

New Jersey

Vector Surveillance

NEW JERSEY AGRICULTURAL EXPERIMENT STATION
MOSQUITO RESEARCH AND CONTROL

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Introduction

The New Jersey Vector Surveillance Program to monitor the encephalitis viruses and their mosquito vectors is entering its 8th year of study. As in the past, information collected from key areas of the State will be used to determine the status of EE, HJ and SLE viruses throughout the encephalitis season. The program identifies periods of virus amplification in New Jersey and functions primarily as a warning system to alert health related agencies to encephalitis activity before human involvement is likely.

The 1983 season has already proven atypical with abnormally low Culiseta melanura populations in the early season. Despite this fact, an equine case has been reported indicating that EE virus is again present in New Jersey this year.

The Vector Surveillance Program will work cooperatively with the New Jersey State Airspray Program to expand the existing surveillance directed toward Aedes sollicitans in 1983. Airspray Program scouts will monitor vector potential in Ae. sollicitans at a number of additional locations along the New Jersey coast. Data will be used to evaluate the need for special control applications at specific locations if EE activity extends to coastal foci.

Methodology of the Survey

Two populations of Ae. sollicitans and two populations of Cs. melanura form the baseline for assessing EE and HJ activity in the State. The study sites represent areas of high mosquito density as well as a history of high virus activity. Each of the study sites is visited twice weekly from May through October. Cs. melanura are monitored with a line of 50 resting boxes to assess peaks and declines in the population from spring until fall. All Cs. melanura are screened for virus by the N. J. State Department of Health; virus in Cs. melanura is interpreted as an indirect indication of viremia in the local bird populations. Wild birds are also bled on a regular basis but the information is not being used for surveillance purposes. The bird bloods are currently being tested under contract at Yale University and the information will be analyzed at the end of the season.

Ae. sollicitans are monitored by a technique that combines population density with physiological age. Landing rates are taken at each study site to assess the nuisance levels during the daylight hours and a subsample is dissected to

determine the age of the biting population. When virus is known to be present in birds, large numbers of Ae. sollicitans are collected for virus screening. The combination of virus in birds and physiologically "old" Ae. sollicitans results in a recommendation for vector control targeted against specific populations along the coast.

SLE virus is monitored by a network of sentinel chicken flocks that are placed in urban areas of the State where the disease has presented a problem in the past. The flocks, consisting of 10 birds each, are bled from the wing vein every other week and the blood is tested for SLE antibody by the N. J. State Department of Health. Sero-conversion (conversion from antibody negative to antibody positive) in any of the birds is a direct indicator of local virus activity. During those periods, accelerated Culex control is recommended to minimize the risk of human involvement.

The Current Status of EE and its Mosquito Vectors

On July 15, the New Jersey State Department of Agriculture reported the first equine case of EE in a 14 month Arabian stabled at Jackson Township in Ocean County. The area is approximately 15 mi from the coast and preliminary surveillance revealed that Coquillettidia perturbans is the dominant mosquito coming to CO₂-baited light traps. This is one of the earliest horse cases on record and the first to occur prior to any indication of virus from Cs. melanura. Tests conducted throughout May and June have failed to yield EE in any of the mosquito pools collected at the standard monitoring sites.

Despite an exceptionally wet spring, Cs. melanura populations have been below normal this year. Specimens began entering resting boxes 1-2 weeks earlier than usual in the early spring but no real population buildup occurred during the month of June. Fig. 1 shows that the trend has been most obvious at New Gretna, the study site on the eastern coast of New Jersey. The mosquito populations have been well below the mean recorded over the past 7 years for this site with near zero recordings during the first portion of July.

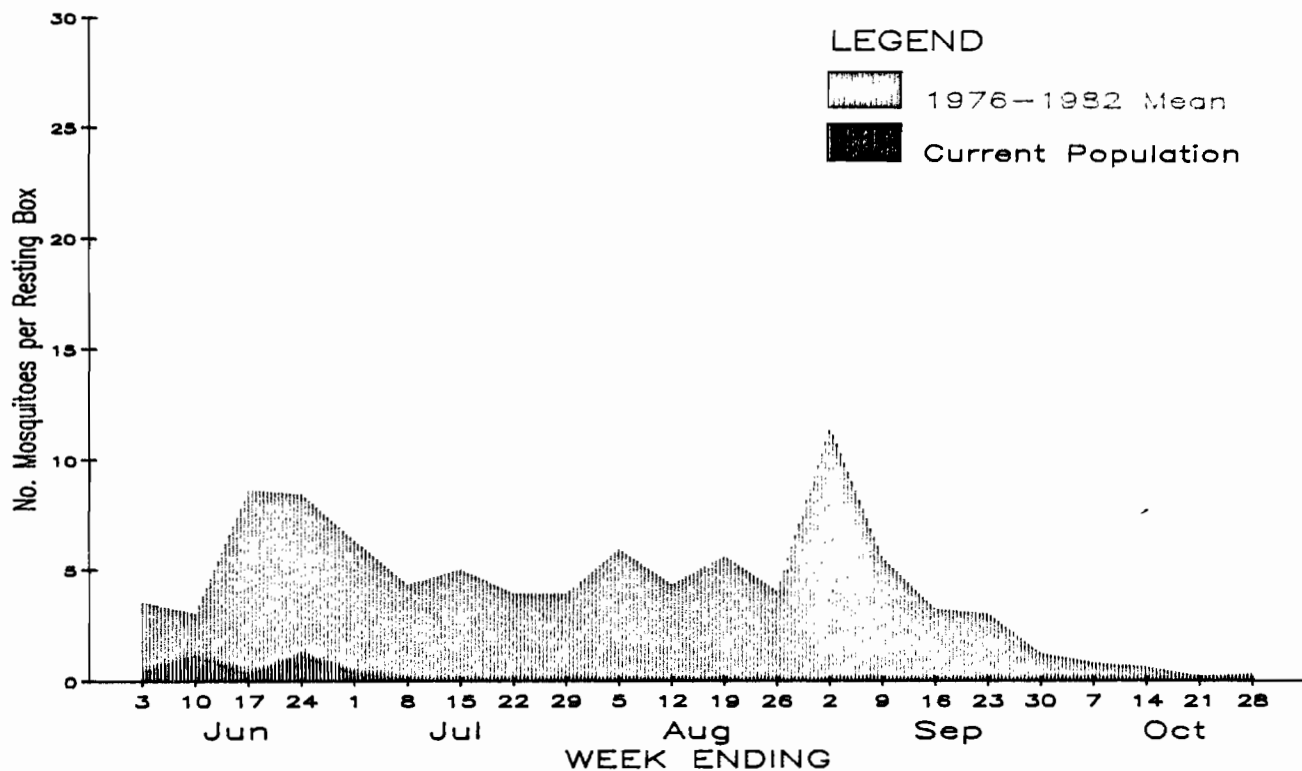
The Dennisville study site on the western coast of southern New Jersey has also shown below normal populations of Cs. melanura this year. Fig. 1 shows that Cs. melanura were about average in early June but dropped markedly during the week of June 17. Parity dissections revealed an aging population with no apparent influx of fresh individuals until early July. The collections of July 8, however, were largely nulliparous, thus, the west coast populations may increase over the next several weeks.

