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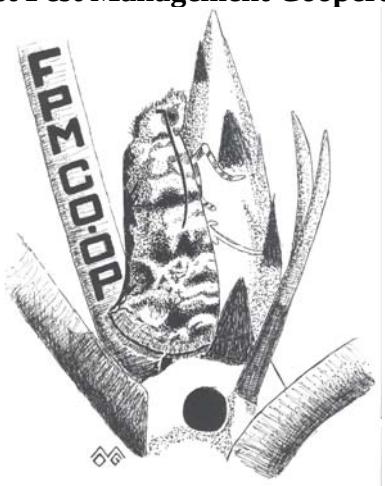
Vol. 17 No. 2 July 2012

Quarterly Newsletter on Forest Pest Management Issues

Forest Pest Management Cooperative



Nantucket Pine Tip Moth, *Rhyacionia frustrana* (Comstock)

Texas Forest Service, Forest Health,
P.O. Box 310, Lufkin, Texas 75902-0310

PEST is a quarterly newsletter that provides up-to-date information on existing forest pest problems, exotic pests, new pest management technology, and current pesticide registrations related to seed orchards and plantations. The newsletter focuses on, but is not limited to, issues occurring in the South (Texas to Florida to Virginia,).

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Announcement:

Tip Moth Meeting – All FPMC members, and industry, state and federal government agency representatives interested in **pine tip moth** are invited to attend a meeting scheduled for August 15-16, 2012. The meeting will begin at 8:00 AM on Wednesday at Flinchum's Phoenix in the Whitehall Forest, which is adjacent to the University of Georgia campus in Athens, GA, and continue until 4:00 PM on Thursday. We will review current knowledge of pine tip moth and discuss research needs for the future. There is **no** registration charge, but we ask that you RSVP. For additional information or to RSVP, contact Don Grosman at 936-639-8170 (ph), 936-546-3175 (cell) or dgrosman@tfs.tamu.edu.

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Summary of 2011 FPMC Research Projects

In 2011, The Forest Pest Management Cooperative (FPMC) continued three research project areas – tip moth, leaf-cutting ant, and systemic injection - from 2010. Results from leaf-cutting ant studies and some of the many tree injection studies were presented in the last *PEST* newsletter (March 2012). Summaries of the results from the remaining systemic injection studies are presented below. Results from tip moth impact, hazard-rating and control studies will be presented in the next *PEST* newsletter (Sept. 2012).

Systemic Injection

The FPMC has continued work to evaluate the potential of using systemic insecticide injections to protect pine seed orchard crops from seed bugs. Emamectin benzoate (EB) (Syngenta/Arborjet) had been shown in several previous injection trials to be highly effective in reducing coneworm damage for extended periods and in preventing the colonization and mortality of injected trees by *Ips* engraver beetles and aggressive *Dendroctonus* species. Trials were continued in 2011 to test EB and other potential insecticides for seed bug protection in pine seed orchards and general insect pest control in oak orchards, and to ascertain efficacy of different chemicals against bark beetles.

Seed Orchard Trials

Loblolly Pine: Two trials were installed in fall 2009 to evaluate the efficacy of 1) eight different systemic insecticides or 2) imidacloprid alone or combined with EB for protection against seed bugs (primarily) and coneworms. In loblolly pine seed orchards (Woodville TX and Magnolia AR), each chemical or combination was injected into 6 or 10 trees, respectively. One group of trees at the Woodville site was also treated with a foliar spray two times during the growing season. Survival was evaluated by counting cones and conelets first in April and again in

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Systemic Injections – Continued from Page 1

August. All cones from each study tree were collected in the fall and evaluated for coneworm damage. Seeds were extracted from 10-cone samples and x-rayed to evaluate seed bug damage.

At the Woodville TX site, five treatments (EB, EB + spray, abamectin, acelopryn and fipronil) improved cone or conelet survival in 2011, while EB as well as imidacloprid and abamectin significantly reduced seed bug damage compared to checks. Mean reductions in 2010 ranged from 9 - 45% (Fig. 1).

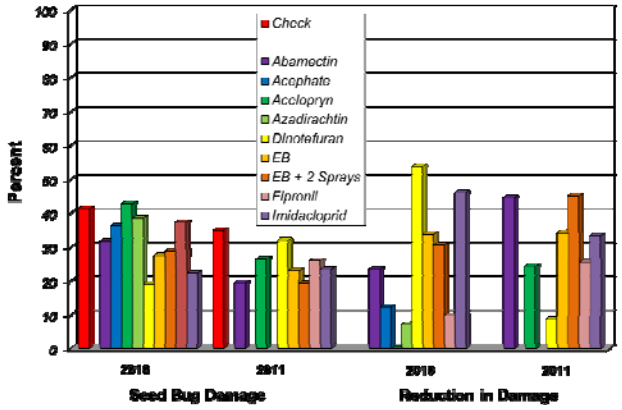

Figure 1. Percent seed bug (*Leptoglossus* and *Tetyra* spp.) damage and reduction in damage on TX loblolly pine seed collected from trees injected with several systemic insecticide treatments, 2010 & 2011.

All treatments containing an EB component or abamectin, acelopryn or fipronil significantly reduced coneworm damage in 2011; reductions for these treatments ranged from 69 - 100% (Fig. 2).

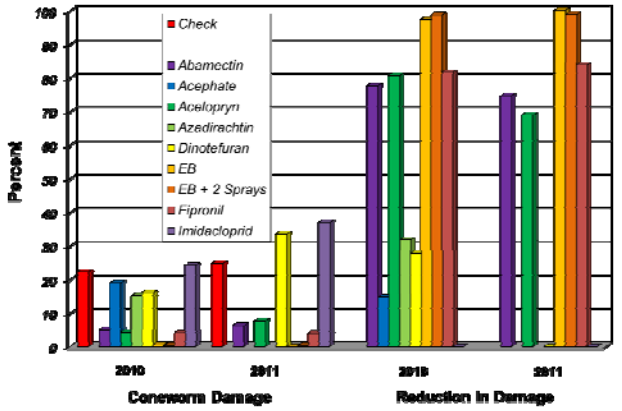

Figure 2. Percent coneworm (*Dioryctria* spp.) damage and reduction in damage on second-year TX loblolly pine cones treated with injections of one of several systemic injection treatments, 2010 & 2011.

