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Newly-registered Insecticide: Fanfare

By *Christelle Guédot*

Fanfare is not a new insecticide, having been first registered with EPA (Environmental Protection Agency) in 1985, but it is new to the cranberry industry. Fanfare is the second pyrethroid that can be applied to cranberry, with Danitol being the first. Fanfare is registered for use in Wisconsin on several crops including bushberries, caneberries, grapes, pears, strawberries, yet cranberry is NOT on the label. Fanfare received a supplemental label specifically for cranberry in 2021 and this will expire in December 2024 unless it is renewed by the registrant. Fanfare is marketed by Adama Essentials under the formulations EC or ES with 2 lbs of active ingredient per gallon as an Emulsifiable Concentrate (EC) or Suspension Concentrate (ES). Adama will likely work to get cranberry added to the label but in the meantime, every grower that purchased and plans to use Fanfare this season MUST have the supplemental label (in addition to the label) in hand as cranberry is not on the official label.

Mode of action and effect. The active ingredient in Fanfare is bifenthrin. Fanfare is in the class of the pyrethroids (IRAC group 3), which have a mode of action that targets the sodium channels on the axon of the neurons. Pyrethroids cause a prolonged depolarization of the neuron from a prolonged influx of sodium into the neurons, leading to repetitive nerve activity that can result in hyperexcitation, paralysis, and death. Fanfare is an insecticide with foliar activity that is fast acting by contact or ingestion of treated plant surfaces. Affected insects will rapidly stop feeding, become paralyzed, and eventually die.

Fanfare has broad spectrum activity on several insect species, found on the supplemental label for cranberry, including fruitworms, tipworm, fireworms, spanworms, flea beetle and white grub adults. In our trials, Fanfare was very effective at controlling most of the pests we tested, including fruitworms, flea beetle, and leafhoppers. Leafhoppers are not specifically mentioned as target pests on the supplemental label; however, in WI, you are allowed to use products on pests not present on the label, as long as the product is labeled for the crop you are applying it to.

Application restrictions. Fanfare may be applied by ground equipment, chemigation, and air, and specific recommendations are provided for the different application methods regarding direction for use, spray drift requirements, and buffer zones. Buffer zones from aquatic habitats are specifically

Insecticide: Fanfare

- Active ingredient: Bifenthrin
- Available as EC or ES (Emulsifiable Concentrate or Suspension Concentrate)
- Restricted-entry interval (REI): 12hrs
- Pre-harvest interval (PHI): 30 days
- No more than 3 applications per year
- Do not exceed a total of 0.3 lb AI (19.2 fl. oz.) per acre per year
- Rate of use per acre: 6.4 fl. oz.
- Minimum interval between applications is 7 days

stated in the label, with a minimum 10-foot wide vegetative strip of grass or other permanent vegetation between the field edge and aquatic habitats. For more information on mixing and spraying, and all other considerations, please see the product label.

Environmental impacts. Fanfare is extremely toxic to fish and aquatic invertebrates and cannot be applied directly to water. It must be used with care (see buffer zones restrictions) when applying in areas adjacent to bodies of water. Fanfare is highly toxic to bees exposed to direct treatment or residues on blooming plants. Do not apply Fanfare when bees are foraging and until flowering is complete. The label also emphasizes the risk to endangered species and prohibits the use of bifenthrin in areas that could result in exposure to endangered species.

Recommendations. Overall, I strongly recommend using Fanfare to target leafhoppers before bloom to target leafhopper nymphs. The reason for this recommendation is that we already have great products to target other insect pests at our disposal that have much lesser impacts on the beneficial insects, including pollinators and natural enemies of these pests. The environmental concerns raised above and the acute toxicity of this compound play an important role in recommending limiting the use of bifenthrin to a single pre-bloom application in order to minimize pesticide residues and environmental impacts. Finally, a 3-day water holding is highly recommended when using this product to allow the product to bind to soil particles and reduce movement of the product in the water system.

Please check with your handlers before using a new product as handlers may have restrictions on certain products for domestic and/or foreign markets. Handlers may extend PHIs beyond the number of days stated on the label to reduce residues, so please always check with your handlers. As of 2022, several handlers have imposed a 120 days PHI on this product. And as always, make sure to read the labels before using any pesticide.

