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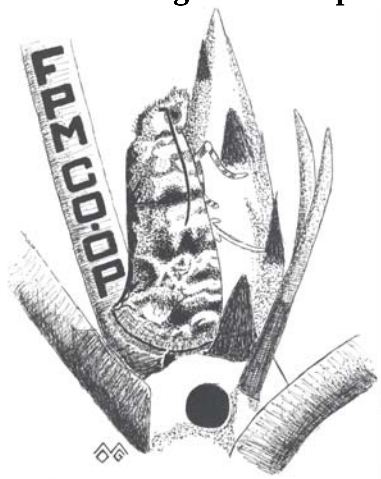
Quarterly Newsletter on Forest Pest Management Issues

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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Announcement:

Entomology Seminar - All FPMC executive and contact representatives, industry, and TFS foresters are invited to attend the fall session of the East Texas Forest Entomology Seminar scheduled for October 13-14, 2010. The meeting will held from 1:00 PM – 8:30 PM on Thursday at Liberty Hall, 805 East Main St. in Nacogdoches, and continue from 8:00 AM until noon on Friday at the Arthur Temple College of Forestry and Agriculture (Room 117) at SFASU also in Nacogdoches. Registration is $30, which includes an evening meal. For additional information and/or an agenda, contact Ron Billings at 979/458-6650 or rbillings@tfs.tamu.edu.

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Summary of 2010 FPMC Research Projects

In 2010, three research project areas – tip moth, leaf-cutting ant, and systemic injection - were continued from 2009. Results from leaf-cutting ant, fire ant and weevil studies were presented in the March 2011 *PEST* newsletter and results from systemic injection studies were presented in the most recent *PEST* newsletter (June 2011). Results from tip moth impact, hazard-rating and control studies are presented below.

The FPMC established a multi-faceted research project directed at pine tip moth in 2001 to: 1) evaluate the impact of pine tip moth on tree height and diameter growth, 2) identify site and stand factors that influence the occurrence and severity of tip moth damage, and 3) evaluate the potential use of systemic insecticides to protect pine seedlings for one or more years after planting. All facets of this project were continued and expanded upon in 2010.

Pine Tip Moth Impact

From 2001 to 2010, 110 study plots were established in Texas, Louisiana, Arkansas and Mississippi. Treatments were continued on 3 second-year sites established in 2009. Four additional (first-year) study plots were established in 2010. In each plantation, one area was selected and divided into two plots each; each plot contained 126 trees (9 rows X 14 trees). Treatments were randomly assigned to a plot in each area. The treatments included: 1) PTM™ dilution applied just after planting (60 ml per seedling) on 1st year plots established in 2009 and 2010, and 2) Check (untreated).

For the seven plots established in 2009 and 2010, PTM™ was applied by PTM™ Injection Probe (Aqumix Inc.) to all trees within the plot (treatment area). Plots established from 2001 - 2009 were not protected in 2010. At the end of each generation, the tip moth damage level was

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Pine Tip Moth (continued from Page 1)

Table 1: Mean percent of pine shoots (in top whorl) infested by pine tip moth on one- and two-year old loblolly pine trees following treatment with Mimic® after each generation in year 1 and 2, or PTM™ in year 1 (2009 and 2010); Arkansas, Lousiana, Mississippi and Texas sites, 2001 - 2010.

	Planted 2001 (N =16)		Planted 2002 (N=7) (N=4)		Planted 2003 (N=10) (N=9)		Planted 2004 (N= 8) (N= 5)		Planted 2005 (N= 6)		Planted 2006 (N=29) (N=22)	
Treatment	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2
Mimic®	1.8	3.8	1.5	3.8	1.2	1.2	1.4	1.8	3.0	7.2	5.0	13.2
Check	23.0	21.9	7.5	15.5	12.2	12.0	10.3	15.6	13.2	15.7	14.0	26.0
% Reduction	92	83	80	75	90	90	87	88	78	54	65	49

	Planted 2007 (N= 13)		Planted 2008 (N=15)		Planted 2009 (N= 3)		Planted 2010 (N= 4)		Mean Year 1	Mean Year 2
Treatment	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	(N=110)	(N=96)
Mimic®	15.5	17.1	4.4	7.7	0.6	16.7	3.3		5.1	8.8
Check	24.0	47.9	24.0	25.0	20.6	58.9	25.5		18.1	26.2
% Reduction	35	64	82	69	97	72	87		**72**	**66**

determined in each plot by surveying the internal 50 trees. Each tree was ranked on the extent of tip moth damage. Trees also were surveyed a final time in December 2010. At this time, data also were collected on tree height and diameter.

Tip moth infestation levels increased in 2010. They were somewhat higher overall (26% of shoots) on first-year check trees in 2010 compared to first-year check trees in 2009 (21%) (Table 1). Tip moth damage was considerably higher (59% of shoots) on two-year old check plots in 2010 compared to 2nd-year sites in 2009 (25%). The PTM® treatments provided moderate protection against tip moth on most second-year sites in 2010. Thus, soil injection applications reduced overall infestation levels by only 72%. The use of PTM™ also provided good protection on first-year sites, reducing damage by 87%.

