

United States Department of Agriculture
Animal and Plant Health Inspection Service

WS Directive

2.420 02/17/04

LIVESTOCK PROTECTION COLLARS

1. PURPOSE

To provide guidelines on the role of WS in the use of Livestock Protection Collars (LPC) in controlling livestock depredations.

2. REPLACEMENT HIGHLIGHTS

This directive replaces ADC Directive 2.420 dated 4/08/94.

3. POLICY

The LPC contains Compound 1080 and is registered by the U.S. Environmental Protection Agency (EPA) for use by private certified applicators and WS operations. The LPC's are produced under EPA Registration No. 56228-22 and are for official WS use only. The collars must be used in compliance with all applicable laws and regulations including a State registration and the User Instructions and Use Restrictions contained in the Technical Bulletin for the Sodium Fluoroacetate (Compound 1080) Livestock Protection Collar. Copies of the Technical Bulletin may be obtained from the WS Operational Support Staff (OSS).

WS personnel must be trained and certified in the use of LPC's prior to application. State Directors should consult with the appropriate State regulatory agency responsible for pesticide application to determine if training will be provided by that agency or by WS. At the State agency's discretion, WS may provide the necessary training.

The registration for use by private certified applicators will be maintained separate from the WS registration. WS personnel may provide technical assistance to those interested in using the non-WS registration.

4. REFERENCES

WS Directive 2.401, Pesticide Use (02/17/04)

Technical Bulletin for the Sodium Fluoroacetate (Compound 1080) Livestock Protection Collar (April 1998)

Distribution:

Originating Office:

Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et
seq.), as amended

Applicator Manual for Compound 1080 in Livestock Protection Collars,
Texas Agricultural Extension Service B-1509 (no date)

A handwritten signature in cursive script, reading "William H. Clay". The signature is fluid and extends to the right with a long tail.

Deputy Administrator

DO'S AND DON'TS FOR LIVESTOCK PROTECTION COLLARS

20

- read the label and Technical Bulletin before using collars
- plan how to target coyotes to your collared animals before using collars
- use appropriate size collars (small collars for 25 to 100 lb. animals; large collars for larger animals)
- be sure to position collars correctly (see pages 4-5)
- check and repair fences if necessary before putting collared animals in pasture
- notify neighbors that collars can be hazardous to free ranging pets
- keep warning signs in place as long as collars are being used (see use restriction #10 on page 18, and see Appendix B)
- check collared animals weekly or more often to be sure that all are present and that collars are in position and not punctured (see pages 7-8, and use restriction #11 on page 18)
- properly dispose of all collars, animals, vegetation, soil, leather clothing, and containers contaminated by 1080 (see pages 9-11, and use restrictions #12 and #13 on page 19)
- report any suspected poisoning of nontarget animals or humans (see page 6, and use restriction #6 on page 17)
- minimize human activity in pastures where collars are being used
- keep records up to date as directed in the labeling (see use restrictions #4 and #5 on pages 16-17)

January, 1998

Compound 1080 Livestock Protection Collar

- take collars off when predation has stopped or is not expected to occur
- store collars properly when not in use (see use restriction #14 on page 20)
- wear water-proof gloves when handling collars
- wash your hands with soap and water after handling collars

DON'T

- waste time by placing collared animals where coyotes won't attack them
- use collars if your livestock can be protected more easily or economically by other measures
- use so few collared animals that coyotes won't find them
- use more than 20 collars in any 100-acre or smaller pasture, or more than 40 collars per section (640 acres) of pasture (see use restriction #16 on page 22)
- use collars on unfenced, open areas (see use restriction #8 on pages 17-18)
- use collars where their use is prohibited to protect endangered wildlife (see use restriction #15 on pages 20-22)
- use collars without required authorizations from the Fish and Wildlife Service Endangered Species Office (see use restriction #15 on pages 20-22)
- use contaminated animals for food or feed (see use restriction #19 on page 22)
- use leaping or damaged collars
- remove toxicant from collars

TECHNICAL BULLETIN FOR THE LIVESTOCK PROTECTION COLLAR

TABLE OF CONTENTS

	Page
DO'S AND DON'TS	
SECTION I. USER INSTRUCTIONS	
A. INTRODUCTION AND THEORY	1
B. TOXIC PROPERTIES OF SODIUM FLUOROACETATE (COMPOUND 108)	2
C. DESCRIPTION OF LP COLLARS	3
D. MANAGEMENT OF LP COLLARS ON SHEEP AND GOATS	3
1. Things to do before putting LP collars on livestock:	3
2. Attaching LP collars	4
3. Monitoring LP collared livestock	7
4. Handling LP collars and contaminated animal remains, vegetation, clothing, water and soil	9
5. Disposal of damaged LP collars and other contaminated materials	11
E. DIRECTING COYOTE PREDATION TO LP COLLARED LIVESTOCK	12
1. General Comments	12
2. Targeting Strategies	12
3. Mistakes in Targeting	13
SECTION II. USE RESTRICTIONS	15
SECTION III. APPENDICES	23

Compound 1080 Livestock Protection Collar

SECTION I. USER INSTRUCTIONS

A. INTRODUCTION AND THEORY

The Livestock Protection Collar (LP Collar), invented by Roy McBride of Alpine, Texas, exploits the coyote's habit of killing sheep and goats by bites to the throat (photo 1). As described in McBride's U.S. Patent No. 3,842,906 (issued in 1974), coyotes that attack collared livestock usually bite through the collars and receive oral doses of the contents. When used with a toxicant, such as sodium fluoroacetate (Compound 1080), LP Collars will kill the attacking coyote. Collars may be used only by specifically certified LP Collar applicators or persons under their direct supervision (see Section II. 2). This Technical Bulletin is part of the EPA-approved labeling and contains detailed instructions for safe and effective use of LP Collars.

