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Should You Use an Adjuvant With Your Insecticides?

By *Christelle Guédot*

Adjuvants are products that are added to a pesticide to enhance the performance and/or physical properties of the pesticide. Adjuvants include, but are not limited to surfactants, oils, defoaming agents, deposition agents, thickeners, spreaders, compatibility agents, drift control agents, to name a few. Using the proper adjuvant may reduce or even eliminate in some cases spray application problems, improving the overall effectiveness of the pesticide. Adjuvants do not have any pesticidal properties by themselves and thus are not required to be registered by U.S. EPA (Environmental Protection Agency) and their distribution is seldom regulated by states. However, adjuvants have labels that you should read and follow to avoid problems.

There are two main categories of adjuvants: the formulation adjuvants that are already mixed in with the pesticide you purchase and are part of the inert ingredients on the label, and the spray adjuvants that are separate products that you may need (per label direction) or decide to add to the spray tank. Here, we are discussing spray adjuvants and for more information on the different types of adjuvants, please refer to this article from PennState Extension.

There is an amazing number of adjuvants to choose from and this can be overwhelming at times. In addition, not all adjuvants are alike and of the same quality. If you are looking for some kind of standard of quality, look for the CPDA stamp of certification. CPDA stands for the Council of Producers and Distributors of Agrotechnology, which is an organization of inert ingredient and adjuvant manufacturers. This organization develops minimum standards to be met in order to receive the CPDA stamp of certification for adjuvants. Here is a list of CPDA certified adjuvants and Figure 1 shows the stamp of certification from CPDA you can look for on adjuvant labels.



If you decide to use an adjuvant, please be sure to first check the label of the pesticide you plan to add the adjuvant to. Pesticide labels often have very specific instructions on what type of adjuvant to use and how to use/mix it with the pesticide. You are required to follow these instructions to be in compliance with the law.

If you have questions about the specific properties of an adjuvant, you should contact the manufacturer or dealer of that product before using it. Adjuvants may cause phytotoxicity, may already be part of the pesticide formulation, may lead to unsafe interaction or improper mixing with some

pesticides, and could cause harm to beneficial insects. We have conducted trials with a few surfactants to improve the effectiveness of insecticides and overall, the surfactants that we have tried did not significantly increase the effectiveness of the insecticides we tried.

Take away. When considering adding an adjuvant, please remember to:

- **Read the pesticide label**
- Read the adjuvant label if available (remember it is not reviewed by EPA)
- Use only adjuvants manufactured and marketed for agricultural/horticultural use.
- If the pesticide label specifies a type and/or brand name of adjuvant, you have to use that type and/or brand name. Any substitution would be a violation of the label.
- Miracle adjuvants do not exist, look for products from a reputable dealer or for the CPDA stamp.
- Pesticide formulations often change which may change the adjuvant recommendations. **Always read the pesticide label.**
- Adjuvants are not always useful. If the pesticide label does not mention using an adjuvant, it is likely because the manufacturer has data showing no benefit, or even adverse effect, from using adjuvants.

Spray adjuvants used according to the pesticide label can play an important role in safe and effective pest control. Make sure to know the site you plan to spray, the target pest, the mixing and spray equipment you will use, and the pesticide you plan to use to insure the correct use of an adjuvant. **And always read the pesticide label for the recommended adjuvant to use.**

Observations From the Field

By Pam Verhulst

We usually spend the 2nd and 3rd weeks in May doing some spot checks and answering field questions. This year a lot of growers are under water due to the extended frost forecasts. While some are under water, many are using irrigation to frost protect because they have renovation projects, conducted moss control, recently applied herbicides or had other situations that did not justify flooding. During our spot checks this week (May 11, 2020) both methods are showing healthy buds. Keep in mind, frost damage is more obvious a couple days after it occurs. We will continue to monitor bud development in both situations.

The frost nights have been stressful, but one positive thing about April was that Wisconsin had around 15 perfect renovation days. Growers are really making progress on renovations this year! Some vines were already planted the first week of May. The last couple years we have seen wet, cold springs-so we haven't seen these early planting dates in a while.

While we wait for the weather to warm up we have another project going on. We are joining 3 growers as Nematode "Citizen Science Cooperators". We will be working with Shawn Steffan in developing a nematode system. We will focus on rearing, application timing, and procedure for Cranberry Flea Beetle control. With market restrictions and late season spraying, we really need another option for Cranberry Flea Beetle. Having an option of a biological insecticide to use against what is becoming one of our number one cranberry pests is a great alternative. The cooperation of growers and consultants during these early stages will hopefully bring the Nematodes into practice sooner.

