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Commissioners

Thomas B. Hart,
Chairman

Joseph H.
Burgess

William M. Ellis

George T.
Mann, Jr.
Vice-Chairman

Lawrence J.
Murphy,
Secretary-
Treasurer

Richard H.
Pritchett, III

Bruce C. Scott

Executive
Director
T. Wayne Gale



2008 Annual Report Lee County Mosquito Control District

15191 Homestead Road, Lehigh Acres, FL 33971

Post Office Box 600005, Fort Myers, FL 33906

Phone: (239) 694-2174 Fax : (239) 694-6959

Website: <http://www.lcmcd.org>

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Board of Commissioners

Board of Commissioners



Thomas B.
Hart

Commissioner Hart was first elected to the Board from Area 6 in 1998 and has been reelected since that time, including the 2006 election.

Dear Residents, Colleagues, and Friends,

I have had the pleasure of serving as Chair of the Lee County Mosquito Control District for 2008, so on behalf of Board of Commissioners it is with great pleasure that we present to you our annual report. We are proud to be able to provide the opportunity for the District employees to highlight achievements during the past year.

Please feel free to contact me, any Board member, or our helpful staff should you have any questions or concerns about the District's programs or services.

Sincerely,

T. Hart, Chairman

Board of Commissioners

Lee County Mosquito Control District



Board of Commissioners

Board of Commissioners

The Lee County Mosquito Control District board is comprised of seven commissioners representing seven areas, and the areas shall be nearly equal in population as possible. Commissioners are elected, at large, in the General Election, by qualified electors residing within the district. This is a 4-year term, non-partisan office. A vacancy on the board shall be filled, by appointment, by the Governor, for the remainder of the unexpired term. A board commissioner takes office the 2nd Tuesday following the General Election.

Area 1

Lawrence J. Murphy was re-elected from Area 1 in 2008 and is currently serving as the Board Secretary/Treasurer.



Area 2

Joseph H. Burgess was re-elected from Area 2 in 2006.



Area 3

Mike Ellis was re-elected from Area 3 in 2008.



Area 4

Richard H. Pritchett, III was re-elected from Area 4 in 2006.



Area 5

George T. Mann, Jr. was re-elected for Area 5 in 2008.



Area 7

Bruce Scott was re-elected from Area 7 in 2008 and served as Chairman of the Board for 2007.



Executive Director



Message from the Director

The Lee County Mosquito Control District was established in 1958 by an act of the Florida Legislature as an independent district and has been providing uninterrupted mosquito control services to the citizens of Lee County for fifty years. During those years the District has remained at the forefront of mosquito control, helping to develop control technologies that are effective and considerate of the natural Florida environment.

We took time to commemorate our 50th birthday with a celebration that included presentations by Lt. Governor Jeff Kottkamp, Representative Nick Thompson and the two former directors, T. Wayne Miller and William Opp. District staff, commissioners, former commissioners, former employees, and many representatives of Florida mosquito control districts were also on hand to help celebrate the District's 50 years of service to Lee County citizens.

This year environmental conditions provided Lee County with a very active mosquito season, as evidenced by the data in this report. Employees worked many overtime hours to ensure citizens were protected from mosquitoes and the diseases they can transmit. Predicting the magnitude of each mosquito season is difficult at best and certainly makes the budgeting process challenging. The District was able to meet operational commitments this year while continuing to move forward with quality improvements in infrastructure and process improvement including the addition of a second Bell 407 helicopter to the aircraft fleet and the completion of several structures to enhance operational support. We will continue to seek ways to improve services, enhance public communication and successfully complete our mission as we begin the next 50 years of service to Lee County citizens.

T. Wayne Gale,
Executive Director



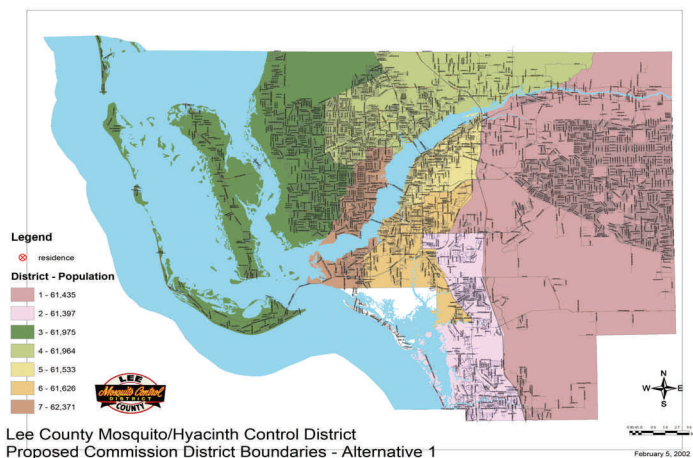
District
Headquarters

Mission Statement: Lee County Mosquito Control District is committed to improving the quality of life, facilitating outdoor activities and protecting the public health in our community by implementing environmentally sound practices that control mosquitoes throughout Lee County.



The objective of Lee County Mosquito Control District is to serve the residents and visitors of Lee County by controlling the mosquito populations through an integrated pest management approach consistent with applicable laws and justified by tenets of public health, vector control, environmental safety and fiscal responsibility. The District provides leadership, research, technical information, and education on mosquitoes and their control.

The District operates under Chapter 388 of the Florida Statutes. It is regulated by the Florida Department of Agriculture and Consumer Services and coordinates operations to comply with regulations established by the U.S. Environmental Protection Agency, Department of Transportation, and Federal Aviation Administration.





The Lee County Mosquito Control District is responsible for mosquito control in ninety-eight percent of the County or approximately 1000 square miles which includes over 56,000 acres of salt marsh mosquito breeding habitat. The District covers over 590 miles of shoreline and 100 plus miles of barrier islands. After high tides or rain, these coastal habitats produce large numbers of aggressive salt marsh mosquitoes that can fly up to 50 miles and literally cover the County. Most of these coastal habitats are not accessible by vehicle and inspectors must use helicopters and boats to gain access to these areas for inspection and control of immature mosquito stages. In addition, there are numerous other mosquito species in Lee County that breed in both permanent and temporary fresh water habitats, including some that can transmit mosquito borne diseases such as Saint Louis Encephalitis, Eastern Equine Encephalitis, West Nile Virus or dog heartworm.



**Lee County Mosquito Control District Directors
William R. Opp (retired), T. Wayne Miller, Jr. (retired) and
T. Wayne Gale (current)**



Historical Perspective

The Lee County Mosquito Control District (LCMCD) was created on January 21, 1958 under Chapter 57-2059, Florida Statutes. The LCMCD was created by consolidating three of the four organized mosquito control districts in Lee County and adding all of Lee County not previously within a mosquito control service area. In 1957, only 8% of Lee County was within a mosquito control district. The three districts merged their assets and liabilities to create a new district encompassing 98% of the geographical area of Lee County. The LCMCD was developed from the Fort Myers Mosquito Control District which was formed in May 2, 1950, the Boca Grande Mosquito Control District which was formed May 27, 1952, and the Sanibel-Captiva Mosquito Control District which was formed October 6, 1952. The fourth district was the Fort Myers Beach Mosquito Control District which was formed July 12, 1949 and is still providing mosquito control service to their area.

