

KENTUCKY VINEYARD NEWSLETTER

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1. Chilling unit accumulation across the state

Here is the situation so far at various reporting stations across the state in our commercial growing regions by 6 September 2007.

Station	Chilling units (45F base)
Lexington	950
Owensboro	932
Louisville	936
Covington	1090

You can also calculate chilling unit accumulation reports at the following URL:

http://www.wagwx.ca.uky.edu/cgi-bin/generic_dd_www.pl for more locations throughout the state. These data are courtesy of the Agriculture Weather Center at the University of Kentucky, College of Agriculture

2. Dormant pruning in wine grapes by S. Kaan Kurtural

Pruning is the removal of plant parts for horticultural objectives. The purposes of pruning grapevines are to:

- 1) Control the size and the form of the grapevine
- 2) Optimize the production potential of the grapevine
- 3) Maintain the balance between shoot and fruit growth.

Grapevine Fruiting Characteristics:

In grapevines, fruiting shoots are borne on one-year old dormant buds. Because of this character trait, we prune to replace the fruiting wood in each year. Pruning results in removal of 80 to 90% of the canes per year.

Effects of Dormant Pruning on the Grapevine:

- 1) A grapevine can only ripen a certain number of clusters in a given season.
- 2) Dormant pruning has a depressing effect on the grapevine.
- 3) The capacity of the grapevine is directly related to the number of shoots retained by dormant pruning.
- 4) The production of crop depresses vine capacity.
- 5) Shoot vigor is indirectly related to the cluster number.
- 6) Bud fruitfulness is indirectly related to shoot vigor.

7) Old growth (large diameter cordon or arm) can carry more fruit versus a newly established cordon.

Time of Pruning

Grapevines can be pruned throughout the dormant season. However, growers in Kentucky should wait until early spring to prune so uninjured canes can be selected by dormant pruning for fruiting. Delaying pruning until early spring tends to hold back spring growth flush that may be affected by late spring frosts in the region. However, dormant pruning should be completed before bud swell. Sap bleeding is seen with delayed pruning of grapevines up to 5 gallons per day, but this does not harm the grapevine.

Types of Pruning

The length of the one-year old dormant fruiting wood retained during dormant pruning determines the type of pruning. Cane pruning has 10 to 20 node fruiting canes (Figure 1) retained during dormant pruning, while spur pruning has 2 to 5 node fruiting canes (Figure 2).



Figure 1. Spur pruned dormant grapevine



Figure 2. Cane pruned dormant grapevine

Generally, most cultivars perform well with either type of pruning. However, some shy-bearing cultivars either with American or European heritage such as 'Norton,' 'Concord,' or 'Thompson seedless' perform better when cane pruned because the buds that are four to 12 nodes from the base of the cane are more fruitful than the basal nodes.

Quality of Wood to Retain at Pruning

Since grapevines produce fruit from only one-year-old wood called canes, the following criteria must be followed to choose the canes or nodes to retain during pruning.

- 1) Wood should be healthy and free from disease or insect damage

2) Wood should be at least $\frac{1}{4}$ " in diameter (about pencil size) at the 5th and the 6th buds and nearly the same thickness at the 10th bud (Figure 3).

3) Large diameter wood ($> \frac{1}{2}$ " diameter) should be removed as they are less fruitful and more susceptible to cold injury.

4) The bark color should be tan to brown with bright hue (Figure 4).

5) The distance between the nodes should be about 4 to 8 inches for hybrids and American type varieties.



Figure 3. $\frac{3}{4}$ " diameter wood to retain



Figure 4. Tan to brown color wood with optimum diameter

Balanced Pruning

The practice of balanced pruning aims to maintain the balance between shoot growth and fruit growth. In this practice, the weight of one-year old dormant prunings determines vine size and thus determines how many buds to retain for the upcoming year. The weight of one-year old dormant prunings essentially is an estimate of the leaf area on the vine. The manipulation of the number of buds to retain essentially adjusts the ratio of clusters per vine to leaf area per vine. The two possible scenarios for not practicing balanced pruning will be:

- 1) Too many cluster per unit leaf area = OVERCROPPING
- 2) Too few clusters per unit leaf area = UNDERCROPPING

Steps in Balanced Pruning are as follows:

- 1) Rough prune the grapevine to three-bud spurs to an upper limit of 65 buds (Figure 5).
- 2) Measure the weight of the prunings to estimate the vine size (Figure 6).
- 3) Adjust the number of buds to retain for fruiting on the grapevine according to the Balanced Pruning Formula (Table 1) for the specific cultivar.



