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AMERICAN PAULOWNIA CONFERENCE – MAY 2-4, 2013

The 22nd ANNUAL AMERICAN PAULOWNIA ASSOCIATION CONFERENCE will be held May 2-4, 2013 at the Tennessee Division of Forestry, Reba Williams Room, 1250 Hwy 73, Newport, Tennessee 37821

Presentations will include marketing, grower and producer reports, addressing current markets, state-of-the-art forest production, Paulownia supply and utilization, the process of seed certification, the specialty market of paulownia guitars and Agricultural Extension in Tennessee Agro-Forestry and Diversification Using Paulownia.

For program details visit the website at www.paulowniatrees.org. Contact person is Sharon Blackenstaff at 301-790-3075.

HEMLOCK WOOLLY ADELGID (HWA)

Larry Tankersley, Extension Specialist, Forestry

As the weather warms, insect activity will become conspicuous, and folks with hemlocks will want to protect their trees from the Hemlock Woolly Adelgid (HWA). This is (From Mark McClure's report at http://na.fs.fed.us/fhp/hwa/control/mcclure.pdf.

Introducing a systemic insecticide known as imidacloprid into the roots of infested hemlocks in April or May is an alternative to protecting trees that cannot be sprayed thoroughly. The soil beneath the tree's crown can either be drenched or treated with pellets. The imidacloprid is then taken up by the roots and distributed throughout the tree where it can control hemlock woolly adelgid for one year or more. However, trees must have a health sap flow for these soil techniques to be effective. Therefore, if infested trees have already declined significantly, pesticide sprays may be the best option.

Evaluating the effectiveness of chemical controls: One of the most difficult tasks for tree owners is evaluating the effectiveness of efforts to control HWA. The presence of "wool" is not necessarily indicative of living adelgid and an unsuccessful control effort. The simplest way to determine if further control measures are needed is to disregard tattered, off-color "wool" on the older twigs and look for fresh fluffy, white "wool" only on the very youngest twigs.

Hope on the horizon: Several native insects, including beetles, flies, and lacewings, are occasional predators of the HWA in North America. Unfortunately, none of these has had a significant impact on adelgid populations or has shown much potential for biological control. In Japan, however there are several effective natural enemies. Two species in particular, an oribatid mite (*Deapterobates humeralis)* and a ladybird beetle (*Pseudoscymnus tsugae)*, are especially effective at locating and destroying infestations of HWA in Japan. We are now evaluating the potential of the arthropods as biological control agents in the eastern US in the hope that someday they can be part of an integrated program for managing the insect in our forests, nurseries and ornamental landscapes.

CAN WE TRUST THE GOOD NEWS FROM THE FOREST INDUSTRY?

Adam Taylor, Associate Professor, Forest Products

There have recently been many positive headlines in the news about wood products industry. Prices are rising and mills are expanding and hiring. However, after the last few years of unprecedented decline, many are understandably cautious in their enthusiasm. So, can we be confident that the good news will continue?

There are reasons to be optimistic about the long-term fundamentals of Tennessee's hardwood industry. First and foremost, the North American forest resource is in good shape. The supply of wood in our forests has been increasing for decades, and the mix of hardwood species grown here is unique and highly valued throughout the world. Second, the world's population is growing and becoming more affluent. More, and more wealthy, people will require more wood products. Third, our wood products industry has the capacity to produce more wood products and has a good reputation for business practices and legality – considerations that are becoming more important in a more global wood marketplace.

In the short-term, there are positive signs too:

- The popping of the housing bubble meant that we as a country have gone from producing too many houses to producing too few. Housing is expected to grow over the next few years, and this will result in strong, consistent demand for wood products.
- Overseas markets, especially in Asia, have been growing in size and importance for years and this trend is expected to continue, especially as markets for finished products within those Asian countries start to grow.
- Production has been slower to respond to prices increases than in previous boom-and-bust cycles. Whether this is because of producers' caution, tight credit or expensive log supplies, or some combination of these factors, it appears that the industry may be slower to over-produce the market this time.

- Prices are still historically low. Because the market has fallen so far over the last few years, there is still plenty of room for growth, both in prices and production levels, before we get back to 'normal'.

Despite these positive signs, there are also causes for concern. The wood products industry has always been volatile. Prices and production have experienced dramatic changes, in response to the economy as a whole and the housing market in particular. An all-too-common occurrence has been over-production during times of high and rising prices, following by slumps in pricing as supply overshoots demand. Also, restrictions on business credit, declines in the logger workforce and landowners who don't want to sell timber may combine to weaken the link between the growing forest resources and our growing demand for wood products.

