A Primer on West Nile Virus
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Unless you’ve been vacationing for an extended period on Mars, you can’t help but have heard about the new disease on the block: West Nile Virus. Where did this disease come from? How much of a threat is it? What do you need to do to protect yourself and your livestock? This article will answer these and other questions as well as identify some good sources of more detailed information.

West Nile Virus (WNV) was first detected in the West Nile Valley of Uganda in 1937. The first U.S. cases were detected in 1999. The recent global spread is probably due to one or more of the following factors:

- International travel (infected mosquitoes stowed away on airplanes and boats)
- Tropical storms carrying infected birds and mosquitoes hundreds of miles off course
- Changing weather patterns that allow infected birds to change migration patterns

As of December 3, 3,775 cases of human illness have been reported to the Centers for Disease Control and Prevention in 2002; there have been 216 human fatalities. Although no human cases have originated in Washington or Oregon, the disease has been found in a dead raven in Pend Oreille County, Washington in September; a dead crow in Snohomish County, Washington in October; an ill horse in Island County, Washington in October; and an ill horse in Whatcom County, Washington in November. Equine and human cases are expected throughout the Pacific Northwest in 2003.

Birds are reservoirs of the virus. More than 110 species can be infected, but corvids (crows and ravens) are most frequently involved and most likely to die from infection with the virus. Various species of mosquitoes pick up the virus from infected birds while taking a blood meal. When these infected mosquitoes feed on another animal such as a human, horse, dog, pig, deer, etc., the virus is passively transmitted into the next victim. For poorly-understood reasons, equines (horses, mules, donkeys, etc.) and humans are the species that show illness most often. Very few cases of illness have been reported in sheep, llamas, cats, dogs and other species.

It is important to realize that even for humans and equines, actual illness is rare. Tests of mosquitoes collected in relative “hotbeds” of infection reveal that less than one percent of mosquitoes in affected areas carry the virus. Related studies show that less than one percent of humans who are bitten develop serious illness. Most human cases are not even noticed, or resemble a mild case of the flu. WNV is most severe in elderly, immuno-compromised, or otherwise ill people. Aside from transmission through blood transfusions, organ donations, and breast milk, it is not believed that people can transmit the disease to other people, nor is it believed that an infected horse can transmit the disease to humans.

The signs of illness in horses are the same as many other diseases of the brain, including rabies: wobbly gait, difficulty walking, stumbling, knuckling over, tilted head, muscle tremors, depression, poor appetite, fever, being down, blindness, staggering, circling and/or head pressing. About 33% of horses that show signs of illness die.
Prevention measures include:

- wearing long-sleeved shirts and long pants when in mosquito-infested areas
- using insect repellents containing DEET (humans); be sure to follow the directions on the label
- housing horses in well-screened barns during prime mosquito-feeding hours (dawn, dusk, and evening)
- eliminating mosquito breeding grounds (stagnant water in tires, buckets, etc.)
- adding larvae-eating fish such as goldfish, carp or bullheads to livestock watering troughs OR changing water in troughs every four days
- agitating or aerating ponds or other stagnant bodies of water
- encouraging bat and insect-eating bird habitat
- vaccinating your horse for WNV every year
- treating bodies of water with mosquito larvicides ONLY as a last resort and ONLY by persons with a valid aquatic pesticide license
- contacting your county public health department or health care professional for more recommendations about WNV prevention in humans

Although no vaccine is available for humans, a vaccine has been developed for horses. This is a killed vaccine, so it does not cause signs of illness in horses. It is not approved for use in pregnant mares, but has been given to many of them with no ill effects. The Food and Drug Administration approved a conditional license for this vaccine, which means it is currently only available through veterinarians. It is expected to be available through catalogs and over-the-counter like the annual equine EWT vaccination in the future. Horses should receive two doses of the vaccine three to six weeks apart with an annual booster in the spring. The spring booster should be given no later than five weeks before the start of mosquito season. If mosquito season in your area usually starts around May 1, give the booster no later than the last week of March.

The presence of WNV is monitored by public health officials in one of several ways: through mosquito pool analyses, through blood tests on sentinel flocks of chickens or other birds, and through dead bird testing. As stated on the Washington State Department of Health’s Web site, “An increase in the number of dead crows is considered the best early indicator of WNV presence.” In Washington, call 360-236-3060 to report dead crows, jays, ravens, magpies, or raptors; in Oregon, call 503-731-4024.

For more information about WNV in Washington and Oregon, contact:

- Washington State Department of Agriculture, State Veterinarian’s office, (360) 902 1878 or www.wa.gov/agr/FoodAnimal/AnimalHealth/WNV/default.htm
- U.S. Department of Agriculture, Olympia office, (360) 753-9430
- Oregon Health Services, (503) 731-4024 or www.ohd.hr.state.or.us/acd/wnile/home.htm
- Oregon State Department of Agriculture, 503-986-4550 or http://oda.state.or.us/information/news/020911west_nile.html
Other excellent sources of information include:

www.cdc.gov/ncidod/dvbid/westnile
http://westnilevirus.nbii.gov
http://www.aphis.usda.gov/oa/wnv/
http://www.mosquito.org
http://npic.orst.edu/wnv
http://www.vetmed.wsu.edu/announcements/westNile/info.html
http://www.avma.org/pubhlth/wnv_faq.asp
Both these figures came from the Washington State Department of Health Web Site:

**West Nile Virus in the United States, 2002**

- Verified avian, animal, and mosquito infections during 2002, as of October 7, 2002
- Pattern indicates human case(s)

**Transmission Cycle of West Nile Virus (WNV)**

- Infected mosquitoes transmit the virus to birds. Birds of some species get ill and die, while others become infected but do not show symptoms of the disease.
- Mammals bitten by infected mosquitoes may test positive for WNV, although most are dead end carriers: The virus in mammals is not generally sufficient to transmit the virus back to the mosquito, therefore ending the transmission cycle.
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Typical WNV transmission cycle:

- Bird → mosquito
- Infected birds can transmit WNV to mosquitoes during a blood meal.