Bug Off

The best way to avoid infectious diseases like West Nile Virus and Eastern Equine Encephalitis is to prevent mosquitoes from taking over your farm.

By Emily Rhoades

The large amount of rain that fell early this spring in the South provided a good breeding ground for flying foes like mosquitoes. Without proper mosquito management and control around your farm, your horses run the risk of being infected with potentially deadly diseases such as West Nile Virus, Eastern Equine Encephalitis, Equine Infectious Anemia, and more.

According to the United States Department of Agriculture's Animal and Plant Health Inspection Service, cases of horses infected with West Nile Virus due to mosquitoes rose considerably in 2002. Florida ended the year with 494 horses infected, while Georgia and South Carolina reported 149 and 14 cases, respectively.

Mosquitoes are wreaking havoc again this year. As of May 23, 2003, 69 cases of Eastern Equine Encephalitis in Florida have already been reported, according to William C. Jeter, D.V.M., diagnostic veterinarian manager, Florida Bureau of Animal Disease Control.

To protect your horse from becoming one of these sad statistics, keep your vaccinations current and practice mosquito control at your farm. Learn more about mosquito populations in your area by visiting http://eis.ifas.ufl.edu.mosquito spray

Around the Stable

By eliminating mosquito breeding grounds in standing water, you will win 80 percent of the battle, according to Nancy Hinkle, Ph.D., associate professor and veterinary entomologist at the University of Georgia. "It is most critical to control mosquitoes when in their larval stage," Hinkle says.

Remember that water that is stagnant for more than four days is a prime breeding location; mosquito larvae can't develop in flowing water. Take inventory of all of your water-holding containers like tires, wheelbarrows, clogged roof gutters, buckets and birdbaths.

For those that are needed for horse-keeping, keep these tips in mind:
- Thoroughly clean troughs and buckets at least every three days.
- Turn wheelbarrows over when not in use so they do not collect water.
- Turn over wading pools.
- Drill holes in miscellaneous containers that collect water.
- Watch for stagnate water puddles in your wash rack, or elsewhere, and

drain them.
• Treat water used for animal consumption with agnique. This light oil material puts a thin film on the water, stopping mosquito larvae's ability to breathe. Testing is being done to see how long it lasts in different types of water and how it affects the oxygen levels of the water. "It is approved for use and it does work from keeping larvae from emerging," says Roxanne Rutledge-Connelly, Ph.D., assistant professor and extension medical entomologist at the University of Florida. You can buy this product from Adapco by calling 1-800-367-0659 or at http://www.adapcoinc.com/.
• Treat standing water with formulations of Bti (Bacillus thuringensis var. israeliensis). Read the precautions on the label before treating water.

Bti is the most common product used to treat water as it is a bacterium that kills mosquitoes in the larval stage and is not harmful to mammals. Bti is commonly sold in forms of "mosquito dunks" or "donuts," which are made from a naturally occurring soil bacterium. Bti treatment typically provides 30 days of protection before needing replacement. Each mosquito dunk can treat 100 sq. ft of water surface, regardless of the depth. These products can be found at most garden centers, hardware stores and feed dealers. Hinkle also recommends buying Bti in its sand form to use in high vegetation. Because sand is heavier than the spray formulas, it can fall past the foliage and land in the water below.

Stabling horses during heavy mosquito feeding times like dusk to dawn is encouraged. Recommendations are often made to stable horses in insect-proof stables. However, these facilities can be expensive to build and require air conditioning during hot summer months to achieve air circulation. Fine screening on windows and doors reduces the amount of mosquitoes coming into the stable but can cause air circulation problems as well. Utilizing fans and air conditioning is another good way to combat mosquitoes because air movement is unfavorable to them.

According to Hinkle, adult mosquitoes hide from the sun and heat during the day in vegetation. Reducing shrubbery, weeds, tall grasses and hedges around the barn or corral will reduce the mosquitoes in the vicinity.

Spray Repellents
Spray stable areas with premise and automatic spray systems. Most of these use a pyrethroid-based spray. Choosing the best repellent for your program will depend on the horse, use, and location. Frequently groomed horses might need a shorter-acting spray applied daily, while a pastured horse might need something that is longer acting and rain resistant. Always read labels and test the product on a small area because some horses are sensitive to different chemicals. Mosquitoes can become resistant to certain types of sprays, so rotate products that contain

different active ingredients.

Common ingredients in sprays include:
• Pyrethrins- extracted from chrysanthemums, very effective but often for short duration.
• Pyrethroid- synthetically developed to be similar to pyrethrins. Effective and longer lasting, and usually has a low toxicity to mammals.
• Permethrin and cypermethrin- two common forms of pyrethroids
• Piperonyl butoxide- a common synergist, enhances effectiveness and persistence of the chemical.
• Other plant extracts like cedar, citronella, eucalyptus, geraniol and pennyroyal.
• DEET- mostly used for humans, but recently approved for horses. It is a repellent only and is a good choice for horses sensitive to pyrethroids.

“ Pyrethroids are the most effective on the market right now,” says Rutledge-Connelly. “They are the active ingredient to look for.”

Mosquito repellents come in several forms. Some ready-to-use sprays are suitable for frequent use, while others are concentrated and must be diluted before use. For legs, faces and wounds, lotions or gels that contain repellents are available. A spot-on gel or lotion that is applied to specific sites and is migrated through the hair coat is longer acting and is effective for pastured horses.

Physical Barriers
Horses can be physically protected from mosquitoes with clothing such as flysheets, face masks, ear nets and leg wraps. While these are effective in preventing mosquito contact, they must also be used cautiously. Remove clothing if the horses become too hot. Also, use caution when turning horses out unsupervised, as the clothing could be caught or tangled up in fencing or bushes and trees. Additional protection can be added by spraying repellents on the clothing.

Natural Predators
Stocking stagnant water with mosquito fish (Gambusia) is another safe and natural way to eliminate mosquitoes. According to Hinkle, these small minnows feed on mosquito larvae, reducing populations. Mosquito fish are very hardy in different temperature conditions and can survive in stagnant water like ditches, lily ponds, and water troughs as long as the area does not dry up. Most ponds already contain fish that feed on larvae and often do not need mosquito fish added.
mosquito fish
Insect-eating birds, like Martins, are also natural predators to mosquitoes. Attract these birds by installing Martin houses around your farm. Martins

will eat mosquitoes along with other insects but are not recommend to be used alone, just as an added benefit to your control program, according to Rutledge-Connelly.

Along with fish and birds, other creatures like frogs can also be an added bonus in your fight against mosquitoes.

Myths

Many myths surround mosquito prevention. Clarke Environmental Mosquito Management in Kissimmee, Florida, reports that while ultraviolet or black light electrocuters do kill thousands of insects, research studies show that in a 24-hour period, only 6.4 percent of insects killed by black light were mosquitoes. According to Hinkle, these traps attract more mosquitoes than they kill. Along the same lines, most flytraps are also ineffective. They typically need a strong attractant factor, and are still effective on a chance encounter basis. Another myth refuted is that bat houses can curb the population of mosquitoes in an area. Unfortunately, studies show that bats are not selective in their eating habits and will eat many types of prey. Mosquitoes tend to be only a small part of their diets in the end.

For more information on WNV and EEE activity and mosquito cases, go to the Florida Medical Entomology Lab's information system at http://eis.ifas.ufl.edu, the Center for Disease Control and Prevention at www.cdc.gov/ncidod/dvbid/westnile/index.htm or the USDA at www.aphis.usda.gov/oa/wnv.

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