The county-wide approach to mosquito control was the result of a Lee County Chamber of Commerce project. Mr. Robert Halgrim, who was a member of the Chamber and a Commissioner of the Fort Myers Mosquito Control District, headed up the committee whose work led to the submission of a bill that would form the LCMCD. After gaining approval of the Florida Legislature, the voters of Lee County passed the referendum by a margin of nearly four to one.

A young engineer, T. Wayne Miller, Jr. was employed on December 1, 1956 to direct a county-wide permanent control program funded by the Florida State Board of Health. Once the Districts consolidated, T. Wayne Miller, Jr. was appointed Director of the LCMCD. His vision and passion for mosquito control led to cutting edge control techniques, research, and education programs which propelled LCMCD to becoming one of the leading mosquito control programs in the world.

The District started with 14 employees, including the Director and increased to 25 with seasonal employees during the height of mosquito season. The District was located at 2647 Canal Street in Fort Myers. Today the District has over 80 permanent and 30 part-time employees and is located at the old Buckingham Army Airbase at 15191 Homestead Road in Lehigh Acres .

The first budget for the LCMCD was \$299,061.39 from State funds and a special tax of 1.5666 mills. The 2007-08 budget was based on a revenue of \$14,922,154 from Ad Valorem tax of 0.1636 Mills.

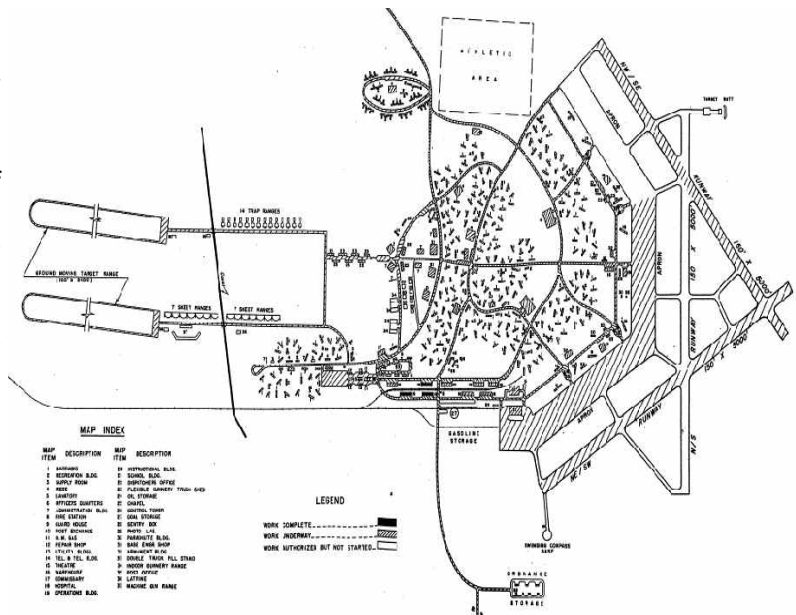


Canal Street Office



Historical Perspective

Buckingham Army Airfield was a flexible gunnery training base, used to train gunners who would defend bombers. It was constructed in 1942 at a cost of 10 million dollars. It encompassed a total of 7,000 acres and had a series of canals constructed on it to drain the swamp land. During its peak the base had 6 runways, housed over 16,000 men and women, contained approximately 700 buildings and graduated over 48,000 aerial gunners. The base was closed on September 30, 1945.

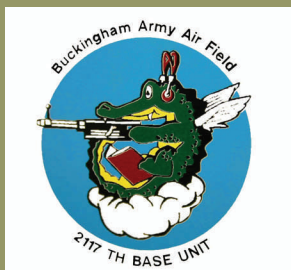


Army Corps of Engineering Diagram of BAAF

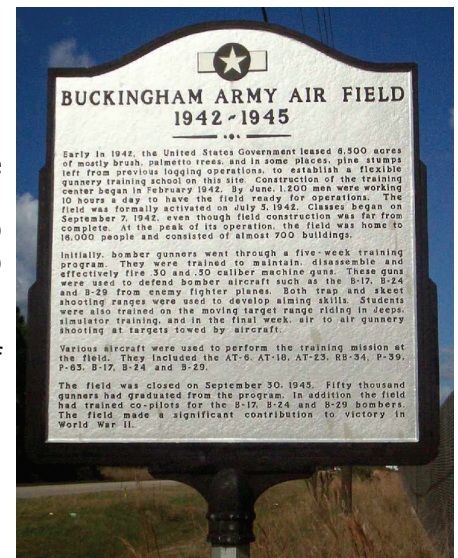


For a brief time the barracks of Buckingham Air Field were used as the classrooms for Edison College. Edison moved out in 1948. In 1968, the Lee County Mosquito Control District (LCMCD) moved its' operations from Canal Street in Fort Myers to the Buckingham Army Air Field in Lehigh Acres. The six runways were gone along with almost all of the buildings. The site had shrunk to approximately 250 acres. There remains one, original building from the base on the property. The airport is often referred to on aeronautical maps as Lehigh West Airport. It is operated as a private field and called FL59 - Buckingham Field Airport by LCMCD.

Buckingham Army Airfield 1945



On July 5, 2002 the Fort Myers Historical Museum; Experimental Aircraft Association, Florida Warbirds, Squadron 24; Lee County Board of Commissioners; Leadership Lee County and LCMCD celebrated the 60th Anniversary of the Buckingham Army Air Field. The Anniversary was celebrated to set aside time to remember those civilian and military personnel who worked, served and trained at the base. A historical marker commemorating the former Buckingham Army Air Field was erected at the intersection of Gunnery Boulevard and Sunset Road.