Coyotes' attacking and feeding behaviors do not seem to be affected by the presence of LP Collars. Attacking coyotes usually kill and feed upon collared animals just as they would if no collar were present. After a lethal dose of sodium fluoroacetate (Compound 1080) has been ingested, symptoms of intoxication typically do not appear for 2 or more hours. Death occurs from 2 to 7 hours (average 4 hours, 20 minutes) after the collar is punctured.

When LP Collars are used properly, coyotes may puncture them in 75 percent or more of their attacks. A 100 percent puncture rate is unlikely to be achieved because coyotes sometimes attack body sites other than the throat (photo 2). Effective use of LP Collars requires not only that collars be positioned correctly, but also that coyote attacks be directed or targeted to collared livestock. Targeting may be difficult or impossible under some conditions. If coyotes are killing less than once per week, the collar technique may be impractical. Collars are recommended for ranches with high rates of coyote predation and management conditions that permit effective targeting of predations to collared livestock.

Technical Bulletin

Experienced persons usually can evaluate local conditions quickly to decide whether or not LP collars will be effective. In addition to the basic problem of targeting, other factors to consider in deciding whether or not to use collars include availability and effectiveness of other control methods; costs of collars; labor requirements to collar and monitor livestock; potential hazards of collars to humans, domestic animals including pets, and nontarget wildlife; and severity of predation.

B. TOXIC PROPERTIES OF SODIUM FLUOROACETATE (COMPOUND 1080)

Compound 1080 is highly toxic to warm-blooded animals, including man when taken internally. Humans are not likely to be poisoned except by ingestion of LP collar contents. Based on available estimates of toxicity (0.7-2.1 mg/kg), one LP collar contains approximately 2 to 6 lethal doses for a 150-pound man. Before using collars, read the label (Appendix A) and the Use Restrictions in this Technical Bulletin (Section II) carefully.

The toxic solution in LP collars contains yellow dye (tartrazine) as a safety marker. Punctured, damaged, or broken collars together with clothing, animal remains, vegetation, soil, or other materials marked by this dye must be cleaned or disposed of in accordance with the label and Sections I D.5 and II. 11 of this Technical Bulletin. Collars with minor damage to straps or fastenings may be repaired by application as long as the toxic reservoirs have not been punctured and do not leak.

Compound 1080 is hazardous to domestic animals including livestock and pets. Dogs are particularly susceptible. In field studies, dogs had died after they attacked collared livestock and punctured the collars. As little as 0.1 mg of a LP collar's contents may be fatal to a 25-pound dog. Dogs could be poisoned by scavenging the carcasses of collared livestock. Therefore, to minimize the potential hazard to dogs, promptly dispose of all livestock carcasses as well as coyote carcasses suspected of being poisoned by Compound 1080 according to instructions in this bulletin.

Compound 1080 Livestock Protection Collar

Pen studies have shown that an adult sheep can be fatally poisoned by eating forage containing as little as 1 ml of 1080 solution from LP Collars. Although no livestock appeared to have been poisoned by eating contaminated vegetation during 5 years of field testing, it could happen. Therefore, contaminated forage must be disposed of as directed on the product labeling.

C. DESCRIPTION OF LP COLLARS

The LP Collar is a rubber bladder that contains a solution of Compound 1080, with neck straps for attachment to a sheep or goat. The type of collar used most up to 1975 has two Velcro® neck straps (0.75 inches wide and 22-25 inches long on neck collars). Three-strap models also are available and are intended for use on goats. Each collar has two toxicant reservoirs that contain 150 mg (0.15 grams) of sodium fluoroacetate (active ingredient). Each collar contains a total of 300 mg (0.3 grams) of sodium fluoroacetate (active ingredient).

LP Collars of two sizes are available (photo 3). The small collar is intended for lambs and kids weighing from 25 to 50 pounds; the larger for sheep and goats weighing more than 50 pounds. LP collars are not recommended for small animals (under 25 lbs). A small collar, properly in place on a lamb, is shown in photo 4.

D. MANAGEMENT OF LP COLLARS ON SHEEP AND GOATS

Things to do before putting LP collars on livestock:

- a. Be sure you have enough LP collars (see Section E).
- b. Inspect all LP collars for leaks and inspect straps to be sure they are securely attached. Do not use leaking or torn collars (photo 7) or collars on which the straps are coming loose (photo 8). Loose straps may be reattached by sewing.

Check the fence around the pasture where collared animals are to be placed and repair as necessary to keep animals within the pasture.

- d. Establish locations for warning signs (Appendix B), and be sure you have enough signs (see use restriction 10).
- e. Inform neighbors of your intent to use LP Collars and advise them of the potential hazards to free-roaming dogs.
- f. If ear tags or other marks are to be used, have the tags and related equipment on hand.
- g. Have an emetic (1-ounce bottle of syrup of ipecac available when LP collars are to be handled). Also have a few good quality plastic bags or other leakproof containers on hand for packaging damaged collars.
- h. Select and mark the target flock (animals to be collared).

