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May Updates

Oh how the world has changed in just a few short weeks. I was expecting to be on the road meeting and visiting vineyards and wineries but that will have to wait for now as ISU has eliminated all but essential travel. The growing season already has been wild with rotating mid 70's with cold or freezing temperatures with what seems every other week.

Weather Forecast

First up for the month is the bad news. Looks like cold temperatures Friday night into Saturday morning. As of now, forecasted temperatures look to be 32 to 35 degrees F across the state. However, we all know actual field conditions tend to be slightly slower.

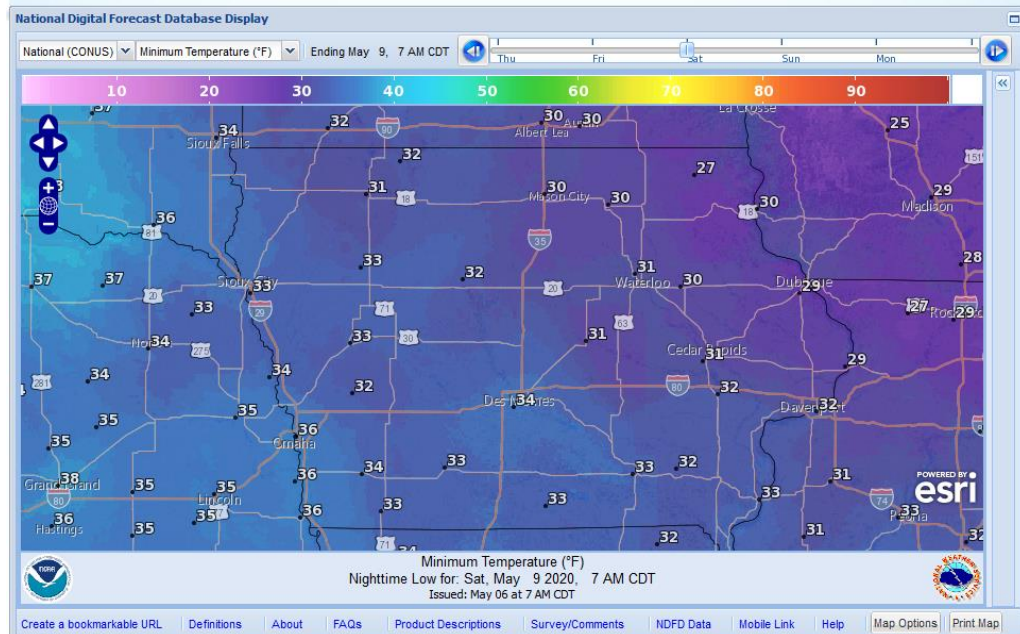
The cold weather that is coming is would be considered an advection freeze. It is a large cold air mass that will pull warm air/energy away from plants. It is different than a radiation freeze that we are better able to manage. A radiation freeze happens when you have a warm air mass at ~50 to 100 ft above the plants, suddenly all air movement stops just prior to sunrise, and temperatures plummet. See Advective vs Radiation Freeze images below. On Saturday morning, there will be no warm air 50 to 100 ft above the surface of the ground to mix with wind machines, frost busters, sprayers, etc to warm the temperature at ground level. This is a case where heaters are your best method of protection.

