



NEW JERSEY
DEPARTMENT OF AGRICULTURE



NEW JERSEY VECTOR SURVEILLANCE

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ABSTRACT: The New Jersey Vector Surveillance Program to monitor EEE virus and its mosquito vectors was threatened by proposed State budget cuts in 1990. Although the monies were eventually appropriated, the surveillance effort was delayed for lack of funds and data on the early portion of the season was not documented for some areas. Available data for selected sites suggest that *Culiseta melanura* populations were above average during the early Spring and data from the month of July show that the species showed population peaks at most sites during the first 2 weeks of the month. EEE virus was first isolated on July 6 and reached epizootic levels during the latter part of the month. Virus has been isolated from every study site in the State and Minimum Field Infection Rates (MFIR) are exceptionally high at most of the sites for this time of year. A single horse case was documented at the very end of July. No human activity has been reported to date.

INTRODUCTION

The New Jersey Vector Surveillance Program got off to a late start in 1990 when the Governor's Budget Message indicated a zero appropriation for the State Mosquito Control Commission. The action would have abolished the Office of Mosquito Control Coordination in Trenton, eliminated the State Air Spray Program and eliminated any virus surveillance for the State. Mosquito control personnel in the State received support from numerous municipalities and media pressure forced the government to reconsider their proposed action. Just prior to July 1, the appropriation for mosquito control was reinstated and the State Mosquito Control Commission was able to fund the needed activities.

The proposed budget action placed the Vector Surveillance Program in a tenuous position and personnel that had been promised summer jobs were released to find other employment. During the early part of the season, County personnel collected specimens from the Ocean City and Dennisville sites to

ensure data from these key locations. The Program is grateful to William Reinert of the Atlantic County Mosquito Control Agency and to Judy Hansen of the Cape May County Mosquito Control Commission for their efforts. Without their help, New Jersey would have had no indication of the pending virus problem that was developing during that period.

The restoration of funds, however, left the Vector Surveillance Program with no experienced personnel to conduct the work and no prospects to engage in the rigorous field collections. Mr. Alberto Garcia, a Ph.D candidate in the Department of Entomology, agreed to take on all of the responsibilities associated with the work and is currently making all of the field collections and is also triturating the specimens for the virus isolation attempts that are being conducted at the State Department of Health.

METHODOLOGY OF THE SURVEILLANCE EFFORT

Culiseta melanura will be used as the main indicator for EEE virus. Specimens will be collected weekly from resting boxes that are placed in areas of the state where human and/or equine cases have occurred in the past. The resting box collection sites for 1990 will include: Bass River, a coastal site in Burlington County just North of Atlantic City, Ocean City, a coastal site in Atlantic County that monitors the critical Ocean City focus and Dennisville, a site in Cape May County along Delaware Bay. Inland sites will include: Hammonton, a site in Atlantic County that monitors an established focus for equine involvement in the South-central coastal plain and Centerton, a site in Salem County where equine cases are common. The Green Bank site in Atlantic County and the Indian Mills site in Burlington County will be dropped because of time restraints due to personnel limitations. Landing rate collections of *Aedes sollicitans* for physiological age assessment will also be eliminated from the schedule this year for the same reasons.

Each of the study sites will be sampled once weekly until late October. Mosquitoes will be frozen on dry ice at the time of collection and

transported to the Mosquito Research & Control laboratories for speciation and pooling. Sorting will be conducted on chill tables to maintain living virus. Mosquito pools will be grouped by Species, Site, Date, Physiological Status and Trapping Method. *Cs. melanura* pools will be triturated at Rutgers and each pool will be split before being sent to the New Jersey Department of Health laboratories for virus isolation attempts. The split samples will be used to perfect an ELISA test system over the Winter months.

Results will be entered into a computer data base for collation, MFIR calculations and graphics. Information regarding EEE in horses will be compiled by the New Jersey Department of Agriculture. The results of equine testing will be coordinated through the New Jersey Department of Health and included in this report in relation to the data obtained from mosquito specimens.

