

## Arbovirus Diseases of Birds (West Nile Virus, Eastern Equine Encephalitis Virus)

*Dr. Bruce Hunter,<sup>1</sup> Ashley Whiteman,<sup>1</sup> Dr. Babak Sanei,<sup>2</sup> and Al Dam<sup>2</sup>*

### Species

Arboviruses are mosquito transmitted viruses that can cause disease in birds, people, horses and other mammalian species. The two most important arboviruses in Ontario are West Nile Virus (WNV) and the Eastern Equine Encephalitis Virus (EEE).

EEE has been reported causing outbreaks in wild and captive Ring-necked pheasants, Chukar partridge, Pekin ducks, domestic pigeons and turkeys but likely infects other bird species as well. In the southern USA, EEE has caused significant mortality and disease in commercially raised emu.

WNV can infect any bird species. In general Gallinaceous species (chickens, turkeys, pheasants etc) and pigeons are quite resistant and geese are more susceptible. A wide range of wild bird species particularly corvids (crow and raven family), blue jays and certain northern species of owls and hawks are highly susceptible. WNV has been reported in pet birds (canaries, parrots and waterfowl) in Ontario.

### Status in Canada

Arboviral diseases are not common in back yard birds but can occur anywhere birds are raised outdoors with access to mosquitoes. EEE occurs sporadically in horses and people in Ontario but is rare in birds. WNV is endemic in Ontario and most Canadian provinces.

### Etiology

Eastern Equine Encephalitis Virus (EEE) is a Togavirus. It has periodically been identified in Ontario and eastern Canada. Wild birds, particularly small song birds, are the main reservoir for the virus and it is transmitted by mosquitoes (*Curliest melanura* is the main mosquito vector in North America). Once a flock is infected with the virus, bird to bird transmission can occur through feather picking and cannibalism.

West Nile Virus (WNV) is a Flavivirus. Since it was introduced into New York City in 1999 it has moved rapidly and now virtually all areas of North America



have reported disease except BC, Newfoundland and the northern territories. Wild birds are the main reservoir for the virus and bird to bird transmission is mainly by ornithophilic (bird-feeding) mosquitoes, although direct transmission by birds feeding on infected carcasses, drinking contaminated water or bites from other species of blood-feeding insects can occur.

## The Disease

EEE: Species exotic to North America like pheasants tend to develop a nervous system form of the disease. They become feverish, depressed and develop nervous signs including tremors, incoordination and partial or complete paralysis. Native species and emus become depressed, develop diarrhea and die, usually without nervous signs.

WNV: The pattern of disease associated with infection with WNV depends on the species of bird infected. Chickens, turkey, quail, pheasants etc. generally do not get clinical disease. Domestic geese develop encephalitis, become incoordinated and may have wing paralysis, and mortality rates may be high. If they survive long enough they often have microscopic damage to the heart muscle. Highly susceptible species like crows and blue jays are usually just found dead.

West Nile Virus infection generally occurs in birds beginning in the spring with the emergence of over-wintering mosquitoes and continues until the mosquitoes disappear in the fall. Recently there have been crow die-offs reported in New York State in the winter demonstrating that bird to bird transmission can occur without the presence of the mosquito vector.

## Prevention & Treatment

There is no treatment for affected birds. Mosquito control is the primary method of prevention. Fine mesh screening of pens or raising birds indoors may not be practical but reducing areas of standing water and chemical spraying for mosquito control by a licensed pest control company are ways to reduce risk. In affected areas of the USA, emus have been protected by the use of vaccines used in horses, in conjunction with programs to control of biting insects.

Remember that both of these viruses can cause disease in people so obtaining an accurate diagnosis of the mortality in your flock is important for both your birds and yourself. You should wear gloves, double-bag dead birds and get a diagnosis as soon as possible if WNV is suspected. See the website of the Canadian Cooperative Wildlife Health Centre for more information on WNV in wild birds in Canada (<http://wildlife1.usask.ca>).



UNIVERSITY  
OF GUELPH<sup>1</sup>

Ontario<sup>2</sup>

## CONTACT

OMAFRA's  
Agricultural  
Information  
Contact Centre:  
1-877-424-1300