Evaluation of Falconry as an Economically Viable Co-Management Strategy to Deter Nuisance Birds in Leafy Green Fields

RESEARCH COMPLETED

SUMMARY

To test the efficacy of falconry to deter pest birds in leafy greens fields, several trials were performed in spring and fall 2015 in Monterey County, California. The goal was to evaluate nuisance bird attractants, and whether the number of birds decreased in leafy greens blocks during bird abatement treatment using falconry, and whether reductions persisted after falconry. Findings from this proof-of-concept study suggest that falconry is a viable approach to reduce bird intrusions and associated fecal contamination in leafy green fields when large numbers of nuisance birds are present. Season plays an important role in bird abundance, with fall being the most effective time to use falconry for bird control (abatement) in produce fields in the central coast. Additional on-farm studies are needed to determine the effect of using falconry in combination with other non-lethal bird abatement approaches (e.g., audio/visual deterrents) to maximize the cost effectiveness of this approach.

OBJECTIVES

The overall goal was to evaluate nuisance bird attractants, and whether the number of birds decreased in leafy greens blocks during bird abatement treatment using falconry, and whether reductions persisted after falconry. The specific objectives were to 1) characterize key bird behavior and attractants in the leafy greens farmscape with a known history of bird intrusions and human pathogen-driven crop losses, and 2) build data-driven support capacity for implementation of commercial falconry to reduce the risk of microbial contamination of leafy greens.

METHODS

Commercial ranches growing leafy greens in Monterey County were enrolled confidentially in the study and divided into two to four (20-40 acre) treatment and control blocks based on similar production practices and farm landscape. Requirements for safe falconry included distance from major roads/highways, buildings, and other raptors. UC Davis field crews conducted bird counts by walking 100-m transects set up on the roads around the blocks. Bird counts were started at sunrise by walking each transect at 10-minute intervals over 3 hours. Observers also recorded the date and location, crop, weather parameters (wind, temperature), irrigation and presence of workers and equipment in the study block. Species and number of birds flying over transects, or on the ground, plants or sprinkler heads in the field were recorded using standardized USGS 4-digit alpha for bird species. The observers also recorded if the birds were seen in flocks or individually.

Table 1. Diversity of bird species identified during spring and fall trials in treatment (falconry) and control fields, Monterey County, 2015.

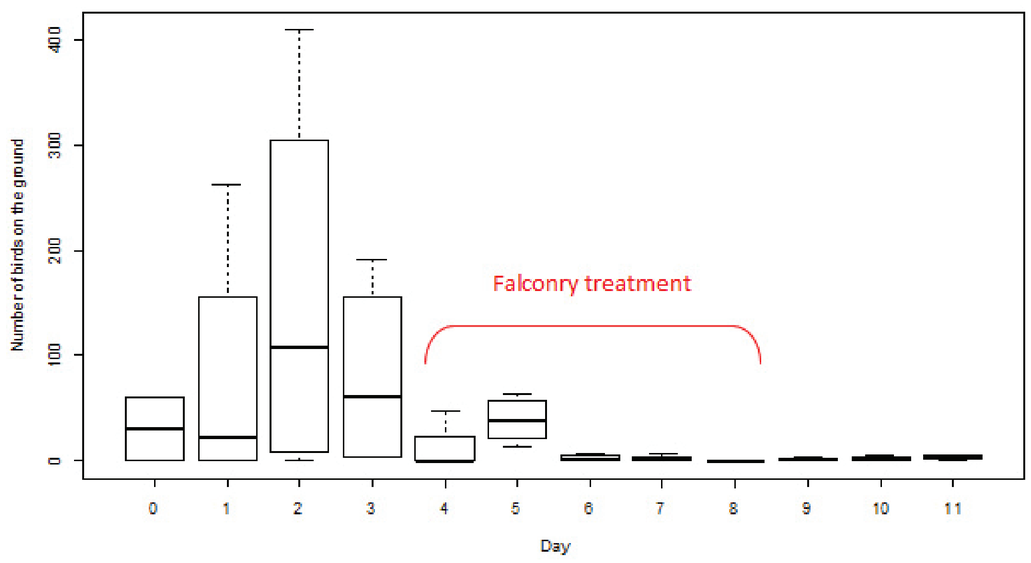
Species	Spring (9 days)	Fall #1 (10 days)	Fall #2 (12 days)	Fall #3 (9 days)	TOTAL
American crow	202	45	148	55	450
American kestrel	0	1	0	1	2
American robin	2	0	27	0	29
Barn swallow	86	25	0	0	111
Blackbird, Brewer's	429	1956	5047	2484	9916
Blackbird, red-winged	134	257	101	0	492
Blackbird, unspecified	350	677	452	178	1657
Black phoebe	0	7	6	2	15
Brown-headed cowbird	0	5	0	0	5
California towhee	0	2	0	0	2
Common raven	0	1	0	21	22
European starling	14	552	2562	3815	6943
Horned lark	0	181	8	0	189
House finch	15	8	5	3	31
House sparrow	0	72	0	0	72
Killdeer	0	82	8	1	91
Mallard	6	0	0	0	6
Mourning dove	32	29	4	0	65
Northern flicker	0	0	1	0	1
Northern mockingbird	4	10	0	0	14
Other: mixed blackbirds and starlings	0	1101	657	283	2041
Red-tailed hawk	1	0	2	0	3
Say's phoebe	0	11	26	13	50
Sparrow, unidentified	0	37	288	172	497
Turkey vulture	16	5	0	2	23
Western meadowlark	3	23	126	436	588
White-crowned sparrow	0	1	8	3	12
Yellow-rump warbler	0	0	5	0	5
TOTAL	1294	5088	9481	7469	23332

RESULTS TO DATE

Overall, we found a high variability in the presence, abundance, and diversity of birds in both treatment and control blocks. The presence of birds was low in the spring. Bird populations were much higher in the fall, but the first trial in September was confounded by interference with a falconer working at an adjacent vineyard. In October and November, falconry effectively reduced bird numbers over 5 days of treatment and for 3 days post-treatment. The percentage of plants visibly contaminated with bird feces was low (range from 0 to 1.9%) throughout the study, but we detected a statistically significant correlation between reduction of birds in treatment blocks and reduced bird feces in these blocks compared with controls. We also found that the number of birds seen on the ground (foraging) was a better indicator of fecal contamination than the number of birds seen in total (flyovers plus ground foraging).

BENEFITS TO THE INDUSTRY

This project was conducted as a proof-of-concept study to systematically gather science-based data for the leafy green industry to evaluate commercial falconry as a non-lethal, effective, affordable, and sustainable approach to reduce the risk of microbial contamination of leafy greens due to bird intrusions. Specifically, recommendations for growers included taking into account the management of pest birds performed by neighboring ranches and considering the use of falconry to decrease bird intrusions into fields when flocking birds are most abundant. The findings will inform future, more comprehensive bird control research projects (for example, the effectiveness of combinations of non-lethal bird control such as falconry and audio/visual deterrents).



Number of birds seen on the ground in Treatment lettuce field (Fall trial #2). Falconry treatment lasted from Day 4 to 8.

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