**P**rogress

**E**ducation

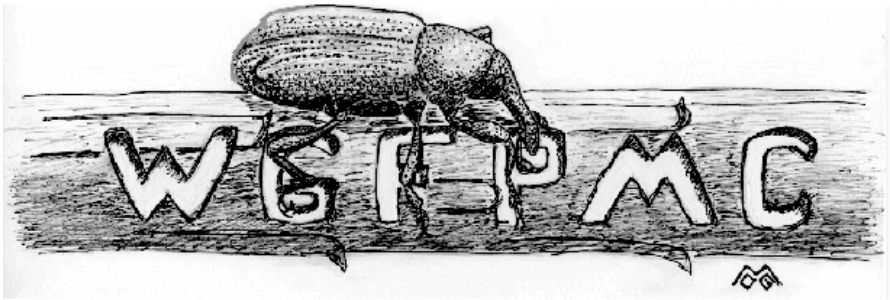
**S**cience

**T**echnology

**Vol. 6 No. 1 Mar. 2001**

**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).

**********

## Announcement:

**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 26-27, 2001. 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 Texas Forest Service Training Building at the Cudlipp Forestry Center in Lufkin. Registration is $20, which includes an evening meal. For additional information and/or an agenda, contact Ron Billings at 936/639-8170 or rbillings@tfs.tamu.edu.

## 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, are presented below. Results from the pest survey and tip moth pesticide study will be presented in the next PEST newsletter (June 2001).

### 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. With the scheduled withdrawal of methyl bromide by 2005, a study was initiated in 1996 to evaluate several alternative products for their effectiveness in halting ant activity.

Previous research by the Texas Forest Service, together with trials conducted by the WGFPMC between 1996 and 1999, showed that a bait containing sulfluramid was highly effective in halting leaf-cutting ant activity. This research was instrumental in obtaining 24C (Special Local Need) registrations for Volcano® Leafcutter Ant Bait in Texas (1999) and Louisiana (2000). Trials were continued in 2000 to further evaluate the effectiveness and attractiveness of Volcano® compared to the standard Griffin (GX-483) bait that had been tested from 1996 to 1999.

Sixty-two (winter of 1999-2000) and 44 (summer of 2000) TLCA colonies were treated and monitored in central east Texas on land managed by Temple-Inland, Louisiana-Pacific, and International

Continued on Page 2

## Research Projects (Continued from Page 1)

Paper. The level of TLCA activity was evaluated 2, 8, and 16 weeks post-treatment for each colony and compared to activity prior to treatment.

During the winter trials, all six sulfluramid treatments significantly reduced ant activity after 2 weeks compared to the check colonies. All rates of Griffin baits were ultimately successful in completely halting ant activity in 100% of the treated colonies after 16 weeks, but one failure occurred at each of the lower rates (2 and 4 g/m$^2$) of Volcano®. These failures resulted from reduced foraging activity brought on by severe drought conditions.

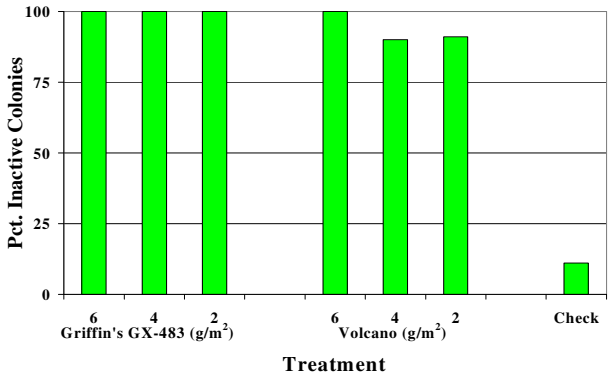



**Figure 1**. Percent of Texas Leaf-cutting ant colonies inactive 16 weeks after treatment with two formulations of sulfluramid (GX-483 and Volcano®) and three rates (6, 4 & 2 g/m$^2$) (winter 1999 – 2000).

During the summer trials, all three chemical treatments (GX-483, Volcano®, and Mirex-S®) significantly reduced ant activity after 2 weeks compared to the check colonies. However, only the standard Griffin bait was 100% effective in completely halting ant activity after 16 weeks (Fig. 2).

