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Quarterly Newsletter on Western Gulf Forest Pest Management Issues

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:

Contact Meeting - All WGFPMC executive and contact representatives, industry, and TFS foresters are invited to attend the 2001 WGFPMC Contact Meeting scheduled for Tuesday, August 14, 2001. The meeting will begin at 9:00 AM at the Texas Forest Service Training Building at the Cudlipp Forestry Center in Lufkin. Lunch will be provided. The tentative agenda is shown on page 7. RSVP by August 1 by contacting Martha Johnson at 936/639-8170 or Don Grosman at dgrosman@tfs.tamu.edu.

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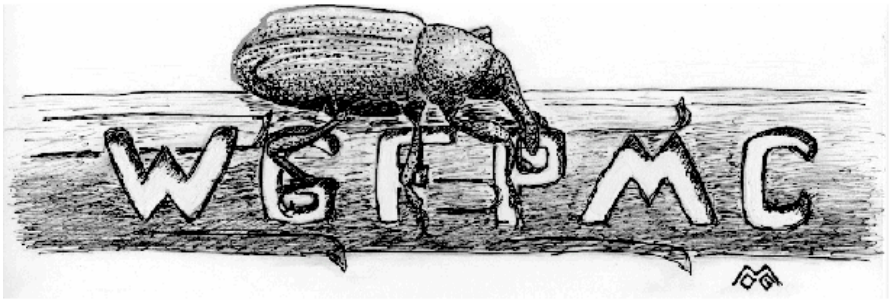
Western Gulf Forest Pest Management Cooperative



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

Summary of 2000 WGFPMC Research Projects

In 2000, four research projects - the leaf-cutting ant control, systemic injection, pest survey, and tip moth pesticide evaluations - were continued from 1999. Summaries of the results from the leaf-cutting ant and systemic injection studies were presented in the last PEST newsletter (March 2001). Results from the pest survey and tip moth pesticide study are presented below.

Pest Survey

It is now common knowledge that growth and yield of pine plantations can be increased and rotations shorted through the use of more intensive site preparation methods and applications of herbicides and fertilizers. But, do these more intensive silvicultural practices influence the occurrence and impact of insects and diseases in treated plantations? A survey was initiated in the fall of 1998 and was continued in 2000 to answer this question.

Two hundred & two sites (plots) (including research sites, progeny tests, and plantations) containing one- to six-year old loblolly pine in East Texas, Arkansas and Louisiana were surveyed during spring 2000 and 221 sites (plots) during the fall 2000. Thirty-five to 50 trees were randomly selected within each treated area. Each tree was evaluated for occurrence of any biotic or abiotic-caused damage, ranked on the extent of damage, and evaluated for form (presence or absence of forks). Each site was categorized based on the intensity of site preparation, weed control, fertilization, and other practices applied by mid-summer 2000.

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Research Projects (Continued from Page 1)

As in 1998 and 1999, the Nantucket pine tip moth, *Rhyacionia frustrana*, was the most common biotic factor damaging loblolly pine plantations in Texas, Arkansas, and Louisiana in the spring and fall of 2000. Nearly all (99.5%) of 202 sites (plots) visited in the spring and all (100%) of the 221 plots/sites visited in the fall had some level of tip moth infestation. Three-year old plots in southern Arkansas and northern Louisiana were generally the hardest hit during the spring with 49% of all trees infested, 10% of all evaluated tips infested, and 16% of all terminals infested. Two-year old trees were hardest hit in Texas plots. In the fall, tip moth infestation levels increased dramatically in most sites (plots), but were generally highest in two- and three-year old stands: 78-100% of the trees, 34-65% of the tips, and 41-82% of the terminals.

Only one other biotic factor, aphids (*Cinara* spp.), was observed at levels that warrant mentioning. Aphids were most commonly found (10-16%) during the spring on two- to four-year old trees in Arkansas and Louisiana sites. However, in most cases, individual trees exhibited infestation levels of less than 10%. This accounts for the low level of sooty mold observed.

Coneworm (*Dioryctria* spp.), common on two-year old seedlings (30% in Arkansas) and older trees (23-34%) in Texas in the spring of 1999, were rare during the spring of 2000.