Frequently Wondered Questions in Frost Tolerance

By Allison Jonjak

These might or might not be the questions everyone wonders about cranberry frost tolerance as buds break dormancy in the spring, but they had been mine, so maybe they'll help you as well. I grew up with "The Frost Tolerance Chart" tacked onto the wall, but I was in middle school, so I didn't read the paper. Talking with growers about frost tolerance heading into this cold weekend encouraged me to take out the paper and connect the dots.

My biggest question as a twelve-year-old, was about the huge jumps. When can a tight bud tolerate -8°F , and when should it be protected at 16°F ? It turns out this was a big question as they were performing the research, too. To understand that range, let's look at how they ran the experiment.

They clipped Stevens uprights with buds on 21 days, through all 9 growth stages. They chilled the uprights in a glycol bath, precisely controlled, to 10 different temps. The 10 temps they used changed based on what we already know about bud tolerance: for tight buds, they tested temps between -4°F and 32°F ; while for bud elongation they tested from 24°F to 32°F . Then after ex-

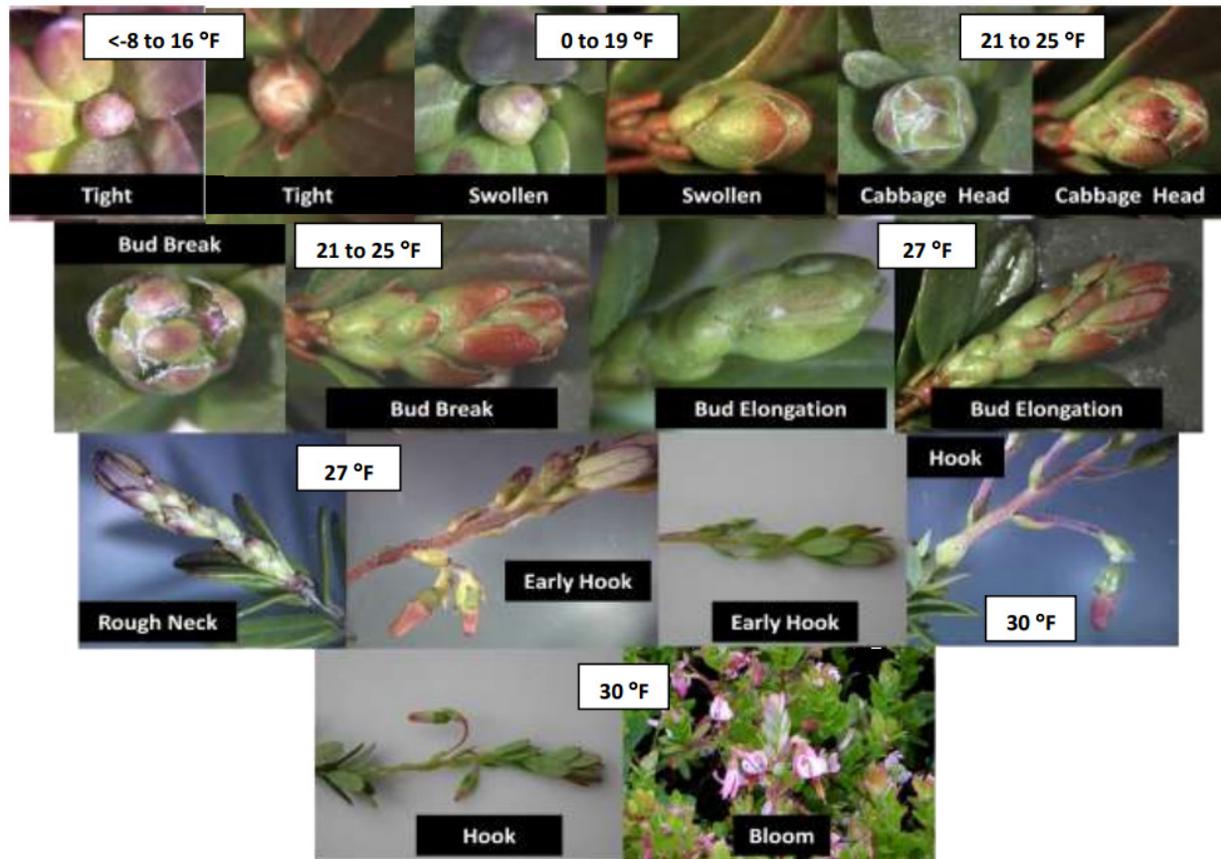


Figure 1. Developmental stages of cranberry bud during spring growth. Although at a given time multiple stages will be present, in our studies the most abundant bud stages at the time of collection were used for frost hardiness evaluation. The range of temperatures accompanying each bud stage represents the frost hardiness changes within that stage during spring growth. These numbers represent the minimum survival temperatures. All of the studies were conducted using 'Stevens.'

