# MOSQUITO & TERMITE CONTROL BOARD

## 2000 ANNUAL REPORT

Mayor Marc H. Morial

Mr. Cedric Grant, CAO

Dr. Rodney Jung, Chairman

Mr. Edgar S. Bordes, Director

### BOARD MEMBERS & ADVISORS

**Council Member Cynthia Williard-Lewis**

**Ms. Sheila Webb**

**Ms. Cynthia Sylvain-Lear**

**Dr. Ann Anderson**

**Dr. Kenneth Boutte**

**Mr. Reginald Glass**

**Dr. Warren Jones**

**Mr. Gary C. Meadows**

**Dr. Harold Scott**

# DIRECTOR'S REPORT

## Edgar S. Bordes

This is a summary of the 36th Annual report of the City of New Orleans Mosquito and Termite Control Board. The year 2000 was one of the driest on record for New Orleans. Only 39 inches of rain was recorded compared with the average of 62 inches. The drought greatly impacted both floodwater and permanent water species. Impounded marshes dried, urban containers dried, and what little rain fell, quickly soaked in. Our main mosquito event was the emergence of a large brood of *Oclerotatus sollicitans* in October. Rainfall and high tides flooded eggs that may have been dormant for up to a year creating a considerable pest problem. Aerial adulticiding was highly successful in containing these broods.

The opening of Jazzland, an amusement theme park adjacent to Bayou Savage refuge, posed a new challenge for us. The park is located within 300' of a leveed marsh, which is one of our most productive *Culex salinarius* breeding sites. CDC traps often collect 5,000-10,000 adult mosquitoes here per night. Numerous aerial and truck adulticiding missions were necessary to protect the park.

June rainfall triggered populations of the container breeding *Aedes albopictus*. These backyard pests persisted through November. This species and several others are potential disease vectors. However, no mosquito-borne diseases were evident in New Orleans this year.

Studies on the buck moth, *Hemileuca maia*, were initiated by us in 1989 at the request of the City Council to address the problems of stinging caterpillars and defoliation of our oak trees. Efforts by us and the Parkway and Parks Commission significantly reduced the populations during the treatment period of 1989-1992. A 200-tree survey area in 1995 revealed 0% caterpillars. This percentage peaked at 96% in 1999, and fell to 67% this year. Further data might possibly establish a 5-10 year population cycle.

Our ongoing Civil Service job studies yielded pay increases for the positions from Inspector I through Specialist IV, Aviations Supervisor, Assistant Director and Director. At any given time we are conducting job studies to attempt to increase our staff's below average wages.

All of out underground storage tanks were removed. The gasoline and diesel tanks were replaced with 500-gallon aboveground tanks. All vehicle fueling is now done at satellite fuel depots.

Federal and industry grants and contracts continue to fund the majority of our termite research and control projects. This has definitely been a win-win situation for the City and the advancement of termite control projects.

Source reduction projects were active in New Orleans east, with several ditching and clearing efforts. Some of these projects were initiated in response to the opening of Jazzland; others involved clearing vegetation and blockage removal. Additionally, our equipment was used to facilitate the Mayor's Strategic Inspection Force program, which on our part involved clearing abandoned city lots.

Encephalitis surveillance again utilized 16, four-chicken cages and mosquito pool sampling. Bloods and mosquitoes were collected weekly from May through October. New Orleans showed no sentinel chicken, mosquito pool or human encephalitis activity.

Our Termite Division continued to expand this year with the addition of new City buildings and new research projects. Our staff now has five licensed termite pest control operators who have 11 university science degrees. We also have three termite technicians. It is unlikely that anyone is doing more applied research on termites than we're doing here in New Orleans. The projects have become too numerous to mention in this synopsis. Details can be found in the three enclosed reports.

Rodent and Vector Control Division activities were normal this year. We have almost entirely eliminated contact (spray) pesticides, having replaced them with low toxicity baits. This has greatly reduced the possibility of accidental poisoning as well as reducing storage space.

Detailed reports of the City of New Orleans Mosquito and Termite Control Board are included in the Body of this report.

# ASSISTANT DIRECTOR'S REPORT

## Mike Carroll

The beginning of the year 2000 for the Assistant Administrator began as most any year; working on a job study to increase the below average wages that most of out employees earn. We had five job classes under consideration by Civil Service, from Inspector I through Specialist IV, Aviation Supervisor, Assistant Director and Director. By spring these efforts would pay off.

The State's Formosan Termite Initiative program moved into our middle shop office area in January. This State-funded, multi-million dollar project is targeting public trees, mostly live oaks, for termite control through foaming the trunk voids.

By the end of April, we were still experiencing drought conditions, as well as preparing for the May 20th opening of Jazzland. Jazzland presents a unique problem in that it is adjacent to one of the country's largest urban National Wildlife Refuges. CDC traps in the refuge often caught over 1,500 adult mosquitoes per trap night. As the year progressed, we had to make numerous aerial adulticiding flights to control the *Culex salinarius* and *Oclerotatus sollicitans* populations.

By mid-year all of our underground storage tanks (gasoline, naphthalene and diesel) had been removed and the holes filled. Smaller aboveground gasoline and diesel tanks were installed. Vehicle fueling must now be done off-site at one of four city Fuel Man facilities.

Capital Project meetings with City and private architects were held here for the purpose of Administration Building renovations. These will include re-roofing and refacing the building, installing a handicap ramp, converting the rear "open area" into a conference room and enlarging the break room.

June had average rainfall, the most we had had in about two years. Mosquito problems increased around Jazzland and were answered with numerous aerial and ground ULV spray missions. A State program allowed us to remove the last

of several thousand pounds of obsolete pesticides, mostly rodenticides. Our termite, rodent and crawling insect control is now done almost exclusively using baits. This has greatly reduced the need for warehouse space and has minimized application and public exposure safety problems.

Federal and industry grants and contracts continue to fund the majority of our termite research and control projects. This has definitely been a win-win situation for the City and the advancement of termite control research.

July and August brought tide driven broods of *Oclerotatus sollicitans* to eastern New Orleans. Much of the permanent leveed marsh has dried up, controlling the production of *Culex salinarius.*

May saw the fruition of pay increases for all the positions mentioned earlier, with raises from 18-27%. Alas, in August we initiated yet another job study for our entomologists. By year's end, little progress had been made.

September ended our second year's contract with the USDA-ARS for the Armstrong Park/French project. This leaves at least three years remaining.

September is also when purchasing through City Hall is cut off. We had planned ahead, and have purchased what we think is sufficient insecticides for the first half of next year.

With the last two months of the year came our operational budget approval. This included funds for: two new engines for the Islander- the original ones are 22 years old; a reduction in our request for 2001's insecticides; and an overall increase of two new positions for our expanding Termite Division.

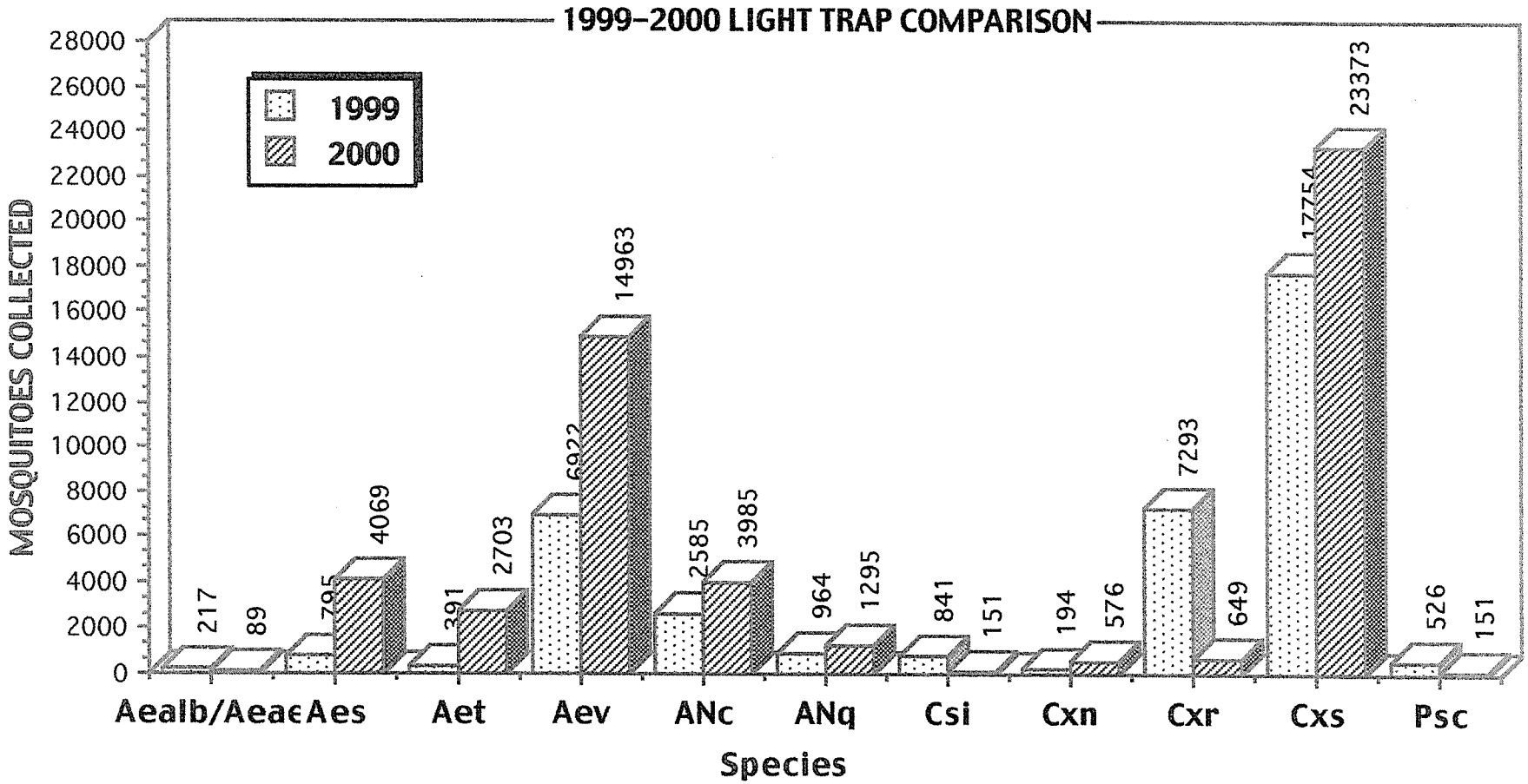
November and December are typically months with reduced field and administrative activity. Budget submission for 2001 had been completed and the 2000 budget year had wound down. The record saltmarsh mosquito swarms were over, and termite activity has somewhat decreased. The Assistant Director settled in to weeding and updating files and reviewing inventory for the upcoming year.

