

The Science of Pest Bird Control

Avian Migrate[®] Goose and Bird Repellent



Abstract

Damage from geese is quickly reaching epidemic proportions. A range of studies from the US Department of Agriculture (USDA), universities, airports, Department of Defense and building management associations demonstrate that geese cause hundreds of millions of dollars of damage annually to the US economy. The invention of Avian Migrate™ Goose and Bird Repellent offers a unique, new method for controlling these destructive birds in a humane, yet effective manner.



Geese are estimated to cause damage in hundreds of millions of dollars to aviation and landscapes in the US annually

Introduction

Damage from geese is quickly reaching epidemic proportions. A range of studies from the US Department of Agriculture (USDA), universities and building and recreation management associations demonstrate that geese cause hundreds of millions of dollars of damage annually to the US economy.

These large birds, Canada Geese (*Branta canadensis*), and small relatives, Snow geese (*Anser caerulescens*), Ross's Goose (*Anser rossii*) and other goose species damage and destroy agricultural plantings, defile ten of thousands of acres of parks and sport fields, golf courses, recreation and lakefront property. Geese foraging by the tens of thousands are capable of consuming 30 acres of crops in just a few hours. They strip leaves and stems off of alfalfa and pull up young wheat seedlings by the roots.

In 1995, a U. S. Air Force E-3 Sentry aircraft at Elmendorf AFB, Alaska, struck a flock of Canada geese on takeoff, and crashed resulting in the loss of 24 service members. Fourteen years later, in 2009, the now legendary collision of US Airways flight 1549 with a flock of Canada geese forced the flight to make an emergency landing in New York's Hudson River, fortunately without loss of life.

As suburban lawns, athletic fields and airfields proliferated, goose populations began to rapidly increase. Geese are protected by Migratory Bird Treaty Act of 1918 making it unlawful to kill, sell, hunt, disturb nests and eggs, or purchase and possess migratory birds unless permitted by the Secretary of the Interior.

As the population of these pest birds continues to grow, the damage costs will also rise.

Previous attempts to control geese by hazing and chasing them out of fields have failed. Some have tried shotgun blasts, propane cannons, drones and dogs. Unfortunately, the satisfaction of seeing thousands of geese rise in the air with a deafening roar is short lived. Once the dogs or other negative stimuli are withdrawn, the geese simply come back to finish eating. Once geese habituate to a field, it is difficult to keep them away.

The US Environmental Protection Agency (EPA) has approved the use of Methyl Anthranilate (MA) in goose control repellents for a number of years. Unfortunately, early generation products using this active ingredient were very limited in their period of effectiveness and required frequent re-application.



**Flocks of geese
can impair the
use of public
lands, parks and
sport fields**

A New Approach to Pest Bird Control

The invention of Avian Migrate® Goose and Bird Repellent was the result of years of research and testing. Existing bird repellents were tested, analyzed for their shortcomings and, as a result, Avian Enterprises LLC designed a revolutionary new goose and bird repellent that delivers the level of repellency that was missing from previous products.

Avian Migrate® Goose and Bird Repellent is an EPA registered liquid repellent that is effective against geese and other plant feeding birds. The active ingredient, methyl anthranilate (MA), has been proven effective in numerous studies and all ingredients in the Avian Migrate® formula are “Generally Regarded As Safe” by the US Food and Drug Administration (FDA).

Avian Migrate® acts as an irritant to geese and birds only, allowing us to focus the repellency effect where it is needed. This feature allows Avian Migrate® to be used in the presence of humans, domestic animals and livestock with confidence and with no harm. Avian Migrate® leaves behind an unobtrusive light citrus/grape scent and requires applicators wear shoes and socks, long sleeved shirt & pants and gloves only. No respiratory protection is required.

In addition, Avian Migrate® has a stronger, longer lasting, more stable formula than earlier generation methyl anthranilate (MA) based products and resists both ultra violet (UV) and microbial degradation. Additionally, Avian Migrate® resists all but the heaviest rains and is enhanced by the addition of InvisiDye™ UV marker which leaves behind a more robust ultraviolet “stain” on treated surfaces that alerts geese and birds to its presence.

Bird Control through Behavior Modification

The science of animal behavior modification has long been studied and understood. Avian Migrate® uses this established science to effect significant changes to goose feeding patterns and to cause them to leave treated areas where their presence creates problems for human use and habitation.