At the Magnolia, AR site, all treatments improved cone survival, but only treatments containing EB (Imid + EB and Dino + EB) improved cone survival in 2011. All treatments significantly reduced seed bug damage compared to checks. Mean reductions in 2011 ranged from 26 - 44% (Fig. 3).

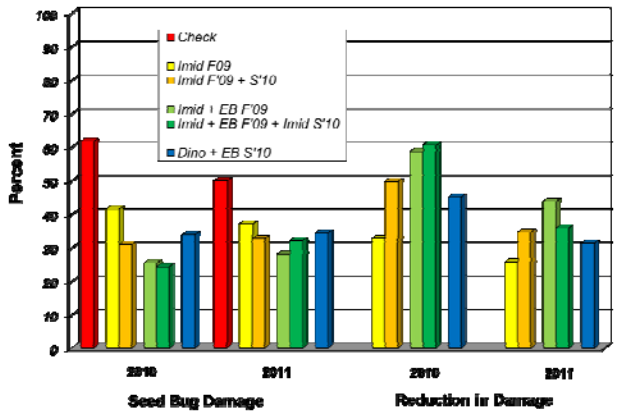

Figure 3. Percent seed bug (*Leptoglossus* and *Tetyra* spp.) damage and reduction in damage on AR loblolly pine seed collected from trees injected with imidacloprid (Imid), dintefuran (Dino) and/or emamectin benzoate (EB) treatments, 2010 & 2011.

All treatments containing an EB component significantly reduced coneworm damage in 2010; reductions ranged from 97 - 100% (Fig. 4).

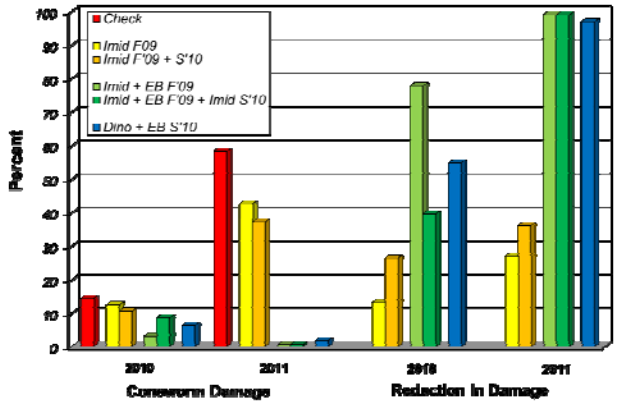

Figure 4. Percent coneworm (*Dioryctria* spp.) damage and reduction in damage on second-year AR loblolly pine cones treated with injections of imidacloprid (Imid), dintefuran (Dino) and/or emamectin benzoate (EB) treatments, 2010 & 2011.

Oak: A trial was installed in spring 2009 at the TFS Hudson TX hardwood seed orchard to evaluate the potential of EB to protect oaks from different insect pests. EB was injected into each of 14 bur and cherrybark oak trees. A similar group of trees was left untreated. The condition of the foliage, branches and stem of each study tree was evaluated every 2 months from April through October in 2009, 2010 and 2011. Insects causing damage were identified to species.

Several insect species (2 foliage feeders and 1 stem borer) were observed to have attacked bur oak and/or cherrybark oak. In all cases, EB significantly reduced the incidence and severity of the insect damage compared to check trees (Figs. 5 & 6).

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Systemic Injections – Continued from Page 2

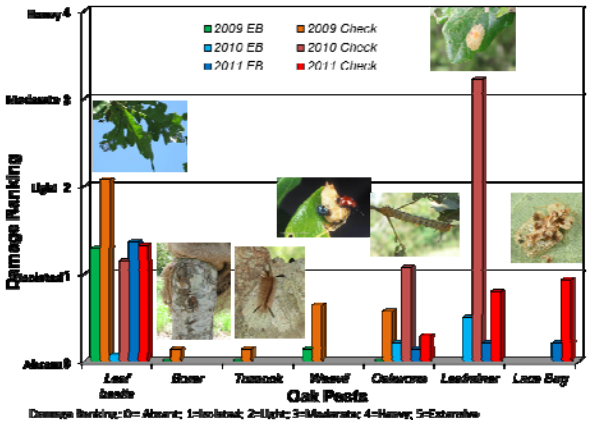

Figure 5. Occurrence and level of damage caused by different insects on bur oak treated with emamectin benzoate, Hudson, TX in 2009, 2010 & 2011.

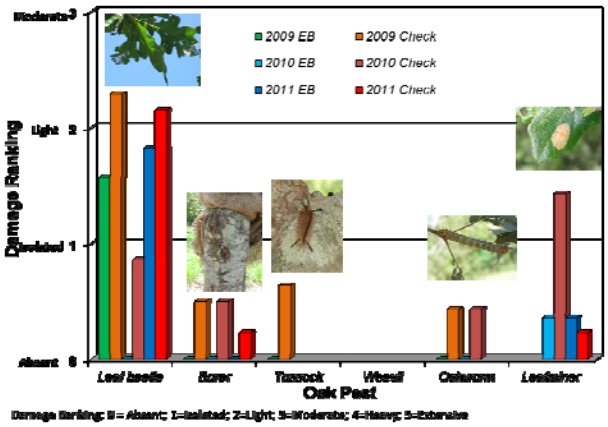

Figure 6. Occurrence and level of damage caused by different insects on cherrybark oak treated with emamectin benzoate, Hudson, TX in 2009, 2010 & 2011.

Bark Beetle Trials

Separate trials were established in 2008, 2009 and 2011 to evaluate different systemic insecticides against:

1) ***Ips* engraver beetles on loblolly pine in TX,**
2) **Southern pine beetle (SPB) on loblolly pine in AL,**
3) **Mountain pine beetle (MPB) on lodgepole pine in UT**

Three *Ips* trials evaluated the duration of 1) two high rates (0.4 and 0.8 g AI/inch DBH) of abamectin in 2008-2011; 2) three lower rates (0.4, 0.2 and 0.1 g AI/inch DBH of abamectin after application in fall 2010 or spring 2011; and 3) azadirachtin (Aza-Sol®) and dinotefuran (Safari®) applied via bole spray, soil drench, or trunk injection in spring 2011. All rates of abamectin were highly and equally effective against *Ips* engraver beetles 5, 10, 16, 22, 28, 36 and 40 months after injection in Trial 1 (Fig. 7) and 3 and 9 months after injection in Trial 2 (Fig. 8). In contrast, both azadirachtin and dinotefuran were ineffective in reducing the colonization of pine logs by *Ips* engraver beetles (Fig. 9).

