



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JAN 25 1991

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

Kim Davis  
RegWest Company  
P.O. Box 2220  
Greeley, Colorado 80632

Dear Ms. Davis:

Subject: EARTHFIRE VAPORIZING FLUID  
Your application of June 8, 1990  
EPA Reg. No. 62331-1

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended is acceptable. A stamped copy is enclosed for your records.

1. The one year storage stability data at ambient warehouse conditions are acceptable & satisfy the ambient storage stability requirement of 40 CFR 158.190, Guideline Reference No. 63-17.
2. At the next label printing, the following changes should be made:
  - a. The term "Active Ingredient" should be made singular.
  - b. The designation "w/w" should be deleted from the percentages since weight by weight is implied.
  - c. Based on a density of 7.52 lb/gal as cited in Block #7 of the CSF dated 6/7/89, your product would contain 0.0752 pounds of Resmethrin per gallon or 9.02 grams per liter.

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Sincerely,

*PH*  
Phil Hutton  
Product Manager (17)  
Insecticide/Rodenticide Branch  
Registration Division  
H7505C



SYSTEM

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MODEL CF001 / PROFESSIONAL GRADE

**A SUBSURFACE THERMAL  
FOGGING INJECTOR SYSTEM**

*DIRECTIONS  
FOR USE  
MANUAL*

ANOTHER PRODUCT OF:

**INVICTA CORPORATION**

P. O. BOX 7584, BEAUMONT, TEXAS 77706

*For Use With:*

FORMICINE  
INSECTICIDE

*and*

*Earthfire*  
VAPORIZING  
FUEL  
(Propane)

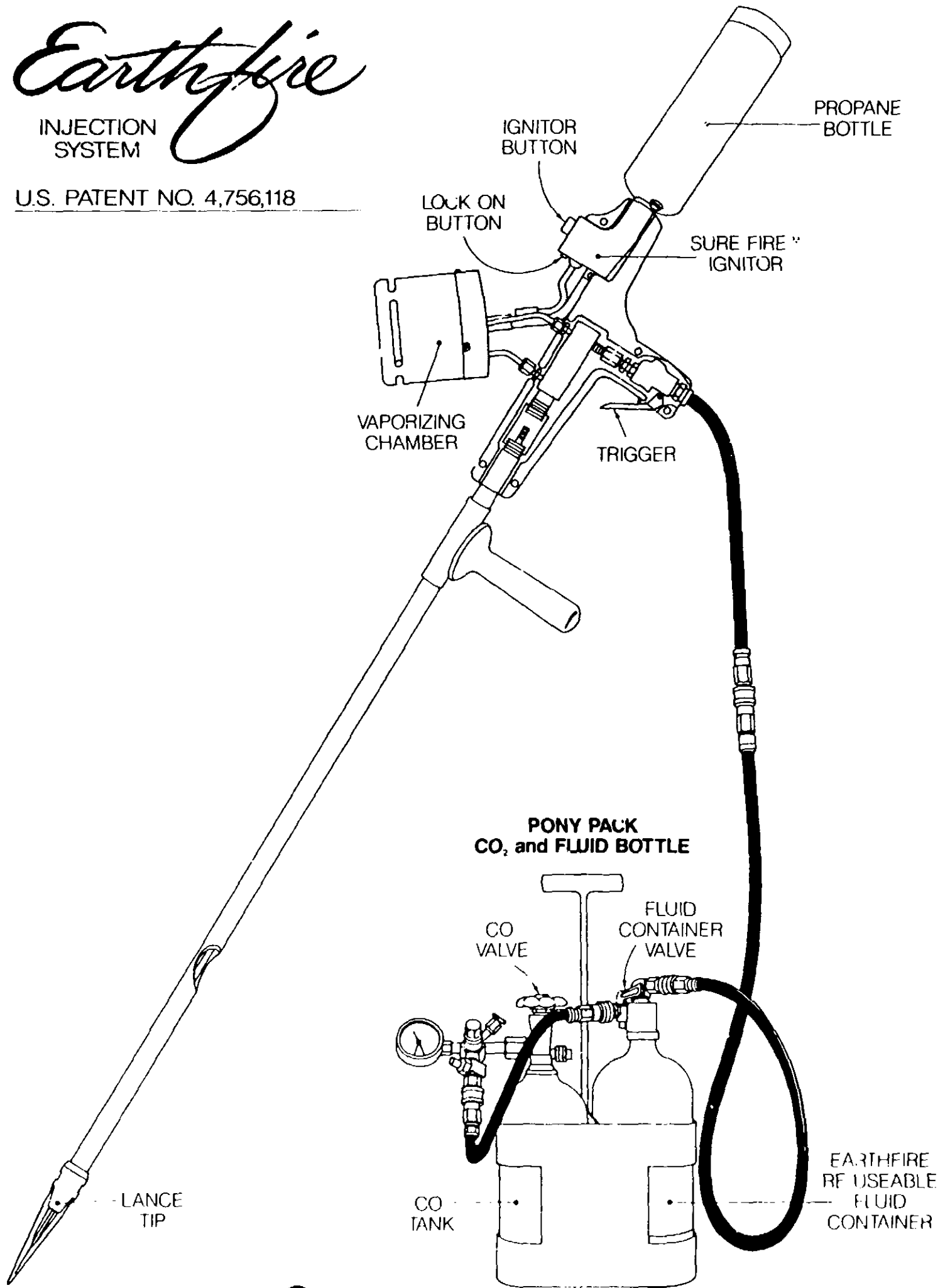
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# Earthfire