# MOSQUITO FIELD OPERATIONS

**Steve Sackett**

New Orleans had one of the driest years on record, receiving only 39 inches of rain compared to the average of 62 inches per year. This drought had a significant impact on most of our mosquito species since their typical breeding sites remained dry for extended periods of time. Reductions in the populations of everything from *Aedes albopictus* to *Culex salinarius* were noted during several months this year, but predator populations in the marsh were also adversely affected. Many of the ditches, bayous, and ponds in the marshes of eastern New Orleans were bone dry for extended periods of time, with deep cracks extending below the topsoil. Fishes and other predators of mosquito larvae were destroyed in these areas. Mud cracks became the primary oviposition site for *Ochlerotaus sollicitans*, collecting eggs throughout the drought and providing sufficient moisture to protect the eggs from dessication. Moisture from rainfall or tidal flooding hatched a high percentage of these eggs, and in the absence of predators, larvae and adult mosquitoes were able to develop unmolested. During October, one collection from a New Jersey light trap at Irish Bayou yielded over 1400 *Ae. sollicitans,* signifying one of the largest broods of salt marsh mosquitoes in recent memory. *Sollicitans* emerged in great numbers from numerous other sites in our marshes and caused considerable pest problems, but aerial ULV treatments were generally successful in reducing their populations.

Jazzland, a new theme park that opened in May of this year, was constructed adjacent to the Bayou Savage National Wildlife Refuge, a leveed marsh located within 300 yards of the theme park's borders. For the past few years the refuge has not posed any major mosquito problems to surrounding areas, primarily due to earlier source reduction activities and water levels which have allowed predators to reduce mosquito breeding. Ditching and adulticiding are no longer allowed in this area, and with the drought conditions limiting predation for much of the year, mosquitoes sometimes developed in large numbers. It was not unusual for a CDC trap within the refuge to collect 5,000-10,000 mosquitoes per night. A great deal of effort was placed on adulticidng Jazzland and the surrounding residential areas to reduce mosquito annoyance and the probability of disease transmission.


1999–2000 LIGHT TRAP COMPARISON
1999
2000
MOSQUITOES COLLECTED
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
217
89
795
4069
391
2703
6922
14963
2585
3985
964
1295
841
151
194
576
7293
649
17754
23373
526
151
Aealb/Aeae
Aes
Aet
Aev
ANc
ANq
Csi
Cxn
Cxr
Cxs
Psc
Species

2000 Light Trap Collections

| SITE | Male | Female | Aes | Aev | ANc | ANq | Cxs | Aeae | Aet | Aealb | Csi | Cxe | Cxn | Cxr | Psc | Psf | Uran |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Willow Dr. | 401 | 11590 | 1\9 | 61\899 | 17\206 | 12\222 | 245\9358 | | 0\30 | | 0\81 | 0\54 | 0\259 | 61\374 | 0\52 | 4\0 | 0\8 |
| 2. Tall Pines | 100 | 1111 | 0\4 | 18\370 | 0\6 | 0\14 | 58\487 | 0\1 | 0\30 | 0\1 | 0\81 | 0\3 | 0\29 | 61\374 | 0\10 | | 0\8 |
| 3. English Turn | 162 | 2512 | 0\2 | 10\423 | 1\174 | 0\52 | 127\1303 | | 4\31 | | 2\32 | 0\16 | 0\60 | 18\378 | 0\24 | | |
| 4. Olivier St. | 195 | 699 | 0\4 | 46\281 | 1\14 | 0\5 | 107\243 | 2\1 | 1\12 | 2\11 | 0\4 | 0\2 | 1\2 | 34\111 | 0\2 | | 1\4 |
| 5. Seine Street | 209 | 766 | 1\2 | 21\227 | 4\12 | 0\13 | 157\340 | 0\1 | 0\13 | 0\2 | 1\10 | 0\1 | 0\6 | 25\120 | 0\2 | 0\1 | 0\14 |
| 6. Tennessee St. | 26 | 57 | | 4\8 | 0\2 | | 17\14 | | 0\1 | 1\1 | 0\8 | | 0\2 | 4\20 | 0\1 | | |
| 7. Louisa St. | 36 | 109 | 1\1 | 12\42 | 0\3 | 0\1 | 17\35 | | 1\7 | 0\1 | 0\3 | | 0\2 | 5\10 | | 0\1 | 0\2 |
| 8. S. Saratoga St. | 235 | 228 | 0\2 | 26\71 | 3\2 | | 182\103 | 1\1 | 1\3 | 0\2 | | 0\1 | 0\3 | 22\38 | | | 0\1 |
| 9. Louisiana Ave | 0 | 0 | | | | | | | | | | | | | | | |
| 10. Hillary St. | 256 | 1014 | 0\3 | 21\288 | 3\7 | 0\7 | 119\355 | 1\2 | 0\8 | 1\6 | 2\8 | | 0\12 | 109\317 | | | |
| 11. Audubon Zoo | 372 | 1674 | 0\1 | 167\685 | 20\56 | 1\31 | 118\540 | 0\2 | 1\0 | | 4\55 | 0\1 | 0\19 | 61\263 | 0\12 | | 0\5 |
| 12. Trafalgar | 189 | 1209 | 0\4 | 34\477 | 10\22 | 0\3 | 76\341 | | 0\2 | | 3\21 | 0\3 | | 64\321 | 2\8 | | 0\2 |
| 13. City Park | 429 | 2660 | 0\9 | 155\1408 | 5\15 | 0\14 | 161\809 | 0\1 | 3\33 | 0\1 | 7\31 | | 0\5 | 98\319 | 0\4 | 0\2 | 0\9 |
| 14. S. Genois | 82 | 205 | 0\1 | 14\82 | 1\2 | | 46\62 | 0\2 | 0\1 | 1\2 | 0\9 | | 0\4 | 20\39 | | | |
| 15. Longuevue Gd. | 414 | 2916 | 0\5 | 107\999 | 3\37 | 2\18 | 124\1030 | 0\1 | 1\7 | 2\1 | 13\56 | 0\3 | 0\16 | 162\727 | 0\3 | 0\5 | 0\5 |
| 16. Elysian Fields | 465 | 1393 | 1\21 | 166\733 | 23\30 | 0\8 | 180\361 | | 0\21 | 0\7 | 5\20 | 0\3 | 0\4 | 90\181 | 0\4 | | |
| 17. Louisville | 258 | 1126 | 0\2 | 131\711 | 2\22 | 0\2 | 45\191 | 0\2 | 0\5 | 2\2 | 6\15 | | 0\4 | 56\167 | | 16\0 | 0\2 |
| 18. Pont. Park | 35 | 288 | 0\5 | 5\72 | 1\3 | | 14\103 | | 0\17 | | 0\5 | | 0\26 | 15\56 | | | |
| 19. Acacia St. | 26 | 79 | 0\1 | 4\44 | 0\3 | | 13\16 | 2\0 | 1\4 | 1\1 | | | | 4\9 | 0\1 | | |
| 20. Werner Dr. | 78 | 657 | 0\1 | 18\376 | 0\8 | 0\5 | 47\194 | 1\0 | 0\4 | 0\5 | 0\3 | | 0\6 | 12\48 | 0\2 | 0\1 | 0\3 |
| 21. Lil. A'Corn | 423 | 1486 | 0\19 | 81\478 | 3\52 | 0\18 | 203\529 | | 3\20 | 2\1 | 3\54 | 1\6 | 0\2 | 126\302 | 0\1 | 1\2 | |
| 22. Vincent | 595 | 2863 | 0\64 | 144\866 | 8\39 | 3\10 | 286\839 | 0\1 | 1\55 | 1\3 | 19\323 | 0\7 | 2\33 | 129\607 | 2\8 | 0\1 | 0\3 |
| 23. Vil. DeL'Es. | 209 | 1974 | 0\49 | 64\784 | 3\20 | 0\47 | 67\579 | | 0\148 | 0\2 | 3\44 | 0\5 | 0\28 | 71\253 | 0\2 | 0\1 | 0\2 |
| 24. Resthaven | 62 | 819 | 0\52 | 17\188 | 2\17 | 0\11 | 38\289 | | 0\180 | | 1\7 | 0\1 | 0\5 | 4\61 | 0\5 | | 0\2 |
| 25. Joe Madere's | 1724 | 5511 | 11\232 | 147\1028 | 142\1075 | 1\45 | 1337\1872 | 0\1 | 1\351 | | 7\451 | 0\16 | 0\10 | 78\342 | | | 0\84 |
| 26. Lk. Barrington | 103 | 301 | 2\8 | 35\137 | 4\4 | 0\1 | 38\78 | 0\1 | 0\2 | 4\0 | 2\28 | | 0\1 | 18\39 | | | 0\1 |
| 27. Irish Bayou | 58 | 2598 | 2\1608 | 5\34 | 30\209 | 2\107 | 12\81 | 0\8 | 1\431 | | 0\14 | | | 6\99 | | | |
| 28. Venetian Isles | 366 | 3467 | 5\207 | 106\711 | 78\728 | 3\28 | 95\764 | 2\1 | 5\512 | 2\4 | 1\16 | 0\4 | 0\5 | 69\476 | 0\4 | 0\1 | 0\2 |
| 29. Green Ditch | 2 | 81 | | 0\1 | 0\14 | | 1\43 | | | | 0\5 | | | 1\18 | | | |
| 30. Rigolets | 239 | 2394 | 8\530 | 39\412 | 56\224 | 6\251 | 44\291 | | 5\390 | 0\2 | 17\60 | | | 64\228 | 0\4 | | |
| 31. Lake Forest | 492 | 1421 | 0\14 | 122\496 | 6\16 | 1\24 | 196\570 | | 0\62 | 2\7 | 3\52 | 0\7 | 0\11 | 161\155 | 0\1 | 1\0 | 0\3 |
| 32. Oak Island | 65 | 358 | 0\7 | 7\86 | 0\7 | | 29\140 | | 0\10 | | 1\14 | | 0\16 | 28\78 | | | |
| 33. Brazilere Isl. | 156 | 6089 | 22\1202 | 14\1546 | 64\956 | 0\358 | 47\1413 | | 0\299 | 0\1 | 0\71 | 0\6 | 0\6 | 8\224 | 0\5 | 1\0 | |
| **Total** | **8462** | **59655** | **54\4069** | **1801\14963** | **490\3985** | **31\1295** | **4246\23373** | **9\26** | **29\2703** | **21\63** | **00\151** | **1\139** | **3\576** | **647\649** | **4\151** | **23\15** | **1\172** |
| % | | | 6.8 | 25.1 | 6.7 | 2.2 | 39.2 | 0 | 4.5 | 0.1 | 2.5 | 0.2 | 1 | 10.9 | 0.3 | 0 | 0.3 |

In addition to the problems with marsh mosquitoes, *Aedes albopictus* populations came into full bloom with the June rainfall. Telephone complaints were constant, inspections were numerous, and adulticiding was on a regular basis when weather conditions would allow. One breeding site for *Ae. albopictus* of particular interest is a large tire pile in the central business district. Over 10,000 tires used as barricades for the Grand Prix du Mardi Gras race have been stored in an open lot since 1994, with legal problems preventing their disposal. Several city departments including Sanitation, Property Management, and Law are now heavily involved in trying to expedite their removal. Until that time we will inspect and treating the site on a regular basis.