Funding

Funding

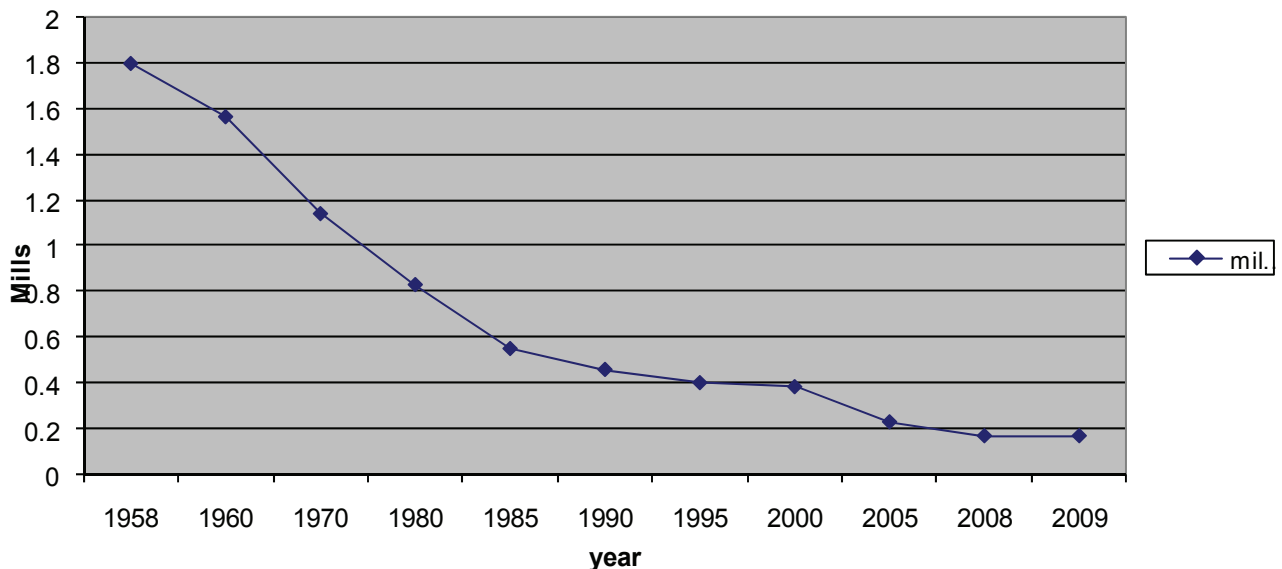
Property Taxes

Property taxes are the primary source of revenue for Lee County Mosquito Control District. General revenues come from property taxes, interest income and miscellaneous. In 2007, total revenues were \$16,094,570. In 2008, total revenues were \$16,031,131.

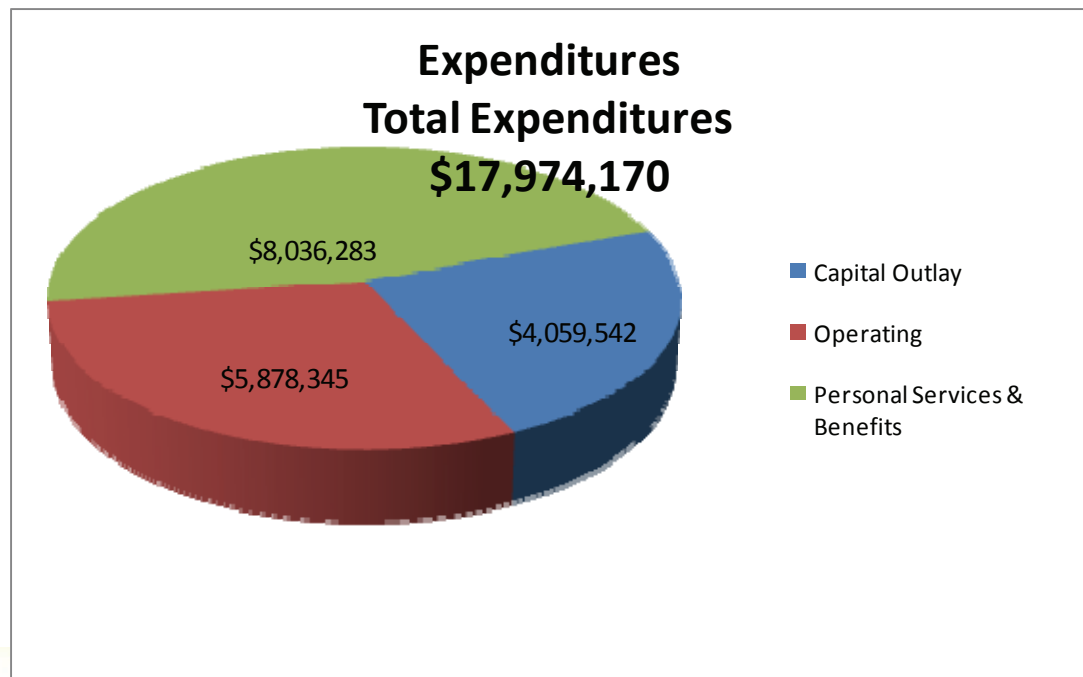
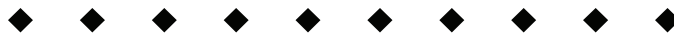
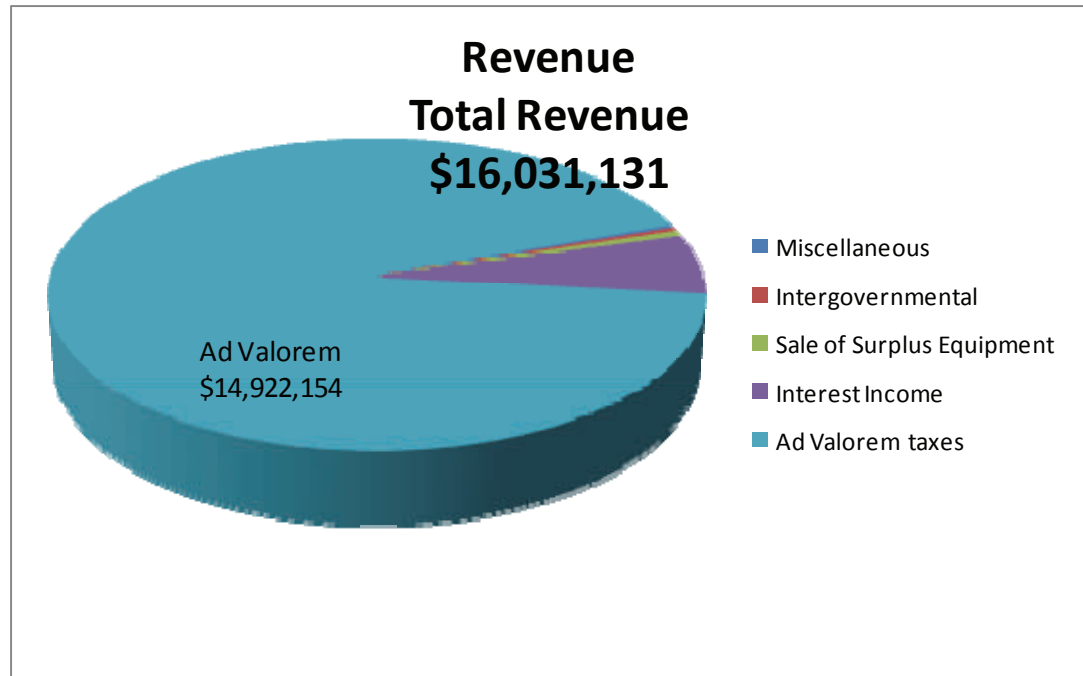
Property taxes are levied each year, and are payable beginning November 1. The Lee County Tax Collector's office bills and collects property taxes on behalf of the Lee County Mosquito Control District. The tax rate levied upon the taxable property within the District boundaries for mosquito control for the fiscal year that ended September 30, 2008 was \$.1636 per \$1000 of assessed taxable property value. For example, a taxable property with an assessed value of \$235,000 would pay \$38.45 in taxes for mosquito control services or approximately ten cents per day.

