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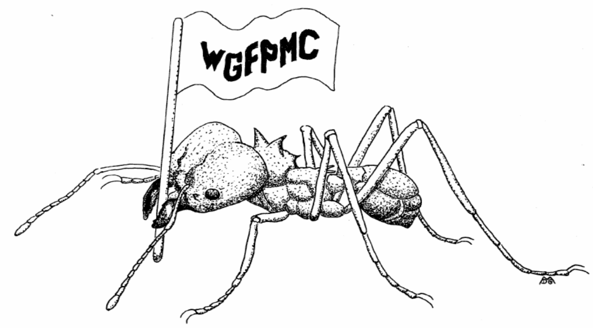
Quarterly Newsletter on Western Gulf Forest Pest Management Issues

Western Gulf Forest Pest Management Cooperative



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:

30th Entomology Seminar - All WGFPMC executive and contact representatives, industry, and TFS foresters are invited to attend the spring session of the East Texas Forest Entomology Seminar scheduled for April 24-25, 2003. The meeting will begin at 1:00 PM on Thursday at Kurth Lake Lodge, north of Lufkin, and continue until noon on Friday at the Arthur Temple College of Forestry (Room 117) at SFASU in Nacogdoches. Registration is $40, which includes an evening meal. For additional information and/or an agenda, contact Ron Billings at 979/458-6665 or rbillings@tfs.tamu.edu.

Summary of 2002 WGFPMC Research Projects

In 2002, two research projects - leaf-cutting ant control and systemic injection - were continued from 2001. Summaries of the results from the leaf-cutting ant and systemic injection studies are presented below. Results from two new studies, tip moth impact and tip moth control, will be presented in the next PEST newsletter (June 2003).

Texas Leaf-cutting Ant

The Texas leaf-cutting ant (TLCA), *Atta texana* (Buckley), is a serious pest in first- and second-year pine plantations in east Texas and west-central Louisiana. Volcano® Leafcutter Ant Bait has been highly effective in halting leaf-cutting ant activity since its registration in Texas (1999) and Louisiana (2000). However, environmental concerns about the sulfluramid class of chemicals have lead to the scheduled phase out of Volcano® in 6 - 9 years (2008-11). Trials conducted in 2001 indicate that a new fipronil bait (Blitz®) is as effective as Volcano in halting ant activity. Additional trials were conducted during the spring and summer in 2002 to evaluate the effect of application technique (loose vs. bagged and spread vs. piled) on the effectiveness of the fipronil bait.

Thirty (spring) and 18 (summer) TLCA colonies were treated and monitored in central east Texas on land managed by Temple-Inland and Louisiana-Pacific. The level of TLCA activity was evaluated 2, 8, and 16 weeks post-treatment for each colony and compared to activity prior to treatment.

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Research Projects (Continued from Page 1)

During the spring trials, both loose and bagged and spread and piled treatments showed marked reduction in ant activity after 2 weeks compared to the check colonies. All treatments were successful in completely halting ant activity in 100% of the treated colonies after 8 weeks. However, the loose/spread bait was quicker at halting ant activity at 2 weeks post treatment than were the other bait treatments (Fig. 1).

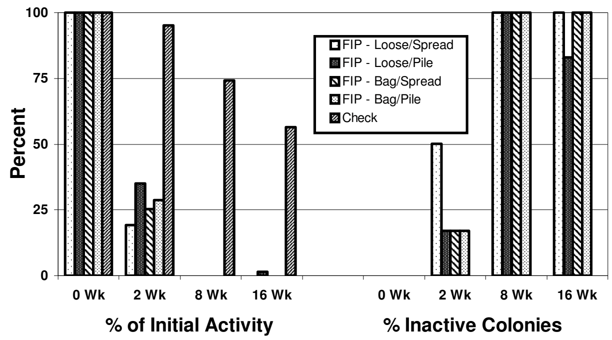

Figure 1. Percent of Texas Leaf-cutting ant activity reduced and colonies inactive 2, 8 & 16 weeks after treatment with fipronil (Spring 2002).