Studies on the buck moth, *Hemileuca maia*, were initiated by our agency in 1989 at the request of the City Council to address the problems of stinging caterpillars and defoliation of our oak trees. With funding from the U.S. Forest Service and assistance from the New Orleans Parks and Parkway department, buck moths were significantly reduced during the treatment period of '89-'92. In 1995 we began an annual survey of 200 oak trees in 4 areas of the city to monitor for the presence of buck moth caterpillars. Table 1 illustrates the percentage of the trees that were found to be positive for caterpillars. Data from St. Charles Avenue has not been included, as those trees have been treated since the study was started. No federal funds have been available since 1992 and buck moth populations have been steadily rising until 2000.

**Table 1.**

| | BANKS Untreated | BIENVILLE Untreated | TOLEDANO Untreated | AVERAGE Untreated |
|---|---|---|---|---|
| **1995** | 0% | 0% | 0% | 0% |
| **1996** | 8% | 8% | 44% | 19% |
| **1997** | 67% | 70% | 70% | 69% |
| **1998** | 87% | 75% | 95% | 85% |
| **1999** | 98% | 93% | 98% | 96% |
| **2000** | 60% | 43% | 97% | 65 |

Collections of male buck moths using pheromone-baited sticky traps were initiated in late November and continued until all flight activity was over at the end of January. Twenty-four traps located in eight areas of the city were monitored once or twice per week to provide information on relative abundance of the moths. Seven hundred fifty seven moths were collected this year, compared to 920 moths collected during approximately the same time period last year. It is hoped that we continue to see a decline in buck moth caterpillars in the New Orleans area.

# AVIATION

## Joseph Reidl

Aerial treatments were started early this year. This was partially due to a long period of dry weather. Our total number of spray flights increased considerably. Good control was attained using malathion (at a rate of three ounces per acre) dispensed from the Britton-Norman (twin engine) Islander and a Scourge and mineral oil mix (2.33 to 1) out of the Grumman (single engine) Ag-Cat at one ounce per acre. Most spray missions extended from New Orleans East to Fort Pike and Lower Algiers. The airplanes also were used on inspection, surveillance, test, proficiency and photo flights.

This year started off before the spraying season, as usual. The public was notified of our continued intentions to adulticides for mosquito control in Orleans Parish. A new plan of operations was submitted and approved by the Federal Aviation Administration. Renewal forms were filled out and insurance acquire. Flight physicals were taken and cholinesterase checks made. Pilot proficiency was maintained. Surveillance flights were conducted. This conforms to preparations made every year.

In the maintenance shop at our hangar, work continued throughout the year. The required F.A.A. annual inspections for the airplanes were completed during the off-season. Spray systems on the planes were cleaned, checked and calibrated. The machines were washed and polished. All applicable Airworthiness directives (compulsory maintenance procedures) on the aircraft were complied with.

Lubrication requirements were met. Preventive maintenance was accomplished. The number one cylinder on the Islander's number two engine was overhauled due to low compression. An audio panel had to be replaced on the same airplane. The hangar and associated ground support equipment was checked and maintained.

Aircraft records and files were kept up to date. Manual revisions and inspection data was inserted as received. I renewed inspection authorization at the Gulf South Aviation Maintenance Seminar. To remain current, I flew a flight review. Preparations are being made for the next season.

# SOURCE REDUCTION

## Brooks Hartman

For most of 2000 the Source Reduction program was active in New Orleans East with the ditching and clearing dense vegetation in the P-2 area located in the East Shore subdivision at Paris Road and Hayne Boulevard in the R-1 area located south of Chef Menteur Highway, north of Old Gentilly Road, east of I-510 Both areas are very important as they are located near or within densely populated, commercial developments such as the Michoud Assembly facility and the Jazz Land theme park. Both the R-1 and S-2 sections will be monitored during the coming year.

Additionally, Source Reduction assisted the Strategic Inspection Force (SIF) program in the cleanup of blighted neighborhoods. This proved to be successful as we were able to remove water-holding containers that breed mosquitoes almost year round, such as old refrigerators, freezers, washing machines etc. We will continue to clear obstructions from all storm drains and drainage pipes within existing Source Reduction areas after heavy rainfall throughout the coming year.

# ENCEPHALITIS SURVEILLANCE

## Greg Thompson

Sixteen large cages, each holding four chickens, were placed at area firehouses and several other locations throughout the city as part of our surveillance activities. Each bird occupied its own individual numbered compartment within these cages. The cages were placed throughout the city each year in a pattern influenced by distribution of the human population, location of previous encephalitis cases, and site availability. Blood was drawn from two of the chickens located at each site each week. Blood was drawn from the other two chickens in the following week.

Mosquito pools were collected on a weekly basis from May through October. Center for Disease Control traps were used to collect the mosquito pools. Mosquitoes find their victims by detecting concentrations of carbon dioxide. This means that every time any land-dwelling vertebrate breathes it reveals its presence to any downwind mosquito. This attraction to carbon dioxide is used to trick mosquitoes into visiting the trap. Dry ice is composed of frozen carbon dioxide. The large quantities of gas released by dry ice dissolving on a hot Louisiana night invites every mosquito in the area to come join the represented feast. Many of these insects are then captured in the traps. The body fluids of the captured mosquitoes were analyzed to see if they were carrying an encephalitis virus.

Blood samples and mosquito pools are now being processed and analyzed at the newly established lab at LSU.

We discontinued our surveillance activities with the onset of colder weather at the end of October. However, distribution of no longer needed chickens to new homes, the maintenance of cages, and the rearing of next season's surveillance chickens continues year round.

Thirty years of surveillance activities had seemed to suggest a recurring pattern for the detected presence of encephalitis in Louisiana. Both St Louis Encephalitis (SLE) and Eastern Equine Encephalitis (EEE) had shown a general pattern of occurrence where a summertime outbreak of one of these diseases was followed by as much as a decade long hiatus before the disease made its reappearance in our state. When SLE cases were reported across Louisiana in 1998, it ran contrary to this pattern because cases of SLE had occurred in our

area in 1996. This seeming long-term pattern may have been completely destroyed this past two years when SLE was once again detected in bird blood. This means that SLE has been documented to be present in our area in four of the last five years. The City of New Orleans, however, experienced a perfect year with no encephalitis detected in any blood serum or mosquito pools. More importantly, no human or animal cases are known to have occurred.

Our locally occurring types of encephalitis are generally warm weather diseases. One unsolved mystery is where do these diseases over winter. Most have never been detected during the colder months of the year. However, current theory for how one type of encephalitis (Eastern Equine Encephalitis) maintains itself during the winter is that the mosquito, *Culiseta melanura*, serves as a reservoir for the disease. Monitoring this mosquito's activity may give an early warning of later season EEE outbreaks and control of this mosquito early in the spring may actually prevent an outbreak from occurring. We located several likely breeding sites for this mosquito on the West Bank. However, these areas remained dry throughout the spring, summer and fall. For additional discussion, see the Biological Control Annual Report.

# BIO-LAB REPORT

## Greg Thompson

West Nile virus has captured the attention of mosquito control agencies. However, until it arrives in our area, we have a killer mosquito-borne virus on which we need to focus. Eastern Equine Encephalitis (EEE) makes periodic appearances in our area and when it does livestock and/or people die. The current theory of how an epidemic of EEE begins involves a two-part cycle. The mosquito, *Culiseta melanura* might serve as a reservoir for the disease. This insect only breeds in swamps and woodland pools that possess specific environmental qualities. These sites are usually somewhat removed from areas of regular human activities and this mosquito seldom bites humans. For these reasons, its possible part of the EEE cycle received little attention until recently. The initial cycle of EEE infection seems to be: *Cu. melanura* bird - *Cu. melanura* – bird. The second part of the cycle, and the part that impacts us, occurs when the infected birds that frequent these woodland habitats move into areas of human habitation. Birds that roost near areas of human habitation are often bitten by species of mosquitoes that also bite livestock and humans. These mosquitoes then have the potential to transfer the illness to new victims.

By treating woodland habitats that harbor *Cu. melanura* in the early spring, it may be possible to stop a potential epidemic at its source and thus both avoid later human or horse cases and the need to treat the entire parish with adulticides to reduce additional cases.

Staff from the Biological Control Lab traveled to East Baton Rouge Mosquito Control for a firsthand look at some known *Cu. melanura* breeding sites. We then identified a few sites in Lower Algiers and East New Orleans that appear to have similar characteristics. Due to two years of dryer weather these sites were not holding water during the critical spring time period. However, these areas will be monitored in the future.

Each year our public education/outreach programs increase in size, scope, and number. An incomplete list of these shows is still very extensive. We maintained educational booths at Tulane University's Environment and the Law conference, Audubon Zoo's two day Earth Fest and two weekend Swamp Fest, City Park's two day Spring Garden Show and two day Fall Garden Show, and U. S. Fish and Wildlife's Gator Fest. We educated people about mosquito and termite control at the Mayor's Earth Day celebration, at a multi-day Air Show in Belle Chasse, at an event at the La Nature & Science Center, at the Farmers Market, at four summer camps of the US Fish & Wildlife Service, and at five additional part-day programs at the Audubon Zoo. We set up a booth at a Home Depot store and at a veterinary event at Xavier University to spread information on both mosquitoes and termites. We have a new display backboard that we premiered at the Louisiana Mosquito Control Association meeting held in New Orleans. We will have the finest educational display currently available and it will greatly improve the effectiveness of our outreach presentations when all the graphics for the display are completed in the spring of 2001. The new graphics will display not only the mosquito lifecycle and termite life stage but will also trace, through photos, how Integrated Pest Management is implemented by our agency. The new display seems to have had an unexpected but exciting effect. Several other mosquito control agencies are planning to begin their own outreach programs after viewing our display. We visited more than a dozen grade schools and six groups of students from local schools, including several classes from the Tulane School of Public Health, visited our facilities. Our ample laboratory, also, permitted us to offer research space to other organizations. Faculty and students from Tulane, Xavier, and LSU made use of this offer.