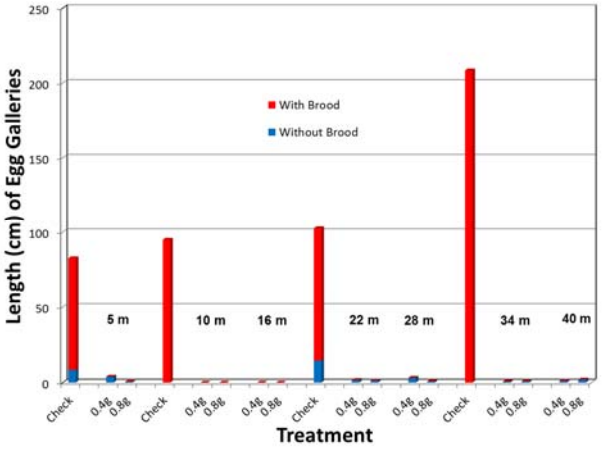

Figure 7. Effect of two higher rate abamectin injection treatments on *Ips* engraver beetle attack success expressed as length of egg galleries with and without brood, 2008 - 2011.

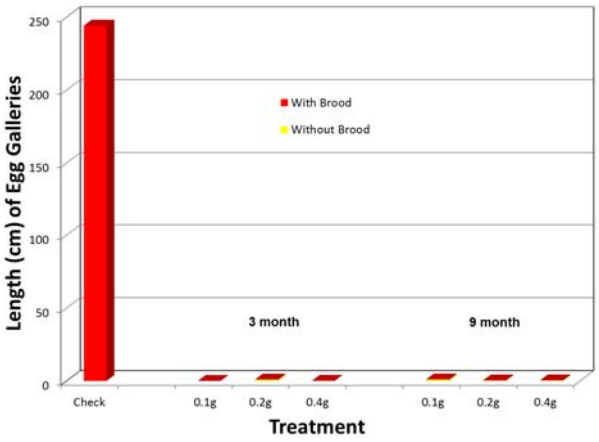

Figure 8. Effect of three lower rate abamectin injection treatments on *Ips* engraver beetle attack success expressed as length of egg galleries with and without brood, 2011.

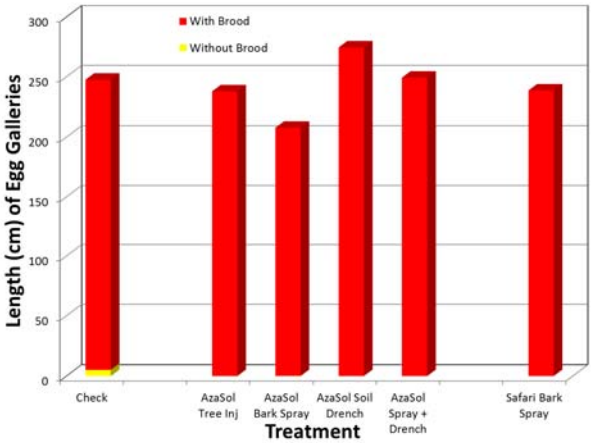

Figure 9. Effect of azadiractin (Aza-Sol) and dinotefuran (Safari) treatments on *Ips* engraver beetle attack success expressed as length of egg galleries with and without brood, 2011.

For the SPB and MPB trials, trees (30) were injected with EB, abamectin, a fungicide mix or combination treatment using Arborjet's Tree IV. All trees (treated and untreated) were baited with species-specific

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Systemic Injections – Continued from Page 3

pheromones to induce beetle attack. In the SPB trial, populations were not sufficient to kill >60% of check trees in AL during the first, second and third year. However, the beetle attack levels on EB-injected trees were markedly lower than those on untreated checks (Fig. 10).

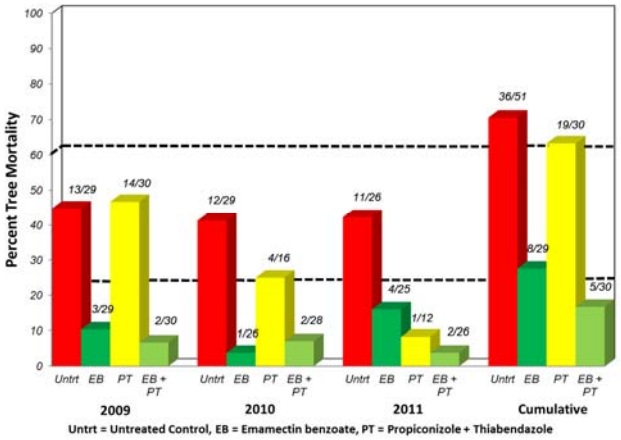

Figure 10. Effects of emamectin benzoate ± fungicide injection treatments on loblolly pine mortality caused by southern pine beetle, Talladega National Forest, AL, in 2009, 2010 and 2011. The dashed line at 60% cumulative mortality is the level of control tree mortality necessary for a valid test; the dashed line at 20% cumulative mortality is the maximum allowable mortality of treatments to be considered efficacious.

In the MPB trial, populations were sufficient to kill ≥60% of check trees in UT during the first and second year. The beetle attack levels on EB- and abamectin-injected trees were markedly lower than those on untreated checks (Fig. 11).

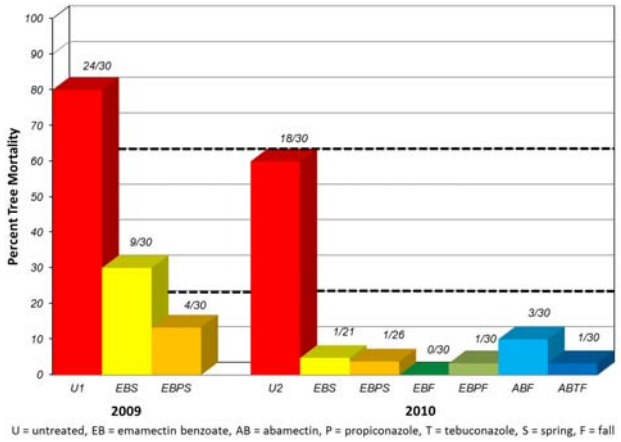

Figure 11. Effects of emamectin benzoate and abamectim ± fungicide injection treatments on lodgepole pine mortality caused by mountain pine beetle, Uinta-Wasatch-Cache National Forest, UT, in 2009 and 2010. The dashed line at 60% cumulative mortality is the level of control tree mortality necessary for a valid test; the dashed line at 20% cumulative mortality is the maximum allowable mortality of treatments to be considered efficacious.

