

Wildlife Services

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Tech Note

May 2008

Sodium Lauryl Sulfate: European Starling and Blackbird Wetting Agent



Ingredients

Sodium Lauryl Sulfate	28%
Water	72%

European starlings (*Sturnus vulgaris*) and various blackbird species sometimes roost in areas where they can cause agricultural, health, and esthetic problems. Concerns associated with these roosts include increased noise levels, fecal accumulation, and disease threats. These birds can also compete with other avian species for resources. For example, introduced starlings compete with native birds for nest sites. Brown-headed cowbirds (a type of blackbird) are known to parasitize songbird nests and may be a major factor in the decline of neotropical migratory birds, such as the endangered Kirtland's warbler.

feathers so that with low temperatures (<41 °F) and sufficient water, birds die of hypothermia.

This product is for use on upland roosts located away from bodies of water. In some situations, this tool may be an appropriate alternative to the registered avicide DRC-1339.

A copy of this tech note and the material safety data sheet (MSDS) must be in the possession of any WS employee or official cooperator applying SLS.

Use Requirements From the Environmental Protection Agency

In 1996, the U.S. Environmental Protection Agency (EPA) exempted 31 minimum-risk pesticides from requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) if the pesticides satisfy certain conditions. In general, conditions for claiming

*Figure 1
Positioning the SLS
sprayer may require
three or more
people.*



Employees of the U.S. Department of Agriculture's (USDA) Wildlife Services (WS) program are often asked by State agencies, municipalities, business owners, and landowners for assistance with dispersing or removing starling and blackbird roosts.

This tech note describes the use of sodium lauryl sulfate (SLS) as a wetting agent in managing European starling; red-winged, yellow-headed, and Brewer's blackbird; cowbird; grackle; American crow; common raven; and magpie roosts. SLS is a surfactant commonly used in soap products. When applied to birds, SLS allows water to penetrate and saturate the

that a pesticide should be exempt from registration under FIFRA Section 25 (b) are that claims cannot be made regarding control of public-health pests, and the product cannot be used on food or feed crops. SLS (Chemical Abstract Service No. 151-21-3) was included on the list of 31 exempt compounds. Individual States retain the right to accept EPA's regulatory exemption or to require State registration.

Efficacy Data

During 2004–07, WS' National Wildlife Research Center and Missouri State office conducted outdoor cage, flight-pen, and small-scale field tests to investigate the effectiveness of SLS in removing urban blackbird roosts. Results document that SLS causes mortality in European starlings, red-winged blackbirds, common grackles, and brown-headed cowbirds and may be useful as part of integrated wildlife damage-management programs designed to reduce local blackbird populations. Birds died as soon as 30 minutes after exposure to SLS.

Obtaining SLS

The SLS product used for this application is Stepanol WA–Extra PC. Product information, including an MSDS can be obtained from Stepan Company (Northfield, IL; <www.stepan.com>; 847–446–7500).

Application Description

Prior to using SLS, please review the Applicator’s Checklist and system schematic included in this tech note.

Equipment

The following is an example of equipment used to develop one ground-based spray system.

Pump—

- Pacer® 5.5-hp Briggs and Stratton pump (gas)
- A 2-inch T-coupler (for connecting SLS line to water supply line)
- Quick-fit couplers for hose and pump
- A water-pressure gauge
- A 2-inch-diameter supply hose from the water source to the pump
- A 1-inch-diameter supply hose from the SLS to the pump
- A 1.5-inch-diameter rolled hose from pump to spray system
- Two 2-inch ball valves for SLS and water supply lines

Sprayer—

- Wobbler® Standard Angle nozzle, 24 degree angle and 0.55 cm (7/32 inch) (Senninger Irrigation Inc., www.senninger.com)
- Bell adaptor, 3/4 inch to 1 inch in diameter, to attach sprinkler head to pipe
- Three 10-ft sections of 1-inch-diameter steel or aluminum pipe with threaded ends (stand pipe)
- One four-legged sprinkler tower base
- Three 24-inch rebar anchors for base and guy wires
- Guy wire
- Three guy-wire plates