2. Attaching LP collars

- a. Hold LP collars up to the necks of target livestock to determine the size of collar needed for each animal (photo 9). The rubber portion of the collar should come up to the ear (photo 4). If the collar is too small, there will be an unprotected region below each ear (photo 10). This will result in a lower puncture rate than would be obtained with collars of proper size.

Compound 1080 Livestock Protection Collar

b. One person can put LP collars on livestock, but the task is much easier for a two-person team. One person holds each animal while the other attaches its collar. To attach a collar, hold it in position under the animal's throat. Tighten the rear strap over the animal's neck just behind the ears and fasten it temporarily. Then tighten the front strap over the head between the eyes and ears and fasten it securely. Straps should be positioned to keep the rubber part of the collar directly below the ear (photos 5, 6). On goats with horns, the front strap may pass in front of both horns or in front of one horn and behind the other. If necessary, use string or twine to tie the front strap to one or both horns to keep the collar in position (photo 11). Once the front strap is in position, readjust the rear strap if necessary and then secure it. If the straps are longer than needed, a knife or clippers can be used to trim off the excess. Fasten the strap ends by stapling (photo 12).

c. LP collar straps must be tight enough to prevent collars from slipping out of position (photo 13), but not so tight as to choke the animal or cause sores (photo 14). Each strap should be loose enough that the applicator can insert 2 fingers between the strap and the animal. Collars stay in place well on animals with wool or mohair, but may be difficult to keep in position on newly shorn or slick-necked animals, particularly goats (photo 11). Head and neck conformation varies among animals and it may be impossible to keep collars in place on some individuals. They should be taken out of the collared flock.

- d. A suitable method of permanently identifying individual animals in a target flock is required to keep track of LP collared livestock. One such method is the use of numbered ear tags. Tags that can be read from a distance of 50 feet or more are most useful (photo 15). If you are using ear tags, attach them before the animal is collared.
- e. When the LP collar is in place, release the animal into a corral or other confined area and observe it carefully. Listen for labored breathing that may indicate the collar is too tight. When first released, collared sheep and goats often shake their heads, rub or make other attempts to rid themselves of the collars. This behavior will stop within a few hours if collars are not too tight. After you are satisfied that the collars are properly adjusted, move collared animals to the desired location.
- f. Place warning signs at logical points of access (see Section II. 10 and Appendix B).

After handling LP collars, wash your hands with soap and water.

SPECIMEN NOT FOR REPRODUCTION

Compound 1080 Livestock Protection Collar

3. Monitoring LP collared livestock

a. Once LP collared animals are in the desired location, the pasture should be checked every 7 days or more often if frequent predation is expected. During each check try to locate each animal and observe collars to be sure they are in position. If the collar has slipped out of position, catch the animal and reposition its collar. Inspect each animal's neck for yellow dye which could indicate a puncture or leaking collar. If dye is seen, catch the animal and check the collar. Replace any damaged or leaking collar. See the label and Section I. D. 5 and 6 of this Technical Bulletin. Collars on small kids or lambs may require periodic adjustment to allow for growth.

b. When searching for LP collared livestock, watch for both animal carcasses and congregations of scattered birds that could indicate the locations of carcasses. Whenever you visit a pasture, record the identity of each collared animal seen. Check each warning sign weekly to ensure that it is in place and is legible.

Based on experience gained in research studies, you will not see every LP collared animal every time you visit large, brushy pastures. Any animal not accounted for in two consecutive checks may be dead. An intensive search for it must be made. In addition, if more than three collared animals are not accounted for during any one check, an intensive search for these animals is required. Pastures must be systematically searched in their entirety or until the missing animals are located.

- c. If more than nine (9) LP collars and/or collared animals are unaccounted for during any 50 day period, remove all collars from animals and terminate their use. Seek technical advice if necessary to determine and correct the cause(s) of collar loss. Collar use may be resumed after adequate steps have been taken to prevent further, excessive loss of collars. See Section II. 11.
- d. Routine checks of LP collared livestock are difficult if the animals are secretive or wild. Feed concentrates can be used to train animals to come to you or your vehicle. This facilitates the identification and inspection of collared livestock (photo 15). It also helps to have a few tame animals in the collared flock. Binoculars may be useful for inspecting collared livestock from a distance.
- e. Infrequently, LP collars may be missing from carcasses of sheep or goats killed by coyotes. In research studies, missing collars appeared to have been carried or dragged away by coyotes. Some were found as far as half a mile away from kill sites, but about half of the missing collars were never recovered. Coyotes sometimes cache (hide or bury) them. Whenever a collar is missing, make a reasonable effort to find it. See Section II. 11.
- f. If you see an animal that you think may have been poisoned, report it promptly to the appropriate regulatory agency. Any suspected poisoning of threatened or endangered species must be reported immediately. See Section II. 6.