Data analyses were performed to evaluate the influence of different levels of stand management on the occurrence and impact of insect and disease pests. As in 1998 and 1999, the data from 2000 indicate that infestation levels of Nantucket pine tip moth increased significantly with silvicultural intensity in one- to four-year old sites during the spring and two- to four-year old sites during the fall (Fig. 1). The primary influences appeared to be the intensity of site preparation and weed control.

The true impact of tip moth on tree growth and yield has not been determined in the Western

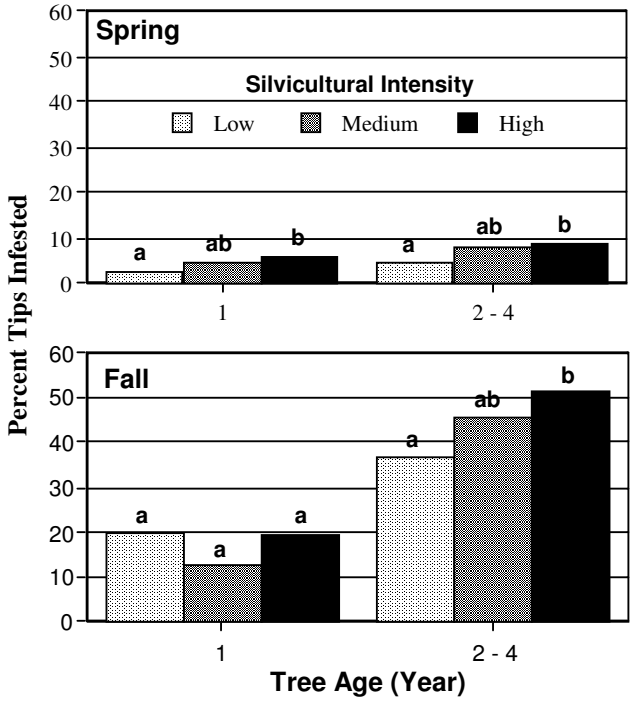

Figure 1. Pine tip moth damage on loblolly pine by tree age and silvicultural intensity in spring and fall, 2000. Bars, within each age group, with the same letter are not sig. diff. at 5% level.

Gulf region. However, in 1999 tree form rank (incidence of branch forking) was significantly related to the percent of trees infested with pine tip moth. In fact, the relative percent of trees with at least one fork more than doubled (24% to 53%) as the level of tip moth infestation increased from 0 to 100%.

The WGFPMC established a new study in 2001 in cooperation with the University of Georgia's Tip Moth Consortium. The main objectives will be to 1) evaluate the impact of pine tip moth on tree height and diameter growth and 2) identify abiotic factors that influence the occurrence and severity of pine tip moth infestations.

Tip Moth Spray Trial

As indicated above, pest surveys conducted by the WGFPMC from 1998 to 2000 indicated that populations of the Nantucket pine tip moth, were high and caused significant damage in young pine plantations. Spray trials were initiated in 1999 and continued in 2000 to 1) evaluate the effectiveness of several insecticides (Pounce® =

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Research Projects (Continued from Page 2)

permethrin, Mimic® = tebufenozide and emamectin benzoate) on reducing tip moth infestation levels, and 2) determine the number of tip moth generations that occur in Angelina Co., TX.

Three second-year plantations in Angelina Co., Texas (owned and managed by Temple Inland) were used for the spray trials and for monitoring tip moth populations in 2000. An area of each plantation was selected and divided into seven plots, each containing 126 trees (9 rows X 14 trees). Tip moth populations were monitored by placing two to four Phericon 1C wing traps (with Trece septa lures) at least 50m apart at each site. Traps were checked weekly and moths counted.

Treatments were randomly assigned to a plot at each site. The treatments included:

1) Pounce® 3.2 EC applied once (1st generation) at 0.08 oz/gal
2) Pounce® 3.2 EC applied once per generation at 0.08 oz / gal.
3) Mimic® 2F applied once per generation at 0.08 oz / gal.
4) Mimic® 2F applied once per generation at 0.04 oz / gal.
5) Emamectin benzoate applied once (1st generation) at 0.6 oz/gal water
6) Emamectin benzoate applied once (1st generation) at 0.6 oz/gal water plus 2% oil
7) Check

Pesticides were applied by backpack sprayer to all trees within the plot (treatment area) until moist. Application dates were determined by degree day model calculations.

