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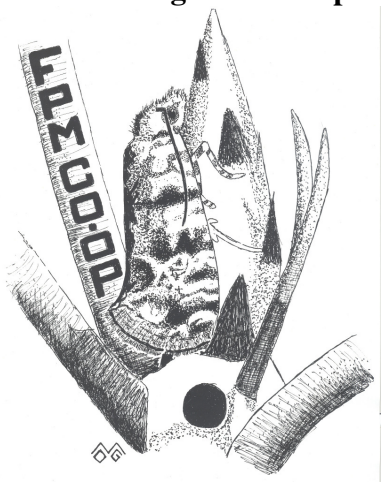
Quarterly Newsletter on Forest Pest Management Issues

Forest Pest Management Cooperative



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

Texas Forest Service, Forest Pest Management,
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 in pine seed orchards and plantations. The newsletter focuses on, but is not limited to, issues occurring in the Western Gulf Region (including, Arkansas, Louisiana, Mississippi, Oklahoma, and Texas).

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Short Survey:

Hard Copy or Electronic? - We have a list of about 250 people who currently receive hard copies of the PEST newsletter. However, more and more people are asking to receive electronic copies of the newsletter via email. Given the cost and effort to prepare and send hard copies we are wondering if we should continue with this format or switch all to the electronic format. Please email Linda Burnett (lburnett@tfs.tamu.edu) and let us know your preference for hard copies or electronic. Also, please let us know if there are additional people that want to receive the newsletter or others that need to be removed from the mailing list. Thanks. DMG.

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Pest Spotlight: Exotic Forest Pests - Our Unwanted Guests

The United States is being invaded! Not by an army of humans, but by leagues of exotic insects, diseases, and weeds which are attempting to establish a foothold in our forests. These organisms are unintentionally transported from country to country each year, primarily as a result of world trade. Exotic stowaways most often travel via ships on or in ballast, cargo, crating, pallets, or other shipping materials.

Over 4,500 exotic organisms have become established in the U.S. (U.S. Congress 1993) and, of these, over 360 insect species and over 20 diseases are known to attack woody plants (Liebhold et al. 1995). Although most tree-attacking exotics cause little damage each year in the U.S., some have caused dramatic changes in our forest ecosystems: consider for example the European elm bark beetle (vector of Dutch elm disease), chestnut blight pathogen, gypsy moth, hemlock woolly adelgid, white pine blister rust, and the beech scale.

Chestnut blight, caused by the fungus *Cryphonectria parasitica*, is probably the most dramatic example. Prior to the introduction of the fungus ca. 1900 from the Far East, the American chestnut comprised 25% of the eastern hardwood forest, an area that included 200 million acres of land (Liebhold et al. 1995). In about 40 years, the disease had eliminated American chestnut throughout its entire natural range. Today, oaks are the dominant species and chestnut survives only as an understory component.

In just the past ten years, several new pests have become established and threaten to again alter forest ecosystems. They include the common pine shoot beetle, *Tomicus piniperda*; emerald ash borer, *Agrilus planipennis*; sirex woodwasp, *Sirex noctilio*; and larch-poplar leaf rust, *Melampsora larci-poplulina* (Liebhold et al. 1995, Haack et al. 1997).

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Exotic Pests (continued from Page 1)

Common Pine Shoot Beetle (CPSB). The CPSB, a native of Europe and Asia, was discovered in six states in the Great Lakes region during 1992 (Haack and Kucera 1993). By 2008, the CPSB had spread to eighteen states (CT, IA, IL, IN, MA, MD, ME, MI, MN, OH, NH, NJ, NY, PA, RI, VT, WI, and WV) and one Canadian province (Ontario). Pine is the principal host tree. Recent experiments indicate that brood development and maturation feeding on loblolly and shortleaf pines is as good as that on the primary European host, Scots pine (C.W. Berisford, pers. comm.). The other two southern pines, longleaf and slash, are more resistant to attack. The most severe damage caused by CPSB is the destruction of shoots during maturation feeding. When populations are high and subsequent shoot feeding is severe, tree height and diameter growth can be reduced by 60 - 70%.

