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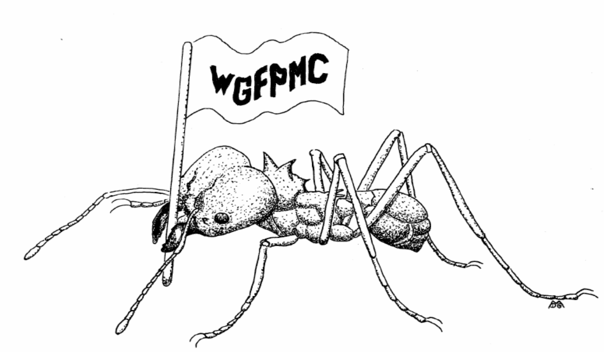
Quarterly Newsletter on Western Gulf Forest Pest Management Issues

Western Gulf Forest Pest Management Cooperative



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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:

<u>EPA Approves Registration of Fipronil!</u> – The WGFPMC was informed by Wilson Edwards, Weyerhaeuser Co., and received confirmation from BASF, that the Environmental Protection Agency (EPA) has approved the registration of fipronil for soil injection applications near newly-planted pine seedlings for protection against pine tip moth and aphids. Some changes are needed before the label is finalized and the label needs to be approved by each southern state. If all goes well, we hope that a product will be available for operational use in the fall 2007. For more information about the effectiveness of fipronil against pine tip moth, see **Pine Tip Moth Control** on pages 2 – 4.

Summary of 2006 WGFPMC Research Projects

In 2006, three research project areas – tip moth, leaf-cutting ant, and systemic injection - were continued from 2005. Results from systemic injection studies were presented in the last *PEST* newsletter (Apr. 2007). Summaries of the results from the leaf-cutting ant and tip moth control studies are presented below. Results from tip moth impact and hazard-rating studies will be presented in the next *PEST* newsletter (Sept. 2007).

Leaf-cutting Ant Control

Amdro® Ant Block bait is the only product currently labeled for control of the Texas leaf-cutting ant bait (TLCA). Although the results of an initial trial in spring 2005 were less than satisfactory (see *PEST* 11.2), additional trials are needed to identify conditions that may improve treatment efficacy. Also, DuPont offered two indoxacarb baits (Advion® fire ant bait and an experimental bait) as potential alternatives to Amdro®. An Archaea microbe used in bioremediation projects was reported to be effective against fire ants and leaf-cutting ants. A small trial was initiated in 2006 to evaluate the efficacy of these baits against the TLCA.

Twenty-five ant colonies were selected in East Texas on land owned by Temple-Inland and private landowners. Five colonies each were treated with Amdro® Ant Block, Advion® fire ant bait, experimental indoxacarb bait or Archaea bait (microbes on citrus pulp pellets) at 3/4 lb per colony, in March 2006. The remaining 5 colonies were monitored as untreated checks. All colonies were evaluated for ant activity at 0, 2, 4, 6, 8 and 22 weeks post-treatment.

The Amdro® bait treatment quickly reduced ant activity (98%) on treated colonies compared to initial activity within 2 weeks after treatment (Table 1). It appeared that a number of treated colonies had become inactive (3 of 5 after 6 weeks). Unfortunately, a reassessment 22 weeks post-treatment found that three of five treated colonies had recovered, although

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Leaf-cutting Ant Control – Continued from Page 1

at a reduced level (39%) compared to initial levels. fficacy of this bait may be improved if it were applied in the winter when little green plant material is available. Both indoxacarb treatments (Advion® and experimental) also reduced overall activity (35% and 33%, respectively) 4 weeks post treatment. However, neither treatment completely halted activity of any colonies. The Archaea treatment had no apparent affect on ant activity.

The WGFPMC is currently working with DuPont to develop a new TLCA bait. Preference and efficacy trials are scheduled to begin this summer.

Table 1. Efficacy of Amdro® (Hydramethylnon), Advion® (Indoxacarb), an experimental bait (Indoxacarb), and an experimental Archaea microbe bait applied by spreader to control the Texas leaf-cutting ant (*Atta texana*) in East Texas (Spring 2006).

