

# Vector Surveillance Report

MOSQUITO RESEARCH AND CONTROL  
NEW JERSEY AGRICULTURAL EXPERIMENT STATION

Vol. 2 No. 2 Period August 8-9, 1977

## Introduction

The Vector Surveillance Program in New Jersey has been directed toward eastern encephalitis rather than mosquito-borne encephalitides in general because of the impact that EE has on the entire State during years when the virus is active. During an outbreak, the number of human cases is generally low and nearly all are restricted to the southern portion of the State but the effects are far reaching and every county mosquito control commission becomes a vehicle for the news media and a source of information which will eventually reach their constituency. This is due in part to the geographic area where human cases are contracted and the time of year that virus activity becomes apparent. Nearly all eastern encephalitis cases are contracted in the shore area and the virus is usually evident prior to Labor Day. The news is quickly spread to the public and people from all areas of New Jersey are faced with the decision of taking the vacation they have saved for in spite of the "risks" or cancelling their plans and blaming the State agencies involved.

In the past, the health related agencies have been unable to completely answer the numerous questions which are posed and the resorts suffer tremendous economic losses as a result of an uninformed public which is seeking guidance that is not available at a moment's notice. The epidemiology of EE is very complex and most of the questions cannot be answered with broad generalizations. To date, the top epidemiologists in the country cannot accurately predict when and where EE will strike because the data for such a prediction has never been gathered prior to the onset of activity.

The New Jersey State Mosquito Control Commission was established to oversee the spending of State allocations for effective mosquito related activities. Their Vector Surveillance Program represents one area where information is needed to solve a riddle that ultimately becomes the responsibility of mosquito control. Eastern encephalitis is widespread along the eastern seaboard but New Jersey has been the center of activity for many years. As a result, New Jersey is the logical place to collect the information which will someday benefit the remaining states on the eastern coast which suffer from sporadic outbreaks.

The Vector Surveillance Program of the New Jersey State Mosquito Control Commission was established to investigate the complex epidemiology of eastern encephalitis and gather continuous data which will ultimately be used to forewarn

mosquito control of potential human involvement. In the past, the disease has appeared without warning and the State was thrust into a situation where mosquito control agencies were forced to explain a set of circumstances which had not been documented and had not been analysed. The Vector Surveillance Program is an attempt to investigate the problem before it occurs. . Hopefully, answers will be found to predict the onset of epidemic cycling and protect the public with mosquito control which is directed toward the source of the infection in nature.

#### Results for the Period August 8-9, 1977

##### Aedes sollicitans

A combination of tidal flooding and rain produced a major brood of Ae. sollicitans which was evident at each of the study sites this week. Landing rates were high in most areas along both coasts of the State and control will be required on a broad scale to reduce the nuisance that these mosquitoes are creating. Counts of greater than 50 per minute were recorded at both West Creek and Dennisville. The landing rates at Tuckahoe and Port Norris were lower but emergence may not yet have peaked in these areas. The influx of fresh mosquitoes caused the parous rates to drop to 10% or less in all areas. This fresh emergence provides a good example of the population dynamics of Ae. sollicitans and the role that fluctuating numbers has on the potential of a population for the transmission of disease.

Last week, Ae. sollicitans were nearly non-existent in most of the areas. The landing rates were below 1 per minute and only the bare vestiges of the last brood remained. The vector potential at each area was close to zero under these circumstances. Even though nearly 100% of the mosquitoes which were coming to bite had blood fed before, the mosquitoes were so scarce that the population had virtually no potential for the transmission of disease.

At the present time, numerous mosquitoes are biting in all of the areas but the vast majority are seeking their first blood meal. Overall, less than 5 out of every 50 mosquitoes that are coming to bite have fed on blood before. Since most of the mosquitoes have never fed on blood, they have had no opportunity to contract blood inhabiting parasites. The majority, therefore, are not capable of functioning as vectors of disease at this point in time.

As the present populations age, an increasing percentage of the mosquitoes will obtain blood, lay eggs and come back to feed a second time. During this period, the parity rate of the population will rise. Mortality will take its toll thus the overall numbers of mosquitoes will decline. If the numbers drop quickly, vector potential will remain low. If a large number of mosquitoes live to take a second blood meal, vector potential will increase. Data from last year showed that local factors governed the outcome thus a great deal of variation occurred in different parts of the State.