Emerald Ash Borer (EAB). The EAB was discovered in Michigan in 2002. By 2008, the EAB has been found in ten states (IL, IN, MD, MI, MO, OH, PA, VA, WI, and WV) and two Canadian provinces (Ontario and Quebec). In North America, it has only been found in ash trees. Trees in woodlots as well as landscaped areas are affected. Larval galleries have been found in trees or branches measuring as little as 1-inch in diameter. All species of North American ash appear to be susceptible The larvae cause most of the damage as they tunnel through branches and boles, subsequently reducing the quality of lumber, veneer, and wood fiber. Tens of millions trees have already been killed. The EAB has already spread so far that an eradication program is unfeasible.

Sirex Woodwasp (SWW). The SWW is native to Eurasia where it is generally considered to be a secondary pest. It was first discovered in Oswego Co., NY in 2004 and has since been found in MI, NY, PA, and VT. This pest has caused extensive losses to (non-native) pine plantations across the Southern Hemisphere, in Australia, New Zealand, Chile and South Africa, and has no known, native natural controls. All pine species are believed to be at risk, particularly stressed Scots (or Scotch) pine and red pine, as well as Eastern white pine. Literature indicates the SWW will also attack virtually all our other native softwood species. The female SWW injects toxic mucus and a fungus while she is laying her eggs in the bark of suppressed or stressed pine trees. The mucus quickly kills tree cells from the egg-laying site upwards. The fungus feeds on the killed wood, and the insect larva actually feed on the fungus. As they grow, the larvae bore galleries deep into and through the wood.

Larch-Poplar Leaf Rust (LPLR). Many species of *Populus* are increasingly being grown in plantations for wood fiber production. However, a new immigrant, the LPLR, is threatening this industry. The LPLR was reported for the first time in the U.S. from hybrid poplar plantations in WA, OR, and CA (Newcombe and Chastagner 1993). The LPLR disease causes premature defoliation in poplars resulting in dieback of young trees and greatly reduced annual fiber production. The spores of this rust are wind disseminated, sometimes over great distances. This pathogen alternates between species of *Larix* and *Populus*, but the rust also has been reported on *Pinus radiata*. The full host range is not known and it remains to be determined if poplars grown in the Western Gulf region are at risk.

In addition to organisms introduced from other countries and continents, insects and diseases native to North America can and have been introduced to new areas of the continent, potentially causing significant problems. A recent example of this phenomenon is the spread of pitch canker disease (caused by the fungus *Fusarium subglutinans* f. sp. *pini*) to California where it is reported to infect 11 species of pine and Douglas-fir (Storer et al. 1997).

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Exotic Pests (continued from Page 2)

Management of Exotic Forest Pests

Given the potential impact of exotic pest species, it is important to focus management activities on them. The appropriate management strategy for an exotic pest depends on the current phase of invasion, e.g., arrival, establishment, spread, and persistent phases (Liebhold et al. 1995).

One of the most effective methods of avoiding the impact of an exotic pest is to prevent its arrival or exclude it from the region. A requisite to any exclusion program is a pest risk assessment which identifies pest species or groups of species as potentially hazardous (e.g., USDA For. Serv. 1991, 1992, 1993). This process can be difficult because an organism that is innocuous on one continent may become a pest when introduced into a new region.

The two major approaches to exclusion are quarantine and inspection. Quarantine laws prohibit the importation of specific commodities from certain regions of the world or within certain portions of the U.S. Inspection of commodities upon entry from another continent is a useful method of excluding unwanted species.

During the establishment phase, when pest populations are low and the geographic range is small, it is possible to apply suppression tactics that force the population to extinction, i.e., eradication. Extensive monitoring is important when the objective is to prevent pest establishment. Eradication programs are much less expensive and more likely to succeed when pest populations are detected early (Haack et al. 1997).