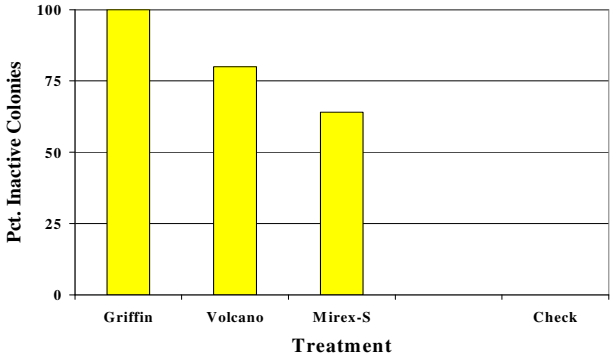



**Figure 2.** Percent of Texas leaf-cutting ant colonies inactive 16 weeks after treatment with three formulations of sulfluramid [GX-483, Volcano®, or Mirex-S®) applied by spreader at 10 g/m$^2$ (summer 1999).

Although Volcano® has been proven highly effective in reducing ant activity, there have been a few failures. The applicator needs to be aware that the best control occurs when the bait is applied when the ants are active above ground and under dry conditions (not within 24 hours of a rain event). An additional trial was conducted in July to determine how long it would take Texas leaf-cutting ants to retrieve bait applied (10 g/m$^2$) to the central nest area. Field observations indicate that all the bait was retrieved within 4-5 hours.

Although Volcano® has performed well against leaf-cutting ants, the Environmental Protection Agency has expressed some concern this past fall about the persistence of sulfluramid in the environment. Because of this, we have begun to look at alternatives to Volcano®. Trials are currently underway to evaluate the efficacy of a new bait, Blitz® (fipronil), during the winter months.

### Systemic Injection

Trials conducted by the WGFPMC in 1999 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 2000 to further evaluate the efficacy of high volume trunk injections of emamectin benzoate, thiamethoxam, and imidacloprid in reducing losses to coneworms and seed bugs, and evaluate the residual activity of products applied in 1999.

The field trials were conducted at the Texas Forest Service Magnolia Springs Seed Orchard in a block containing drought-hardy loblolly pine. Seven to 10 ramets from four to ten loblolly clones were selected. The 10 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
6) Imidacloprid (Imid.) 5% by STIT in April '99, Group 1
7) Imid. 5% by STIT in April '99 & '00, Group 2
8) Asana XL applied to foliage 5X at 5 week intervals in '00
9) EB 4% by Wedgle Tip injector in April '98

Continued on Page 3

**Research Projects** (continued from page 2)

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.

Evaluations of picked cones showed moderate coneworm damage (21%) on check trees in both 1999 and 2000. Treatments that included emamectin benzoate consistently provided the best overall protection against coneworm attack (Fig. 3). In 2000, both emamectin benzoate alone, and emamectin benzoate + thiamethoxam reduced overall coneworm damage by 96+%, 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 two full years.

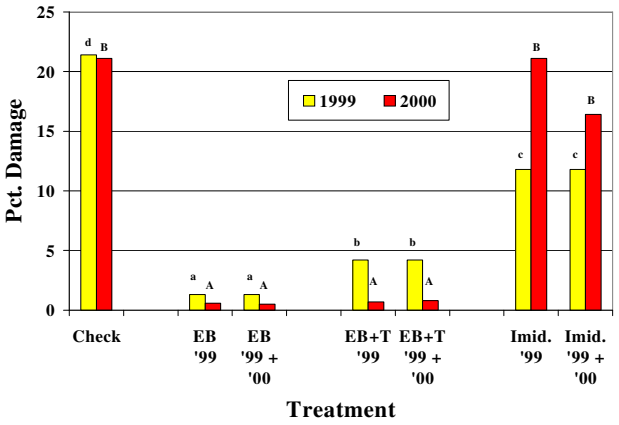



**Figure 3.** Coneworm infestation in picked cones. EB = Emamectin benzoate; Thia = Thiamethoxam; Imid. = Imidacloprid. Bars of total coneworm for a given year with the same letter are not significantly different at the 5% level, based on Fisher's Protected LSD.

Emamectin benzoate treatments applied by Wedgle Tip™ injector in 1998 continued to show residual effects in 2000. Surprisingly, the level of coneworm damage reduction in 2000 (61%) was nearly identical to the level of damage reduction observed in 1998 (59.8%) and 1999 (59.2%).

