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EFFECTIVE DISPERSAL OF BIRDS FROM BUILDINGS AND STRUCTURES BY FOGGING WITH REJEX-IT[®] TP-40

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ABSTRACT: Fogging of Rejex-it[®] TP-40 offers an efficient method for the management and dispersal of nuisance birds from many areas. The amount of the methyl anthranilate (MA) based repellent is greatly reduced over any other application method. The method is direct and is independent of the activity of the birds. Application with any aerosol generator, thermal or mechanical, that can deliver droplets of less than 20 microns, has been shown to be very effective. The operation can be manually or fully automatic and pose only minimal risks to operators or animals. All birds that became a nuisance and safety problem in the hangars and warehouses of TWA and AA at LaGuardia and Newark were successfully driven out by fogging Rejex-it[®] TP-40 with a thermal fogger. Applications in a dairy barn, a dry boat storage, on a pipe rack, and electric substation all have also been demonstrated to be very cost effective and long lasting without killing a single bird.

KEY WORDS: Rejex-it[®] TP-40, aerosol, fogging, birds, bird problems, hangar, dairy barn, electric substation, boat storage

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INTRODUCTION

Birds are probably the most common and least understood pest control problems. They are naturally attracted to food and moisture and routinely infiltrate facilities and structures that offer food and shelter. They roost on the outside and inside of food facilities, where droppings can form and degrade food service areas and evidence of adulteration or filth is not tolerated by government regulators. Bird droppings, feathers, or nesting materials in food processing plants, warehouses, or any other food establishments are not tolerated.

In dairy farms and feed lots, they not only eat the feed but also act as the main vector for diseases. The accumulating bird droppings are unsightly and can cause severe health problems (Fischer 1995). In many manufacturing plants the bird droppings represent a health hazard, safety hazard, and a quality problem. In electric transformer stations they cause costly corrosion and short outs. Eventually the birds need to be driven off by an economical method, no matter what they do. Preferably, this should be done in a so-called "friendly" way with minimal risk to the birds or any other animal.

Many existing methods do not work or have questionable side effects. Most mechanical devices, from plastic owls, alligators, plastic geese, and swans to flapping eagles and other disco devices with flashing lights and sounds, are not regulated and are sold to the unsuspecting client without solving the problems on hand. Of the physical barriers, exclusion by wire netting works, but is expensive and hard to install. Others, such as spikes are good to collect flying debris and then provide a good place to roost or nest. Sonic devices constantly appear on the market with changing labels as a cure for everything. Mostly they attract birds who use them as a roosting site. Noise makers have limited effects on birds but negative effects on the neighboring residents. If there is no unpleasant experience, birds learn to live with all visual and sound effects.

METHYL ANTHRANILATE

The effectiveness of Methyl Anthranilate (MA) as a taste repellent for birds has been known for many years (Kare 1961) and has been demonstrated under many conditions (Dolbeer 1992, 1993; Mason and Clark 1996; Vogt 1997). The treatment of fruits and berries with Rejex-it[®] AG-145, the micro-encapsulated agricultural formulation works very well in reducing or even eliminating bird depredations in berries (Curtis 1994). The application of Rejex-it[®] AG-36 to turf has shown great results in repelling geese from lawns, golf courses, parks, and other manicured grass areas if done at the right time. However, taste repellents are ineffective for roosting and nesting birds in buildings and structures.

The application of the MA formulation to the eye and mucous membranes of birds via an aerosol has first been demonstrated on landfills in 1993 (Nachtman 1993). Several large experiments with Rejex-it[®] TP-40 on roosting starlings (*Sturnus vulgaris*) in trees have been shown to be very efficient in dispersing all birds for the season (Lewis 1995; Vogt 1997). The effectiveness of the aerosol to disperse geese (*Branta canadensis*) and tree swallows (*Stelgidopteryx serripennis*) has been demonstrated (Dolbeer 1996) and migrating waterfowl was effectively diverted from two salt ponds (Stevens 1998).

PRODUCT

The Bird Repellent Rejex-it[®] TP-40, U.S. EPA Reg. No. 58035-7, from Becker Underwood, Inc. (1) is a clear liquid, lighter than water and completely immiscible with water. It is formulated from naturally occurring food grade ingredients listed as Generally Recognized As Safe (GRAS) by FDA. The odor is reminiscent of concord grapes and orange blossoms. The formulation contains 40% active ingredient methyl anthranilate (CAS # [134-20-3]) and has a viscosity of 16 cps and due to its dielectric properties as a dielectric fluid, it can be used around any high voltage equipment.