Compound 1080 Livestock Protection Collar

4. Handling LP collars and contaminated animal remains, vegetation, clothing, water and soil.
 - a. The toxic solution in the LP Collar contains a yellow dye, tartrazine, which is used as a marker for the presence of 1080 on punctured, damaged or broken collars; on clothing, animal remains, vegetation, soil, or other materials; and in water. Always use waterproof gloves when handling collars or any materials known to be contaminated by 1080.
 - b. Inspect carcasses of LP collared animals to determine the cause of death. When the carcasses are fresh (within 24 hours after death), coyote kills usually are obvious (photo 17). Remove punctured collars carefully and examine the punctures. Holes made by coyote teeth usually can be distinguished from accidental punctures. When collars are punctured by cactus thorns, the thorns sometimes remain in the holes (photo 18).
 - c. If the LP collar was punctured, remove it carefully to minimize leakage and place in a leakproof plastic bag or other container for transport to your disposal site. If necessary, double-bag to prevent leakage. Examine the carcass for contamination as indicated by yellow dye. Cut away the contaminated parts for disposal along with the punctured collar. See Section II, 12-13. Dispose of the remainder of the carcass using your normal practice. Cut or dig up contaminated forage and soil and place them in a leakproof container for transport to the disposal site.

SPECIMEN NOT FOR REPRODUCTION

- d. If the LP collar was not punctured, save it for reuse on another animal. Dispose of carcass using your normal practice. No special handling is required. If an unpunctured collar has only minor damage to straps or fasteners, the applicator may repair it.
- e. When predation has stopped, or when LP collars are to be taken off for other reasons such as shearing, gather the collared flock into a corral. Hold each animal and inspect its collar for punctures. Loosen the neck straps and pull them free. Do not pull so hard that you rupture the collar (photo). It may be necessary, particularly with Angora goats, to use a knife or scissors to free collar straps from the animals' hair. Clean unpunctured collars as necessary and return them to locked storage until you need them again.
- f. If clothing becomes contaminated with 1080 solution, remove it promptly. Wash clothes before wearing them again. Contaminated leather clothing, including gloves and footwear, should be disposed of in the same manner as contaminated animal remains because pesticides cannot be easily cleaned from leather. See Section II. 13.

Compound 1080 Livestock Protection Collar

5. Disposal of damaged LP collars and other contaminated materials.

- a. Damaged, punctured, or leaking LP collars, contaminated animal remains, vegetation, soil, water and leather clothing must be properly disposed of. The preferred method is by deep burial under 3 feet of soil in a safe field location at least one-half mile from human habitations and water supplies. For disposal on the ranch, it may be convenient to drill several deep holes using a mechanized post hole auger, or to make a trench with a backhoe. Then, waste materials are produced, they can be dropped into the hole or trench and covered with earth. Not more than 10 collars may be buried in any one hole. If buried in a trench, each group of ten collars must be at least 50 feet apart.

Incineration may be used instead of burial for disposal on the field (preferably on property owned and managed by the applicator) at least ¼ mile from human habitation and water supplies. Place collars and wastes (listed above) in an incinerator or refuse hole, saturate with diesel fuel, and ignite. Attend the burn until the contaminated material is completely consumed.

Alternatively, contact your State Pesticide or Environmental Control Agency or the Hazard Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities.

- b. When snow or frozen ground make on site disposal impractical, up to one cubic foot of wastes may be stored in a leakproof container, in a dry, locked place for up to 90 days.

2. DIRECTING COYOTE PREDATION TO LP COLLARED LIVESTOCK

1. General Comments

The process of directing coyote predation to LP collared livestock is called targeting. Knowledge of targeting is in its infancy and should improve as more people gain experience with LP Collars. Three different approaches or targeting strategies are described here. Ranchers and predation control specialists are encouraged to apply these methods as necessary to achieve the best results in their own circumstances.

2. Targeting Strategies

- a. Place LP Collars on vulnerable livestock. Collaring all sheep or goats on a ranch would solve the targeting problem. This strategy has not been tested due to the cost of collars and the large number that would be required in large flocks (over 100 animals). Nevertheless, in small flocks (50 or fewer animals) it may be practical to collar all lambs or kids. In flocks with 50 to 100 lambs or kids, it may be worthwhile to collar the smallest 20 to 50 individuals. Do not use more than 20 collars in any pasture under 100 acres, or more than 50 collars per square mile of fenced pasture.

Use target (LP collared) flocks. When coyotes are killing in particular pastures, remove all vulnerable livestock. Place 20 to 50 collared lambs or kids with their mothers in the pasture while all other vulnerable animals are penned at night or moved elsewhere. Add uncollared adult sheep or goats to the target flock to increase its total size to 50 or 100 head. If coyotes have been killing adult sheep or goats in the area, both adults and kids in the target flock should be collared. Remove collars 30 days after predation ceases, or whenever the risk of predation has abated.

Compound 1030 Livestock Protection Collar

This was the strategy used in most field tests and is the usual approach when LP collars are introduced onto a ranch where depredation is in progress. This strategy also can be employed by placing collared flocks in vacant pastures 1 to 2 months before large bands of sheep or goats arrive.

- c. Collar vulnerable individuals in large flocks. Coyotes usually prefer kids and lambs to adult goats or sheep. Experience with Andean goats has shown that if a few collared kids are placed in wether flocks (5-10 collared kids per 100 uncollared adults), coyotes will select the kids (photo 2004). As this strategy has not been tested on sheep, it is not recommended for sheep at this time.

