Field Notes

Kerr Center for Sustainable Agriculture E-Newsletter

E-Field Notes
January 2025

Happy New Year!

This month, we look at a new approach to pest control that **literally listens in on insects to detect them before they can cause harmful outbreaks**.

The breaking news from the butterfly front is that **monarchs have been officially proposed for threatened status** under the Endangered Species Act.

Which works better for treating infections in cattle: antibiotics, or sugar? The answer may surprise you!

What better way to kick off the new year than by **making a new contribution to the Kerr Center**? **We appreciate it!**

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Bugging the Bugs

Most of us probably have that gardener in our lives - you know, the one who talks to the plants? Maybe they even listen to the plants.

Entomologist Emily Bick is taking that one step further - she **puts microphones out into the fields, to listen to plants - for the sounds of insect pests**.

Bick, a researcher at the University of Wisconsin, is developing a device called the **Insect Eavesdropper**, which **takes insect pest scouting to a whole new level**.

Unlike traditional visual monitoring methods - plant inspection, sticky cards, sweep nets - the acoustic approach **takes less time, and doesn't depend on pests showing themselves**. Their noises give them away.

What noises? The answer depends on the species of pest.

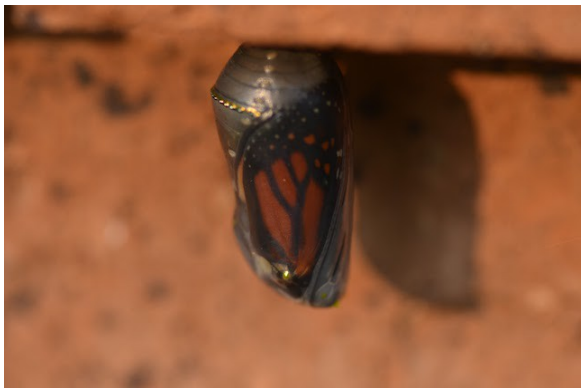
For corn rootworm, one of the pests Bick is working on, the giveaway is the sound of the insect chewing on the plant's roots. The vibrations are transmitted up through the stalks, where the mic picks them up. The system detects the pests while they're still hidden underground.

What gives aphids away is the tiny slurping sounds they make as they suck fluids from the plant - similar to the sound of finishing a milkshake, says Bick.

The technology, she says, **also detects insect pests much earlier than visual monitoring**. That gives producers more lead time to mount a response before the pests reach damaging levels.

Bick is working to commercialize the Insect Eavesdropper, with numerous trials currently underway. She hopes to have it marketable within a couple of years.

Threatened Status Proposed for Monarch



Last month, the U.S. Fish & Wildlife Service (USFWS) proposed **listing the monarch butterfly as threatened** under the Endangered Species Act. The agency published a proposed rule in the *Federal Register*, and is **accepting public comment** on that rule **through March 12**.

According to the agency's most recent monarch **Species Status Assessment**, "by 2080 **the probability of extinction for eastern monarchs ranges from 56 to 74**% and the probability of extinction for western monarchs is greater than 95%. **Threats** to the species **include** the **loss and degradation of breeding, migratory and overwintering habitat, exposure to insecticides, and the effects of climate change**."

A *threatened* species is one step safer than an *endangered* one. An *endangered* species faces "danger of extinction throughout all or a significant portion of its range," while a *threatened* species is "**likely to become an endangered species within the foreseeable future**."

The proposal is the latest stage in the monarchs' long and winding journey toward official federal recognition of their plight. In 2014, in response to several conservation organizations' request for the agency to list the monarch butterfly as a threatened species, USFWS published a "finding" that listing the monarch butterfly might be warranted.

Six years later, USFWS published another finding, stating that listing the species as endangered or threatened was warranted, but "precluded by higher priority actions." In other words, the monarch met all the criteria for listing, but so many other candidate species were in even worse shape that the monarch's status was left unchanged.

In both 2022 and 2023, the agency reiterated that finding.

USFWS has released a **fact sheet on the proposed rule, specific to agricultural producers**. It states that the rule's goal is "to **encourage voluntary conservation measures**. That means that **activities that may maintain, enhance, remove or establish milkweed and nectar plants within the breeding and migratory range would be allowed** in many circumstances."

