



## Are we going to have an early budbreak?

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It's the question that is on a lot of people's minds right now, given the weather that we've had for the past several days, and which is supposed to just continue for at least the next week or so. Given those conditions, it seems likely that the answer to our question would be yes.

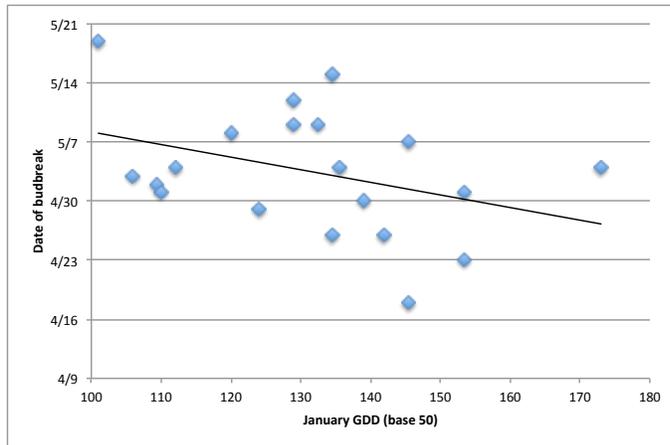


It would be nice if there was some nice, clean and easy to use formula to help us figure out when budbreak would happen, but unfortunately we don't. Some research has been done to try to figure out just what influences budbreak, but based on the work that I've looked at there isn't a solid answer that we can use yet.

Several different projects have looked at the influence of soil temperature on budbreak in grapes. Earlier studies done by scientists in California (Zelleke and Kliewer 1979, Kliewer 1975) saw a difference of several days in budbreak of Cabernet Sauvignon canes that were grown in soils at 11-12°C (about 53°F) and soils that were at 25°C (77°F). Studies on other perennial crops like apples (Greer et al. 2005) and trifoliate oranges (Stathakopoulos and Erickson 1965) have seen similar responses. However, a more recent study on Shiraz done in Australia did not see any impact of soil temperature on the timing of budbreak (Field et al. 2009).

So where does that leave us? It would seem to make sense that soil temperature should influence early-season physiology of the vine. But we also know (at least anecdotally) some warm days in late March or early April (2010, anyone?) can get the buds kicked into gear as well. So air temperature has to be the real driving factor, doesn't it?

If we look at the phenology data collected at the Fredonia and Portland stations out in the Lake Erie region, we actually don't see much of a relationship between the date of budbreak and the number of base-50 growing degree days (GDD) accumulated since January 1 (Figure 1). Now, that doesn't mean that there's almost no relationship



**Figure 1.** Relationship (or lack thereof) between January GDDs and date of Concord budbreak in the Lake Erie region.

between warm air temperatures and budbreak, but rather that a) GDDs calculated from January may not be a very good measure of what is needed to influence budbreak, and b) that air temperature is not the only driving force to determine when budbreak will happen.

As I mentioned earlier, we really don't have any way of predicting when budbreak will happen based on climatic data. But as with many things with growing grapes, your gut

can often be the most reliable guide. And while it may not be able to give us a precise date, I think most of us are anticipating an early budbreak this year.

### Can you do anything about it?

Well, perhaps. My colleague Imed Dami has done a lot of work looking at the use of oils to delay budbreak. He has examined several different types of oil, including soybean-based oils and mineral oils like Stylet Oil, on a number of different varieties, to see just what kind of delay these products might give growers in certain years or in certain locations where early budbreak and spring frost damage might be a concern.

I won't go into a lot of the grisly details here (I've provided a few links at the end of this write-up, if you want more information), but here are the basic messages from his work:

- 1) Applying soybean, mineral and vegetable oils can delay budbreak by anywhere from 2 - 20 days, depending on several factors including variety, timing, and coverage (Dami and Beam, 2004).
- 2) These oils can be phytotoxic at high enough levels. For a mineral oil like Stylet Oil, symptoms of phytotoxicity occurred at about 5% concentration (v/v). Phytotoxicity for soybean oils did not occur at concentrations up to 10% by volume (Dami and Wolf). If you want to use a mineral oil like Stylet Oil, the suggestion is to use less than a 2.5% solution to avoid phytotoxicity problems (Dami 2007).
- 3) Typical practice in Ohio, where a number of growers use this practice every year, is to apply a mixture of 8% soybean oil, 1% of an emulsifier (i.e. spreader/sticker), and 91% water. Imed recommends using 100 gallons of water directed at the wood (so change all of those percentage signs to gallons and there's your

tank mix). I know this seems like a lot of water to use when there's so little surface area to catch it, but the canes need to get soaked in order to for this to work.

- 4) Concord appears to be the most sensitive variety to this treatment, but it does delay budbreak on other varieties as well, perhaps just not as long as Concord or as consistently.
- 5) The closer the material is applied to budbreak, the less of an effect that the treatment seems to have. Imed found that mid-winter applications were more effective than early spring applications. What does that mean for this year? It would have been closer to ideal to apply these sprays a few weeks ago, but then again, who would have thought that we were going to have this kind of weather 3-4 weeks ago?
- 6) Imed has found, as have growers in Ohio who have used this, that the delay in budbreak does not impact fruit composition or maturity (i.e., delayed harvest) at the end of the season, unless the delay is extensive (more than 2 weeks).

So is it worth trying? I'll give you the standard, yet truthful, Extension answer: It depends. The fact that we're in a warm stretch of weather, closer to budbreak than we normally would be this time of year, probably means that the treatment won't be as effective as it would be if it was applied earlier in the winter. The other factor, obviously, is cost. The material that Imed used in his trial is a soybean oil called Amigo, which is currently running about \$24/gallon. At 8 gallons/acre, plus a gallon of a spreader/sticker, you're looking at just over \$200/acre just in materials (ouch!). Now, protecting a Concord crop from freeze damage might be worth that if you were pretty confident that it would get you past any last freezes that might occur. But I'm sure most growers will take a hard look at that number and want some better information about the practice before spending that kind of money.

Speaking of getting better information, Mike is out today (Thursday, March 15) applying this treatment in some replicated plots in a few different varieties - Concord, Foch and Chardonnay. We will be collecting budbreak data on these vines for the next few weeks and report what we find later this spring. In the meantime, give us a shout if you start to be buds swelling or breaking in your vineyard over the next few weeks. Hopefully, we won't hear from anybody for a while longer.

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#### Other Resources:

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Dami, I. and B. Beam. 2004. *Response of Grapevines to Soybean Oil Application*. American Journal of Enology & Viticulture 55(3): 269-275.  
([You can download this paper here](#))

Zabadal, T., I. Dami, M. Goffinet, T. Martinson and M. Chien. *Winter Injury to Grapevines and Methods of Protection*. Michigan State University, 2007.