3. Mistakes in Targeting

As with any new technique, one must learn how to use LP Collars before optimum results can be expected. Following is a list of some mistakes commonly made by persons learning this technique:

- a. Placing collars where effective targeting cannot be expected. In one example, 20 lambs were collared in a ewe-lamb flock containing hundreds of lambs. Coyotes subsequently killed the uncollared lambs. Effective targeting did not occur because collared lambs were far outnumbered by uncollared lambs that were equally attractive to coyotes.

¹Wethers are castrated male goats.

- b. Placing collars where predation is too frequent. In one such case, collared sheep were exposed for four weeks during which no predation occurred. The users then lost interest and removed the collars. There was no further predation on this ranch for several months. Collars cannot be used effectively where there is little or no predation.
- c. Using target flocks that are too small. In a Montana trial, six LP-collared lambs were placed in a 640 acre pasture. Coyotes passed through the pasture without finding the collared animals and then killed sheep from a large flock in an adjacent pasture. The larger the flock, the more likely it is to attract coyotes. The optimum size for target flocks has not been determined, but pastures of 100 acres or more should probably contain at least 50 head.
- d. Using target flocks that are not sufficiently isolated from uncollared livestock. On one small farm, a group of ewes and LP-collared lambs was exposed while other sheep on the place were penned each night. Instead of killing in the collared flock, coyotes switched to a neighbor's unprotected flock half a mile away. With small farm flocks, adjacent land owners may have to work together to achieve effective targeting.
- e. Using collars of the wrong size. When small LP collars are used on large sheep or goats, the throat region is inadequately covered (photo 10). Coyotes frequently kill these animals without puncturing the LP collars.

Compound 1030 Livestock Protection Collar

- f. Attaching collars improperly or insecurely. When LP collars are attached improperly, or they slip out of position (photo 13), coyotes will kill these animals but are unlikely to puncture the collars. LP collars in proper position are shown in photos 4, 5, 6, 11 and 16.
- g. Placing collars on sick or cull animals. Placing collars on sick or cull animals in an effort to avoid sacrificing more valuable livestock may be a false economy, as coyotes may not attack ill or lethargic animals. Collars should be used only on animals of the size and kind that coyotes are killing locally.
- h. Greatly increasing level of human activity on ranch while collars are in use. Coyotes often are wary of unusual activity and may temporarily stop killing because of it. Collars should be placed and monitored with a minimum of disruptive activity.

SECTION II. USE RESTRICTIONS

1. Use of LP collars shall conform to all applicable Federal, State, and local regulations.
2. Collars shall be sold or transferred only by registrants or their agents and only to certified Livestock Protection Collar applicators. Collars may be used only by specifically certified Livestock Protection Collar applicators or by persons under their direct supervision.²

² "Direct Supervision", as described in this restriction, conforms to the requirements established under 40 CFR 171.6.

Compound 1030 Livestock Protection Collar

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Technical Bulletin

The certified applicator is directly responsible for assuring that all use restrictions are met. The certified applicator will decide, in accordance with label direction, when and under what circumstances LP collars will be used. The certified applicator will either apply collars or be physically present where collars are applied by a non-certified person. However, a noncertified person who has received adequate instructions from the certified applicator may store collars, check collars in the field, remove collars, repair or dispose of damaged collars in accordance with use restrictions, retrieve collars laying in the field and properly dispose of contaminated material and animal carcasses.

3. Certification of applicators shall be performed by appropriate regulatory agencies. Prior to certification, each applicator shall receive training which will include, but need not be limited to:

- (a) Training in safe handling and attachment of LP collars.
- (b) Training in disposal of punctured or leaking LP collars, and contaminated animal remains, vegetation, soil, and clothing.
- (c) Instructions for practical treatment of 1080 in humans and domestic animals.
- (d) Instructions on record keeping.

4. Registrants or their agents shall keep records of all collars sold or transferred at their address of record. Records shall include the name, address, state where LP Collar certification was issued, certification number of each recipient, and dates and numbers of collars sold or transferred.

5. Each applicator shall keep records dealing with the use of LP Collars and the results of such use. Records shall be maintained in accordance with appropriate State or Federal regulations but for not less than two years following disposal or loss of collars. Such records shall include, but need not be limited to:

- (a) The number of LP collars attached on livestock.

Compound 1080 Livestock Protection Collar

- (b) The pasture(s) where LP collared livestock were placed.
 - (c) The dates of each attachment, inspection, and removal.
 - (d) The number and locations of livestock found with captured or punctured LP collars and the apparent cause of the damage.
 - (e) The number, dates, and approximate location of LP collars lost.
 - (f) The species, locations, and dates of all suspected poisonings of humans, domestic animals or non-target wild animals resulting from LP collar use.
6. Any suspected poisoning of threatened or endangered species must be reported immediately within three days to the Environmental Protection Agency. For all suspected poisonings of humans, domestic animals or non-target wild animals. The person to contact at the Environmental Protection Agency is Dr. Tina Levine, Chief, Insecticide Registration Branch, Registration Division, 401 M Street, NW, Washington, DC 20460.
7. Only the registered collar manufacturer is authorized to fill LP collars with 1080 solution. Certified applicators are not authorized to fill LP collars. Compound 1080 solution may not be removed from collars and used for any other purpose.
8. LP collars shall only be used to take coyotes within fenced pastures no larger than 2,560 acres (4 square miles). But where average annual precipitation does not exceed 20 inches and vegetation is sparse, consisting only of short to mid-height grasses and scattered shrubs, collars may be used in pastures up to a maximum of 10,000 acres (16 square miles) in size.