Pine Tip Moth Hazard Rating

FPMC members provided first-year plantations (many were the same as those used in the impact study). A plot area within each plantation was selected; each plot contained 50 trees (5 rows X 10 trees). One hundred and thirty-eight (138) Western Gulf sites have been used to collect site characteristic data that included:

Tree - Age (1-2), percent tip moth infestation of terminal and top whorl shoots after of 4 - 5 generations, and height and diameter at 6 inches at end of 2nd year.

Site - **Previous** stand history, site index (**SI**, at 25 yrs), silvicultural prescription **(spDebris, spChem, spFert, AddChem, Release**; for 2-year monitoring period), topography (slope, aspect, and **position**), competing vegetation: (proportion of **bare ground, grasses, forbes, and woody** stems after 2nd and last generation each year), rainfall (on site or from nearest weather station), and acreage of loblolly stands (**LobLess15**, < 15 ft tall) within 1/2 mile of study stand boundary.

Soil - Texture (**TextB**) and **drainage**, percent organic matter, soil description/profile (**depth** of 'A' and to 'B' horizons; color and texture of 'B' horizon), depth to hard-pan or plow-pan, depth to gleying, and soil sample (standard analysis plus minor elements and pH).

Tip moth infestation levels were determined in each plot by surveying the internal 50 trees during the pupal stage of each tip moth generation in the same manner as in the impact study. Data on tree height and diameter at 6 inches were collected in November or December on 2nd-year sites.

Most data have been collected from each of the 138 plots established from 2001 through 2009. Mr. Trevor Walker, graduate student at Stephen F. Austin State University, used the data set in a thesis project to develop mixed-effects logistic regression models to predict the probability of tip moth infestation in pine plantations.

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Table 2. Stand and site properties with significant type III test of significance in mixed-effects logistic regression models of probability of tip moth infestation of tree terminal in loblolly pine plantations by state that displayed the association.

	Texas	Arkansas	Louisiana	Mississippi
Stand	AddHerb	AddHerb	AddHerb	
Factors	LobLess15			
	Previous		Previous	
	Release	Release		
	spDebris	spChem		
	spFert			
Site	DepthB	DepthGl	Position	
Factors	DepthGl	SI		
	PerSand	Thick		
	PerSilt			
	Aspect			
	Drainage		Drainage	
	TextB	TextB	TextB	
Soil	P, K, B, Zn, CU	P, K, S, Zn, Mn, Cu	Ca	
Nutrients	Cation	pH		
	PerSatK		PerSatK	
	PerSatMg		PerSatMg	
Competing Vegetation	A1G2 Grass	A1G2 Ground & Forbes	A1GL Ground	
	A1GL Woody	A1GL Grass & Ground		
		A2G2 Woody		

A1G2, Age 1 generation 2; **A1GL**, Age 1 Last Generation; **A2G2**, Age 2 Generation 2
from Walker 2011

Unfortunately, the site and stand properties that produced significant Type III tests of fixed effects on the probability of terminal infestation differed between generations, and the associations appeared to differ between states and in some cases between establishment years within the same state. The sites spanned a wide geographic area and are spread out between establishment years, inducing a large amount of variability in infestation that made detection of strong relationships between individual site and stand properties difficult. Comparisons of infestations against different levels of a site or stand property on sites that are in different regions or have different establishment years within the same region are confounded by the between region or between year variation in infestation.

Site and stand properties found to be significant by state and appeared to influence terminal infestation are listed in Table 2. The influential factors differed from state to state with the Texas sites displaying the most associations, followed by the Arkansas, and then the Louisiana sites. No strong evidence for an association between any of the site and stand properties and the probability of pine tip moth infestation of the terminal existed for the Mississippi sites due to low replication. Note: Two factors, soil

Continued on Page 4

Pine Tip Moth (continued from Page 3)

texture and drainage class (Table 2), showed some trends in certain locations, including east Texas. A small trial is planned for this fall to further evaluate the relationship of soil texture and drainage to tip moth damage late in the year in a relatively small geographic range. Stay tuned.

Pine Tip Moth Control

SilvaShield™ Forestry Tablets (imidacloprid plus fertilizer, Bayer) and PTM™ (fipronil, BASF) were registered with EPA in 2006 and 2007, respectively, based largely on efficacy trials conducted by FPMC. Both products have been shown to provide extended (18 – 36 months) protection of pine seedlings against pine tip moth. Several trials have been established since 2006 to determine optimal application techniques, rates and timing.

A trial was also established in 2007 on two sites to test the efficacy of fipronil applied to containerized seedlings prior to planting. The effects were excellent the first year, very good through 2008, moderate (but still significant) the third year (2009), and faded in the outbreak (4th) year (Figure 1). Volume growth improvements due to fipronil treatments ranged from 17 – 59% (Figure 2). Due to concerns related to chemical leaching and worker exposure, BASF has postponed a request to modify the PTM™ label to include use on containerized seedlings. FPMC is currently developing a plug injection system to address these concerns. A second containerized trial was established this past winter (2010/2011) to evaluate simulated plug injection treatments at different rates versus post-plant applications. Preliminary results are promising.