Resources. You can find the labels for Fanfare at the following links:

Fanfare EC Label: <http://www.cdms.net/ldat/ldC86005.pdf>

Supplemental Label for Fanfare EC for cranberry use: <http://www.cdms.net/ldat/ldC86002.pdf>

Fanfare ES Label: <http://www.cdms.net/ldat/ldB3C005.pdf>

Supplemental Label for Fanfare ES for cranberry use: <http://www.cdms.net/ldat/ldB3C000.pdf>

Happy growing season!

Update from the Wisconsin Cranberry Research Station

By Wade Brockman

It feels weird to say we are approaching May 1st as the daytime temps struggle to reach 50 degrees most days. All of our irrigation is in and ready for the start of frost watch. We experienced a large hail event on April 12th as did most growers through the central part of the state. Guess time will tell if there was any real damage done. Once again, I would like to thank all those who donated to the research station for this upcoming growing season!



Orthene (acephate), Pollinator Activity, and Yield

By Dave Jones, Ocean Spray Agricultural Scientist

Orthene (acephate) is a broad spectrum-organophosphate insecticide that has been available to the cranberry industry for many years, but usage of the material in Wisconsin has been low in recent years due to the popularity of Lorsban (chlorpyrifos), another broad-spectrum organophosphate. Lorsban is no longer permitted for usage in cranberry, and this combined with the recent re-emergence of the blunt-nosed leafhopper in Wisconsin has led to a renewed interest among growers in pre-bloom acephate applications. Acephate is only available for a single application per season prior to bloom, so this material has been among the most commonly considered as a replacement for Lorsban across the Wisconsin industry due to its niche in terms of timing and broad spectrum of control. However, some growers cite observations from 25+ years ago that acephate usage appeared to be associated with a reduction in pollinator activity and poor subsequent yield. These historical concerns have led to recent grower interest in investigating whether these same patterns are observable under modern production conditions. Growers are interested in using acephate again, but only if it can consistently demonstrate it does not have a negative impact on pollinator activity and subsequent yield.

To help address these concerns, the WI Ocean Spray Ag Science team conducted a 2-year study to test 1.) is a modern grower-standard Orthene (acephate) usage pattern associated with a measurable reduction in pollinator activity? 2.) is this usage pattern associated with a measurable reduction in yield? 3.) Is there consistency in pollinator activity and yield data following a grower standard Orthene application across multiple seasons?

Approach: A grower cooperator made full bed applications of Lorsban at the maximum labelled rate to three beds approximately 2 weeks prior to the arrival of bees in both 2020 and 2021. The grower cooperator applied Orthene 97 at the maximum labelled rate to three separate beds at the grower standard time of approximately 2-3 weeks prior to the arrival of the bees in both seasons. Six one-meter square pollinator observation plots per bed were established, with pollinator

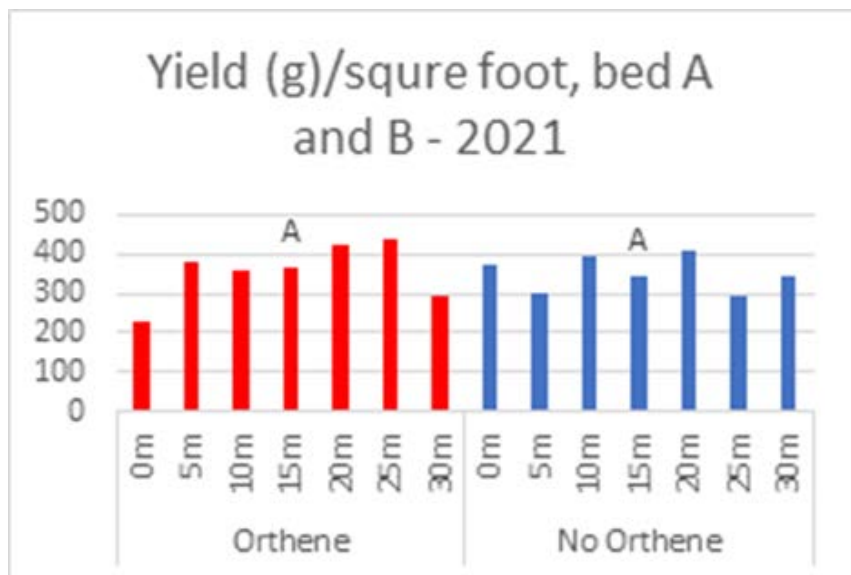
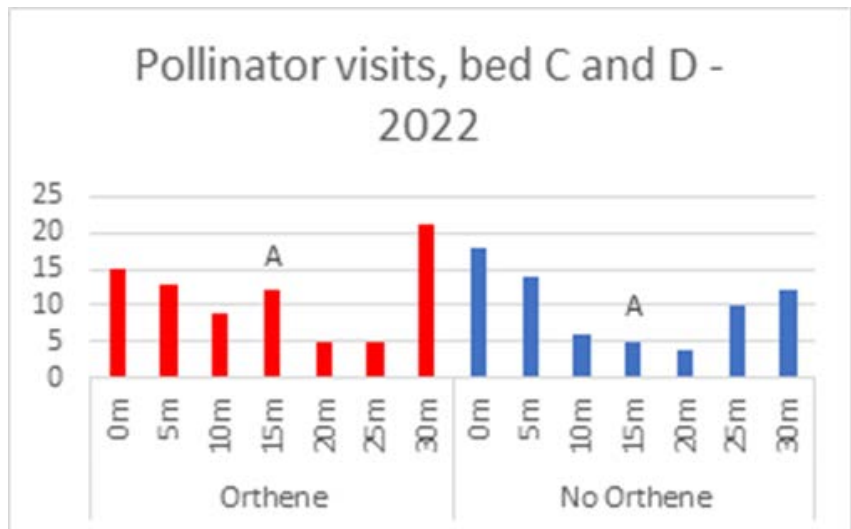


