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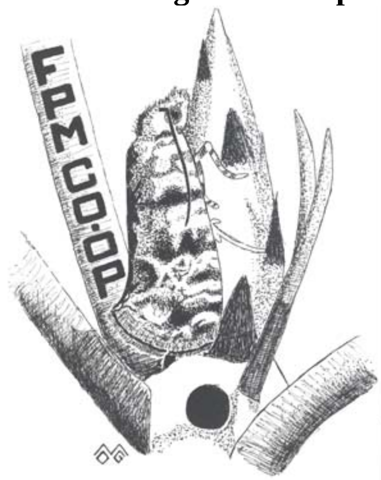
Quarterly Newsletter on Forest Pest Management Issues

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 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:

New leaf-cutting ant bait to be registered – Central Garden & Pet (CGP) has announced that they will move forward with the registration of a new leaf-cutting ant bait. FPMC has been testing the new larger bait (modified from Amdro Ant Block) for the past two years. Efficacy has been improved 30-40%. The registration will likely take 4-6 months. Assuming the federal and state registrations are approved, the bait should be available for purchase and use around the first of the year 2012. For additional information, contact Don Grosman at 936-639-8170 (ph), 936-546-3175 (cell) or dgrosman@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 last *PEST* newsletter (March 2011). Summaries of the results from 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. 2011).

Systemic Injection

The Forest Pest Management Cooperative (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) already has been shown in several injection trials to be highly effective in reducing coneworm damage for extended periods and effective in preventing the colonization and mortality of injected trees by *Ips* engraver beetles and aggressive *Dendroctonus* species. Trials were continued in 2010 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

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 August. All cones from each study tree were collected in the fall and evaluated for

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Systemic Injections – Continued from Page 1

coneworm damage. Seeds were extracted from 10-cone samples and x-rayed to evaluate for seed bug damage.

At the Woodville TX site, four treatments (EB, EB + spray, abamectin and acelopryn) improved cone or conelet survival in 2010, while EB as well as imidacloprid and dinotefuran significantly reduced seed bug damage compared to checks. Mean reductions in 2010 ranged from 0 - 54% (Fig. 1).

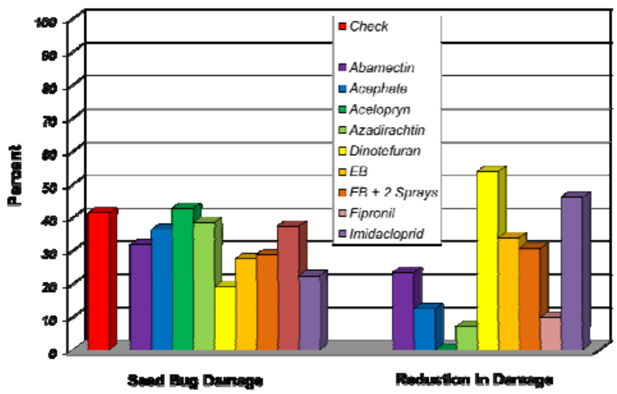

Figure 1. Percent seed bug (*Leptoglossus* and *Tetyra* spp.) damage and reduction in damage on TX loblolly pine seed collected from trees injected with several systemic insecticide treatments, 2010.

All treatments containing an EB component or abamectin, acelopryn or fipronil significantly reduced coneworm damage in 2010; reductions ranged from 78 - 99% (Fig. 2).

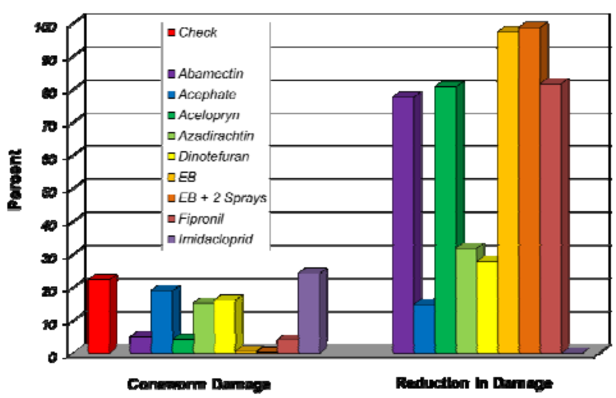

Figure 2. Percent coneworm (*Dioryctria* spp.) damage and reduction in damage on second-year TX loblolly pine cones treated with injections of one of several systemic injection treatments, 2010.

