

TUSCOLA COUNTY MOSQUITO ABATEMENT

2016 Annual Report
2017 Program Plan



CONTENTS

2. Tuscola County / TAC
3. TCMA Staff
4. Organization
5. Overview
6. Tuscola County Map
7. Training and Testing
8. Weather Data
9. Biology
10. Mosquito Traps
11. Disease Surveillance
12. 2016 Mosquito Trapping Summary
13. Suspend Treatment
14. Treatment Sites / Materials Used
15. Operations
16. Spring / Summer Larviciding
17. Adulticiding
18. Roadside Ditch Treatments
19. Roadside Truck Fogging
20. Garage News
21. Long Driveway Program
22. Tire Page
23. Public Education
24. Membership
25. 2017 Highlights
26. 2016 TCMA Crew

TUSCOLA COUNTY BOARD OF COMMISSIONERS

Thomas Young	District 1
Thomas Bardwell	District 2
Kim Vaughan	District 3
Craig Kirkpatrick	District 4
Matthew Bierlein	District 5

COUNTY ADMINISTRATION

Michael Hoagland	County Controller
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TECHNICAL ADVISORY COMMITTEE MEMBERS

Norm Adams	Saginaw Valley Beekeepers Association
Cynthia Chilcote	Midland County
Doug D. Enos	Midland County Drain Commission
Erik S. Foster	Michigan Department Community Health
John Hebert	Bay County
John Hill	Michigan Department of Agriculture/Rural Dev
Mike Krecek	Midland County Public Health
Joseph Rivet	Bay County Drain Commission
Kent Singer	Tuscola County Health Department
Jerry Somalski	Bay Landscaping
Thomas Young	Tuscola County Commissioner

CONSULTANTS

Richard Merritt, Ph.D.	Michigan State University
Michael Kaufman, Ph.D.	Michigan State University
Edward Walker, Ph.D.	Michigan State University

TUSCOLA COUNTY MOSQUITO ABATEMENT STAFF

Kimberly Green, Director

Gavin Greer, Biologist

Lisa Ozbat, General Office Clerk

Larry Zapfe, Equipment Technician

SEASONAL STAFF	POSITION	YEARS OF SERVICE
Thomas Perkins	Foreman	13
John Adamczyk	Technician	10
Pat Webster	Technician	9
Renee Raney	Office Assistant	7
Bill Owensby	Technician	7
Amos Perkins	Technician	7
Mark Seelye	Technician	7
Matt Downing	Technician	7
Lee Garnsey	Technician	6
Rich Myers	Technician	6
Mike Sherman	Assistant Foreman	5
Kurt Fritz	Assistant Foreman	5
Don Gohs	Assistant Lab Technician	4
Larry Langenburg	Foreman	4
Adam Hildner	Technician	4
Warren Swackhamer	Technician	4
Kirk Bauer	Technician	3
Terry Morely	Technician	3
Jeff Edgley	Technician	3
Robert Burcham	Technician	2
Jack Clark	Technician	2
Richard Lester	Technician	2
Nick Schultz	Technician	2
Marissa Marz	Utility	1
Aaron Longerbeam	Technician	1
Patrick Dennis	Technician	1
Robert Potrykus	Technician	1
Rodney Hood	Technician	1
David Smith	Technician	1
Michael Westerby	Technician	1

ORGANIZATION

The Tuscola County Mosquito Abatement (TCMA) district was originally formed in 1997, after a millage proposal was passed by the citizens of Tuscola County. In August 2014, a six year renewal was passed with 85% being in favor. Funding for the 2016 mosquito control season was collected during the winter of 2015 taxes, at a rate of 0.65 mils.