Just prior to each spray date, the tip moth damage level was determined in each plot by surveying the internal 50 trees. Each tree was ranked on the extent of tip moth damage including: 1) tree identified as infested or not, 2) if infested, the proportion of tips infested on the top whorl and terminal was calculated, and 3) separately, the terminal was identified as infested or not. Trees also were surveyed a final time in November, 2000. At this time, data also were collected on tree height, diameter and form (forking).

The distribution of tip moths captured in traps at the three sites in 1999 and 2000 is shown in Figure 2. Given the latitude of Angelina Co., four tip moth generations were expected. However, as in 1999, warmer than normal temperatures allowed five tip moth generations to develop in 2000.

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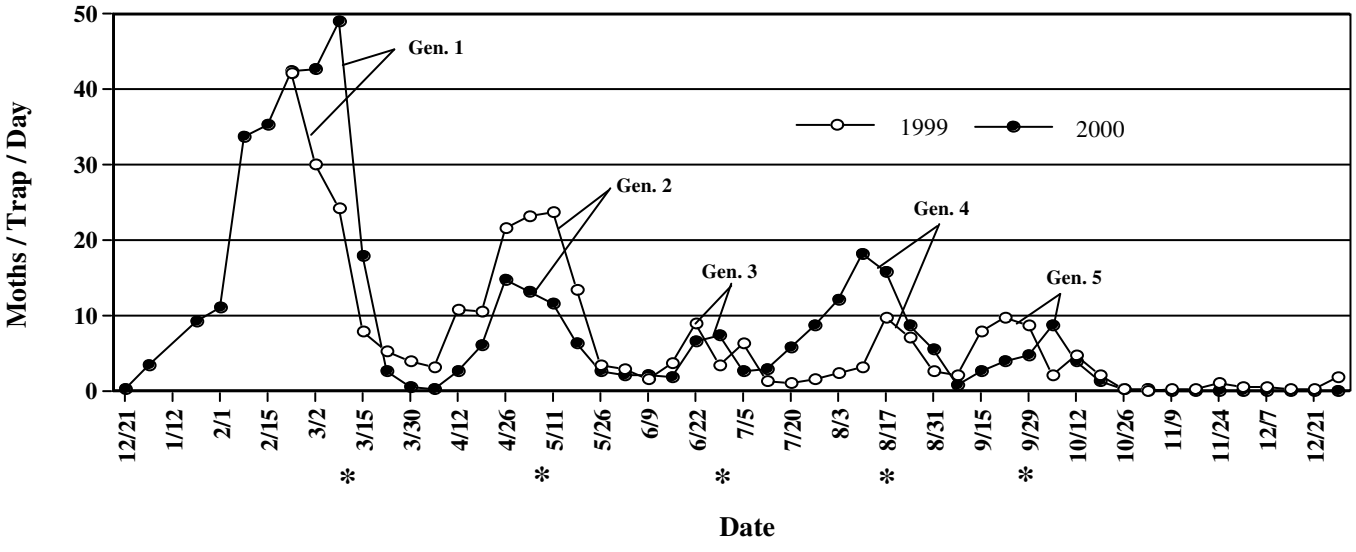

* = Degree day calculated spray dates on March 10, May 9, June 26, August 18 and September 22

Figure 2. Pine tip moths captured per trap per day in Angelina Co., Texas – 1999 and 2000

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Research Projects (Continued from Page 3)