A direct comparison trial, between PTM™ and SilvaShield™, was established on an east Texas site in fall 2009. Treatments were applied at different times during planting or post-plant (Table 3).

Table 3: *Treatments for PTM and SivaShield Comparison*

Code	Treatment	Color
A	PTM in plant hole at planting (Dec. '09)	red
B	PTM post plant at 1 pt next to seedling (Dec. '09)	blue
C	PTM post plant at 2 pt next to seedling (Sep. '10)	orange
D	PTM at planting + PTM post plant (2 pts, Sep. '10)	pink/blue
E	PTM post plant at 2 pt next to seedling (Feb. '11)	white
F	PTM at planting + PTM post plant (2 pts, Feb. '11)	red/white
G	PTM post plant (1 pt, Dec. '09) + PTM post plant (2 pts, Feb. '11)	yellow/blue
H	SS in plant hole at planting (Dec. '09)	yellow
I	SS post plant next to seedling (Dec. '09)	green
J	SS post plant next to seedling (Sep. '10)	pink
K	SS at planting + SS post plant (Sep. '10)	blue/white
L	SS post plant next to seedling (Feb. '10)	green/orange
M	SS at planting + SS post plant (Feb. '11)	yellow/green
N	SS post plant (Dec. '09) + SS post plant (Feb. '11)	blue/red
O	Check (lift and plant bare root seedlings)	green/white

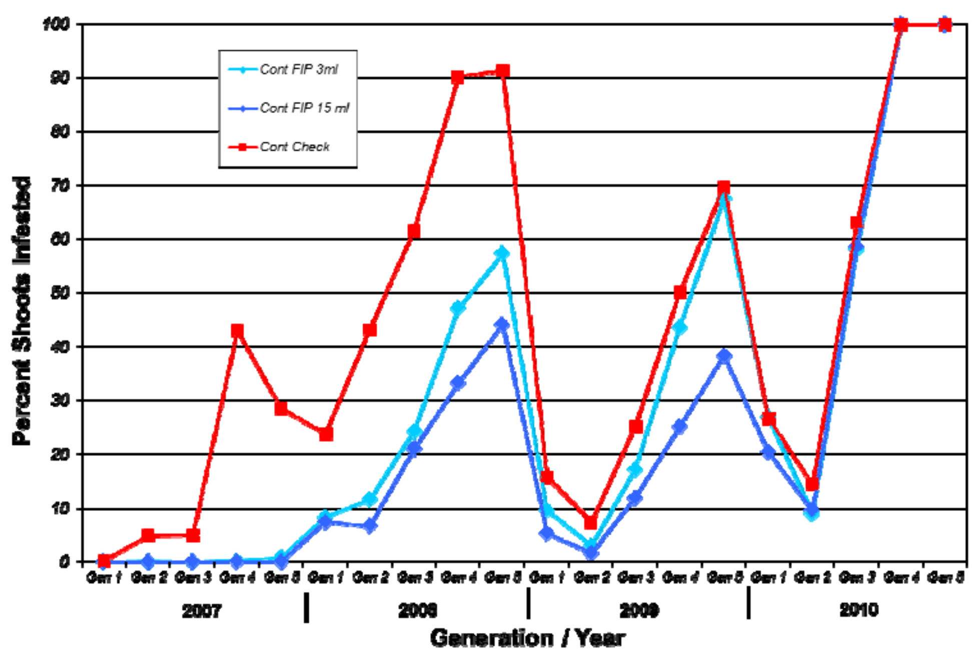

Figure 1. Tip Moth Damage by generation in 2007, 2008, 2009 and 2010 (Angelina and Polk Co. sites combined)

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Pine Tip Moth (continued from Page 4)

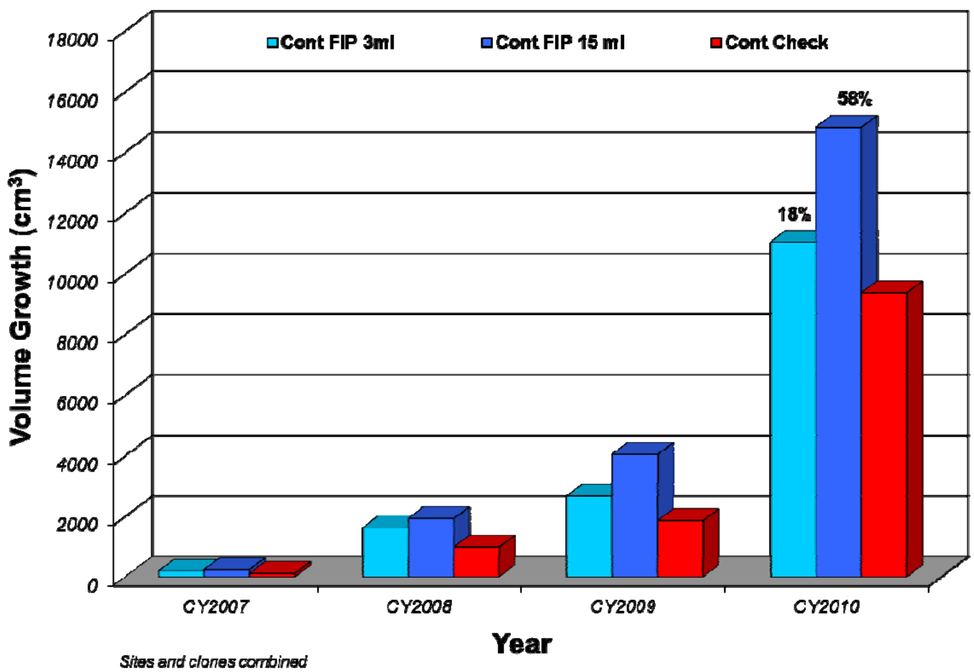

Figure 2. Mean volume index (cm^3) by treatment and year for loblolly pine.