EPA approved the full (Section 3) registration of emamectin benzoate (TREE-äge®) in December 2010 for "control of mature and immature arthropod pests of deciduous, coniferous, and palm trees, including, but not limited to, those growing in residential and commercial landscapes, parks, plantations, seed orchards, and forested sites (in private, municipal, state, tribal, and national areas)." FPMC will continue to evaluate the duration of treatment efficacy in the pine seed orchard and bark beetle trial. The oak trial has been discontinued. Two additional trials to evaluate efficacy of EB against SPB and the walnut twig beetle, vector of the thousand canker disease fungus, were established in early 2012.

Mauget's abamectin has shown excellent protection against *Ips* engraver beetle and MPB and some activity against coneworms. Assuming all goes well; bark beetles will likely be added to the Abicide 2 label in the near future.

Acknowledgements - We greatly appreciate the effort and support provided by:

U.S. Forest Service (Steve Clarke, Chris Fettig, Cynthia Ragland)
ArborGen (Lance Nettles)
Weyerhaeuser Co. (Steve Smith)
Arborjet (Joe Doccola)
Bioforest Technologies (Joe Meating)
DuPont (Bruce Steward)
Mauget (Marianne Waindle)
Syngenta Crop Protection (David Cox)

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Pest Spotlight: Walnut Twig Beetle and Thousand Cankers Disease

Dieback and mortality of eastern black walnut (*Juglans nigra*) in several western states have become more common and severe during the last decade. A species of tiny bark beetle is creating numerous galleries beneath the bark of affected branches, resulting in fungal infection and canker formation. The large numbers of cankers associated with dead branches provides the disease's name—*thousand cankers disease*.

The principal agents involved in this disease are a newly identified fungus (*Geosmithia* sp. with a proposed name of *Geosmithia morbida*) and the walnut twig beetle (*Pityophthorus juglandis*). Both the fungus and the beetle only occur on walnut species. An infested tree usually dies within 3 years of initial symptoms.

Thousand cankers disease has been found in many western states (Fig. 12). More recently, the fungus and the beetle were discovered in Tennessee (2010) and Virginia (2011) and Pennsylvania (2011), within the native range of black walnut.

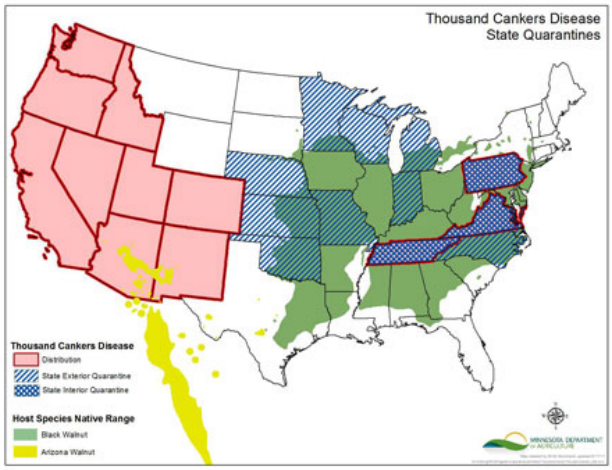

Figure 12. Thousand cankers disease (TCD) occurs in 9 western states. Since 2010, TCD has been found in three locations in the East (TN, VA, PA). The native ranges of eastern black walnut (dark green) and four western black walnut species (yellow) are shown. Eastern black walnut is widely planted in the West, but is not depicted on this map.

Disease Symptoms

The three major symptoms of this disease are branch mortality, numerous small cankers on branches and the bole, and evidence of tiny bark beetles. The earliest symptom is yellowing foliage that progresses rapidly to brown wilted foliage, then finally branch mortality (Fig. 13). The fungus causes distinctive circular to oblong cankers in the phloem under the bark, which eventually kill the cambium (Fig. 14). The bark surface may have no symptoms, or a dark amber stain or cracking of the bark may occur directly above a canker. Numerous tiny bark beetle entrance and exit holes are visible on dead and dying branches (Fig. 15), and bark beetle galleries are often found within the cankers. In the final stages of disease, even the main stem has beetle attacks and cankers.

Figure 13. Wilting black walnut in the last stages of thousand cankers disease.

Figure 14. Small branch cankers caused by *Geosmithia morbida*.

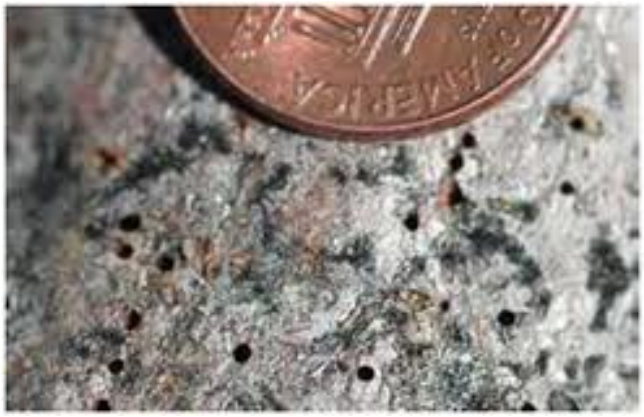

Figure 15. Exit holes made by adult walnut twig beetles.

WTB and TCD – Continued from Page 5

Geosmithia sp.

Members of the genus *Geosmithia* have not been considered to be important plant pathogens, but *Geosmithia morbida* appears to be more virulent than related species. Aside from causing cankers, the fungus is inconspicuous. Culturing on agar media is required to confirm its identity. Adult bark beetles carry fungal spores that are then introduced into the phloem when the beetles construct galleries. Small cankers develop around the galleries; these cankers may enlarge and coalesce to completely girdle the branch. Trees die as a result of these canker infections at each of the thousands of beetle attack sites.