THE CURRENT STATUS OF EEE

New Jersey experienced a relatively wet spring this year and data from the Ocean City site as well as the Dennisville site suggested that *Cs. melanura* populations were somewhat higher than normal for the period. During the month of

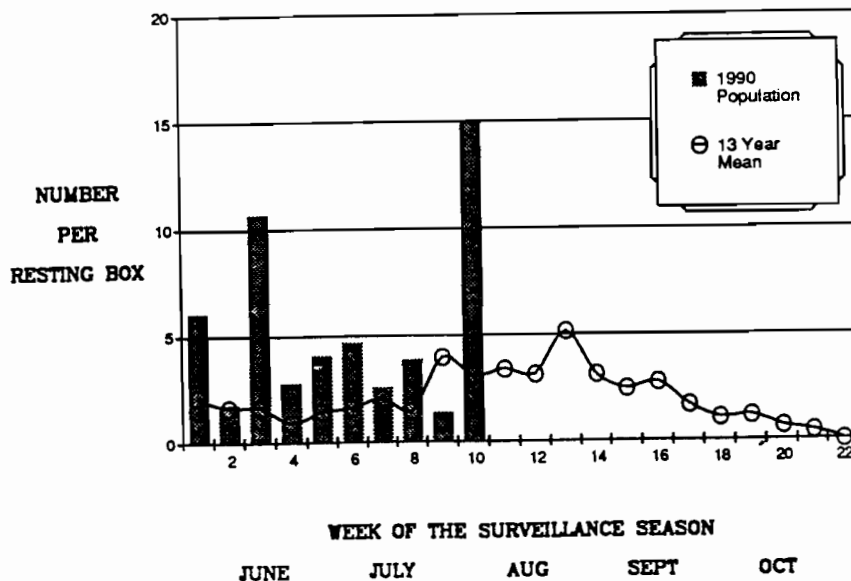


Fig. 1. Resting box populations of *Cs. melanura* at Dennisville in Cape May County during 1990.

June, 939 *Cs. melanura* were tested for virus from these two sites with no indication of EEE activity. In early July, the program expanded to include collections from all of the study areas. Data showed that *Cs. melanura* were in the process of reaching abrupt population peaks in all of the areas. EEE appeared in *Cs. melanura* at Ocean City on July 6, Dennisville on July 7, Hammonton on July 15, Centerton on July 27 and Bass River on July 29.

MFIR values for the month of July (Table 1) indicate that the epornitic was intense at the Ocean City and Dennisville sites. MFIR values higher than 3.00 isolations per 1000 specimens tested signal possible equine activity and values above 5.00 suggest human risk in coastal areas if *Aedes sollicitans* populations are high. At Dennisville and Ocean City, EEE was isolated at a rate of >7.00 isolations per 1000 during the month of July. The figure of 3.98 for Bass River is misleading because all of the isolations were made from the last collection period in the month. During that period, 4 of the 5 pools of *Cs. melanura* that were tested yielded EEE virus.

In early August, the State Department of Agriculture announced that a 6 year-old Shetland Pony from Woodbine in Cape May County had been diagnosed as the first equine case of the

season. The town of Woodbine is immediately adjacent to the Dennisville study site and an August 1 onset date shows that the animal contracted EEE during the epornitic that was documented in that area during the month of July. Fig. 1 shows the population trends for *Cs. melanura* in that area. During Week 6 (July 7), the MFIR rate was 19.61. No further isolations were made until Week 9 (July 28) when the MFIR rate was 10.3. We have no way of knowing when the epizootic vector acquired the virus but transfer to the animal probably occurred early in the last week of July. The most likely vector for that area would be *Ae. sollicitans*. The abrupt population peak in *Cs. melanura* depicted for Week 10 (August 4) suggests that epizootic activity will continue in New Jersey

Table 1. Minimum Field Infection Rates in *Cs. melanura* during July, 1990

LOCATION	TOTAL TESTED	NO. POOLS	POSITIVE EEE	MFIR VALUE
JULY VALUES				
Coastal Sites				
Bass River	1004	25	4	3.98
Ocean City	254	13	2	7.87
Dennisville	383	13	3	7.83
Inland Sites				
Hammonton	7041	20	2	2.84
Centerton	685	17	1	1.46

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