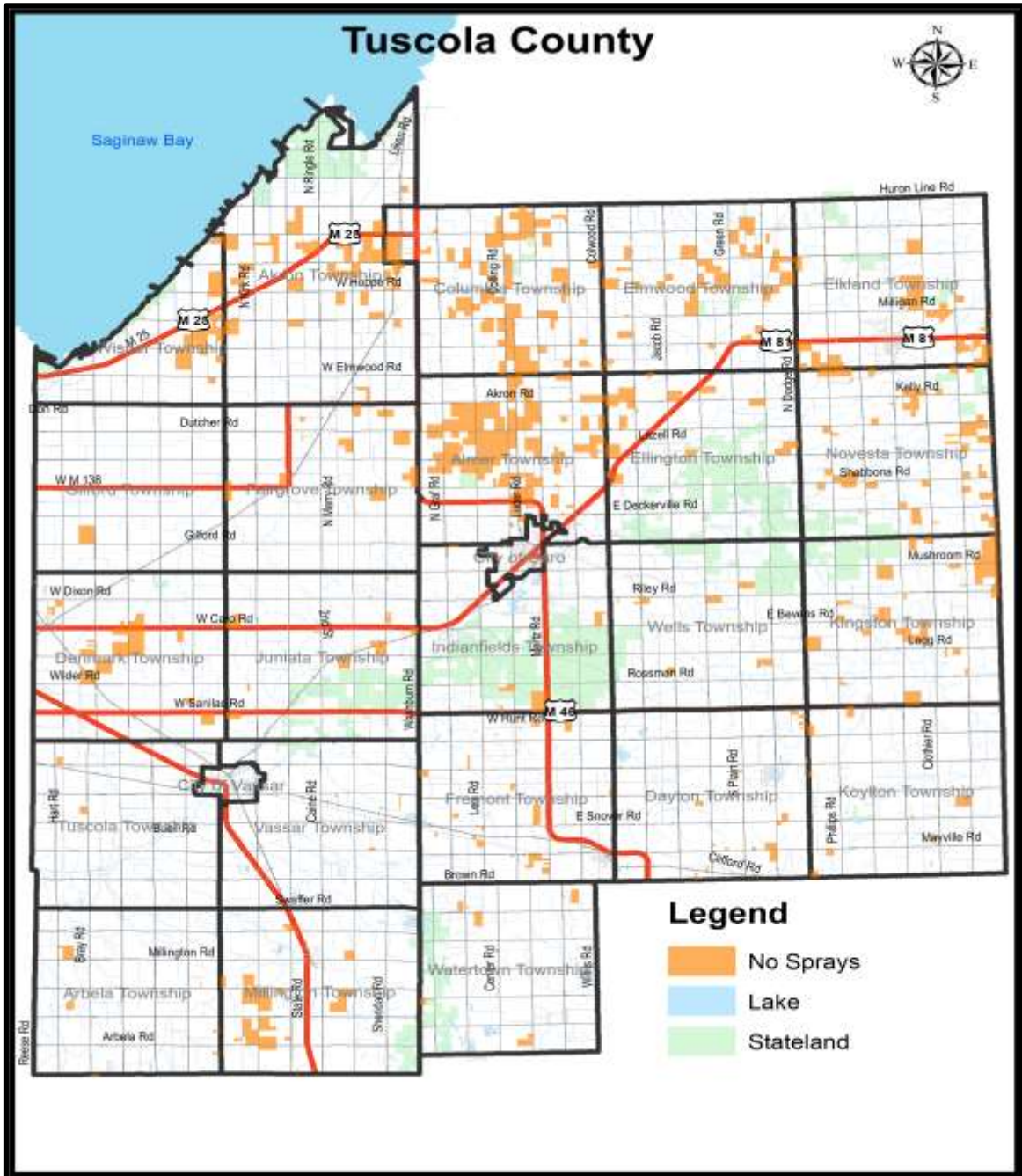
Tuscola County is one of four counties in Michigan with a formal, comprehensive mosquito control program. TCMA is a county governmental agency, which serves to control nuisance and disease vectoring mosquitos. A Technical Advisory Committee (TAC), which is composed of some of Michigan's leading biologists, entomologists, conservationists and scientists, review TCMA's program every March. Mosquito Abatement is based on Integrated Pest Management (IPM) practices. IPM is generally broken down into five categories or steps. These steps include: identification of pest, understanding the biology of the pest, monitoring the pest, developing sound goals to manage the pest, and implementation of an IPM program.