Walnut Twig Beetle

The walnut twig beetle is native to Arizona, California, and New Mexico. It has invaded Colorado, Idaho, Oregon, Utah, and Washington where walnuts have been widely planted. The beetle has not caused significant branch mortality by itself. Through its association with this newly-identified fungus, it appears to have greatly increased in abundance. Adult beetles are very small (1.5 to 2.0 mm long or about 1/16 in) and are reddish brown in color (Fig. 16). This species is a typical-looking bark beetle that is characterized by its very small size and four to six concentric ridges on the upper surface of the pronotum (the shield-like cover behind and over the head) (Figure 16A). Like most bark beetles, the larvae are white, C-shaped, and found in the phloem. For this species, the egg galleries created by the adults are horizontal (across the grain) and the larval galleries tend to be vertical (along the grain) (Fig. 17).

Figure 16. Walnut twig beetle: top view (A) and side view (B).

Survey and Samples

Visually inspecting walnut trees for dieback is currently the best survey tool for the eastern United States. Look for declining trees with the symptoms described above. If you suspect that your walnut trees have thousand cankers disease, collect a branch 2 to 4 inches in diameter and 6 to 12 inches long that has visible symptoms. Please submit branch samples to your State's plant diagnostic clinic. Each State has a clinic that is part of the National Plant Diagnostic Network (NPDN). The names and contact information can be found at the NPDN Web site (www.npdn. org). You may also contact your State Department of Agriculture, State Forester, or Cooperative Extension Office for assistance.

Figure 17. Walnut twig beetle galleries under the bark of a large branch.

Control

Currently, there is no known means of reliably controlling this disease. Standard pesticide treatments (drenching or trunk/branch sprays with permethrin or bifenthrin) to control the bark beetle vector have been tested (Cranshaw and Tisserat 2010). However, infected black walnut trees continue to decline and die even after repeated insecticide spray applications. The FPMC recently received a grant through the Forest Service Pesticide Impact Assessment Program to evaluate the effectiveness of recommended rates of emamectin benzoate (TREE-äge®) alone and combined with the fungicide propiconazole (Alamo®) for reducing the attack success of WTB (and other insect pests) on individual black walnut trees and the progression of fungi introduced during initial phases of tree colonization. Stay tuned.

References:

Cranshaw, W., and N. Tisserat. 2010. Questions and answers about thousand canker disease of walnut. http://www.coopext.colostate.edu/pf/pdfdocs/thousand_canker_questions_answers.pdf.

Seybold, S., D. Haugen, and A. Graves. 2011. Thousand Cankers Disease. United States. Department of Agriculture. Forest Service. Northeastern Area. State and Private Forestry. NA–PR–02–10.

Thought You Might Be Interested to Know . . .

Southern Pine Beetle Multi-state Trend Predictions for 2012

by Ronald F. Billings, Texas Forest Service

In the South, southern pine beetle (SPB) activity remained at a very low level in 2011. Only 63 SPB infestations were reported in 13 southern states, compared to 71 infestations in 2010. Based on pheromone traps deployed during the spring of 2012, continued low levels of SPB are expected this year throughout the South, with some increased activity possible in portions of Virginia and Florida. (**Note:** This just in – 300+ infestations have developed on the Homochitto National Forest in MS. For reasons that remain unclear, the pheromone survey did not predict this SPB outbreak.)

The southern pine beetle, *Dendroctonus frontalis*, has a well-deserved reputation as the most destructive forest pest of pine forests in the South. In 2000, nearly 60,000 multiple-tree infestations were detected on federal, state and private forest lands throughout the South, resulting in the loss of millions of dollars of resources. By 2008, the number of SPB infestations had declined to 1,433 spots detected in 16 states, with most spots occurring in Alabama, North Carolina and South Carolina. SPB activity continued to decline in 2009, 2010 and 2011 to levels seldom enjoyed throughout the South. Only New Jersey experienced an outbreak in 2011 while 31 spots were reported in Virginia and 28 in Alabama. The remaining spots were reported in MS (2 spots) and Florida (2 spots, including one active carryover from 2010). No SPB activity was reported in the other southern states or in Maryland or Delaware.

A reliable system for predicting SPB infestation trends (increasing, static, declining) and levels (low, moderate, high, outbreak) using pheromone traps has been implemented across the South since 1986. This information provides forest managers with valuable insight for better anticipating SPB outbreaks and more lead time for scheduling detection flights and preparing suppression programs.

Each spring, traps baited with the SPB attractant (frontalin) and host compounds (alpha-pinene and beta-pinene) are set out in pine forests when dogwoods begin to bloom. Dogwood blooms mark the primary dispersal season for populations of the destructive SPB as well as certain beneficial insects. Federal and state cooperators monitor the traps weekly for a 4-6 week period. Of particular value for forecasting purposes are catches of clerids (also called checkered beetles), known predators of SPB. Using data on the average number of SPB captured per trap per day and the relative proportion of SPB to checkered beetles, infestation trends for the current year can be forecasted.

The results from the 2012 prediction survey, based on 194 trapping locations within 14 states, indicate continued low SPB activity in all southern states, with the exception of a couple of counties in Virginia and Florida, where some SPB activity may occur. Of those locations surveyed in the southern U.S., only Appomattox/Buckingham counties in Virginia and St. Johns County in Florida are expected to see increasing SPB activity in 2012. No SPB were caught in Oklahoma, Arkansas, Texas, Louisiana, Kentucky or Tennessee (150 traps), but clerid beetles were abundant in most traps. Although trapping data from New Jersey and Maryland is not yet available, the outbreak is expected to continue in southern New Jersey (Atlantic, Cumberland, Salem counties, and Wharton State Forest) where most of the SPB infestations were uncontrolled in 2010 and 2011. Very few or no SPB infestations are expected again this year in the other southern states (with the exception of MS). A state-by-state summary of trap catches for SPB and clerids for 2011and 2012, together with SPB predictions for 2012, are listed in Table 1.

Annual predictions of infestation trends have proven to be 75-85% accurate. Collectively, trend predictions from numerous specific locations provide insight into SPB population shifts within a given state as well as across the South. Also, comparison of trapping results for the current year with those from the previous year for the same localities provides additional insight into SPB population changes.