Treatments that included imidacloprid or thiamethoxam consistently provided the best overall protection against seed bug attack (Fig. 4). Two treatments, imidacloprid and emamectin benzoate + thiamethoxam; reduced overall seed bug damage by 81.9%, and 52.9%, respectively, compared to the check in 1999 (Fig. 2) and by 75% and 69%, respectively in 2000. In 2000, single injections of most chemicals from 1999 continued to provide significant protection against seed bugs through the 2000 growing season. However, additional reductions in damage were obtained with a second injection of treatments containing thiamethoxam or imidacloprid. This indicates that yearly treatments of thiamethoxam or imidacloprid are generally necessary to maintain adequate protection against seed bugs.

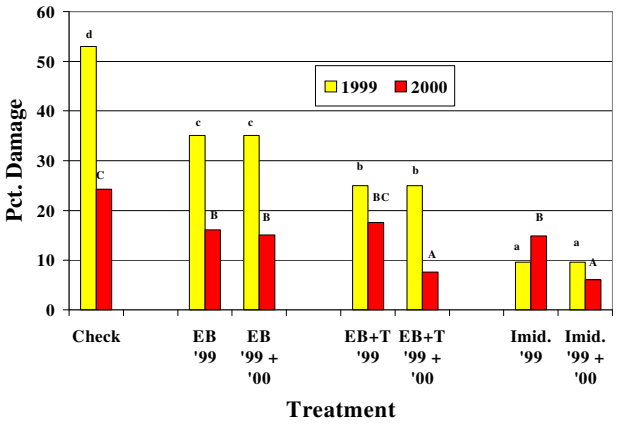



**Figure 4.** Seed bug damage in loblolly pine seed from Magnolia Springs Seed Orchard, Texas in 1999 and 2000. EB = Emamectin benzoate; Thia = Thiamethoxam; Imid. = Imidacloprid. Bars of percent seed damaged in a given year with the same letter are not significantly different at the 5% level, based on Fisher's Protected LSD.

Over the past three years, emamectin benzoate treatments have exhibited the best overall protection against coneworm, but generally had little effect on seed bug. Although emamectin benzoate treatment effects were good in 1998, use of higher injection volumes in 1999 and 2000 improved protection of cones against coneworm by >35%. In addition, the data suggest that a single injection of emamectin benzoate can protect trees against coneworm for 30 months or longer. The actual extent of this chemical's residual activity has yet to be determined.

In contrast, thiamethoxam and imidacloprid provided good protection against seed bug in 1999 and 2000, but generally showed little effect against coneworm.

A new study is being established in 2001 to determine the optimal application rates of these products.

## Texas Forest Pest Conditions - 2000

(by H. A. (Joe) Pase III, Texas Forest Service)

During 20000, weather and pine engraver beetles were the topics of interest related to forest health. A widespread and severe summer drought coupled with unprecedented high temperatures followed earlier local occurrences of ice, hail, and a tornado that damaged timber. Pine bark beetles were the predominant insect pest. They are the most destructive group of insects in the forests of the United Sates. There are five (5) species of pine bark beetles that inhabit the forests of the South, including East Texas. Low populations of the dreaded southern pine beetle that were present in 1999 continued into 2000. However, populations of three species of pine engraver beetles (*Ips* spp) that were very high in 1999 continued to cause pine tree mortality across all of East Texas in 2000. The black turpentine beetle was only slightly above normal levels. The information below summarizes forest insect and disease activity in East Texas for 2000.

**PINE ENGRAVER BEETLES**

The severe drought that began in 1998 in East Texas continued into 2000 resulting in another year of significant *Ips* beetle activity. Ips beetles impacted many landowners and homeowners in 2000. These beetles tend to attack and kill scattered single trees or small groups of trees (seldom more than 10-15 trees in a group). Cutting and removing (salvage) infested trees is about the only control method that can be used; however, in most cases this control technique is not economically feasible because of the scattered pattern of *Ips*-attacked trees. Cutting *Ips*-infested trees and leaving them on the ground is of no value for control. In addition, cutting a buffer of green uninfested trees around *Ips*-infested trees is not recommended. Once the bark begins to "slip" from a dead tree, the beetles that killed the tree have all left and there is no need to cut the tree down unless there is danger of the tree eventually falling on a building, road, fence, power or utility line, etc. Insecticides typically are not economical or practical to use for engraver beetles. It is common for all three species of *Ips* beetles to attack a single pine tree. If drought conditions persist across East Texas in 2001, engraver beetles will continue to kill pine trees.