Graphical Forecasts

Weather.gov - National Digital Forecast Database Graphical Forecasts

National Weather Service
National Headquarters

<https://digital.weather.gov>

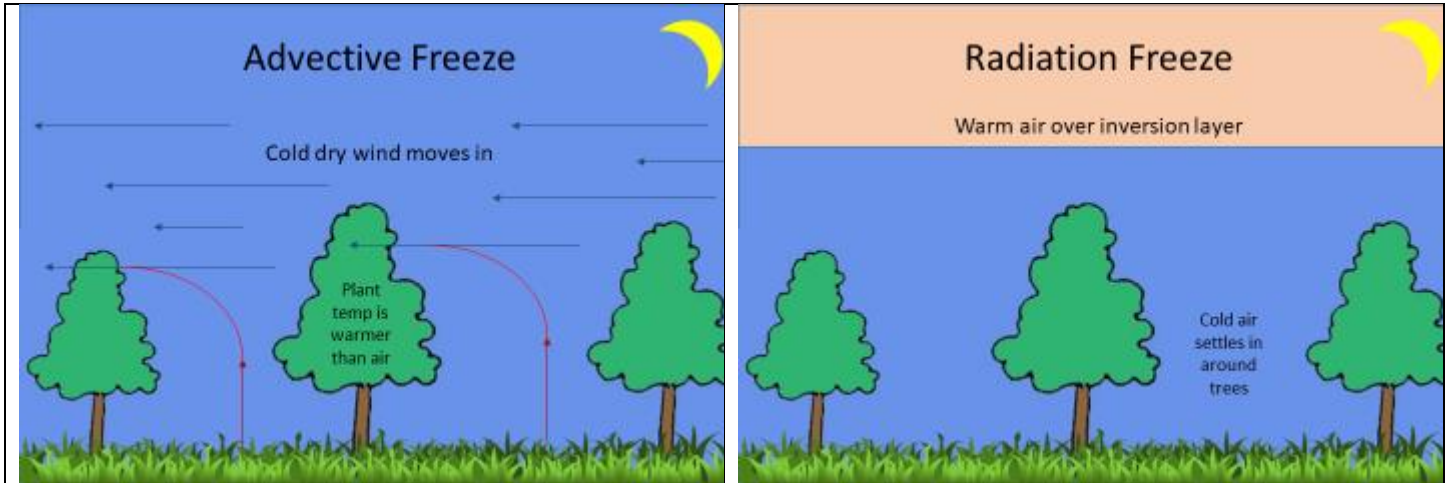


Most farms don't have smudge pots or enough small heaters to heat their vineyard. Some will be tempted to build a large bonfire to try to warm the area. However, heat is radiational which means only the surface facing the heat source will be heated. The back side of the plants and anything a few rows in will not be protected by a large bonfire. In the past, several of my orchards across the state have tried many (MANY) small bonfires across the field in a pattern much more

representative of how smudge pots would be placed. This is a more effective method but reports from the field still list the following problems:

- Too much heat causing injury to the plant
- That's a whole lot of firewood needed!
- The firewood must be dry. If you set it out today and we get rain...it will be too wet to get a good fire going and worthless.
- It takes a small army to manage all of these small fires. They must be started prior to air temperature reaching freezing and be sustained until temperatures warm up after sunrise. It takes a lot of running around and stoking small fires to keep them going all night.

Advection vs Radiation Freeze



What about row covers? Can they be used for freeze protection? Spunbond polyester row covers, such as Agribon™ or Reemay®, act as blankets which slows the rate of heat loss from the soil. Row covers protect plants by trapping heat released from soil and are available in several weights and dimensions. The heavier the row cover, the more protection it provides but the less light is transmitted. While very common in vegetable production, they are very cumbersome to place over high-density orchards and vineyards due to wind. A 0.5 oz/yd² cover will provide 2°F to 4°F of protection outside. They must be closely monitored so that temperatures do not get too warm during the day. If it is a sunny day, expect to have to remove the cover. Honestly...don't. It's been tried and is a giant pain!

What about potassium (or some other product). Can those products be used for freeze protection. This time of year I get a thousand questions asking if there is a magic potion that can be sprayed on plants giving them superplant strength to survive the cold temperatures. There are all sorts of trials and testimonials using foliar potassium (Nutri-K, Agro-K), carbohydrates, and sugars sprayed onto plants a few days prior to cold temperatures setting in. Each product is basically acting like antifreeze in the cell to prevent internal freezing and cell bursting. I think the correct language is to prevent nucleation of ice crystals in the cell (but how many farmers do you hear talking about preventing nucleation of ice crystals in their truck/car/tractor radiator). At this time, I cannot say there is solid evidence of any product being effective consistently and replicated in trials. A lot of factors go into it including timing, product, and rate (and probably a bunch of other things). It appears there are other products (see recent [ISU lab research with salicylic acid on lettuce](#)) that can be applied to provide protection but nothing I am going to go out on a limb to recommend at this time.

Additional Resources

[MSU Extension](#) has an excellent chart listing critical temperatures for grapes.

[PSU](#) has an excellent article discussing freeze issues with grapes.

An article I wrote about [Frost Protection for High Density Orchards](#)

Podcast

I have started doing some podcasting in an effort to deliver timely info. They are just starting to roll out via the [ISU Viticulture website](#). The first episode is with Ray Wolf of the National Weather Service discussing late spring freeze events. Super timely! The second episode is with Anne Zwink, Winemaker at Soldier Creek Winery. I am looking for weekly cohosts to drop in and talk about what is going on in the industry. If you are interested in joining me as a cohost, please drop me a note. We do not record live so that we can go back and edit before releasing!