Starting at a millage rate of 1.8 mills in 1958 when the District was formed, the Board of Commissioners for LCMCD has steadily reduced millage to 0.1636 mills for 2008.

Lee County Mosquito Control District Millage Rates



District Revenues and Expenses



Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control and Scientific Intelligences (MCSI)

This Division of the District is composed of three Sections, Mosquito Control, Scientific Intelligences and Field Validation. Katie Heggemeier manages the Mosquito Control Section, James Burgess manages the Scientific Intelligences Section and the Division Deputy Director, Jonathan Hornby, directs the Field Validation Section as well as the MCSI Division.

Deputy
Director
Of
Mosquito
Control and
Scientific
Intelligences

Jonathan
Hornby,
Ph.D.



Jonathan Hornby



Katie Heggemeier

Manager,
Mosquito
Control

Katie
Heggemeier



Mosquito Control Section

Mosquito Control Larviciding Program

Larviciding refers to the control of mosquitoes in the larval, aquatic stage. Our efforts are focused toward controlling mosquitoes in this stage, because the insects are confined to the aquatic environment and can be efficiently targeted with minimal effect on other organisms. Mosquitoes remain in the larval stage for as little as four days which requires an intense effort to locate and treat them before they become adults. Larval inspections are conducted by trained personnel capable of identifying mosquitoes to genera and larval stage. Aircraft are used to expedite locating and treating larval mosquitoes in remote areas and large acreages while ground inspections and treatments are performed in residential and small areas using vehicle-mounted spraying equipment. All larvicide applications are based on a demonstrated presence of mosquito larvae.



Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control Section

The larviciding program at LCMCD has three components; Aerial Larviciding, Ground Larviciding and Marine Larviciding. There are six teams that work in concert to insure the District's primary tool for controlling mosquitoes is applied in a rapid and efficient manner. Any particular team consists of members working in one or more of the larviciding components. Each team is responsible for a specific geographical zone and the composition of a team is defined by the habitat within its assigned zone (Fig. 1 & Fig. 2.). Aircraft pilots are an integral part of the larvicide program and are assigned to a larviciding zone as needed. Assignments vary from a single zone to many on any particular day.



Figure 1. Zone Components

Larvicide Zone	Larvicide Component		
	Aerial	Ground	Marine
Boca Grande	X	X	X
Sanibel	X	X	X
Cape Coral/N. Ft. Myers	X	X	X
South of Ft. Myers	X	X	X
Ft. Myers and East	X	X	
Pine Island	X	X	X





Mosquito Control and Scientific Intelligences (MCSI)



Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control Section

Figure 2. Larviciding Staff		Zone Assignment					
Name	Title	Boca Grande	Pine Island	Cape Coral / NFM	South of Ft. Myers	Ft. Myers & East	Sanibel
Bryan Smith	Aerial Larviciding Supervisor	X	X	X	X		X
Robert Hedrick	Aerial Inspector		X				
Paul Morgan					X		
Tommy Stewart							X
Mike Thomas				X			
Clyde Nabors	Aerial/Field Inspector	X					
Dick Baker	Ground Larviciding Supervisor					X	
Jonny Jeter	Field Inspector		X				
Roger Zocki							X
Mike Hein	Transport Operator		X				
Chuck Herzog				X			
Wayne Luetlich					X		
Sonny Williams							X
Danny Corbitt	Ground Larviciding Inspector					X	
Rodney Wolford						X	
Steve Luce	Larviciding Inspector			X			
Judy Thomas					X		
Richard Daughetry	Marine Operative Inspector	X	X	X			X
Bill Stephens					X		





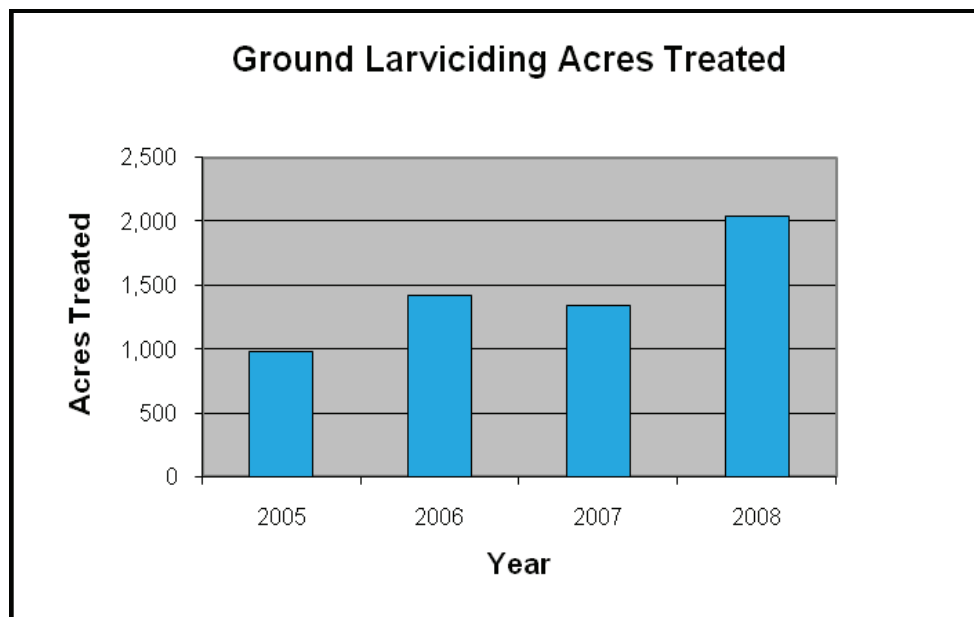
Standard pint dipper with larvae.

Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control Section

The Ground Larviciding Component is used in all areas of the county and involves an inspector examining roadside swales, fields and retention ponds for the presence of mosquito larvae with a standard pint-sized dipper. When mosquito larvae are found appropriate control measures are taken to insure that the larvae or pupae do not become adults.



Marine Larviciding Component

The Marine Larviciding Component used in the coastal areas of the county and is comprised of a marine operative inspector who inspects the coastal islands and mangrove fringes of the larviciding zone by boat. When larval mosquitoes are found the marine inspector coordinates with the aerial inspector to treat using helicopters.