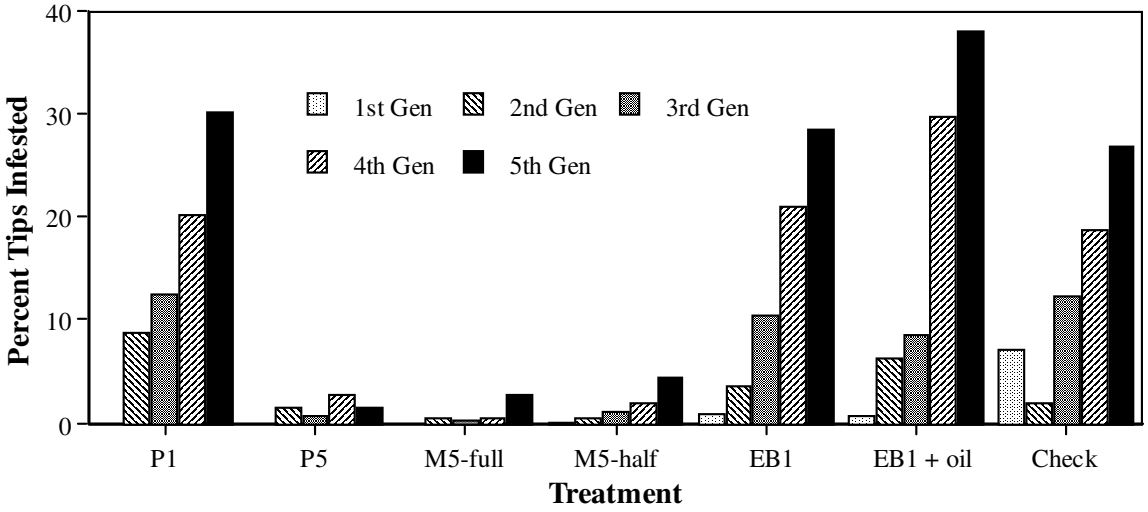

Figure 3. Nantucket pine tip moth infestation on loblolly pine trees tips after applications of Pounce® (P), Mimic® (M) or emamectin benzoate (EB) once or 5X at three sites in Angelina Co., TX – 2000

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Based on trap catch numbers and degree day calculations, the optimal spray dates for the five generations were estimated to be March 10, May 9, June 26, August 18 and September 22 (Fig. 2).

Tip moth infestation levels were low early but than increased to moderate later in the year on check plots (Fig. 3). All treatments provided good control during the first tip moth generation, but the single Pounce® and emamectin benzoate treatments did not protect the trees during later moth generations. The multiple Pounce® and Mimic® (full and half rates) treatments provided excellent protection against tip moth. These treatments significantly reduced infestation levels (percent tips infested) for nearly all generations compared to the check (Fig. 3). Mimic®, applied at full rate, was the only treatment that significantly improved tree height, diameter and form compared to the check in 1999 (Table 1).

Table 1. Tree height, ground line diameter and incidence of forking on two-year old loblolly pine after foliar applications of different insecticides in Angelina Co., Texas - 2000

	Mean Height (cm)	Mean Diameter (cm)	Percent w/ at least 1 fork
Pounce 1X (0.08 oz/gal)	159.9 **bcd**	3.4 **cd**	29.5 **c**
Pounce 1X (0.08 oz/gal)	126.6 **a**	2.7 **a**	11.7 **ab**
Mimic 5X (0.08 oz/gal)	177.2 **f**	3.4 **d**	8.4 **a**
Mimic 5X (0.04 oz/gal)	162.9 **cde**	3.2 **bcd**	18.4 **b**
EB 1X (0.6 oz/gal)	164.7 **cde**	3.2 **bcd**	20.5 **b**
EB + oil 1X (0.6 oz/gal)	152.0 **b**	3.0 **b**	16.1 **b**
Check	159.3 **bc**	3.1 **bc**	17.8 **b**

* Means followed by the same letter within each column are not significantly different at the 5% level (Fisher's Protected LSD).

A single application of Pounce® or emamectin benzoate solution was not sufficient to protect seedlings from tip moth throughout the first growing season. However, multiple applications of Pounce® or Mimic (full and half rate) did significantly reduce tip moth damage during most of the year.

The effort required to predict optimal spray dates in a given year by means of degree day calculations is a significant deterrence toward establishment of tip moth control programs in plantations. The WGFPMC is working with Dr. Chris Fettig, U. of Georgia, to further develop his predictions of optimal spray intervals in the Western Gulf region. In addition, the WGFPMC has established a new study to evaluate the potential of emamectin benzoate, applied as a root soak or in plant holes, for protecting first-year seedlings against pine tip moth.

Outlook for Southern Pine Beetle Activity in 2001

(by Ron Billings & Bill Upton, Texas Forest Service)

Last year, nearly 60,000 multiple-tree infestations (spots) of the southern pine beetle (SPB) were detected on federal, state, and private forest lands throughout the South. This represents nearly a four-fold increase in infestation levels from 1999. The increased populations occurred exclusively east of the Mississippi River, as predicted by early spring pheromone trap surveys.