Fenced pastures include all grazing land that is enclosed by livestock fencing. This includes wire or other man-made fences such as rock walls, and natural barriers such as escarpments, lakes, and large rivers that will prevent escape of livestock.

Technical Bulletin

In no case shall the applicator place LP collared livestock in pastures where compliance with other Use Restrictions, such as monitoring, is impossible; in fenced pastures larger than 10,000 acres; or in unfenced, open range.

9. LP Collars shall be used only where losses of sheep or goats due to predation by coyotes are occurring or, based upon prior experience, where coyote predation can reasonably be expected to occur.
10. Where LP collars are in use, each logical point of access (for example, roads, gates, and trails) shall be conspicuously posted with a bilingual (English/Spanish or other second language appropriate for the region) warning sign not less than 3" X 10" in size. Signs shall be inspected weekly to ensure their continued presence and legibility and will be removed when collars are removed. The signs will have a minimum type size for "DANGER-PELIGRO" of 24 point (3/4 inches), with remaining text at least 18 point (3/16 inches).
11. All LP collared livestock must be checked at least once every seven days and collars adjusted if needed.

If any LP collared animal is not accounted for in two consecutive checks, an intensive search for it must be made.

In addition, if more than three LP collared animals are not accounted for during any one check, an intensive search for these animals is required.

If more than nine (9) LP collars are unaccounted for during any 30 day period, remove all collars from animals and terminate their use. Do not resume use until adequate steps have been taken to prevent further, excessive loss of collars.

Compound 1080 Livestock Protection Collar

12. Damaged, punctured, or leaking LP collars shall be removed from the field for repair or proper disposal. Damaged collars shall be placed individually in leakproof containers while awaiting repair or proper disposal. Authorized collar repairs are limited to minor repairs of straps and fastenings. Leaking or punctured collars must be properly disposed.
13. Dispose of 1080 wastes (punctured, leaking, or otherwise unrepairable LP collars; contaminated leather clothing, animal remains, wool, hair, vegetation, water, and soil) under three feet of soil, at a safe location, preferably on property owned or managed by the applicator and at least ¼ mile from human habitations and water supplies. No more than 10 collars may be buried in any one hole. If buried in a trench, each group of 10 collars must be at least 10 feet apart.

Incineration may be used instead of burial for disposal in the field (preferably on property owned or managed by the applicator) at least ¼ mile from human habitation and water supplies. Place collars and wastes (listed above) in an incinerator or fire hole, saturate with diesel fuel, and ignite. Attend the burn until the contaminated material is completely consumed.

Alternatively, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities.

When snow or frozen ground make on-site disposal impractical, up to one cubic foot of wastes may be stored in a leak-proof container, in a dry, locked place for 90 days.

Metal Container: Triple rinse contaminated and uncontaminated containers with water. Puncture and dispose of contaminated container and rinse as above.

Plastic Container: Triple rinse with water. Then puncture and dispose of container and rinse as above.

14. All persons authorized to possess and use LP Collars shall store them under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals and in outbuildings, or in outdoor storage areas attached to but separate from human living quarters.
15. Provisions for protection of endangered species

The LP Collar may not be used in the following areas due to potential adverse effects to endangered species (California condor).

STATE	COUNTIES
California	Fresno, Kern, Kings, Los Angeles, Monterey, San Benito, San Luis Obispo, Santa Barbara, Tulare, and Ventura

The LP Collar may be used in the following areas without written approval from the nearest U.S. Fish and Wildlife Service Office (FWS Endangered Species Specialists). If FWS or the user determines that use of collars may adversely impact an endangered species (San Joaquin kit fox, black-footed ferret, Northern Rocky Mountain wolf, or grizzly bear) in the specific areas requested, collars may not be used in these areas. Written approval must be obtained annually.

Compound 1080 Livestock Protection Collar

STATE	COUNTIES OR AREA	NEAREST FWS OFFICE PHONE
California	Alameda, Contra Costa, Merced, San Joaquin, Santa Clara, and Stanislaus	Sacramento, California 916-445-2700
Idaho	Bonner, Boise (north of State Highway 21), Boundary, Clearwater, Custer (north of local road running from Sun Valley to Chilly and corresponding line northeast from Chilly to Patterson), Fremont, Idaho, Lemhi, Shoshone, and Valley	S-Boise Idaho 208-334-1931
Michigan	Keweenaw (Isle Royale) and entire Upper Peninsula	Twin Cities, Minnesota 612-725-3276
Minnesota	Ancker, Becker, Beltrami, Carlton, Cass, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Kittson, Koochiching, Lake, Lake of the Woods, Mahan, Marshall, Pennington, Pine, Roseau, and St. Louis	Twin Cities, Minnesota 612-725-3276
Montana	Beaverhead, Carbon, Flathead, Gallatin, Glacier, Lake, Lewis and Clark, Lincoln, Madison, Missoula, Park, Powder, Powell, Sanders, Stillwater, Sweet Grass, and Teton	Helena, Montana 406-449-5322
Washington	Grand Oreille, Okanogan (National Park and Forest Land), Skagit, and Whatcom	Boise, Idaho 208-334-1931

SPECIMEN FOR REPRODUCTION

Technical Bulletin

Wisconsin	Douglas, Florence, Lincoln, Oneida, and Price	Twin Cities, Minnesota 512-732-2227
Wyoming	Fremont, Park, and Teton and Yellowstone National Parks	Helena, Montana 406-325-2222

16. The number of LP collars used shall be the minimum necessary for effective livestock protection. For pastures of the following size classes, do not use more collars than the number indicated.