Other—

- 5 gal of Stepanol WA Extra–PC (SLS)
- SLS transport cooler
- One 10-ft Y-tipped pole (to help raise sprinkler tower)
- Wrenches for couplers
- Silicon tape for stand-pipe joints
- Water source of 6 gal/minute and a total of 500 gal/sprinkler head
- Portable temperature and wind gauges
- Data sheet
- Trash bags
- Rakes and shovels for bird pickup
- Personal Protective Equipment for each worker handling SLS (impervious gloves and goggles or a face shield) and birds (impervious gloves)

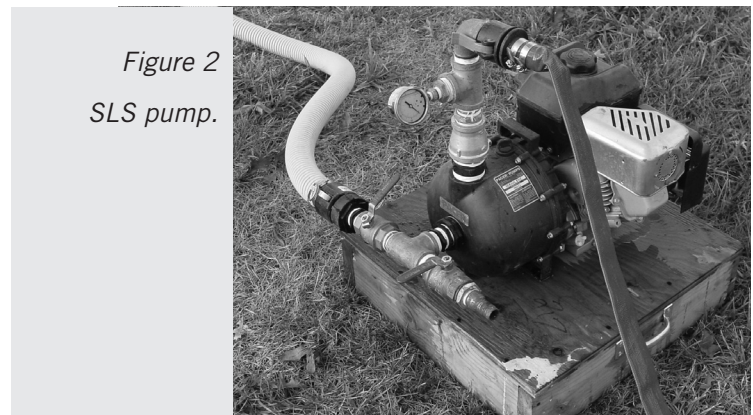


Figure 2
SLS pump.

Pumping System Requirements

The pump must be able to deliver 500 gal of water at a rate of 6 gal/minute per sprinkler head. Operating below 6 gal/minute is not recommended. A pressure gauge should be installed on the outlet pipe near the pump in order to monitor the flow rate. The pressure needed to operate the system effectively can be calculated with the following formula:

$$\text{psi} = H/2.3 \text{ ft/psi} + 15 \text{ psi} + 10 \text{ psi}$$

H = height of tower in feet

15 psi = minimum operating pressure for sprinkler head

10 psi = friction loss in system

For example, a 30-ft tower would require $30/2.3 + 15 + 10 = 38$ psi to achieve the necessary flow rate. The psi will not change if more towers of the same height are included; however, the pump must be capable of delivering the necessary water at 38 psi. Multiple sprinkler heads should not be run in series.

Flow rates should be adjusted before application and checked during application using the pressure gauge. Run the pump at the desired pressure during the entire application. If the flow rate is too high or low, throttle the pump to the desired level until the correct pressure is achieved.

Testing has been done with up to four sprinkler-head spray systems running off one pump. Placement of more than four systems in a roost will require increasing the size of the pump or adding more pumps and increasing the water source.

Applying SLS to Roosting Birds

The following steps describe the application of SLS and water through a ground-based sprinkler-head spray system. Other application techniques (e.g., aerial, water cannon, or hand-held wand) have not been tested. These steps are in compliance with FIFRA 25(b) exemption requirements.

1. The top of the stand pipe should be higher than the top of the roosting vegetation to be sprayed. The system has been tested up to a height of 30 ft.
2. The system(s) should be erected in areas of the roost where they will be most effective in bird coverage and require minimum supply hose. The spray area for one nozzle is approximately 2,000 ft² (a 50-foot-diameter circle).
3. To erect a single system, a sprinkler head is attached to the end of a 10-ft section of 1-inch-diameter aluminum or steel pipe.
4. As the three sections of pipe are connected together with couplers, a guy-wire plate with three attachment points evenly spaced around the plate is placed above each coupler.
5. The base is a four-legged “tepee” style frame that supports the standpipe. The base has a 90° elbow section of pipe welded in the center so that the upright standpipe can be coupled to the supply line (fig. 3).

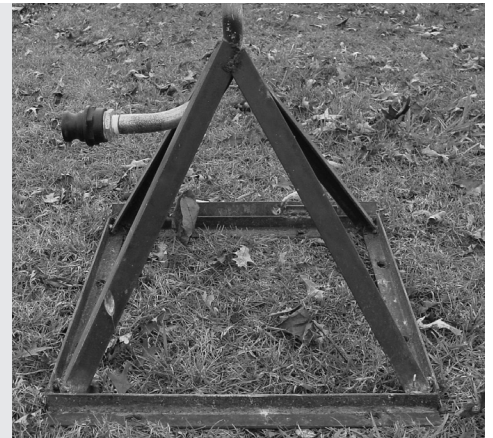
6. Once the sections have been assembled on the ground and guy wires attached to the plate, two people can raise the tower by pulling on the guy wires while a third person supports the tower by hand (figure 1). A 10-ft pole with a “Y” on the end can be helpful to raise the towers.