Treatment	No. of Colonies Treated	Mean Nest Area (ft^2)	Mean # Mounds @ Trt.	Mean % initial activity (% inactive colonies) 2 wk		4 wk		6 wk		8 wk		22 wk	
Amdro® Ant Block (Hydramethylnon, 0.44% ai)	5	744	177	2.1	(60)	3.2	(60)	11.9	(60)	33.5	(40)	38.8	(40)
Advion® Fire Ant Bait (Indoxacarb, 0.045% ai)	5	447	102	69.4	(0)	64.9	(0)	82.0	(0)	93.8	(0)	84.0	(0)
Experimental bait (Indoxacarb, 0.18% ai)	5	668	144	61.7	(0)	61.7	(0)	68.5	(0)	74.5	(0)	78.4	(0)
Archaea + citrus pulp	5	438	108	79.9	(0)	79.9	(10)	83.9	(0)	86.2	(0)	97.3	(0)
Check (no treatment)	5	573	93	124.5	(0)	113.7	(0)	98.4	(0)	107.2	(0)	92.5	(0)
Total	25												

Pine Tip Moth Control

Fipronil Trials: A preliminary study, initiated in 2002, evaluated the potential of systemic chemicals for control of pine tip moth for one or more years. The results showed that fipronil was the most effective for reducing tip moth damage well into the second growing season (see PEST 9.1). A subsequent trial was initiated in 2003 on 8 sites across the South to further evaluate the potential of fipronil for extended protection of pine seedlings against tip moth. This active ingredient was applied at different rates to nursery beds, lifted bare root seedlings, and plant holes. The results showed that fipronil, applied in plant holes, as a dip, or by higher rate root soak, was effective in reducing tip moth damage by > 75% over the first growing season. The dip and plant hole treatments continued to reduce tip moth damage through the second year. Tree measurements taken after 3 years indicate that on average plant hole-treated trees had twice the volume compared to untreated checks. Due to concerns about worker exposure, the focus of subsequent research was placed on the treatment of soil around seedlings after transplanting. Below is a brief overview of the latest results of these trials.

Fipronil Technique and Rate Refinement Trial:
One of three new trials initiated in 2004 evaluated fipronil applied at different rates to seedlings in nursery beds alone or combined with a plant-hole treatment. Three research plots were established in 2004 in second-year plantations in Texas and Louisiana. A randomized block design (with rows as blocks) was used for each trial. Ten seedlings from each treatment were planted on each of five beds. The treatments included:

1) Regent (fipronil) applied to nursery bed furrows in (Dec.) at 2x annual limit + Regent (0.3%) applied to plant hole..
2) Regent 4x in furrow + plant hole treatment.
3) Regent 4x + methanol in furrow + plant hole treatment.
4) Regent 8x in furrow + plant hole treatment.
5) Regent plant hole treatment alone.
6) Mimic foliar spray 5x at 0.8oz/gal
7) Check - Bare root seedlings (lift and plant)

Tip moth damage was evaluated after each tip moth generation (3-4 weeks after peak moth flight) by determining the percent of infested shoots in the top whorl. Each tree was measured for diameter and height in the fall (November) following planting.

All treatments that included a plant-hole treatment provided good to excellent protection (84% - 97% reduction in damage) against tip moth and significant gains (9 – 21 cm^3) in volume growth in 2004 (Table 2). Further evaluations in 2005 and 2006 indicate that all plant-hole treatments continued to protect young trees and improved growth through the third year. The conclusion was to focus on the development of soil injection as a means to treat pine seedlings.

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Table 2. Effect of fipronil treatments on tip moth damage to loblolly pine shoots (top whorl) and volume growth during first three growing seasons on three sites in Texas and Louisiana, 2004, 2005 & 2006.

		Pct. Shoots Infested (**Pct. Reduction Compared to Check**)						Volume Growth (cm^3) (**Growth Diff. (cm^3) Compared to Check**)					
Treatment §	N	2004		2005		2006		2004		2005		2006	
RNF 2x + RPH	150	3.0	**84** *	4.1	**86** *	4.7	**49** *	29.5 *	**13**	446 *	**169**	903 *	**373**
RNF 4x + RPH	150	0.8	**96** *	4.3	**85** *	4.6	**51** *	37.5 *	**21**	547 *	**270**	1041 *	**511**
RNF 8x + RPH	150	0.6	**97** *	3.4	**89** *	4.9	**47** *	25.9 *	**9**	337	**60**	749 *	**219**
RPH only	150	0.6	**97** *	2.2	**93** *	5.4	**42** *	26.9 *	**10**	374	**97**	699	**169**
Mimic spray	150	0.9	**95** *	1.3	**96** *	8.0	**14** *	14.6	**-2**	227	**-50**	365	**-165**
Check	150	18.2		29.5		9.3		16.6		277		530	

§ RNF = Regent in Nursery Furrow, RPH = Regent in Plant Hole   [shaded] = treatment reduced damage by >75% compared to check
* Means followed by an asterik are significantly different from checks at the 5% level based on Fisher's Protected LSD.