Adult mosquito control is the best weapon to reduce the vector potential of any given population. An airspray directed at a newly emerged Ae. sollicitans population has the capability of reducing the overall numbers to the point where landing rates will be minimal after the survivors reach maximum parity. This is best accomplished before the mosquitoes move too far inland. If the populations disperse too widely prior to the airspray, the number of survivors will be greater and vector potential will increase after the mosquitoes recongregate close to their breeding site.

The best timing for an adult airspray is difficult to predict because of the number of factors which play a major role on the outcome. Wind can disperse a population before it would normally move inland and weather conditions can delay or interfere with an application. If the pesticide is applied too soon, further emergence can take place and negate the results. Most of the State Airsprays are now being monitored to find answers which will solve the problems caused by these variables.

#### Culiseta melanura

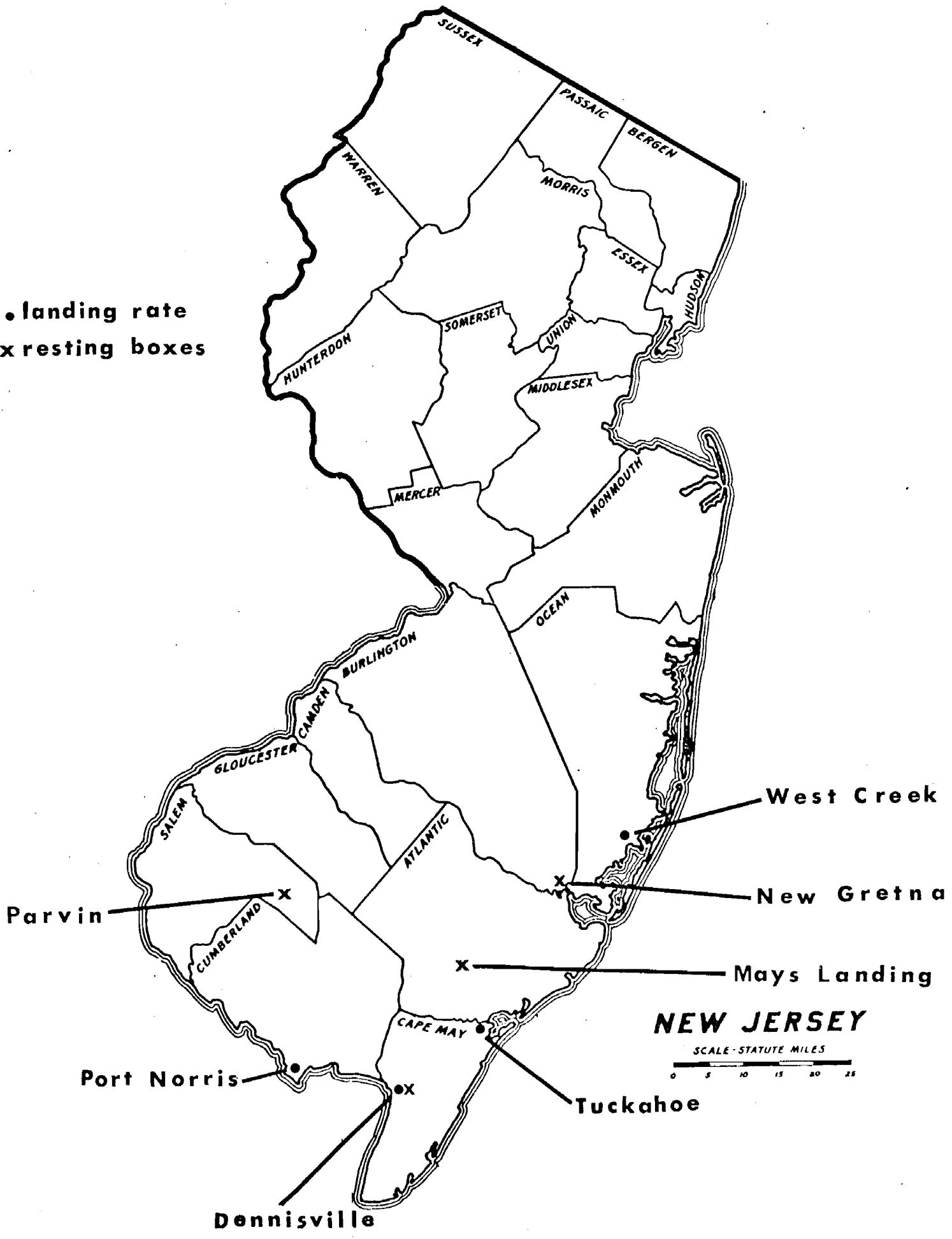
Although Cs. melanura populations showed an indication of increasing over the last several weeks, the most recent resting box collections showed another downward trend in the numbers. The Dennisville site is the only area where adequate numbers are being collected for study. At each of the other areas, the Cs. melanura are so low that population fluctuations cannot be defined.