During the summer trials, all bait treatments were again 100% effective in completely halting TLCA activity after 8 weeks. However, the reduction in ant activity was much more pronounced for the two loose bait treatments after 2 weeks compared to the bag treatment (Fig. 2).

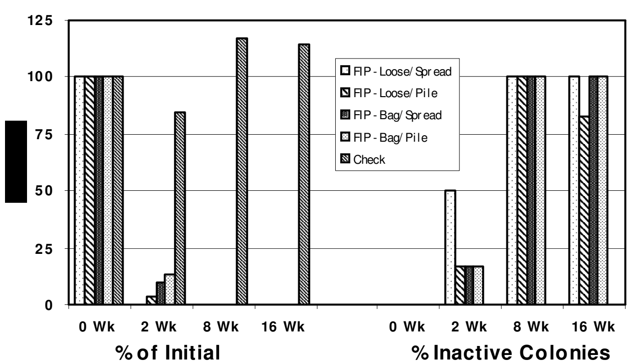

Figure 2. Percent of Texas Leaf-cutting ant activity reduced and colonies inactive 2, 8 & 16 weeks after treatment with fipronil (summer 2002).

Bayer Crop Science (formerly Aventis) is currently pursuing registration of the fipronil bait in the United States under the new product name "BES-100". I will keep you informed as to progress of this registration as information becomes available.

Systemic Injection

Trials conducted by the WGFPMC from 1999 and 2001 showed that injection of systemic insecticides using the high volume STIT injector (Helson 2001) could significantly reduce coneworm and seed bug damage compared to checks. Field tests were continued in 2002 to further evaluate the residual activity of high volume trunk injections of emamectin benzoate and thiamethoxam in reducing losses to coneworms and seed bugs, and to evaluate the efficacy of different application rates of emamectin benzoate and thiamethoxam applied in 2001.

The field trials were conducted at the Texas Forest Service Magnolia Springs Seed Orchard in two blocks containing drought-hardy loblolly pine. For the duration trial, 5 ramets from 10 clones were selected. The 5 treatments consisted of:

1) Check
2) Emamectin benzoate (EB) 4% by STIT Injector in April '99, Group 1
3) EB 4% by STIT Injector in April '99 & '00, Group 2
4) EB 4% + Thiamethoxam (Thia.) 5% by STIT in April, '99, Group 1
5) EB 4% + Thia. 5% by STIT in April, '99 & '00, Group 2

For the rate study, 7 ramets from 10 clones were selected. The 7 treatments consisted of:

1) Check
2) 20 ml emamectin benzoate (EB) 4% by STIT injector in April '01
3) 20 ml each of EB 4% + Thiamethoxam (Thia.) 5% by STIT
4) 10 ml each of EB 4% + Thia. 5% by STIT
5) 3 ml each of EB 4% + Thia. 5% by STIT
6) 20 ml Thia. 5% by STIT
7) Asana XL (foliar hydraulic) 5 times per year at 5 week intervals

For both studies, the effects of treatments on 2nd-year cones were checked by evaluating damage on picked cones from each tree. Seed lots, from a subsample of apparently healthy cones, were radiographed to measure the extent of seed bug damage.

Duration Study: Evaluations of picked cones showed moderate coneworm damage (21%) on check trees in 1999 and 2000, but more extensive damage in 2001 (34%) and 2002 (32%).

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Research Projects (continued from page 2)

Treatments that included emamectin benzoate consistently provided the best overall protection against coneworm attack (Fig. 3). Both emamectin benzoate alone and emamectin benzoate + thiamethoxam reduced overall coneworm damage by 96+% in 2000, 84+% in 2001, and 52+% in 2002, compared to the check. Two-injection treatments containing emamectin benzoate did not differ from single-injection treatments. Therefore, a single injection of emamectin benzoate is sufficient to protect trees against coneworm for at least four full years.