Biological surveillance, disease surveillance, product evaluations, field operations, and public education are included in this program.

OVERVIEW

- In early March, Foremen and a few seasonal staff returned to help move into and set up operations in our new building.
- A review and testing day was held in our building on March 14th and 15th.
- Biology staff returned on March 28th with seasonal staff returning on April 4th.
- The first week was spent issuing equipment and training.
- During March and April we were accepting requests for the Long Driveway Program. Foremen were sent to assess those driveways to see if they met the requirements.
- Route maps were then updated with the new long driveways and no spray's.
- On April 11th, Lisa Ozbat was appointed to a full time office position.
- First pupae was found on April 26th, however cold temperatures and even some snow flurries into May kept things pretty quiet.
- Technicians treated 2,529 flooded woodlots during the spring of 2016.
- The week of May 23rd brought very warm and humid conditions along with our first large hatch.
- Roadside ditch treatments began on May 31st .
- We began a trial of Suspend Polyzone Barrier treatment in a few locations, with impressive results.
- June and July yielded very low trap counts with extremely dry conditions.
- Heavy rains in August resulted in the busiest time of the 2016 season.

TUSCOLA COUNTY MAP



TRAINING AND TESTING

Newly hired staff, and those in need of re-certifying, are given study materials prior to the testing day.

A day for review of the materials and questions is provided before a representative, from the Michigan Department of Agriculture, oversees on-site testing.

All TCMA technicians are required to have an MDA Certified Pesticide Applicators License (with a mosquito specific – 7F endorsement).

Once newly hired staff have passed all testing requirements, several days of training are provided to help technicians become familiar with equipment and operations.