Marine
Operative
Inspectors

Richard
Daugherty

Bill Stephen



Aerial
Larviciding
Staff

Aerial
Larviciding
Supervisor

Bryan Smith

Aerial
Inspectors

Robert
Hedrick

Paul Morgan

Tommy
Stewart

Michael
Thomas

Aerial/ Field
Inspector
Boca Grande

Clyde
Nabers

Field
Inspector

Johnny Jeter

Roger Zocki

Transport
Operators

Mike Hein

Wayne
Luetlich

Sonny
Williams



Aedes taeniorhynchus larva

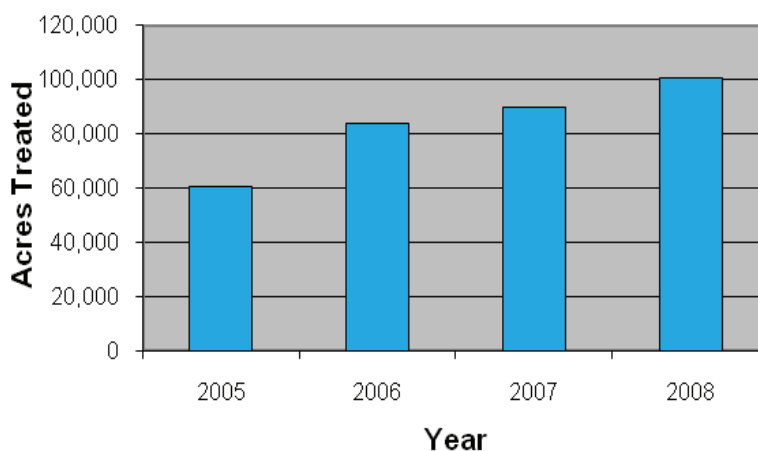
Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control and Scientific Intelligences (MCSI)

Mosquito Control Section

The Aerial Larviciding Component is applied in areas of the county that flood from either rainfall or tide and are not accessible by ground vehicles. The aerial inspector uses a helicopter to search for the presence of mosquito larvae and treat them appropriately. The inspector also works with the transport operator to load the helicopter with larvicide and fuel and also coordinates the activities of the ground larviciding component.

Aerial Larviciding Acres Treated





***Culex nigripalpus* adult**

MCSI

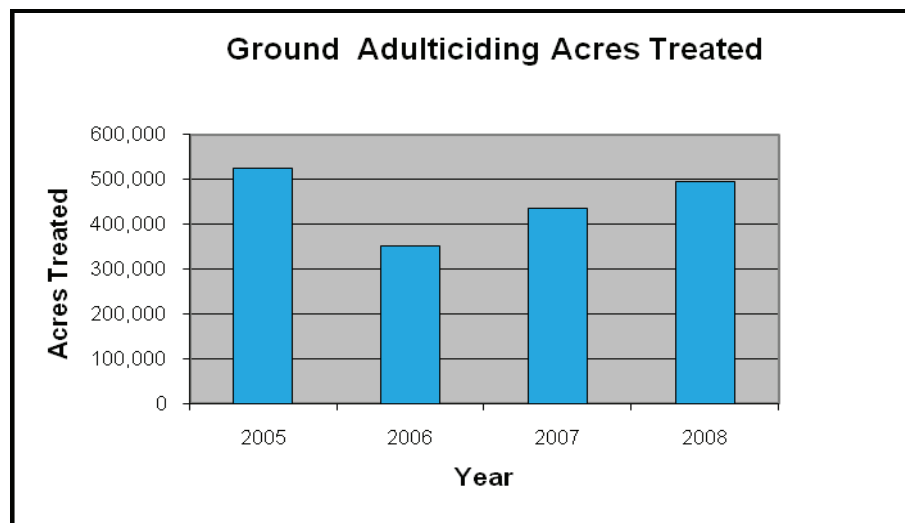
MCSI

Mosquito Control Section

Adulticiding

Adulticiding refers to the control of mosquitoes in the adult, terrestrial flying stage. Despite all efforts to prevent adult mosquito populations from reaching annoyance levels, it is inevitable that outbreaks will occur. When this happens, it is the mosquito control adulticiding program's responsibility to reduce the adult mosquito population. All of LCMCD adulticiding activity is based on surveillance data, no adulticide spraying is performed on a scheduled basis. Each weekday, inspectors are busy monitoring Lee County's adult mosquito populations. Inspectors use several different techniques to check for the presence of adult mosquitoes. An inspector can monitor the adult mosquito biting population by performing landing rate counts. The inspector will walk into a wooded area and count the number of mosquitoes that land on their body in a one minute period of time; this is referred to as a Landing Rate.

Once an area has been determined to have an adult mosquito problem which needs to be treated, it will be adulticided with either ground or aerial equipment. Which technique and type of equipment used depends on the severity of the mosquito problem, road access, and the size of the area.



Ground Adulticiding Program

A small area of infestation can be treated with Ground Adulticiding Trucks these trucks use ULV ((Ultra-Low-Volume) technology. The equipment atomizes or creates many tiny droplets which drift through the air and contact the mosquito in flight. The Ground Adulticiding Trucks achieve excellent results in areas with good network of roads. These trucks usually begin just after sunset and treat an average of 2,000 acres per night. Lee County Mosquito Control Ground Adulticiding fleet consists of 11 trucks.



Ground
Adulticiding
Supervisor

John W.
White





Night Vision Goggles

MCSI

MCSI

Mosquito Control Section

Aerial Adulticiding Program

During periods of high adult mosquito activity, it is necessary to treat large areas of the County; this can be accomplished by using helicopters or fixed-wing aircraft. Lee County Mosquito Control District has five Douglas DC3's allowing for quick coverage of the county when there is a significant mosquito problem. Equipped with the latest technologies of GPS (Global Positioning System) navigation and night vision goggles these fixed-wing adulticiding missions are conducted at night, usually between 10 p.m. and 2 a.m., when adult mosquitoes are active and more likely to be exposed to the very small droplets produced by the ULV (Ultra-Low-Volume) spray system. Lee County also has one Huey UH-1H equipped with a high pressure ULV spray system for treating the outer islands of the County, these missions are conducted in the early morning hours, usually at sunrise.

Aerial
Adulticiding
Coordinator

Donald
Claytor, Jr.



Creating spray maps for AG-NAV system.