In general, average trap catches that exceed 30 SPB per day, especially those in which SPB make up more than 35% of the total catch (of SPB and clerids), are indicative of increasing or continued high SPB infestation levels in the current year in southern states. Conversely, when catches of predators far outnumber those of SPB and fewer than 10 SPB adults are caught per day, infestation trends are likely

Continued on Page 8

SPB Prediction – Continued from Page 7

to decline or remain at low levels. For reasons that remain unclear, these thresholds appear to be different at the northern extreme of the SPB range. In NJ, MD, and DE, experience has shown that trap catches of greater than ca. 6 SPB/trap/day are indicative of increasing or high SPB populations, while less than 1 SPB/trap/day is typical for declining or low infestation levels. It is uncertain whether the predator population is directly responsible for declines in SPB outbreaks. Most likely, predators are just one of many contributing factors.

Landowners with pine stands throughout the southern states are encouraged to take advantage of these low SPB population levels to thin overly-dense pine stands as a preventive measure before the next SPB outbreak occurs. Federal cost shares for precommercial thinning of natural or planted pine stands and first thinning of pulpwood stands are available in many states as part of the SPB Prevention and Restoration Program. Contact your state forest pest specialist for details. On the other hand, in New Jersey, immediate control of active beetle infestations is warranted in high priority areas to avoid even greater resource losses than were suffered in recent years.

Appreciation is expressed to the many state and federal cooperators who provide the data for this annual survey. If you have questions, contact Dr. Ronald Billings, Texas Forest Service, at (979) 458-6650 or by e-mail at rbillings@tfs.tamu.edu.

Table 1: Summary of Southwide Southern Pine Beetle Trend Predictions for 2012

Compiled by Ron Billings, Texas Forest Service, based on data received from Southwide cooperators

		2011					2012					
State	No. of infestations 2010	No. of locations trapped	%SPB	SPB/ trap/day	Clerids/ trap/day	No. of infestations 2011	No. of locations trapped	%SPB	SPB/ trap/day	Clerids/ trap/day	2012 Prediction Trend / Level	Most Likely Locations of SPB Activity
Oklahoma	0	3	0%	0.0	1.4	0	3	0%	0.0	9.0	Static/None	
Arkansas	0	9	0%	0.0	3.1	0	10	0%	0.0	8.0	Static/None	
Texas	0	17	0%	0.0	8.9	0	17	0%	0.0	13.0	Static/None	
Louisiana	0	8	0%	0.0	6.7	0	8	0%	0.0	3.7	Static/None	
Mississippi	10	20	15%	0.7	3.7	2	20	4%	0.5	10.6	Static/Low	
Alabama	26	8	30%	1.6	3.8	28	8	16%	1.2	6.5	Static/Low	
Georgia	4	29	29%	2.0	4.3	1	27	3%	0.4	14.0	Static/Low	
Kentucky	0	2	0%	0.0	2.0	0	2	0%	0.0	0.6	Static/None	
Tennessee	0	6	1%	0.02	2.7	0	6	0%	0.0	4.2	Static/None	
Virginia	25	6	34%	5.0	9.9	31	6	33%	5.0	5.0	Static/Low	Appomattox/Buckingham Co.
Florida	1	26	40%	0.2	0.3	2	26	28%	0.7	1.8	Static/Low	St. John's Co.
South Carolina	0	34	9%	0.3	3.1	0	35	2%	0.1	6.1	Static/Low	
North Carolina	5	18	10%	0.3	2.6	0	21	3%	0.1	3.3	Static/Low	
Maryland	3	4	10%	0.2	2.0	0	4					
Delaware	0	2	7%	0.1	2.1	0	1	6%	0.2	2.3	Static/Low	
New Jersey *	389	6	36%	7.9	14.2							
16 States	463	198	22%	1.1	4.4	64	194	22%	0.6	6.3	Static/Low	14 states: Static, low levels in all southern states, particularly west of the Mississippi River.

* based on data from week 2 & 3 only.

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Spray Water Quality Impacts Herbicide Efficacy

(OK Coop Ext Service Pesticide Reports, March 2012)

A series of studies at Purdue University has shown that spray water pH and hardness can reduce the effectiveness of herbicides, making it vitally important for crop producers to test water sources. "Hard water or water with pH values as low as 4 or as high as 9 have been shown to lower the efficacy of herbicides, including glyphosate, nicosulfuron and saflufenacil," said Bill Johnson, Purdue

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Extension weed scientist and professor of botany and plant pathology. An ideal pH value would be 6-7. "At this point, it seems to be specific to a limited number of compounds," Johnson said. "It's amazing how little we know about this topic, considering the number of acres of crops planted in Indiana each year." In his research with saflufenacil, Johnson said the herbicide is less soluble at a low pH. "It's similar to what happens when you put too much sugar in a glass of tea," he said. "The granules are then harder for plants to absorb." With spray water at a high pH, the molecules in saflufenacil break apart, turning the herbicide into a different compound altogether. The high mineral content of hard water makes it more difficult for plants to take up the compounds through their tissues because the minerals bind to the herbicide, Johnson said. Water sources in Indiana tend to have higher iron content, bringing pH levels lower. Further west in the Corn Belt, water sources can have higher pH values because there is more sodium. Regardless of location, Johnson said crop producers need to test spray water and understand pH and hardness. He said that is especially important if producers are getting water from multiple sources because levels can vary from well to well. Growers can buy test kits for both pH and hardness, and there are pH adjuster treatments to neutralize spray water. Hard water issues can sometimes be corrected by adding ammonium sulfate. "Producers also need to read their herbicide labels and understand which water conditions they need to avoid," Johnson said. He also warned producers against making complex mixtures of herbicides, insecticides, fungicides and foliar fertilizers because the characteristics of each chemical potentially could change the way the other chemicals perform. "If farmers are putting together complex mixtures, they really need to pay attention to what each chemical does," Johnson said. "A unique mixture will have unique characteristics. For example, you might be adding hardness to the mix when you shouldn't." More information on spray water quality, testing and solutions to hardness and high pH values are available in the Purdue Extension publication *"The Impact of Water Quality on Pesticide Performance."* The publication, number PPP-86, is available for free download at Purdue Extension's Education Store at www.the-education-store.com. (Crop Life January 26, 2012) http://www.croplife.com/article/24787/researcher-spray-water-quality-impacts-herbicide-efficacy

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What's Buggin' Me and You this Season

It's difficult to keep track of what's happening pest-wise in your own county let alone across the United States. However, I'm sure most forest managers would be interested in hearing if an urban and/or forest pest problem is popping up in their area. If you've seen or heard of a current or recent pest problem (insect, disease, weed, etc.) in your area, I would like to hear about it. Please provide me (dgrosman@tfs.tamu.edu) with the species or common name of the pest, hosts, and relative extent of problem. I will then consolidate and list them in the next issue of the *PEST* newsletter. Below are a few things that have been brought to my attention so far this spring.