The intent is "to **avoid large-scale, permanent conversion of monarch habitat**. The **proposed rule explicitly allows for routine agricultural activities, livestock grazing and ranching** activities... **encouraging active habitat management that supports monarchs while landowners manage their land as they intended**."

The **full text of the proposed rule, and instructions for submitting comments**, are available in the *Federal Register* Reading Room. The USFWS website offers **additional information**.

Sweet Solution for Antibiotic Resistance?

Going by Mary Poppins' well-loved line, **a spoonful of sugar can help the medicine go down - but what if sugar is the medicine?**

For treating mild uterine infections in dairy cattle, a group of researchers at the University of Pennsylvania recently reported that **a solution of dextrose can be as effective as antibiotics**.

In addition to treating infections, the researchers noted, **this alternative approach could also postpone the development of resistance to antibiotics**. It also **diversifies organic cattle ranchers' medicine kit**, where standards restrict their use of antibiotics.

The researchers compared a common antibiotic against the sugar solution for effectiveness in treating mild cases of endometritis, a common uterine infection in dairy cattle.

The idea itself is not new. Sugar solutions have been effective in treating other bacterial infections, including in humans. The approach relies on the principle of osmosis - the concentrated solution draws water out of the bacterial cells, essentially dehydrating them to death.

Based on that established information, **the research team expected that the sugar solution would be effective. The surprise was that it performed as well as the antibiotic.**

“We were hopeful that we would find positive results, but we were definitely not expecting to find that both treatments worked similarly for mild cases of metritis,” said Adrian Barragan, co-lead author on the study. “That was a very exciting discovery.”

The dextrose solution had an additional benefit: **unlike antibiotics, it did not disrupt the balance of the cows' naturally occurring beneficial gut bacteria**.

With further research, Barragan said, ““Our findings may be applicable for reproductive disease in human medicine.”

The **study** was published in the journal *Frontiers in Veterinary Science*.

Winter Events: SOWTH Conference, Virtual Fence, Homemade Food Freedom Act, Blue Thumb, Organic Research....

Conference season continues, with the **SOWTH** Conference (Feb. 4-6; Atlanta, GA) next week.

Upcoming **grant application deadlines** include the **Virtual Fence Conference Fund** (Feb. 1) and the **Organic Agriculture Research and Extension Initiative** (Feb. 13).

Learn how to meet the legal requirements for selling processed food out of the home in OSU Food & Agricultural Products Center's latest **Homemade Food Freedom Act Workshop (**Feb. 5, Stillwater). **Get trained as a Blue Thumb volunteer** (Feb. 15, Ada), and start monitoring local streams as a citizen scientist.

There are many more sustainable agriculture educational activities going on, and we're adding more to the calendar all the time. Get the latest on our online **events calendar.**

Don't forget that you can also use our online calendar to **keep yourself and your friends up to date** on these and other upcoming events, including our tours:

SAT 1

February 1

Virtual Fence Conservation Fund (application deadline)

Ranchers, landowners, and conservation groups are invited to apply to the Virtual Fence Conservation Fund, by February 1.

TUE 4

February 4 - February 6

SOWTH Conference

Atlanta, GA Atlanta, GA, United States

At the SOWTH conference, join a three-day gathering committed to sowing a strong sustainable agricultural movement across the South.

WED 5

February 5 @ 8:30 am - 5:00 pm

Homemade Food Freedom Act Workshop

ROBERT M. KERR FOOD & AGRICULTURAL PRODUCTS CENTER Stillwater, OK, United States

Specific training requirements, such as this workshop, are required before selling food out of the home under the Homemade Food Freedom Act.

THU 13

February 13

Organic Agriculture Research and Extension Initiative (application deadline)

February 13 is the deadline for applications to USDA NIFA's Organic Agriculture Research and Extension Initiative.

SAT 15

February 15 @ 8:30 am - February 16 @ 4:30 pm

Blue Thumb Training – Alva

Northwestern Oklahoma State University 709 Oklahoma Boulevard, Alva, OK, United States

Love science and the outdoors? Help protect Oklahoma streams by becoming a certified Blue Thumb volunteer at this training in Alva.

- **Subscribe to our feed** and receive **updates to your personal calendar** as they are made.
- **Share events on the calendar** via a number of **different social media sites**, including Facebook, Twitter, and Pinterest.

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