Size (acres)	Number of Collars
up to 100	20
101 to 640	40
641 to 10,000*	100

*See Section II. 8.

17. Each applicator will have a one-ounce bottle of syrup of ipecac (to induce vomiting in case of accidental poisoning) available when attaching, inspecting, removing, or disposing of LP collars.

18. No contaminated animal will be used for food or feed.

SECTION III. APPENDICES

- A. Registered Label
- B. Bilingual Warning Sign
- C. Photo Captions
- D. Photos

APPENDIX A

REGISTERED LABEL

Specimen Label
Not For Reproduction

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND
DOMESTIC ANIMALS**

DANGER

Fatal if swallowed. Wear waterproof gloves when handling collars. Wash hands after handling collars or animals that have been contaminated with 1080 solution. Do not use contaminated animals for food or feed.

ENVIRONMENTAL HAZARDS

This product is very highly toxic to mammals and other wildlife. Birds and mammals feeding on carcasses of contaminated livestock may be killed. Keep out of any body of water. Apply this product only as specified on the label.

NOTE TO PHYSICIAN

WARNING SYMPTOMS. 1080 poisoning results from the transformation of fluoracetate into fluoracetate within cell mitochondria. Poisoning is characterized by a symptom-free latent period of 1/2 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behavior leading to convulsions, coma, and cyanosis). Ventricular fibrillation is commonly noted and is the primary cause of death. Early symptoms include alteration of heart sounds and premature, weak contractions.

TREATMENT: No effective antidote is known, but symptomatic treatment may be effective. Establish respiration, create artificial airway if necessary. Check adequacy of tidal volume. Initiate emesis. If patient is comatose, convulsions or has lost the gag reflex, endotracheal intubation must precede gastric lavage with large bore tube. Administer activated charcoal and magnesium sulfate. Treat seizures with IV diazepam. Monitor cardiac function closely. Treatment with glyceryl monoacetate (monacatin) may be effective; however, it is experimental and unproven in humans. **CONTACT NEAREST POISON CENTER FOR CURRENT INFORMATION.** Symptoms of non-lethal intoxication usually subside within 12-24 hours.

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

Riverdale, MD 20837
EPA Est No. 46779-TX-01
EPA Reg. No. 56228-22
U.S. PAT. 3,842,806

Net Contents: 30.4 grams (1.1 oz.) per collar

**RESTRICTED PESTICIDE
DUE TO ACUTE ORAL TOXICITY AND NEED FOR
HIGHLY SPECIALIZED APPLICATOR TRAINING**

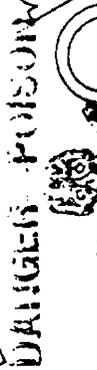
Collars shall be sold or transferred only by registrants or their agents, and only to certified Livestock Protection Collar applicators. Collars may be used only by specifically certified Livestock Protection Collar applicators or by persons under their direct supervision.

**SODIUM FLUOROACETATE
(COMPOUND 1080)
LIVESTOCK PROTECTION COLLAR**

*For use on sheep or goats to kill
depredating coyotes*

ACTIVE INGREDIENT	
Sodium Fluoroacetate	1.0%
INERT INGREDIENTS	99.0%
TOTAL	100.0%

KEEP OUT OF THE REACH OF CHILDREN



**STATEMENT OF PRACTICAL TREATMENT
IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL
CENTER IMMEDIATELY!**

IF SWALLOWED: Induce vomiting at once with an emetic such as syrup of ipecac, if available. If emetic is not available, drink 1-2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or take anything by mouth to an unconscious person. **PROMPT TREATMENT IS MANDATORY. GET MEDICAL ATTENTION IMMEDIATELY.**

IF ON SKIN: Wash exposed area twice with soap and water.
IF IN EYES: Flush eyes with plenty of water. Call a physician if irritation persists.
IF ON CLOTHING: Remove contaminated clothing and wash before reuse. Dispose of all contaminated leather, including shoes, boots, and gloves, according to the Pesticide Disposal Section. See disposal instructions on back panel.

SEE LEFT SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

NOTICE

Seller makes no warranty, expressed or implied, concerning the use of this product other than that indicated on the label. Buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.

STORAGE AND DISPOSAL

Do not contaminate water bodies or feed by storage or disposal.

STORAGE: Store Livestock Protection Collars in their original container, in a dry place, away from food, feed, domestic animals and humans. Do not store in any structure occupied by humans.

When rows of open ground make on-site disposal impractical, up to one cubic foot of wastes may be stored in a weathered container, in a dry locked place for up to 90 days.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of such materials is a violation of Federal law.

Dispose of collars and other wastes contaminated by 1080 (carcasses, up to one cubic foot of soil, soil, leather clothing, and wastes) in a secure location, preferably on property owned and managed by the applicator and at least one-half mile from human habitations and water supplies.