Insect - Native

- Over 300 **southern pine beetle** (SPB, *Dendroctonus frontalis*) infestations (spots) were counted during a recent aerial survey over the Homochitto National Forest in Mississippi. Ground crews are currently checking to determine the level of activity of each infestation. Additionally, high SPB numbers and activity were observed by FPMC staff in the Talladega National Forest in Alabama.
- **Loblolly pine sawfly** (*Neodiprion taedae linearis*) on loblolly pine in residential sites in Kaufman Co., TX and **black-headed pine sawfly** (*Neodiprion excitans*) on loblolly pine in Houston and Montgomery Co., TX and in a pine seed orchard near Taylor, LA (Bienville, Parish). These two species normally feed on older needles of mature pine, but can completely defoliate trees later in the summer if populations remain high.
- **Texas leaf katydids** (*Paracyrtophyllus robustus***)** defoliating live and post oaks in Bandera, Bexar, Burnet, Comal, Hays, Medina, Travis and Williamson Counties, TX.
- An outbreak of the **periodical cicada** (*Magicicada* sp.) occurred this May across much of Roanoke, Botetourt and Bedford counties in VA.

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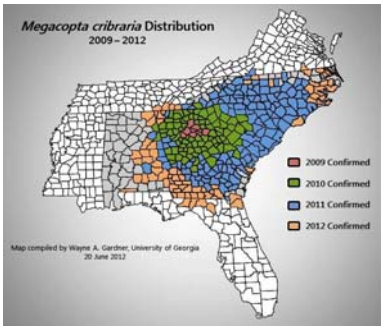
- Heavy **fall cankerworm** (*Alsophila pometaria*) and **spring cankerworm** (*Paleacrita vernata*) populations have appeared in parts of suburban Richmond, particularly Henrico, Hanover, Chesterfield, Powhatan and New Kent counties, VA. Cankerworms feed on a large variety of hosts, but tend to strongly prefer oaks and maples over other species.
- ***Ips* engraver beetles** (western *Ips* sp.) are causing mortality of ornamental Afghan and pinyon pines and Atlas cedar in Brewster, Jeff Davis and Presidio counties of TX.

Insect - Invasive

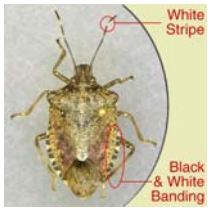
- **Emerald ash borer** (*Agrilus planipennis*) is moving south. In addition to previously-known infestations in the northern Virginia counties of Frederick, Fairfax and Prince William, new infestations were discovered recently near Danville (Pittsylvania Co.) and South Boston (Halifax Co.), VA, near the border with NC.

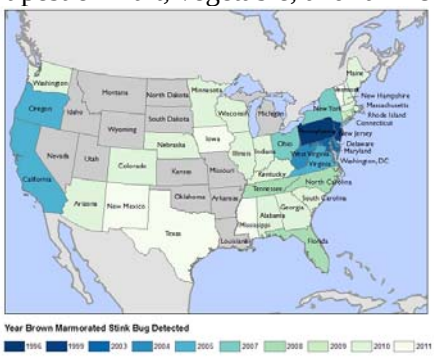
- The **European elm flea weevil** (*Orchestes ulni*) is also spreading to new areas. It is now reported on Siberian/Chinese elm in Colfax, Union, Taos, San Miguel, Mora, Torrance, and McKinley counties of northern NM. The larvae are leaf miners and the adults cause "bird shot" feeding damage. The resulting defoliation can make the trees susceptible to attack by the **banded elm bark beetle** (*Scolytus schevyrewi*).

- The **kudzu bug** (*Megacopta cribraria)* is spreading as well. Since being discovered in GA in 2009, this insect has been reported in 154 of GA's 159 counties – only five along the coast remain unconfirmed. The kudzu bug has also been found in all 47 SC counties, 73 of NC's 100 counties, 25 counties in AL, two counties in VA, four counties in TN and six counties in FL; that's 312 counties in seven states in 2+ years. This is good news for kudzu haters, but unfortunately, this bug is a nuisance pest in the fall and it likes sucking on soybeans too.



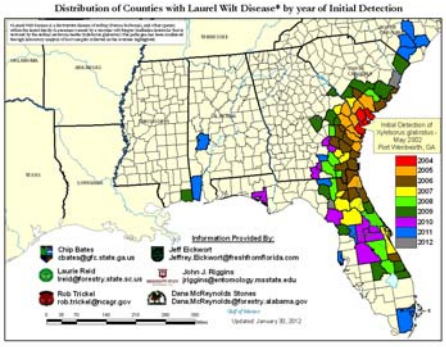
- The **brown marmorated stink bug** (*Halyomorpha halys*) was first discovered in Pennsylvania in 2001. Since then, it has spread to at least 35 other states and was recently detected in MS, TX, and NM in 2011. This is another nuisance pest around homes, as well as becoming a significant pest on fruit, vegetable, and farm crops.





Insect /Disease Combo

- **Walnut twig beetle** (*Pityophthorus juglandis*)/**Thousand cankers disease** (*Geosmithia morbida*) on black walnut was recently reported in TN (2010), VA and PA (2011). See detailed article beginning on page 5.
- **Redbay ambrosia beetle** (*Xyleborus glabratus*)/**Laurel wilt disease** (*Raffaelea lauricola*) on redbay and avocado has spread to AL, NC and southern FL.



- **A new scale/disease complex has been discovered on white pine.** *Matsucoccus sp*, (white pine scale) and *Caliciopsis pinea* (pine canker disease) appear to be causing the decline and mortality of eastern white pine in several counties in VA (7), WV (8), GA (5), and NC (1).