Figure 1 From Workmaster and Palta (2009): [Frost Hardiness of Cranberry Plant](#)

posing the uprights to these lab-controlled frost nights, they watched how the uprights recovered and continued growing. The research marked the temp at which 50% of the uprights were impaired (that is, 50% were killed or 50% of the tissue was damaged).

Now for those large ‘tolerable ranges’ for tight buds and swollen buds. There were tight buds in their samples on 14 of the 21 sample days—every sample between April 15 and May 28 (1997) was more than 30% tight buds. The first 5 sample days, the buds were fully dormant—even at -8°F , they weren’t damaging 50% of the uprights. By the 6th sample day, some buds had swollen, but more than 50% of the tight buds were still surviving -8°F . On May 9, 50% damage was reached at $+8.4^{\circ}\text{F}$. (Swollen buds on the same day were damaged at $+6.9^{\circ}\text{F}$). Across the next 7 sample days, the tight buds gradually became less and less tolerant—on May 28, 50% of uprights were impaired at 16°F . After May 29, enough buds were swollen or cabbagehead that growers should focus on those buds instead. So we really are seeing a big difference in the temperatures tight buds can withstand over the course of the spring. This suggests to me that more is happening within the bud than we can see just by watching bud stage.

Swollen buds tell a similar story. Swollen buds made up more than 10% of the samples on 11 days—between May 5 and June 1. Across these days, we see swollen buds becoming 50% damaged at -0.8°F on May 5; and swollen buds becoming 50% damaged at 18.7°F on June 1.

The huge ranges on “The Frost Tolerance Chart” really do represent exactly what the research found—that you can see a tight bud, or you can see a swollen bud, or you can see a cabbagehead—and that information by itself is not enough to tell you when to frost protect. You need more information: depending on the length of time since ice-off, depending on your pattern of air temperatures, and accumulated heat, and possibly even day length—your cranberries will be more or less vulnerable to dropping temperatures.

Another question I’ve wondered: this research was done with Stevens, a very popular and wide-spread variety—and also a very durable variety. Now that we have more than a dozen varieties popular among growers—many of which are earlier, or more “racehorse-y” varieties than Stevens—should we start to ask if we want to consider these varieties as we set our sprinkler switches? One possibility is that all varieties are “the same when they’re at the same bud stage.” But given what I know about how many factors impact bud sensitivity—I want to ask how variety impacts it, too.

The more I dig into this research, the more I’m grateful for the immense good work Beth Ann Workmaster and Jiwan Palta have done for us already. And the more I feel curious: What’s going on within tight bud, and within swollen buds, that we might notice, if we look using more than our eyes?

Update from the Wisconsin Cranberry Research Station

By Wade Brockman

Well it looks like Mother Nature threw us a very cold curve ball to start May. We were able to plant our 4 lined research beds last week and we planted a 3.5 acre bed on the 11th. I am hoping to get Casoron on this week yet. Let’s hope for a warmer second half of May.

Grower Updates

Flying Dollar Cranberry

By Seth Rice

Hello from Flying Dollar Cranberry! We got a great jump on our pipe laying this spring and our two flood events have balanced our work and play. If you are like us, we have enjoyed watching the baby wildlife as we go about our day to day work routines. We have not had any plans of renovations but except for a few problem spots that we have had our eyes on.

We got our Casoron on time and were happy until we had to make the hard choice of flooding over it. With the warm weather coming about we are making plans for the rest of our herbicide applications weather pending. We are hopeful that this last flood has caught some of our sneaky pests known as the “Pittsville Looper”. Some of our early varieties have a jump start on coming out of dormancy than our Stevens such as our Mullica Queens and HyReds.

Social distancing can be a challenge for some of us here but some see it as a “mini vacation”. Let’s hope that Covid19 is the biggest hurdle we have to face this year. 2020, here we go!

Gardner Cranberry

By Willow Eastling

Starting on 5/6- 5/7 a lot of our properties flooded up for frost protection due to the consecutive nights of cold and low dew points. All of those properties will let the flood go around 5/12. Our vines haven’t moved a whole lot since we last talked, many of them are still bud swell. The BL’s up north are greening up quickly whereas ST’s are holding on to their purple hue. As of 5/11, no pest concerns in any region.

