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## CONTROL OF NUISANCE BIRDS BY FOGGING WITH REJEX-IT® TP-40.

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*Abstract:* Many bird problems are caused by birds congregating, roosting, loafing, and nesting rather than by the birds' feeding activities. No matter what their activity, eventually birds will need to be driven off, preferably in a so-called "friendly" way without harming the birds or other animals. Unlike other avian aversion methods, fogging of ReJeX-iT® TP-40 relies on the exposure of the target birds to the aerosol rather than relying on birds eating treated food. Best results are achieved when birds congregate in the early morning or early evening when they settle down. After several exposures the birds generally leave the area completely. The fogging can be done by using either thermal or mechanical equipment.

**Pages 63-66 in C. D. Lee and S.E. Hygnstrom, eds. Thirteenth Great Plains Wildl. Damage Control Workshop Proc., Published by Kansas State University Agricultural Experiment Station and Cooperative Extension Service.**

**Key Words:** ReJeX-iT® TP-40, fogging, birds, airports, repellent, aerosol

Birds, birds, and birds. They are everywhere when you do not need them, and nowhere to find if you want to admire them. Most of the time we enjoy birds and most people do not see the problems the birds cause. Single birds have never been a problem, except the occasional woodpecker who mistakes a house for a tree or a great sounding board to signal his territory. However, things are changing and the flocks of birds are getting larger. The improvements in our environment have helped many bird populations to increase rapidly. This increase of the nuisance bird populations has created many new problems and sometimes large losses for many operations.

ReJeX-iT® Bird Repellents have found widespread use in many States and foreign counties. The treatment of fruits and berries with ReJeX-iT® AG-145 works very well in reducing or even eliminating bird depredations. The protection, however, is only required for a short period during the final ripening of the fruits (Curtis 1994, Vogt 1997). 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. While treating large areas of turf with ReJeX-iT® AG-36 may be difficult, the effectiveness can be enhanced with observations on the behavior of the geese and by conditioning with visual cues.

### **PROBLEMS**

While it is possible to overcome some shortcomings of existing bird repellents, such as ReJeX-iT® AG-36 or Bird Shield™, for large areas of turf or on airports, it becomes quite unmanageable to use these products on large bodies of water. To apply anything to lakes and ponds requires far too much product. Several studies (Dolbeer 1993, Askham 1995) have shown that a minimum concentration of 500-1,000 ppm active ingredient is needed to repel birds. Application of TP-40 to the surface of water has solved that problem (Dolbeer 1992), but runoff and wind drift make it unpractical for large bodies of water (Table 1). To protect livestock feed from bird depredations with the addition of repellent formulations requires far too much product to be economical and does not stop the accumulations of bird droppings in feed troughs.

**Table 1. Amount of products needed to repel geese and ducks from a one acre lake with an average depth of three feet of water.**

Formulation		Quantity needed
Bird Shield™	(to achieve a repellent conc. of 1000 ppm a.i.)	30,000 lbs
ReJeX-iT® AP-50	(to achieve a repellent conc. of 1000 ppm a.i.)	16,000 lbs
ReJeX-iT® TP-40	(application to lake surface)	20 lbs
ReJeX-iT® TP-40	(fogging 4 times)	1 lb

Bird Shield is a Trademark of Bird Shield Repellent Corp. ReJex-iT is a registered Trademark of PMC Specialties Group, Inc.

Many problems are not only due to birds eating something, but when many birds congregate and roost, loaf, nest or otherwise become a nuisance. The accumulating bird droppings are not only unsightly but can also cause severe health problems (Fischer 1995). Eventually the birds need to be driven off by an economical method, no matter what they do. Preferably, this needs to be done in a so-called “friendly” way without harming the birds or other animals.

Many existing methods do not work or have questionable side effects. Many lawns and ponds can be seen with a mixture of ducks, geese and “Dead Duck Decoys” happily living together. Noise makers have limited effects on the birds but negative effects on the neighboring residents. Mesurol works, but is only approved for slug control - if there are no slugs, there are no geese! Avitrol causes severe pain and neurological problems to target and non-target birds with eventual death. The limited use of -Chloralose kills non-target birds along with the target birds sedated for “relocation.”

If there is no real threat to the birds, they learn to live with all visual and sound effects. We see geese and ducks crossing the streets in front of cars. Dogs on leashes do not irritate them very much, and people can walk up to them, if the geese do not attack children and adults. Whatever method is used to chase the nuisance birds away, it has to make the environment unpleasant to them without any side effects. As birds adapt to our human-made changes and harassment methods, and they are

very resourceful at it, we have to adapt our strategies accordingly.

#### **PRODUCT AND EQUIPMENT USED**

ReJeX-iT® TP-40 is a clear liquid, lighter than water, and immiscible with water. It is completely 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. It contains 40% of the active ingredient methyl anthranilate (CAS # [134-20-3]) and has a viscosity of 16 cps. When used in a thermal fogger directly without any dilution, it generates a dense fog that is very repelling to birds.

While TP-40 is ideal for use in thermal fogging equipment, the use of other fogging or aerosol generating equipment is possible. Other delivery systems are under investigation and are being tested to judge their usefulness and reduce the amount of product needed.