7. Guy wires are secured at a 30° angle from the stand pipe and are attached to rebar anchors driven into the ground about 18 inches.

8. Once a system has been erected, all equipment and personnel should move at least 200 ft away to avoid being sprayed by the SLS solution or disturbing the birds.

9. The pump is attached to the system using 1.5-inch rolled hose. If more than two systems are used, the supply line should be attached to a central system and branch out to all sprinkler systems. Do not run the supply line in series as this will reduce pressure to each successive sprinkler.

Figure 3
SLS base.



10. A supply of water (at least 500 gal of water per sprinkler head) should then be attached to the pump with a 2-inch-diameter flexible hose. Water trailers containing 1,000 gal or more work well and can be transported to the site. A distance of 400 ft between the pump and sprinkler head is advised.

11. A 1-inch-diameter supply line for the SLS should be connected to the pump. The two supply lines can be fitted to the pump with a “T” fitting with on/off valves on each side (fig. 2). All connections should be “quick-connect fittings” for ease of assembly and disassembly.

12. The sprinkler system should be tested prior to birds arriving at the roost to ensure that the system is working properly.

13. The system should then be closed or slowed down so water is barely running out of the top to avoid letting any air siphon back into the lines. Any noise during the spray procedure, such as air leaving the sprinkler head(s) or guy wires hitting the pipe, will cause birds to flush.

14. The temperature at the time of application and following the spray must be below 41 °F. Do not spray when the wind exceeds 20 mi/hr; doing so will cause significant drift and incomplete coverage of the target area.

15. The spray operation can commence about 30 minutes after birds have settled into the roost.

16. The system should be brought up to operating pressure slowly to reduce the amount of noise generated by air escaping the system.

17. Once the birds have become accustomed to the water, SLS can slowly be introduced into the system through the supply line. It is important to note that SLS must remain heated above 70 °F before use. (Suggestions on how to do this follow in the section on storing SLS.)

18. To inject SLS into the system, slowly open the SLS supply line so water can back-fill the line and expel any air.

19. Once the SLS supply line has been purged of air, the water supply line can be closed slowly as the SLS supply line is completely opened. During this portion of the operation, if at any time the birds flush or are observed leaving the roost, the SLS supply line should be closed and the water supply line opened. The SLS can then be reintroduced once the birds have settled back down.

20. About 5 gal of SLS should be sprayed per system.

21. After injecting the SLS into the system, close the SLS supply line while opening the water supply line.

22. Continue spraying until two-thirds of the birds are dead or dying or until the water runs out.

23. Do not disturb the birds during the spray operation. Observe the roost through binoculars from at least 200 ft to ensure that the birds are not flushed from the roost.

Storing SLS

All containers of SLS must bear a product label, and storage facilities must have an MSDS on record. Follow storage instructions indicated on the product label. The SLS 28-percent solution solidifies at temperatures below 55 °F. It is important to note that SLS must remain heated above 70 °F before and during use to ensure proper flow during application. This can be accomplished by leaving SLS in a heated vehicle until injecting it into the system.

Evaluating Roost Mortality

A roost mortality estimate must be determined in order to fulfill requirements of the depredation order, State depredation permit or the WS Management Information System and to evaluate overall success of the spray operation. Data gathered should include the number and type of each species, total weight of birds collected, and the average weight per bird.