Soil Injection Trial: A trial was initiated in 2006 to further evaluate the efficacy of different formulations of fipronil applied by soil injection at different volumes.

One first-year plantation was selected in Texas. A randomized block design (with rows as blocks) was established at each site in February. Ten seedlings from each treatment were planted on each of five beds. The treatments included:

1) Fipronil solution applied by soil injector 3 ml/seedling
2) Fipronil solution applied by soil injector 6 ml/seedling.
3) Fipronil solution applied by soil injector 12 ml/seedling
4) Fipronil solution applied by soil injector 24 ml/seedling
5) Mimic foliar spray 5x at 0.8oz/gal
6) Check - Bare root seedlings (lift and plant)

Tip moth damage was evaluated after each of five tip moth generations (3-4 weeks after peak moth flight) in the same manner as in other control studies. Each tree was measured for diameter and height in the fall (November).

The fipronil treatments showed no effect on tip moth damage levels for the first two generations. However, by the third generation, all treatments had significantly reduced tip moth damage. Tip moth damage was reduced by 87 – 95% over the 5-generation period, but none of the treatments resulted in significant gains in growth parameters (height, diameter or volume) compared to the checks (Table 3).

Table 3. Effect of different fipronil solution volumes applied by soil injection on tip moth damage to loblolly pine shoots (top whorl), volume growth and survival during the first growing season on one site in Texas - 2006.

Treatment §	N	Pct. Shoots Infested (**Pct Reduction Compared to Check**)		Volume Growth (cm^3) (**Growth Diff. (cm^3) Compared to Check**)		Mean % Tree Survival (**Pct. Gain Compared to Check**)	
Fipronil Inj 3ml	50	0.5	**94** *	6.1 *	**-9.3**	86	**39**
Fipronil Inj 6ml	50	1.0	**87** *	16.9	**1.5**	74	**19**
Fipronil Inj 12ml	50	0.4	**95** *	22.7	**7.3**	70	**13**
Fipronil Inj 24ml	50	1.1	**86** *	7.7 *	**-7.7**	66	**6**
Mimic spray	50	0.0	**100** *	13.5	**-1.9**	76	**23**
Check	50	7.9		15.4		62	

§ Fipronil Inj = Fipronil Soil Injection   [shaded] = treatment reduced damage by >75% compared to check
* Means followed by an asterik are significantly different from checks at the 5% level based on Fisher's Protected LSD.

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A new trial also was established in fall of 2006 and winter of 2007 to evaluate the operational application of fipronil by hand or machine equipment. Results will be presented in the next spring issue of the *PEST* newsletter.

<u>*Imidacloprid Tablet Trial:*</u> Bayer Environmental Science also is interested in developing a product to protect young seedlings against insects. Preliminary trials in 2004 and 2005 showed that spikes/tablets containing imidacloprid and fertilizer could reduce tip moth damage to pine seedlings and improve growth (2005 and 2006 Annual Reports). A new trial was established in 2006 to evaluate several new formulations containing imidacloprid and/or fipronil.

Two first-year plantations were selected; one in Texas and one in LA. A randomized block design was established at each site in February. Ten seedlings from each treatment were planted on each of five beds. Tip moth damage was evaluated and trees were measured as described before. The treatments included:

1) Imidicloprid (Imid) + Fertilizer (Fert) standard (Std) tablet (1) in soil next to transplant.
2) Imid+Fert Std. tablet (2) in plant hole.
3) Imid+Fert Std. tablet (1) in plant hole
4) Imid+Fert 'Burst' tablet (1) in plant hole
5) Imid gel in plant hole
6) Imid + fipronil gel in plant hole
7) Imid granular in plant hole
8) Mimic foliar spray 5x at 0.8oz/gal
9) Check - Bare root seedlings (lift and plant)

Severe drought conditions during the spring and summer of 2006 at the TX site resulted in significant seedling mortality. The site was dropped. Tip moth populations were very low during the first two generations at the LA site, thus no treatment effects were observed for these generations. In contrast, all treatments containing imidacloprid provided excellent protection during the third through fifth generations, reducing damage overall by 77 – 100% (Table 4). Imidacloprid tablet and granular formulations had similar effects on tip moth damage levels. In contrast, the gel formulations (imidacloprid alone or combined with fipronil) had short term effects against tip moth and/or significantly reduced survival of seedlings. As a result of low tip moth pressure throughout the year, none of the study treatments significantly improved any of the growth parameters compared to check trees.