Rejex-it® TP-40 is used "as is" without any dilution. The formulation is dispersed in air with any aerosol generator, which is capable to produce droplets of less than 30 microns. The fog poses minimal risk to bees, mammals, and people, and tested benign in inhalation studies with rats. While the odor itself is not effective, the fog irritates the eyes and mucous membranes of the birds sufficiently for them to leave the site of exposure without the desire to return.

EQUIPMENT

The thermal fogger used was a Curtis Dyna-Fog® (2) Model "Golden Eagle - Electric Start XL" and the Model "Blackhawk." The cold foggers from Curtis Dyna-Fog® were the "Hurricane," an electric portable aerosol applicator and the model "Cyclone." Great results were recently achieved in a pipe rack with a fogging system by Universal Fog (3), which uses a high pressure (800 to 1200 psi) nozzle to disperse the product into an aerosol with a droplet size of 8 to 12 microns. The system was automated by timers to operate at times of bird activity.

APPLICATIONS

Boat Storage, Puerto Rico

The largest small craft harbor on the north east coast of Puerto Rico at Puerto del Rey near Figwort has three dry dock storage buildings of 30 feet x 380 feet for about 450 boats in 19 bays, four stories high. At 5:00 p.m. Grackles (*Quiscalus quiscula*) are coming from the adjacent wooded area to roost under the roof and on the boats, defecating the boats until they leave in the morning.

In January 1997, an attempt was made to get the birds out of the open storage buildings by fogging the area with Rejex-it® TP-40 using a Curtis Dyna-Fog "Golden Eagle" thermal fogger. Stepping up the efforts with a second fogger, all of the 10,000 birds were driven off for a few weeks when they started to come back. To stop the re-infestation, small electrically driven foggers (model "Hurricane") were installed in every third bay on the top

level of one of the three structures and were automated with electrical timers to operate for 20 seconds every 30 minutes throughout the night from 5:00 pm to 5:00 am.

During the automated operation no birds were observed in the target area while birds were roosting in the other two structures, parallel to the treated one.

Airline Hangars and Warehouses

The fogging experiments were done on five different test sites, three American Airline hangars at La Guardia from November 11-13, 1997, one TWA hangar at La Guardia from June 15-17, 1998, and one TWA warehouse at Newark Airport from November 3-5, 1998.

All applications were done at night at 1:00 am to minimize exposure of the people working in the area. The dry and dense white fog of Rejex-it® TP-40 was highly visible and rose to the 75 feet (23 m) high ceiling of the hangar. The fog had a strong "Concord Grape" like odor, characteristic of MA which dissipates after a few days. It slowly drifted with time and dissipated completely without wetting any surfaces.

The three American Airline Hangars at LaGuardia, NY of one acre (4,000 sqm) enclosed area (175 feet x 250 feet) and a height of 75 feet (23 m) each, had a population of 200 pigeons (*Columbia livia*) and 1,200 starlings (*Sturnus vulgaris*). During the first application of two quarts TP-40 on November 11, 1997 all birds left the test sites, but came back later as they had no other place to go for the rest of the night. The second night on November 12, 1997 all pigeons had come back and 90% of the starlings. As during the first application all birds left on fogging with another two quarts TP-40 and returned later after the fog had subsided. On the third night, November 13, 1997 all pigeons had gone and only 100 starlings were remaining. To assure complete removal of all birds, the third and fourth application was done as the two preceding ones. An inspection two weeks later showed no birds present in the hangar (Table 1).

Table 1. Summary results for the fogging of starlings (*Sturnus vulgaris*) and pigeons (*Columbia livia*) in several hangars and one warehouse.

	<u>AAA Hangars, LaGuardia</u>		<u>TWA Hangar, LaGuardia</u>		<u>TWA Warehouse, Newark</u>	
	Starlings	Pigeons	Starlings	Pigeons	Starlings	Pigeons
Day 1	1,200	200	500	200	750	0
Day 2	1,000	200	500	200	400	0
Day 3	0	0/0	100	0	0	0
2 Weeks	0	0/0	0	0	0	0
6 Months	0	0/0	0	0	0	0

The one acre (4,000 sqm) TWA hangar at LaGuardia, NY had 200 pigeons and 500 starlings. During the first fogging application on June 15, 1998 all birds left and returned after the fog had dissipated. The second night on June 16, 1999 all birds were back in the hangar. Fogging operation proceeded as the first night. On the third night on June 17, 1999 all pigeons were gone and only 100 starlings had returned. The third and fourth fogging application was done as the two preceding ones. No return of the displaced birds was observed. An inspection two weeks later showed no birds in the hangar, except two young pigeons that had died of starvation as the adults did not return to feed them.