Geese are creatures of habit and have shown a remarkable ability to learn new habits and change old ones as environmental changes occur. In order to affect bird behavior and force changes, a repellent must cause stress to the birds. Consuming grass, turf and leaves treated with Avian Migrate® will temporarily irritate the bird’s trigeminal nerve system, causing the geese to feel uncomfortable and stressed. The irritation caused by the presence of Avian Migrate® will abate when the goose removes itself from the treated area, beginning the re-training process.

Avian Migrate® will cause treated foods to become unpalatable and as these feeding sites become undesirable, geese will begin the process of seeking less stressful areas in which to feed.

Avoidance Behavior

This behavior in geese and birds is integral in the behavior modification process. Avian Migrate® is often referred to as “tear gas for birds”. In many cases, the bird’s response to Avian Migrate® will mimic the human response to tear gas or pepper spray. Human exposure to tear gas or pepper spray creates an irresistible urge to flee the area. When birds consume grass, turf and leaves treated with Avian Migrate® they also feel the urge to flee the area. While humans will make the connection between the tear gas or pepper spray and the pain associated with exposure, bird’s sympathetic nervous system takes over and forces them to leave the area immediately.

Both the stress effect and avoidance behaviors contribute to the modification of goose behavior and begins the control process.

The Chemistry Behind the Difference - Strengthening the Bond

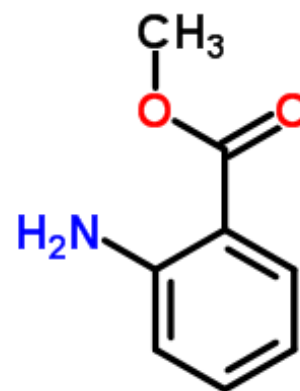
Methyl anthranilate(MA), the active ingredient in Avian Migrate®, contains an aromatic ring as part of its structure. This aromatic ring is not robust and is subject to rapid breakdown from either UV rays and/or microbiological organisms.

The science of chemistry has long understood the principle of electron donation, that is, the capacity of one molecule to donate one or more electrons to another molecule. In the case of Avian Migrate®, the inert ingredients donate electrons to the active ingredient, MA, which fortify and stabilize the aromatic ring.

In USDA studies, electron donation also leads to increased levels of repellency. According to “Chemical Repellency in Birds: Relationship Between Chemical Structure and Avoidance Response” pub. 1991, testing showed that the strength of the repellent response was greatly increased in situations where electron donation was present. The increased repellency effect allows Avian Migrate® to be used at rates up to 4X lower than competitive products.

The increased stability of the aromatic ring also increases MA’s resistance to breakdown from UV rays, providing a much longer period of effectiveness in the field, up from an average of two or three days for other products to as much as fourteen days for Avian Migrate®.

Methyl anthranilate is found naturally in some fruits and flowers. It is also used widely in foods for human consumption





The Chemistry Behind the Difference – Increased Resistance to Microbes

USDA research finds that the period of effectiveness of MA based bird repellents is directly related to the ability of the compound to resist microbiological degradation.

Other MA based bird repellents typically last in the field for as little as two or three days. Avian Migrate's® inert ingredients act as a natural preservative and protect against attack by microbial organisms and extends the life of Avian Migrate® in the field for as long as 14 days. The substantially greater length of efficacy in the field makes Avian Migrate® less expensive and more effective to use.

The Chemistry Behind the Difference – Ultraviolet “Stain”

Geese and birds see both in the visible light spectrum familiar to humans and the ultraviolet range (300nm to 400nm) that is invisible to humans. Research by the USDA has shown that when Avian Migrate® is applied to a surface, it creates a “stain” that is visible to pest birds that causes the birds to be on alert.

The "stain" is enhanced by the addition of InvisiDye UV Marker. Geese learn to associate the “stain” with the discomfort caused by contact with Avian Migrate®. This discomfort is experienced as irritation to the nasal passages from inhalation, to the mouth through consuming treated grass, turf and leaves, and through absorption through the feet, which causes what can best be described as the “hotfoot” effect.

Geese quickly learn that “stained” surfaces are warning signs and begin to change their behavior in order to avoid these treated areas. They will actively seek out new roosting and feeding areas that are less stressful and will modify both individual goose and flock behavior.