At the Magnolia AR site, all treatments improved conelet survival, but only (Imid + EB and Dino + EB) improved cone survival in 2010. All treatments significantly reduced seed bug damage compared to checks. Mean reductions in 2010 ranged from 33 - 61% (Fig. 3).

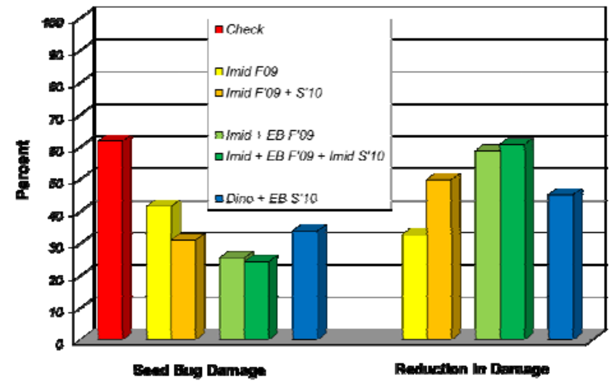

Figure 3. Percent seed bug (*Leptoglossus* and *Tetyra* spp.) damage and reduction in damage on AR loblolly pine seed collected from trees injected with imidacloprid (Imid), dintefuran (Dino) and/or emamectin benzoate (EB) treatments, 2010.

All treatments containing an EB component significantly reduced coneworm damage in 2010; reductions ranged from 40 - 78% (Fig. 4).

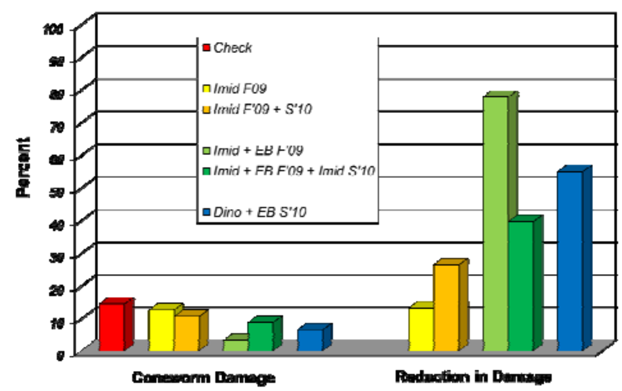

Figure 4. Percent coneworm (*Dioryctria* spp.) damage and reduction in damage on second-year AR loblolly pine cones treated with injections of imidacloprid (Imid), dintefuran (Dino) and/or emamectin benzoate (EB) treatments treatments, 2010.

A trial was installed in spring 2009 at the TFS's Hudson TX hardwood seed orchard to evaluate EB's potential 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 and 2010. Insects causing damage were identified to species.

Several insect species (5 defoliators and 1 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

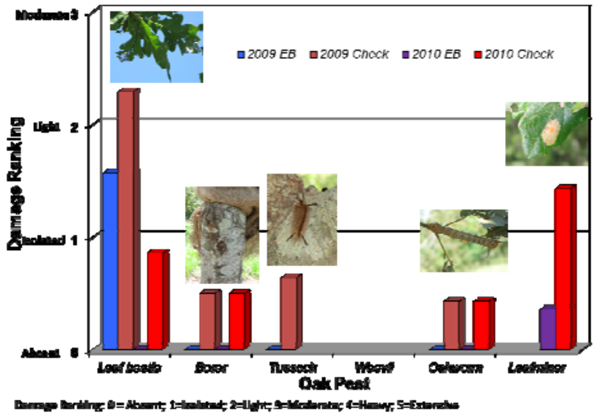

Figure 5. Occurrence and level of damage caused by different insects on bur oak treated with emamectin benzoate, Hudson TX, 2009 & 2010.