We assist one or more high school students each year in designing and conducting a research project for entrance in the state science fair. Each year our students excel in this competition. This year our student won the local

competition and placed second at the state level. We look forward each year to working with some of these best and brightest of New Orleans students.

Fewer international scientists visited NOM&TCB, last year, to learn about the use of biological control techniques. However, we did spend time with a very interested and interesting group of French entomology students and their faculty advisors who were touring the U.S. The fact that fewer foreign delegations visited here in no way reflects a lessening of international interest in biological control. I had the opportunity to speak on the potential value and current uses of biological control organisms for mosquito control at an international conference held in Martinique. Surrounded by reports of pesticide resistance worldwide and the continuing spread of mosquito-borne diseases, I was literally the only presenter will even minimal good news. We are in correspondence with an increasing number of researchers and mosquito control personnel worldwide. We are involved with researchers in The Philippines, Vietnam, Trinidad, Ecuador, Barbados, Martinique, Vietnam, Japan, Jamaica, Uruguay, and Great Britain. What is truly exciting about our involvement with these researchers is that most are setting up biological control programs rather than simply engaging in university research.

Dr. Janet McAllister, formally of the Center for Disease Control and now with NOM&TCB, tested the susceptibility of *Aedes albopictus* mosquitoes, obtained locally, and of *Culex pipiens* mosquitoes, from the country of Jordan, to six pesticides commonly used by mosquito control agencies or by homeowners for insect control.

Working with Mieu Nguyen and Cynthia Harrison, it was determined that most local mosquitoes demonstrate no more resistance to the chemicals used by the NOM&TCB than are shown by naïve mosquito populations never subjected to previous control efforts (result chart appears in the July-September Quarterly Report). This positive result can probably be attributed to the Integrated Pest Management (IPM) procedures used by NOM&TCB.

The effect of persistent unregulated use of pesticides seems to be reflected in the other results obtained in this study. Local *Ae. albopictus* population showed significant resistance to permethrin, a non-regulated pesticide, used by homeowners for insect control. The *Culex pipiens* mosquitoes from Jordan had faced continual use of pesticides by local residents and they showed significant resistance to several of the chemicals presented.

## Percent of Population susceptible to selected chemicals

| Mosquitoes tested | Organophosphates | | | | Pyrethroids | |
|---|---|---|---|---|---|---|
| | Malathion | Temephos | Naled | Fenthion | Resmethrin | Permethrin |
| ***Culex pipiens*** *molestus* from Jordan | 100% | 100% | 99% | 93% | 28% | 14% |
| *Aedes albopictus* | 100% | 100% | 100% | 100% | 100% | 87% |
| *Ochlerotatus taeniorhynchus* | 100% | | | | 100% | |
| *Culex quinquefasciatus* private residence | | | | | 48% | |
| *Culex quinquefasciatus* Moss St. | | | | | 100% | |
| *Culex quinquefasciatus* Franklin St. | | | | | 100% | |

*Culex pipiens molestus* – Bottles run with synergists show partial recover of this population when both esterase and oxidase inhibitors are used. This indicates that both esterases and oxidases are involved in conferring resistance in this population. Tests run at the CDC to measure the levels of these two mechanisms show high levels of two esterases but do not measure higher than normal levels of oxidases. At this time the presence of KDR as an additional mechanism has not been determined.

*Aedes albopictus* – No resistance to organophosphates was detected. A small percentage of the population (13%) showed a low level of resistance to permethrin but not resmethrin. This level is not great enough to cause control failure at this time.

*Culex quinquifasciatus* – No resistance in populations from two sites within the City. One site from East New Orleans has about half the members of the

population exhibiting resistance to resmethrin. No tests to determine the possible mechanism have been conducted.

*Ochlerotatus taeniorhynchus* – No resistance to resmethrin or malathion detected.

# TECHNICAL SUPPORT/PUBLIC EDUCATION

## Jack Leonard

Three laptop and five desktop computers were purchased this year to replace machines that had become obsolete. The old machines were both too slow and lacked sufficient data storage. The new machines all required setup, installation of programs and transfer of user data. Also, one laptop and one desktop had to be returned to the manufacturer for repair before acceptance.

A virus was discovered on two of our machines. I was able to clear the virus from the computer in the reception area, but the Assistant Director's computer was damaged too badly. I was able to save his data on disks, format the drive and install the Windows 2000 operating system. The applications were re-installed, set up and data replaced. I am trying to ensure that Norton Anti-Virus 2000 is installed on all of our machines and kept up to date.

PowerPoint presentations were created for numerous meetings during the year. These presentations grew over time until they were more than 100 MB in size. Presentations this size are too large for the resources of most computers used to display them. The presentation takes too long to load and to play.

To solve this problem I began sampling the slides used in the presentations to produce a smaller file size. Since these slides are displayed or projected and not printed, the smaller file size is acceptable. The sampled presentations are now only about 10MB in size. The program loads and runs much faster.

A new display board was purchased. Images were scanned from our slides and used by the manufacturer to produce graphics for the display. The display includes both mosquito and termite information.

Digital cameras now produce almost all of our images. All our presentations are done on PowerPoint. PowerPoint saves a thumbnail image and keyword information on each image and catalogues the images. Images can be searched by a keyword or by scanning the thumbnail images. The original images are stored on CD's and can be retrieved by the catalogue program.

A similar system is being used to catalogue video footage by saving thumbnail images of the scenes and cataloguing them by keyword and tape number. The system is simple because the computer can do the thumbnail capture process automatically. This saves a great deal of time. We can now find scenes quickly without having to scan through the original tapes.

Thermal surveys were done of several buildings, including: fire station Decatur Street, trees in City Park, Riverwalk mall, driving range in City Park. The thermal surveys located Formosan termite infestations and damage. Thermal imaging has been shown to be an efficient tool for the detection of termites. A training program is being produced to teach several of our employees to use this technique.

Video footage of mosquitoes and termites was sent to several agencies such as the Centers for Disease Control, New York Times and USDA for use in their programs. Video and digital pictures were taken of several termite related events: tree on St Charles fall damages streetcar wires, carton nest found in electrical box at hangar on Lakefront Airport.

Maintenance carried out in 2000

All computers:

1. Change dial-up number for ISP
2. Install anti-virus software

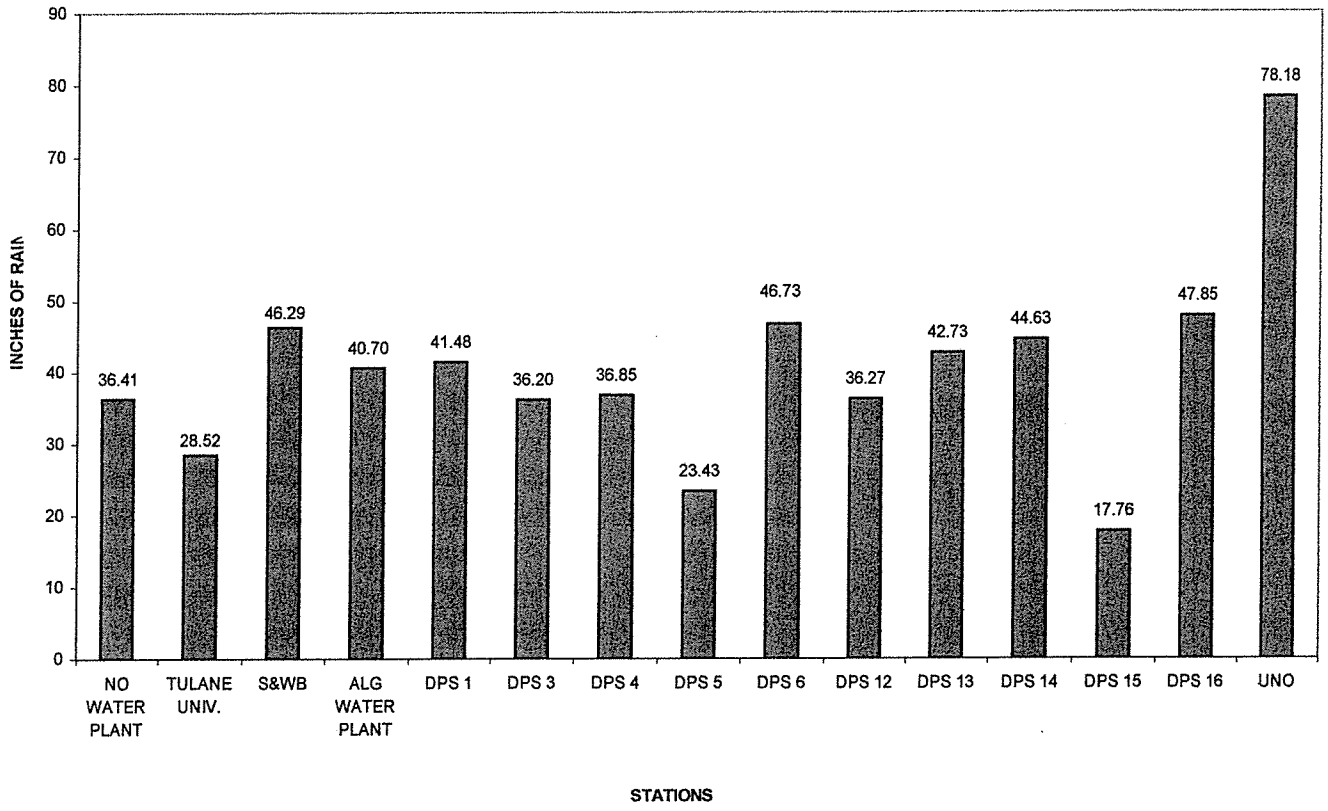
Miscellaneous computers:

73 new programs installed
8 new computers set up and installed
9 operating system upgrades
7 machines formatted and Operating System re-installed
3 Bios updated
3 program software bugs corrected
2 viruses cleared
1 external CD Rom installed
1 printer problem corrected
1 dial up connection re-configured
1 older machine optimized
1 Internal zip drive re-installed

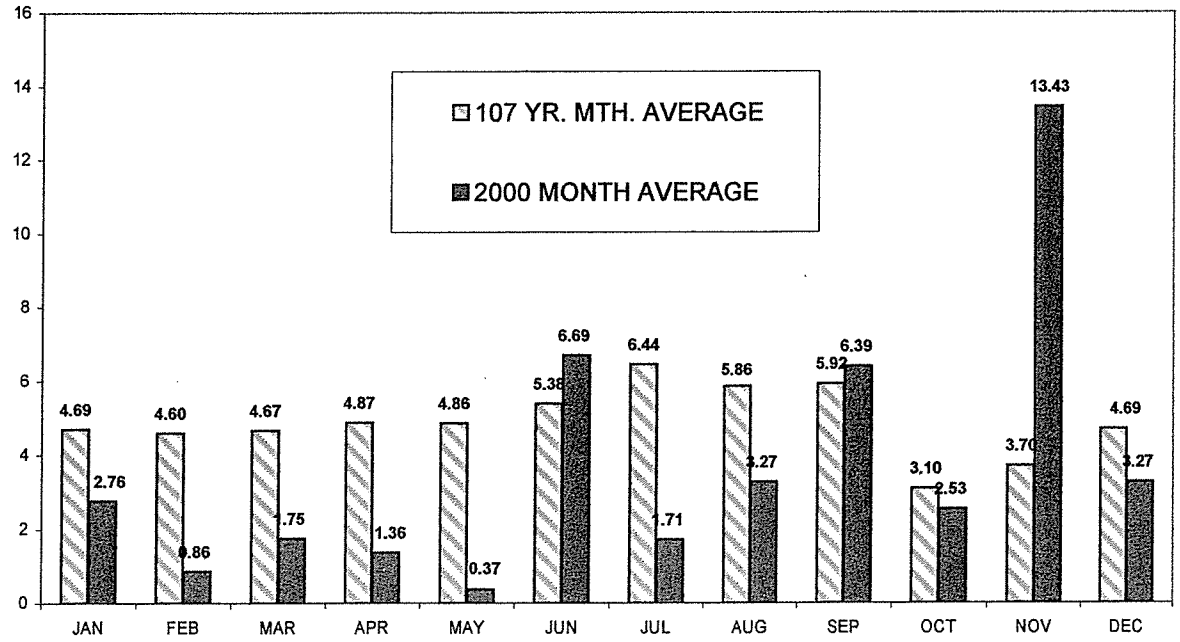
# 2000 NEW ORLEANS RAINFALL CHART

| STATIONS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL | AVG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *NO WATER PLANT* | 0.85 | 0.55 | 0.15 | 1.57 | 0.42 | 7.69 | 1.14 | 0.62 | 4.64 | 1.58 | 14.55 | 2.65 | 36.41 | 3.03 |
| *TULANE UNIV.* | 1.79 | 0.20 | 2.10 | 1.08 | 0.00 | 4.05 | 0.00 | 0.00 | 0.00 | 1.61 | 13.29 | 4.40 | 28.52 | 2.38 |
| *S&WB* | 1.45 | 0.36 | 1.98 | 1.60 | 0.13 | 3.89 | 1.16 | 3.21 | 7.02 | 2.17 | 19.84 | 3.48 | 46.29 | 3.86 |
| *ALG WATER PLANT* | 2.39 | 0.23 | 1.94 | 0.56 | 1.34 | 8.03 | 1.22 | 3.60 | 4.85 | 1.62 | 11.99 | 2.93 | 40.70 | 3.39 |
| *DPS 1* | 3.19 | 0.43 | 2.45 | 1.40 | 1.10 | 4.23 | 1.46 | 3.43 | 3.86 | 2.67 | 13.32 | 3.94 | 41.48 | 3.46 |
| *DPS 3* | 2.20 | 0.71 | 2.43 | 1.26 | 0.66 | 6.09 | 0.32 | 2.18 | 5.73 | 0.48 | 11.63 | 2.51 | 36.20 | 3.02 |
| *DPS 4* | 2.10 | 0.72 | 0.50 | 0.99 | 0.09 | 8.75 | 2.39 | 3.27 | 4.30 | 2.49 | 8.64 | 2.61 | 36.85 | 3.07 |
| *DPS 5* | 3.66 | 0.47 | 2.72 | 0.75 | 0.51 | 0.00 | 0.00 | 4.44 | 8.61 | 2.27 | 0.00 | 0.00 | 23.43 | 1.95 |
| *DPS 6* | 3.74 | 1.77 | 2.17 | 2.07 | 0.30 | 8.33 | 0.79 | 2.91 | 6.31 | 1.53 | 12.24 | 4.57 | 46.73 | 3.89 |
| *DPS 12* | 3.44 | 1.70 | 1.51 | 0.76 | 0.28 | 6.39 | 2.49 | 1.92 | 7.12 | 2.08 | 8.58 | 0.00 | 36.27 | 3.02 |
| *DPS 13* | 2.04 | 0.18 | 2.63 | 1.32 | 0.46 | 7.30 | 1.10 | 2.95 | 9.47 | 1.42 | 11.04 | 2.82 | 42.73 | 3.56 |
| *DPS 14* | 2.29 | 1.19 | 0.70 | 1.26 | 0.00 | 5.89 | 3.62 | 4.12 | 5.97 | 4.93 | 12.35 | 2.31 | 44.63 | 3.72 |
| *DPS 15* | 1.78 | 0.39 | 0.26 | 0.77 | 0.13 | 3.55 | 1.84 | 3.68 | 0.00 | 2.38 | 0.00 | 2.98 | 17.76 | 1.48 |
| *DPS 16* | 2.37 | 1.08 | 0.63 | 2.07 | 0.02 | 8.65 | 1.97 | 4.13 | 6.92 | 4.25 | 12.86 | 2.90 | 47.85 | 3.99 |
| *UNO* | 5.76 | 2.92 | 4.21 | 2.89 | 0.06 | 10.83 | 2.75 | 5.23 | 8.47 | 6.46 | 24.20 | 4.40 | 78.18 | 6.52 |
| *107 YR. MTH. AVERAGE* | 4.69 | 4.60 | 4.67 | 4.87 | 4.86 | 5.38 | 6.44 | 5.86 | 5.92 | 3.10 | 3.70 | 4.69 | 58.78 | 4.90 |
| *2000 MONTH AVERAGE* | 2.76 | 0.86 | 1.75 | 1.36 | 0.37 | 6.69 | 1.71 | 3.27 | 6.39 | 2.53 | 13.43 | 3.27 | 44.39 | 3.70 |
| *1999 MONTH AVERAGE* | 3.06 | 4.63 | 4.18 | 0.03 | 4.86 | 10.37 | 2.84 | 3.97 | 4.00 | 4.07 | 3.61 | 2.76 | 48.38 | 4.03 |
| *1998 MONTH AVERAGE* | 20.70 | 5.03 | 9.28 | 4.12 | 0.74 | 3.28 | 5.02 | 7.59 | 26.90 | 0.99 | 3.65 | 1.74 | 89.04 | 7.42 |
| *1997 MONTH AVERAGE* | 4.25 | 3.76 | 3.50 | 5.43 | 5.48 | 4.84 | 4.30 | 1.92 | 0.52 | 1.21 | 7.26 | 1.90 | 44.37 | 3.70 |
| *1996 MONTH AVERAGE* | 3.52 | 2.55 | 4.47 | 4.92 | 2.41 | 5.90 | 7.27 | 5.82 | 3.11 | 0.97 | 3.02 | 4.66 | 48.62 | 4.05 |
| *DAYS OF RAIN* | 9 | 2 | 12 | 12 | 2 | 17 | 0 | 0 | 11 | 2 | 10 | 9 | 86.19 | 7.18 |

## TOTAL 2000 RAINFALL BY STATION




## 2000 MONTHLY RAINFALL AVERAGE



# TERMITE ENTOMOLOGY

## Ed Freytag

This year we continued with many of the ongoing operational research projects and started several new ones. Nearly all of these projects are completely supported, through funds and materials, by outside government and industry contracts. All of these projects are designed to obtain a better understanding of how the new breed of termiticides help in reducing termite populations in and around City buildings or trees.

Because we use scientific terms that may be unfamiliar to our readers, I will define some of these terms used in this report:

**Triple-mark-(release)-recapture (TMR)-** A process used to determined the territory size, wood consumption rate, and approximate colony size of subterranean termites. The termites are captured with wood blocks placed inside plastic buckets buried in the soil where the termites are known to be active. The infested wood blocks are brought into the laboratory, the termites separated from the wood, and the number of termites calculated by weight. The termites are then placed in containers with paper moistened with either a blue or red dye. Within a week the termites absorb the dye and are released back into the collection site. The wood blocks are cleaned, oven-dried and weighed to determine the amount of wood consumed. This process is repeated three or more times. The termite population is calculated with a statistical formula using the number of recaptured dyed termites from each collection and the total number of termites collected and released. The colony territory is defined by where the dyed termites are collected.

**Aboveground station (AG)-** This is a term used by DowAgrosciences for their Sentricon bait stations, which are placed on the aboveground horizontal and vertical surfaces of buildings.

**Termite baits-** Slow acting toxicant-impregnated matrices. These are most often placed in the ground, but sometimes on vertical or horizontal aboveground surfaces, where termites eat the cellulose material and transfer it to colony members. Marked colony reduction or elimination usually occurs from three months to two years. The most widely used baits are from Dow AgroSciences, the system being called Sentricon.

**Premise-** Non-repellant liquid termiticide. Active ingredient is imidacloprid. Produced by the Bayer Co.

**Sentricon-** Termite bait. Active ingredient is hexaflumuron. Produced by DowAgrosciences.

**Wood stakes-** Pine stakes measuring 1.5" x 0.75" x 6". These are driven into the soil and pulled up periodically to determine if termites are active in the area.

**Wood Buckets-** One gallon plastic buckets buried in the soil in which pre-weighed wood blocks are placed to collect termites.

**Termidor-** Non-repellant liquid termiticide. Active ingredient is fipronil. Produced by Aventis.

**Foam-** Produced by mixing a soapy liquid with a liquid termiticide in a foaming machine. Pressurized air is mixed with the liquid mixture to produce foam. The foam density can be varied depending on the amount of air mixed into the solution, measured in a ratio of water to foam. A 1:15 ratio means that for every gallon of liquid, 15 gallons of foam are produced.