Despite these cautions, the outlook for the forest products industry is pretty optimistic in the short and long term. This is good news for the people and working forests of Tennessee.

STAYING INFORMED ON FOREST CARBON OFFSETS

David Mercker, Extension Specialist, Forestry

About a-half-dozen years ago, there was considerable discussion in the forestry community regarding the possibility of compensating forest landowners for sequestering atmospheric carbon. These ecosystem payments were viewed, by many, as a reward for landowners who kept their woodlands as woodlands and as a potential for improving the ROI when timber markets were struggling.

Our Extension Forestry Team was receiving inquiries on how to participate in this emerging market. It prompted the writing of a UT Extension Publication, "The Business of Carbon Credit Trading for Forest Landowners." https://utextension.tennessee.edu/publications/Documents/W217.pdf

This publication provided an overview of carbon sequestration and helped inform forest landowners about CO^2 storage, carbon measurement, participant eligibility and included an estimate of cash flow. It stressed that only those landowners with a serious and lasing commitment to long-term sustainable forest management should consider the project. Carbon credit trading is a contractual agreement, lasting several years, with initial costs that may not be suited for all ownerships. Removing timber during a contract period affects carbon sequestration rates, potentially resulting in a penalty. Further, the program is funded by private investors, not the government, and these investors are counting on participating landowners to deliver a product: sequestered carbon. And like the stock market, prices paid for sequestered carbon fluctuate, with no minimum guarantee. Finally, it concluded that profitability would more likely occur on larger forested tracts, uniform in stand structure, pine over hardwoods, existing on high-quality sites and with rapidly growing trees. The size requirement eliminates most landowners in Tennessee from participating.

About the time of that publication, the great economic stagnation occurred, and interest in this subject waned. The Chicago Climate Exchange (CCX), a primary commodity-based trading market for carbon credits in the United States, closed. More recently, renewed interest has arisen, with the California Green House Gas Emissions Trading Program becoming a leading option. In the U.S., carbon markets are broken into voluntary and compliance sectors. The compliance sector, which purchases carbon offsets to fulfill legal obligations to offset emissions, has grown rather quickly and composes about 85% of the U.S. carbon market. Still, in a report published in the *Consultant* (Jenkins and Smith, 2013), minimum feasibility requirements for projects are about 4,000+ acres at market price of $10-12 per carbon offset (an offset is a metric ton of CO^2). However, the authors report that prices could reach 3-to-7 times higher.

Figures that high could change everything. The market could also expand if governments intervene and establish mandatory targets for CO^2 reduction. It could also become less significant as industries adapt to be more successful in lowering their carbon emissions. For now, for the average Tennessee forest landowner, the recommendation is to be patient, but keep an ear to the rail and close (and cautious) eye on this developing market.

OAK STUMP SPROUTS

David Mercker, Extension Specialist, Forestry

Forests, and trees in general, regenerate naturally one of two ways: from seed or from stump sprouts. Regeneration via *seed* is highly variable, and depends on such things as the available seed crop, sunlight, weather, soil condition, predation (from both insects and wildlife) and adjacent competition. Regeneration from *stumps* arises when trees are harvested or top killed (such as from fire) thereby causing dormant buds near the ground line to flush from a stump and grow to become a tree. Typically stump sprouts grow rapidly.

In forested settings, following a stand initiating disturbance (such as a heavy harvest), oak seedlings are normally more capable of surviving if they originate from stumps. This is attributed to large root systems that provide growth elements such as moisture and nutrients. On better forested sites, oak reproduction often cannot compete with reproduction of more aggressive species such as tulip-poplar and red maple, *unless* the reproduction originates from sprouts.

The position of the sprout on the stump often determines its future success. Sprouts that initiate closer to the ground line are normally more likely to survive and develop onto a favorable tree, than those originating higher on the stump. Also, sprouts on the windward side are less prone to breaking-off in high winds. The propensity of an oak tree to produce stump sprouts increases with stump diameter up to a point, peaking at about 8 inches in diameter then dropping dramatically. Very few oak stumps larger than 20 inches will sprout. It is believed that the thicker bark on larger stumps prohibits dormant bud penetration. Further, larger stumps have expansive root systems, and these require sufficient photosynthate to support root cells. New sprouts on sizable stumps cannot meet this photosynthate demand and root mortality (through energy depletion) results.