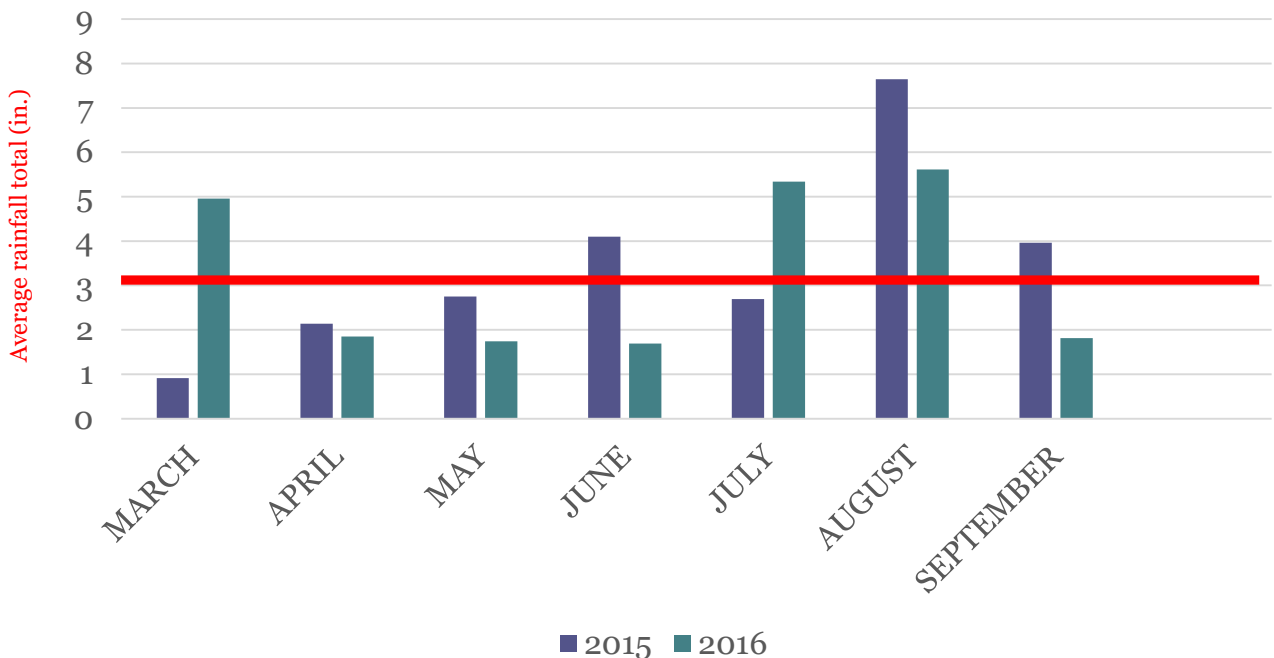
WEATHER DATA

Weather plays a very important role in determining our mosquito population. We experienced very cold temperatures this spring, along with some snow flurries in the month of May. During the last week of May, with the warm temperatures finally arriving, we began to see adult mosquitoes.

June and July were almost completely dry, resulting in very low trap counts in many areas. During the first week of August, we received a large amount of rainfall in the southern part of the county. With the dry conditions, most of the rain soaked in quickly, resulting in little change in mosquito activity. However, large amounts of rainfall received in the middle of the month resulted in increased activity, keeping us busy treating roadside ditches and fogging at night until the end of the season.

Monitoring the weather is a daily event due to the fact that all of our treatment techniques are weather dependent.

2015/2016



BIOLOGY

The Biology Department, through various mechanisms, conducts routine trapping as a means of monitoring for mosquito population levels and disease testing. This information helps in developing a mosquito suppression strategy, a critical component in an IPM approach.

Our Biology staff is also involved with monitoring the effectiveness of our control materials.

During the course of the season, the lab also conducts in house testing on dead birds that have been turned in by residents.

The Biologist will record all data obtained during the season to include in the annual report.



MOSQUITO TRAPS

New Jersey Light Traps are fixed in various locations throughout the county.

These remain the same from season to season, supplying a historical perspective of mosquito populations.

They require a supply of electricity, which produces the mode of attraction: a light source. Unfortunately, many insects are drawn to light, making the sorting of mosquitoes from the rest of the catch a laborious activity.



The Center for Disease Control (CDC) Trap is more mosquito specific, and very useful for getting into remote areas. They also give us quick insight as to localized activity.

DISEASE SURVEILLANCE

Gravid traps use highly organic water to lure egg laying mosquitoes.

Certain species prefer this type of medium, and since these species of mosquitoes are known to be vectors of disease (and have taken blood from a host), the female mosquitoes collected in these types of traps are desirable as potential indicators of disease activities.

The mosquitoes captured in all forms of traps, are identified. Those species, which are more likely to be involved in disease transmission, are selected for testing. The Insect Microbiology Lab at Michigan State University, tested 207 pools (groups of the same type), while others were tested in house, using the Vector Test Kit. Four pools tested positively for WNV during the 2016 season.



2016 MOSQUITO TRAPPING SUMMARY

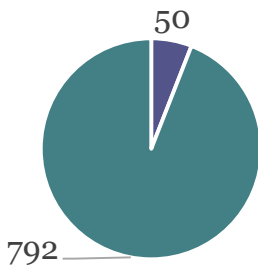
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
AEDES:						
canadensis	53	123				176
cinereus						
implicatus	20	39				59
japonicus		6	5	11	10	32
provocans	76	88				164
stim/fitch	153	382				535
triseriatus						
trivittatus			2	142	308	452
vexans	1	390	351	1446	1684	3872
ANOPHELES:						
punctipennis	6	118	165	153	105	547
quadrimac.	7	746	3035	2378	757	6923
walkeri		181	643	473	232	1529
CULEX:						
pipiens	22	102	277	1080	615	2096
restuans		63	82	88	51	284
territans		4	18	62	37	121
CULISETA:						
inornata	2	4	1		6	13
minnesotae		2	2		9	13
moresitans						
melanura	4	2	4	7	2	19
COQ. perturbans		2279	3548	308	46	6181
UR. sappharina		1	30	29	12	72
PS. ciliate				1	4	5
PS. ferox				3	1	4
TOTAL FEMALES:	344	4530	8163	6181	3879	23097
TOTAL MALES:	701	2992	2430	8632	2189	16944

Barrier Treatment

We began a barrier treatment using Suspend Polyzone during the 2016 season. To our delight, we had plenty of success with this new treatment. This treatment gave us control in areas that we have been unable to regulate. Testing sites included several different habitats.