Additional resting boxes have been placed in other areas to locate populations that are more stable. To date, adequate numbers have not been obtained, even though the new areas are known to have sustained the species in the past.

Cs. melanura appears to be severely stressed by the dry weather in New Jersey this year. Whether or not this will continue into the Fall is unknown at this point in time.

# Study Sites

• landing rate  
x resting boxes



# Aedes sollicitans

SITE WEST CREEK

COUNTY Ocean

**COLLECTION DATA**

Date Aug. 8, 1977

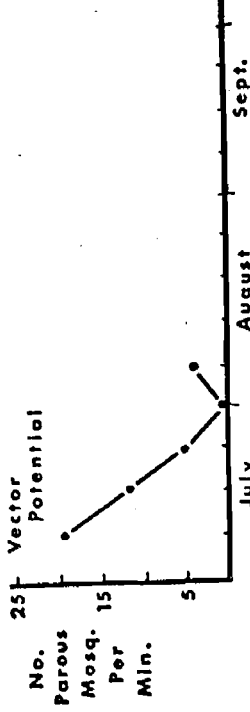
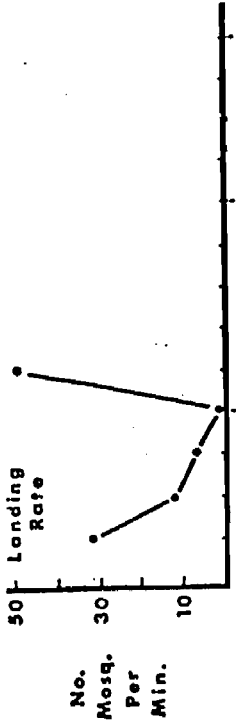
Landing Rate 50+/min

Parous Rate 10%

Vector Potential 5.0  
(Parous LandingRate)

**REMARKS:** Data indicate that a major emergence occurred in this area within the past week.

**CUMULATIVE RECORD**



**NOTES:** The Ocean County Mosquito Commission has scheduled a State Airspray to control this population.

# Aedes sollicitans

SITE TUCKAHOE

COUNTY Cape May

**COLLECTION DATA**

Date Aug. 8, 1977

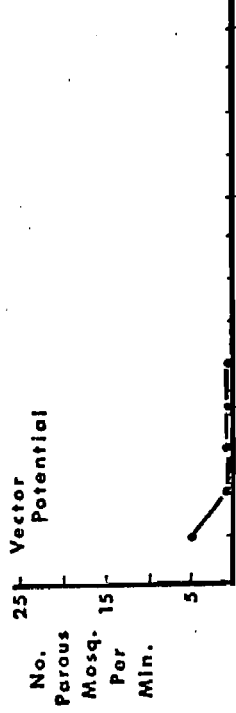
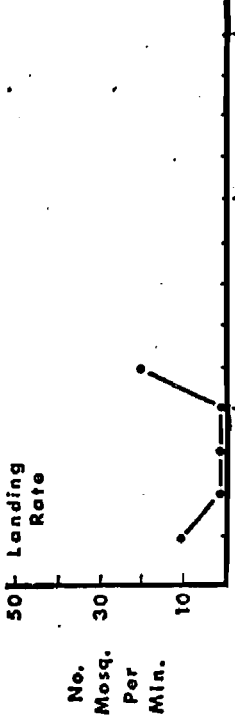
Landing Rate 20/min