Avian Migrate® Features

Avian Migrate® has a number of distinct advantages over old technology products; significantly extended length of effectiveness, increased strength of repellency, no Re-Entry Interval for treated areas, no evidence of damage to grass, turf and plants and suitability for use around people, pets and animals.

Prior to the availability of Avian Migrate® the average period of efficacy for liquid bird repellents was two to three days. This was due to the rapid degradation from UV rays and microbiological attack. Avian Migrate® has been shown to last from ten to fourteen days in outdoor applications.

Due to its unique chemistry, the Avian Migrate® formula, with 14% MA, is significantly more effective than other products with higher levels of MA. Competitive products with higher levels of MA may require application rates up to ten times greater than Avian Migrate®.

The Avian Migrate® formula is composed entirely of ingredients that are considered “Generally Regarded As Safe” by the FDA. In fact, Avian Migrate® is considered to be "non-toxic".

Geese can be highly territorial and aggressive, even attacking humans.

Application Methodology

Among the most effective goose control measures are chemical irritants that are applied to their preferred source of nutrition, grass and turf. These products irritate the goose's trigeminal nerve (the part of the nervous system responsible for sending pain, touch and temperature sensations from your head, mouth and nose to your brain). When the geese feed on treated grass and turf, they experience an unpleasant sensation that, with repeated exposure, forces the goose to move to an untreated location.

It is recommended that Avian Migrate® be applied at the rate of 32 ounces per acre in a light mist, rather than a heavy spray. Best results are obtained by applying Avian Migrate® immediately after the grass/turf has been cut. Avian Migrate® may not be applied via irrigation equipment. Spreader/sticker additives are not required but may be used if their pH is between 6.5 and 8.0

Plant Safety

Phytotoxicity is a toxic effect of a compound upon plant tissue and fruit. In numerous tests and field reports, Avian Migrate® has shown no evidence of any damage to grass or turf health, or beneficial insects such as bees.

All ingredients in the Avian Migrate® formulation are "Generally Regarded As Safe" by the FDA, making it suitable for use around people, pets and animals. There are no reports of adverse effects to humans, pets and farm animals.

Avian Control Studies and Testing

Numerous studies have been published such as "RejeX-iT AG-36, THE GENTLE WAY TO REPEL GEESE FROM GOLF COURSES AND OTHER TURF AREAS", Peter F. Vogt, PMC Specialties Group, which show a direct correlation between the exposure to Avian Migrate® (formerly known as RejeX-iT™ AG-36) and the avoidance of geese to the treated areas.

In a USDA study "Repellency of Methyl Anthranilate to Pre-Exposed and Naive Canada Geese", Belant, Seamans, Tyson and Ickes, demonstrates a positive correlation between Canada geese and plot avoidance in the presence of RejeX-iT™ AG-36 (now marketed as Avian Migrate®).

A high number of user comments and testimonials echo these types of results.

Proper Timing for Applying Avian Migrate®

Avian Migrate® should be applied at the first sighting of goose feeding. Delaying the application will result in geese that are more difficult to remove. It is known that geese prefer to feed on freshly cut grass and turf. It is recommended that Avian Migrate® be applied soon after cutting to insure that geese receive that maximum negative impact from the product.

A fine mist has been shown to be more effective than a heavy spray that may run off the grass or turf onto the ground. Treatment should be withheld if rain is expected within 12 hours.

Aircraft collisions with geese can cause catastrophic damage, injuries and even crashes



Avian Control® Cost Benefit Comparisons

Operators of buildings, airports, athletic fields and other public spaces may be subject to expensive repairs and remediation as a result of damage from geese.

Much, if not all, of this damage may be eliminated by using Avian Migrate® in a bird control program. When offset by dramatically reduced repair and remediation costs, Avian Migrate® is the least expensive and most effective method of bird control available. When compared to effigies, audio alert systems, lasers and other less effective methodologies, Avian Migrate® provides the user with the greatest possible economic advantage.

Conclusion

As the population of geese and pest birds continues to grow, the level of damage faced by the aviation industry, property managers and others will increase. By taking advantage of the unique properties of Avian Migrate® to manage the growing pest bird problem, users can assure themselves that they have applied the most modern technology available in their effort to mitigate the growing level of goose and bird damage.

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