CENTER for PRODUCE SAFETY

Project Examines Pathogen Risks of Wildlife

A group of researchers hope to shed light on the various wild bird and mammal species that visit produce fields and the prevalence of pathogens within those species. Although each crop field and agricultural operation is different, principle findings from this project may help producers begin to separate high-risk from low-risk fields and develop appropriate wildlife mitigation measures.
Alan Franklin, Ph.D., and a wildlife ecologist with the U.S. Department of Agriculture's Animal and Plant Health Inspection Service in Fort Collins, Colorado, is leading work that will examine the wildlife species that frequent leafy green fields and whether their fecal droppings carry foodborne pathogens. In addition, researchers will sample produce near the droppings to determine whether contamination has occurred.

The project fits into Franklin's overall area of expertise with APHIS' Wildlife Services to identify risk from wildlife conflicts and work with producers to develop non-lethal ways to resolve those conflicts.

Along with co-investigators Sarah Bevins, Ph.D., Bledar Bisha, Ph.D., Jeffrey Chandler, Ph.D., and Kurt Vercauteren, Ph.D., Franklin is conducting studies in lettuce and spinach fields in the San Luis Valley of south-central Colorado.

Sitting at more than 7,000 feet elevation, the San Luis Valley presents a unique production environment with near-pristine water supplies and arid climate that must be considered when making comparisons to other production regions.

Nevertheless, the findings may be applicable to areas with similar valley topography near wildlife habitat and could allow producers to begin separating out high-risk fields that would require mitigation from low-risk fields.

"I think a lot of times, it requires an adaptive management approach," Franklin said. The researchers chose 10 fields based on randomized distances from managed wildlife habitat and divided each into four sub-sampling units. The project involves placing 60 camera traps around field exteriors to monitor wildlife movement into, out of, and within selected blocks using both time-lapse and motion detection. Each time a mammal or bird passes a camera, it trips a sensor that snaps an image. Franklin said they have already collected more than 1,000,000 images that they have begun examining to determine the rate and make-up of wildlife visitors.

Researchers also walk the field peripheries, looking for animal tracks and tracing them into fields. At the same time, they scout for fecal matter, which they sample for testing. Microbiologists at the University of Wyoming are testing the fecal samples for Shiga toxin-producing *E. coli*, *Salmonella enterica* and noroviruses.

Franklin praised the cooperating leafy greens grower, who provided invaluable help with typical agricultural practices in the San Luis Valley. "The producer has been very open-minded and helpful, and she wants to know what the answers are," he said. "Working with a producer gives you very good insight into what will work and what won't work. Without that level of expertise, we could have made some incorrect choices on our own. I think these types of partnerships are really key to dealing with these problems." The project in the San Luis Valley is only one year, but Franklin said he'd like to repeat it to factor in weather variability. "You have to temper everything with the idea that some years, wildlife may not be a problem and some years they may be," he said. "In a drought year, that nice green block of irrigated forage may be more attractive."

Franklin said he'd also like to expand the work to a location along Colorado's urbanized Front Range to determine whether climatic variation and land-use affect wildlife visits to produce fields and whether some of the mitigation measures used by producers in the San Luis Valley would also work there.

Key Industry Take-Aways

- Project is looking at wildlife species visiting produce fields
- Wildlife fecal samples, as well as produce adjacent to fecal matter, will be analyzed for three pathogens
- Findings may help producers separate high-risk from low-risk fields

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