The TWA warehouse, Newark Airport, New Jersey, of one-half acre (2,000 sqm) with a height of only 25 feet (8 m) had a population of 750 starlings roosting in the structural beams. The first application with two quarts of TP-40 was done in the night of November 3, 1998. All birds left and returned after the fog had subsided. On the second night on November 4, 1998 only half of the starlings had returned. On the third night no birds were observed. To assure no hidden bird, the warehouse was fogged as on the first day. An inspection two weeks later showed no birds in the warehouse.

Electric Substation

The local electric utility "Autoridad de Energia de Puerto Rico" has a severe bird problem on about 70 transformer substations on the island. They have tried everything without success.

The test site selected was the transformer station in Fajardo on the east side of Puerto Rico. The affected area was about one acre in size and the structures were about 25 to 30 feet high. The test was done on November 4, 1997. The weather was cloudy with no rain in the direct area.

At 5:06 pm the first Grackles (*Quiscalus quiscula*) arrived and more continued up to 6:00 pm when 900 to 1000 birds had settled in the steel beams and on the transformers of the substation. At 5:30 p.m. the fogger ("Blackhawk") was started for about 5 minutes without any actual fogging operation. The birds totally ignored the roaring noise of the machine. At 6:00 pm the fogging operation started from ground level at a fogging rate of about 8 gal/hr directly into the transformer station. The affected birds took off immediately and started flying away, some settling somewhat downwind until the fog chased them off from that area. The total fogging time was intermittently from 6:00 to 6:30 pm with a consumption of one gal Rejex-it® TP-40. At 6:30 pm only five birds were left, and at 7:00 pm not one bird was visible.

Next day, November 5, 1997 a few birds came through the staging area (a small tree) and flew off through the substation. At 6:00 pm no bird was visible. Four weeks later the personnel at the substation did not see any bird settling in the transformer station.

Shell Oil Refinery, Wood River, Illinois

The Shell Oil Refinery at Wood River, Illinois covers 41 acres with open structures and piping, typically for a petroleum processing plant. The beams, pipes, catwalks

and towers provide birds with almost unlimited structures for sheltered roosting. The constant heat generated by the processing draws starlings to use the plant as their preferred winter roost. On the days before the operation about 300,000 birds were counted for the whole plant site. The selected target sites, which covered about 6.6 acres, had various structures with a maximum height of up to 480 feet. The target height for fogging was up to 80 feet. There were about 100,000 starlings in the selected area.

The target sites were selected by Shell Oil, based on the high bird density, accumulated droppings, and the necessity of refinery production workers to move through the sites on a daily routine work schedule, and the concern of plant management for the safety and health of its employees. The protocol called for the application to start at dusk (6:00 pm) after the majority of birds had arrived. The weather was abnormally warm and sunny with daytime temperatures of 55 to 60°F. At night the temperature dropped to the low 30s with light wind.

Fogging took place for four days from January 28 to 31, 1998 with two "Golden Eagle" foggers, using a total of six gallons product on the first day and three gallons on each of the following days.

It was obvious to all operators and observers, that the starlings were clearly moved by the exposure to the relative small quantities of Rejex-it® TP-40 aerosol. Areas that received three to four complete treatments were almost free of birds. Since the whole population was not treated, level of response and population interaction creates many unknowns. However, one fact was obvious that the starlings evacuated and one week later the treated structures either were completely free of birds, or attracted only significant lower populations of starlings.

DISCUSSION

In all locations the fogging operation was very successful in driving the birds out of the affected areas without a single fatality. Even six months after completion of the fogging operation no birds had returned in the treated structures. In the hangars and warehouse where the fogging was done during the night and the birds did not have enough light to fly to an alternate roosting site, they returned to the hangar once the fog had dissipated, requiring several applications. Fogging operations in the early evening with some daylight still available proved more efficient on the first fogging operation, as in the electric sub-station, where the birds left the site after one fogging.

Depending on the location and the applicator's skills, it can take from one to six applications to repel established flocks of birds for the season. The aerosol has to irritate the eyes and mucous membranes of the birds sufficiently to initiate the desired behavior modification. For best results, it is important to expose as many birds as possible to the aerosol and have enough daylight available for them to find an alternate feeding, roosting, or nesting sites. As with any other animal training method, it takes time to be 100% effective and normally it cannot be accomplished in one operation. Generally, three applications should be planned to get 95% effectiveness or an automated system should be

considered, which uses less product. Usually, successive applications use less product than the first application as operators learn to become more efficient.