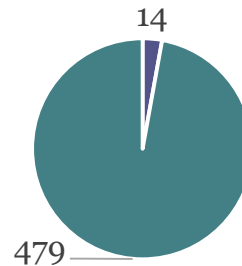
We setup our experiment using CDC traps that we placed once our application was made. We placed one CDC trap outside of the barrier in the woods and placed another trap relatively close to the woods inside the barrier. The traps were 40 feet away from each other. As you can see from the following graph, we were able to gain control in this area and provide much needed relief for the homeowners. The numbers on the graph show the total number of mosquitoes caught within the CDC traps we placed.

June 8



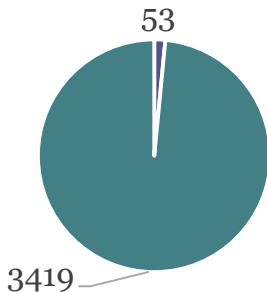
- Inside Barrier
- Outside Barrier

June 15



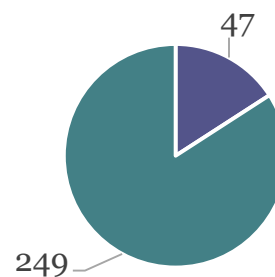
- Inside Barrier
- Outside Barrier

June 21



- Inside Barrier
- Outside Barrier

June 28



- Inside Barrier
- Outside Barrier

TREATMENT SITES / MATERIAL USED

MATERIALS	TREATMENT SITE
BVA 2 Mosquito Larvicide Oil (Highly refined petroleum distillate)	Swamps, Flooded Woodlots, Flooded Fields
Evoluer 4-4 (Peremethrin 4%)	Roadside Fogging, Public Use Areas, Private Property
FourStar Briquets 90 Day (Bacillus sphaericus 6% Bacillus thuringiensis 1%)	Retention Ponds
Mavrik (Tau-fluvalinate)	Public Use Areas, Private Property
Mosquito Dunks (Bacillus thuringiensis)	Small Water Holes, Artificial Containers
Spheratax SPH (50G)	Catch Basins
Suspend Polyzone (Deltamethrin)	Public Use Areas, Public Property
VectoBac G (Bacillus thuringiensis)	Flooded Woodlots, Artificial Containers, Tires, Ponds
VectoBac 12AS (Bacillus thuringiensis)	Roadside Ditches, Retention Ponds

OPERATIONS

Mosquito Abatement strives to keep residents safe from mosquito-borne disease, by reducing the mosquito population in our county.

This is done through various forms of treatment, typically beginning in late March, when we begin surveillance and treatment of the flooded woodlots with ground crews.

Once adult mosquitoes are present, usually in mid May, we introduce our second shift of technicians. They will begin to conduct routine roadside fogging and yard treatments for homeowners when requested.

Early summer larviciding will include routine surveillance and treatment of ditches, catch basins and sewage lagoons. Later in the season we will conduct surveillance and treat cross country ditches.

We maintain public use areas such as parks, campgrounds, trails, conservation clubs and golf courses on a weekly schedule during the season. This is to keep our citizens safe from disease carrying mosquitoes.

Residents may request yard treatments for special events such as weddings, parties, etc. We also provide treatment for the many festivals that occur throughout the county.

SPRING LARVICIDING

We begin in the early spring with the treatment of flooded woodlots. This is done with technicians using a hand held spreader to deliver granular BTI or a backpack sprayer to deliver BVA oil to the flooded areas.