Disease

- **Hypoxylon canker** on red, water and post oaks has been running rampant in Texas. The severe drought of 2011 activated fungal infections in many trees and has resulted in high tree mortality in many areas of east and central Texas.

Here's a Good Cause: Preserve Predatory Insects

(Utah Pest News, Summer 2011)

Predatory insects contribute to natural pest control by eating unwanted pests and helping to maintain pest populations at non-damaging levels. By conserving and encouraging predator populations, plants can be protected from excessive damage.

A common group of beneficial insects are the generalist predators that feed on a wide variety of insect prey. Generalist predators capture and kill their prey immediately and eat many prey individuals during their development. Some of the most abundant generalist predators include damsel bugs, big-eyed bugs, and lady beetles. Each of these predators is found in many different habitats, from backyard gardens to large agricultural operations. These predators overwinter as adults, becoming active and producing eggs in spring.

Damsel bugs are slender, soft-bodied insects with long antennae and legs. A key characteristic of these predators is their enlarged front legs modified for grasping their prey (also known as raptorial legs), similar to a praying mantis. Damsel bugs use a sit-and-wait hunting strategy, capturing prey that comes within reach. They kill by inserting their piercing/sucking mouthparts into their prey and sucking up the body contents.

Adult damsel bugs wait for insects such as aphids to approach.

Big-eyed bugs also have piercing-sucking mouthparts and feed in a similar way. Big-eyed bugs have large bulging eyes and excellent vision. Although they are very small predators (3/16-inch or less), they are very fast, active hunters that eat large numbers of prey. Their diet consists of small prey, like insect eggs, mites, aphids, and young larvae and nymphs, but they also feed on plants to sustain their populations. (Feeding on plants does not result in noticeable plant damage.) The advantage is that big-eyed bugs can remain in an area and feed on plants when prey is not abundant.

Big-eyed bugs eat eggs, mites, aphids, and other small insects.

Lady beetles are perhaps one of the most recognizable predators. However, their eggs and voracious larvae are often overlooked. Lady beetles typically deposit their clutches of bright yellow eggs on the undersides of leaves. Larvae are active hunters that seek out their prey and kill with their chewing mouthparts. The larvae have very large appetites and can attack large prey. Unlike lady beetle adults which can fly, the larvae are wingless and are more likely to stick around an area with insect prey to complete their development.

Lady beetle larvae are colored black to dark purple with spots of orange.

Beneficial insects can be conserved by reducing broad spectrum pesticide use and selecting pesticides that are "soft" or selective and specifically target the pest. Predatory insects can be encouraged by providing them with alternative food resources and shelter. In general, diverse cropping systems and flowering plants may be a way to enhance predator activity. When sampling and monitoring pests it is important to also monitor predator populations and incorporate them into an integrated pest management program.

Truisms When Spraying Trees

(by Paul Wolfe in Tree Care Industry, June 2008)

A "truism" is any self-evident, obvious truth. It's something to which everyone can nod their head in agreement. For instance, the sun rises in the east and sets in the west. The shortest distance between two points is a straight line. The one time you fail to come to a complete stop will be the time the officer is parked around the corner. It's five months to the general election and I'm sick of hearing about politics.

Now that the pest management season is again in full swing, I would like to share some truisms regarding the spray business. I come about these having spent the better part of the past 37 years pulling the trigger of a bean 785 spray gun.

1. In spite of my best preparations, there will always be a major mechanical problem on the first day of the season.
2. With the advent of low odor pesticides, it is important to hit the top of tall trees as you can no longer tell the client that the "stink" will kill the bugs.
3. Even with her body pumped with steroids, Marion Jones cannot outsprint spray drift. We mortals should just accept the fact that we're going to get wet.
4. It is best to drive a truck with an automatic transmission as it is virtually impossible to steer, look at a map, eat a sandwich, and shift gears at the same time.
5. There is always one homeowner adjacent to your client who doesn't want any chemicals to enter their property, even though they have six rat bait stations hidden beneath their shrubbery.
6. At least once a day you will pull the trigger of the spray gun thinking it is set to apply a steady stream only to discover a fine mist emerging from the nozzle. At precisely this time, a breeze catches the mist. See item 3.
7. Be prepared to encounter a locked gate, dog in the backyard, windy conditions, or a thunderstorm upon arriving at the furthest job from your office.
8. Given multiple tanks flowing through a single pump, there is nothing more frustrating than discovering that you spent the entire day treating insects with fungicide because you threw the wrong valve.
9. When in the spray business, one learns exciting new words. Patina, for instance. Patina is the green tint that coats older bronze blobs some people call sculptures. It is the covering you'll be accused of destroying with your spray materials this year even though you have been treating the trees with the same material for the past 12 years.
10. There is no such thing as a perfect day as something will always go wrong. And the worst breakdowns always occur on the calmest days. And carry one spare of everything except spray guns, where you will need two.
11. If you pull too hard on a hose that is hung up, you're guaranteed to uproot a shrub, bend a downspout, or snap an irrigation head.
12. When spraying, it is vital to be constantly aware of your surroundings. It takes approximately five seconds for a novice to climb out of a swimming pool. For those of us with considerable experience, it is possible to both enter and exit a pool without getting wet.
13. If you want privacy when standing in line at McDonald's, spray with something stinky like Orthene.
14. There was a time when pesticides left white spots on the leaves. Now that we use a new generation of materials, it is difficult for clients to tell when a treatment has been completed. When a client asks how they will know if you've been on the property, we use the old Walt Money line, "when you get the bill."
15. The one time you fail to look over the fence before spraying will be the time when the local garden club is having tea beneath the neighbor's pagoda.
16. There will be precious little left of both 200 feet of hose and the gun if they are dragged along the highway for five miles.
17. The longest, hardest drag with the largest diameter hose is always the last one of the day.
18. There is always one client who approves their contract the day after you've finished the route in their area.
19. Try as you will, it is never possible to squeeze an 8-foot-wide truck through a 7-foot, 11-inch opening.
20. Regardless of how well you cover the fish pond, when removing the tarp, all the chemical will be dumped into the pond.
21. When driving by, it may seem appropriate but never polite to shut off a competitor's pony engine when he's in his client's rear yard. It is neither appropriate nor polite to shut off mine.

Forest Pest Management Cooperative's

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