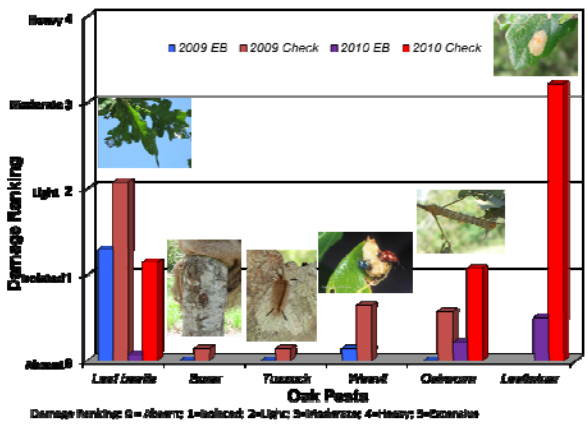

Figure 6. Occurrence and level of damage caused by different insects on cherrybark oak treated with emamectin benzoate, Hudson TX, 2009 & 2010.

Bark Beetle Trials

Two separate trials were established, one in 2008 and the second in 2009 to evaluate different systemic insecticides against:

1) ***Ips* engraver beetles on loblolly pine in TX, and**
2) **Southern pine beetle (SPB) on loblolly pine in AL**

The *Ips* trial evaluated the duration of two rates of abamectin in 2008. Both rates of abamectin were highly and equally effective against *Ips* engraver beetles 5, 10, 16, 22 and 28 months after injection (Fig. 7).

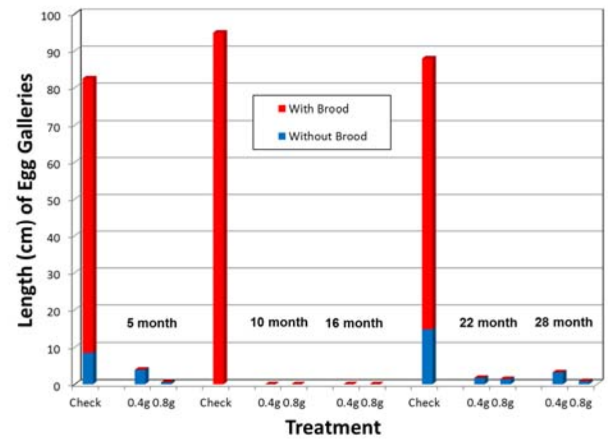

Figure 7. Effect of two abamectin injection treatments on *Ips* engraver beetle attack success expressed as length of egg galleries with and without brood.

In the SPB trial, trees (30) were injected with EB, a fungicide mix or combination treatment using Arborjet's Tree IV. Four weeks later, all trees (treated and untreated) were baited with species-specific pheromones to induce beetle attack. SPB populations were not sufficient to kill >60% of check trees in AL during the first and second year. However, the beetle attack levels on EB-injected trees were markedly lower than those on untreated checks (Fig. 8).

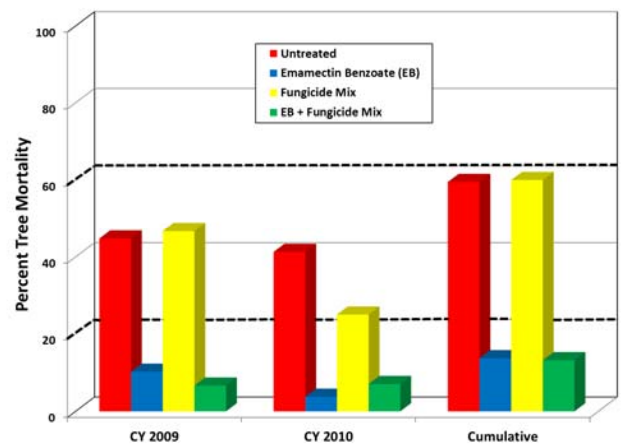

Figure 8. Effects of injection treatments on mortality of loblolly pine attacked by southern pine beetle in 2009 and 2010, Oakmulgee, R.D., Talladega N.F., AL.