The methods used for reducing the spread of pests are the same as those used to prevent arrival and establishment. Exclusion of the pest by inspection and quarantine has been effective at minimizing the spread of forest pests. Currently, there are domestic quarantine regulations that limit the interstate movement of forest products associated with the gypsy moth, common pine shoot beetle, oak wilt pathogen, and *Scleroderris* canker pathogen. Pest detection and eradication along the expanding front of an infested area can slow the rate of expansion (e.g., gypsy moth), but have often failed to completely halt the spread.

Once an exotic pest species has become well established in a large area, eradication is no longer an option. Because pests often arrive in a new habitat without their natural enemies, i.e., parasites, predators, and pathogens, introduction of biological control agents can and have been used successfully to reduce pest impact. Among exotic pests that may have become major problems in North America but were successfully controlled via introduced natural enemies are the winter moth, European pine sawfly, and larch casebearer (Liebhold et al. 1995). Additionally, guidelines are available to reduce impacts of exotic forest pests through manipulation of stand structure, species composition, or genetic composition (e.g., Hoff et al. 1976). Probably the best forest pest strategy would be to manage for multiple tree species. Although pests may eliminate one or more tree species before the end of the rotation, growth losses and mortality are likely to be partially compensated by unaffected tree species.

As world trade continues to increase and despite our efforts toward prevention, many new and damaging forest pests will arrive and become established in North America in the future. We can all get involved by collecting and/or reporting unusual insect, disease, or weed specimens or damage to our local County Extension agent or the Forest Pest Management Cooperative.

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Southern Pine Beetle Microbial Ecology

Source: eurekalert.org, 10/2/08 *via. Chemically Speaking Newsletter, October 2008.*

As the southern pine beetle, *Dendroctonus frontalis*, moves through the forest boring tunnels inside the bark of trees, it brings with it both a helper and a competitor. The helper is a fungus that the insect plants inside the tunnels as food for its young. But also riding along is a tiny, hitchhiking mite, which likewise carries a fungus for feeding its own larvae. In a recent issue of *Science*, a team of researchers report that the pine beetle harnesses a second microorganism (an actinomycete) to protect its fungus from the mite's competing one. The bacterium does so by wielding an antibiotic that is brand new to science.

Figure 4. Females (right) are distinguished from males (left) by the presence of a transverse, rather broad elevated ridge, called a mycangium, on the anterior pronotum. Males lack the mycangium but have a distinct frontal groove, and elevations or tubercles on the head are more distinct.

The isolation of the novel antifungal compound - dubbed mycangimycin for the specialized compartments, or mycangia, in which the beetles carry both their fungi and bacteria - raises the intriguing possibility that other such discoveries could follow. "There are perhaps 10 million species of insects on the planet," says University of Wisconsin-Madison evolutionary biologist and symbiosis expert, Cameron Currie, who led the study with Harvard University chemist Jon Clardy. "So, if insects associate with actinomycetes like this more generally, then there's potentially a huge number of new places to explore." The realization couldn't come at a better time.

Historically, the greatest source of antibiotics in the world has been the actinomycetes, especially members of the genus *Streptomyces*. But in recent years, the number of new compounds successfully isolated from these organisms as well as from all microbes has dwindled as resistance to existing antibiotics has spread. Whether symbiotic associations end up being a treasure trove of new antimicrobials and other useful agents remains to be seen. But it's promising to see insects pairing up with actinomycetes. "Actinomycetes are likely very attractive in these situations because of their potent antibiotic-producing abilities," says UW-Madison graduate student, Jarrod Scott, who works with Currie. "In much the same way that we recognize the power of these microorganisms, I think other organisms, in an evolutionary sense, have also recognized their power."

Currie also has good reason to suspect these interactions are widespread. In the 1990s, he was the first to discover that a fungus-farming ant, the leaf-cutter, used an actinomycete to protect its fungal crop from a parasitic mold. That got him thinking about the importance of parasites and disease in the evolution of all organisms, and how these pressures may have led many insects to team up with beneficial microbes as a defense.