During January and February wood stakes were placed around several city buildings, including fire and police stations, and Parks and Parkway buildings, to begin TMR studies prior to new termiticide trials. These stakes will be checked monthly, and replaced with buckets when they become infested. Earlier in the spring we had some activity or "hits" on the stakes, and were replaced with buckets.

Meetings were held with the Louisiana Department of Agriculture and Forestry to determine how best to treat the approximately 300,000 trees on city property. These trees will be foamed by pest control operators (PCO) using Premise and Termidor. Each gallon of foaming agent/termiticide will expand to 15 gallons of foam. This will be applied through ½" holes drilled in the trunks of the trees. Our staff trained many of the PCO's in the use of the sprayers and drilling techniques.

In March, an agreement was made with the Audubon Zoo administrators to treat five of their termite-infested buildings for conducting termiticide trials using Premise. We inspected these buildings and installed wood stakes around their perimeter to determine the termite activity

As part of the USDA Operation Full Stop program, we inspected and treated the trees at the courthouse building (formerly the Wildlife and Fisheries building) at 400 Royal St. We used Termidor at a rate of 0.125% injected into the tree

cavities as foam at a 1:15 expansion ratio. Most of the magnolia trees were infested with Formosan subterranean termites, several of which had large swarming mud tubes.

Several lectures and tours were given to the following groups: The Historic Mobile Preservation Society, DowAgrosciences, Southern Pine Council (Memphis), American Wood Preserver's Association, American Institute of Architects (Nat. Convention in Philadelphia), National Urban Entomology Conference (Ft. Lauderdale), Georgia Pest Control Regulators, CBS, Quebec Wood Export Bureau (Quebec), Zeneca and Readers Digest.

We started testing wood treated with new types of preservatives to determine if they could be used to prevent damage from Formosan subterranean termites. Samples were obtained from an investment company in Florida. Laboratory tests showed that the termites died from "off gassing" of the solvents used to treat the wood, but in the field the termites destroyed the treated wood samples after a period of two months. The data was sent to the company and a new testing protocol was written so that funds would be provided for future wood preservative tests.

July and August were extremely hot and dry, with July the driest on record. A "white paper" entitled *Research History of the Sentricon System at Historical New Orleans Sites* appeared in the July-August monthly report. This seven-page report reviews the treatment history of six historic French Quarter buildings around Jackson Square and the elimination of a 60 *million*-member Formosan termite colony in the Algiers Regional Library.

August and September continued unseasonably hot and dry, resulting in a rainfall deficit in New Orleans of about 26 inches. This delayed the TMR characterization of several study colonies. Entomologist Matt Messenger and I attended the International Congress of entomology held in Iguazu Falls Brazil in August, and presented scientific posters.

More test buildings, especially at the Zoo, were staked to evaluate new liquid termiticides. By year's end the drought conditions had prevailed, extending the pre-treatment trials on many buildings. Since we were having a difficult time collecting subterranean termites in our collecting buckets using a wood block made of ¼" wood strips, I redesigned it using black spruce furring strips, ¾"x 3 ½"x 4" with 3/8" grooves equally spaced lengthwise. Four of these were strapped together and placed in the buckets. These will be evaluated next year to see if the grooves make them more attractive to the termites.

# TERMITE ENTOMOLOGY

**Janet McAllister**

BUILDINGS

We were called to inspect one apartment in the Upper Pontalba Apartments were old termite damage was being repaired in the floorboards. Only two live soldiers were found so no above ground baits were installed. An apartment in the Lower Pontalba building with the five above ground baits was negative for termite feeding by March. Only dead soldiers were found in these baits so they were removed in May. These above ground baits were initially installed in December1999.

In May the main fire station on Decatur Street was added to our Prolinx accounts. The building has a long history of termite activity. The floors in this building feel like you are walking on jello in some spots. The infrared camera was used to look for termites in the floors but no activity was found. Termites were found at the top of one of the stairwells where there is a roof leak. Prior to having Sentricon installed this building was part of a wick study. The study was set up to try and increase the number of above ground stations that could be installed, thus delivering more active ingredient to termites. The wick study will continue even though the building has now been cored and in ground Sentricon stations have been added.

We were called to inspect one of the French Market Buildings, Building C, in December 2000. This building, the Halle des Cusines, houses the Bella Luna Restaurant, the Temporary Jazz Museum and an empty space being renovated. Five feet away from the building, along the back of it, are multiple termites' trails hidden behind vines growing on the flood protection wall. Termites were discovered in the building when a pest control operator was doing routine spraying for roaches. The termites were disturbed by the spray and began coming out of one of the walls upstairs near the kitchen. Above ground stations were place where the termites were but the chemical used for the roaches drove them from their established trails and no feeding on the baits was established.

The termite division was requested to inspect all of the city libraries. The City Librarian, Gertiana Williams, wanted to know which buildings she needed to get termite contracts on. Contact was made with the individual branches and began inspections in July. Native subterranean termites were found in the attic of Nix

## Monthly Prolinx Summary – 2000

| Site/total # | Number of stations with baits installed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **stations** | **Mar** | **Apr.** | **May** | **June** | **July** | **Aug.** | **Sept.** | **Oct.** | **Nov.** | **Dec.** |
| HDLC / 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Vieux Carre / 43 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 3 | 1 |
| Training Academy / 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Court House / 88 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| Pharmacy Museum / 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Decatur Fire Station / 34 | 0 | 0 | 0 | 0 | 1 | 0 | 3 AG | 0 | 0 | 0 |
| City Park Trees * / 238 | 0 | 1 | 5 | 5 | 4 | 4 | 10 | 15 | 10 | 12 |
| St. Raphael's / 41 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 3 | 2 |
| Jackson Square / 88 | 0 | 1 | -- | 3 | 2 | 2 | 2 | 1 | 2 | 2 |
| Upper Pontalba / 160 | 2 | 3 | 3 | 1 | 1 | 0 | 2 | 2 | 1 | 0 |
| Lower Pontalba / 135 | 1 | 0 | 1 | 0 | 5 AG | 2 AG | 2 AG | 2 AG, 1 | 2 AG | 1,1 AG |
| Presbytere / 67 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 1,4 AG | 1,4 AG |
| Madam John's / 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cabildo / 78 | 2 | 0 | 3 | 0 | 0 | 1 | 2AG, 1 | 4 AG, 1 | 1,4 AG | 1,4 AG |
| Algiers Library / 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gallier Hall / 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Perseverance Hall / 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

***26 historic trees**

Library and at several locations in Latter Library. Navra, Keller, Gentilly, Smith libraries were also inspected during this period. No live termites or evidence of past damage were visible at any of these sites.

In addition to inspecting libraries, we were requested by Carlos Mentoya of airport maintenance to look for termites at several of the airport buildings. Inspection of these buildings at the New Orleans International Airport turned up a small infestation of native termites on concourse B and empty mud tubes on concourse A. The airport fire station and the relocation office on Williams Blvd. had no visible signs of termites present.

TMR

In January we began installing wooden stakes at all Fire stations and some Police stations throughout the City. Activity at the staked buildings was to be used for triple mark recapture. Stakes were driven into the ground every 10 feet around the perimeter of each building. In addition to the 14 fire stations with soil contact we put stakes around: 2 buildings at Parks and Parkways, 3 police stations, 3 buildings at the zoo and the carriage house at the Latter library. We inspected these buildings monthly and installed bucket monitoring stations wherever termites were found. After a dry spring, termite activity began to increase in May. Seven of the sites had termite activity. In June the number of sites had increased to 10. Termites from two of the positive sites, the zoo and the carriage house at Latter library, were returned to the lab where they were weighed and dyed. The termites from the zoo perished before they could be re-released. The termites from the carriage house were successfully re-released. Before the first round of releases at the positive sites in our study could be completed termite activity dropped off due to lack of rainfall. The studies moved forward during July and August when a small amount of rain was received increasing the feeding at some of our selected sites. As a result of this rain we had enough feeding activity to begin dying and releasing termites at 4 of our 13 sites. Unfortunately the activity at our TMR sites never picked up enough to get three rounds of mark and recapture before temperatures and activity dropped in December.

Bob Anderson with FMC inspected trap placements at two buildings where we are testing Frontline. He helped move some traps that were in the drip line of the buildings. The traps were originally set in the ground between the drip line and the building but due to settling of the ground around the buildings they shifted into the drip line. The traps were moved a second time in the fall for the same reason. The frontline monitors did not have any termite activity although there was quite a lot of ant activity in them with the ants using the monitoring tubes to build nests.

## TREES

All the trees were treated at the Wildlife and Fisheries building with Premis. Each tree was inspected for termite activity. These trees are being monitored as part of the Operation full Stop project.

We treated more termite-infested trees in May adding them to a study already in progress using Fipronil. Five trees were treated with a rate of 0.125% AI (active ingredient) and 6 trees were treated with 0.0625 AI. It became increasingly hard to find trees suitable for conducting these types of studies thanks to the hard work of the pest control industry and the State tree program.

## WICK PROJECT

A wick project started in 1999 with Dow AgroSciences continued in 2000. The buildings being used for this project were reevaluated after being monitored for one year. Several of the buildings from 1999 were dropped from the program because they have not produced any data or they have been renovated and we can no longer access our drilled holes. One of the remaining buildings, the driving range at City Park, was refitted with new wooden dowels. The dowels are birch with a spiral cut around the outside. This change was determined after a separate experiment showed formosan termites preferred birch to maple, ramin and ash and spiral cut grooves over fluted and plain dowels. Wooden stakes were installed around the building to determine if we are dealing with one or several colonies at this site. We continued to use the Decatur Street fire station as part of this study during 2000. The dowels at the fire station still need to be changed over to birch. Two new buildings will have to be found to replace the ones we are dropping.

## INSECTICIDE RESISTANCE

Studies were begun to evaluate insecticide resistance in mosquitoes throughout the Parish in conjunction with encephalitis surveillance. Oviposition buckets to collect *Culex* eggs were placed at fire stations where surveillance chickens were housed. Egg rafts from these buckets were collected, transferred to the lab, reared to adults and tested for resistance to resmethrin, permethrin and malathion. The test we used to detect resistance is the bottle bioassay developed by the CDC. Resistance to resmethrin was detected in some *Culex* from a site in eastern New Orleans. The mechanism and cross-resistance pattern was not worked up for this population. We plan to see if they show resistance again next year and if so we will do the necessary tests to determine

the mechanism and if there is cross-resistance. None of the other sites in town showed signs of resistance development.