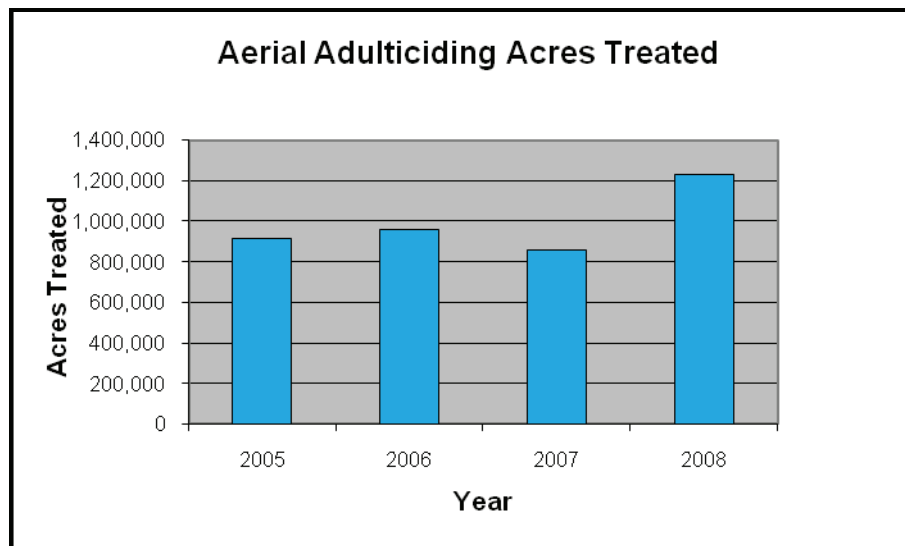


AG-NAV - GPS Navigation System



AG-NAV provides pilot with swath, directional guidance, and other navigation information required to carry out

**Acres of Aerial
Adulticide
Treatment**



Improvements And Upgrades

Ground Adulticiding Program

Improvements to this program involved the installation of a global positioning system (GPS) which synchronizes the flow of the pesticide with the vehicle speed (variable flow system) on the ground ULV trucks. This insures the vehicle applies the adulticide at the labeled rate at all speeds. The system also records the vehicle location, spray activity, material flow and vehicle speed. This data is summarized in a report listing total material used, miles traveled and vehicle speed statistics. The data can be ported into the LCMCD Data Management Software System.



Aerial Adulticide Program

The spray system upgrade of the DC3 fleet was initiated by Wayne Gale and completed this year. Three ships are fitted with blade-driven rotary nozzles (Micron AU4000) and a spray flush system. A fourth ship is fitted with electric-motor driven rotary nozzles (Micron AU6600) and a flush system. The District's fifth DC3's spray system is high-pressure (1000 psi) with Bete PJ20 impingement nozzles. These replace the previous flat-fan nozzle systems resulting in improved droplet spectra from the ships and brought LCMCD into compliance with EPA labeling.



Aircraft Nozzle Statistics

Nozzle System	Material	Dv _(0.5) (microns)	Dv _(0.9) (microns)
Flat Fan	Orchex 796	60	149
AU4000		37	84
AU6600		29	71
High Pressure PJ20		27	55

Dv_(0.5) :50% of spray volume is composed of drops of stated size or smaller.

Dv_(0.9) :90% of spray volume is composed of drops of stated size or smaller.





***Aedes taeniorhynchus* adult**

MCSI

MCSI

James Burgess



Scientific Intelligences Section

This division involves the scientific collection and analysis of data necessary for the District to control larval or adult mosquitoes in the most efficient manner with minimal impact on the environment. The main facets of the program are monitoring of environmental factors, the monitoring of adult mosquitoes, the monitoring of mosquito-borne disease transmission and the monitoring of the susceptibility of mosquitoes to larvicides and adulticides.



James Burgess, Tom Miller, Sandra Martin, Sandy Gross, Lisa Hunt and Milton Sterling

Adult Mosquito Surveillance Program

Adult surveillance is conducted to determine the need for control as well as the type and intensity of control necessary to reduce adult mosquito populations to an acceptable level. Three forms of adult surveillance make up the program. Nightly collection of male and female mosquitoes by truck-trap in 48 areas, provide a measure of mosquito flight activity, species diversity and adult development. Daytime landing-rate measurements provide data related to the level of biting activity while citizen service request alert the District to localized problems not detected by other means.



Tom Miller setting a CDC Light





MCSI

MCSI

Truck-Trap Program

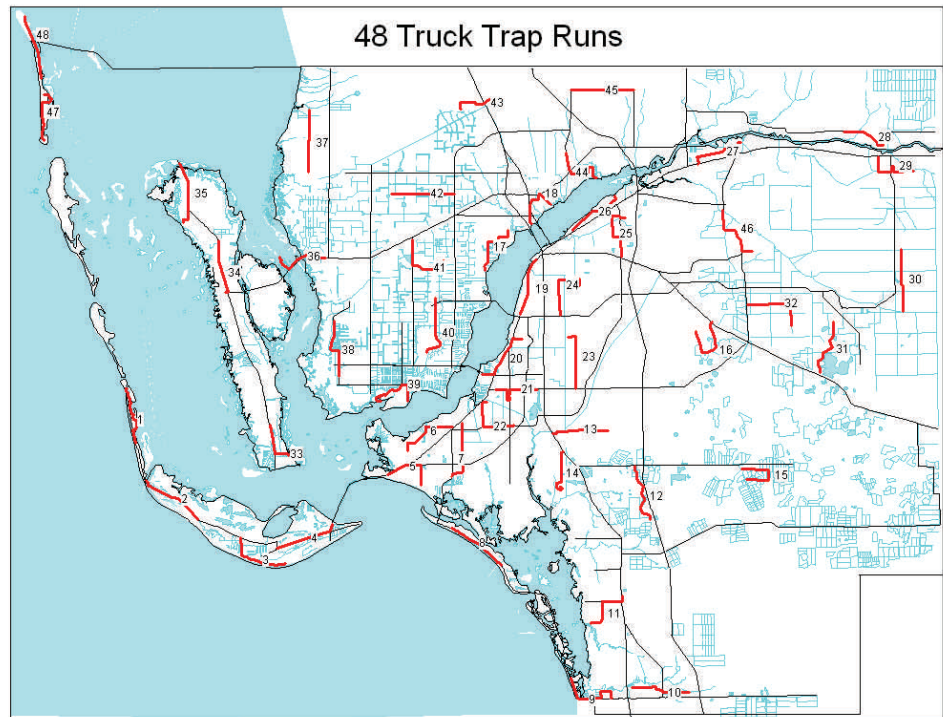
Scientific Intelligences Section

The Truck-Trap Program covers two facets of the Scientific Intelligences; the monitoring of environmental factors of rainfall and temperatures as well as monitoring adult mosquito distribution, population levels and species diversity. From May 1st through October 31st flight activity data of male and female mosquitoes is monitored at 48 locations around the county using a non-selective trap, the Truck Trap. A truck-trap is a large screened funnel attached to the top of a pickup truck. A three mile long drive constitutes a route along which mosquitoes are trapped in a net bag attached to the end of the screen funnel. Rainfall data is recorded at the beginning and end of each route providing information for the larviciding program on possible new larval breeding. The insect collections from the truck-traps are taken to the District's laboratory where the mosquitoes are identified to species and sex and counted. This information along with weather data collected from each route is tabulated and used to determine where adult control may be necessary.