Parous Rate 0%

Vector Potential 0  
(Parous LandingRate)

**REMARKS:** Data indicate a recent emergence which may not yet have peaked.

**CUMULATIVE RECORD**



**NOTES:**

# Aedes sollicitans

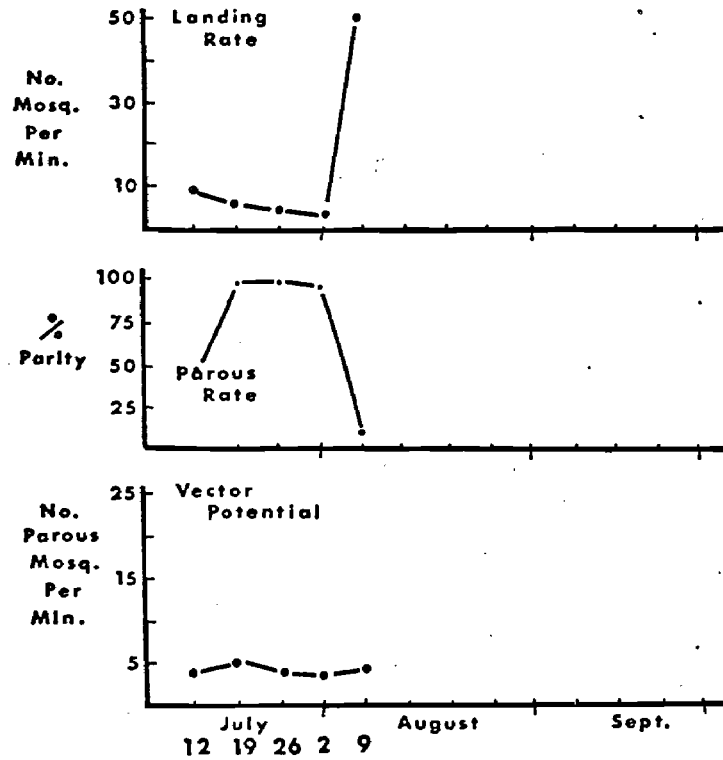
**SITE** DENNISVILLE  
**COUNTY** Cape May

**COLLECTION DATA**

Date Aug. 9, 1977  
Landing Rate 50+/min  
Parous Rate 10%  
Vector Potential 5.0  
(Parous Landing Rate)

**REMARKS:** Data indicate a major emergence.

**CUMULATIVE RECORD**



**NOTES:** The Cape May County Mosquito Commission has scheduled a State Airspray to control this population.

# Aedes sollicitans

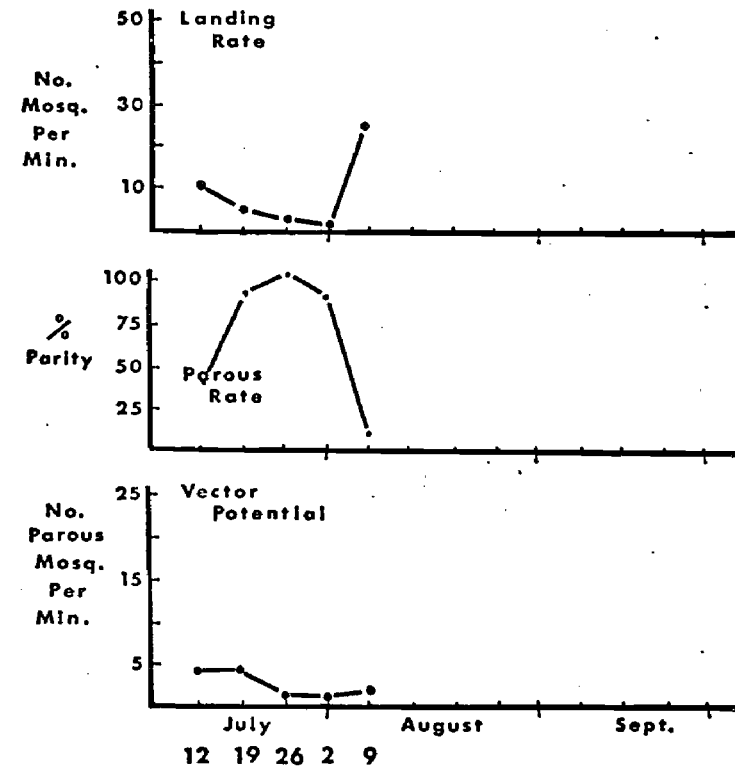
**SITE** PORT NORRIS  
**COUNTY** Cumberland

