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OBSERVATIONS FROM THE FIELD

by Pam Verhulst
Lady Bug IPM, LLC

We wrapped up scouting the week of August 19th with our last official visits. Some spot checks will continue through this week (Aug 26th) as a couple growers continue to address lingering pests. Cranberry Flea Beetle can continue to emerge and feed on the vines until harvest. Sparg are pupating (Image 1) and we can see their flights in the beds, which are indicators for next spring's pressure. The Sparg damage that can be observed now is likely all they will do this season.

Image 1

Early Rot can be found on some properties. We encourage all growers to watch their irrigation thresholds and try to keep the berries as dry as possible (without drought) during these final weeks. We all hope that the yearly precipitation will average out and this spring's rainfall will result in a dryer August and September.

Agronomic crop progress is around 2 weeks behind normal (according to the WI Pest Bulletin). For Cranberries these crisp nights and sunny seasonable days will certainly help us to the finish line. Buds for the 2020 season are setting and berries are starting to blush (Image 2). With the cooler nights dormant colors will start to show on the vines (Image 3). While some properties show noticeably larger fruit than last year other properties still have a lot of sizing to do.

Fertilizer and pesticide booms are being winterized and harvest equipment is being brought out of storage. Pesticide usage reports are being filled out and turned into their markets. Harvest schedules are being orchestrated.

It was a great season.

The Lady Bug team wishes everyone a safe and happy harvest!

Image 2

Image 3

FACTORS AFFECTING FRUIT GROWTH IN CRANBERRY

by Amaya Atucha
Extension Fruit Crop Specialist
UW-Madison

During the summer field day, I gave a short talk on the factors affecting fruit growth and I thought it might be a good idea to summarize some of the most important points in an article. Most of the information provided in this article came from research studies done by previous UW-Madison faculty, as well as cranberry researchers from other cranberry growing regions in the U.S. and Canada.

One of the most important factors affecting fruit growth rates is temperature. The number of days with moderate temperature (60 to 85 °F) is the best predictor of fruit fresh mass accumulation. What this means is that the higher the number of days the temperature stays in this range in the period between fruit set and harvest, the larger the fruit will be. This is because the rate of photosynthesis in cranberry leaves is the highest when temperatures are in the mid-70s, which means that in that range of temperatures more carbohydrates (sugars) are being produced through photosynthesis in the leaves, and those carbohydrates are the ones that will make the fruit grow. When temperatures are over 85 °F during the fruit growing period, the production of carbohydrates is lower, resulting in smaller fruit, which basically means as seasons get warmer and we experience more days with temperatures over 85 °F, especially in July and the early part of August, we will struggle to achieve bigger fruit size. The same is true with cooler temperatures (< 60 °F) during the beginning of fruit development in late June and early July that will result in smaller fruit, or when we have an early fall and fruit stop gaining fresh weight because the rate of photosynthesis decreases and fewer carbohydrates are being produced.

Which brings me to my next topic, over-fertilizing or late season fertilizer application will not compensate for small fruit. I often hear that growers want to "pump up" berries with fertilizer to get them to size, but it is not the nutrients in fertilizer that will make the fruit grow, but the carbohydrates produced through photosynthesis in the leaves that are translocated into the developing berries. So why do cranberries need to be fertilized with nitrogen (N), phosphorus (P), and potassium (K)? In the case of N, this element is used to produce amino acids, which are the building blocks to assemble proteins. Proteins are essential to capture the energy from the sun through photosynthesis, resulting in the production of carbohydrates that will support fruit growth. The N is not needed in the fruit, but in the leaves for the production of carbohydrates to grow the fruit. Previous research studies have shown that in a bed producing 300 bbl/a only 15 to 20 lb N/a is removed by the fruit. In the case of P, this element is key to the production of the ATP molecule that carries energy in plants. P is part of the cell membrane and has an important function of transferring carbohydrates in the chloroplast to the cytoplasm, where they will be used for growth. Several studies have shown that reductions in P fertilization have no impact on yield or fruit size. I highly encourage growers to cut production costs by reducing their P fertilization, as long as tissue tests are in the normal range. Previous research studies have shown that in a bed producing 300 bbl/a only 3 to 6 lb P/a is removed by the fruit. In the case of K, this element is not part of proteins or the cell membrane, and does not have a direct role in metabolism. The main function of K is water movement in the plant, as it is key to the opening and closing of the stomata in leaves. Stomata are small openings or pores that allow gas exchange in the plant; water vapor leaves the plant and CO_2 enters. Many growers believe K makes fruit bigger, but this is not true. Uptake of most of the nutrients that go to the fruit occurs in the first stages of fruit development (fruit set to pea-size berry). After that, it is just carbohydrates that make the fruit grow. K is different from N and P in that more K is removed by the fruit, and in the case of a bed producing 300 bbl/a of fruit an estimated 30 to 35 lb/a of K (or 34 to 40 lb/ a of K_2O) is removed by the fruit.

Since we are talking about K, I would like to briefly comment on the topic of K fertilization in August and September for bud set. There is no research supporting that K fertilization in late summer to early fall is needed or beneficial for bud set. K fertilization at any point during the growing season is made to support growth, yield, and overall plant health, not for bud setting. Most likely, the notion of applying K in the fall to help set buds comes from the recognition that growth in spring is supported by stored nutrients, and thus, K fertilization in fall specially in the case of low K in tissue and soil would help next year's initial growth. However, in beds that have received adequate K during the growing season and have tissue and soil K in the normal ranges, there is no need to apply K in the fall.