All treatments (PTM and SilvaShield) applied in December '09 provided good to excellent protection against tip moth (Figure 3). Mean reductions in damage range from 79% to 98% for PTM™ and from 91% to 99% for SilvaShield™. Treatments applied later (Sept. '10 and Feb. '11), obviously were ineffective during the first growing year. Significant height growth improvements due to three of five "December" SilvaShield™ treatments averaged 14% to 20% (Figure 4).

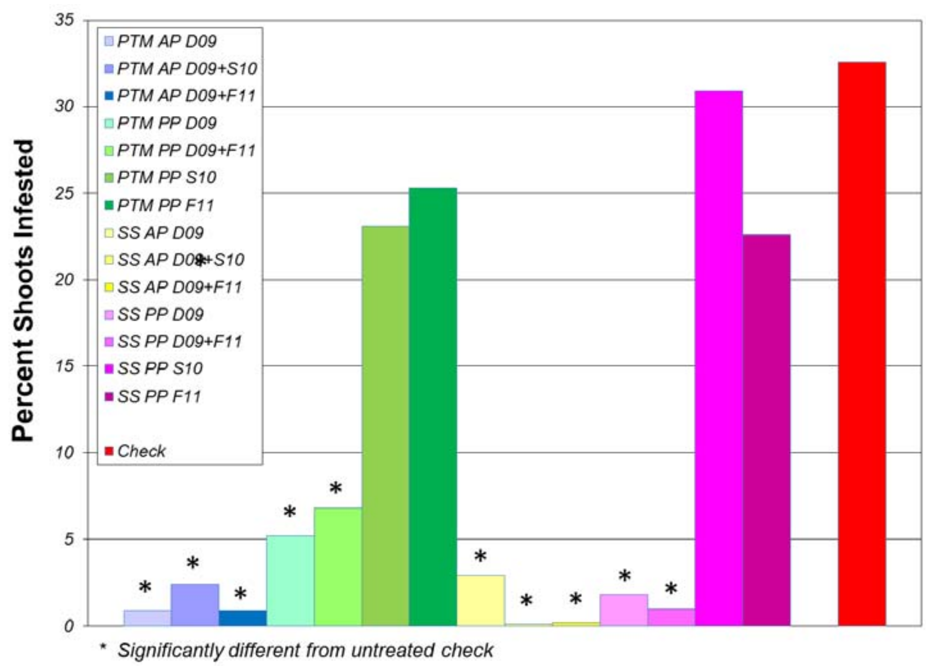

Figure 3. Mean tip moth damage over five generations on one east Texas sites, 2010.

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Pine Tip Moth (continued from Page 5)

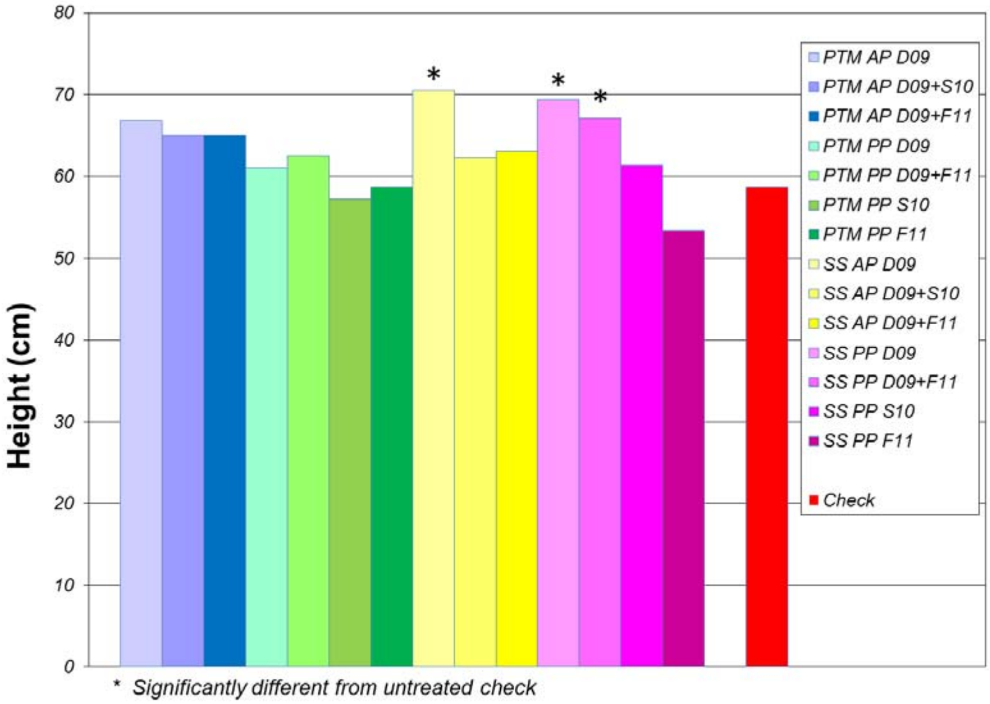

Figure 4. Mean height (cm) of first year loblolly pine by treatment, 2010.