We utilize a citizen tracking database, which allows us to keep historical record of homeowners and locations throughout the county with woodlots that may need treatment in the spring.

Biology staff and larviciding crews conducted routine surveillance and quality control on 2,529 flooded woodlot sites during the 2016 season.

SUMMER LARVICIDING CATCH BASINS – SEWAGE LAGOONS

Tuscola County is home to nine sewage lagoon. Many of these areas have been known to be breeding sites. Each of these sites were checked routinely and treated throughout the 2016 season, using liquid BTI (Vectobac12 AS) or granular BTI (VectoBac G®).

Catch Basins are treated 2-3 times throughout the season, depending on need, using granular BS (Spheratax SPH 50).

In addition, larviciding is also performed in the cross country ditches, flooded fields and artificial containers as needed using BTI (VectoBac G®).

ADULTICIDING

Tuscola County is made up of 23 townships. Each township is assigned a technician that will perform the roadside treatments.

Tuscola County has many “No Spray” areas (organic farms or bee keepers). Assigning a technician to a specific township, allows them to become familiar with these special conditions. No Spray signage is checked at the beginning of every season to replace or post signs where needed. Treatment route maps are updated routinely during the season, utilizing updates received from Field Watch and our county citizens.

Evoluer 4-4 (Permethrin) is applied at 5 oz. per minute, with truck mounted ULV units. Treatment is also conducted on a routine basis in all public use areas (parks, golf courses, rail trails, gun clubs and archery clubs) using our Kawasaki Mule, equipped with a ULV unit.

Citizens requesting treatment of their property are treated using a hand held thermal fogger, ULV sprayer or a Pioneer backpack ULV sprayer.



ROADSIDE DITCH TREATMENTS

TOWNSHIP	MILES DRIVEN	GALLONS USED/ VectoBac12AS
AKRON	818.80	8.60
ALMER	372.23	2.58
ARBELA	862.80	8.34
COLUMBIA	367.20	1.99
DAYTON	478.30	3.67
DENMARK	655.00	3.30
ELKLAND	412.90	1.32
ELLINGTON	455.00	2.00
ELMWOOD	525.40	2.80
FAIRGROVE	691.90	6.36
FREMONT	690.60	3.50
GILFORD	493.20	6.20
INDIANFIELDS	426.97	2.85
JUNIATA	333.30	2.86
KINGSTON	476.00	2.25
KOYLTON	441.90	3.38
MILLINGTON	866.40	6.67
NOVESTA	485.70	2.78
TUSCOLA	637.20	5.22
VASSAR	841.90	20.56
WATERTOWN	672.50	4.66
WELLS	721.10	4.51
WISNER	370.50	3.58

ROADSIDE TRUCK FOGGING

TOWNSHIP	MILES DRIVEN	GALLONS USED/ EVOLUER 4-4
AKRON	1760.40	242.84
ALMER	631.20	83.92
ARBELA	2000.30	352.62
COLUMBIA	220.00	21.31
DAYTON	2063.16	335.43
DENMARK	556.20	67.11
ELKLAND	1043.97	200.96
ELLINGTON	957.91	122.94
ELMWOOD	1181.26	156.88
FAIRGROVE	833.00	100.80
FREMONT	2558.00	284.54
GILFORD	598.50	165.77
INDIANFIELDS	2041.35	314.88
JUNITA	986.80	254.59
KINGSTON	1149.44	121.67
KOYLTON	1321.30	136.46
MILLINGTON	1691.41	296.75
NOVESTA	1950.40	276.37
TUSCOLA	949.80	218.46
VASSAR	2849.28	604.72
WATERTOWN	1864.40	350.97
WELLS	1872.18	280.75
WISNER	913.90	179.78

GARAGE NEWS

During the 2016 mosquito season, Tuscola County Mosquito Abatement's twenty truck fleet, added 192,147 miles.

Our trucks, ULV's, hand held equipment and mule (ATV), receive routine maintenance and repairs when needed.