**COLLECTION DATA**

Date Aug. 9, 1977  
Landing Rate 25/min  
Parous Rate 10%  
Vector Potential 2.5  
(Parous Landing Rate)

**REMARKS:** Data indicate a recent emergence.

**CUMULATIVE RECORD**



**NOTES:** The Cumberland County Mosquito Commission has scheduled a State Airspray to control this population.

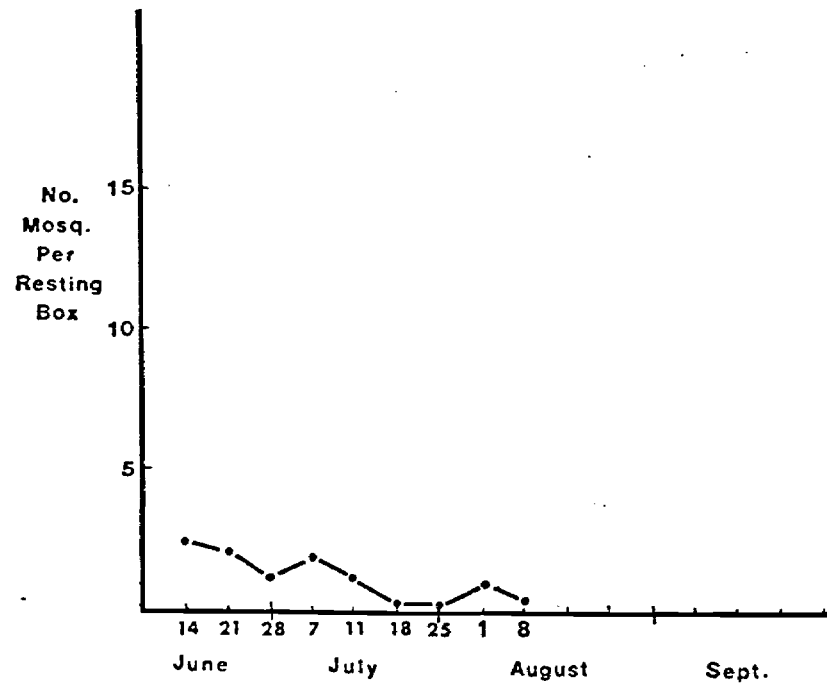
## Culiseta melanura

SITE NEW GREINA  
 COUNTY Burlington  
 COLLECTION DATA

Date Aug. 8, 1977  
 No. Boxes  
 Examined: 25  
 Total C.mel. 8  
 C.mel./Box 0.3

REMARKS: Resting box collections  
 have returned to very low levels  
 after last week's slight increase.

### CUMULATIVE RECORD



NOTES: Submitted 5 blooded and 3 nonblooded Cs. melanura for virus assay.