INJECTION  
SYSTEM

U.S. PATENT NO. 4,756,118



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## **DIRECTIONS FOR USE**

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*For use only in subsurface injection as a  
Thermal Fog.*

**NOT FOR USE AS AN OPEN AIR FOG OR AEROSOL.**

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*It is a violation of Federal Law to use  
this product in a manner inconsistent  
with its labeling.*

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**THERMAL APPLICATION:** For the control and eradication of the Imported Fire Ant by direct injection into the mound and subsurface colony. The formulation is to be used, undiluted, only in thermal applicator equipment capable of heating the liquid to a minimum of 2,000°F (1,093°C), and capable of delivering spray particles within the aerosol size range.

Using this company's Earthfire Injection System as a guide, the following is the acceptable procedure:

### **PREPARATION**

- 1.** Fill the Earthfire Fluid (insecticide) container (**fig. 1**) to the bottom of the neck. Do not overfill. Use only *undiluted* Earthfire Vaporizing Fluid. Be sure the "O" ring seal is in the screw cap of the snorkel tube assembly.
- 2.** The propellant or pressurizing device for the insecticide is the CO<sub>2</sub> bottle (**fig. 1**) which has an attached pressure regulator with gauges and connecting hose.
  - a.** Snap the CO<sub>2</sub> connecting hose onto the insecticide container cap at the male, "sabre" connector.
  - b.** Open the CO<sub>2</sub> bottle by turning the large valve on top of the regulator. This will activate the gauges. Normal operating CO<sub>2</sub> pressure is 800-900 psi. **WARNING:** Do not leave this tank in direct sunlight or anywhere that it can become heated above 80°F. *Never permit the tank pressure to exceed 1,800 psi.*

c. Adjust the operating pressure to 8 to 12 p.s.i. as indicated on the Green, low pressure gauge. The pressure should be set at the factory, but if any adjustment is necessary, loosen lock nut, turn large, silver colored screw clockwise to increase the pressure; loosen the screw to decrease the pressure and tighten lock nut.

d. Open the in-line ball valve located on the incoming line attached to the insecticide container cap.

e. At this point, the entire system should be charged and ready to use. Carefully fill the heating coils with fluid by "tapping" the trigger. You will notice a distinct surge in the hoses. When the first drops of liquid come out of the nozzle, the entire system is full. While performing this procedure — *keep the lance tip pointed toward the ground.*

f. At this point, carefully check your entire system for leaks. If there is any evidence of either fluid or gas leaks, **DO NOT PROCEED!** If there are leaks, shut the pressure off and check the leaking connection for misalignment, bad seals or "O" rings, or loose connections. Adjust and start over.