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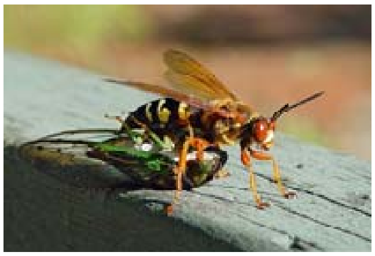
Thought You Might Be Interested to Know . . .

Yard Wasps

Kentucky Pest News 1206, July 28, 2009

Cicada killers, velvet ants, and Scolia wasps can be seen over or in lawns now. These insects are intent on carrying out their daily chores and tend to disregard humans but they attract attention and can cause a painful sting if disturbed.



Cicada killers are among the most impressive of the wasps that can be seen during the summer. These solitary wasps establish tunnels in well-drained, light-textured soil, usually in full sun where vegetation is sparse. Common sites include along sidewalks, in landscaping beds, or in lawns or fields where the turf is sparse. Many burrows may develop in a landscape over time so the wasps can be very numerous and their normal activities can be unsettling and/ or intimidating. Most encounters are with stingless males that challenge intruders who enter their territory. These wasps may get quite close but ultimately they lose interest and fly away. Females can sting but are busy hunting cicadas and burying them in underground tunnels as food for their larvae. However, they may respond to direct disturbance of their burrows and will sting in self-defense.

Cicada tunnels usually have a distinctive U-shaped collar of loose soil around the opening. Individual tunnels are 12 to 18 inches long and may extend 6 to 12 inches deep. There is an average of 15 egg-shaped cells as side chambers to a tunnel. Each contains a paralyzed cicada and a developing wasp larva. Development will be completed next year with the wasps emerging in late summer.

The presence of large numbers of cicada killers in an area is a sign of ideal conditions for them plus an ample supply of cicadas. Over the long term, developing a thick turf may help to reduce wasp numbers. Direct treatment of burrow openings with Sevin dust may provide some short term control.

Velvet ants are striking insects covered with red and black or orange and black "hairs." Females are wingless; males have two pairs of black wings. The female have very long stingers, the potency of the punch is reflected in the common name "cow killer wasps." Picking one up can provide a memorable experience. These wasps, seen walking determinedly across the lawn, do not have a home, so there is no place to treat. They pose no threat unless handled or stepped on by bare feet.

The Scolia wasp has a black head, thorax and wings. The front half of the abdomen is black, the back half is dark orange with two distinct yellow bars. Female wasps cruise just over the turf and occasionally enter the soil in search of white grubs, which serve as food for the wasp larva. These wasps can be very abundant in turf where white grubs are numerous; however, the wasps are not aggressive, and in fact, may not sting at all. These distinctive wasps can be found in many lawns. While their bright warning coloration accentuates their ability to sting, they are not aggressive and control efforts rarely are warranted.

Spider wasps vary in size, but the most obvious species are shiny black to blue-black and are one and one-half inches long. Some species also have red or yellow markings on them. Their wings are transparent black, bluish-black, or reddish. Their larvae feed on stung and paralyzed, but still living, spiders that the mother collects. Similar to velvet ants, spider wasps are also very hard-shelled to withstand bites from their spider prey. In the southwest U.S., there are very large species of spider wasps that attack tarantulas. In Illinois, spider wasps tend to attack wolf spiders and grass spiders.

All You Wanted To Know About Induced Resistance In Trees

[1] Eyles A, Bonello P, Ganley R, Mohammed C. 2010. Induced resistance to pests and pathogens in trees. New Phytologist 185: 893-908 via. Forest Health News 206, June 2010

As part of Scion's research program on induced resistance, supported by capability funding, a review of induced resistance to pests and pathogens in trees was written. This review has recently been published in New Phytologist [1].

The review summarizes findings from studies on induced resistance in trees, describes the mechanisms underlying induced resistance and discusses the large knowledge gaps that need to be addressed if the potential offered by the application of induced resistance in forests is to be harnessed. This article summarizes the main points of the review, with particular reference to conifers and plantation forestry.

Trees have evolved diverse defense strategies to overcome insect and pathogen attack. They include multiple defenses that impede access, deter or kill insects and inhibit or exclude pathogens by physical or chemical processes. Active, or constitutive, defenses present the first line of defense and when breached induced defenses are triggered. These induced defenses can be categorized into five mechanisms, each of which can contribute to induced resistance. A tree response may include a combination of these mechanisms, modified by biotic and abiotic factors. The five categories of induced defence mechanisms are chemical (i.e. phenolic compounds, alkaloids) and protein based defenses (i.e. oxidative enzymes, proteinase inhibitors), anatomical defenses (mechanical barriers), ecological or indirect defenses (attraction of the pest's natural enemies), and civilian defenses (reallocation of resources to growth – i.e. tolerance).