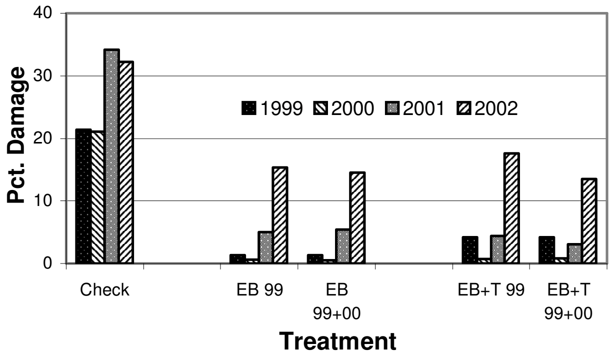

Figure 3. Coneworm infestation in picked cones from Magnolia Springs Seed Orchard, Texas from 1999 to 2002. EB = Emamectin benzoate; T = Thiamethoxam.

Treatments that included thiamethoxam consistently provided the best overall protection against seed bug attack (Fig. 4). Emamectin benzoate + thiamethoxam reduced overall seed bug damage by 52.9%, compared to the check in 1999, and by 69% in 2000. However, both single and double injections of these chemicals did not continue to provide significant protection against seed bugs through the 2001 and 2002

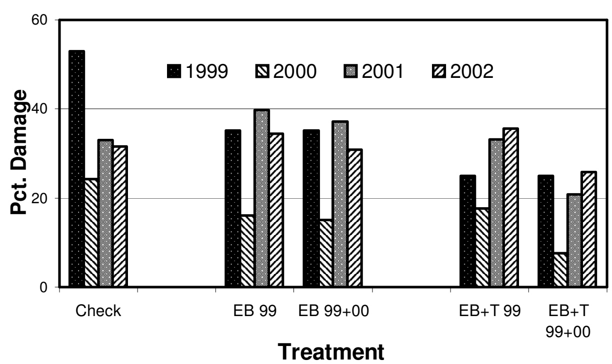

Figure 4. Seed bug damage in loblolly pine seed from Magnolia Springs Seed Orchard, Texas from 1999 to 2001. EB = Emamectin benzoate; T = Thiamethoxam.

growing seasons. This indicates that yearly treatments of thiamethoxam are necessary to maintain adequate protection against seed bugs.

Rate Study: Evaluations of picked cones showed lower levels of coneworm damage (31%) on check trees in 2002 compared to 2001 (46%). Although, all injection treatments significantly reduced coneworm damage compared to check trees, there was a marked reduction in efficacy compared to 2001 (Fig. 5). As in 2001, emamectin benzoate alone and the higher rates (10 and 20 ml) of emamectin benzoate + thiamethoxam reduced coneworm damage to the greatest extent compared to the check in 2002.

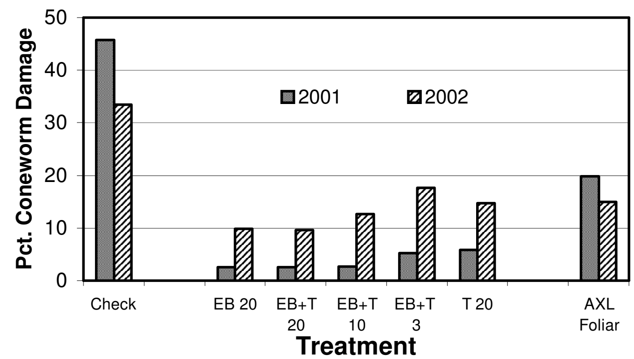

Figure 5. Coneworm infestation in picked cones from 2001 - 2002 Rate Study at Magnolia Springs Seed Orchard, Texas. EB = Emamectin benzoate; T = Thiamethoxam; AXL = Asana XL.

As expected, the higher rates (10 and 20 ml) of emamectin benzoate + thiamethoxam also provided the best protection against seed bugs (Fig. 6).