Additional Information

For more information, please contact:

U.S. Department of Agriculture

Animal and Plant Health Inspection Service

Wildlife Services

National Wildlife Research Center

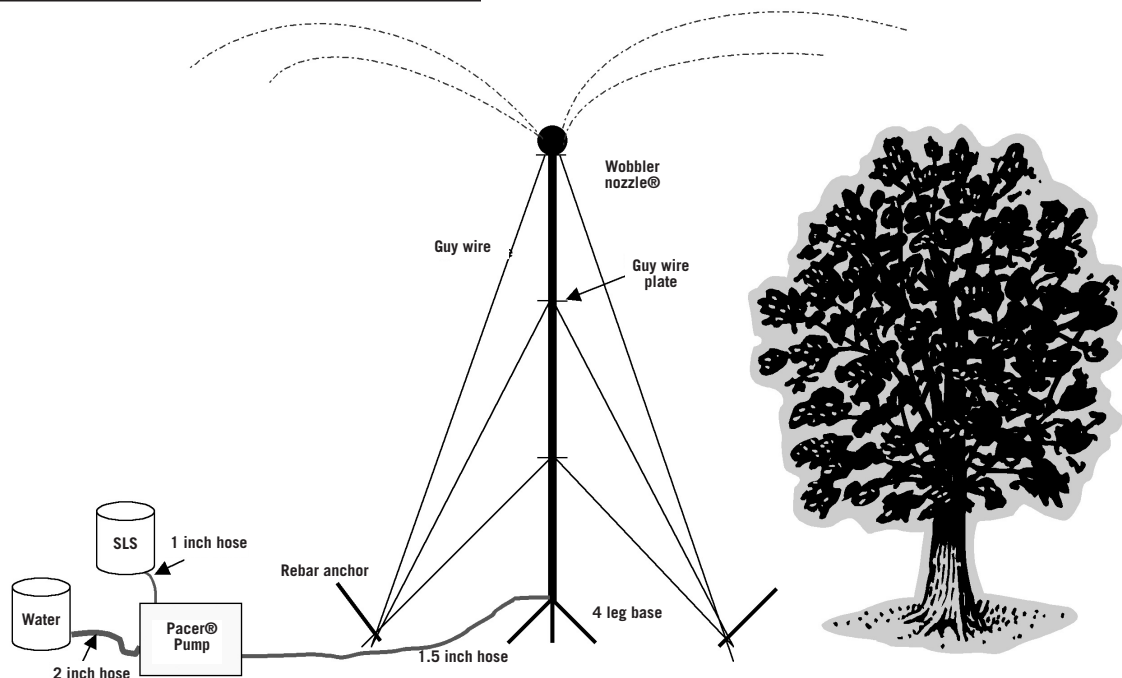
4101 LaPorte Avenue

Fort Collins, CO 80521

(970) 266-6000

Applicator's Checklist

<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that take of birds is consistent with depredation orders, State and Federal permitting requirements, and/or other authorities. 	<ul style="list-style-type: none"> <input type="checkbox"/> Carry printed copies of this tech note and the MSDS. These items must be in the possession of any individual applying SLS.
<ul style="list-style-type: none"> <input type="checkbox"/> Contact the appropriate State regulatory agency to assure that SLS can be used in the State under a FIFRA Section 25(b) exemption. Not all States accept the EPA minimum-risk designation. A wetting-agent product label and possibly efficacy data would have to be submitted to each State that does not accept the EPA minimum-risk designation for SLS. 	<ul style="list-style-type: none"> <input type="checkbox"/> Use SLS as described in this tech note in order to meet FIFRA Section 25(b) exemption requirements.
<ul style="list-style-type: none"> <input type="checkbox"/> Consult with appropriate Federal and State wildlife authorities to ensure that the use of SLS presents no hazard to threatened or endangered species. 	<ul style="list-style-type: none"> <input type="checkbox"/> Limit applications to upland areas where direct runoff will not enter permanent bodies of water. SLS is considered moderately toxic to aquatic organisms. It can also impact aquatic organisms, such as mosquitoes and water spiders, by lowering the surface tension of the water. There is some evidence that SLS is harmful to plants. Care should be used when applying it around ornamental plantings.
<ul style="list-style-type: none"> <input type="checkbox"/> Discuss the proper use of personal protective equipment with workers prior to the removal of bird carcasses following application. Develop a plan for the disposal of bird carcasses. Large roosts can result in several tons worth of carcasses (10,000 birds weigh approximately one ton). 	<ul style="list-style-type: none"> <input type="checkbox"/> Monitor the spray area prior to application to determine if nontarget species are present. Nontarget birds, such as American robins and cardinals, may be affected if they roost in the spray area.



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United States Department of Agriculture
Animal and Plant Health Inspection Service

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