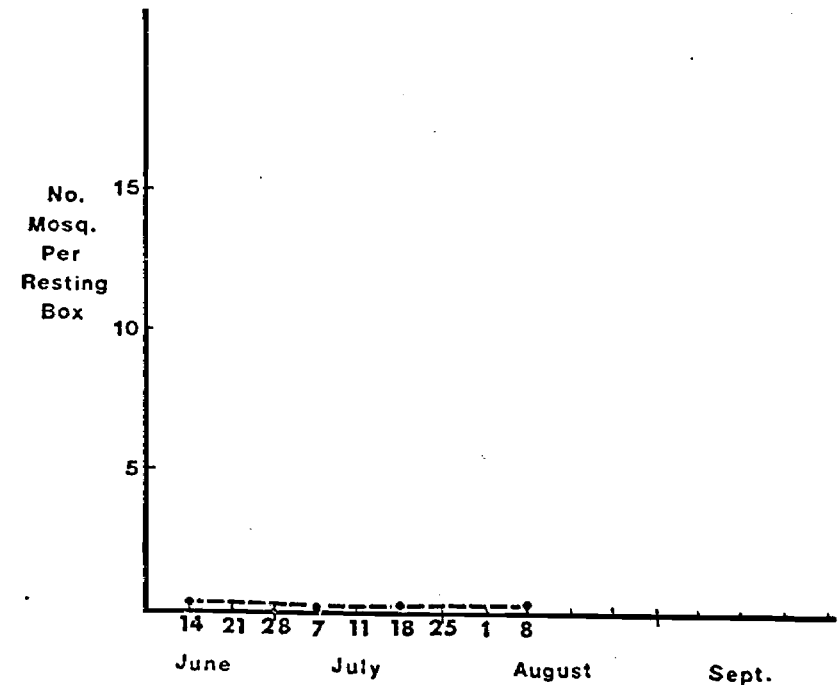
## Culiseta melanura

SITE MAYS LANDING  
 COUNTY Atlantic  
 COLLECTION DATA

Date Aug. 8, 1977  
 No. Boxes  
 Examined: 20  
 Total C.mel. 3  
 C.mel./Box 0.15

REMARKS: Cs. melanura barely  
 detectable in this area.

### CUMULATIVE RECORD



NOTES: Submitted 3 nonblooded Cs. melanura for virus assay.

## Culiseta melanura

SITE DENNISVILLE

COUNTY Cape May

COLLECTION DATA

Date Aug. 9, 1977

No. Boxes

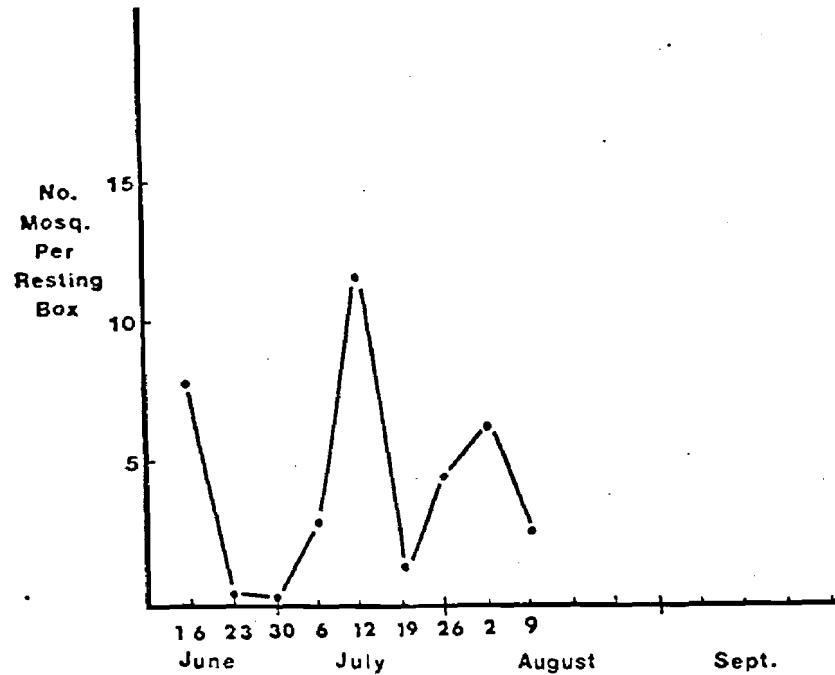
Examined: 18

Total C.mel. 49

C.mel./Box 2.7

REMARKS: Cs. melanura still evident in this area but collections show a marked drop from the levels of the previous two weeks.

CUMULATIVE RECORD



NOTES: Submitted 10 blooded and 39 nonblooded Cs. melanura for virus assay.