That one of the pine's most devastating enemies in the southern United States and Mexico relies so heavily on a bacterium seems incredible, but that's precisely the case for the southern pine beetle. If the beetle's fungus is outgrown by the mite's fungal partner, the beetle larvae will starve. Holding the mite fungus in check has therefore become the job of the actinomycete. What's interesting about the small molecule antibiotic it produces, though, is that it doesn't seem to target the mite fungus specifically. The researchers suspect the beetle fungus has developed some resistance over time, allowing it to survive the same low doses of antibiotic that wipe out its competitor. This suggests the antibiotic could have broad-spectrum activity against other fungi and parasites.

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Thought You Might Be Interested to Know . . .

Liability of Pesticide Exposure

Source: North Dakota Pesticide Quarterly, October 2008.

Editor's note: The following article is a reprint of a paper delivered by Marc G. Kurzman at the EPA's North American Pesticide Applicator Certification and Safety Education Workshop in Portland, Maine, in August 2007. It has some excellent advice, especially for employers of pesticide applicators, regarding the need to adopt "best practices" to avoid lawsuits.

Wrongful death law is an area of law that seeks to provide financial compensation to the heirs of a person whose death was caused by the negligent, willful or wrongful act, neglect, omission or default of another. Each state has drafted its own set of civil "wrongful death statutes," and some form of wrongful death claim action exists in all state jurisdictions today. While they all follow similar principles, each state jurisdiction is unique, so laws will vary from state to state. There are no federal statutes for wrongful death.

Successful wrongful death (and fear of/developing chronic diseases) verdicts can be obtained when there are occupational (and nonoccupational) exposures to hazardous conditions or substances.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs pesticide manufacturing, sale, use and labeling in the United States. FIFRA is regulated by the Environmental Protection Agency (EPA). In order to register a pesticide, the applicant must submit data to the EPA to establish that the pesticide will not cause unreasonable adverse effects on the environment. The unreasonable adverse effects standard, which appears throughout FIFRA, includes "man or the environment." This definition incorporates a risk-benefit standard since it recognizes that pesticides are toxic and, therefore, present a risk to man and the environment, but are also designed to render a benefit - control of a pest. EPA registration of a pesticide pursuant to FIFRA does not mean that the pesticide is "safe," even for its intended use. It merely means that, in EPA's opinion, the benefits of the pesticide outweigh its costs.

Tort pre-emption allows defendants some immunity to civil liability because they have done what is required by statute. The leading case supporting tort pre-emption is Cipolloance v. Liggett Group Inc., 505 U.S. (1992). Cipolloance held that the pre-emptive clause in the Public Health Cigarette Smoking Act pre-empted civil liability. The leading case against tort pre-emption is Medtronic Inc. v. Lohr, 518 U.S. (1996). Medtronic held that the pre-emptive clause in the Medical Device Amendments of 1976 did not pre-empt the plaintiff's tort claims. So far, courts have followed Cipolloance more than Medtronic; however, in 2008, the U.S. Supreme Court will be re-examining this issue in Riegel v. Medtronic.

FIFRA contains an express pre-emption clause regarding labeling requirements. Therefore, the majority of cases regarding pesticides, which have been FIFRA and EPA approved, hold that this approval pre-empts any state common law cause of action arising out of any alleged product liability; however, there is enough precedent to bolster a court's decision either for or against pre-emption.

As the EPA noted in an amicus brief filed in Etcheverry v. Tri-Ag Services Inc., 22 Cal. 4th 316 (Ca. 2000), "Given that FIFRA establishes no private damages remedy for those injured by pesticides, it would be astonishing that, without any discussion, Congress could have intended to deprive injured persons of all means of relief."

In Bates v. Dow Agrosciences LLC, 81 U.S (2005), the U.S. Supreme Court held that FIFRA did not pre-empt the farmer's claims alleging defective design, defective manufacture, negligent testing and breach of express warranty. In Wuebker v. Wilbur-Ellis Co. (8th Cir. 2005), relying on Bates, the court held that EPA regulation did not impliedly pre-empt common law claims.