The season of cutting trees also affects sprouting success. This is a function of energy reserves in the roots. During the winter months, when trees are dormant, root energy concentration is high. If trees are cut during the dormant season, more root-stored energy is available in the spring to “feed” emerging stump sprouts. In contrast, if trees are cut shortly following leaf flush in the spring, fewer sprouts can be expected due to depleted root energy reserves.

Landowners and foresters should not rely solely on stump spouts to replenish seedlings following a harvest because stumps that produce desirable sprouts will normally be too sparse for adequate stocking. Regeneration from seed will be needed too. Still, stump sprouts are important in maintaining an oak component in forested systems.

Ref. Dey, Daniel. 2002. The Ecological Basis for Oak Silviculture in Eastern North America. In: Oak Forest Ecosystems. Edited by McShea and Healy. The John Hopkins University Press. Baltimore, MD.

THE DYNAMICS OF HIGH GRADING

Wayne Clatterbuck, Professor, Silviculture and Forest Management

Concern exists among forest practitioners, owners, industry and the public that high-grading --- the practice of harvesting those trees that will give the highest intermediate economic return --- may lead to a widespread decline in the forest resource. Recent statewide forest inventory statistics (from USDA Forest Service, Forest Inventory Analysis) for Tennessee indicate that the grade of hardwood trees is diminishing. Less than 5% of existing hardwood sawtimber trees are considered grade 1, the trees that yield the most highly-valued lumber. In addition, 3 out of every 10 hardwood sawtimber trees are considered culls with minimal value or usable volume.

Two cutting practices have perpetuated high-grading: Diameter-limit cutting and selective cutting. Both practices are essentially the same in harvesting the most saleable, and the largest, most valuable trees and leaving the poor quality, defective and low value trees, the unacceptable growing stock to populate the next forest. Neither practice gives thought to the species composition or regeneration of the future forest.

For most forests in Tennessee, smaller-diameter trees are not necessarily younger trees. Most of these smaller trees are:

- Slower growing trees of the same age, but different species, that are not capable of growing into the overstory when larger trees are removed (many midstory species such as dogwood, blackgum, sourwood),
- Trees capable of release but of an inferior species (red maple), or
- Trees of the same species and age as the larger trees, which did not grow as quickly as their larger-diameter counterparts due to greater competition between trees. These trees have low-vigor and sparse crowns at an advanced age with low probability of responding to overstory release.

High-grading is considered a dysgenic function in stand growth and development by promoting survival of or reproduction by less well-adapted trees especially at the expense of well-adapted trees. Because slower-growing and poor-quality trees are retained, high-grading diminishes the diversity, tree grade, and economic value of the future stand. Landowners may agree to high-grading given a lack of knowledge about the practice and its undesirable consequences. High-grading can also be driven by short-term economic considerations. Immediate cash flow may be greater with high-grading, but potential environmental degradation and decreased future timber values will more than cancel the immediate cash advantage.

Stewardship requires that landowners consider the future consequences of high-grading when making a decision whether or not to accept the use of high-grading practices on their land. Resource professionals and harvesters also have an obligation to look beyond the present when recommending forest management practices to landowners. Cutting the best growing trees prematurely reduces the rate of return and can impact the future value of the forest. Recent hardwood market reports indicate that prices for grade 1 sawlogs (depending on species) are 3 to 6 times greater than the poorer grade 3 logs. High quality (better grade) timber is more in demand, less in supply, and yields greater prices. Growing high quality trees gives a much greater financial return during a rotation (even with the time value of the investment) than short-term high-grading.

PRODUCTION OF HIGH QUALITY HARDWOOD PRODUCTS OR HOW TO GROW HIGH QUALITY GRADE TREES

Wayne Clatterbuck, Professor, Silviculture and Forest Management

The questions to be addressed in this article are (1) What are the characteristics of high-value hardwoods and (2) How to grow trees with those characteristics.

Attributes of high-value hardwoods include being straight, free of defects and knots, solid, large in diameter, and the proper species. How do we grow trees with these characteristics? Growing trees in a dense young forest promotes bole straightness and pruning limbs of the lower crown to create stems free of defects. Controlling forest density also encourages larger crowns and subsequently larger diameters. The proper species is controlled by the amount of light received by the seedling or regeneration. Trees without damage or decay are protected from injurious agents such as fire, insects or disease. The answer to how we grow high value hardwoods is answered by controlling density, sunlight and outside injuries. Density controls the stem quality, stem straightness, and the diameter growth. Sunlight controls species composition.