In summary:

- One of the most important factors affecting fruit growth rates is temperature, and the number of days with moderate temperature (60 to 85 °F) is the best predictor of fruit size.
- Carbohydrates (sugars) NOT fertilizer nutrients make berries!

- The goal of monitoring nutrient levels in plant tissue and soil is to apply enough nutrients so that it is never a limiting factor for yield and growth. Applying more fertilizer than that is a waste!
- There is no research supporting the notion that fall K fertilization helps set buds.

REDUCED RISK INSECTICIDE: EXIREL

by Christelle Guédot
UW-Madison, Department of Entomology

Exirel is registered for use in Wisconsin on several crops including cranberry. It was first registered around 2014 on other crops and cranberry was just added to the label in 2019. It is marketed by DuPont™ under the formulation 10SE (10% of active ingredient as a Suspo Emulsion, which is an oil in water emulsion). Exirel, similar to Altacor, is in the class of the anthranilic diamides (IRAC group 28), with a mode of action acting on the insect ryanodine receptors in the muscles, causing an uncontrolled release of calcium in the cells. Exirel contains the active ingredient cyantraniliprole. Exirel has contact activity but is most effective through ingestion of treated plants. Affected insects will rapidly stop feeding, become paralyzed, and eventually die within 1-3 days. Applications should be timed to the most susceptible insect stage, typically egg hatch and or newly hatched larvae.

Insecticide: Exirel

- **Available as 10SE (10% AI, Suspo Emulsion)**
- **Restricted re-entry interval (REI): 12hrs**
- **Pre-harvest interval (PHI): 3 days***
- **No more than 2 applications within single generation of target pest**
- **No more than 2 successive applications with 30-day period**
- **Do not exceed a total of 0.4 lb AI (62 fl. oz.) per acre per year**
- **Rate of use per acre: 10 – 20.5 fl. oz. depending on pest**
- **Minimum interval between applications is 5 days**

From a cranberry standpoint, Exirel is registered for control of cranberry fruitworm and suppression of tipworm (also known as blueberry gall midge). Other insects under the bushberries group are also included on the label but are not reported as pests in cranberry production.

In our previous trials conducted by Jack Perry, Exirel showed great activity against cranberry fruitworm, sparganothis fruitworm, blackheaded fireworm, flea beetle, and the spanworm common Eupithecia. Our trials did not show efficacy of Exirel against tipworm and Exirel is listed for suppression only for tipworm. Timing and environmental conditions may have impacted our results (though we do not think that Exirel will be a good fit for tipworm control in cranberry). Overall, Exirel performs similarly to Altacor on our cranberry pests and this is not too surprising as they both belong to the same IRAC class of insecticides (group 28). This means that Exirel and Altacor have the same mode of action and should NOT be used in rotation to delay insecticide resistance. Instead, Exirel could be used to replace an application of Altacor.

Exirel may be applied by ground equipment, chemigation, and air (see label for specific application regulations). For ground foliar applications, use a minimum of 30 gallons of water per acre and the label recommends applying 100-150 gallons of water per acre for best results.

Exirel is highly toxic to bees exposed to direct treatment or residues on blooming plants. Do not apply Exirel when bees are foraging and until flowering is complete. Exirel is toxic to aquatic invertebrates and oysters and must not be applied directly to water.

*Please check with your handlers as PHI may vary. For example, in 2019, Ocean Spray has a 50 day PHI for domestic as well as export processed and fresh fruit.

As always, you are encouraged to check with your handler before using any new product and please make sure to read the label before using any pesticide. You can find the label of Exirel at the following link:

*www.agrian.com/pdfs/DuPont_**Exirel**_Insect_Control_**Label**2ne.pdf*

GROWER UPDATES

GARDNER CRANBERRY

Overall, most of our marshes had low pressures of flea beetle this season. Only two properties had to treat all their acreage and only a couple marshes spot treated for flea beetle.

All our properties are focused on ditching, repairing dikes, mowing, working on harvest equipment and taking soil and tissue samples.

The berries have been gaining size and blushing up nicely.

Harvest is approaching quickly, none of this would be possible without all our managers and crews, near and far that continue to put in the effort! Thank you, managers and crews for all your work!

Have a safe and successful harvest, everyone!

Willow Eastling

RUSSELL REZIN & SON INC.

Bugs kept us on our toes the entire month of August. From flea beetle and fruit worm to sparg, we were driving around every day checking for spots and sweeping for bugs. Thankfully we were able to get things under control, but we are still keeping an eye out for flea beetles.

Just like that, the growing season is coming to a close and harvest is right around the corner. We are seeing lots of pink and half red/half green berries and just waiting for the upcoming cool nights to get the deep red color on the fruit. We are starting to get our harvest equipment prepped and ready to go while we wait for the final summer days to wind down.

For my final article, I'd like to leave you all with my favorite cranberry joke:

What's the difference between a pirate and a cranberry grower?

A pirate buries his treasure and a cranberry grower treasures his berries!

Wishing you all a safe and successful harvest!

Amber Bristow

WISCONSIN CRANBERRY RESEARCH STATION UPDATE

As the nights are cooler and the days are getting shorter, we know harvest time is right around the corner. I was hoping to see warmer days and nights going into the last week of August and into September as my new plantings were really starting to take off.

We are currently putting in the last of the drain tile on beds we will be planting next spring. I also hope to have all the irrigation in by harvest time.

Hope everyone has a great harvest.

Wade Brockman

References to products in this publication are for your convenience and are not an endorsement of one product over similar products. You are responsible for using pesticides according to the manufacturer's current label directions. Follow directions exactly to protect the environment and people from pesticide exposure. Failure to do so violates the law.

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