Plaintiffs can recover "compensatory damages," such as the loss of support, services, lost prospect of inheritance, and medical and funeral expenses. Damages also typically include interest from the date of the decedent's death. Punitive damages may also be awarded in cases of serious or malicious wrong-doing to punish the wrong-doer and/or deter others from behaving similarly.

The law is constantly changing in terms of how it is applied. However, as more health professionals are becoming aware of the potential link between exposure to toxic substances and disease and, accordingly, more plaintiffs' lawyers are looking for more "experts" to bolster lawsuits, it is

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Liability (continued from Page 5)

likely that lawyers seeking money will push against case law and utilize publicity to generate pressure upon manufactures and applicators to settle cases rather than expending millions of dollars defending and hundreds of millions of dollars paying verdicts which may, or may not, be reversed on appeal.

The best practice to avoid civil liability is to use "best (applicator) practices" when dealing with potentially hazardous substances - without regard to whether or not a particular risk is recognized at a particular point in time by a majority of scientific evidence. While no one can be expected to "know" all of the literature and research within a field, it is a safe bet that the plaintiff's lawyer will find it - and an expert to tell the fact finder that a particular defendant knew, or could have known, about the risk. Documenting the steps being taken gathering information and establishing safety routines is essential to later establishing why a particular defendant, be it an individual or a multinational corporation, should not be held liable

Marc G. Kurzman is a litigator with 35+ years of experience trying cases in state and federal courts. A graduate of New York University Law School, he wins more than 85 percent of his trials, with an even higher success rate negotiating satisfactory outcomes. He is admitted to practice in the states of Minnesota, Wisconsin, Florida and New York. He is admitted to practice in a number of U.S. District Courts, U.S. Court of Appeals and the U.S. Supreme Court. His clients have included lawyers, physicians, teachers, legislators, business owners and other professionals. He has been an assistant professor at the University of Minnesota, a lecturer at continuing education programs in Minnesota and numerous other states, a patent attorney and a pharmacist. He served as lead counsel for formaldehyde litigation for the Association of Trial Lawyers of America (representing thousands of plaintiffs nationwide). He is a consultant to managed-care providers and under contract to study civil litigation issues regarding pesticide applications and civil liability as they relate to both health-care professionals and applicators.

Carbaryl Cancellations

(Source: Federal Register, August 20, 2008 via OK CES Pesticide Reports, Sept. 2008)

EPA has received voluntary cancellation request from the registrant to cancel many uses. Uses requested for cancellation are wheat, millet, cotton, fresh/succulent shelled beans and peas, use on poultry or in or on poultry premises/dwellings; all use on pests (dogs, cats and other pets) except for flea collars, use on pet premises, use in or on pet sleeping quarters; and all indoor applications. The use of dust formulations in or on agricultural crops, application of granular formulations to leafy vegetables (except Brassica), ULV for adult mosquito control, and all applications by backpack sprayers and uses of liquid formulations to residential lawns. EPA intends to issue an order allowing the use of existing stocks until the product in hand is used.

Malathion Cancellations

(Federal Register, August 27, 2008 via OK CES Pesticide Reports, Sept. 2008)

EPA has issued a notice to accept the voluntary cancellation request for several Malathion uses. Uses lost are: cowpea forage and hay, soybean, peanuts (pre-harvest and post harvest), sunflower (post harvest), greenhouse food uses, and plum, prune uses; **forest trees,** field and garden seeds; cattle feed concentrate blocks (non-medicated); direct animal and livestock treatments including pet and domestic animal uses for beef cattle, cats, chickens, dairy cattle (lactating and non-lactating), dogs, ducks, geese, goats, hogs, horses (including ponies), pigeons, sheep and turkeys; animal premise uses for dairy and livestock barns, stable and pens, feed rooms, poultry houses, manure piles, kennels, rabbits on wire, beef cattle feed lots and holding pens, cat and dog sleeping quarters, poultry houses, human clothing (woolens and other fabrics); mattresses; and commercial and industrial uses for bagged flour; cereal processing plants, dry milk processing plants, eating establishments, food processing plants, packaged cereals, pet foods and feed stuff. Persons with existing stock can use that Malathion according to the existing product label directions until that container is depleted.