Truck Trap
Supervisor

Sandy Gross

There are seven employees who work for the six months as truck trap drivers. Lee County is divided into four sections: North, Midtown, South, and Boca Grande. The North section has 14 collection runs and requires driving 165 miles to cover the route. The midtown section has 16 collection runs and requires driving over 126 miles. The South section has 16 collections runs and requires driving over 160 miles. The Boca Grande section has two collection runs and requires driving over 10 miles. To make the program more efficient, the Boca Grande truck is stationed on the island. The Boca Grande collections are made, identified and reported to operations by the staff on the island.





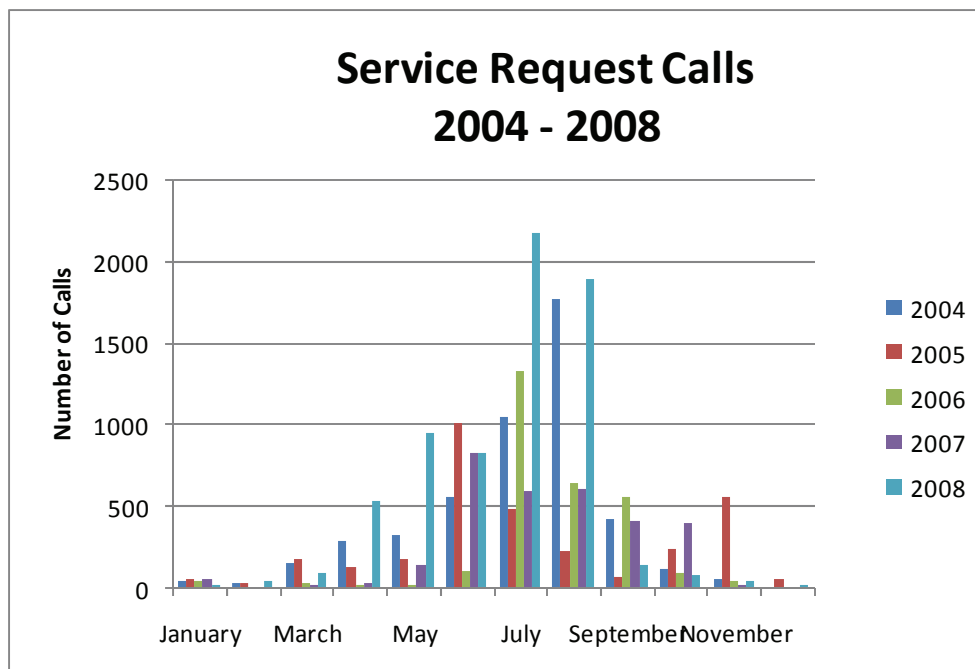
MCSI

MCSI

Scientific Intelligences Section

Daytime Landing Rate Program and Citizen Service Request Response

The Daytime Landing Rate Program supplements the Truck-Trap Program by providing information on the biting activity of adult mosquitoes. This program functions in conjunction with the Citizen Service Request Program since citizen service requests are triggered by mosquito biting activity. The inspector visits the site of the request and determines the level of adult infestation, the species of annoyance mosquitoes and breeding source if possible. The resident is informed, verbally or with a Door Hanger, of measures the individual may be able to take if the mosquito source is from their property. If the inspector determines the infestation is wide spread by taking multiple mosquito landing rates, the resident is informed and the inspector makes recommendations to his supervisor. In addition to visiting the areas where citizen service requests occur, the inspector will visit areas found to have high adult mosquito flight activity from truck traps. He or she will determine the level of annoyance by adults and/or the presence and stage of larval mosquitoes.





Mosquito-Borne Disease Surveillance

Mosquito-borne disease surveillance program is made up of four parts. The first part is sentinel chicken surveillance. This portion uses the appearance antibodies to Eastern Equine Encephalitis (EEE), Saint Louis Encephalitis (SLE) and West Nile virus (WN) in chickens to monitor the transmission of disease among the disease's reservoir hosts, birds. The blood is analyzed by hemagglutination/hemagglutination-inhibition (HA/HI) for the three mosquito-borne diseases. The second part of the program is specialized adult mosquito trapping. This trapping is performed with CDC Light Traps to monitor the level of the vector mosquito, *Culex nigripalpus* or *Coquilletidia* spp. The third part is the analysis of the collected vector mosquito for the presence of viral RNA through Real Time Reverse Transcriptase (RT) Polymerase Chain Reaction (RT-PCR). This data indicates the presence of infected or potentially infected mosquitoes. RT-PCR provides the most sensitive technique available for rapid testing of mosquitoes to determine the presence of virus. The final part is the human case investigation. Human case investigation involves determining when and where the disease was contracted. The disease contraction could be outside the neighborhood of the victim or outside the county. This year three human cases of malaria were investigated. All of which were contracted outside the county.

Six hundred chickens are raised to be used for Eastern Equine Encephalitis (EEE), Saint Louis Encephalitis (SLE), and West Nile virus surveillance. Traveling over 2600+ miles a year, Sandra Martin visits 18 chicken sites throughout Lee County. The chicken sites are checked twice a week to ensure the overall health, food, water, and shelter of the chickens. Blood samples are taken every other week, all year for antibody screening. If a positive sample is detected, weekly sampling will be performed until three weeks of negative samples are documented. Testing will then return to every other week. Each sample of blood is divided in-half with one-half going to the Florida Department of Health laboratory in Tampa for arbovirus testing and the other half is used for District testing. Over 2650 blood samples were taken and forty-four weeks of HA/HI tests were performed in 2008. Over 1041 pools *Cx. nigripalpus* and *Aedes albopictus* adult mosquitoes were tested for WN and SLE using RT-PCR.

Arbovirus
Technician

Sandra
Martin

Bio-
technology
Specialist

Milton
Sterling



Susceptibility Monitoring

Susceptibility bioassays are conducted using established lab mosquito colonies and wild mosquitoes in their larval, pupal, and adult phases to monitor for any indication that wild mosquitoes are developing tolerance to the chemical control measures used. Colonies of fresh-water, *Culex quinquefasciatus*, and a major pest salt-marsh species, *Aedes taeniorhynchus* are maintained daily (seven days a week) for the bioassay reference, Field Validation Section, Lee County Public School Science curriculums, and public education.

Ten larval susceptibility bioassays and over sixteen pupal emergence trials for field applied S-Methoprene were performed in 2008. The "Bottle Bioassay for Adult Mosquitoes" was added to the program this year with six adult bottle bioassays being performed for the active ingredient naled, which is used in the adulticide Dibrom.

