

*PubMed search Mosquito Adulticide Control WNV or EEE efficacy*

5. J Am Mosq Control Assoc. 2010 Mar;26(1):57-66.

Evaluation of efficacy and human health risk of aerial ultra-low volume applications of pyrethrins and piperonyl butoxide for adult mosquito management in response to West Nile virus activity in Sacramento County, California.

Macedo PA, Schleier JJ 3rd, Reed M, Kelley K, Goodman GW, Brown DA, Peterson RK.

Sacramento-Yolo Mosquito and Vector Control District, 8631 Bond Road, Elk Grove, CA 95757, USA.

The Sacramento and Yolo Mosquito and Vector Control District (SYMVCD, also referred to as "the District") conducts surveillance and management of mosquitoes in Sacramento and Yolo counties in California. Following an increase in numbers and West Nile virus (WNV) infection rates of *Culex tarsalis* and *Culex pipiens*, the District decided on July 26, 2007, to conduct aerial applications of Evergreen EC 60-6 (60% pyrethrins: 6% piperonyl butoxide) over approximately 215 km<sup>2</sup> in the north area of Sacramento County on the nights of July 30, July 31, and August 1, 2007. At the same time, the District received notification of the first human WNV case in the area. To evaluate the efficacy of the applications in decreasing mosquito abundance and infection rates, we conducted pre- and post-trapping inside and outside the spray zone and assessed human health risks from exposure to the insecticide applications. Results showed a significant decrease in abundance of both *Cx. tarsalis* and *Cx. pipiens*, and in the minimum infection rate of *Cx. tarsalis*. Human-health risks from exposure to the insecticide were below thresholds set by the US Environmental Protection Agency.

15. Ann N Y Acad Sci. 2001 Dec;951:74-83.

Vector surveillance for West Nile virus.

White DJ.

Arthropod-Borne Disease Program, New York State Department of Health, Albany 12237, USA. djw05@health.state.ny.us

West Nile virus (WNV) was detected in the metropolitan New York City (NYC) area during the summer and fall of 1999. Sixty-two human cases, including seven fatalities, were documented. The New York State Department of Health (NYSDOH) initiated and implemented a statewide mosquito and WNV surveillance system. We developed a WNV response plan designed to provide local health departments (LHD) a standardized means to begin to assess basic mosquito population data and to detect WNV circulation in mosquito populations. During the 2000 arbovirus surveillance season, local health agencies collected 317,676 mosquitoes and submitted 9,952 pools for virus testing. NYSDOH polymerase chain reaction (PCR) testing detected 363 WNV-positive pools. Eight species of mosquitoes were found to be infected. Of the 26 counties conducting mosquito surveillance, WNV-positive mosquitoes were detected only in NYC, on Long Island, and in four counties in the lower Hudson River valley region. LHD larval surveillance provided initial or enhanced mosquito habitat location and characterization and mosquito species documentation. Adult mosquito surveillance provided LHD information on species' presence, density, seasonal fluctuations, virus infection, minimum infection ratios (MIR) and indirect data on mosquito control efficacy after larval or adult control interventions. Collective surveillance activities conducted during 1999 and 2000 suggest that WNV has

dispersed throughout the state and may affect local health jurisdictions within NYS, adjacent states, and Canada in future years. Vector surveillance will remain a critical component of LHD programs addressing public health concerns related to WNV.

16. J Urban Health. 2001 Jun;78(2):372-81.

Balancing the risks: vector control and pesticide use in response to emerging illness.

Thier A.

Environmental Advocates, New York City, NY, USA. athier@vgernet.net

The competing public health concerns of vector-borne disease and vector control strategies, particularly pesticide use, are inherently subjective and difficult to balance. Disease response decisions must frequently be made in the absence of data or clear criteria. The factors to be weighed include the vector control measures versus those posed by the disease itself; short-term versus long-term disease management goals, specifically with regard to the issue of pesticide resistance; the need to distinguish among diseases of differing severity in making response choices; and the issue of pesticide efficacy. New York City's experience with West Nile virus has illustrated each of these issues. A framework for assessing the appropriate response to West Nile virus can serve to guide our response to likely new pathogens.

*From Google Scholar 9/7/12*

**Efficacy of Aerial Spraying of Mosquito Adulticide in Reducing Incidence of West Nile Virus, California, 2005**

**Ryan M. Carney,\*<sup>1</sup> Stan Husted,\* Cynthia Jean,\* Carol Glaser,\* and Vicki Kramer†**

Epidemic transmission of West Nile virus (WNV) in Sacramento County, California, in 2005 prompted aerial application of pyrethrin, a mosquito adulticide, over a large urban area. Statistical analyses of geographic information system datasets indicated that adulticiding reduced the number of human WNV cases within 2 treated areas compared with the untreated area of the county. When we adjusted for maximum incubation period of the virus from infection to onset of symptoms, no new cases were reported in either of the treated areas after adulticiding; 18 new cases were reported in the untreated area of Sacramento County during this time. Results indicated that the odds of infection after spraying were  $\approx 6\times$  higher in the untreated area than in treated areas, and that the treatments successfully disrupted the WNV transmission cycle. Our results provide direct evidence that aerial mosquito adulticiding is effective in reducing human illness and potential death from WNV infection.