After three (long) years, 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)."

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Systemic Injections – Continued from Page 4

Mauget's abamectin has shown excellent protection against *Ips* engraver beetle and some activity against coneworms. A second abamectin trial was established in fall 2010 to evaluate lower rates. 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:

Texas Forest Service (Tom Byram)
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DuPont (Bruce Steward)
Mauget (Marianne Waindle)
Syngenta Crop Protection (David Cox, Jackie Driver)

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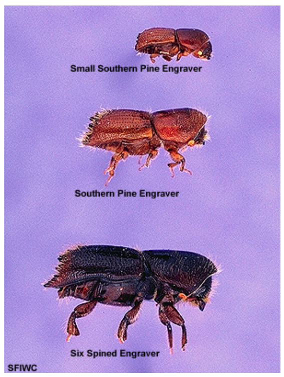
Pest Spotlight: *Ips* Engraver Beetles

Little or no southern pine beetle (SPB) activity has been predicted again for this year in Texas and much of the South (see SPB article). However, many foresters and private landowners are probably noticing the death of numerous small groups of pines and are wondering if perhaps the predictions were wrong - that SPB is back. The appearance of these small infestations is likely to be the work of three species of pine engraver beetles (the small southern pine engraver, *Ips avulsus*, the eastern five-spined engraver, *Ips grandicollis*, and the six-spined engraver, *Ips calligraphus*).



Most of the time these beetles breed harmlessly in logging debris and weakened trees, but numbers of beetles and infested trees can increase dramatically during prolonged droughts when large numbers of trees have been stressed or damaged by fire, lightning, wind (i.e., hurricanes and tornadoes), ice, logging/thinning, or disease.

The three *Ips* species commonly attack all species of pine in their range, but are of particular importance in loblolly, shortleaf and slash. Attacks by bark beetles can be determined even before the foliage begins to discolor by the presence of reddish-brown boring dust in the crevices of bark and/or dime-sized, resinous pitch tubes formed at the beetles' entrance holes into the tree. The presence of *Ips* can be confirmed by cutting away the bark at the entrance hole with a hatchet to reveal the gallery pattern. For *Ips*, the forester will find a "Y-" or "H"-shaped pattern (lower left). This pattern differs from the "S"-shaped gallery patterns constructed by SPB.

The three species differ in their distribution on the host. The small southern pine engraver often infests the crown area and upper bole of its host. The five-spined engraver infests the intermediate portions of the bole as well as large limbs in the crown. The six-spined engraver tends to infest the lower portion of the bole. There can be considerable overlap in these distributions on the host tree.

The effects of severe droughts the past few years and recent fires have stressed large areas of forest from Texas to Florida and north to New Jersey. *Ips* beetle infestations have long been associated with prolonged droughts during the growing season. Generally, timber growers can expect that a severe drought will occur at least once during the lifetime of a pulpwood stand and twice during the lifetime of a sawtimber stand. Pines growing in shallow soils or in heavy clay soils are especially subject to moisture stress during droughts.

Trees whose trunk and roots have been charred by fire become susceptible to *Ips* attack. The probability of beetle attack is high when 80% or more of the trunk is charred and 50% or more of the foliage is consumed. Storm-damaged pines also invite infestations of *Ips* bark beetles.

Plantation trees often have a higher incidence of *Ips* infestations than do trees in natural stands. The higher susceptibility in plantations may be due to planting errors, such as planting the wrong species on a given site; planting seedlings incorrectly in the field; or planting seedlings too close together.

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Ips Engraver Beetles – Continued from Page 4

Logging/thinning operations tend to increase the incidence of *Ips* attacks when fresh logging debris is left on site (right) and/or when cutting, skidding, and hauling result in injuries to above- and below-ground portions of residual trees.

