

# BUG BUSTERS!

## INVESTIGATING INSECT PESTS AND THE ARTHROPODS THAT CONTROL THEM IN AGRICULTURAL DRAINAGE DITCHES

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Do you know how many bugs can be vacuumed from a ditch in 15 seconds? Hundreds! Actually, it depends on which plants were vacuumed and how much vegetation is covering the ground. At least this is the hypothesis of the new project we launched in November. The goal of the project is to examine the presence and abundance of three insect pests and the other arthropods that can help control them naturally such as predators and parasitoids. We talk about arthropods when referring to predators and parasitoids because some are not insects such as spiders which are arachnids. For this project, we focused on three common insect pests that cause millions of dollars in damages to key agricultural commodities. These are diamondback moth (*Plutella xylostella*), lygus bug (*Lygus hesperus*), and the western flower thrips (*Frankliniella occidentalis*). These species have been documented to use weedy plant species that are common in drainage ditches. In the Spring, we will also be testing weedy plant species for the Impatiens Necrotic Spot Virus. The virus is transmitted by western flower thrips and infect a wide variety of plants including economically important crops such as lettuce. It was detected in multiple fields in Ventura in 2022.



Two drainage ditches sampled for the project showing how the vegetation at each site has been managed differently. Photo by Abigail Brondos.

We are interested in exploring how the vegetation present in the ditches affects what we find. To investigate these relationships between arthropods and plants, we are carrying out vegetation surveys in 8 drainage ditches in Ventura County. Based on this vegetation data, we are using a bug vacuum to collect arthropods in the most common plant species in each ditch. One of the reasons we are interested in agricultural ditches is because they frequently maintain conditions that can sustain vegetation year-round which can provide resources and refuge to arthropods.



Abigail Brondos cleaning samples from the bug vacuum to extract arthropods from plant fragments at the UCCE Ventura lab. She is wearing a mask because some arthropods are so small and light that even a breath will blow them away. Photo by Maripaula Valdes-Berriz.

This can be especially important when these resources are scarce as plants dry up in natural areas. It is assumed by some that they will harbor pests that can impact nearby crops, and sometimes, these areas are managed heavily by mowing and the use of herbicides. However, they might also provide habitat for many beneficial arthropods that can help growers control troublesome pests. We also expect these relationships to change through the seasons as the vegetation changes, so we will repeat our vegetation surveys and arthropod sampling every 3 months.

Beneficial arthropods that can help control these pest species include many general predators such as spiders, beetles, and 'true bugs' as well as parasitoid wasps and flies, which are usually host specific. This means they usually parasitize a specific genus or species that they require to be able to reproduce. Worldwide trends show arthropod diversity and abundance is decreasing significantly. Semi-natural areas such as drainage ditches can become valuable habitat to preserve beneficial arthropods and their services for agriculture, if managed correctly. This information will be valuable to make recommendations to growers and local agencies who manage ditch vegetation. By implementing better management practices in these areas, we could maintain ecosystem services provided by arthropods and preserve biodiversity.

We are currently sorting through thousands of specimens we collected in November, so stay tuned to continue learning about this project in upcoming newsletters.