**3.** Next, attach the Earthfire Vaporizing Fuel (Propane) bottle to the Sure Fire™ Ignitor, (**fig. 1**).

**4.** Turn the black ignition button knob located on top of the Sure Fire™ Ignitor to "On" and press down. When the gas(propane) has ignited, press the small, silver colored lock-on button on the front, top of the Sure Fire™ unit. This allows a constant, regulated amount of fuel to be fed into the vaporizing chamber.



**CAUTION:** Once you have started vaporizing the insecticide, you *must* vent the coils by pulling the trigger at least every 10 to 15 minutes to prevent filling the coils with carbon which will pack so tightly that you will have total blockage of the coils. You will also overheat the insecticide causing it to lose its effectiveness. A gentle tap of the trigger to allow a burst of vapor to escape is sufficient. The vapor should be completely white at all times. Discolorization of the vapor indicates you are overheating the insecticide and that you should vent more often. Continue to expel vapor until it becomes *white*. After you have shut the system off, vent vapor occasionally to aid in the cool down process and to reduce carbonization.

- 5.** To shut the fuel system off, press the ignition button again. This will automatically disengage the constant flow button.
- 6.** In warm weather, allow about three (3) minutes for the vaporizing chamber and coils to reach maximum temperature. NOTE: In cold weather, below 40°F (4.4°C), wait at least five (5) minutes as it takes more energy to vaporize the cold fluid. If the coils are not allowed to reach maximum temperature, you will not be able to maintain constant vaporization of the fluid and thus you will not be able to inject the Fire Ant nests properly. You must inject a white smoke-like vapor to fill the entire mound properly — hot fluid is wasteful and is of no more value than any other drench method.
- 7.** To test for proper vaporization, place the lance tip on the ground, downwind, and gently pull the trigger one time. If proper vaporization has been reached, you will see a large cloud of dry, *white* vapor. This vapor is highly flammable! NEVER fire a burst upwind of the vaporizing coil! Do NOT breathe this vapor!

**NOTE:** It is strongly recommended that the user of this device wear a protective mask at all times. We recommend a respirator of the type approved by NIOSH/MSHA (National Institute for Occupational Safety of Health/Mine Safety and Health Administration) for organic vapor protection. Such masks are available upon request at additional cost.

**WARNING:                      WARNING:                      WARNING:                      WARNING:**

When in use, parts of this injector system are extremely hot and will cause severe burns if brought in contact with any part of your body. Be extremely careful never to touch the vaporizing chamber, the lance, or the small vapor lines. Use only the fixed handle and the adjustable foregrip (handle).

## **INJECTION**

### **For Imported Fire Ant - *Solenopsis spp.***

**NOTE:** Due to the wide variety of soil types and soil water content over the range of the Imported Fire Ant, you may find that by slight adjustment of the following techniques, you will produce the best results for your area. The following descriptions are for a worst case scenario, i.e., heavy clay soils. Sandy and loamy soils are much easier to inject with near perfect results every time. The most difficult injections will be after heavy rains, when there is 90% to 100% water saturation of the soil. The next most difficult injection will be in the very dry summer mounds of heavy clay that are extremely hard and have a surface pack of grass or weeds woven into the outer cover of the mound.

**CAUTION:** You must be ready to begin your injection immediately upon approaching the mound because the workers will begin an evacuation of the entire colony as soon as they detect any vibration of approaching footsteps. They are so sensitive to pressure changes that they begin this evacuation when you are eight (8) to twelve (12) feet away. An entire colony can be evacuated in less than 60 seconds! Do not mistake the swarming workers that will appear on the surface of the mound as the entire colony. They are only the defenders of the colony. The queen(s) and the brood — larvae, pupae and eggs - will already have been evacuated. To kill the colony, you **MUST** kill all of the queens and the brood.