Figure 1: left: yield/square foot for a pair of beds treated with Orthene vs. Lorsban in 2020 ($p>0.05$). Right: pollinator visits by plot position in beds treated with Orthene vs. Lorsban in 2021 ($p>0.05$). This result was consistent across years and beds.

observed in each plot.

counts made three times in each plot during bloom for two years. Honeybee and bumblebee activity was observed three times during bloom in all six beds in both 2020 and 2021. On each observation date, all visits to a flower by any species of bee lasting more than two seconds were counted in each observation plot for two minutes by two researchers counting the same position in an Orthene-treated and Lorsban-treated bed simultaneously. Each visit of more than two seconds to any flower was counted, regardless of whether it was the same or a different bee making each visit during the counting period. The two researchers started the timer for each of the two-minute measurements at the same time to eliminate differences attributed to environmental factors during counts. Counts were conducted between 9AM and 5PM when wind speeds were under 10mph and the sky was not overcast.

Results: Orthene did not significantly reduce pollinator activity in 2020 or 2021. Similarly, there was no significant difference in yield between Orthene and Lorsban treated beds in either year. This was consistent with results recorded by Leroy Kummer and Tim Dittl of Ocean Spray in the 1990s while conducting similar work.

Discussion: There are several possible explanations as to why acephate usage may have been associated with adverse effects on pollinator activity and yield 25+ years ago but that these observations have not been replicable in recent years under modern production conditions. One possible reason for the difference is increased water carrier volumes in modern applications - most growers apply at least 20-25gpa through the boom today compared to significantly lower water carrier volume application by other means 25+ years ago. A highly concentrated solution of any pesticide can sometimes be more associated with adverse effects than a less concentrated solution. Growers today are also well informed and cautious in timing pre-bloom organophosphate sprays, generally placing them 2-3 weeks prior to the arrival of bees on the marsh. It used to be more common to push pre-bloom applications of bee-toxic materials closer to the bloom window than is acceptable today, so it is possible that an acephate application were pushed closer to bloom (less than 2 weeks to the arrival of bees) would have resulted in a negative impact in this study. Finally, formulations change, and modern formulations of acephate (including Orthene 97) have been formulated to have a reduced odor compared to older formulations. It is possible that an older (and higher odor) formulation of acephate may have been somewhat repellent to bees. There are other possible explanations, but some combination of these three variables may be at least partially explain both historical grower observations and this more recent research. In general, this work demonstrates that a modern formulation of acephate used at a grower standard timing (2-3 weeks prior to arrival of bees) and with 20-25gpa of water carrier appears unlikely to have an adverse effect on pollinator activity and subsequent yield.