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A Little Humor Goes a Long Way

Editor's note: Given that hunting season has started, I thought y'all might appreciate these stories.

Just Follow the Tracks

Three men are stranded in the middle of the Canadian Forest and they don't know where they are at. They decide that they have to find some food. So the first man leaves and tells the other two that he is going to get some food.

Several hours later, he comes back with a deer over his shoulder. The other two are amazed and ask him how he got a deer with no weapons. He replies, "I find tracks, I follow tracks, I get deer". They both are slightly confused but let it go.

One week later, they have eaten the deer, so they need to get more food. The second guy leaves and says that he is going to get food. He comes back a couple hours later with an elk over his shoulder. The other two ask how he got the elk. He simply replies, "I find tracks, I follow tracks, I get elk".

Five days later, they have eaten the elk, so they need more food. The third guy, feeling very cocky, thinks to himself, "This is going to be a piece of cake. The other guys got the other animals so easy. I'm going to get an animal better than theirs put together!". So he leaves to get some food. They wait a couple hours... he doesn't come back. They wait another couple hours, he is still missing. Finally, after 9 hours of waiting, they see him coming back. His clothes are torn rags; he is covered in dirt with scrapes and bruises all over his body. He is bleeding from different gashes in his arms and legs along with one on the side of head. They ask, "What happened!" He looks at them, wide-eyed and confused, and replies, " I find tracks, I follow tracks, I get hit by train".

Duck Hunting

A man and a friend go duck hunting up North during the winter, and of course all the lakes are frozen. These two guys drive out on the lake ice in his brand new Navigator SUV with their guns and a dog. Now, they want to make some kind of a natural landing area for the ducks, something for the decoys to float on.

In order to make a hole large enough to look like something a wandering duck would fly down and land on, it's going to take a little more effort than an drilling a hole in the ice. So, the man reaches in the back of the SUV and pulls out a stick of dynamite with a short, 40-second fuse.

Now, these two Rocket Scientists do take into consideration that they want to place the stick of dynamite on the ice at a location far from where they are standing (and from the new Navigator truck), and they don't want to take the risk of slipping on the ice when they run from the lit dynamite fuse and possibly go up in smoke with the resulting blast. They light the 40-second fuse and throw the dynamite as far away as they can.

Remember a couple of sentences back when I mentioned the vehicle, the guns, and the dog??

Let's talk about the dog: it's a highly trained Labrador used for RETRIEVING. Especially well trained at retrieving things thrown by the owner. You guessed it, the dog takes off at a high rate of doggy speed on the ice and captures the stick of dynamite with the burning 40-second fuse about the time it hits the ice. The two men yell, scream, wave their arms and wonder what to do now. The dog, cheered on, keeps coming.

One of the guys grabs the shotgun and shoots the dog. The shotgun is loaded with #8 birdshot, hardly big enough to stop a Lab. The dog stops for a moment, slightly confused, but continues on. Another shot and this time the dog, still standing, becomes really confused and of course terrified, thinking these two geniuses have gone insane. The dog takes off to find cover, under the brand new Navigator SUV.

The men continue to yell as they run away. The exhaust pipe on the truck is still hot, so the dog yelps and drops the dynamite under the truck, and takes off after his master.

Then --BOOM-- the truck is blown to bits and sinks to the bottom of the lake in a very large hole, leaving the two idiots standing there with this "I can't believe this happened" look on their faces.

The insurance company says that sinking a vehicle in a lake by illegal use of explosives is NOT COVERED. He still had yet to make the first of those $560.00 a month payments!!!

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