**1.** Before approaching a mound, note its size and shape and decide exactly where you will make your first injection. Then walk quickly up to the mound and insert your lance tip into the surface of the mound. It is usually best to make this insertion on the side of the mound about one half of the distance between the top of the mound and ground level. This will allow you to insert the lance tip into the mound at an angle of  $45^{\circ}$  to  $60^{\circ}$  — a comfortable angle for the operator.

**2.** Your first injection should be made by inserting the lance tip into the mound deep enough to break the surface “pack”. This is the relatively smooth covering of the colony that is about one half to one inch thick and covers the ends of the complex of tunnels of the colony.

**3.** After you have made this first probe, withdraw the lance tip to near surface level at the same time that you are pulling the trigger to let vapor be drawn into the mound. Do not be concerned about how deep you have made your probe; you can not probe too deeply. With about two inches of the lance tip left in the mound, pull the trigger to release your vapor. If the insertion has been made properly, the vapor will be forcefully pulled into the mound with a distinct “sucking” sound and action.

**4.** There is a natural vacuum effect within the colony that will allow you to fill the colony chamber completely from this near surface position. Within seconds you should see vapor coming out of the mound or out of the ground somewhere other than your injection site. As soon as you notice this effect, move to another site on the mound and repeat your insertion and vaporization. This will fill any other areas within the colony that may have been missed with your first injection. A properly injected colony will have a thick, white vapor flowing over the entire surface of the mound as it comes up from inside the colony. Also, you will see vapor coming out of the ground from nearby foraging tunnels or cracks in the ground. When this is noted, you have completely filled the colony and you will have eliminated it.

**CAUTION:** Do not stand downwind of the vapor. Never allow the vapor to be blown over any water supply. Do not use within fifty (50) feet of animals, birds, or valued insects such as honey bees. Do not use this procedure when there are gusty winds of more than 8 to 10 mph.

**5.** For large colonies it is recommended that you make several insertions with the lance and continue to flood the entire colony with vapor. Be particularly sure that you have injected vapor into the edges of the mound. It has been found that in most instances of incomplete destruction (kill) of a colony, the fault lies with the equipment operator's failure to fill the edges of the colony with vapor, thus leaving pockets of untreated ants and untreated areas inside the colony. When you have treated the entire colony in the above manner, you will have effected a 100% kill of this mound. Always fill the entire mound with vapor so that when the vapor cools and recondenses, you will have left a long lasting lethal residue to kill all returning forager ants that will have been away gathering food while you were treating the mound. Remember, you can not make too many injections or put too much vapor into the colony. It is better to "overkill" and be sure, than to have to return for a follow-up treatment.

**NOTE:** Although these instructions are quite lengthy, the procedures should require no more than one (1) minute per mound. Each injection should take about 10 seconds total time, with the length of time you hold the trigger down being about one (1) to three (3) seconds in each injection site.

## VARIATIONS

**1.** For very small surface colonies, one injection is usually sufficient. You may also "stir" the surface part of the mound while releasing vapor as described in Number 4 of *Injection*. Always be sure to inject as deeply as possible.

**2.** In those colonies that are water logged (100% water saturated), you will find there is a "free water" level, i.e., at a point below ground level there will be 100% water in which no ants can survive. There will also be isolated pockets of ants and brood that have been sealed off from the water. In some instances there will be some pockets of survivors *below* the free water level. Many of the tunnels and chambers will be sealed by a "water-lock", very much like the grease trap below your sink. These are extremely difficult colonies to kill because of these isolated pockets of ants. Remember: if *one* queen survives, the colony survives. If practical, leave these colonies for injection when they are dry. However, if you must try to kill these colonies, you must do the following: (a) make your normal injections just as described above since most of the colony will be very near the surface, warming and drying the brood; (b) next, insert your lance as deeply as possible into the colony, even below the free water level, and with stirring motions continue to release vapor. In other words, you must virtually destroy the mound and the subsurface chambers with the lance while contaminating it with Earthfire to be sure of a complete kill of the colony.