Acephate has systemic and translaminar properties, and uptake by the plant is fastest during warm, sunny weather. While Lorsban was a strong contact killer of insects, the preferred mechanism for kill with acephate is through ingestion. As with other insecticides that work best through ingestion this means that thorough coverage is helpful to achieve best results, so a high water carrier volume (25gpa+ if possible) is suggested. Acephate's half-life (the time it takes 50% of the applied active ingredient to degrade) in cranberries is not well studied, but in other crops where it has been studied a half-life as short as 7 days has been observed. This serves as a general reminder that although the product will move into the cranberry plant following application, the active ingredient still degrades over time even though it is more resistant to wash-off from rain or irrigation. This means that like any other insecticide, an application of acephate may not achieve acceptable kill if applied too early and needs to be made based on specific insect population data collected on the farm each week. There has been some anecdotal observation of secondary pest resistance historically, including reported observations of reduced sensitivity in spiny looper populations. Consult with your scouting service following an application of acephate to check that kill of various caterpillar species has been thorough. Growers are also advised to check with their beekeeper if they plan on using any formulation of acephate this year, as well as to consult the mandated usage patterns of their respective handler.

Three Years' Growth at WCRS Breeding Plots

By Juan Zalapa

Juan Zalapa and his team are proud of the diversity they've been able to plant at the Wisconsin Cranberry Research Station. In three years of planting, they have planted a total of 3750 individual plants. These represent 2,933 experimental clones and 697 Stevens clones as controls. The experimental controls are a robust collection: they include natural diversity (wild selections from Wisconsin, Michigan, and Minnesota) in addition to older and traditional cultivars. The fruits of Dr. Zalapa's labor are included as well: many crosses (Stevens x Yellow Bell; other red x yellow crosses; Murphy's Green x high anthocyanin leaf plants; Pilgrim x Ben Lear, Pilgrim x Stevens, Pilgrim x HyRed, Pilgrim x LeMunyon, Stevens x Ben Lear, Stevens x, BL-8; #35 x HyRed, #35 x WSU108; HyRed x WSU108) along with selfs of DP14, DP17, Sweetie, Sundance, HyRed, Ben Lear, and Pilgrim.

More crosses are being worked on at the lab and are looking forward to their new home, including several crosses from #35, an unnamed cross from the 1940s USDA breeding program which is a parent of many popular modern cultivars.

This is a recap of Dr. Zalapa's presentation at the April 21, 2022 Mini Clinic, prepared by Allison Jonjak.



Fig 1: Cranberry plants preparing to be planted in Dr. Zalapa's breeding plots, along with a coded map of plant locations.

Early Spring Recommendation for Cold Protection and Fertilization Plans

By Amaya Atucha

Last week at the mini clinic I talked about cold hardiness of buds during this time of the year and addressed some of the concerns many of you had about potential damage during this week's cold temperature forecast. Here's a summarize of my recommendations:

- The weather we have experienced so far this spring has followed the general pattern of spring temperatures in Wisconsin. Last year, we had very warm temperatures in late March that pushed the vines out of dormancy faster than expected followed by low temperatures that might have resulted in the overall lower than expected yields we had in 2021. This 2022 spring, temperatures have raised at a slower rate, and even though we have had warm days with high >70 °F, the minimum temperatures have mostly stayed below the freezing point and 40 °F.
- Our cold hardiness studies concluded there is a significant loss in bud cold hardiness during the spring period when buds resume their growth and new vascular tissue is developed, even when there are no visible changes to the bud's appearance. This shift in bud cold hardiness usually happens after 5 to 7 consecutive days of exposure to daily minimum temperature over 40 °F. The initial shift in bud cold hardiness goes from tolerating temperature below 0 °F to incurring damage when temperatures range between 10 to 15 °F.
- Based on the weather records for our growing regions, I would anticipate that at this point buds will be able to withstand minimum temperature of up to 15 °F. However, our studies did not consider windspeed, so if you still have frost in the ground you might want to flood and protect mostly the leaves (since buds should be hardy enough to withstand the forecasted temperature) from desiccating and dropping before bud break.

Fertility recommendations:

During the mini clinic last week there were several discussions about leaf damage and severed upright from the hailstorm experienced a couple of weeks ago in some growing regions. I know that many growers get anxious when looking at uprights that have dropped leaves, but there isn't much we can do about it at this point. Many growers might be tempted to apply fertilizers earlier than normal to increase fruit set and vegetative growth. My recommendation is not to apply extra fertilizer to the vines since this will not help them during this early stage. The best you can do is to make sure you are not stressing the damaged vines so they can use all the reserves they have left to push new growth and flowers. One recommendation would be to avoid flooding the beds that have severe leaf damage, because flooding results in less reserves available for the upright and fruit to grow while new leaves are developing. If possible, skip the insect flood that is done later in the spring when temperatures are warm. Stress to vines that have experienced damage will be intensified if they are flooded during warm temperatures.