*Ips* beetle activity was greatest in the counties that lie along the western fringe of the natural pine range in East Texas. In October and November 2000, aerial surveys covering over 2,000,000 acres in Anderson, Houston, Walker, and Montgomery counties were conducted to monitor the extent and severity of drought and associated pine bark beetle timber losses. In the survey area, 25% or more of the stand was dead on 3,250 acres, with 78% of the tree mortality occurring in sawtimber stands. The total dollar value of the timber loss was estimated to be more than $1.8 million. In addition, it is estimated that less then 5% of this timber was salvaged. Information about pine engraver beetles is available on the Texas Forest Service web site (http://txforestservice.tamu.edu).

**BLACK TURPENTINE BEETLE**

Black turpentine beetle activity was slightly higher than normal in Texas in 2000, probably related to the drought. These bark beetles usually attack the lower six to eight feet of a pine tree. Of the five pine bark beetles in East Texas, the turpentine beetle is usually the least damaging.

**SOUTHERN PINE BEETLE**

No infestations of southern pine beetle were reported on state, private, or federal lands in Texas in 2000. This is the first time in almost 50 years that no southern pine beetle activity was reported in Texas for two consecutive years. Early indications are that southern pine beetle activity in 2001 will continue to be very low.

**FOREST TENT CATERPILLAR**

Localized activity by this defoliator occurred in Texas in 2000, but no outbreak areas were reported. This defoliator does not cause serious harm to the trees, unless it occurs several years

Continued on Page 5

**Pest Conditions** (continued from page 4)

in succession. Defoliated trees produce new leaves and look normal by early summer. The caterpillars are sometimes a nuisance.

**NANTUCKET PINE TIP MOTH**
In Texas, pine tip moth activity remained static from 1999 to 2000 with about 75% tip infestation. Some areas were heavily infested while other areas experienced moderate damage. Infestation levels were light early in the year, but increased markedly from July through September after the drought began. The small, orange-colored larvae of this insect attack the growing tips of young pine trees. Their feeding rarely causes mortality, but some growth loss does occur. Once trees grow taller than about eight feet, tip moth seldom attack them. Drought seems to have contributed to increased activity in 1999 and 2000.

**BLACKHEADED PINE SAWFLY**
Blackheaded pine sawfly activity declined from locally moderate levels in 1999 to very low levels in 2000. Feeding by this sawfly is not known to directly kill trees. Outbreaks tend to be short in duration and high larval populations usually are controlled by parasites, predators, and disease.

**REPRODUCTION WEEVILS**
Very little weevil activity was noted in 2000. This was probably because most planting in 2000 was replants of trees killed during the 1998 and 1999 drought. These weevils may kill recently planted seedlings by feeding on the tender bark. Wildfires in September of 2000 killed many acres of timber. After salvage operations, many of these areas will be replanted with pine trees. Weevils could be a concern if the harvest-to-planting interval is less than six months. If weevils are expected to be a problem, landowners are encouraged to plant seedlings treated with the insecticide Pounce®.

**TEXAS LEAF-CUTTING ANT**
In 2000, this insect continued to defoliate young pine trees in East Texas and west central Louisiana. Volcano® Leafcutter Ant Bait that was registered for use in Texas in 1999 received Special Local Need (SLN) registration in Louisiana in 2000. A single application of Volcano® Leafcutter Ant Bait completely eliminates ant colonies in as little as four weeks. Research by the Texas Forest Service on another new bait continues.

**GYPSY MOTH**
No gypsy moth infestations are known to exist in Texas. The US Department of Agriculture, Animal and Plant Health Inspection Service in cooperation with the Texas Department of Agriculture deploys traps in Texas each year and a few male moths are caught. This insect was introduced to the northeastern United States over 100 years ago and has slowly spread, mostly due to man's activities. Most of the northeastern US, the Lake States, and some localized areas in the Pacific Northwest have established infestations. Male moths that are trapped in Texas are brought here from infested areas by persons who unknowingly transport pupae or egg masses on their vehicles, camping gear, or other items.

**PINE COLASPIS BEETLE**
Pine colaspis beetle activity was reported in extreme SE Texas in May of 2000. An area of about 3800 acres in Hardin and Jefferson counties was affected. These insects chew on the needles of pine trees and cause the foliage to appear burned or scorched. Although the trees look like they may be dying, they actually suffer little permanent damage.