The registration of the "SilvaShield" Forestry Tablet (= Imidicloprid + Fertilizer Standard tablet) was approved by EPA in the fall of 2006 (see *PEST* 12.1). It is now approved for use in all southern states. Bayer Environmental Science is currently developing agreements with potential distributors but anticipates that the product will be available around September 2007 at a cost of \$0.25 or less per tablet.

Table 4. Effect of different imidacloprid or fipronil formulations and rate on tip moth damage to lob pine shoots (top whorl), volume growth and survival during the first growing season on one site in L 2006.

Treatment §	N	Pct. Shoots Infested **(Pct Reduction Compared to Check)**			Volume Growth (cm^3) **(Growth Diff. (cm^3) Compared to Check)**		Mean % Tree **(Pct. Gain C to Che**	
Imid.+Fert. Std. Ball 2X PH	50	1.9	**77**	*	15.4	**-0.1**	70	
Imid.+Fert. Std. Ball 1X PH	50	1.6	**79**	*	19.1	**3.6**	70	
Imid.+Fert. Burst Ball 1X PH	50	0.5	**94**	*	9.9	**-5.5**	78	
Imid. gel PH	50	0.3	**96**	*	6.0	**-9.4**	36	*
Imid.+Fip. gel PH	50	2.6	**67**	*	12.9	**-2.5**	40	*
Imid. granular PH	50	0.0	**100**	*	14.3	**-1.2**	74	
Imid.+Fert. Std Ball in Soil	50	0.5	**94**	*	16.2	**0.8**	78	
Mimic spray	50	0.0	**100**	*	13.5	**-2.0**	76	
Check	50	7.9			15.4		62	

§ Imid. = Imidacloprid; Fert. = fertilizer; PH = plant hole   [shaded] = treatment reduced damage by >75% compared to ch

* Means followed by an asterik are significantly different from checks at the 5% level based on Fisher's Protected LSD.

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Thought You Might Be Interested to Know . . .

Drought Stress

(Source: The Physiological Ecology of Woody Plants by Kozlowski, Kramer and Pallardy, 1991, and, Physiological Plant Ecology by Larcher, 1995 via Forest Insect and Diesease Newsletter, Nov. 16, 2006.)

(Editor's Note: Although drought conditions are not currently a problem in the Western Gulf Region, invariably, some area of the South is experiencing abnormally low moisture conditions. Thus, I thought you may be interested in the article below.)

Plants, like animals, are composed mainly of water and water is essential for the biochemical processes necessary for life. On average, soft leaves are 80-90% water, fine roots are 70-95% water and freshly cut wood is about 50% water. Lack of rainfall and shortage of soil moisture result in drought stress in plants, but what is actually going or not going on in plants suffering from drought stress?

Drought stress in plants develops gradually and affects plant function through a sequence of events as the internal water deficit intensifies.

1. The first response to a water deficit is a decrease in turgor pressure within cells and a slowing of growth or expansion. Water stress during leaf expansion results in smaller leaves; during the summer water stress results in less wood production.
2. Next, the metabolism of proteins and the synthesis of amino acids and chlorophyll are reduced. This suppresses cell division, further reducing growth.
3. As drought stress increases from mild to moderate, cell biochemistry is increasingly disturbed. One of the enzymes most inhibited by water stress is nitrate reductase. This enzyme is necessary for nitrogen assimilation in plants. Plants need nitrogen to form amino acids, which are the basic ingredients of proteins.
4. A moderate water deficit is also enough to start the production of abscisic acid, a plant hormone, which is created in the roots. Abscisic acid is transported upwards and acts as a signal to different parts of the plant, including the leaves, where it stimulates stomates to close. This reduces water loss through transpiration but also reduces the uptake of carbon dioxide leading to a further decrease in photosynthesis.
5. The conversion of starches to sugars increases. The tree uses its stored reserves for emergencies such as this.
6. If water stress continues, premature senescence and shedding of leaves may occur. This may involve the normal process of abscission with the formation of an abscission layer or simply a wilting and drying of leaves. Premature senescence and shedding of leaves varies by season and species of trees.
7. Reproduction of trees is affected because drought stress generally lowers pollen fertility.