Results from the 2001 trapping survey indicate another year of very low SPB activity in the Western Gulf states. Although outbreak levels are expected to continue in certain areas east of the Mississippi River, a decline in overall SPB activity is predicted in many states. The attached summary of the South-wide prediction system provides trap catch data for 2000 and 2001, together with individual predictions for SPB trend and level for 156 locations within17 states (Table 2). Predictions for 2001 include data for two additional states not surveyed in the past - Delaware and Ohio.

Based on the early season pheromone survey, SPB activity in 2001 is expected to remain at high or outbreak levels, particularly national forest lands in Alabama, Kentucky, North Carolina and Tennessee (Table 2). Some of the largest SPB trap catches on federal lands were recorded on the Armuchee Ranger District in Georgia, the Bankhead, Shoal Creek and Talladega ranger districts in Alabama, the Ocoee Ranger District in Tennessee, the Stearns and Somerset ranger districts in Kentucky, and the Tusquitee and Grandfather ranger districts in North Carolina.

On private forest lands surveyed, high SPB activity is expected in Alachua and Orange counties in Florida, and Cherokee, Greenwood, Lexington, McCormick, Newberry, Pickens and Spartanburg counties in South Carolina. Moderate declines in SPB activity from last year's outbreak levels are expected in many other counties in Mississippi, Alabama, Georgia, Virginia, Tennessee, Kentucky, North and South Carolina. Very low SPB activity (most likely none) is predicted again this year in Texas, Louisiana, Arkansas, and Oklahoma. Indeed, out of 49 trapping locations in these four states, only 12 adult SPB were collected - 11 in Texas, 1 in Arkansas and none in Louisiana and Oklahoma. SPB activity this year also is likely to remain insignificant in at the northern limits of the SPB range in Ohio, Delaware and Maryland.

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.

This survey system, developed by the Texas Forest Service, has been in use across the South since 1986. 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.

Continued on Page 6

SPB Prediction (Continued from Page 5)

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. Of the 156 specific counties, parishes, or ranger districts surveyed in 2000, predictions proved correct for both trend and level of SPB activity in 107 cases (70%). The correct trend (decline, static, increase) was predicted in 88% of the cases and the correct level (low, moderate, high, outbreak) in 72%. In relatively few cases (10%) were prediction errors made in both infestation trend and level for a given locality.

Results of the SPB survey, including trend predictions for 2001 for over 150 locations within 17 states, are posted on the Internet at http://www.fs.fed.us/research/4501/ or http://txforestservice.tamu.edu. For additional information, contact Dr. Ron Billings, Texas Forest Service at (936) 639-8170 or by e-mail at rbillings@tfs.tamu.edu.

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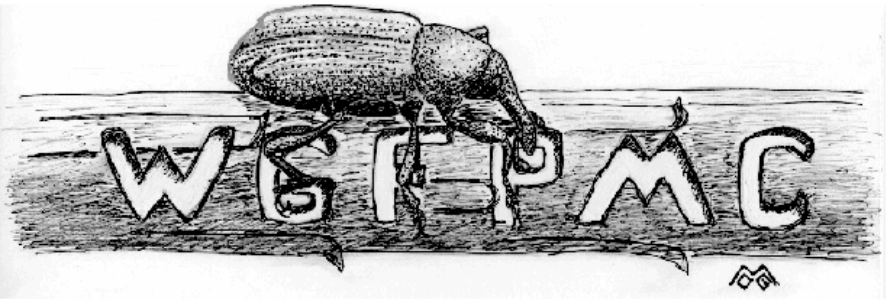
Table 2. Summary of Southwide Southern Pine Beetle Trend Predictions for 2001

