

FIELD CROPS

Avipel Shield Seed Treatment Repels Birds and Improves Corn Establishment

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Introduction

Many species of birds, including crows, ravens, black birds, starlings, grackles, Canada geese and wild turkeys, are a pest problem annually for corn growers in several areas in New York State. Many growers have issues with birds picking corn seed and seedlings out of the ground after planting.

Birds can greatly reduce corn plant populations in fields. Many farmers indicate that they do not achieve high yields in fields with high bird pressure. Bird damage is not easily predictable. But small fields surrounded by roosting areas with soils that are compacted or gravelly, and where seed is planted shallow tend to be most susceptible. However, damage can be observed in any corn field where a random flock of birds decides to feast. Many farmers have this problem annually, and struggled to find effective options to keep birds out of the fields.

A biological seed treatment, called Avipel Shield, developed by Arkion Life Sciences, is marketed to repel birds from feeding on newly planted corn seed and seedlings. The active ingredient is “anthraquinone”, which is a plant extract found in aloe, rhubarb, buckthorn and more. The corn seed is coated with Avipel Shield, which is also compatible with other conventional seed treatments. As it states on the product’s website, “Avipel Shield (AQ) creates a powerful negative intestinal reaction in all birds”

This product does not harm the birds, but causes them to forage elsewhere. The product can come pretreated on seed, or the farmer can apply it themselves.

Corn growers in NY were interested to know if this product really worked. Therefore, NYS IPM and CCE collaborators around the state conducted 3 years of research to determine the efficacy of this product for deterring birds from feeding on newly planted corn fields.

Methods and Procedures

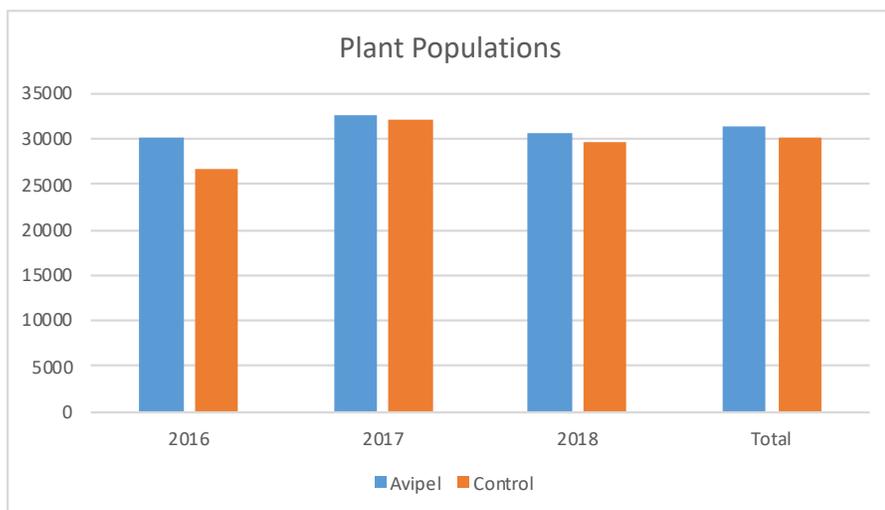
We worked cooperatively with nine CCE educators/specialists who organized 11 farms in eight counties (Schenectady, Delaware, Jefferson, Ulster, Green, Lewis, Oneida and Franklin) to implement this on-farm research project. Trials were established in fields that traditionally had a history of excessive bird damage to newly seeded field corn. Each trial involved a split-field design on 5 acres. Half of each trial (2.5 acres) was treated with Avipel Shield and the other half was not. A 97-day, multi-purpose triple-stacked hybrid was selected with a typical insecticide and fungicide seed treatment package from Dairyland (HiDF 3197RA) in order to minimize other possible variables from interfering with the research. Any remaining acreage of each field was planted to a hybrid of the farmer’s choice. Data was collected at each trial from each treatment at the V3 growth stage from two random samples in four



quadrants of each treatment area. Plant populations were measured in each of the quadrants in 100 ft lengths of two consecutive rows. Observations on crop damage from birds were recorded at this time. Yields were recorded, when possible, for both silage and grain trials. For silage trials, scales and wagons/trucks were used to measure the wet plant weight of the entire treatment area (2.5 acres), or were hand harvested at five random locations in each treatment block, cut a 20' row length at 10" above the soil surface. For grain trials, yield monitors were used to determine bushels/acre.

Results

The results of the five replicated trials in 2016 showed that the seed treatment significantly reduced feeding by birds. On average, the plant population in the Avipel treated plots was 30,237 plants/acre, compared to 27,604 plants/acre in the non-treated plots, resulting in 2,632 more plants/acre in the Avipel treated plots. In 2017, there were 16 replicated trials, and the Avipel treatment resulted in significantly higher plant populations overall when compared to the non-treated control, with an average of 612 more plants per acre. In 2018, there were 20 replicated trials. Once again, the Avipel treatment resulted in significantly higher plant populations overall when compared to the non-treated control, with an average of 962 more plants per acre. With plant population data pooled from all three years of the study, the difference between the Avipel treatment and the control was highly significant (Figure 1). Despite the significant increase in plant populations in the Avipel treated plots, there was no significant difference in yield between the treatments. However, many factors account for end of season yields in field corn, including weather and other environmental factors.



Impacts and Observations

In this study, crows were the main pest observed in the fields, but there were also turkeys, seagulls and red winged black birds observed. It is thought that the birds learn the effect of the product, and likely do not return to those fields in subsequent years, though this was not specifically measured in this study. The main impact of this research revealed that Avipel Shield helps maintain plant populations, especially in fields with high bird pressure. But, birds, like crows, are complicated in how they select where they want to roost and feed from year to year, making it difficult to predict bird damage.

One observation from this study is that there may have been an effect within the same field where Avipel-treated seed is planted next to the non-treated seed. The birds may have left and avoided the entire field after experiencing the Avipel, rather than seeking to feed on the non-treated half of the field. A second observation is that once the birds learned the taste of Avipel in certain fields, they did not return, and many of the fields used in this study were planted to the same trial each year. This may explain the low bird pressure in some fields.

Avipel Shield has since been registered for use in New York, and some of the growers involved with this project have decided to treat all of their corn with Avipel based on the results of participating in these trials.

This research was made possible with funding from the NYS Corn Growers Association and the NYS Farm Viability Institute, and with extensive assistance from CCE collaborators Aaron Gabriel, Kevin Ganoe, Jeff Miller, Mike Hunter, Dr. Kitty O'Neil, Joe Lawrence, Paul Cerosaletti, Dale Dewing and Dr. Paul Curtis.