## Culiseta melanura

SITE PARVIN STATE PARK

COUNTY Salem

COLLECTION DATA

Date Aug. 9, 1977

No. Boxes

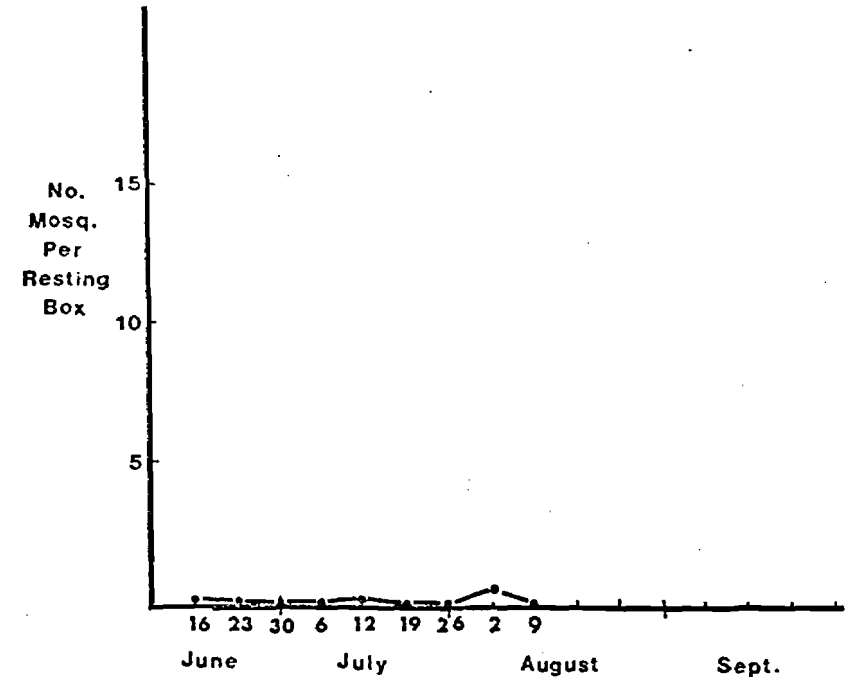
Examined: 20

Total C.mel. 0

C.mel./Box 0

REMARKS: No specimens in any of the resting boxes this week at this study site.

CUMULATIVE RECORD



NOTES:



Data From Vineland Diagnostic Laboratories  
Culiseta melanura tested for EE virus during 1977

<u>Date Collected</u>	<u>Area</u>	<u>No. Tested</u>	<u>Initial Screening</u>	<u>Confirmation of Positive Pools</u>
7/25/77	New Gretna	5 blooded 3 nonblooded	Negative Negative	
7/26/77	Dennisville	19 blooded 186 nonblooded	Negative Negative	
8/01/77	New Gretna	32 blooded 16 nonblooded		
8/02/77	Dennisville	37 blooded 116 nonblooded		
8/02/77	Parvin	7 blooded		
8/08/77	New Gretna	5 blooded 3 nonblooded		
8/08/77	Mays Landing	3 nonblooded		
8/09/77	Dennisville	10 blooded 39 nonblooded		

List of Personnel:

Project Leader:	Wayne J. Crans
Surveillance Specialist:	Jere D. Downing
Mosquito Program Coordinator:	Anthony A. Di Edwardo
Mosquito Program Acting Director:	Harry D. Brown
State Airspray Program Director:	Donald J. Sutherland
Associate Mosquito Program Staff:	Bunnie Hajek            Sherry Smith Robert Kent            Noel Shubert Ned Jacobson            Leon Blaustein
Cooperating Experiment Station Personnel:	David Tudor Otto Schwabe
Cooperating State Health Personnel:	Ronald Altman            Walter Gusciora Oscar Sussman            David Adams
State Health Associate Staff:	
Cooperating County Mosquito Control Superintendents:	Frederick Lesser, Ocean County Brian Gooley, Burlington County Judy Hansen, Cape May County Joseph Mason, Atlantic County Patrick Slavin, Cumberland County William Fisher, Salem County
State Mosquito Control Coordinator:	Kenneth W. Bruder
State Mosquito Control Commission:	Eleanore Renk Grant Walton Aaron Rappaport Theodore Czech Leonard Spiegel Benjamin Hiatt James Gaspari