The price of fertilizer is outrageous this season and increasing nutrient application before bloom will not result in faster vine recovery from the hailstorm damage nor will it get the vines to bloom faster. Save yourself some money and wait to fertilize until you see fruit set.

CranCam Update 2022

By Jyostna Devi Mura

As a root project that will be able to feed lots of future work, Dr. Mura's lab in 2021 piloted a CranCam project, which will be deployed at a larger scale in 2022. Developing a Raspberry Pi-based camera system that can take pictures of cranberry growth stages will improve selection of cultivars (color development, early flowering), as well as developing phenological models (GDD & more), as well as inform crop management practices (irrigation, fertilization, crop protection, and harvest planning).

Currently, Dr. Mura's lab staff are identifying growth stages present in photos manually. But in order for the project to scale effectively, a model that identifies growth stages present in photos using machine vision. Fig. 4 shows two examples of progress being made on these models.

This is a recap of Dr. Mura's presentation at the April 21, 2022 Mini Clinic, prepared by Allison Jonjak.

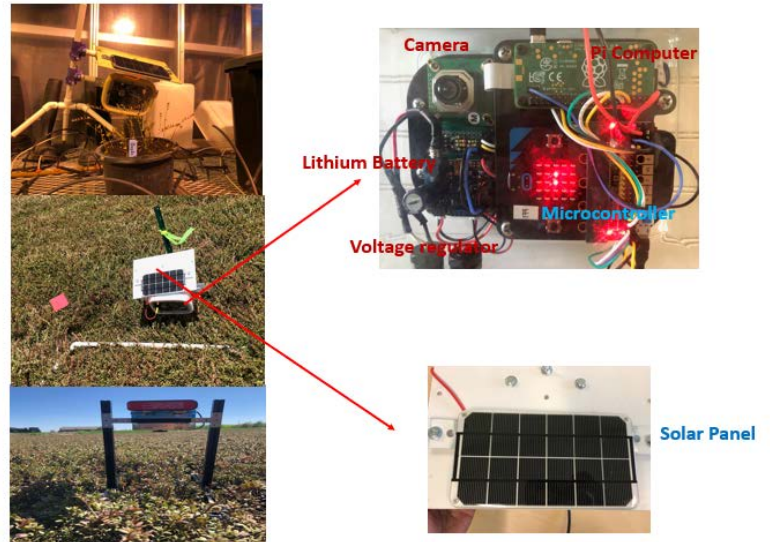
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Fig. 1: Development and testing of the CranCam.

Fig. 2: Six pilot test cultivars on the same marsh in the same week.

Fig. 3: A pilot study of when threw cultivars hit growth stage milestones in the 2021 growing season. Aproximate Growing Degree Days (GDD) caulculated with images collected at Cranberry Creek, WI (Dharani Suresh Babu, Ph.D. student, Horticulture).

Fig. 4: A machine vision model's labeling of dormant vines (with 85% confidence) and hook phase vines (86% and 85% confidence). These models will continue to improve with training.



Stage	Mullica Queen	Stevens	Crimson Queen
Bud swell	200	200	200
Bud break	364.5	427	347
Elongation	472	557	446
Rough neck	642	642	600
Early Hook & Hook	783	783	644
Blossom	1024	1024	749
Blossom & Pinheads	1282	1248	988
Pinheads & Peas	1495	1495	1282
Fruit set	1573	1573	1495
Sizing	2054	1776	1677
Blush	2323	1969	1803



Early Season Update: Late Spring and Hail

By Pam Verhulst

Across the state of Wisconsin, spring is late. A Vilas county grower reported being 100% frozen, and some areas have 12” of ice yet. In Price county, sanded beds have exposed vines but unsanded beds remain 75 to 100% covered. Monroe county has most beds thawed, with some growers flooding for recent high wind and cold days. In Wood County, much has thawed and many have irrigation ready before flooding against wind and cold.

Asked to rate their own buds, 48% of growers have not yet seen them, 35% rate them as better than last year, and 17% rate them as about the same as last year.

April 12 saw a hail event across much of central Wisconsin. 52% of growers participating in the Mini-Clinic did not have hail; 14% had hail but their vines were covered by flood waters, and 33% had hail on exposed vines. 20% of participants thought they will have damage but don't know the extent yet; 7% expect less than 1% of damage, 7% expect between 1 and 2%, while 13% expect more than 2% damage. 19% also had more trash than usual without knowing the reason, and 31% had more trash than usual and attribute this to hail.

