APHIS Factsheet

Veterinary Services

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Screwworm

Screwworms are parasites that can cause great damage to domestic livestock and other warmblooded animals. The larvae of this pest enter open wounds of the host animal and feed on the raw flesh. Rare cases of humans being infested with screwworm have been reported.

The United States has been free of screwworm since 1966. The U.S. livestock industry could suffer $750 million in production losses annually if this pest were reintroduced to the United States.

The Pest and Its Life Cycle

The screwworm is actually an insect that, in its adult stage, is about twice the size of the common housefly. It has orange eyes and a blue-grey or grey body with three dark stripes running down its back.

After mating, the female screwworm fly lays her eggs in the open wounds of livestock and other mammals. One female can lay up to 400 eggs at a time and as many as 2,800 eggs during its 31-day lifespan. These eggs can hatch into larvae in as little as 12 hours.

Screwworm larvae grow by feeding on the flesh of living animals and can grow to be over one-half inch within 5 to 7 days after hatching. The full-grown larvae then drop from the wound and tunnel into the soil where they form protective cases to house the pupae. The adult screwworm flies emerge from the pupal case and are ready to mate again within 3 to 5 days.

Clinical Signs of Screwworm Infestation

Animals are infested when the eggs hatch in the wound of an animal and the larvae feed on the animal's flesh. Wounds that may become infested by screwworm include those caused by feeding ticks, bites of vampire bats, castration, dehorning, branding, shearing, wire cuts, sore mouth in sheep, and shedding of the velvet in deer. Navels of newborn mammals are a common site for screwworm infestation. It is very difficult to see early stages of screwworm larvae feeding in a wound; only slight movement may be observed. As the larvae feed, the wound is gradually enlarged, becoming wider and deeper.

Usually at this stage additional screwworm flies have deposited eggs, resulting in multiple infestations. A bloody discharge often exudes from the infested wounds, and a distinct odor may be detected. In some cases, the openings in the skin may be small with extensive pockets of screwworm larvae beneath.

Animals with screwworm infestations may die in 7 to 14 days if wounds are not treated to kill the larvae, especially in cases of multiple infestations. As many as 3,000 larvae may be found in a single wound. Death results from toxicity and/or secondary infection.

Infested animals usually exhibit discomfort, may go off feed, and produce less milk. Typically, these animals also will separate themselves from the rest of the flock or herd and seek shady or secluded areas to lie down.

Control

A screwworm infestation is treated with topical application of approved chemicals to kill the larvae. Wounds should be treated until the wound is completely healed. The larvae should be removed from the wounds with tweezers.

Treating wounds and spraying or dipping animals with an approved organophosphate insecticide will provide protection against screwworm for 7 to 10 days. However, the most effective way to control screwworm infestation is through eradication.

History of the U.S. Screwworm Eradication Program

As early as 1825, U.S. Western States were reporting serious problems with screwworm. By the 1930's, screwworm had spread to the southeastern States, where livestock producers were losing $400 million annually.

In the early 1950's, the U.S. Department of Agriculture's (USDA) Agricultural Research Service developed a new method to help eradicate the pest using a form of biological control. During the pupal stage of the fly's life cycle, the pupae are subject to gamma radiation designed to leave the fly sexually sterile. The flies are artificially raised in a production plant (originally located in Mission, TX) and then released by aircraft over infested areas. When the sterile males mate with females of the native fly populations, no offspring result. With fewer fertile mates available in each succeeding generation, the fly, in essence, breeds itself out of existence.

This sterile insect technique was successfully tested in a field trial on the Dutch island of Curaçao in 1954 and then used operationally in Florida in 1957. By 1959, screwworm had been eradicated from the entire southeastern United States. The technique

was next applied to the more extensively infested Southwest in 1962. Self-sustaining screwworm populations were eliminated from the United States by 1966. A barrier zone of sterile flies was established along the 2,000-mile U.S.-Mexico border to prevent reinfestation from Mexico.

However, constant reinfestation from migrating flies or larvae carried by animals and then transported by people, remained a problem. Therefore, in 1972, the U.S.-Mexico Joint Commission for the Eradication of Screwworm was formed with the goal of eliminating the pest from Mexico and pushing the sterile fly barrier to the Isthmus of Tehuantepec, just north of Guatemala. A new sterile screwworm plant at Tuxtla Gutierrez, Chiapas, Mexico, was dedicated in 1976, replacing the former production plant in Mission, TX, which closed in January 1981. As a result of the Commission's efforts, Mexico was officially declared free of the pest in 1991.

APHIS has also been cooperating with Central America to eradicate screwworm from those countries and ultimately to establish and maintain a permanent sterile fly barrier at the Darien Gap between Panama and Colombia. The Darien Gap is the narrowest geographical region in southern Panama, stretching only 102 miles long. The region is mainly jungle and has no roads, so there is minimal risk of infested animals being transported by land from South America into Panama.

In addition, as part of the program's overall strategy, a new sterile fly-rearing facility in Panama, to be established around 2003, will replace the existing one in Mexico. Locating the new facility in Panama, an area where screwworm has not been eradicated, will reduce the risk of reinfestation of the United States through accidental release of fertile flies.

To date, Belize, Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica have been declared free of screwworm. Currently, screwworm program officials are focusing their efforts on eradicating the pest from Panama. Eradication activities include regulation of cattle movement, treatment of wounds, and release of sterile flies.

Threat to U.S. Cattle Producers

Although the screwworm program has been very successful, limited outbreaks have occurred. In 1997, screwworm larvae were detected on a dog shipped to San Antonio, TX, from a military base in Panama. Fortunately, a quick-thinking private veterinary practitioner detected and collected the larvae. State and Federal animal health authorities immediately took appropriate measures to track the dog's movement into the United States, disinfect sites, and prevent the spread of the pest.

In March of 2000, a similar incident occurred when a private practitioner found screwworm on a horse shipped to West Palm Beach, FL, from Argentina. Since the screwworm larvae were at least 24 hours from maturity when they were collected, it is unlikely that any larvae dropped from the wound. Still, the premises were thoroughly treated to ensure that any larvae that might have exited the wound were destroyed.

Suspicious Cases

These incidents remind us that screwworm is still a real threat to U.S. livestock. Veterinarians and livestock owners who suspect an animal may be infested with screwworm larvae should immediately contact State or Federal animal health authorities.

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Current information on animal diseases and suspected outbreaks is also available on the Internet. Point your Web browser to http://www.aphis.usda.gov to reach the APHIS home page.