Induced resistance can occur at the site of attack, in the distal parts of the plant, or throughout the plant (systemic response). There are at least seven types of systemic induced resistance, the most well-known to New Zealand forestry is induced systemic resistance that may be activated by colonization of plant roots by plant growth promoting rhizobacteria, or fungi such as *Trichoderma*, *Penicillium*, or *Phoma*. For instance, the rhizobacteria *Bacillus pumilus* and *Serratia marcescens* induced systemic resistance to fusiform rust caused by *Cronartium quercum* f. sp. *fusiforme* on *Pinus taeda*. Examples of systemic induced resistance in conifers include a demonstrated effect against the pitch canker pathogen *Fusarium circinatum* in *Pinus radiata* in California. Young *Pinus nigra* trees inoculated in the stem with *Diplodia pinea* and the less aggressive *D. scrobiculata* became more resistant to subsequent inoculations in the stem or branches with *D. pinea*.

Fungal endophytes (left) have been shown to confer host resistance in several tree species. Endophytes from *P. monticola* were effective at increasing the survival from attack by *Cronartium ribicola*, the cause of white pine blister rust. Inoculation of leaves with endophytes isolated from leaves of infected but disease symptom-free cocoa trees significantly reduced leaf dieback and death when challenged with a pathogenic foliar *Phytophthora* sp.

Induced resistance, obviously, must be activated by a signal generated as a consequence of attack. The pathways by which the signal is transmitted through the plant appear to be mediated by jasmonic acid, salicylic acid, and ethylene. These are commonly-known as elicitors.

In pines, elicitors or signaling molecules have been shown to increase *P. radiata* resistance to artificial inoculation with *F. circinatum*, increase resistance to *D. pinea* and increase *P. sylvestris* resistance to the pine weevil *Hylobius abietis*.

Some compounds combine the effect of direct action on the pest or pathogen plus induced response from the plant. The imidaclioprids Admire® and Confidor® are examples, as are jasmonates and phosphonates (i.e. Fosphite® and Agriphos®).

The application of induced resistance mechanisms can have its drawbacks. It is possible to obtain a negative response and systemic induced susceptibility has been reported in herbaceous plants and trees. Basal stem inoculation with the butt rot pathogen *Heterobasidion annosum* induced susceptibility to *D. pinea* shoot dieback of *P. pinea*. Inoculation of *P. nigra* with *D. pinea* resulted in

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Induced Resistance (continued from Page 8)

resistance of stem tissues but increased susceptibility of shoot tips to *D. pinea*. The trade-off between disease resistance and the high cost of defense activation needs to be considered, where resources that could have been allocated to growth are diverted to defense. Some studies have shown that application of methyl jasmonate reduced growth compared to untreated controls.

Induced resistance does not offer complete control and will have to be deployed in a manner that considers environmental factors, the pest or pathogen and the risk of making the host more susceptible to attack. Nevertheless, the authors conclude that results from recent studies are highly encouraging and suggest that using induced resistance as a future management option is a plausible goal.

Oh No! Bark is Piling Up at the Base of My Tree!

Gretchen Riley, Texas Forest Service, In the Shade, The Newsletter of the ISA – Texas Chapter, Sept. 2011

Don't panic! There are several reasons bark can be sloughing off and piling at the base of a tree and not all of them are fatal.

Sloughing or peeling of the bark can be a normal process, especially in the spring when the tree increases growth. Bark may peel or fall off the tree in sheets, plates, strips or blocks depending on species.

Smooth patch (left) is a disease typically caused by the fungus *Aleurodiscus oakesii*. The fungus breaks down the dead bark of an oak tree and uses it as a food source, causing the bark to fall off. Smooth patch may cause the oak to appear unsightly, but it is not a threat to the tree's overall health.

Sunscald and frost cracks (left) can also cause splitting and sloughing of bark. Both sunscald and frost cracks are localized bark injuries that often occur on the southwest side of younger trees, and normally heal on their own. Usually not fatal themselves, sunscald and frost cracks can allow the entry of bacterial pathogens or insects which may cause harm to the tree.

Sometimes, sloughing of bark is cause for concern. Extensive infestations of borers can cause sloughing of bark and result in death of young or newly transplanted trees. Typically evidence of borer infestation is observed as sawdust found beneath exit holes in the trunk and large branches, or sawdust-filled tunnels beneath the bark. Damage often manifests as sparse and yellowing foliage.

Hypoxylon canker, caused by the opportunistic fungi *Hypoxylon atropuntatum*, also results in sloughing of bark in infected trees. Tan, olive green, or reddish-brown powdery spores can be seen where the bark has sloughed off and the bark chips are found at the base of the tree. Hypoxylon is quick to colonize weakened or damaged wood and is often more prevalent during drought. Typically, by the time the symptoms are apparent, it is too late for the tree.

