

MyLandPlan.org is a recently launched easy-to-use, fun, and interactive website from the American Tree Farm System® (ATFS) designed to give woodland owners the tools they need to better protect and enjoy their land. Landowners have many different goals for their property, so MyLandPlan.org is designed to address a wide array of interests.

“That’s why the very first question we ask website visitors is: ‘What do you want to do with your land?’” said Caroline Kuebler, Outreach Manager for ATFS.

MyLandPlan.org will help you create a map of your land and record features such as streams and trails. It will also allow you to prioritize your goals and track progress as you take action. And it can connect you to local professionals and organizations to help tackle your “to do” list.

“Do you want more songbirds? We can help. Do you want to attract more wild game for hunting? We can help. Is there something special you want to protect on your property? We can give you some ideas of how to do that. Do

you want to ensure that your property can be kept in your family? We can show you how to make it happen”, said Kuebler

Among the many features of MyLandPlan.org:

- **Pass It On:** An important part of caring for your woods is planning for the future. MyLandPlan.org can help you get your family on board with your legacy plans, find the right estate planner, and set up the mechanisms for implementing your vision for your land.
- **Profit From It:** Looking for new opportunities to generate income from your land? This tool will help you explore whether your land is a good candidate for a hunting lease or financial assistance like Farm Bill conservation programs.
- **Make It Healthy:** Learn how to care for your streams and lakes, address pests attacking your woods, and implement an Integrated Pest Management plan.

- **Enjoy It:** Find out how to establish your family’s connection with the land through hunting, fishing, wildlife watching, and hiking.
- **Protect It:** Learn the steps to take to discourage trespassing, recover from a natural disaster, and choose the right type of insurance for your property

These and other tools on MyLandPlan.org can help protect the land you love for future generations. Sign up today at www.mylandplan.org.



The Back Page

All Good Things

Sometimes it's hard for me to believe I have been back 'home' here at Mizzou for ten years and even harder to believe I have been co-editing Green Horizons for more than eight of them. But, as the saying goes, "All good things must come to an end." While I will be stepping down as co-editor after this issue, I do plan to contribute articles on a regular basis. It has been real, it has been fun, and most times it has been real fun. See you down the trail.

- Hank Stelzer



Hank trekking the BSA Philmont Scout Ranch in Northern New Mexico

NEW deadlines for newsletter submissions

Summer issue: April 15
 Fall issue: August 15
 Winter issue: December 15

Please help us!

You can help us keep Green Horizons free by receiving our fantastic publication electronically. What's more, you will not only receive each issue sooner, but also in color! To switch from snail mail to email, contact us at paptx4@mail.missouri.edu and we will add you to our listserv. Be sure to send us your full name and address so we can take you off the snail mail list. Do it today!

Content Contributors



Missouri Chapter Walnut Council



Green Horizons Editorial Board

- Hank Stelzer, Co-Editor, Green Horizons, MU Forestry Extension (573) 882-4444
- Laura Orozco, Co-Editor, Green Horizons, MU Center for Agroforestry (573) 882-9866
- Shibu Jose, Director, MU Center for Agroforestry (573) 882-0240
- Shelby Jones, President, Missouri Consulting Foresters Association (573) 635-4598
- Brian Schweiss, MDC Private Land Forestry Programs (573) 522-4115, ext. 3118
- Clell Solomon, Missouri Christmas Tree Producers Association (660) 273-2368
- Rick Merritt, Chair, Missouri Tree Farm Committee (573) 324-3366
- Dennis Potter, Chair, Missouri Walnut Council (573) 808-0837

Contact GH

Send story ideas, address changes and subscription requests for Green Horizons to:

Michael Gold
 Green Horizons
 University of Missouri
 203 ABNR
 Columbia, MO 65211

e-mail: goldm@missouri.edu

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University of Missouri
Center for Agroforestry
203 ABNR
Columbia, MO 65211

Calendar of Events

October 12-13: Ozark Regional Timberfest. Doniphan, MO. Celebrate the past, present, and future of the timber industry in Southeast Missouri. Food, fun and entertainment guaranteed. For more information visit <http://www.ripleycountymissouri.org/ozark-regional-timberfest>.

October 20: Great River Road Chestnut Roast. Elsberry, MO. Join the folks at Forrest Keeling Nursery as they usher in fall with a festival centered on delicious local food, artisan vendors, live music and lots of activities for families to enjoy. And, since fall is a great time to plant, folks can select from a wide selection of trees, shrubs and perennials.

January 30-February 1, 2013: Missouri Natural Resources Conference. Tan-Tar-A Resort, Osage Beach, MO. The conference theme is "Conservation Pays – Exploring the Social and Economic Impact". Online registration at www.mnrc.org will be available November 1, 2012.