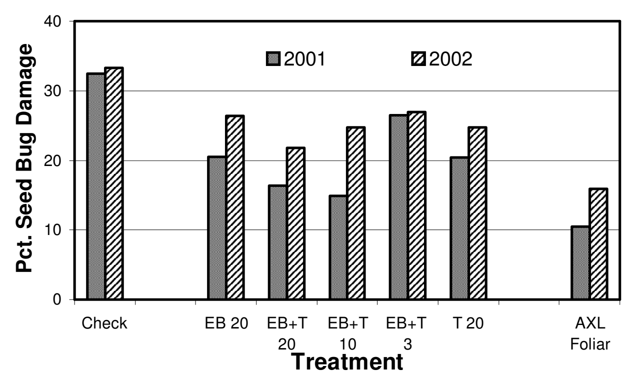

Figure 6. Seed bug damage in loblolly pine seed from 2001 - 2002 Rate Study at Magnolia Springs Seed Orchard, Texas. EB = Emamectin benzoate; T = Thiamethoxam; AXL = Asana XL.

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Research Projects (continued from page 3)

The reduction in injection treatment efficacy after only the second season in this rate study may be linked to the application rate per tree diameter. The application rates for both the duration and rate studies were based on the label recommendations for the Arise® formulation (from Japan). Larger trees (17 in. mean dia.) in the duration study, on average, received about 8 ml of product per inch of tree diameter and whereas rate study trees (10 in. mean dia.) received about 6 ml of product per inch diameter. It was recently announced by Dave Cox, Syngenta Crop Protection, that the Arise® formulation will not be registered in the U.S. However, another emamectin benzoate formulation, Denim®, is already registered in the U.S. and may be a good alternative to Arise®. A study will be established in 2003 to evaluate the efficacy of Denim® in reducing damage by cone and seed insects in pine seed orchards.

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Spotlight – Phylloxera (aphids) and Needle Midge

I received two calls late last summer about two "new" pest problems – phylloxera and needle midge.

The first call was from the nursery manager of one WGFPMC member who described leaf curl damage occurring on oak seedlings at their nursery. Upon visiting the nursery, I observed severe damage to the terminal area of most overcup oak seedlings (Fig. 7). In contrast, neighboring Shumard oak seedlings showed very little damage. Leaf samples were taken and the culprit was determined to be phylloxera (closely related to adelgids and aphids). Similar damage also was observed at the TFS Indian Mounds Nursery the same year.

Figure 7. Leaf curl damage caused by Phylloxera on overcup oak in East Texas nursery, August 2002.

Several phylloxera species are known to cause galls on hickories and pecan. The species of phylloxera causing damage in Texas has yet to be determined. However, the damage caused in Texas is somewhat similar to that described for an imported phylloxera species that has become a considerable pest on Garry oak in British Columbia. The species reported in British Columbia is believed to have come from Europe. The small, pear-shaped insect is 1 mm long and an orangish yellow color. It feeds by sucking the plant sap near the leaf veins. Like its aphid relatives, phylloxera has several generations per year.

The phylloxera mainly attacks Garry oak and English oak in British Columbia. The damage observed in Texas was most prevalent on overcup oak, but some light damage was found on shumard oak. The damage in British Columbia is reported to be first visible as yellow spots on the leaves in May and June. This gradually progresses to complete browning and defoliation of some trees by late July. By late July or early August heavily affected trees lose their leaves. Often the trees produce a second flush of leaves in August. Most trees with phylloxera seem to have light infestations without damage, while a few trees are heavily attacked, year after year, becoming severely weakened. Many infested trees are cut down by the owners, but for the first time in 1993, chronically attacked trees were found to have died from phylloxera infestations. It is likely that all heavily attacked trees will eventually die.

