

BIOAG PROJECT FINAL REPORT

TITLE:

Bovine-avian interactions on dairies: improving cow welfare and farm economic stability by implementing effective and sustainable bird deterrence methods

PRINCIPAL INVESTIGATOR(S) AND COOPERATOR(S):

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KEY WORDS:

Animal welfare, Behavior, Dairy cattle, Economic, Pest bird management

ABSTRACT:

Pest bird damage to vineyard, orchard, and berry acreage has been a focus of recent research; however, much less is known about how pest birds affect dairies. In other areas of the U.S., the impact of the non-native European starling on dairies has been linked to significant economic damages and disease transmission concerns. The pest bird problem in the Pacific Northwest, especially regarding European starlings, has been compounded with changes in land use and agricultural practices over the past 20-30 years. In a recent survey of approximately 50 dairy producers in Washington, respondents valued their pest bird damage losses between \$1,000 and \$200,000/dairy/year. Furthermore, survey participants described a wide variety of bird deterrent techniques (most commonly shooting and poisoning) they have implemented, with low levels of effectiveness. Other bird deterrent options such as professional falconry or native raptor attraction are potentially more cost effective and environmentally sustainable, but most producers do not understand the nature and costs of these options.

Before specific bird deterrent techniques can be recommended to producers, a better understanding of the true economic losses dairy producers face due to pest bird damage must be achieved. Results from a comprehensive survey of dairy producers focusing primarily on producer perceptions of bird damage on their farms, coupled with on-farm bird counts and feed bunk loss experiments, will provide a foundation from which to make pest bird control recommendations in the future.

Although literature documents the potential disease vector role of starlings, no known studies have evaluated the impact of pest birds on dairy cow behavior and welfare. Video recordings targeting dairy feed bunks will shed light on pest bird-cow interactions that occur when cows are feeding and whether pest bird presence is detrimental to dairy cow welfare. Documenting feed quality loss and *Escherichia coli* O157:H7 prevalence at the feed bunk will also lead to a more accurate estimate of bird damage costs.

By assessing bird populations, cow behavior and related health factors, and feed losses, this project will result in a comprehensive identification of economic impacts of pest birds for producers in the region. By further conducting pilot efficacy trials of falconry and native raptor attraction techniques, the project will provide information on sustainable bird deterrence techniques.

PROJECT DESCRIPTION:

The primary objective of the BIOAg planning grant was to support a two-day meeting in Lynden, WA. This meeting allowed the research team to meet face-to-face for the first time, strengthened producer-researcher relationships, and resulted in the development of a Western SARE Research and Education grant proposal. After the success of this meeting in 2015, the research team submitted a Western SARE grant proposal that was funded for \$238,105. During the final year, research team members focused on outreach and education activities related to this project.

OUTPUTS

- **Work Completed:**
Recruited dairy producers to participate in on-farm data collection for this project, developed outreach materials, and established new collaborations to build the interdisciplinary research team.
- **Publications, Handouts, Other Text & Web Products:**
Due to the support provided by the BIOAg planning grant, handouts about pest bird management on farms were designed and shared with stakeholders. Additionally, a factsheet on pest bird management was created.
- **Outreach & Education Activities:**
Research team members attended the 2016 Washington State Dairy Industry Annual Meeting, distributed handouts, and shared information about the project at a WSU Extension booth.

IMPACTS

- **Short-Term:**
In 2015, 100% of the participants in the pest bird management seminar increased their level of understanding, with 95% of participants interested in assisting with future study trials.
- **Intermediate-Term:**
In 2015, the research team submitted a Western SARE Research and Education grant proposal, which was funded. In 2016, ten dairies enrolled in the Western SARE project to collect bird number data and four dairies enrolled in the animal behavior component of the project. Producers are demonstrating a renewed interest in alternative pest bird management options, as over 80% of producers interviewed wanted to learn more about alternative pest bird deterrence strategies.
- **Long-Term:**
The Western SARE Research and Education project will continue until March 31, 2019. Due to the support provided by the planning grant, our team will be able to further investigate how pest birds affect dairy cows and producer profits. This information will transform how dairy producers implement effective, sustainable pest bird management techniques. This project has the potential to save dairy producers up to \$200,000/year.

ADDITIONAL FUNDING APPLIED FOR / SECURED

Our research team secured a \$238,105 grant from Western SARE (4/01/2016 – 3/31/2019)

Two research team members (Adams-Progar and Steensma) are Co-PIs on a NSF grant proposal “An Autonomous Multi-robot Unmanned Aerial System for Bird Deterrence” (Lead PI: Matt Taylor, School of Electrical Engineering and Computer Science; \$1,000,000; pending)

GRADUATE STUDENTS FUNDED

The BIOAg planning grant did not provide funding for a graduate student; however, the funding our team secured from Western SARE will provide two years of funding for a Master’s student (Tyler Caskin). The student began his studies August 2016 in the Department of Animal Sciences. Additionally, three undergraduate students have participated in this project.

RECOMMENDATIONS FOR FUTURE RESEARCH

Our research team intends to pursue further research aimed at determining how new technology systems (unmanned aerial systems, etc.) may assist with pest bird management on dairies. Future research funded by BIOAg may include the effects of hot weather on livestock operations (everything from how it affects the animals, crops, and water use) or studies on public perceptions of agricultural practices.