**ANNOSUM ROOT DISEASE**
Localized mortality and growth loss from annosum root disease occurred in Texas in 2000. Most activity was noted in northeast Texas. This disease attacks the roots of pine trees (usually loblolly pine and slash pine) and eastern red cedar. This disease is not considered a serious problem in Texas.

**FUSIFORM RUST**
Moderate levels of fusiform rust occurred on scattered and occasional tracts in Texas in 2000. On a statewide basis, fusiform rust infection

Continued on Page 6

## Pest Conditions (continued from page 5)

levels have declined slightly in the past few years. This rust disease infects slash and loblolly pine trees. Rust diseases must have an alternate host to develop. Fusiform rust spores produced on pine trees in the early spring infect newly developing oak leaves (they cannot infect other pine trees). Then in early summer, spores produced on the oak leaves infect the growing tips of pine trees (these spores cannot infect other oak trees). The disease does little harm to oak. Rust infections on the main stem of pine trees less than 10 years old may cause tree mortality.

**OAK WILT**

Oak wilt continues to devastate over 60 counties in Texas, mostly between Dallas and San Antonio. Urban and rural oaks are affected. Live oak, the premier tree species in the region and highly valued for beauty, shade, and wildlife benefits, is severely impacted by the disease. The Texas Forest Service began its 14th year of a cooperative oak wilt suppression project in October 2000. Since the Project's inception, more than 2.4 million feet (>468 miles) of barrier trenches have been installed with project assistance to treat 2,065 oak wilt centers. Placing trenches between diseased and healthy trees severs interconnected root systems and halts the spread of the disease. Oak wilt foresters with the Texas Forest Service conducted aerial surveys for oak wilt infection centers over about 3.1 million acres in central Texas in 2000.

**CONEWORMS**

Losses caused by coneworms in unsprayed pine seed orchards remained static at about 21% in Texas in 2000. Losses in treated orchards were considerably less. Insects can cause serious losses to seeds and cones in pine seed orchards. These orchards are established with genetically improved trees. The seed collected from the cones that develop on these trees will produce genetically superior trees – trees that grow faster, straighter and have better quality wood. Coneworms destroy cones and seeds in cones.

**SEED BUGS**

Seed bug damage to seeds in unsprayed pine seed orchard trees was 24% in 2000. This was down from 53% damaged seed in 1999. These insects extract the contents of seeds inside cones. They do this from outside the cone by inserting a long beak between the cone scales to find the seeds. About the only way to detect seed bug damage is to x-ray seeds and observe what is inside the seeds.

**PITCH CANKER**

About 10% of the pine cones harvested from state seed orchards in 2000 in Texas were damaged by what was apparently pitch canker (unconfirmed). Pitch canker is a disease that appears to be increasing, especially in pine seed orchard.

**********

## More Announcements

### WGFPMC Research Funding

Don Grosman and Ron Billings were awarded a $36,000 grant by the FSPIAP (Forest Service Pesticide Impact Assessment Program) for the two-year (2001-2002) proposal entitled "Systemic Insecticide Injection Rate Study for Control of Cone and Seed Insects in Loblolly Pine Seed Orchards."

## More Announcements

### Pesticide Labels

(Source: Georgia Pest Management Newsletter, 2/01)

Now available at the EPA web site (**www.epa.gov/pesticides**), every pesticide label for every product that has a Section 3 registration. This system can be very useful, particularly when you need to see an obscure label. The database is organized by EPA registration number. Because the labels are pictures, not text, you must have the registration number to find a particular label. If you do not have the registration number, you can search all federal registrations by product name, active ingredient, or company name at www.cdpr.ca.gov/dprdatabase.htm. You can obtain the registration number from this database. If you need a label for a common product or a product from a major company, it is usually easier to search for the product name or visit the company web site. All major pesticide companies and many smaller ones have a web site with all of the product labels. Keep in mind that a pesticide must also be registered in the state where it is sold.

**********

## Thought You Might Be Interested to Know . . .

### Entomologist Warns of Blackfly Outbreak

Source: by Robert Burns, (903) 834-6191, rd-burns@tamu.edu
Contact: Dr. James Robinson, (903) 834-6191, jv-robinson@tamu.edu.