In a separate study, pupae were collected from the Bayou Savage marsh and allowed to emerge to the adult stage. These mosquitoes were a mix of *Culex salinarius* and *Aedes taeniorhynchus*. Both species of adults were tested for resistance to malathion and permethrin. No resistance was detected in either species.

Bottle bioassays to monitor the development of resistance to insecticides in *Aedes taeniorhynchus* from the eastern part of the parish continued again in October. No resistance was detected in these mosquitoes. This is good news, as our control efforts do not seem to be selecting for resistance in this species as the spray season progresses.

LMCA

The Louisiana Mosquito Control Association Annual meeting went off without a hitch in late November. Things were slow around here for that week as almost everyone including most of the office staff were either attending the meeting or helping with registration. As we were the hosting district, everyone chipped in and helped including the termite division. Everyone who helped deserves a big thank you. In particular, Pat Schultz and Cindy Krohn whom manned the registration desk and helped get all the pre registration paper work done. Gus Ramirez and Perry Ponseti helped by running errands and picking up things that were needed as well as getting all the equipment to the hotel. Jack Leonard ran the audio-visual equipment for the presentations. Ed Freytag presented an update on termite activities in New Orleans. Mike Carroll helped with obtaining door prizes. The inspectors and entomologists attendance of these meetings is mandatory for them to keep their section 8 licenses up to date. There were 175 people in attendance at the meeting. Two were students, 7 were companions and 15 were vendors.

PRESENTATIONS/TRAINING/MEETINGS

A presentation was made to the Village D'Lest homeowners association in March. About 30 people attended. After discussing termites for an hour they invited us back to talk about mosquitoes at a later date. Also in March tours of the study sites in the French Quarter were given to a group of French Entomology students from the University in Bordeaux. Tours of the Sentricon sites in the Quarter and Armstrong Park were given to a group of 55 PCO=s from Texas and Dow sponsored a media day in Jackson Square in March.

I attended a meeting sponsored by the American Mosquito Control Association in Washington, D.C. in mid May. The focus of the meeting was to discuss legislation that would effectively shut down mosquito control operations on school properties. A Senate bill, known as the Boxer amendment, called for a 48 hour written notification to go to all parents prior to any insecticide application and a 24-hour re-entry period. If this legislation ever passes it will be impossible to conduct mosquito control activities for any school events. The AMCA is asking that public health insecticides be exempt from the requirements. While this bill has stalled in the house, the author of the Bill, Senator Barbara Boxer has already attached it to another bill in an attempt to get it through. In addition to this legislation, the AMCA is requesting the House and Senate to continue funding for West Nile Virus and to appropriate funds for Health and Human Services to begin data collection on re-registration of public health pesticide products. This re-registration is required by the newest version of FIFRA. Currently EPA is looking at the Carbamate and Organophosphates. Several of our mosquito control products are organophosphates. Various personnel within EPA were on hand at the meeting to discuss where the agency stands in this re-registration process.

Matt Messenger and I attended a training class put on by the Louisiana Pest Control Association. We viewed the class held in Baton Rouge at the LSU distance-learning center in Mandeville. The class covered how to properly fill out the wood destroying insect report (WDIR) now used by the state. You must now have a WDIR license for submitting reports. This license is in addition to the termite license.

Termite personnel took several trips during September and October. I took a trip to Baton Rouge to scan slides from the late Dr. Meeks collection. Ed Freytag and myself traveled to Dow AgroSciences headquarters at Indianapolis to present seminars on our research projects sponsored by Dow. Perry Ponseti and Gustavo Ramirez attended a termite technician class sponsored by Clemson University. The class was designed to give technicians hands on training for treating termites. Both men passed with flying colors.

I gave a presentation for the Botanical Gardens at City Park in October. The presentation was part of their monthly garden series. The talk included information on termite biology and how it affects gardening choices. Just a few of the specific topics covered were the use of mulching, does planting trees attract termites, and how soil disturbance affects termite contracts. I also attended the Georgia Mosquito Control Association annual meeting to present a paper on mosquito control in New Orleans, toxicology of resistance testing and how we are setting up a program to monitor resistance development in our mosquito populations in conjunction with our existing encephalitis surveillance.

I attended a termite control class at Clemson University in November. The class certifies individuals as Master Termite Technicians. The class consisted of both classroom and field instruction. A written exam and a practical exam were administered before the designation of Master Termite Technician could be earned. Both exams were passed and my Master Termite Technician certificate and patches arrived in December.

Matt Messenger and I traveled to Entomological Society of America (ESA) annual meeting in Dec. The meeting was in Montreal Canada and was a joint meeting with the ESA, the Entomological Society of Canada and the Societe D'entomologie du Quebec. I presented a paper on our wick project with DOW AgroSciences.

# LOUIS ARMSTRONG PARK

## Matt Messenger

Louis Armstrong Park is one of the many projects included in the Operation Full Stop Program, which is led by USDA-ARS SRRC in New Orleans. The goal of the Louis Armstrong Park project is to identify and characterize each subterranean termite colony and monitor the invasion by nearby established colony(s), or re-establishment of new colony(s) by alate pairs into vacated territory of colony(s) that have been eliminated using baits containing hexaflumuron.

Triple mark-recapture (TMR) studies were initiated in May 1998 to identify and characterize every termite colony present in the park. There are currently 14 Formosan subterranean termite (FST) colonies in the park, in addition to six smaller native subterranean termite colonies. Three of the eleven FST colonies tend to forage predominantly in the surrounding neighborhoods and occasionally invade the park. These 14 colonies are monitored on a monthly basis using over 60 underground monitoring stations scattered throughout the park.

The list below represents the total number of termite alates recovered during 2000 from 68 glue traps and a light trap in Armstrong Park. Peak Formosan swarming activity occurred on the evening of May 14.

| | | |
|---|---|---|
| 7,224 | Formosan subterranean termites | (*Coptotermes formosanus*) |
| 30 | Western drywood termites | (*Incisitermes minor*) |
| 25 | Eastern subterranean termites | (*Reticulitermes flavipes*) |
| 6 | Dark southern subterranean termites | (*Reticulitermes virginicus*) |
| 5 | Southeastern drywood termites | (*Incisitermes snyderi*) |

The 2000 total rainfall average from two rain gauges inside the park was 34.8 inches.

During 2000, I completed the first trial of the foraging arena experiment and am currently conducting the second and third trials. In addition, the third and final trial of the petri dish agonistic experiment was completed. So far, the results from the second foraging arena trial have been consistent with the results from the first trial. Certain Formosan colonies from Armstrong Park will always fight when placed together in the foraging arenas and others will not. These results also have been consistent with the three petri dish experiment results. The combined results of the petri dish and foraging arena experiments will be compared with the cuticular hydrocarbon analysis of each colony and analyzed statistically to see if there is a significant correlation between hydrocarbons and aggressive behavior. Dr. Mike Haverty (USDA-FS) will complete the hydrocarbon analysis in 2001.

Periodic samples from each Formosan and native subterranean termite colony were sent to Dr. Haverty for cuticular hydrocarbon analysis, to Dr. Nan-Yao Su (Univ. of Florida) for morphometric studies, and to Dr. Claudia Husseneder (Univ. of Hawaii) for DNA fingerprinting. Dr. Husseneder has completed the DNA fingerprinting of each Formosan colony and has found that each colony can be separated statistically from each other based on their DNA profiles. It will also be interesting to see if each colony can be separated based on their cuticular hydrocarbon compositions.

The statewide survey for termites using the pest control industry was concluded in November, however, the NOMTCB survey will continue until summer 2001. Throughout 1999 and 2000, 52 of the 91 participating pest control operators returned a total of 401 vials containing termite alates, soldiers, workers, and secondary reproductives. The following list represents the total number of each species received and identified both years:

- 196 vials containing *Reticulitermes flavipes* (Eastern subterranean termite)
- 112 vials containing *Coptotermes formosanus* (Formosan subterranean termite)
- 38 vials containing *Reticulitermes virginicus* (Dark southern subterranean termite)
- 9 vials containing *Incisitermes snyderi* (Southeastern drywood termite)
- 7 vials containing *Crytotermes brevis* (West Indian powderpost termite)

- 1 vial containing *Incisitermes minor* (Western drywood termite)
- 38 vials containing an unknown species (either empty or containing only workers)

In addition, the following two species have been collected throughout Louisiana by NOMTCB staff and/or other individuals:

- *Reticulitermes hageni* (Light southern subterranean termite)
- *Kalotermes approximatus* (Dark southern drywood termite)

Over 500 termite samples have been taken throughout the state during the NOMTCB survey. The total number of each of the eight species collected has not been calculated yet, however, *Reticulitermes flavipes* and *R. virginicus* seem to be the most commonly collected around the state.

Some of the professional meetings I attended during the past year included the International Congress of Entomology meeting in Iguassu Falls, Brazil, on August 20 – 26, where I presented two posters. The first poster was on the Digital microProbe (DmP) and its uses in detecting foraging galleries inside trees and structural lumber and the other poster summarized and discussed the agonistic experiment data from the three petri dish trials and the single foraging arena trial. In early December, Dr. Janet McAllister and I attended the Entomological Society of America Annual Meeting in Montreal, Canada. I presented a 10-minute oral presentation on the current distribution of termite species in Louisiana.

Beginning spring 2001, I will begin eliminating three Formosan termite colonies in Armstrong Park using baits containing hexaflumuron. I will also be monitoring the area for re-invasion or movement of existing colonies into the vacated territories. Other goals for 2001 include: finishing the foraging arena experiment, finalizing the statewide termite survey publication, publishing the current results on the wood consumption rate and foraging territory for each FST colony in Armstrong Park, developing a termite identification key for pest control operators, and monitoring the current distribution of the FST throughout Louisiana. The 2000 annual report submitted by NOMTCB to USDA-ARS SRRC is included on the following page.

**ANNUAL RESEARCH PROGRESS REPORT**
**Report of Progress (AD-421)**

**Accession:** **Year: 2000** **Project Number:**
**Mode Code:** **STP Codes:**

**Title: Alate Flight Activity in Louis Armstrong Park, New Orleans, Louisiana, the Louisiana Termite Survey, New Termite Detection Technology, and Monitoring of Historical Buildings in the French Quarter**

**Ed Bordes, Matt Messenger, and Ed Freytag**
**City of New Orleans Mosquito and Termite Control Board,**
**6601 S. Shore Harbor Blvd., New Orleans, LA 70126**

Question 1: What major problem or issue is being resolved and how are you resolving it?