State	No. of Infestations in 2000	No. of Locations Trapped	2000			2001			2001 Prediction Trend/Level	Most Likely Locations of SPB Activity
			% SPB	SPB/ trap/day	Clerids/ trap/day	% SPB	SPB/ trap/day	Clerids/ trap/day		
Oklahoma	0	1	0%	0.0	1.0	0%	0.0	1.0	Static/Low	----------
Arkansas	0	7	0%	0.0	2.5	0%	0.0	5.3	Static/Low	----------
Texas	0	20	0%	0.0	3.2	0%	0.0	8.1	Static/Low	----------
Louisiana	0	22	0%	0.0	4.0	0%	0.0	7.8	Static/Low	----------
Mississippi	809	10	31%	23.2	33.7	18%	4.0	14.8	Declining/Low	Bienville & Shoal Creek R.D., Tishimingo Co.
Alabama	26,407	6	70%	112.2	30.9	56%	66.7	42.3	Declining/High	All Areas Trapped
Kentucky	1,664	7	97%	197.6	7.0	31%	15.2	24.5	Declining/Moderate	Stearns & Somerset R. D.
Georgia	2,682	10	54%	42.1	10.6	30%	13.8	23.3	Declining/Low-Moderate	Armuchee & Tallulah R.D., Cowetta & Walker counties
Tennessee	9,883	7	80%	49.1	5.3	35%	25.0	20.1	Declining/Moderate	Nolichucky & Ocoee R.D., Rhea & Wayne counties
Virginia	1,946	4	50%	25.5	20.5	33%	3.8	18.8	Declining/Low	----------
Florida	1,172	23	62%	13.2	1.6	68%	45.0	1.7	Increasing/Moderate	Alachua, Madison, Marion, Orange, Putnam & Washington counties
South Carolina	13,124	35	57%	25.5	8.9	43%	23.8	19.6	Declining/Moderate	Abbeville, Cherokee, Greenwood, Lexington, McCormick, Newberry, Oconee, Pickens, Spartanburg & York counties
North Carolina	2,199	13	55%	72.4	8.2	29%	14.6	14.7	Declining/Low-Moderate	Grandfather & Tusquitee R.D., Cleveland, Davidson & Wilkes counties
Maryland	0	3	16%	0.8	3.8	7%	0.3	3.1	Static/Low	----------
Ohio	-----	6	-----	-----	-----	19%	2.6	7.1	Static/Low	----------
Delaware	-----	1	-----	-----	-----	13%	0.3	2.1	Static/Low	----------
Southern States	59,886	175	41%	40.1	10.1	24%	13.4	13.4	Declining/Moderate (East) with localized High/Outbreak areas and Static/Low (West)	Alabama, Kentucky, Georgia, Tennessee, North Carolina, South Carolina, Florida

More Announcements

Contact Meeting Announcement continued

Western Gulf Forest Pest Management Cooperative
2001 Contact Meeting



August 14, 2001

Texas Forest Service
Cudlipp Forestry Center Training Building
Lufkin, Texas Forest Service

AGENDA

9:00 AM	Meeting called to order, introductions, opening comments
9:15 AM	WGFPMC Research Update (Don Grosman, WGFPMC)
10:15 AM	Break
10:30 AM	Formosan Termite (Harry Howell, TAMU)
11:00 AM	Other Exotic Pests (Ron Billings, TFS)
11:30 AM	SPB Information Center (Steve Clarke, USFS)
12:00 Noon	Lunch (provided)
1:00 PM	Insects Associated with Intensive Management (Kier Klepzig, USFS)
1:30 PM	Silvicultural Applications for Airborne Chlorophyll Content Imagery (Anton Cush, Associated Technical Management Corp.)
2:00 PM	Break
2:15 PM	Ice Damage Review (Joe Pase, TFS)
2:45 PM	WGFPMC Research Update (continued)
4:00 PM	Meeting Adjourned

More Announcements

Benlate Canceled

(W. Burr, 23 Apr 01; Ms. Env., Vol. 29, No. 3 via Alabama Pesticide Information, May 2001)

Dupont announced on April 19 that it is going to stop manufacturing benomyl (sold under tradename of Benlate) by the end of this year. The company expects to phase out distribution and sale of all benomyl products by the end of 2002. Approximately 1 million pounds of benomyl are used annually in this country on some 70 fruit, nut, vegetable and field crops. Dupont emphasized that this is not a product recall and all existing stocks can be used according to label instructions. One of the main reasons Dupont decided to withdraw benomyl is the company is no longer willing to bear the high and continuing costs of defending the product in the U.S. legal system. Dupont says that this system allows other factors than good science to influence decisions. Dupont remains fully confident that this 30-year old fungicide is safe when used as directed.

Diazinon Update – Some Good News!