Susceptibility
Analyst

Lisa Hunt



Improvements and Upgrades: Susceptibility Monitoring

The susceptibility testing unit added 'Adult Bottle Bioassay' testing in 2008. This adds the ability to look for resistance to adulticides in the adult mosquito. The resistance testing unit has incorporated a water chiller into the water bath used for larval bioassays. Cold water temperatures cause mosquito larvae to cease activities (such as feeding) and reduce general metabolic activity. The chiller will allow us to evaluate larval response to pesticides in cold water and to determine the temperature at which pesticides become ineffective.

Improvements
And Upgrades



Improvements and Upgrades: Truck Trap Program

The 2008 season started with the truck trap program having some runs adjusted and two new runs added. This was done to reflect areas of growth and environmental changes to mosquito habitat. Two runs in Lehigh Acres were adjusted and a new run was added off of Gunnery Road. Alva and North Fort Myers each had a run adjusted. Iona had one run adjusted and a new run added. Cape Coral had only one run adjusted to reflect the increase in roads.

The trap trucks themselves were upgraded with the installation of Live GPS tracking. This allows for oversight of the speeds the trucks are driven. This is necessary because when the truck travels over 55 mph on the open road, the screens can be blown out of the trap and, on the trap run itself, when the truck drives over 20 mph the mosquitoes are badly damaged and can't be identified. Monitoring of the trucks is in real time through the internet from any computer. The District also receives a daily activity report by e-mail.

**CDC Light Trap Collection****Mosquito-Borne Disease Surveillance****Improvements and Upgrades: CDC Light Trap Unit**

In the past CDC Light traps were only used in conjunction with disease monitoring. This year a CDC Light Trap Unit was established to trap for disease surveillance and also has a protocol for trapping of special events. Special events are request made of the District to adulticide for weddings, wedding receptions, Jazz on the Green, etc. Since adulticiding cannot be performed without the justification of adult mosquitoes present, all requests need to be made 72 hours prior to the event to allow us to map and trap by 48 hours before the event. If the mosquito counts justify treatment, it is made 24 hours before the event; this timing is to prevent pesticide exposure of the public attending the event. The CDC trapping unit also takes a proactive approach in the trapping of special public events without the request form organizers, such as high school football games.

The CDC trapping unit has participated in the Field Validation Section by conducting trapping using a rotator trap. This trap has a computer time clock and 8 collection bottles. It allows the sampling of mosquito populations at different time periods and lengths of time day or night.



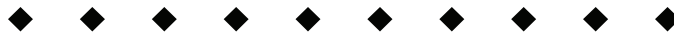
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Field Validation Section

Field Validation Section

This program's mission is to conduct studies designed to evaluate and validate the District's current techniques and practices in larval control, adult control and mosquito surveillance. The studies are of sufficient scientific design to provide accurate evaluations but generally are not as comprehensive as a research level experimental design focused on publication. Modifications to the control and surveillance programs will be made relative to the results of these studies. This year's focus was on the ULV ground adulticide truck variable flow/GPS tracking system evaluation/installation, the evaluation of low-drift nozzles for aerial larviciding and flight activity of host seeking *Cx. nigripalpus* mosquitoes.



Ground Adulticide:

The ULV ground adulticide truck variable flow/GPS tracking system evaluation involved the comparison of the Clarke SmartFlow and the Adapco GeoFlow products. The companies were very cooperative in providing us with evaluation units for this study. Our ULV truck drivers and mechanics were the main participants in the study and provided their opinions on each system's ease of use, user friendliness, dependability, value of the features and manufacturer service. The system chosen and installed was a scaled down version of the Adapco system called the Monitor 4. This system is similar to the GeoFlow product but does not provide an in-the-vehicle moving map or programmability of the spray mission and cost ~\$2000 less. This company develops its software in-house and has been very responsive on the software modifications we've requested as well as on equipment service.

Aerial Larvicide:

The second project of this program was developed in response to an unacceptable amount of drift occurring during LCMCD aerial larviciding activities and new EPA label requirements. By reducing drift its expected that more of the larvicide will be deposited on the target and fewer complaints will occur related to larvicide drift. However, the reduction of drift will require a more precise application by the helicopter pilot. Three nozzles were compared by visual and physical examination of the production and movement of small drops away from the aircraft flight path, drop size and uniformity in drop spectra of drops depositing on the ground. The District's current Delavan Raindrop nozzles were compared to TeeJet extra coarse flat-fan nozzle (TF-TP 10) and superior drift control Accu-Flo Radial nozzles. The Accu-Flo nozzles were found to produce narrow drop size spectra with few drifting drops. As expected, a reduction in swath width accompanied the loss of drifting drops which is a necessary downside when reducing drift. Operational trials were setup during the second half of the summer by fitting the two Bell 407 helicopters with the Accu-Flow nozzles. The aerial inspectors found that the nozzles performed well and a less than accurate application became more apparent. The installation of these nozzles to all the larvicide aircraft will proceed as these systems are upgraded by adding filters.



Larvicide Nozzles Evaluated:
TeeJet Flat-Fan,
Delavan Rain Drop,
Accu-Flow



Field Validation Section

Mosquito-Borne Disease Surveillance:

A study was undertaken to look at flight times of host seeking *Cx. nigripalpus*. This was performed by using a pair of rotator traps. They were programmed to change collection bottles every hour from 17:00 to 8:00. It was determined that the most active period was during the 21:00 and 22:00 hours, with a smaller period of activity during the 3:00 and 4:00 hours. This study informed us of the best times to focus our adulticiding for maximum benefit of *Cx. nigripalpus* control. In 2009 this study will continue with an emphasis on which hours of the night virus carrying *Cx. nigripalpus* appear. Two more rotator traps have been acquired to study the hours of activity for host seeking *Aedes taeniorhynchus* and *Psorophora columbiae* with the intent of maximizing adulticiding benefits.



ACRES TREATED	GROUND ADULTICIDING	AERIAL ADULTICIDING	GROUND LARVICIDING	AERIAL LARVICIDING
January	5,155.3		1.4	469.0
February	3,696.5		34.3	5,624.9
March	178.0	0.0	35.6	1,069.1
April	34,961.1	35,632.1	58.3	5,512.6
May	46,362.0	71,591.0	33.6	4,732.3
June	79,490.0	138,707.0	198.0	19,487.8
July	153,682.1	531,803.3	540.2	33,286.9
August	80,442.6	360,226.3	471.2	11,592.6
September	47,836.6	91,764.5	494.2	13,458.3
October	21,984.4	0.0	161.7	3,959.6
November	2,813.2	0.0	3,443.0	0.0
December	0.0	0.0	11.6	845.8
Y-T-D Totals	494,225.1	1,229,645.0	2,039.2	100,294.1

Total
Acreage
By Month