High stand densities create straight clean stems. However, high density also leads to small crowns that reduce diameter growth. Density must be regulated or reduced after initial stem development to provide larger crowns and greater diameter growth. Hardwood stems develop best when young trees are grown at high densities and trees are thinned after clean stem development (merchantable length) to obtain consistent diameter growth.

Each tree species has specific requirements for sunlight. Some species tolerate growing in the shade more than others (known as shade tolerant) and others require considerably more sunlight (known as shade-intolerant). Shade-tolerant trees include beech, maples, dogwood, hornbeam, sugarberry, hickories and some elms. Shade-intolerant trees include cherry, walnut, yellow-poplar, most oaks, sweetgum, locust and cottonwood. Generally, the trees that require more direct sunlight, the shade intolerants, are the commercially valuable species compared to the shade-tolerant species. Thus, copious sunlight is needed to grow species of high value.

To produce high-value hardwoods, we must insure adequate regeneration densities to force development of straight, clear boles, regulate density at the proper time to encourage larger crowns and greater diameter growth, and provide adequate sunlight to regenerate and develop shade intolerant species.

A few summary thoughts:

- Low-quality trees take just as long to grow as high-grade trees. Intermediate management through density control should be undertaken to ensure the development of high-valued trees.
- Stand density must be controlled at the proper time to set bole merchantability, build larger crowns, and to increase rate of diameter growth.
- Management of sunlight is needed to regenerate desirable species. Most of our valuable species do not tolerate the shade.
- Planning regeneration well before the final harvest is necessary to secure the more valuable species.
- Management of young trees is crucial so that they will develop into quality trees. The opposite is not necessarily true. Most large trees will increase in diameter, but not in grade/quality.
- Many missed opportunities to ensure development of high value stems occur when young trees are not managed for growth and value. According to recent hardwood market reports, prices of Grade 1 logs are worth 3-6 times per unit volume than poorer, grace 3 logs.

WILDLIFE MANAGEMENT CALENDAR FOR APRIL

Craig Harper, Professor, Wildlife Management

Wildlife Notes

White-tailed deer antlers begin new growth
Black bears emerge from dens
Bobcat kittens are born
Peak ruffed grouse drumming and wild turkey gobbling
Wild turkeys, ruffed grouse, and bobwhites begin nesting
Wood ducks and Canada geese are nesting; early clutches hatch by end of April
Bluebirds are nesting; early clutches hatch by end of April
Neotropical songbirds arrive and males establish territories
Hummingbirds return

Habitat Management

Finish burning woods and old-fields to enhance conditions for wildlife

- secure burning permit and develop burning plan with Tennessee Division of Forestry
- make sure firebreaks are in place
- get help from experienced personnel if you don't have experience burning
- burning fields is **much** more beneficial for wildlife than mowing!
- refer to *Introduction to Prescribed Fire in Southern Ecosystems*, US Forest Service publication SRS-054, for additional information on the use of prescribed fire
- refer to Chapter 6 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on managing early succession

Plant firebreaks for additional forage, seed, bugging opportunities

- iron-clay cowpeas, re-seeding soybeans, milo, Egyptian wheat, and various millets provide forage and seed for a variety of wildlife species
- see *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for seeding rates and additional information

If you won't burn or disk fields, mow in late March/early April – just before spring green-up

- for best results for wildlife, **disk the area after mowing** to facilitate litter decomposition, improve travel for small wildlife and stimulate the seedbank
- mow now, but **don't mow during the growing season** or you'll disrupt nesting and reduce fall recruitment of wildlife that use early successional cover in summer

Spray tall fescue, orchardgrass, and other perennial cool-season grasses

- eradicating these undesirable grasses will enable the seedbank to germinate and provide better quality forage and cover for wildlife that need early successional habitat
- spray a glyphosate herbicide @ 2 quarts per acre (with surfactant) when grass is 8 – 10 inches tall and actively growing in early April (just prior to warm-season plants germinating or sprouting)
- after grass is killed, burn the field (if needed), then disk to stimulate the seedbank
- when disking in the spring, a preemergence application of imazapic (6 – 10 ounces of Plateau) may be necessary after disking to control johnsongrass, crabgrass, broadleaf signalgrass, and other undesirables germinating in late spring
- Refer to Chapter 5 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on eradicating perennial cool-season grasses and other undesirable species

Finish fertilizing trees/shrubs for increased soft mast production

- this is for trees out in the open, not those in woods
- fertilizing oaks in woods is a waste of time and money; to increase mast potential for trees in the woods, timber stand improvement practices are needed