In addition, truck mounted ULV equipment is calibrated at the beginning of the season and again in July.

All truck mounted ULV's are set to deliver 5 ounces of adulticide per minute. Utilizing the Army Insecticide Measuring System (AIMS). The droplet sizes produced by each ULV are measured and calibrated. Following the label recommendations, the droplets are set to be delivered in a range that helps ensure safety and efficiency.

The completion of the new garage and insecticide storage building, provided a improved change to our daily operations.



LONG DRIVEWAY PROGRAM

We realize that many homes in Tuscola County are set back from the county road and therefore, are subsequently shielded from the effect of the road-side adulticiding operations. If requested by the owner, their property will be reviewed to see if it meets the criteria. If the property does meet the established requirements, it will be placed on our Long Drive Program. The drive, at that time, will be marked with our long drive stake, that has a reflective band at the top. These stakes are placed by our technicians. (We do ask the homeowners to remove them during the winter months to avoid possible damage from snow plows etc.). By placing these stakes at the end of the drives, our technicians are able to see the reflective band and treat the drive as required.

The basis criteria for a home to be placed on the Long Drive Program are:

- There must be a primary residence on the property and the front of the home must be 300 ft. or greater from the roadway.
- There must be an adequate turnaround for our trucks that does not require driving across any lawn areas.
- The drive must be passable with two-wheel drive vehicles.
- The drive must have significant vegetation that provides areas for mosquito harborage.

In 2016, we held an open enrollment for the long driveway program from March through April. Tuscola County currently has 415 residents enrolled in this program.

TIRE PAGE

In collaboration with the Tuscola County Recycling Center and a grant from the MDEQ, we were able to host scrap tire collections throughout the County.

With many of our townships participating in these collections, it allowed residents to take their scrap tires to a nearby location to drop off.

A trailer was also provided for the annual Cass River clean up. We are grateful to the volunteers who took the time to remove these tires from the river.

In 2017 we plan to continue the tire collections in various townships. We will also offer a collection for oversize tires as many of our residents have expressed a need.



PUBLIC EDUCATION

The goal of TCMA's Public Education Program is to make residents aware of the mosquitoes habitat and life cycle. This will help citizens to be aware of how to prevent and eliminate breeding sites for disease carrying mosquitoes. Informed residents can be integral in creating a safe and disease-free environment.

When mosquito populations are high, we hope the residents can identify the source or the reason for the increased activity. They will also be aware of the steps they can take to reduce mosquito related problems and prevent breeding sites on their property.

This task is completed in many different ways. Some of the most important ways TCMA distributes this information are through citizen phone calls to our office, face to face contact with our trained technicians, as well as our web site and Facebook page. The technicians carry various brochures with them and are encouraged to distribute them to the homeowners of Tuscola County. These brochures are also made available to township halls and at the county administration building.



MEMBERSHIP

TCMA staff are required to obtain and maintain licensing through the Michigan Department of Agriculture (MDA) as certified pesticide applicators, in both the Core Category and 7F (Mosquito Control). To assist our technicians and ensure proper training, a two day training seminar was held March 14th and 15th, with the MDA available onsite for testing the second day.

In order to stay informed of current developments, the permanent staff of TCMA are also encouraged to attend conferences, classes and seminars relating to mosquito biology and control. TCMA's Technical Advisory Committee (TAC) also provides new insight and important data in the areas of Biological Environmental Sciences. The permanent staff of TCMA also maintains memberships and are active in the Michigan Mosquito Control Association (MMCA) and The American Mosquito Control Association (AMCA).



2017 HIGHLIGHTS

- Purchase of two truck mounted ULV's
- Purchase of an Electric ULV
- Purchase of one truck
- New phone system installation
- Replace windows in office building
- Purchase lift for the garage
- Additional trials of larvicide materials and barrier treatments
- 2017 Tire collections
- Plans to attend the MMCA conference
- Plans to attend 7f training conference
- Hiring of a new Utility Person
- Purchase of 2 new Pioneers

2016 TCMA CREW



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