Preventative actions that help maintain stands in a healthy, beetle-resistant condition are recommended. Among these are careful establishment of plantations, thinning of overstocked stands, prescribed burning, and avoidance of logging injuries. Pine stands should be promptly inspected following incidences of drought, wildfire, lightning, wind, and ice-storms. The rapid salvage of heavily damaged, merchantable timber can often minimize losses and reduce the threat of *Ips* infestations. Control of *Ips* infestations with insecticides is seldom recommended in forested areas. However, preventative sprays, using bifenthrin (Onyx®), permethrin (Astro®, Dragnet®, Permethrin Pro), or carbaryl (Sevin®) may be warranted to protect especially high-valued stands or seed orchard trees. Complete coverage of the entire tree is necessary for protection. This can be very difficult with trees over 40 feet tall. A new alternative treatment is injections of emamectin benzoate (TREE-age, Arborjet). FPMC research (see page 3) has shown that this product can prevent mortality by *Ips* engraver beetles for 2 or more years with a single application.

References:

Coulson, R.N. & J.A. Witter. 1984. Forest Entomology - Ecology and Management. John Wiley & Sons. 669 pp.

Wilkinson, R.C. & J.L. Foltz. 1982. *Ips* engraver beetles: Identification, biology, and control. Ga. For. Comm. Ga. For. Res. Pap. No. 35. 10 pp.

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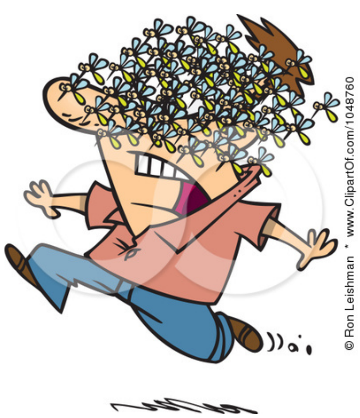
A Little Humor Goes a Long Way

Boom Boom Bees

(Source http://www.darwinaward.com)
2009 At-Risk Survivor

Here is an unconfirmed story about a person who was a runner up for a Darwin Award after attempting his brand of pest management. What's a Darwin? Darwin candidates celebrate life by reminding us how close we've each come to death as a result of our own foolish actions. Aren't you relieved that YOU have (thus far) managed to avoid the "wet feet & light switch" accident? This fool fared worse... Enjoy, but remember – think before you leap (and bee careful).



(1999) Our hero had just moved into a rental home. The yard had not been mowed in over a year. He set about mowing down the overgrown weeds, and soon ran right over a foot-wide hole. Out came an angry army of yellowjackets! As he ran in terror, our man knew he had to get rid of these pests somehow, and soon.

He sat on the porch pondering the problem over a few brews. As an interim solution, he poured a five-gallon jug of gasoline down the hole, then drank more beer and watched the sun set. What was the likelihood that the mission was accomplished? An hour later he decided to err on the side of caution and burn them out.

He lit a match and tossed it at the hole. Boom, and I mean KABOOM. Hair on arms? Gone! Eyebrows? Gone! Walkway? Cracked, and a six-foot crater where the wasp nest had been. As he stood there burnt and smoking, beer in hand, wife shrieking in the background, he knew he had won...the Dumb Ass Award.

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Thought You Might Be Interested to Know . . .

Southern Pine Beetle Multi-state Trend Predictions for 2011

by Ronald F. Billings, Texas Forest Service

In the South, southern pine beetle (SPB) activity declined to a very low level in 2010. Only 71 SPB infestations were reported in 13 southern states. Based on pheromone traps deployed during the spring of 2011, continued low levels of SPB are expected this year throughout the South, with some increased activity possible in portions of Georgia, Alabama, and Virginia. Interestingly, 389 SPB spots totaling at least 14,000 acres occurred in southern New Jersey in 2010, primarily on the Pinelands National Reserve and intermingled private lands. Results from pheromone traps suggest that the SPB activity in New Jersey will continue at a high level in 2011. This prediction has already been confirmed by recent aerial and ground surveys.