The thermal foggers used were the Curtis Dyna-Fog®<sup>1</sup> Model “Golden Eagle - Electric Start XL” which is a portable unit, and the “Model 1200” a large unit that requires truck mounting. The mechanical foggers from Curtis Dyna-Fog® were the “Hurricane,” an electric portable aerosol applicator and the model “Cyclone ULV.” While thermal foggers are capable of producing a “dry” fog that penetrates dense foliage without any phyto-toxic effects, mechanical units usually only produce a wet fog that cannot penetrate foliage and can cause some damage to foliage if operated too closely.

## APPLICATIONS

While the grape-like odor does not work as a repellent, higher concentrations, as present in aerosols, have a fast and great impact on birds. It has been shown that the aerosol alone and not the noise associated with the thermal fogger repels the birds (Dolbeer 1996). In all documented and undocumented trials, the birds left the area on exposure to the aerosol. Most birds, however, returned within the hour to the original site. After the second application it took slightly longer for the birds to return. After the third application a considerable reduction in the number of returning birds is observed. It takes 4 to 6 applications until the birds leave the treatment area completely.

### Areas of application

The expected 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 is toxic to birds. For use on airports generally large model foggers are used that can efficiently fog ReJeX-iT® TP-40 at a rate of 30-60 gallons per hour and cover a wide area in short time. For warehouses usually small electric units can be used with great success. The product is effectively applied at a rate of about 2-4 gallons per 100 acres or 6-12 ounces per hectare. Usually a minimum of 4 applications is needed to convince the birds to leave the area.

### Chambersburg, PA

A 2-block area of the downtown district was plagued by 20,000 European starlings (*Sturnus vulgaris*) that had selected 40 Bradford pear trees for their winter roost, causing excessive defecation of the business district. On 16 Nov. 1995 the first application of 1 gallon ReJeX-iT® TP-40 with 2 Curtis Dyna-Fog® Model "Golden Eagle" was done from 8:00-8:30 pm. Three more applications were done from 20 Nov. to 29 Nov. between 8:00-9:00 pm. Before the last fogging 1/3 of the birds were left. After the last fogging all

birds had left the area and did not return for the season.

**Charles Town, WV** Similar to Chambersburg, the city was plagued by 20,000 European starlings in Bradford pear trees on both sides for 6 blocks of Main Street. Everything under the trees was white from the bird droppings. Treatment started on 16 Dec. 1995 from 8:00-10:00 pm and continued until 28 Dec., for a total of 6 applications with 2 foggers at a rate of 1 gallon TP-40 per application. A great reduction of birds occurred after the second fogging and all birds left after the last fogging.

### RJ Advantage, Inc., Cincinnati, OH

About 300 starlings that started to roost in 3 beach trees were exposed to the fog of ReJeX-iT® TP-40 from a Burgess Portable Propane Insect Fogger<sup>1</sup>. The applications lasted about 5 minutes until the birds left and were repeated twice until all the birds had left and did not return for the season.

An open 90 x 90 foot storage shed that had attracted thousands of starlings and pigeons and had accumulated 1 inch of bird droppings in 4 weeks was exposed to TP-40 fog generated by a Curtis Dyna-Fog Golden Eagle for 6 times over a 2 week period in February 1997. The most effective time was in the evening when the birds started coming into the building. The method was very effective in repelling over 95% of the birds. A few birds have come back after the termination of the fogging, but they appear very nervous and leave with any strange noise.

**Puerto del Rey, Puerto Rico** The largest small craft harbor on the north east coast of Puerto Rico near Fajardo has 3 dry dock storage buildings of 30 feet x 380 feet for about 450 boats in 19 bays, each 4 stories high. At 5:00 p.m. grackles (*Quiscalus quiscula*) were coming from the adjacent wooded area to roost under the roof and on the boats, defecating on the boats until they left in the morning. Removal of the birds with Avitrol resulted in disgust and outcries from the boat owners when they found their boats

full of dead birds and the owners requested a more friendly method of effective bird control and to keep the boats clean.

In January 1997 a new 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 slowly started to come back. To stop the reinfestation, small mechanical, electrically driven foggers (model “Hurricane”) were installed in every third bay on the top level that will be automated with electrical timers to operate for 20 seconds every 30 minutes throughout the night. In the first partial installation the birds left within the first 10 seconds as the fogger was turned on and it took considerable time for them to return to the exposed area.

## DISCUSSION

Fogging with ReJeX-iT® TP-40 offers an efficient delivery method of the aversion agent for the dispersal of nuisance birds from many diverse areas and it does not depend on the feeding activity of the birds. The amount of active ingredient is greatly reduced over any treatment of the food source for repellency.

The method is direct and if needed, it can be automated in many applications. As with many methods, combination with other bird dispersal tools will increase its effectiveness even further.

While the application of repellents by fogging works immediately, it takes several applications to get long term results. It is a training of the birds and it will take time for them to find new places to roost, loaf or eat. Usually 4-6 applications are sufficient to repel established flocks of birds for the season. For best results, it is important to expose as many birds as possible to the aerosol in the first 2 applications. Any successive application is more focused to force the birds to leave the area.

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