Spring is warming up late. Figure 1 shows accumulated to-date GDDs from Wood County over the past several years, and the season long GDDs to compare. We see a similar trend in 2018 with the late spring, although we were lucky that in 2018, we had caught up by May 15.

More than half of the participants thought that we are 2 weeks behind a “typical” year in terms of weather and management. Despite that, 90% of growers plan to continue with their usual Casoron management, while only 10% will use it at a reduced rate due to the late start.

The take-home message from the late spring is to plan for various scenarios and to prioritize your tasks and inputs.

This is a recap of Pamela Verhulst's presentation at the April 21, 2022 Mini Clinic, prepared by Allison Jonjak.

	Date	2022	2021	2020	2019	2018
This week	04-18	93.95	287.8	157.2	152.1	66.5
First Scouting week	05-15		542.8	404.2	407.6	451.4
ST Peak Bloom	07-04		1844.9	1667.25	1486.15	1832.75
Harvest	10-01		4145.55	3864.75	3782.2	4144.55

Figure 1: accumulated GDDs as measured by Elm Lake Cranberry.

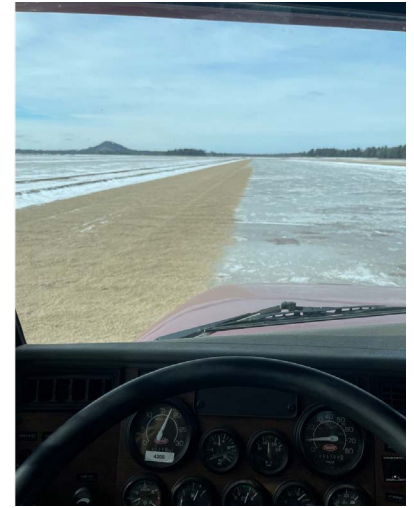
Grower Updates

Flying Dollar Cranberry

By Seth Rice

Wisconsin always keeps us on our toes! Mother Nature will always do what she wants. Hopefully everybody got their sanding done like we did. On April 12th we got hit with hail like many others around the area. Some growers were flooded or in the process of flooding and might have had a better chance but most of everyone felt some damage of some sort. This will be interesting to see how the crop turns out overall here in Central Wisconsin. It's been a long time since we had hail that bad in this area.

Most growers have a good chunk of their pipe out already or already have it done. Still some frost in the ground in spots but that's just how it goes. Every year we have some underground pipe either frozen or broken and in need of repair. For those who are going to renovate some beds, the time for mowing vines is just around the corner. This time of year, there is never nothing to do! See you next time!



Vilas 51

By Jeremiah Mabie

Hello everyone! As always everyone up north is eagerly awaiting spring to officially show its face. Up until this past weekend most beds that were not sanded were still covered in a good layer of ice, as well as our lakes. The few spots we are able to see vines they look to have wintered very well. The next couple days are pretty cold (snowing currently here) but then after that it looks like things will really start to thaw and we will be racing to get all the irrigation in and spring applications on. Most if not all growers have a flood up currently and are keeping busy with spring clean-up and other projects. Think warm thoughts!

2022 Spring Mini-Clinic Recap

By Allison Jonjak

On April 21, the Spring Mini-Clinic was held in person for the first time at the Wisconsin Cranberry Research Station. To provide an opportunity for people to interact with their local community while also keeping travel times short, we offered live broadcasts at 3 locations (Cranmoor, Manitowish Waters, and Spooner) in addition to the in-person meeting at the research station. In all, 55 people attended at the Station and 34 attended from our broadcast sites. Of those at the Station, 48% were there for the first time.

Each speaker's presentation is recapped in this week's CCMJ. They are:

- Consultant Update, Pam Verhulst, LadyBug IPM
- Orthene and Pollinators, Dave Jones, Ocean Spray
- Spring Frost Watch, Amaya Atucha
- Fanfare Information, Christelle Guédot
- CranCam Update, Jyostna Mura
- Genetics Update, Juan Zalapa

Finally, Allison Jonjak gave a presentation of research conducted at the Wisconsin Cranberry Research Station in 2021, and Dr. Zalapa provided a tour of the variety trial bed at the northern end of the marsh.