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Spotlight (continued from page 4)

At least 10 species of predators have been recorded feeding on the phylloxeran in British Columbia, but they do not appear to control it. In Europe, the phylloxeran is a minor pest, causing discoloration to some trees in some years. Several ladybird beetles and lacewing were observed on the infested trees in Texas, but were apparently insufficient in numbers to prevent damage. Several contact and/or systemic insecticides (acephate, bifenthrin, dimethoate, disulfoton and imidacloprid) are registered for use against aphids in nurseries. (Source: BC Pest Monitor, June 1995)

The second call came from a plantation manager who had observed "sawfly defoliation" in his company's eight-year old loblolly pine plantation. A visit to the plantation, South of Diboll, found unusual needle loss to the upper tree crown and many of the remaining needles were bent in the middle (Figs. 8 & 9). The damage appears to have been caused by a species of pine needle sheath midge, most likely *Contarinia acuta* Gagne. Similar outbreaks were observed in 1971 at the Erambert Seed orchard in Brooklyn, Mississippi and in 1983 at the Stuart Seed Orchard in McNair, Louisiana.

Figure 8. Defoliation caused by pine needle sheath midge on 8 year old loblolly pine in East Texas plantation, September 2002.

The pine needle sheath midge has four generations per year and each generally corresponds to the growth flushes of the trees. The larvae feed on the needle tissue within the fascicle sheath. The damaged areas become visible after the needles elongate.

Figure 9. Bent loblolly pine needles caused by pine needle sheath midge in an East Texas plantation, September 2002.

The defoliation that occurred in 2002 was primarily restricted to the second to last growth flush, so loss of tree vigor was probably minimal. However, when defoliation is extensive (occurring on over 50% of the canopy) and/or prolonged, dieback may be expected. In addition to loss of tree vigor caused by midge defoliation, the potential exists for an influx of secondary insects, *Ips*, deodar weevils, etc. Severe infestations of needle midge are usually followed by pitch canker, *Fusarium moniliforme*, outbreaks.

Pine needle sheath midge populations are normally controlled by a parasitic mite, *Pyemotes emarginatus* Cross, Moser, and Rack, and the predaceous larvae of several midge species. However, this needle midge apparently becomes a problem sporadically in seed orchards when regularly sprayed pesticides kill natural enemies, leaving the midges to feed and grow undisturbed within the needle fascicle. Under these circumstances, systemic insecticides may be more effective for control operations.

Reference:

Weatherby et al. 1989. Biology of a pine needle sheath midge, *Containia acuta* Gagne (Diptera: Cecidomyiidae), on loblolly pine. Proc. Entomol. Soc. Wash. 91: 346 – 349.

Thought You Might Be Interested to Know . . .

New Warrior® Uses

After loosing a number of forestry-use insecticides, we finally get a new one. The federal label for Warrior® with Zeon Technology (lambda cyhalothrin) has been expanded to include use on conifer and hardwood trees in plantations, nurseries and seed orchards. In seed orchards, Warrior® can be applied by air or on the ground using low and high volume sprayers. New targeted pests include the following:

Conifer Pests		Deciduous Pests	
coneworm spp.	pine weevil spp.	Bagworm	sawfly spp.
seed bugs spp.	pine conelet bug	tent caterpillar spp.	Japanese beetle
pine tip moth spp.	pine leaf chermid	leafroller spp.	May beetle spp.
spruce budworm	balsam wooly aphid	gypsy moth	June beetle spp.
pine sawfly	balsam twig aphid	webworm spp.	leaf beetle spp.
pine chafer	webworm spp.	tussuck moth spp.	spittlebug spp.
pine colaspis beetle	spittlebug spp.		
pales weevil	tussuck moth spp.		

For some insects, like pine tip moth, control with insecticides require precise timing to apply the spray just before the larvae are exposed. However, Mr. Mark Dalusky and Dr. Wayne Berisford, University of Georgia, have reported that Warrior® has a week to 10 days longer application window than Pounce® so spray timing is not as critical.

List of Restricted-Use Pesticides

(Source: Georgia Pest Management Newsletter, Mar. 2003)

If you need a list of restricted-use pesticides, here are some good sources. If you need the original source, go to the EPA web site **http://www.epa.gov/opprd001/rup/**. Many people find the EPA list cumbersome. A Nebraska list found at **http://www.ianr.unl.edu/pubs/pesticides/ec2500.pdf** is more streamlined, but it may not be as current as the EPA list. Finally, the label of every restricted-use pesticide carries the words "Restricted Use Pesticides" at the top of the front panel. Although both of the lists above can be expected to be reasonably accurate, the label is the definitive source.

