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Summer Field Day Letter from the Editor

By Allison Jonjak

A rare Thursday Cranberry Crop Management Journal delivery, as yesterday (Aug 11) was the 2021 Summer Field Day. I wanted to include recaps of two of our Mini-Clinics for those who were visiting vendors. A total of 430 cranberry growers joined about 100 vendors at Whittlesey Cranberry Company, in honor of the 150th anniversary of the founding of the marsh.

The Wisconsin Cranberry Growers Association and the team at Whittlesey hosted a spectacular event, in spite of relocating from the warehouse site to drier ground in the midst of the marsh itself due to recent rains. It was wonderful to meet everyone face to face!



Leslie Holland presents an update on False Blossom and Leaf Spot Diseases to growers at the 2021 Summer Field Day Mini-Clinics.

Cranberry False Blossom Update and Leaf Spot Diseases

By Leslie Holland (Fruit Crop Pathologist), Casey Trickle (MS Student), Emma Nelson (Research Intern), Allison Jonjak (Cranberry Outreach Specialist)

Research has been under way during 2021 to understand false blossom and its spread, considering both the disease itself and the vector. The Wisconsin Cranberry Board has funded research into the distribution and diversity of leafhopper populations across Wisconsin, and the distribution of cranberry false blossom in Wisconsin cranberry marshes.

Leafhoppers

Leafhoppers were swept at <10 Wood County and Jackson County marshes, both in the nymph stage and the adult stage. Populations declined in mid-July, and numbers in early August were quite small. No significant feeding damage was observed at the sites sampled.

Cranberry False Blossom

Cranberry plants (the whole plant, root-to-shoot) with false blossom symptoms were sampled during the periods of early bloom, late bloom, and early fruit set. Additional samples will be collected during late fruit set, harvest, and post-harvest. In 2022, sites where leafhoppers were observed will have follow-up samples collected.

In these plants, DNA of false blossom is being amplified and compared across flowers, uprights, leaves, runners, roots, and last year's fruits. We are currently using an extensive nested PCR assay to confirm the identity of the pathogen but hope to use other molecular tests to speed up this process. Our next line of inquiry will focus on whether false blossom can be detected in asymptomatic plants near symptomatic plants.

Symptomatic, infected plants showing abnormal floral structure with deep pink petals, erect pedicels, and the retention of pistils in last season's infected fruits.



A leafhopper swept in a cranberry bed, to scale on a human hand.

Leaf Spot Diseases

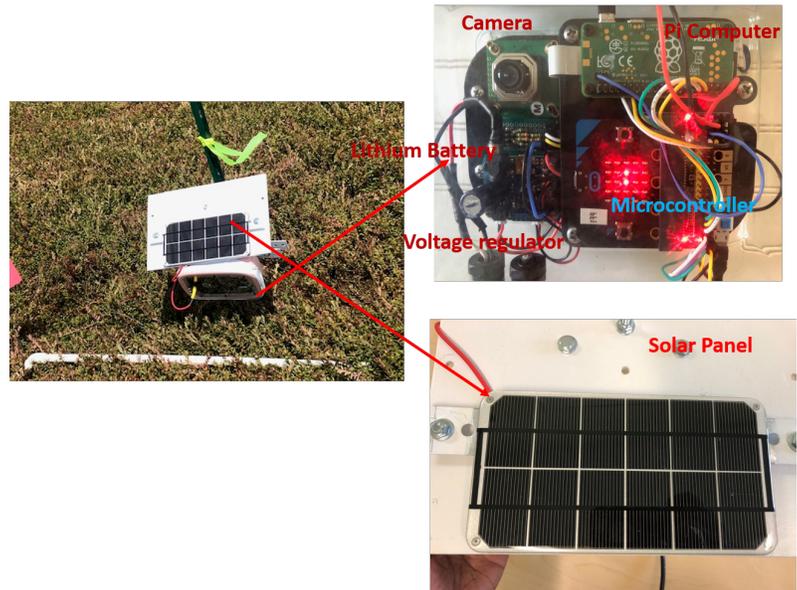
Leaf spot diseases are common in Wisconsin marshes but typically do not result in significant yield losses. 2021 is seeing more reports of leaf spots, and some reasons might be dense vine growth, excessive moisture, lack of fungicides, or secondary fungi—but no answer is certain currently. Common leaf spot diseases growers may encounter include *Protoventuria* leaf spot, *Cladosporium* leaf spot, and Red leaf spot—these diseases can co-occur, and all flourish in similar environmental conditions. To address leaf spot diseases, manage moisture and fertility levels to promote a less dense canopy.



