

The Science of Pest Bird Control

Avian Control[®] *Bird Repellent*

Abstract

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

Introduction

Studies have estimated the amount of damage done by pest birds in the United States to be as much as \$3 billion annually. These damage estimates include food crops lost to bird damage, increased bovine illness and reduced milk output, damage to buildings and the cost of repairs and remediation, damage to equipment, vehicles, aircraft and lost productivity.

The birds involved in causing this damage are not the typical “backyard” birds. They are large flocks of seagulls, pigeons, blackbirds, starlings, geese and others. The Audubon Society describes the exponential growth in the flocks of pest birds as the “blackening” of American skies, putting pressure on the habitat of native songbirds and other native bird species.

As the population of these pest birds continues to grow, the damage costs will continue to climb.

Previous attempts to stem this damage have not been successful. They have included bird spikes and netting, audio scare devices, visual scare devices and sticky gels. All of which have proven to be less than successful, if effective at all.

The US Environmental Protection Agency (EPA) has approved the use of Methyl Anthranilate (MA) in bird control repellents for a number of years. Unfortunately, products using this active ingredient were very limited in their period of effectiveness and have been shown to change the taste of the treated crops.

A New Approach to Pest Bird Control

The invention of Avian Control® 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 bird repellent that delivers the level of repellency that was missing from previous products.



Pest birds may cause up to \$3 billion dollars damage annually in the US

Avian Control® Bird Repellent is a patent pending, EPA registered liquid repellent that is effective on all pest birds. The active ingredient, methyl anthranilate (MA), has been proven effective in numerous studies and all ingredients in the Avian Control® formula are “Generally Regarded As Safe” by the US Food and Drug Administration (FDA).

Avian Control® acts as an irritant to birds only, allowing us to focus the repellency effect where it is needed. This feature allows Avian Control® to be used in the presence of humans, domestic animals and livestock with confidence and with no harm.

In addition, Avian Control® has a stronger, longer lasting, more stable formula than other earlier generation methyl anthranilate (MA) based products and resists both ultra violet (UV) and microbial degradation. Additionally, Avian Control® resists all but the heaviest rains and leaves behind an ultraviolet “stain” on treated surfaces that alerts birds to its presence. **Avian Control® does not translocate or penetrate when applied to crops, preventing any alteration to the taste of treated crops.**

Avian Control® is unique among bird repellents in that it may be applied by ground or aerial spraying, thermal fogging or ultra low volume fogging.

Bird Control through Behavior Modification

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

Birds 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. Avian Control® will temporarily irritate the bird's trigeminal nerve system, causing the birds to feel uncomfortable and stressed. The irritation caused by the presence of Avian Control® will abate when the bird removes itself from the treated area, beginning the re-training process.

Avian Control® will make treated roosting sites unfit for use and treated foods will become unpalatable. As these feeding and roosting sites become undesirable, birds will begin the process of seeking less stressful areas in which to roost and feed.



Flocking birds represent an immediate and significant threat to agriculture

Avoidance behavior in birds is integral in the behavior modification process. Avian Control® is often referred to as “tear gas for birds”. In many cases, the bird's response to Avian Control® will mimic the human response to tear gas or pepper spray. Human exposure to these compounds creates an irresistible urge to flee the area. When birds encounter Avian Control® they also feel an 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 bird behavior and begins the control process.

The Chemistry Behind the Difference - Strengthening the Bond

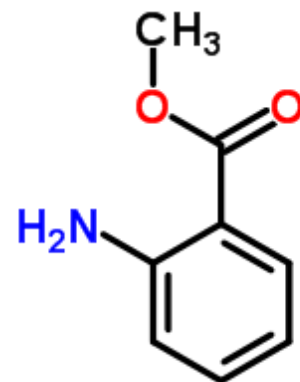
Methyl anthranilate(MA), the active ingredient in Avian Control®, contains an aromatic ring as part of its structure. This aromatic ring is not robust and is subject to rapid breakdown from either UV rays and/or microbiological organisms.

The science of chemistry has long ago proven 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 Control®, 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 Control® 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 Control®.

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 Control's® inert ingredients act as a natural preservative and protect against attack by microbial organisms and extends the life of Avian Control® in the field for as long as 14 days. The 500% greater length of efficacy in the field makes Avian Control® less expensive and more effective to use.



**Scarecrows
didn't work
years ago
and they still
don't**

The Chemistry Behind the Difference – Rain and Moisture Resistance

Old technology repellents are water and surfactant based, increasing their tendency to be washed away with the slightest amount of rain or irrigation. Avian Control® does not contain either water or surfactants, dramatically increasing its resistance to being washed away. Field reports have demonstrated that Avian Control® is able to resist irrigation and all light to moderate rains. It is, however, dispersible in water for ease of application.