There are also many indirect effects of drought. For example, slowing or cessation of root growth during drought indirectly decreases water absorption because it reduces the invasion of previously unoccupied soil. Also, as root growth slows and ceases, the outer tissues of the root turn brown and harden or they degenerate, so they are less able to absorb moisture.

Using a broad definition of disease, drought stress itself can be called a disease because it causes abnormalities in the function of trees. Effects of internal water deficit on metabolism and structures can be direct or indirect. Drought stress usually increases the susceptibility of affected trees to attack by opportunistic insects and fungi, usually due to the host tree's altered metabolism. Drought stress in oaks increases their susceptibility to attack by two-lined chestnut borers; in birches to bronze birch borers; and, in pines to bark beetles, particularly *Ips* engraver beetles. Drought stress can increase the ability of *Armillaria* fungi to grow, invade roots and kill trees. Here's how it is thought to work in oak trees. A seriously drought stressed oak converts stored starches into sugars. These sugars are a preferred energy source for *Armillaria,* so fungal activity is stimulated and nourished. Under normal conditions, phenols in the bark inhibit the growth of *Armillaria* but in the presence of a rich sugar source, the growth of *Armillaria* is actually stimulated. These two significant changes in host physiology allow *Armillaria* to attack and kill the cambium of the roots. If prolonged, the drought and fungal attack can kill oak trees.

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Southern Pine Beetle South-wide Trend Predictions for 2007

by Ronald F. Billings (with data contributed by southern forest pest specialists)
(See http://txforestservice.tamu.edu/main/article.aspx?id=1171)

Will 2007 be a year of severe southern pine beetle (SPB) outbreaks? Not unless you are in Alabama or selected National Forests in Mississippi, Georgia, South Carolina or North Carolina. Very low SPB activity is predicted on private forest lands in most southern states, based on this year's SPB prediction survey.

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 2005, the number of SPB infestations had declined to 4,415 for all southern states combined. SPB activity remained low in 2006, with a total of 3,669 spots detected in 16 states, with most spots occurring in South Carolina and Alabama. The Texas Forest Service (TFS) has developed a reliable system for predicting infestation trends (increasing, static, declining) and levels (low, moderate, high, outbreak) that 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 southern pine turpentine 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. The traps are monitored weekly for a 4-6 week period by federal and state cooperators. 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 2007 prediction survey, based on 193 trapping locations within 16 states, indicate increasing or outbreak SPB populations in Alabama and on certain National Forests in Mississippi, Georgia, South Carolina and North Carolina. Of those locations surveyed, the Homochitto N.F in MS, the Oakmulgee, Shoal Creek, and Talladega Ranger Districts in Alabama (plus the only two counties surveyed in AL - Lowndes and Monroe counties), the Oconee Ranger District in Georgia, the Long Cane and Wambaw/Witherbee Ranger Districts in South Carolina, as well as the Croatan Ranger District in North Carolina, are expected to experience high beetle populations. Moderate levels of SPB activity may occur on the Tombigbee Ranger District in Mississippi, the Bankhead Ranger District in Alabama, and an occasional location elsewhere (i.e., Newberry County, SC, Fort Stewart Army Base, GA). Overall, beetle activity is predicted to remain low in most areas surveyed in other states. Very few or no SPB infestations are expected again this year in Texas, Arkansas, Oklahoma, Louisiana, Kentucky, Tennessee, Virginia, Florida, Maryland, New Jersey, or Delaware. Local increases at low levels may be seen in certain counties in Virginia and North Carolina. A state-by-state summary of trap catches for SPB and clerids for 2006 and 2007, together with SPB predictions for 2007, are listed in Table 5.