The Formosan subterranean termite (FST), *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae), is one of the most economically important subterranean termites in the southeastern United States and Hawaii. The FST was introduced from southeast Asia to the continental U.S. in the mid-1940s and has spread throughout the southeastern U.S. In 1966, FST infestations were confirmed in New Orleans and Lake Charles. Since then, the FST has become one of the major pests of trees and structures in those cities and has spread throughout southern Louisiana. Therefore, we are conducting a termite survey that will identify the complete distribution of the FST and other termite species throughout the state. In addition to the survey, we are conducting a succession ecology field experiment with FST colonies in Louis Armstrong Park, a 31-acre park adjacent to the French Quarter in New Orleans. Certain colonies will be eliminated and the abandoned foraging territory will be monitored to determine whether or not surrounding FST colonies will invade the territory. The abandoned territories will also be monitored for the establishment of new colonies founded by FST alate pairs. Glue traps are placed throughout the park to monitor FST alate flight activity. We have also been evaluating infrared videography technology, which will help termite investigators better locate potential termite activity inside structures and trees.

Question 2: How serious is the problem? Why does it matter?

According to the Louisiana Cooperative Extension Service, the cost of treatment and repair for the FST in the U.S. and Hawaii is estimated to be $1 billion annually. In Louisiana, the FST is believed to be responsible for over $300 million dollars in total control, damage, and repairs to structures and trees in

Orleans, Calcasieu, Jefferson, St. Tammany, and St. Bernard Parishes. A better understanding of the biology, ecology, distribution, and detection of the FST is essential to controlling this pest and lowering the overall economic impact the FST has on Louisiana and the rest of the nation.

Question 3: How does it relate to the National Program(s) and National Program(s) components?

The monitoring of alate flight activity and the FST succession ecology experiment contribute to the Louis Armstrong Park project. The Louisiana termite survey contributes to the National Termite Survey. Both projects, in addition to developing and evaluating new termite detection devices, are included in the Operation Full Stop Program / National Formosan Subterranean Termite Project. The monitoring and treatment of city- and state-owned historical buildings, including Jackson Square, is included in the 15-block treatment area, which is also part of the Operation Full Stop Program.

Question 4: What were the most significant accomplishments this past year?

A. Single Most Significant Accomplishment during FY 2000 year:
FST alates and soldiers were collected and verified from the following locations in Louisiana: Baton Rouge, Covington, Grand Isle, Lafayette, West Monroe, Monroe, Pierre Part, and Prairieville.

B. Other Significant Accomplishment(s), if any:
Western drywood termite (*Incisitermes minor*) alates and soldiers were collected from Natchitoches, Lafayette, Schriever, Gretna, and Algiers Point (New Orleans).

C. Significant Accomplishments/Activities that Support Special Target Populations:

The ability to detect termites in a variety of materials was tested extensively this year. Detection of termite activity underneath carpet was a significant event. Termites were active in a wooden floor; the carpet over the floor diffuses and attenuates the thermal signature characteristic of termite activity. With the proper detector, we were able to find the termites, which were subsequently controlled by baiting.

Long-term suppression of subterranean termites in the French Quarter has been successfully conducted in the Cabildo, Presbytere, and Madame John's Legacy Museums, as well as the Upper and Lower Pontalba apartments and in Jackson Square with the use of in- and above-ground termite baits. By monitoring the bait

stations in and around these structures on a monthly basis and applying the bait toxicant whenever activity has been detected, the main colonies as well as incipient colonies have been considerably reduced, and are some cases, eliminated.

Several trees surrounding the Wildlife and Fisheries building were harboring FSTs and were subsequently treated by injecting a liquid termiticide into the voids and galleries. The suppression of FSTs in trees helps to prevent re-infestation of nearby wooden structures and trees. The termiticide will also eliminate hundreds to thousands of FST alates present inside the tree.

Question 5: Describe the major accomplishments over the life of the project, including their predicted or actual impact.

In 1999, close to 10,000 FST alates were collected from glue traps in Louis Armstrong Park from January to July. However, in 2000, only 7,200 alates were collected. This decrease may be linked to extremely dry environmental conditions and/or to the overall stability and health of each colony inside and adjacent to the park. During FY 2001, selected FST colonies will be eliminated in the park and alate flight activity will continue to be monitored from FY 2001 to FY 2003. As the number of FST colonies in the park declines, it is expected that the total number of FST alates collected from the glue traps will also decline.

The statewide survey has revealed the presence of eight termite species: four subterranean species and four drywood species. *Reticulitermes flavipes* is by far the most common subterranean termite species in the state and *Incisitermes snyderi* is the most common drywood termite species.

The most significant accomplishment in thermal imaging was the selection of the proper imaging device to detect the FST. Several imagers were tested with prices ranging from $12,000 to $65,000. Infrared wavelengths from 3 - 14 micrometers or µm were tested. The imaging device chosen is a hand-held thermal video camera sensitive to the 7 - 12 range. The device is uncooled (some detectors must be cooled in order to detect IR radiation), and about the size and weight of a 8mm camcorder. This imager performed the best in all tests and is also the easiest to use. Images are captured from the thermal camera by a digital 8mm camcorder. These images can be processed by computer software and eventually used in a training program.

Question 6: What do you expect to accomplish, year by year, over the next 3 years?

During FY 2001, selected FST colonies inside Louis Armstrong Park will be eliminated using baits containing hexaflumuron. Alate flight activity will be monitored to determine whether or not overall flight activity inside the park has been affected. Then, during FY 2002 and FY 2003, all FST and other subterranean termite colonies within the park will be eliminated.

The statewide termite survey will continue through FY 2001 with the help of pest control operators, mosquito control district officials and various local, state, and federal officials. By the end of FY 2001, a complete distribution map of the four subterranean termite species will be available. The distribution of the four drywood termite species collected will also be presented.

Development of a thermal imaging training program is the priority for FY 2001. The program will teach operators to use thermal imaging to identify live termites, termite damage, moisture, damage caused by excess moisture, and structural damage. Operators completing the program will be certified as thermographers. Training will consist of several classroom sessions using the images captured over the past two years. Training aids, which are yet to be constructed, will allow students to view different types of damage and infestation under controlled circumstances. During FY 2002 and FY 2003, the training program will be further refined. An interactive CD-ROM will be produced so that part of the training can be completed outside the training course. Students will also undergo actual field training with the imager, which includes a review of images captured in the field.

Question 7: What science and/or technologies have been transferred and to whom? When are the science and/or technology likely to become available to the end user (industry, farmer, other scientists)?

The FST distribution in Louisiana will help local, state, and federal authorities determine appropriate actions, such as control decisions. The survey will also serve as a prototype for the National Termite Survey, which will also involve the assistance of pest control operators and various local, state, and federal officials.

The thermal imaging training program to be developed this year will begin the transfer of technology to pest control operators and freelance thermographers.

Question 8: List your most important publications in the popular press and presentations to non-scientific organizations, and articles written about your work.

Entomological Society of America Annual Meeting, December 12-16, 1999, Atlanta, GA. Foraging populations of the Formosan subterranean termite (Isoptera: Rhinotermitidae) and the interactions among colonies in Louis Armstrong Park, New Orleans, Louisiana. Ten-minute paper presentation.

Press:

New York Times
Times Picayune N.O.
The following presentations were made:
Termite meeting held in New Orleans by National Center for Preservation Technology and Training (NCPTT).
Simulcast over LSU university network, to the Louisiana Architects Association.
Presentation to the American Wood Preservers Institute.
Presentation to the Louisiana EPA, DEQ.
Presentation to the French Quarter Association.

Scientific publications:

Messenger, M.T., R.H. Scheffrahn, N.-Y. Su. First report of Incisitermes minor (Isoptera: Kalotermitidae) in Louisiana. Florida Entomologist. March 2000. v. 83 (1). p. 92-93.

Su, N.-Y. and M.T. Messenger. Measuring wood consumption by subterranean termites (Isoptera: Rhinotermitidae) with digitized images. Journal of Economic Entomology. April 2000. v. 93 (2).
p. 412-414.

# VECTOR RODENT CONTROL

## Joseph A. Yurt, Director

### Typhus Surveillance

The Typhus Surveillance program monitors the riverfront by live trapping rodents on the wharves. During the year no rats were live trapped. Bloods would be extracted from the rats and sent to the state laboratory for compliment fixation testing for typhus. Ectoparasites are combed from the rats and identified. The ectoparasite of concern is *X. cheopis, which* transmits the disease from rodent to man. A flea count is maintained and used as an n index for crisis management.

### Urban Rat Survey

Pest control technicians inspected 1,087 blocks, 23,609 premises to determine rat infestation and other environmental deficiencies. Of the premises inspected, 838 unapproved refuse containers, 83 premises with active rat signs and 264 premises with exposed garbage. Twenty-two pounds of rodenticide was used.

### Source Reduction

Source Reduction notices were issued by pest control technicians to premises with environmental deficiencies such as high grass and weeds, trash and debris, exposed garbage and/or food, improper storage of material and any other conditions that may cause a rat harborage. 1,184 Source Reduction notices were issued. The violations noted on the notices were sent to Environmental Enforcement, a division of the New Orleans Health Department, for corrective action.

### Complaints

Vector/Rodent Control received 1,642 complaints from the community. All the complaints were serviced via investigations, referral or consultation. Four hundred eighty-five pounds of rodenticide was used in servicing the complaints.

## Demolition Inspection

According to city ordinances, before Safety & Permits issues a demolition permit to a contractor Vector/Rodent Control must declare the building free of rodents. One hundred seventy premises were inspected and declared rodent free.

## Strategic Inspection Force (SIF)

Pest control technicians inspected 850 blocks, 16,664 premises and fund 84 premises with active rat signs, 708 premises with unapproved refuse containers, 392 premises with exposed garbage, 1,264 source reduction notices were issued and 18 pounds of rodenticide was utilized.

## Other Public Facilities

The program inspected and/or treated the following city owned facilities or properties during 2000. One hundred thirty-three inspections at police facilities, 171 inspections at fire stations and 708 other city owned buildings utilizing zero gallons of finished spray and 153 pounds of rodenticides. 55 ounces of gel bait, 28 cans of crack and crevice.