The Chemistry Behind the Difference – Ultraviolet “Stain”

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 Control® is applied to a surface, it creates a “stain” that is visible to pest birds that causes the birds to be on alert.

Birds learn to associate the “stain” with the discomfort caused by contact with Avian Control®. This discomfort is experienced as irritation to the nasal passages from inhalation, to the mouth through preening and consuming treated food and through absorption through the feet, which causes what can best be described as the “hotfoot” effect.

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

Avian Control® Features

Avian Control® has a number of distinct advantages over old technology products; significantly extended length of effectiveness, strength of repellency, no Pre-Harvest Interval for crop applications, short Re-Entry Interval for crop applications, no evidence of damage to plants, suitability for use around people, pets and animals, no effect on treated crop taste and no damage to treated hard surfaces.

Prior to the availability of Avian Control® the average period of efficacy for liquid bird repellents was two to three days. This was due to the rapid biodegradation from UV rays and microbiological attack. Avian Control® has been shown to last from ten to fourteen days in outdoor application such as hard surfaces and crops. Indoors, Avian Control® has been shown to last as long as 60 days.

Due to its unique chemistry, Avian Control® formula, with 20% 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 Control®.

The Avian Control® formula is composed entirely of ingredients that are considered “Generally Regarded As Safe” by the FDA. In fact, all of the ingredients in Avian Control® are found in foods designed for human consumption. This makes the product ideal for use on food crops and in areas where humans may come into contact with the product.

Agricultural Applications

In agricultural applications, two factors allow Avian Control® to stand above other bird control products. First, Avian Control® is not a “Restricted Use” product and may be applied to crops up to the day of harvest, giving the grower complete protection.

Secondly, Avian Control® will not translocate into the treated crop. Translocation is the tendency of a compound to move through the tissues of a plant. This effect is particularly troubling when repellents translocate from the outer skin of a fruit through the skin and into the fruit body. When this occurs, a distinct change in taste can be noticed. Due to its unique formulation, Avian Control® remains on the surface of the plant and its fruit where it is available to repel birds and does not translocate into the plant or its fruit, preserving the natural taste of the crop.

Plant Safety

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

All ingredients in the Avian Control® 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.

Birds have been shown to destroy up to 87% of a crop. Even a small flock can cut harvests by 15% to 20%



Avian Control Testing

Third party verification of grower experiences is important to validate effectiveness. All of the groups listed below have contacted Avian Enterprises, LLC and asked for permission to perform testing. The following universities and organizations are currently in testing and data gathering phases. Results are expected after the close of the 2013 growing season.

Michigan State University & Trinity Western University – Blueberries and other berry crops

UCLA – Irvine- Strawberries

Penn State – Wine grapes

NC State University – Blueberries

University of Hawaii – Native grasses and fruits

Growers and Grower Consortiums – Sunflowers, soybeans, apples, cherries and other fruits

SinoChem Ningbo LTD (China) – Millet, grapes, tree fruits and wheat

Proper Timing for Applying Avian Control®

When used in agricultural applications, Avian Control® should be applied at the first signs of bird presence or bird damage. Generally, small flocks of foraging birds will “scout” potential future feeding sites. These small flocks, 15 to 25 birds, determine the feeding potential of ripening crops and carry that information back to the main flock, which may contain more than 5000 birds. When these “scout” flocks are present, the grower can be certain that their crop will be subject to damage and the first application of Avian Control® would be in order. Discouraging these scout flocks may cause the main flock to bypass the treated crop and seek more appealing feeding sites.

If birds have infested the field, treatment should begin immediately and should continue as needed. Avian Control® has the advantage of being able to be tank mixed with other agricultural chemicals.

If the bird infestation is in trees or in or on buildings, treatment should begin immediately and continue as directed by the label.

Many crops may require only one or two applications. The decision on when to re-cover the crop may be based upon proximity to harvest, sugar level (brix) and potential for continued bird feeding pressure.

Treatment should be withheld if rain is expected within 12 hours.



Research and field observations attest to the efficacy of Avian Control® Bird Repellent

Avian Control® Cost Benefit Comparisons



Pest bird control means increased yields, lower food costs and improved nutrition

Growers report that bird damage to individual crops may vary from 20% to 50% or more. This level of crop loss may mean the difference between a profitable season or losing money. Operators of buildings, airports, athletic fields and other public spaces may be subject to expensive repairs and remediation as a result of damage from pest birds.

Much, if not all, of this damage may be eliminated by using Avian Control® in a bird control program. The cost of using Avian Control® is minimal. At the suggested rate of 24 ounces per acre (43,560 square feet), the cost per application may be less than \$19.00. When offset by higher crop yields or dramatically reduced repair and remediation costs, Avian Control® is the least expensive and most effective method of bird control available. When compared to bird spikes, audio alert systems, lasers and other less effective methodologies, Avian Control® provides the user with the greatest possible economic advantage.

Conclusion

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

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