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 and 2010 to levels seldom enjoyed throughout the South. Only New Jersey experienced an outbreak in 2010 and no SPB spots were reported in Oklahoma, Arkansas, Texas, Louisiana, Tennessee, Kentucky, South Carolina or Delaware.

A reliable system for predicting SPB infestation trends (increasing, static, declining) and levels (low, moderate, high, outbreak) 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 2011 prediction survey, based on 196 trapping locations within 16 states, indicate continued low SPB activity in all southern states, with the exception of a few counties or Ranger Districts in Georgia, Alabama, and Virginia, where some SPB activity may occur. Of those locations surveyed in the southern U.S., only the Chattooga River Ranger District (Chattahoochie/Oconee National Forest) in Georgia is predicted to have SPB activity that may increase to a moderate level. Severe outbreaks are expected only in southern New Jersey (Atlantic, Cumberland, Salem counties, and Wharton State Forest where most of the SPB infestations were uncontrolled in 2010 and a high proportion of the SPB population survived the winter. Very few or no SPB infestations are expected again this year in Oklahoma, Arkansas, Texas, Louisiana, Mississippi, Kentucky, Tennessee, Florida, South Carolina, North Carolina, Maryland, or Delaware. A state-by-state summary of trap catches for SPB and clerids for 2010 and 2011, together with SPB predictions for 2011, 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

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SPB Prediction – Continued from Page 6

adults are caught per day, infestation trends are likely 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 2010.

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 2011

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

		2010					2011					
State	*No. of infestations 2009*	*No. of locations trapped*	*%SPB*	*SPB/ trap/day*	*Clerids/ trap/day*	*No. of infestations 2010*	*No. of locations trapped*	*%SPB*	*SPB/ trap/day*	*Clerids/ trap/day*	Prediction Trend / Level	Most Likely Locations of SPB Activity
Oklahoma	0	2	0%	0.0	1.1	0	3	0%	0.0	1.4	Static/None	
Arkansas	0	10	0%	0.0	4.5	0	9	0%	0.0	3.1	Static/None	
Texas	0	16	0%	0.0	11.6	0	17	0%	0.0	8.9	Static/None	
Louisiana	0	27	0%	0.0	1.9	0	8	0%	0.0	6.7	Static/None	
Mississippi	0	20	10%	0.4	3.4	10	19	18%	0.7	3.7	Static/Low	
Alabama	31	8	18%	1.2	5.6	26	8	30%	1.6	3.8	Static/Low	AL: Barbour Co.
Georgia	24	23	38%	3.4	5.5	4	29	29%	2.0	4.3	Static/Low	GA: Chattooga River R.D. (Chat./Oconee NF), Hall Co.
Kentucky	1	2	0%	0.0	1.7	0	2	0%	0.0	2.0	Static/None	
Tennessee	0	6	8%	0.2	2.2	0	6	1%	0.02	2.7	Static/None	
Virginia	25	6	33%	5.2	10.7	25	6	34%	5.0	9.9	Static/Low	VA: Appomattox/Buckingham Co., Chesterfield Co.
Florida	15	26	33%	0.3	0.6	1	26	40%	0.2	0.3	Static/Low	
South Carolina	344	31	24%	2.7	8.5	0	34	9%	0.3	3.1	Static/Low	
North Carolina	5	20	10%	0.5	4.5	5	17	10%	0.3	2.6	Static/Low	
Maryland	1	4	64%	2.1	1.1	3	4	10%	0.2	2.0	Static/Low	
Delaware	0	1	*5%*	*0.1*	*1.3*	*0*	*2*	*7%*	*0.1*	*2.1*	Static/Low	
New Jersey*	*50*	*6*	*62%*	*7.4*	*4.6*	*389*	*6*	*39%*	*9.5*	*14.6*	Increasing/High-Outbreak	NJ: Atlantic, Cumberland, Salem counties, Wharton State Park
16 States	496	208	26%	1.5	4.3	463	196	22%	1.2	4.5	Increasing/Low	16 states: Static, low levels in most southern states, particularly west of the Mississippi River. Increasing trends in certain counties and Ranger Districts in GA and VA. High activity in southern NJ.