Status of Organophosphate Reregistrations

(Source: Georgia Pest Management Newsletter, Mar. 2003)

Now that the smoke has mostly cleared for the organophosphates, here is a recap of the impacts for homeowner pesticides.

Chlorpyrifos. Sales for all uses around the home ended December 31, 2001.

Diazinon. All retail sales for indoor uses stopped December 31, 2002. Manufacturing for all lawn, garden, and turf uses stops June 1, 2003. Sales and distribution for these products will stop August 1, 2003. All registrations for these uses will be canceled December 31, 2004, and the registrants will initiate a buy-back program for remaining retail stock.

Dimethoate(Cygon). All residential uses cancelled, including home gardens, buildings, recreational facilities and playgrounds. Retailers can sell dimethoate products for residential sites and public areas until March 12, 2003.

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Acephate(Orthene). The cancellation order is expected to include all residential indoor uses and most turfgrass sites. Acephate will still be available for fire ant mound treatments. Acephate products for residential use could be sold until December 31, 2002.

For all of these products, it is legal to use existing products for residential uses. If you have it, you can use it according to the label. If you do not want to use it, give it away or dispose of it in with your trash. For trash disposal, we recommend that you protect against leaks. If you can do so easily, pour cat litter (or another absorbent) into the container to soak up the liquid. Otherwise, place the sealed container and cat litter into a larger container (like a plastic bucket) with a lid. The cat litter will absorb any leaking pesticide.

Keep in mind that the decisions to cancel these pesticide uses were primarily economic. The EPA did not discover a new health risk, but the Agency was concerned. The pesticide registrants were asked to address the concerns in order to maintain the registrations. Developing new data can be very expensive, so the registrants decided to withdraw the registrations for household uses.

Our book of pesticide recommendations for residential uses has been whittled down to a half sheet of paper written on just one side. Our recommendations for residential insecticides can almost be summed up in one line, "Use a pyrethroid, imidacloprid, carbaryl (Sevin), or malathion."

All four of these options have serious disadvantages. Pyrethroids exacerbate problems with mites and scale insects. Additionally, some groups are already calling pyrethroids "endocrine disruptors." Using the words "endocrine disruptor" and "children" in the same sentence will become as bad as handing out cigarettes in day care centers. Furthermore, entomologists have raised concerns about resistance if pyrethroids are the only alternative for some major pests.

Imidacloprid is very effective against certain insects (*e.g.,* aphids), and it lasts a long time. These two factors make resistance more likely. Without other alternatives, many entomologists are concerned about the long-term efficacy of imidacloprid.

Carbaryl and malathion are effective against some pests, but they do not provide the broad-spectrum activity of some of the organophosphates. Additionally, carbaryl is a carbamate insecticide. The carbamate group is next in line for cumulative risk assessment by EPA.

Other Pesticide News

(Source: Illinois Pesticide Review, Jan. 2003)

GUTHION (azinphos-methyl)—Bayer —Details regarding the phaseout of this product are as follows: Unless additional data are submitted, the time-limited registrations on almonds, apples, blueberries, Brussels sprouts, cherries, nursery stock, parsley, peas, pistachios, and walnuts will be canceled 12-31-05. The use on cotton, cranberries, nectarines, peaches, potatoes, **southern pine seed orchards**, and caneberries will be phased out and prohibited after December 31, 2005.

BASF— The company has purchased from Bayer its **fipronil** insecticide chemistry. Included in the sale was Bayer's manufacturing facility located in France.

BAYER—The company has sold its insecticides **fipronil** and ethiprole and the fungicides procloraz, iprodione, triticonazole, fluquinazole, and pyrimethanil to BASF. Bayer retained the rights under a license agreement to market **fipronil** in certain nonagricultural markets.