

The Livestock Protection Collar

Coyotes are the leading cause of predation losses in the sheep and goat industry. The livestock protection collar (LPC) is a wildlife damage management tool used by the Wildlife Services (WS) program of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) to protect sheep and goats in fenced pastures from depredating coyotes. The collar is the most selective method available to manage coyote predation on sheep and goats and can only be used by certified pesticide applicators. The LPC is a very selective management tool because only the coyote attacking the sheep or goat is killed.

The LPC is registered by the Environmental Protection Agency (EPA), and WS personnel who use it must be certified in its use through the State pesticide regulatory agency. Certified WS applicators must follow all label directions and use restrictions set forth by the EPA when using the LPC.

The collar is one of many tools available to WS for predator management. WS uses an integrated wildlife damage management approach to reduce or prevent wildlife damage. In selecting control techniques for specific wildlife damage situations, WS personnel consider the species responsible, the frequency, and the extent of the damage. In addition to damage confirmation and assessment, consideration is also given to the status of the species, local environmental conditions, environmental impacts, and other factors. Then these factors are evaluated and used in formulating management strategies that may include the application of one or more damage management techniques.

LPC Mode of Operation

The LPC consists of two small rubber bladders containing 15 ml each of Compound 1080 (sodium fluoroacetate), placed under the throat of a sheep or goat, and held in place with Velcro™ straps. When a coyote attacks a collared animal and bites the throat where the LPC is positioned, the coyote receives a dose of Compound 1080 in the mouth.

Sodium fluoroacetate is a naturally occurring organic fluorine compound extracted from the West African plant "ratbane" (*Dichapetalum toxicarium*). WS currently uses less than 4 tablespoons of the compound nationwide each year. It works by block-

ing the krebs cycle, the major mechanism for releasing energy from food. Within 5 hours of receiving a dose in the mouth, the coyote will die a painless death from cardiac failure or central nervous system failure.

Environmentally Safe

Sodium fluoroacetate is a chemically stable, non-volatile compound and is relatively insoluble in most organic solvents. Should sodium fluoroacetate spill to the soil during a predator attack, the compound is degraded by soil microorganisms. Most soils contain a microbial population that is sufficiently varied and abundant to result in degradation of any sodium fluoroacetate that spills to the soil. Accumulation of the toxicant in plants is limited, as plants produce enzymes capable of degrading sodium fluoroacetate.

The toxic contents of LPCs are dyed yellow and easily detected when spilled. Affected soil can be scooped up with a shovel according to the directions on the pesticide label. However, should a spill go undetected, it will be degraded in the soil.

Nontarget Hazards

WS employees use their expertise in animal behavior patterns and biology to determine the risk to nontarget animals. When WS employees recommend using LPCs for a particular situation, the risk to nontarget animals must be determined, as directed in the WS decision model.

Secondary poisonings do not occur because after coyotes ingest the sodium fluoroacetate in the LPC, their carcasses contain only nontoxic, trace levels of the compound.

Species vary considerably in their response to sodium fluoroacetate, with primates and birds the least sensitive and carnivores the most susceptible. Fish show no sensitivity to the toxicant.

In research conducted by WS, scavenger species were given tissues from coyotes killed with sodium fluoroacetate to eat and showed no negative effect.

Livestock carcasses contaminated with the toxicant in its raw form on the wool or hair near punctured collars may pose a risk to scavengers. However, in research studies with dogs, skunks, magpies, and eagles that were allowed to feed on contaminated carcasses, these species were not adversely affected because they would not eat the contaminated wool or hair.

Wildlife Services Program

A Federal service program that shares costs with cooperators, WS is authorized by Congress to manage wildlife damage as stated in the Act of March 2, 1931.

The employees of WS recognize that wildlife is an important public resource greatly valued by the American people, and they conduct their wildlife damage management programs accordingly.

Additional Information

For more information about this and other WS programs or to find out how to request assistance from your WS State office, contact the WS Operational Support Staff at (301) 734-7921 or write to:

USDA, APHIS, WS
4700 River Road
Unit 87
Riverdale, MD 20737

You can also find information on WS programs by visiting our Web site at <http://www.aphis.usda.gov/ws>.

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