DuPont Suspends Sale of Imprelis™

Pesticide & Chemical Policy, August 8 2011, Volume: 39 Issue: 35 via.
Oklahoma Coop Ext Serv. Pesticide Reports, Sept. 2011

DuPont is voluntarily suspending the sale of Imprelis™, which EPA and the company are investigating regarding a potential link between the herbicide and damage to certain evergreen trees, particularly Norway spruce and white pine trees. The agency says it is considering issuing a stop sale, use or removal order, noting in an Aug. 3 letter to the company it has reason to believe - based on DuPont data and information collected during EPA and state investigations - that the directions for use and/or warning or caution statements on Imprelis™ are inadequate to protect non-target plant species.

A source familiar with the matter reportedly told *Reuters* EPA is in fact preparing an SSURO, the news service reported Aug. 4.

In an Aug. 5 letter to turf management product distributors, DuPont announced the voluntary suspension as well as plans to conduct a product return and refund program for Imprelis™. DuPont says the action is consistent with ongoing discussions with EPA.

EPA notes on its website that it has received reports from "numerous states" that Imprelis™, which contains the active ingredient aminocyclopyrachlor, is injuring evergreen trees. The agency says it is working closely with state agencies to determine the cause of the reported damage and is in contact with DuPont.

"We are requiring the company to expedite submission to the agency of detailed information about incidents, and are also requiring DuPont to determine what is causing the injuries," EPA says on its website.

In the Aug. 3 letter, the agency notes concerns with "the sweeping nature" of confidential business information claims DuPont has made for submitted studies. EPA is evaluating whether they warrant such treatment and "strongly encourages DuPont to reconsider CBI claims for these studies, especially for the phytotoxicity studies related to effects on trees.

EPA and DuPont are advising that Imprelis™ not be used where Norway spruce or white pine trees are present or nearby. DuPont has also taken a number of actions to make it easier to report and resolve problems with Imprelis™. DuPont is engaging 20 arborist companies to work on and evaluate claims, and the company has launched a website, *imprelis-facts.com*, with the latest information about Imprelis™. It has also established a toll-free hotline, 866-796-4783, to handle all reports of problems and answer questions.

EPA conditionally registered aminocyclopyrachlor in August 2010, finding the active ingredient poses low risk to humans and non-target organisms, except for plants.

"In roughly 400 efficacy and phytotoxicity field trials that the manufacturer, DuPont, conducted in their development of the chemical, they reported to EPA that they did not observe adverse effects to trees," the agency notes on its website.

Aminocyclopyrachlor is related to other herbicides that have caused plant damage - but not significant damage to trees - when present in compost or manure due to their use on turf grass or pasture grass. EPA required labeling restrictions to reduce these risks.

Three companies sued DuPont last month in the U.S. District Court for the District of Delaware for allegedly misrepresenting the safety of Imprelis™ and concealing or omitting the fact that it seriously damages trees. They contend applications of the pesticide were followed within weeks by lethal damage to mature evergreen trees. At least 14 additional lawsuits have been filed against DuPont in the past three weeks, *Courthouse News* reports.

EPA Issues Stop Sale Order to DuPont on Sale and Distribution of Imprelis™ Herbicide

Oklahoma Coop Ext Serv. Pesticide Reports, Sept. 2011

The U.S. Environmental Protection Agency (EPA) today issued an order to E.I. DuPont de Nemours (DuPont) directing the company to immediately halt the sale, use or distribution of Imprelis™, an herbicide marketed to control weeds that has been reported to be harming a large number of trees, including Norway spruce and white pine. The order, issued under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), requires DuPont to stop the sale and distribution of Imprelis in the U.S. and outlines specific conditions to ensure that the removal of Imprelis™ from the market meets legal requirements.

This action follows EPA's investigation into why a large number of evergreens and other trees have been harmed following the use of the herbicide. In its evaluation, EPA is investigating whether these incidents are the result of product misuse, inadequate warnings and use directions on the product's label, persistence in soil and plant material, uptake of the product through the root systems and absorbed into the plant tissue, environmental factors, potential runoff issues or other possible causes. On June 17, 2011, DuPont issued a letter to professional applicators cautioning against the use of Imprelis™ where Norway spruce or white pine trees are present on, or in close proximity to, the property being treated.

On July 27, 2011, DuPont acknowledged to the EPA that there has been damage to trees associated with Imprelis™ use and the company had developed an internet web page to provide information and updates concerning Imprelis™ use.

On August 4, 2011, DuPont voluntarily suspended sales of Imprelis™ and announced that it will soon conduct a product return and refund program.

FIFRA is a federal law that requires the registration of pesticide products and pesticide-production facilities, and the proper labeling of pesticides. This requirement protects public health and the environment by ensuring safe production, handling, and application of pesticides and by preventing false or misleading product claims.
Information about today's order: www.epa.gov/compliance/resources/cases/civil/fifra/dupontimprelis.html (EPA August 11, 2011)

My Tree is in Decline, Now What?