In open areas as little as 2.5 to 5.0 ounces (70 to 140 g) of product are sufficient to fog an area of one acre (175 to 350 g/ha). In the enclosed confines of a hangar or warehouse one to four ounces per 10,000 cu ft give excellent result.

The fogging of Rejex-it® TP-40 thus represents a very direct and benign method that has an effectiveness well in excess of 95%. Success or failure is not a function of the product but rather a result of the training and experience of the operator. Fully trained applicators nearly always achieve 100% success rate.

SUMMARY

Fogging provides an ideal tool for the training and behavior modification of birds. Besides the product, the method of application and the knowledge of the bird behavior is important for fast and long-term results. For best results, the product should be dispersed in a fine aerosol with a droplet size of less than 20 microns. The aerosol droplets have to reach the trigeminal nerve endings (pain nerve) in the eye and mucous membranes of the birds to achieve the proper reaction. The grape-like odor does not work as a repellent on birds. It also has been shown that the aerosol alone and not the noise associated with the thermal fogger repels the birds (Dolbeer 1996).

A more efficient method is to install automated fogging systems. Depending on the conditions, the machine will fog every 10 to 30 minutes for 10 to 30 seconds during the time the birds are active in the targeted area. Thus, the amount of product is greatly reduced and no personnel is required. Fogging over an eight-hour period per day at 10 seconds, every 10 minutes will result only in a total of eight minutes of actual fogging. After several days when the birds have identified the site as the source of the pain, the system might even be shut down until new birds arrive or the intervals are greatly increased to have continued protection at very low usage rates.

The applications are widespread and include airports, hangars, warehouses, trees, roof tops, fisheries, landfills, garbage transfer stations, feed lots, oil spills, and many more. It includes all open areas where birds can congregate and cause problems or that are toxic to birds. For use on airports generally large model foggers should be used that can efficiently fog Rejex-it® TP-40 to cover a wide area in short time or install automated fogging nozzles on the periphery of the airfield. For confined spaces such as in warehouses small electric units are used with great success.

ACKNOWLEDGMENTS

(1) Rejex-it® TP-40 is a registered Trademark of Becker Underwood, Inc., 801 Dayton Avenue, Ames, Iowa 50010.

(2) Curtis Dyna-Fog, Ltd., P.O. Box 297, Westfield, IN 46074-0297.

(3) Universal Fog, Inc., 2851 S. 44th St., Phoenix, AZ 85040.

LITERATURE CITED

- CURTIS, P. D., I. A. MERWIN, M. P. PRITTS, and D. V. PETERSON. 1994. Evaluation of Methyl Anthranilate for control of bird damage to sweet cherries. Cornell University.
- DOLBEER, A. R., and J. L. BELANT. 1996. Experiment 5: Methyl anthranilate aerosols as a dispersal technique for swallows in evaluation of harassment/repellent methods for wildlife at airports (Task3). Nov. 1996, 32-40 pp.
- DOLBEER, R. A., J. L. BELANT, and L. CLARK. 1993. Methyl anthranilate formulations to repel birds from water at airports and food at landfills. Proc. Great Plains Wildl. Damage Workshop. 11:42-52.
- DOLBEER, R. A., L. CLARK, P. P. WORONECKI, and T. W. SEAMANS. 1992. Pen tests of methyl anthranilate as a bird repellent in water. Proc. East. Wildl. Damage Control Conf. 5:112-116.
- FISHER, J. R. 1995. Human health concerns in the practice of wildlife damage management. Proc. East. Wildl. Damage Conf. 12:21-26.
- FOOD AND DRUG ADMINISTRATION. 1993. 21 CFR 182.60, Federal Register Vol.
- KARE, M. R. 1961. Bird Repellent. U.S. Patent No. 2,967,128 (Jan., 3. 1961).
- LEWIS, K. A. 1996. Personal Correspondence. J. E. Ehrlich Co., Inc.
- MASON, J. R., and L. CLARK. (1996). Evaluation of methyl anthranilate and activated charcoal as snow geese deterrents. Crop Protection 14: 467-469.
- NACHTMAN, T. 1993. Fogging of gulls with methyl anthranilate mist. Private communication.
- STEVENS, G. R., L. CLARK, and R. A. WEBER. 1998. Evaluation of an integrated Bird Hazing System at the Jim Bridger Power Plant, Rock Springs, Wyoming. Meet. 8th Bird Strike Comm. USA.
- VOGT, P. F. 1997. ReJeX-iT Bird Aversion agents and their use in agricultural operations. Status and update. Proc. Mo. Small Fruit Conf. 17:59-63.