Figure 5. Rough-pruned, three-node spurs



Figure 6. Measuring vine size using a top-load scale

Table 1. Suggested Balanced Pruning Formulae for various grapevine cultivars

Cultivar	Number of buds for 1 st Pound of prunings	Number of buds for <u>each</u> <u>additional pound</u>	Maximum number of <u>buds</u> <u>per 8 ft of canopy</u>
<u>American cultivars</u>			
Concord	30	10	60
Catawba	20	20	40
Delaware	20	20	40
Niagara	30	10	60
Norton \diamond	60	10	80
<u>French-American hybrids</u>			
Baco noir	20	10	40
Chambourcin*	20	20	40
Chancellor*	20	20	40
Chardonel	20	20	45
Leon Millot	30	10	60
Marechal Foch	30	10	60
Seyval blanc*	20	20	40
Traminette	20	20	45
Vidal blanc*	20	20	40
Vignoles	20	10	60
Villard blanc	20	10	40
Villard noir	20	10	40
<u>Vinifera</u>			
	20	20	40
<u>Seedless table grapes</u>			
Canadice	30	10	45
Jupiter	20	20	45
Mars	30	10	60
Reliance	20	20	45
\diamond	Trained to GDC		
*	Requires cluster thinning		

Adjusting the number of buds

For example, if a 'Vidal blanc' vine has a vine size of 2.0 pounds, then prune so that $20 + 20 = 40$ buds on the vine. Using a spur-pruned training system such as the bi-lateral cordon (Figure 7), the grower would leave 20 fruiting spurs with 2 buds on each of them with the spurs spaced about a hand's width apart on the cordon (Figure 8).



Figure 7. Balance pruned dormant grapevine



Figure 8. Correct spacing of fruiting spurs on cordon

Pruning and shoot thinning

Generally, if more than 60 buds are left on a vine with vines spaced 8 feet apart, considerable mutual shading occurs within the grapevine canopy. A general rule of thumb is to retain five to six shoots per foot of canopy run to achieve optimum sunlight interception and spray penetration within the grapevine canopy. For example, 'Vidal blanc' vines spaced 8 feet apart within the row can have between 40 to 50 shoots per vine. Growers should shoot thin during the pre-bloom period.

3. New Registered Fungicides by Dr. Wayne Wilcox NYSAES, Cornell University

1. Nova is now Rally. Since its release nearly 20 years ago, the very same product has been labeled as Rally for use in the western states and Nova for use in the east (thereby allowing different price structures in the two regions). Now, however, "Nova" is history, and the product will be sold as Rally throughout the U.S. The only change from Nova is the name on the package (and one digit in the EPA registration number). Old product is fine to use according to its label directions.

2. New product, Adament. Adament is a new combination product containing virtually equal amounts of tebuconazole (the active ingredient in Elite) and triflozystrobin (the a.i. in Flint); 2 oz of Adament contains the same quantity of active ingredients as 1 oz of Elite + 1 oz of Flint. Thus, at the rate of 3 oz/A labeled for control of powdery mildew at 14-day spray intervals, Adament will provide the equivalent of 1.5 oz per acre of both Elite and Flint (or 2 oz of each component when used at the rate of 4 oz/A, as labeled for 21-day spray intervals).

Flint is an excellent PM fungicide when used alone at these rates in vineyards where the strobilurins still work, and the addition of tebuconazole (Elite) may help to slow the build-up of resistance in vineyards where it has not yet developed. However, resistance is already common

throughout much of New York and is reported to be an increasing problem in the mid-Atlantic region. Unfortunately, the low rates of tebuconazole included in these rates of the Adament combination product (equivalent to 40-50% of the recommended rate of Elite) are unlikely to provide adequate control of the disease in vineyards where strobilurins are no longer doing the job, particularly in those with a long history of sterol inhibitor use. (Recall that prolonged use of the SI [or, DMI] fungicides “shifts” the sensitivity of the fungus population to a point where such fractional rates are no longer effective). In contrast, another combination product, Pristine, has been widely effective in such vineyards, because the non-strobilurin component is included at a rate sufficient to provide very good to excellent PM control by itself, even if the strobilurin component fails.