* based on data from week 2 & 3 only.

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Weed Resistance to Herbicides Seen Increasing In United States

(Pesticide & Chemical Policy, April 15 2011, Volume: 39 Issue: 20 via
Oklahoma State Extension Service's Pesticide Reports, May 2011)

Due to the almost universal adoption of biotech corn and soybeans tolerant of the herbicide glyphosate, weeds resistant to glyphosate continue to thrive and are getting worse, speakers told a March 31 conference, in Davenport, Iowa, according to an account of the meeting in Wallaces Farmer magazine.

Summing up his own presentation and those of other university researchers, Mike Owen, an Iowa State Extension weed scientist, reportedly said glyphosate-resistant populations of weeds are continuing to evolve and develop resistance to herbicides other than glyphosate. For example, resistance to HPPD inhibitor herbicides has been documented in seed corn fields, he reported. "I suspect resistance to this herbicide group is more widely distributed than most farmers realize," he is quoted as saying.

Owen said it's critical for farmers, chemical dealers, crop consultants and everyone involved in weed management to take steps to help prevent further spread or development of herbicide resistant weeds. Proper weed management will make farmers more money every year than managing any other pest, he said.

"Weeds represent the most important and economically damaging pest that Iowa soybean and corn farmers face every year," he said, stressing that diversity of management tactics is the key.

Evolving resistance. Evolving resistance to herbicides continues to escalate in Iowa, Owen reported. Glyphosate-resistant populations of waterhemp are widespread and increasing. Likewise, glyphosate resistance in giant ragweed and marestail are becoming increasingly important. Last year, resistance to HPPD inhibitor herbicides, such as Laudis, Callisto and Impact, was documented in seed corn production fields, he reported.

"I suspect that resistance to this herbicide group is more widely distributed than most growers realize. Thus, in Iowa, we have resistance in waterhemp to the triazine herbicides (atrazine), ALS inhibitors (Pursuit), PPO inhibitors (Phoenix), glyphosate [Roundup] and now the HPPD inhibitor herbicides," he is quoted as saying.

Many populations of waterhemp have multiple herbicide resistance, Owen reports. "If you are not sure if waterhemp in your fields is herbicide resistant, you are better erring on the side of being conservative," Owen is quoted as saying. "You should presume resistance exists and manage accordingly."

Owen reportedly offered the following recommendations to farmers and weed management advisers:

1) Don't use only one management tactic or herbicide to control weeds;
2) Do use tank mixes of herbicides with different mechanisms of action (MOAs) that will control the weeds of concern. Tank mixes are better than rotation of MOAs. Refer to the herbicide group number (voluntarily included on many herbicide labels) to determine if the herbicides have different MOAs;
3) Do scout for weeds early in the spring and continue to scout throughout the season. While you may not think weeds exist in the untilled fields, look closer, because they are there, and they will cost you money if you do not manage them prior to or immediately after planting;
4) Do use a soil-applied residual herbicide on all acres regardless of crop or trait. Whether you plan to till the fields or not, it would be worthwhile to include a residual herbicide that controls the weeds that will germinate first, are most populous, and are of greatest concern; and
5) Do know what herbicides you are planning to use, what they control (and do not control), what replant restrictions exist and if there is significant potential for crop injury.

"Anything that is suggested to be simple and convenient -- herbicide, crop trait, whatever -- will inevitably fail and cost you yield potential," Owen warned. "No single tactic will protect the potential crop yield nor deter the evolution of herbicide-resistant weed populations. Be proactive and manage herbicide resistance before it becomes a major problem. Diversity of tactics is the key to consistent weed management and high crop yields."

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Forest Pest Management Cooperative's

P.E.S.T. Newsletter

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