**NOTE:** In cool and/or wet weather the eggs, larvae, pupae, and most of the colony will be very near the surface, facing the sun, warming and drying. This is particularly true in the winter or any time the ground temperature falls below 68°F (20°C). Commence your kill at this point. However, in hot weather, the entire colony normally will be quite deep in the nest. The ants and the brood can not tolerate temperature extremes.

**3.** In dry sand and soft loam type colonies, the internal dimensions are usually quite large compared to the clay colonies. However, the pressure of your Earthfire system provides a complete filling of the chambers with vapor, and, by following the above described methods of injecting, you will effect a 100% kill of the colony.

**4. NOTE:** This system works best when the weather is bad! That is, any condition that keeps all of the ants in the colony at a given time is, of course, the ideal time to inject. Also, those conditions that cause the entire colony to "clump" or gather into a single area of the mound are the best times to inject for a 100% kill of the colony.

**5. SPECIAL NOTE:** When you have treated a colony during those times when large numbers of forager ants are away from the nest, you may find that these workers will establish a small, surface colony, usually on the southeast side, near the killed mound. These ants

are sterile; they *cannot reproduce* and usually will die within a few days. Always check these small colonies for the presence of larvae and pupae. If you see any white, egg shaped objects, then you have probably failed to kill the entire colony. These are escapees and should be treated at once. If you see no larvae or pupae, you need not treat any further since the original nest is contaminated and will kill any ant that re-enters.

6. If you find larvae or pupae in more than 10% (1 out of 10 mounds) of the small, satellite colonies described above, you are failing to inject the nests properly. There are lateral foraging tunnels about one to two inches beneath the surface, leading away from the main mound chamber which the ants can use as escape tunnels. It is necessary that you completely fill the mound with vapor as rapidly as possible to prevent the use of these escape tunnels. The vapor usually paralyzes the Fire Ant in less than 15 seconds. Of course, every ant that is touched by the vapor is contaminated, so just be sure that you have filled all of the chambers and tunnels of the mound, and you will have effected a 100% kill of that colony.

**GOOD LUCK!** And remember, when properly administered, this system *eliminates* the Imported Fire Ant and does not merely allow them to move to another location as is the case with drenches, poisons, and other methods.

If you have any questions or problems regarding your Earthfire Injection System or about the Imported Fire Ant in general, please feel free to contact us. Send your inquiry to:

### **INVITA CORPORATION**

Att'n Biology  
P.O. Box 7485  
Beaumont, Texas 77706

Enclose a self-addressed, stamped envelope and one of our biologists will attempt to answer your questions completely and to your satisfaction.

**WARNING:**

Earthfire vapor is highly flammable. Keep away from sparks, open flame, and extremely hot surfaces! NEVER eject vapor upwind of hot vaporizing chamber on the injector gun

## **SHUT DOWN PROCEDURE**

**It is IMPORTANT to do the following procedure in order:**

- 1.** When you are ready to discontinue the use of your system, first shut the flame off by pressing the ignition button on the Sure Fire™ Ignitor. This will automatically release the lock-on button to the "Off" position.
- 2.** Next, close the CO<sub>2</sub> valve and the valve to the insecticide container. Disconnect the CO<sub>2</sub> line from the cap. Slowly open the valve on the cap to relieve the CO<sub>2</sub> pressure from the system. Now you may disconnect the line to the injector gun.
- 3.** Next, unscrew the Propane bottle and remove it from any contact with the injector system. The system will remain hot for some time and the Propane is highly flammable. *Be Safe! Prevent Accidents!*
- 4.** Now, with the lance tip on the ground, pull the trigger to vent all of the pressure from the system and expel the remaining vapor.
- 5.** Finally, be sure your system has cooled completely before storing or transporting. *The vaporizing chamber cover is very hot when in use. Do Not Touch it or place it near any flammable substance.* The lance and the vapor lines are also extremely hot. Never touch these or place them on or near any flammable substance.

**NOTES:**