Intensive Early Season Adulticide Applications Decrease Arbovirus Transmission Throughout the Coachella Valley, Riverside County, California

HUGH D. LOTHROP,<sup>1</sup> BRANKA B. LOTHROP,<sup>2</sup> DONALD E. GOMSI,<sup>2</sup> and WILLIAM K. REISEN<sup>1</sup>

VECTOR-BORNE AND ZOOONOTIC DISEASES

Volume 8, Number 4, 2008

**ABSTRACT**

In the Coachella Valley of California the seasonal onset of St. Louis encephalitis virus (SLEV), western equine encephalomyelitis virus (WEEV), and West Nile virus (WNV) has been detected consistently at the shoreline of the Salton Sea near the community of North Shore. The timing and

intensity of initial amplification in the *Culex tarsalis* Coquillett/wild bird cycle at this focus seemed closely linked to the subsequent dispersal of virus to the rest of the Coachella Valley and perhaps southern California. In 2004, an attempt was made to interrupt the amplification and dispersal of WNV using ground ultra-low volume (ULV) applications of Pyrenone 25-5®. Although these localized treatments were started 1 month after the initial detection in April, surveillance indicated no dispersal from this focus at this time. However, these treatments appeared to have little effect, and WNV eventually was detected throughout the valley, with seven human cases reported in the urbanized upper valley near Palm Springs. In 2005, the initial detection of WNV at North Shore at the end of May was followed rapidly by dispersal throughout the valley precluding efforts at containment. Evaluation of ground and aerial applications at North Shore during May and June 2005, respectively, indicated variable kill of sentinel mosquitoes (overall mortality: ground, 43%; air, 34%) and limited control of the target *Cx. tarsalis* population. In 2006, aerial ULV applications with the same chemical were begun immediately following the first detection of virus in mid-April, resulting in an apparent reduction of *Cx. tarsalis* abundance and delay of WNV activity in the rural lower valley and a marked decline in transmission by *Culex quinquefasciatus* Say populations in the densely populated upper northwestern valley with no human cases reported. Key Words: Adulticide—Control—*Culex tarsalis*—*Culex quinquefasciatus*— West Nile virus.

Impact of Aerial Spraying of Pyrethrin Insecticide on *Culex pipiens* and *Culex tarsalis* (Diptera: Culicidae) Abundance and West Nile Virus Infection Rates in an Urban/Suburban Area of Sacramento County, California

DIA-ELDIN A. ELNAIEM,<sup>1,2</sup> KARA KELLEY,<sup>1</sup> STAN WRIGHT,<sup>1</sup> RHONDA LAFFEY,<sup>1</sup> GLENN YOSHIMURA,<sup>1</sup> MARCIA REED,<sup>1</sup> GARY GOODMAN,<sup>1</sup> TARA THIEMANN,<sup>3</sup> LISA REIMER,<sup>4</sup> WILLIAM K. REISEN,<sup>3</sup> AND DAVID BROWN<sup>1</sup>  
J. Med. Entomol. 45(4): 751-757 (2008)

**ABSTRACT** In response to an epidemic amplification of West Nile virus (family *Flaviviridae*, genus *Flavivirus*, WNV), the Sacramento and Yolo Mosquito and Vector Control District (SYMVCD) sprayed ultralow-volume (ULV) formulations of pyrethrin insecticide (Evergreen EC 60-6: 6% pyrethrin insecticide, 60% piperonyl butoxide; MGK, Minneapolis, MN, applied as 0.003 kg/ha [0.0025 lb/acre]) over 218 km<sup>2</sup> in north Sacramento and 243.5 km<sup>2</sup> in south Sacramento on three consecutive evenings in August 2005. We evaluated the impact of this intervention in north Sacramento on the abundance and WNV infection rates of *Culex pipiens* L. and *Culex tarsalis* Coquillett. Mortality rates of caged *Cx. tarsalis* sentinels ranged from 0% under dense canopy to 100% in open fields. A comparison of weekly geometric mean mosquito abundance in CO<sub>2</sub>-baited traps in sprayed and unsprayed areas before and after treatment indicated a 75.0 and 48.7% reduction in the abundance of *Cx. pipiens* and *Cx. tarsalis*, respectively. This reduction was statistically significant for *Cx. pipiens*, the primary vector of WNV, with highest abundance in this urban area, but not for *Cx. tarsalis*, which is more associated with rural areas. The infection rates of WNV in *Cx. pipiens* and *Cx. tarsalis* collected from the spray zone were 8.2 and 4.3 per 1,000 female mosquitoes in the 2 wk before and the 2 wk after applications of insecticide, respectively. In comparison, WNV infection rates in *Cx. pipiens* and *Cx. tarsalis* collected at same time interval in the unsprayed zone were 2.0 and 8.7 per 1,000, respectively. Based on the reduction in vector abundance and its effects on number of infective bites received by human population, we concluded that the aerial application of pyrethrin insecticide reduced the transmission intensity of WNV and decreased the risk of human infection.