An incinerator may be used instead of burial for disposal in the field, preferably at least 1/2 mile from human habitation and water supplies. Place collars and wastes (listed above) in an incinerator or refuse hole, saturated with diesel fuel, and ignite. Attend the burn until the contaminated material is completely consumed.

Alternatively, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities.

CONTAINER DISPOSAL:

Metal Containers: Triple rinse contaminated and uncontaminated containers with water. Then puncture and dispose of contaminated containers and rinse as above.

Plastic Containers: Triple rinse with water. Then puncture and dispose of container and rinse as above.

COLLAR DISPOSAL: Dispose of punctured or unserviceable collars as above, except that not more than 10 collars may be buried in any one hole. If buried in a trench, groups of 10 collars must be at least 10 feet apart.

SEE TECHNICAL BULLETIN FOR ADDITIONAL STORAGE AND DISPOSAL INSTRUCTIONS



1080 LIVESTOCK PROTECTION COLLAR
DANGER-POISON
EPA REG. NO. 56228-22
USDA/APHIS RIVERDALE, MD
SERIAL NO.

Specimen Label
Not For Reproduction

APPENDIX B

BILINGUAL WARNING SIGN

Specimen Label
Not For Reproduction

(Minimum type size 18 point, except "DANGER-POISON" which will be 24 point)



DANGER — POISON



TO CONTROL STOCK-KILLING PREDATORS
SHEEP OR GOATS IN THIS AREA ARE WEARING NECK
COLLARS THAT CONTAIN A POISON, COMPOUND

1080 (Sodium fluoroacetate)

**DO NOT TOUCH COLLARED LIVESTOCK,
COLLARS, OR DEAD ANIMALS,
DO NOT RELEASE LIVESTOCK**



PELIGRO VENENO



PARA CONTROLAR ANIMALES PREDATORIOS QUE
ATACAN AL GANADO

ALGUNAS OVEJAS O CABRAS EN ESTA ÁREA
LLEVAN COLLARES QUE CONTIENEN UN VENENO,
COMPUESTO 1080 (Fluoroacetato de sodio)

**NO TOQUE LOS ANIMALES, LOS COLLARES, NI
LOS ANIMALES MUERTOS
NO SUELTE A LAS OVEJAS O CABRAS**

APPENDIX C

PHOTO CAPTIONS¹

1. When coyotes attack sheep or goats, they usually bite at the throat. The LP Collar is an effective way to deliver chemicals selectively to depredating coyotes.
2. A coyote attacked this Angora goat at the rear, but did not puncture the LP collar. The goat had to be destroyed because of its injuries.
3. Large and small LP Collars made by Ranchers Supply, Alpine, Texas. Each toxicant reservoir is 1.5 inches wide and 3.75 inches long on large collars (top) or 2.25 inches long on small collars (bottom). The beige Velcro straps are 0.75 inches wide and 22-25 inches long.
4. LP Collar on a 30-pound lamb. Note that the toxicant reservoir comes up almost to the ear.
5. Large LP Collar on an adult Angora goat.
6. Elastic-strap LP collar on a 50-pound lamb. In field tests on Angora goats the rate of collar puncture by attacking coyotes was lower for elastic-strap than for velcro-strap collars.
7. The corner of this LP collar tore when the collar was being removed from the goat. To avoid such damage, a knife or scissors can be used to free collar straps from hair or wool.
8. The lower portion of this LP collar was poorly attached to the neck straps. Repairs can be made by sewing or stapling neck straps back in position. Only heavy thread or staples should be used.
9. This small LP collar is too small for effective coverage on this 100-pound lamb.

¹ Photo 2 by D.A. Wade, Texas Agricultural Extension Service; others by G. Connolly, Denver Wildlife Research Center.

Compound 1080 Livestock Protection Collar

10. This lamb's LP collar is too small. Note the unprotected region below the ear. Large collars are better used on lambs of this size.
11. To keep the LP collar in position on this Angora goat, the forward collar strap was tied to a horn using butcher's twine. Any heavy string or cord will do.
12. An ordinary office stapler can be used to tack LP collar strap ends in place. These staples are inadequate for reattaching straps to collars (see photo 8).
13. The LP collar on this Angora goat has slipped back out of position. If the LP collar was in this position when a coyote attacked, the collar probably would not be punctured.
14. If LP collar straps are too tight, they will cause abrasions that become infected and attract flies, as shown on this Angora goat. The problem is more common with goats than sheep. It can be avoided by checking strap tension frequently.
15. Numbered ear tags are a valuable aid in keeping track of collared livestock. The numbers on this tag can be read at a distance of 50 feet or more.
16. Checking of LP collared livestock is easy if the animals are trained to come for feed.
17. Typical remains of a LP collared lamb that was killed and fed upon by coyotes. The collar was punctured.
18. An LP collar punctured by prickly pear thorns. Thorn punctures are similar to coyote tooth punctures. This damaged collar cannot be reused.
19. The coyote was found dead 0.4 miles from the spot where it attacked a LP collared lamb and punctured the collar. Laboratory analyses confirmed that it was killed by the collar toxicant, Compound 1080.
20. Adult Angora goat flocks can be protected with LP Collars by adding 5 to 10 collared kids per 100 uncollared adults. Two collared kids appear in this photograph (facing camera, left of center). Tests showed high coyote selection for the kids.