(W. Burr, 23 Apr. 01 via Alabama Pesticide Information, May 2001)

Earlier this year EPA announced that diazinon would be canceled. This included all home, garden, and agricultural uses. However, many agricultural uses will be retained according to the EPA. An agreement between Makhteshim-Agan of North America, Syngenta Crop Protection and EPA will allow a number of agricultural uses to remain. The reason for this decision being made was due to several factors. These included comments received (see your comments do matter on these issues) and the fact that the agricultural uses were not being canceled due to dietary concerns but were a voluntary business decision by the registrants.

The use of diazinon on bananas, celery, cucumbers, ground squirrel/rodent burrow/dust stations for public health use, parsley, parsnips, peas (succulent), peppers, potatoes (Irish and sweet), squash (winter and summer), Swiss chard, and turnips (roots and tops) will be retained as Section 24-c state special local needs uses. Spinach, strawberries and tomatoes will retain their Section 3 (full label registration) registrations.

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Thought You Might Be Interested to Know . . .

Methyl Bromide Alternatives

(Ag. Research 1-01, Farm Chem. 12-00, Chem. Speaking, 1-01, via. Ga. Pest Mgt. News., Vol. 24, No. 4 via Alabama Pesticide Information, May 2001)

As the methyl bromide phase-out continues, alternatives are being identified. Methyl iodide and propargyl bromide have been examined as alternatives and neither are risks to ozone. A mixture of dichloropropene (Telone) and chloropicrin is being used with metam sodium (Vapam) in strawberry production.

Some natural compounds are being touted such as BioFume (derived from herbs) and DiTerra (a microbial product). Benzaldehyde and glucosinolates are produced by the Brassica family (e.g., cabbage).

Thought You Might Be Interested to Know . . .

Organophosphate Alternatives

(USDA PMC Update, 4/30/01 & 5/8/01 via Chemically Speaking, May 2001)

On April 24th, EPA's Reduced Risk Committee granted organophosphate alternative status to several products. One is the herbicide butafenacil for use as a cotton defoliant. Butafenacil is an alternative to the organophosphate cotton defoliant tribufos.

The second product is the insecticide methoxyfenozide for use on stone fruit. The compound is a second generation insect growth regulator which causes lepidopteran larvae to prematurely molt with consequent death. Methoxyfenozide is an alternative to the organophosphate insecticides azinphos-methyl, methyl parathion, chlorpyrifos, and phosmet.

The third product is the insecticide indoxacarb for use on alfalfa, peanut, potato, soybean, and lettuce. The compound is a sodium channel disruptor with a narrow spectrum (mostly lepidopteran). Indoxacarb is an alternative to the organophosphate insecticides methyl parathion and chlorpyrifos.

Wood Preservative Under Fire

(Pest. And Toxic Chem. News, Vol. 29, No. 26 via Alabama Pesticide Information, May 2001)

Copper cromated arsenate (CCA) is a commonly used wood preservative that is currently undergoing reregistration by EPA. The reregistration eligibility decision (RED) has been delayed and it was expected to be finished in 1998 by EPA. However, EPA could be stepping up the CCA case in part due to a class action lawsuit that was recently filed in U.S. District Court for the Southern District of Florida.

The class action suit names nine companies as defendants. The lawsuit has many claims but it will seek to determine, among other things, whether the defendants knew or had reason to know of the dangerous nature of treated wood, failed to adequately notify the Class of their dangerous products, were negligent or reckless in failing to properly give warning to the Class and whether conduct was willful or intentional. The American Wood Preservers Institute (AWPI) was quick to defend CCA and argues that the lawsuit is unwarranted.

CCA-treated wood has a 60-year history of safe use. It is commonly used in decks, walkways, fences, boat docks, playground equipment, utility poles and retaining walls. Treated wood products create more durable structures that won't rot or collapse, increasing safety, reducing replacement costs and preserving our valuable forests, according to AWPI. They also cited an EPA report in 1997 that concluded that pressure-treated wood did not pose unreasonable risks to children or adults, either from direct contact with the wood or surrounding soil. EPA's assessment to date has not identified any significant health concerns from the arsenic residues associated with pressure-treated wood. Several playgrounds have been torn down or closed due to the publicity about CCA. As a result of this ongoing debate Sen. Bill Nelson (D-Fla.) has asked EPA to consider requiring a warning label for woods products treated with CCA.