Encouraged by heavy rains and cool weather, black flies or buffalo gnats are emerging in record numbers from streams in central and eastern Texas, from College Station to Texarkana. "It's the worst I've seen in 10 years - we're talking about the potential of millions of dollars of damage to livestock owners, the paper manufacturing industry and tourism," said Dr. James Robinson, an entomologist with the Texas Agricultural Extension Service.

The black fly, less than 1/8 inch long, lives only six to eight weeks as an adult, takes 10 minutes to drink half a drop of blood, and rarely flies at night. Though individually tiny, in mass numbers the buffalo gnat has the power to drain the pockets of Texas livestock producers of hundreds of thousands of dollars when its larvae hatches and it emerges from rivers and streams in large numbers. Each fly takes only a minuscule serving of blood, but thousands of servings add up, irritating animals and causing them to go off feed. Paper mill managers also dread a heavy emergence of the fly. Millions of tiny flies invade the mills, finding their way into the paper-making machines, their bodies leaving minuscule black specks on freshly milled paper. During a year of heavy emergence, the black specks may ruin paper worth hundreds of thousands of dollars. On recreational areas, the flies can turn a tourist's outing or a fishing enthusiast's excursion into a nightmare, Robinson noted.

Robinson has been comparing different controls of black flies since 1979. One thrust of his work has been to find the most effective, environmentally safe control for the insect. Since the late 1980s, Robinson has recommended using *Bacillus thuringiensis israelensis* (Bti) in streams where the black fly larvae develops. Bti is a proven and highly effective and environmentally safe control, Robinson said. Very similar to compounds occurring naturally in Texas waterways, Bti is non-toxic to humans, amphibians, fish, crustaceans, adult insects, flatworms and mollusks. Neither is it toxic to insect predators of the black fly, such as dragonflies.

Continued on Page 8

**Blackflies** (continued from page 7)

For all practical and economic purposes, it is impossible to completely eradicate an insect species such as the black fly. Every year, varying numbers emerge but most years, these emergences range from being inconvenient to mildly irritating for those who live and farm next to streams. When conditions are optimal, however, the flies emerge in large enough numbers to endanger livestock. The optimum conditions came this year. With unseasonable rains and untimely temperatures during the late fall of 2000 and early 2001, conditions were perfect for the eggs to hatch and the larvae to survive. County extension agents periodically surveyed streams in their area and tried to draw estimates of how severe the hatch would be from the number of larvae they find sticking to submerged twigs and branches. Large numbers have been found.

Persons working outdoors or enjoying recreational activities such as boating should wear heavy, long sleeved clothing and use insect repellents. "Pay close attention to protecting your neck and face with the repellent," Robinson said. Pets should be kept indoors during the day and allowed to freely roam at night. "The black fly is not active during darkness, so letting them out at night is safe," Robinson explained. The infestation could last as late as the end of May, depending on the weather.

## Termites Go Hungry on Resistant Trees

(Source: USDA ARS News Release, 10/12/00 via The Label Oct, 2000)

Agricultural Research Service scientists in New Orleans, La., have identified 30 types of commercial lumber that attract or repel Formosan subterranean termites, painting a more complete picture of where this invasive pest species is likely to turn up in processed wood. In termite-plagued Louisiana, for example, builders could use the information to select lumber--such as Western red cedar or Alaskan yellow cedar--that's less apt to lure the insect into homes.

Knowing which types of hardwood or softwood species Formosan termites prefer could also improve the effectiveness of bait products that kill the pests by luring them to slow-acting toxins, according to Juan Morales-Ramos and Guadalupe Rojas, entomologists at ARS' Southern Regional Research Center in New Orleans. There, they designed a series of carefully controlled, replicated lab experiments in which termite colonies were fed wooden blocks cut from 30 types of lumber.

Wood that termites did not like include old growth bald cypress; Western red-, Alaskan yellow-, Eastern red-, and Spanish cedar; mahogany; sassafras; and Indian-, Honduras-, and Bolivian rosewood. In fact, eight of the wood samples actually killed termite colonies during 3-month forced-feeding trials, probably because of noxious chemicals in the wood.

Wood that topped the pest's favorites in the studies included birch, red gum, Parana pine, sugar maple, pecan and red oak. Each stimulated more termite feeding than southern yellow pine, a control species the scientists used, and a commonly used lumber tree in the South. Southern yellow pine has also been used as bait to help monitor termites foraging for food. This new information, along with ongoing field studies with living trees, points to other, more attractive woods that should improve such monitoring to control the pest.