

Results from Aerial Spraying in Denton County

Denton County Health Department

September 19, 2012

Introduction

Denton County's first West Nile Virus (WNV) case of 2012 was reported on May 31, which was considered by experts to be early in the season. Case counts rose to new records throughout June, July, and August. By August 22, 105 cases had been reported in Denton County, and the County had the highest incidence rate of the West Nile Virus in the state of Texas. The Denton County Health Department (DCHD) recommended that Denton County Judge, Mary Horn, declare a West Nile Virus Health Emergency and request that the Department of State Health Services (DSHS) make additional resources available to Denton County, in the form of aerial spraying.

Process

DSHS contracted with Clarke, a company that provides mosquito control services in response to natural disasters or mosquito-borne illness outbreaks. This firm also conducted the Dallas County aerial spraying. Clarke provided mosquito surveillance, aerial application of the pesticide Duet, and post-spray analysis of mosquito mortality. Aerial spraying was conducted on the evenings of August 31, September 1, and September 2. Four (4) aircraft sprayed a total of 565,629 acres in Denton County with Duet, at an application rate of 0.8 ounces per acre. All exclusion zones were successfully avoided.

Surveillance

Surveillance was used to determine overall effectiveness of aerial spraying. Surveillance consisted of fifteen (15) traps strategically placed in common areas (parks, sports complexes, residential and commercial locations) within the zones to be sprayed. Traps were set up prior to spraying (August 29), and after spraying (September 2 and 3) to record mosquito populations. All mosquito species were identified and counted to determine overall effectiveness.

Results

Surveillance revealed a 60% reduction of *Culex tarsalis* and *Culex quinquefasciatus* mosquitoes (carriers of WNV) from pre-spraying to post-spraying. Overall mosquito reduction, which included all types of mosquitoes found in traps, was 56%. The results are consistent with two Denton County municipalities, which found reductions of 67% and 53% from mosquito surveillance conducted on September 4. Both communities were consistently ground spraying prior to aerial spraying. In contrast, one community with no ground spraying program experienced a reduction of 94%. Clearly, aerial spraying significantly reduced the mosquito population in Denton County.

Quality Assurance

"Control" and "test" mosquitoes were used as a quality assurance test, to determine accuracy of Duet application in aerial spray zones. Control mosquitoes were exposed to the natural elements for thirty (30) minutes, and then were transferred indoors to protect them from the spray. Test mosquitoes were then placed in the same locations as the control mosquitoes had been, in order to be sprayed by the aerial application. Once aerial spraying was completed, the test cages were kept in place for thirty (30) minutes, to allow the spray to completely pass through. Mosquitoes in both the control cages and test cages were monitored for mortality, and the control and test numbers were compared.

Control cages (mosquitoes that were not exposed to aerial spraying) showed a 0% mortality rate. Test cages (mosquitoes that were exposed to aerial spraying) showed an average mortality rate of 94%. (See QA Findings table.)

QA Findings

CAGE LOCATION & TYPE	24 HOUR MORTALITY RATE
Southlake "Test" Cage	95%
Trophy Club "Test" Cage	93%
Untreated "Control" Cage	0%

Conclusion

Aerial spraying conducted in Denton County from August 31, 2012 to September 2, 2012 resulted in a reduction of 56% of all mosquito types, and 60% of the mosquito species that carry West Nile virus. Several of the communities with the highest incidence rates in Denton County experienced the most dramatic reductions in mosquitoes as a result of aerial spraying. The number of new cases of WNV has decreased substantially since aerial spraying; however, it is premature to conclude that these results are solely attributable to aerial spraying. The Centers for Disease Control and Prevention (CDC) will release a comprehensive regional report on this year's West Nile Virus season in the fall. It is important to remember that aerial spraying is one piece of a WNV control program. Ground spraying, larviciding, education, and personal protection are also vital strategies to the prevention of this illness, and must continue throughout the remainder of West Nile Virus season.