Adament is labeled at higher rates for control of black rot (4 to 7.2 oz/A) and Botrytis (6 to 7.2 oz/A). Flint has consistently provided very good to excellent control of Botrytis at a rate equivalent to 6 oz/A of Adament, although the Elite component won't do much, if anything, within the labeled rate range. However, both components are very effective against black rot and Adament should provide dynamite control of this disease, since the Flint component provides excellent activity in a “forward” (protective) manner and the Elite component is particularly active in a “backward” (post-infection) mode, especially at the higher end of the rate range (see data in the Black Rot section later on). Furthermore, the highest rate, providing the equivalent of 3.6 oz/A of Elite, should also do a reasonable job against PM in most vineyards where the strobies no longer work, although it's not yet clear how price-competitive this rate option will be. Remember that Flint has weak activity against downy mildew and Elite, like all sterol inhibitors, has absolutely none (unlike typical fungi, the downy mildew organism doesn't produce sterols for its membranes, so fungicides that inhibit their production have no effect on it). Therefore, Adament is likely to provide control of this disease only during periods of drought.

3. Tebuconazole generics. The patent on tebuconazole (Elite) has expired, and other products containing this active ingredient are now coming onto the market. Such generic “knock offs” are often as effective as the original “name brand” product, but not always, as the formulation chemistry can have a major impact on a product's activity (the 55% “inert ingredients” in Elite 45DF are there for a reason). Of the generic tebuconazole products now labeled on grapes, the only one that we've tested is Orius; its activity has been comparable to that of Elite in several different trials that we've run.

4. New fungicide, Revus. This is a downy mildew-specific fungicide (no control of other grape diseases) that just recently received federal EPA registration; however, it is unlikely to be registered in NY in time for the 2008 season. It is unrelated to any other grape fungicide on the market, although it is in the same family as Acrobat, a material used on potatoes and some vegetable crops. There are virtually no U.S. data available to indicate the degree of its efficacy against grape downy mildew under our climatic conditions, although a number of trials are planned for the coming year.

5. New Pristine label, redux. Growers used to be required to possess a separate, supplemental label to allow them to use the higher Pristine rate registered for Botrytis control (18.5-23 oz/A, versus 8-12.5 oz/A for all other diseases). This should no longer be necessary for newly-purchased product, which now includes the Botrytis rate on the standard label (be aware, however, that older product must still be used according to the label that's on the package, so

keep some new stuff around if you're going after Botrytis). This new label also clarifies that the re-entry interval is 12 hours for all rates used, unless workers are involved with cane tying, turning, or girdling (when it becomes 5 days). As noted in previous years, we've consistently obtained excellent Botrytis control at a rate of 19 oz/A, with significant but often reduced levels at lower rates. I'd consider 12.5 oz/A a minimum rate if I thought I was likely to need Botrytis control, and would recommend the higher rate range on susceptible varieties under any sort of pressure. It's quite possible that you might be able to drop down to 12.5 oz/A at bloom and save the higher rate for veraison or pre-harvest (the higher rate should also provide more help against secondary "sour rot" organisms), as we had some indication when first trying this approach last year; nevertheless, if I had \$6,000/A of Pinot Noir on the vine and it was raining hard during bloom, I'm not sure how frugal I'd try to be.

4. Phomopsis cane and leaf sport control in vineyards by Dr. Wayne Wilcox NYSAES, Cornell University

PHOMOPSIS (Ph) NEWS AND REMINDERS

1. Early sprays are the most important for control of rachis infections. Your annual reminder that in multiple spray-timing trials, we've found that applications during the early shoot growth period (as clusters first become visible) are the most important for controlling disease on the rachises. Rachis infection by the Phomopsis fungus is among the most common causes, if not **the** most common cause, of disease loss that I see on Concord and Niagara grapes. Early sprays also provide the greatest control of shoot infections, which serve as sources of Ph spores in subsequent years if retained as infected canes, spurs, or pruning stubs. A minimal Ph spray program should include at least one application during the period soon after clusters emerge.

NOTE: In a trial on Niagara grapes in 2006 (not an unusually wet season at its start), we documented a loss of over 3 tons/A, primarily due to rachis infections (and those that progressed into the berries), when early Ph sprays were withheld. I'm painfully aware of the current economic realities for Concord and Niagara producers, but fear that completely eliminating Ph sprays on these varieties is likely to lose more money than it saves, unless we're lucky enough to get another 2007.

