Birds and files: Local ag researcher shares study results

By Mara Knaub, @YSMMaraKnaub  Jan 21, 2018

A scarecrow stands guard over a field of spinach in the Yuma Valley. This method is not always successful in scaring away birds from fields, leading local researchers to look into more effective methods.

Photo by Karen Bowen

Does it seem that there are more flies than usual in Yuma County? If you think so, you’re not alone. Many residents have complained in recent years that the number of flies has increased significantly, leading local researchers to look into the problem.

The Yuma Center of Excellence for Desert Agriculture is in the business of conducting research with a focus on desert agriculture. As part of the University of Arizona College of Agriculture and Life sciences, the private-public partnership is charged with finding solutions to agriculture’s most pressing problems.

For the last three years, researchers have been focused on projects that maximize productivity, irrigation and soil salinity management, mitigating soilborne disease and more.

The facility hosted the first Research Symposium in November to report on the research projects it has undertaken, including results ready to be put to work and recommendations for further research.

Among the research presented were two projects centering on bird deterrents and the number of flies.

Bird deterrents

Dr. Paula Rivadeneira, assistant professor and extension specialist in wildlife and food safety at UA Yuma Agricultural Center, reported on the two projects. The Bird Deterrent Task Force and Design Challenge, funded with $5,467 from the YCEDA, took place from March 1 through July 31, 2016.

The objective was to help fresh produce growers who lose an estimated $1.5 million worth of product each year as a result of bird damage to crops and fecal contamination.

"Birds are a significant problem in agriculture. They poop all over and eat your crops," Rivadeneira said.

She noted that growers have tried numerous types of deterrents involving noise (bird bombs, cannons, injured bird calls) and visual distractions (scarecrows, Mylar strings, effigies of dead birds), but none have completely worked.

Growers have hired people to scare away birds by firing warning shots. However, they are not allowed to harm or harass certain bird species due to the federal and state regulations, causing financial losses as a result of birds in their fields.

“We sought out the assistance of bird experts to explore ways in which we can use their knowledge of bird behavior, specific for each nuisance species, to design and implement effective bird deterrents within the limitations of state and federal regulations,” Rivadeneira noted in her report.
The researchers invited industry stakeholders, bird behavior experts, technology companies, Cooperative Extension personnel, including those in wildlife, food safety and agricultural engineering, to an meeting to explore the problem and find solutions. The attendees came up with a list of qualities that a “new and improved” bird deterrent would need to be effective.

The Bird Deterrent Challenge was presented during the meeting. One company and one UA Yuma engineering student accepted the challenge. Black Fence Company presented a drone-based system, for which it is seeking funding. The student was provided a work-study salary and developed several iterations of bird deterrent but none of the trials were successful.

A startup company in attendance has since applied for a Small Business Innovation Research grant funding to develop a high-tech deterrent system.

Rivadeneira said that further research is still needed since a truly effective bird deterrent has yet to be developed. However, she noted, this project was successful in that “we came up with a list of qualities required for a new and improved bird deterrent and showcased that in front of researchers and technology companies who may eventually use their creative minds in developing the next latest and greatest bird deterrent.”

Too many flies?

Another project led by Rivadeneira centered on the number of flies in Yuma County. Citizens have reported more flies than usual in their neighborhoods and work sites over the past few years. Growers are concerned about the number of flies since they are known to carry foodborne pathogens, such as salmonella and E. coli.

“This could affect the safety of their crops and the health of their workers,” Rivadeneira reported.

Funded by $20,000 from YCEDA, the researchers conducted a study from March 13 to May 13 to determine if the flies were coming from landfills, salad waste or biosolids. They also wanted to find out if the flies carry pathogens and if the use of biological parasitoids, such as wasps, affect the number of flies in the area.

The researchers tested four types of sites: agricultural areas that used biosolids, landfill biosolids, landfill sludge and salad waste dump sites in the fields. Agricultural lands that use biosolids averaged two flies per day in the traps, while landfill sites averaged less than one fly per day.

“When we examined the salad waste dump sites, we found that areas that were well disked had approximately 130 flies per day, while areas that did not disk, the waste very well had over 3,700 flies per day,” Rivadeneira said.

“Once we confirmed the location of fly breeding sites, we were able to determine that a biological fly control method could help alleviate the problem, thereby reducing flies and potential risks to growers.”

When researchers released parasitoid wasps to eat fly larvae in areas with a lot of flies, the number of them were went from more than 3,700 to 611.

Of the flies researchers caught, 5.4 percent tested positive for e.coli and 1.1 percent tested positive for non-0157 shigal toxin-producing e.coli.

The researchers also checked biosolids for flies and larvae fresh off the transport trucks. One sample from Carson, Calif., had one fly, but none of the six samples had larvae. None of them tested positive for pathogens.

“These findings are important to agriculture because they can play a significant role in decreasing fly populations by implementing strict guidelines for salad waste disposal,” Rivadeneira’s report noted.

However, Rivadeneira is recommending further research, noting that the study was conducted over an “extremely” short period of time at the end of the salad waste dumping season. She recommends a similar study over the course of year to see how the adult fly numbers change with the seasons. She would also like to learn how many parasitoid wasps need to be released in specific conditions to control fly populations.

She also noted that they were not able to complete the study on biosolids because they were banned from the dump areas by the lessee.

“Future studies should include testing these and other possible sources of flies,” she said.

To find out more about the Yuma Center of Excellence for Desert Agriculture and its research projects, go to desertagsolutions.org.