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. Conversely, when catches of predators far outnumber those of SPB and fewer than 20 SPB adults are caught per day, infestation trends are likely to decline or remain at low 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. It is interesting to note, however, that average trap catches of clerid beetles remained about the same as last year across the South (Average = 5.2 clerids/trap/day in 2007 versus 5.6 in 2005), down from 16.8 clerids per trap in 2004. Average numbers of SPB/trap/day across the South was 7.4 in 2006, compared to 2.6 SPB/trap/day in

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SPB Prediction – Continued from Page 6

2006. At least in part, this increase in SPB catch can be attributed to a more attractive bait used on most of the National Forests surveyed. This bait included *endo*-brevicomin, a beetle-produced compound recently shown to add significant attraction to pheromone traps if located at 10-12 feet from the trap. At this point, it is difficult to interpret these increased trap catches in terms of subsequent SPB infestation levels, until comparisons with the standard turpentine bait can be made.

The South-wide SPB survey results and trend predictions will also be posted on the Internet at http://texasforestservice.tamu.edu . Appreciation is expressed to the many state and federal cooperators who provide the data for this annual survey. For additional information, contact Dr. Ronald Billings, Texas Forest Service, at (979) 458-6650 or by e-mail at rbillings@tfs.tamu.edu.

Table 5: Summary of Southwide Southern Pine Beetle Trend Predictions for 2007.

State	No. of Infestations in 2006	2007 No. of Locations Trapped	2006 % SPB	2006 SPB/ trap/day	2006 Clerids/ trap/day	2007 % SPB	2007 SPB/ trap/day	2007 Clerids/ trap/day	2007 Prediction Trend / Level	Most Likely Locations of SPB Activity
Oklahoma	0	3	0%	0.0	1.5	0%	0.0	4.5	Static/Low	-----------
Texas	0	23	0%	0.0	1.9	0%	0.0	8.7	Static/Low	-----------
Arkansas	0	7	4%	0.1	3.1	0%	0.0	1.8	Static/Low	-----------
Louisiana	0	24	0%	0.0	1.1	0%	0.0	1.3	Static/Low	-----------
Mississippi	50	10	21%	5.8	17.7	36%	19.8	17.0	Increasing/Low to Moderate	Homochitto, Tombigbee N.F.
Alabama	1,286	6	52%	14.3	13.4	78%	74.4	19.6	Increasing/High to Outbreak	Bankhead R.D., Oakmulgee R.D., Shoal Creek R.D., Talladega R.D., Lowndes Co., Monroe Co.
Georgia	0	17	32%	6.6	14.3	37%	7.4	9.0	Increasing/Low-Moderate	Oconee R.D.
Florida	3	26	28%	1.0	1.6	33%	0.3	1.1	Static/Low	-----------
South Carolina	2,267	35	33%	4.1	9.5	25%	5.7	4.8	Declining/Low to Increasing/High	Long Cane R.D., Wambaw/Witherbee R.D., Newberry Co.
North Carolina	49	16	37%	3.1	5.2	14%	0.4	2.9	Static/Low to Increasing/High	Croatan N.F.
Virginia	0	7	37%	4.0	6.7	41%	5.8	4.1	Static/Low	-----------
Tennessee	14	6	27%	1.5	4.0	11%	0.7	1.6	Static/Low	-----------
Kentucky	0	2	0%	0.0	3.1	35%	2.0	0.8	Static/Low	-----------
Maryland	0	4	5%	0.1	1.9	3%	0.1	1.3	Static/Low	-----------
Delaware	0	1	1%	0.0	1.0	0%	0.0	1.6	Static/Low	-----------
New Jersey	0	6	24%	1.1	3.4	29%	1.0	3.0	Static/Low	-----------
Southern States	3,669	193	32%	2.6	5.6	21%	7.4	5.2	High activity expected in AL; increases on National Forests of MS, GA, SC,and NC; static, low levels elsewhere.	

A Little Humor Goes a Long Way

The operation to sabotage a UK potato trial was planned with care and under conditions of great secrecy. Nearly 250 protesters swooped down on the 16-hectare site outside Hull, armed with shovels. In less than an hour they had moved to invalidate the trial, planting thousands of organic potatoes. Mission accomplished. If only they had got the right field. Activists from Mutatoes.org apologized to farmer David Buckton after it emerged that they wrongly identified his land as the site of the potato trial. The field they planted was sown with beans. (*Guardian Unlimited*, 4/25/07 via Chemically Speaking, May 2007).

(Editor's Note: Ron would like to invite this group to his place the next time he needs his garden spade up. Ron's address is . . .)