Updates on Crancam—Phenotyping Cranberry Genotypes

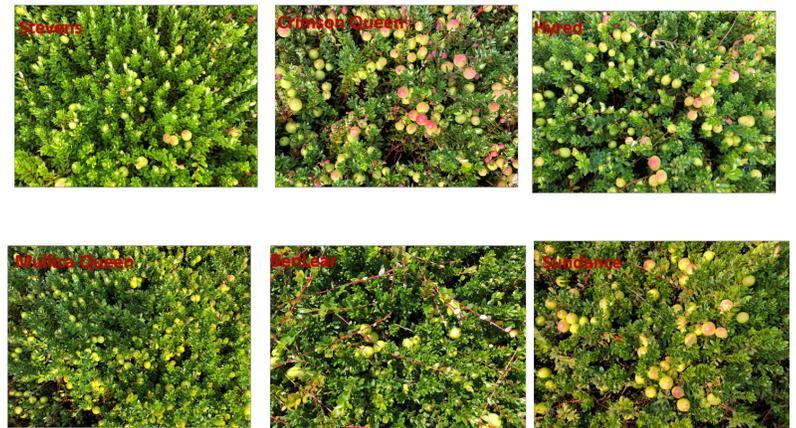
By *Jyostna Mura and Allison Jonjak*

Work continues on the Crancam project, which aims to develop a full understanding of how each cranberry cultivar's genotype interacts with its growing environment to ultimately produce the harvested crop. Objectively understanding how genetics and the environment interact (GxE) requires hundreds of thousands of measurements—and the time scales in cranberries mean that, unlike bacteria and insects, in cranberries most GxE interactions are understood as intuitions, rather than facts. The development of Raspberry Pi imaging is finally making measurements cheaper, and the Mura lab is leading the charge to collect data to support firm understandings.



Raspberry Pi imaging is desirable because of its low cost, robust features and wifi data capture. The computers can capture images (visible light or full-spectrum), temperature, light, humidity, air pressure, and more. The automated data collection does not destroy the growing crop, and can collect data on multiple plants simultaneously.

Use in Cranberries will allow us to make many decisions based on amassed and precisely measured data. Tracking the growth pattern and time frames of bud development, of flower development, of fruit and color development in each cultivar will allow precise frost management and nutrient management.



Observing each cultivar's response to environmental factors like temperature, pH, and management (like nutrient timing) will strengthen our decisions more. Longer term, information will be gathered about photosynthetic behavior and radiation response. All of this information will be able to inform not only cranberry production by growers, but also will speed the breeding of improved cultivars by selecting for desired traits. Understanding the developmental time frames for each cultivar will also improve the success of cellular studies, and other physiological research in the future.

Next Steps We are already improving the Crancam to version 2.0, and will install cameras in both central and northern Wisconsin. Our future plans include improving data collection by making the images cloud-accessible and available via a web platform or cellphone app, as well as using machine learning to detect developmental stages.

Compounding Advantages The Crancam project represents investing in a solid foundation of cranberry research—to inform management for production cranberries in the short term, and to strengthen the efficiency and success of cranberry research in the medium and long terms.

Update from the Wisconsin Cranberry Research Station

By Wade Brockman

We have gotten 6+ inches of rain in the last week at the station. The berries are putting on size and the flea beetles are under control.

The big project for the coming weeks is preparing the ground for the 2ac pollinator garden, which will be planted on Sept 1. Fall planting for this pollinator mix is preferred, and the seed vendor has been storing the seed in a controlled temperature environment this summer so it will be ready to germinate.

The other exciting new news, is that we will have internet in the office, starting next week!



Grower Updates

Flying Dollar Cranberry

By Seth Rice

All this rain and humidity makes things interesting on the marsh here at Flying Dollar. Making sure water is off the beds and our reservoirs are kept in check are some of our top priorities right now. Of course Flea Beetle is showing its ugly head at times here in central Wisconsin. Fruit size is coming along, especially with our hybrids. Now is a good time to get any big projects done on the marsh that you want to do before harvest because it will be here before we know it. I hope everybody is having a good and safe summer!