Finish erecting boxes for bluebirds

- bluebird boxes should be no closer than 80 yards apart

Build brushpiles

- put large limbs on bottom and small limbs on top for crevice space and overhead protection
- this is best done and the effect greatest along the edges of and within early successional areas (native forbs and grasses with scattered brambles and shrubs) where good cover already exists
- building brushpiles along a woods edge adjacent to a tall fescue pasture or hayfield may do more harm than good because all rabbits present will then be isolated for predation

Spray weeds in cool-season food plots before the weeds get too large

- most cool-season weeds are best killed when sprayed before they reach 3 – 5 inches tall
- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for herbicide recommendations
- always read and follow directions on the herbicide label before using

Plant warm-season food plots

- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for information on planting and soil amendment

Plant native warm-season grasses and associated forbs

- non-native cool-season grasses (such as tall fescue, orchardgrass, and bromegrasses) should have been killed last fall before planting!
- spraying cool-season grasses in spring before planting nwsg often does not eradicate the csg
- do not plant nwsg/forbs until you have evaluated the seedbank after killing existing sod cover
- use preemergence herbicides when planting native grasses
- plant before June
- plant bluestems, indiangrass, switchgrass, and sideoats grama seed **no deeper** than ¼ inch; eastern gamagrass approximately 1 inch
- Refer to Chapter 5 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on establishing native grasses and forbs

Collect soil test samples from plots to be planted this fall and lime now as needed

- applications of lime require about 6 months before full effect on pH is realized

Establish salt/mineral licks for white-tailed deer

- this is especially helpful to attract deer to sites and get pictures of deer with an infrared-triggered camera
- do not expect increased weights, reproductive success, or larger antlers following establishment of mineral sites; there are no data to support such

Conduct drumming counts for ruffed grouse in mid-April

Wildlife Damage/Population Management

Leave young wildlife alone
- let nature takes it's course; you'll do more harm than good by trying to save "orphans"
- young birds "fall" out of the nest as they learn to fly
- fawns remain bedded in seclusion throughout the day for the first few weeks of life

Check for openings in the attic as nesting season approaches
- helps keep bats and squirrels from getting into places where they are not welcome

Close all entrances to crawl spaces and other areas where skunks are not wanted
- most skunks are born in May
- females are choosing sites to give birth now

Set traps correctly to catch moles!
- make sure runway (tunnel) is active before setting traps
- excavate 6-inch by 6-inch square exposing runway and determine exact depth of runway
- replace dirt firmly, but not compacted
- set trap at exact depth so mole will be caught

Vole activity may be more apparent as there is increased activity planting gardens, flowers, and shrubs. Pine voles, in particular, eat bark from roots, bulbs, tubers, and seeds in and around flower gardens and shrubbery
- flowers may be protected by placing ¼-inch mesh galvanized hardware cloth under and around flower beds
- zinc phosphide-impregnated baits are effective when placed in the runway through the burrow opening
- snap-traps baited with peanut butter and bird seed are also effective; place baited snap-traps under some type of cover, such as an open-ended box approximately 3 – 4 inches in diameter, to prevent catching birds and other non-target species

Put up chicken-wire fence 2 feet high around vegetable gardens to protect them from rabbits

Put up a 2- or 3-strand electric fence (one strand 6 inches above ground and the other 6 inches higher) to keep groundhogs and raccoons out of vegetable gardens

Erect a single-strand electric fence (2 ½ feet above ground) with aluminum tabs attached every 3 – 5 feet to repel deer from vegetable gardens
- smear peanut butter on the aluminum tabs
- deer are attracted to peanut butter; when they touch the aluminum tabs with their mouths, they learn to stay away

Plant "alternative" forages for wildlife on the outside of fencing around a garden to satiate the appetite of deer, groundhogs, and rabbits, further helping to keep them out of the garden
- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for seeding rates and additional information

Snakes are beginning appear with warmer days
- clean-up around the house (mow, remove piles of wood, brush, and trash) to repel snakes
- there is no reliable repellent for snakes; only "snake oil"

Vultures can present a real problem for calving by plucking out eyes and eventually killing calves

- try scare tactics as soon as vultures appear during calving season
- contact USDA-Wildlife Services if problems continue; they can give you a referral to the US Fish and Wildlife Service for depredation permit if warranted

Refer to *Managing Nuisance Animals and Associated Damage Around the Home*, PB 1624, for additional information on wildlife damage management

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