Pest Scouting / Modeling Updates

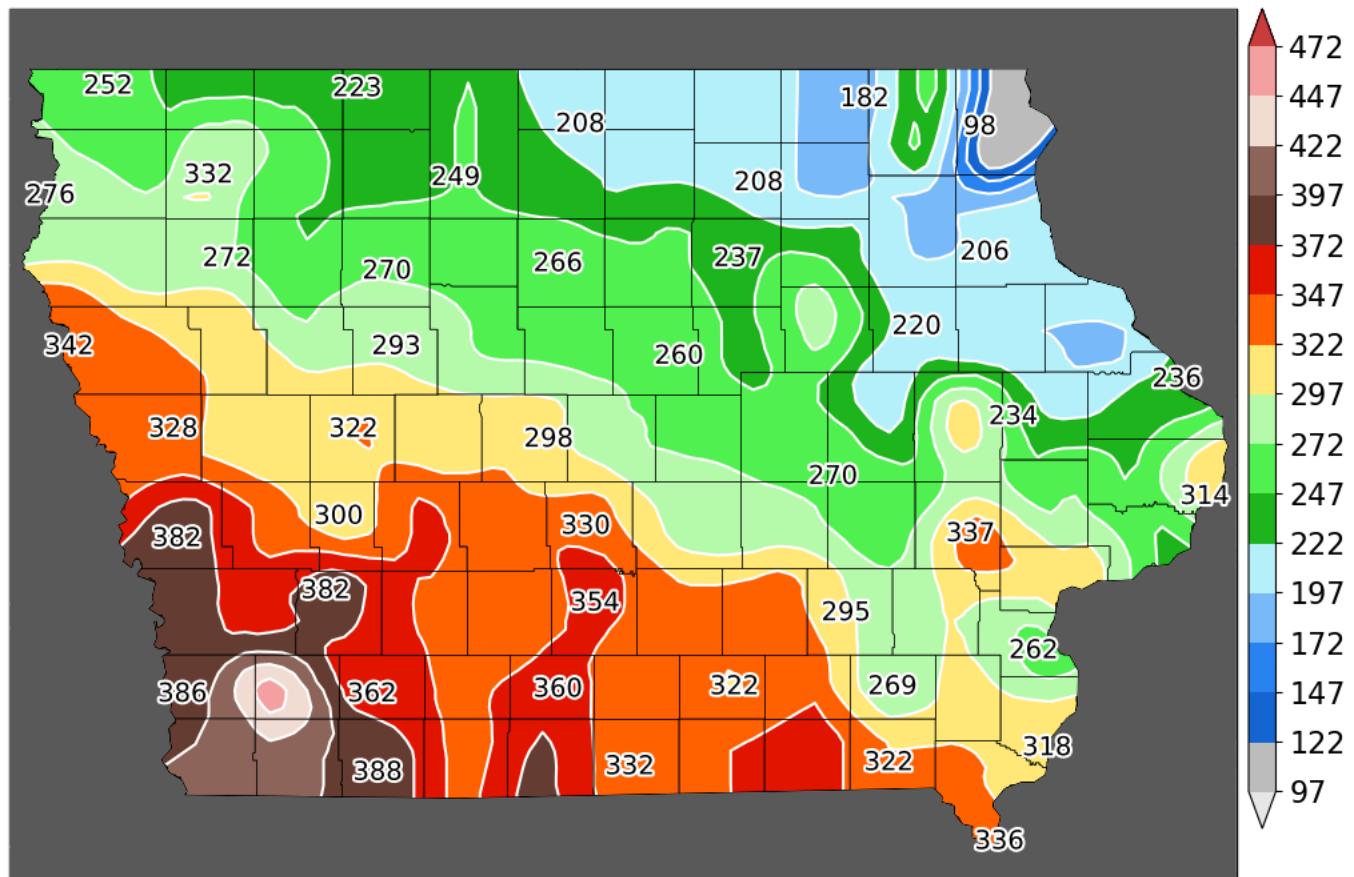
Japanese beetle

The Japanese beetle model uses accumulated growing degrees from January 1st. Base 50 and Cap 86. Adults are active between 1030 and 2150 gdd. We are still a long ways out from Japanese beetle emergence but it is also an excellent map to look at overall gdd for the season so far so I have included it here.

And since someone will ask...no you cannot prevent Japanese beetle during the season by controlling grubs in your sod now. Japanese beetles are very mobile and will find your vineyard even if you treated for the larvae that are in your soil now. You should not treat Japanese beetle larvae in your soil unless you are having actual problems with your sod (cut roots).



Iowa 2020: 01 Jan thru 05 May GDD(base=50,max=86) Accumulation



Grape Berry Moth

We haven't reached a point where grape berry moth can be tracked yet. Nothing to report at this time. Grape Berry Moth modeling requires local input to identify when wild grapes are blooming in addition to growing degrees days. If you would like to provide wild grape bloom data for your region, I would GREATLY appreciate it. I cannot be out there so I need your eyes in the field.

EnGeniousAg Seeking Input

Hunter Feldman from CyBIZ Lab, a program through Iowa State University that helps conduct market research for start-up companies trying to bring their products to market, reached out to me seeking vineyard managers input. The team that has developed low-cost, instantaneous nitrate sensors for plant sap, soil solution, and drainage/irrigation waters. They're hoping to enter into the viticulture market and are wondering if any of you are interested in this type of technology in your vineyard. They are looking for market feedback. Hunter can be reached at: hfeldman@iastate.edu and phone is 515-423-4212.

Weather Station Report

Following this newsletter you will find weather station summary data from the 5 vineyard weather stations across the state. Data is assembled weekly and posted to the Viticulture website. For your convenience, data from the most weekly report will be included at the end of the Viticulture newsletter (or in this case as a separate attachment).

These reports are assembled by James Schrader, ISU Department of Horticulture. For questions on these reports, please feel free to contact him directly at jschrade@iastate.edu.

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