By Stephanie Porter - Home, Yard & Garden Pest Newsletter, Issue 14, August 22, 2011

Most trees samples are immediately put into culture in order to isolate any fungal pathogens that may be infecting the vascular system of the tree, after they arrive at the University of Illinois Plant Clinic. If the trees are negative for vascular, fungal pathogens, such as oak wilt (*Ceratocystis fagacearum*), Dutch elm disease (*Ophiostoma ulmi*), and *Verticillium* wilt (most often caused by *Verticillium dahlia*), the sample is carefully examined for signs of tree decline, such as:

- poor branch tip and stem growth (This is a sign that the tree may have been declining for several years, but our client is just now seeing symptoms of major decline)
- pale or yellow leaves
- delayed spring flush of growth
- leaf scorch (Lack of water can also cause leaves to scorch)
- smaller leaves than normal
- early leaf drop
- premature fall color
- dieback of the crown, twigs, and branches
- production of suckers on the branches or trunk
- abnormally large seed production (This also can be a normal response to certain weather conditions or a normal occurrence in some tree species)

Ash decline (photo by Nancy Pataky)

Continued on Page 12

Tree Decline (continued from Page 11)

If the tree does show signs of decline, we will report this to our client, but it will be up to them to figure out what may be causing stress to their tree. Most clients would like to have a quick fix, but most of the time, it is not that easy. Here is a checklist of causes for decline:

- Have you had extremely high or low temperatures, such as rapid drop in temperature following a period of mild weather in the fall or spring?
- Has there been a fluctuation in soil moisture (drought or flooding)?
- Could there have been mechanical damage to tree roots from nearby construction, livestock, or environmental effects?
- Was there damage to the trunk or limbs due to lawn mowers, vehicles, vandalism, animals, or cracks (ex. sunscald, frost, and lightning)?
- Has the tree experienced adverse weather conditions such as strong winds or hail, diseases, insects, or herbicides at critical periods of plant development?
- Could there have been winter injury?
- Has there been changes in the soil near the tree such as compaction (parked cars), changes in soil drainage, or excessive or lack of soil moisture?
- Has there been soil fill or soil removed near the tree?
- Could the roots have been injured from excess deicing salt, pesticide, fertilizer, or herbicide?
- Was the tree planted incorrectly?
- Was the tree planted too deeply? Is there volcano mulch or excess soil near the base?
- Did you provide the tree with the proper maintenance after planting?
- Is the tree planted in a site with poor soil structure and drainage (clay)?
- Have you had a soil test? Could there be a soil nutrient or mineral deficiency, imbalance, or improper soil pH?
- Could there be an obstruction that could restrict growing space for roots such as a sidewalk, driveway, patio, or septic tank?
- Do the roots appear to be girdled, poorly formed, or bound in twine (if above the ground)?
- Is there too much competition from surrounding trees or plants?
- Are the surrounding plants near the declining tree injured as well (ex. gas leak, environmental, or chemical injury)?
- Do you have comprehensive history of the pesticide use near the tree? Could a soil sterilant or biocide been used in a nearby gravel driveway or sidewalk?

If you need help with the evaluation of your tree contact your local County Extension office or contact a Certified Arborist.

Unfortunately, a stressed tree is more susceptible to disease, insects, and other secondary organisms.

Oak in decline, with a heavy infestation of oak gall (photo by S. Porter)

You will need to identify what may be stressing your tree, and correct it, if possible. You can refer to the following report on disease, "Decline and Dieback of Trees and Shrubs" (Adobe PDF), for further information. In the meantime, we always recommend that you water the tree in times of drought greater than two weeks, fertilize with a general tree fertilizer in the fall, and prune and destroy any dead branches or leaves on or near the tree. It is especially important to remember to trim oaks in late summer and fall only, to avoid infection of oak wilt.

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Tree Injection Workshops

The Texas Forest Service is offering a half-day workshop on new technology for injecting trees against insect and disease pests. The workshop, to be held at 6 different locations, will begin at 9:00AM and run until 2:30PM. A catered lunch and field demonstration of injection equipment are included. Mark your calendar and plan to attend one of these workshops.

October 17	Lufkin	Angelina County Extension Center	2201 S. Medford Drive
October 18	Conroe	AgriLife Extension Office	9020 Airport Road
October 25	Midland	Martin Luther King Rec. Center	2300 Butternut Lane
October 26	Austin	LBJ Wildflower Center	4801 La Crosse Ave
October 27	Dallas	Whitehurst/Education Building	17360 Coit Road
October 28	Overton	AgriLife Extension Center	1710 N. FM 3053

Topics

- Target forest and tree pests: identification, biology and types of damage
- Systemic pesticides: registered chemicals, application technology and safety
- Effectiveness, duration, costs, and methods of application
- Field demonstration of tree injection methodology and available equipment

Target audience: Certified pesticide applicators, foresters, forestry technicians, arborists, private landowners. CEUs from TDA, TSAF and ISAT will be provided.

Fee: $15 per person (includes lunch and refreshments)

To RSVP for the workshop & lunch, contact Harold Read by email (hread@tfs.tamu.edu) or phone (936-639-8170).

Pay at the door or mail check payable to Texas Forest Service to Harold Read, Texas Forest Service, P.O. Box 310, Lufkin, TX 75901.

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