The status of Ae. sollicitans usually does not become significant to transmission until late in the season, but monitoring has shown that 2 broods occurred during the month of June. The first was the result of a May 26 new moon flooding and produced a biting population that required aerial spraying in some areas. The second emergence was the result of the full moon flooding of June 10 which produced moderate annoyance at most coastal sites. More recent floodings have not resulted in any sizeable emergence, due, in part, to large areas of marsh not drying completely between the flooding cycles.

The Current Status of SLE

Sentinel chicken flocks have been placed in Camden, Burlington, and Middlesex counties with no evidence of sero-conversion to date. Information from CDC, however, suggests that enzootic SLE activity may be occurring in the mid-west at the present time.

NEW GREटना



DENNISVILLE

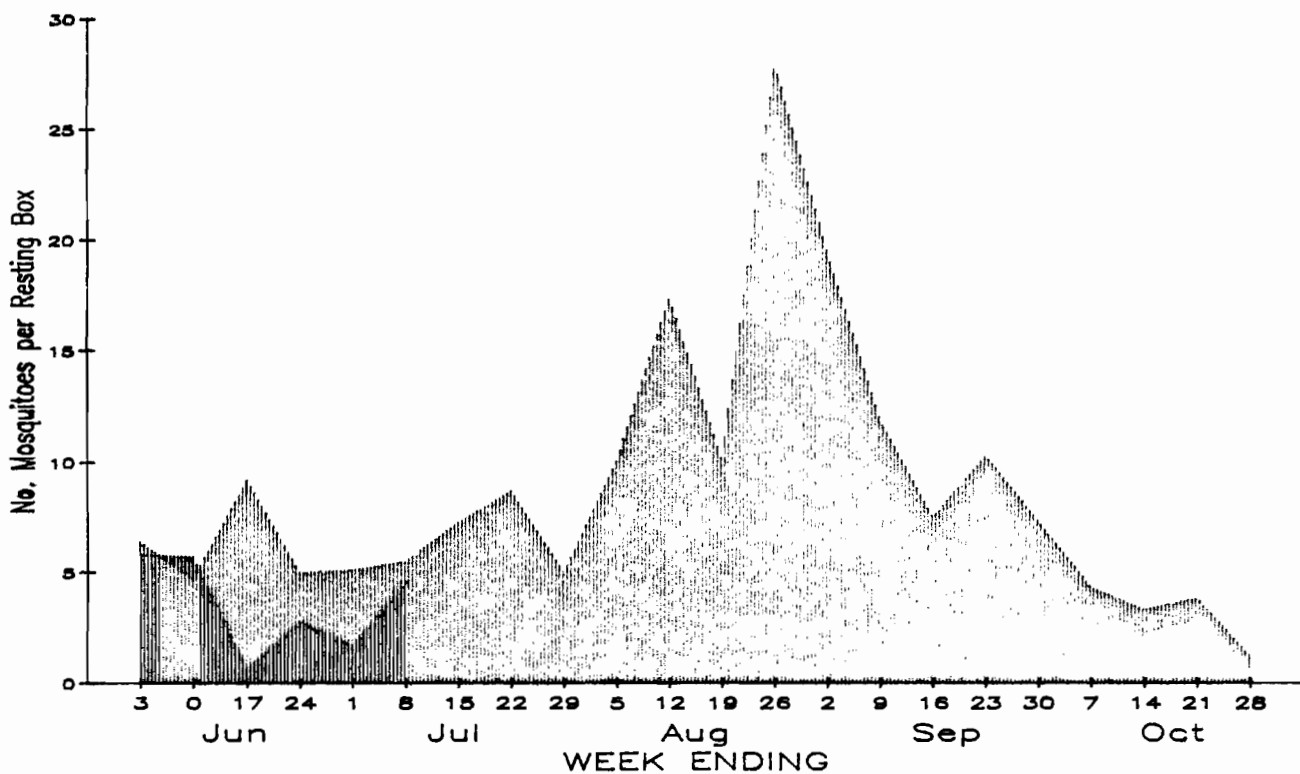


Fig. 1. *Culiseta melanura* populations at the New Greटना (East Coast) and the Dennisville (West Coast) study sites as measured by resting box collections. Monthly means are based on data from the previous 7 years.

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