



Lessen the Bite

West Nile virus may be here to stay, but agricultural producers can take precautions to help prevent infection.

by **Corinne Blender**

Almost everyone can relate to the swollen, red, irritated bump that a mosquito leaves when it bites through flesh to feed. But there may be more to that bite than an irritating itch.

During summer 2002, West Nile virus (WNV) spread across the Midwest, mainly infecting birds, humans and horses. It was first discovered in the United States in 1999 in the state of New York.

“WNV is amplified in the environment by continuous transmission between bird reservoir hosts by mosquitoes,” said Gayle Johnson, a pathologist in the University of Missouri’s (MU’s) Department of Veterinary Pathobiology, in a report released last summer. “Birds have several days of high-level viremia that produce, via blood ingestion, high viral concentrations in mosquitoes.”

While the spread of the disease followed the migrations of birds, the viral transmission from last summer ceased after the first hard freeze. Steve Kleiboeker, a virologist in MU’s Department of Veterinary Pathobiology, warns that West Nile didn’t wash away with the snowmelt this spring.

West Nile virus survives the winter in mosquito eggs. The eggs hatch in the spring when temperatures warm up, Kleiboeker says, and they are already infected with the virus when they hatch.

Vulnerability

Birds, mosquitoes and humans made the top news early in last summer’s outbreak; however, as the mosquito season wore on, other mammals were found with the virus. The peak of reported equine cases, Johnson’s report says, was July through September.

“We confirmed West Nile virus encephalitis in a dog and a sheep. Although we only had one case for each of these species, it does illustrate that the host range of this virus extends beyond humans, horses and birds,” Kleiboeker says.

Johnson’s report says, “Seroconversion (becoming infected) has been observed in a

variety of species, including dogs and cats, cattle, bats, rodents, rabbits and raccoons.” However, most of these cases have been rare, with birds, horses and mosquitoes leading the cases of infection.

West Nile virus can infect humans exposed to mosquitoes that transmit the virus into the bloodstream via feeding on their hosts. There are many types of mosquitoes throughout the United States, several of which can carry the West Nile virus. Kleiboeker says most species that do carry the virus are most active at dawn and at dusk and feed during these times.

These periods of time coincide with the ag labor force’s most active times. Livestock handlers generally want to move cattle during the cooler periods of the sweltering summer heat, which puts them at greater risk. However, while ag workers are at risk of exposure to West Nile virus, Kleiboeker says he doesn’t foresee this virus becoming any more hazardous than other responsibilities of the occupation.

Protection is key, Kleiboeker says, because the virus is probably here to stay. “Whether we develop some effective vaccines or not will determine whether we have morbidity from it on an annual basis,” he adds.

The “dose” that a human or animal is exposed to, Kleiboeker says, can determine if the individual will seroconvert.

“Anybody can be unlucky. If you get one bite by the wrong mosquito, you can certainly develop the disease. But not every mosquito is positive,” Kleiboeker says. “There is some good data where they actually measured infectivity in terms of pools of 100 [mosquitoes]. Even in areas where they have a very high incidence of West Nile in the crows and jays and have had human cases, the majority of mosquito pools were not positive, they were negative. And a positive pool can be just one or two mosquitoes.”

He adds that being bit several times increases your chances of developing West Nile virus.

Best prevention

While there is much known about the epidemiology — or how the virus is spread — there is very little known about prevention in terms of vaccination, Kleiboeker states.

“There’s some data out there about equine vaccine. But honestly, it is not very convincing, and there’s not much of it,” he points out. “There are several developmental vaccines on the human side, but from the veterinary standpoint, we really don’t know of anything coming that’s going to provide good, solid protection.”

Kleiboeker says that recent reactions to West Nile virus and the use of the equine vaccine remind him of the time he lived 10 miles from Lyme, Conn., where the tick-borne illness called Lyme disease was discovered in 1977. He says dog owners raced out to vaccinate their beloved pets with a vaccine for which there wasn’t much scientific data proving it would work. Pet owners felt their animals would be protected by the vaccine, and then didn’t continue to apply tick-control methods such as collars and powders.

Humans treated themselves the same way, he says. They went out and got a vaccination and thought they were protected. The human vaccine was later found not to be effective and was pulled from the market. The pet vaccine is still on the market, but he says it is still not very effective.

In these cases, the best way to protect animals and humans was to use tick-control methods, including spraying pets, humans and yards. That’s still the best protection, he says.

The equine vaccine was first given a conditional license by the U.S. Department of Agriculture (USDA) in fall 2001, and it received full licensing in 2003. Talk to your veterinarian about vaccination protocol.

While the vaccine is available, Kleiboeker says, horse owners need to continue using mosquito repellents and possibly keep horses stalled during dawn and dusk hours when the mosquitoes are more likely to be feeding. People should also use over-the-counter repellents on themselves and avoid being outdoors during dawn and dusk if possible.

The Environmental Protection Agency’s (EPA’s) Office of Pesticide Programs has listed steps people can take to help control the mosquito population. These steps are listed online at www.epa.gov/pesticides/citizens/mosquito.htm.

► Empty water standing in old tires, cemetery urns, buckets, plastic covers, toys or any other containers where “wrigglers” and “tumblers” live.

- ▶ Empty and change the water in bird baths, fountains, wading pools, rain barrels and potted plant trays at least once a week if not more often.
- ▶ Drain temporary pools or fill them with dirt.
- ▶ Keep swimming pools treated and circulating, and keep rain gutters unclogged.
- ▶ Use mosquito repellents when necessary, and follow label directions and precautions closely.
- ▶ Use head nets, long sleeves and long pants if you venture into areas with high

mosquito populations, such as salt marshes.

- ▶ If there is a mosquito-borne disease warning in effect, stay inside during the evening when mosquitoes are most active.
- ▶ Make sure window and door screens are “bug tight.”
- ▶ Replace your outdoor lights with yellow “bug” lights.
- ▶ Contact your local mosquito control district or health department. Neighborhoods are occasionally sprayed to prevent disease and nuisance caused by large mosquito numbers. If you have any

questions about mosquitoes and their control, call your local authorities.

“There’s really nothing anybody can do to prevent the spread of this virus,” Kleiboeker says. “It is in the wildlife, and there is no way you can control mosquitoes and wild birds — they are going to go where they want to go.”

While livestock owners and outdoor enthusiasts were probably happy to see the 2002-2003 winter freeze, mosquito season is here again. Protection measures can’t promise that West Nile virus won’t invade an area, but they are a step in the right direction.