2. Dead wood and canes may be particularly important sources of Ph spores. The Ph fungus is especially prolific in dead tissues, including dead wood. The obvious practical implication of this observation is that removing dead wood during pruning operations is an important component of a Ph management program. This includes not only obvious sources such as dead canes and arms, but also less-obvious ones such as old pruning stubs. The Ph fungus can remain active in such wood for at least several years, so a "dirty" block is going to stay that way until you prune that stuff out.

3. Little fungal inoculum, if any, is available by mid-summer. We monitored the release of Ph spores in several Lake Erie and Finger Lakes sites over 3 consecutive years. And in each year, we detected few if any infectious spores beyond early- to mid-July, with the vast majority released between bud break and bloom. A similar study conducted by Annemiek Schilder in Michigan produced generally similar results. These data suggest that even though berries may remain susceptible throughout the season, as

indicated by recent work from Ohio, the risk of infection is probably low once berries become pea-sized, since inoculum is scarce beyond that time.

4. *Spray timing to control berry infections.* In a trial conducted in a problem block of Niagaras--the poster child for Ph problems--we were surprised to find that sprays applied shortly after cluster emergence (i.e., the important sprays for controlling rachis infections) also provided significant control of berry infection. These results, and repeated observations in multiple vineyards, suggest that some berry infections probably result from the fungus growing into the fruit after it first becomes established in the cluster and berry stems. In our trial, control improved when we continued sprays through the immediate prebloom phase, and was almost complete when we continued until the 2nd postbloom spray. Nevertheless, these early sprays appear to be important for control of Ph fruit rot.

Note on berry infections: These are most problematical in very wet seasons, but are probably more common than some of us recognize (they look a lot like black rot, but don't show up until preharvest). We sometimes see significant Ph berry rot in our test block of Vignoles, and Dr. Schilder reports it on this variety in Michigan as well. Furthermore, Ph gets reported from time to time as part of the berry rot complex in warmer regions such as Missouri. I don't mean to overstate the threat, but don't assume that you don't have to worry about this form of berry rot if you don't grow Niagaras.

5. *Fungicides.* Mancozeb, captan, and ziram have all provided good control of basal shoot infections in our fungicide trials. Captan has been touted by some individuals as far superior to the others. This hasn't been my experience, although it did show a slight edge over mancozeb in one trial with extreme disease pressure. For those who aren't prohibited from using captan, I'd consider other issues (captan is better at conserving mite predators, mancozeb doesn't have the 3-day re-entry restriction) to be more important than any modest differences in biological activity between the two, especially in commercial vineyards that have maintained relatively good control over the years (low inoculum). Experience with the strobies has been mixed. Fortunately, they've looked better against fruit (and maybe rachis) infections than they have against basal shoot infections. We've seen no difference between the efficacy of Abound versus Ziram for controlling fruit infections when mancozeb was used prebloom and these materials were compared in subsequent postbloom sprays.

6. *Spray application technique.* Many growers like to spray alternate rows in the early season when it's the critical time for controlling Ph, assuming that sufficient spray will blow through the target row and impact on vines in the "middle" row. For 3 consecutive years, Andrew Landers helped us examine this issue in a commercial Niagara vineyard. Consistently, vines in the middle row received less spray than vines subjected to every-row spraying, and perhaps more importantly, the coverage was more variable. The benefits of alternate-row spraying are obvious and there's no reason to fix things if they ain't broke; however, if you've had trouble controlling Ph while using alternate-row spraying, the suggested remedy also is obvious.

5. Grape Flea Beetle by Dr. Ric Bessin, UK Entomology

As buds begin to swell, growers should monitor for grape flea beetle. Adult flea beetles overwinter in protected areas around vineyards, and start feeding on interior of primary buds and opening grape leaves in early spring. These are often the first insect pests to begin attacking grapes. The grape flea beetle is about ¼ inch in length and a dark, metallic blue in color. It is this injury to the developing buds that can cause economic losses in some years. Once the buds are 1/2 inch long, only slight injury is caused. The beetles feed on the developing tissue in the buds before it has a chance to expand, so a small amount of feeding can result in a large amount of resulting tissue loss. In some situations, entire buds can be hollowed out.

Damage is often restricted to vineyard borders, particularly near wooded areas. When grape flea beetle is a problem, it occurs early in the season, just when the buds begin to swell. Scheduled sprays for grape berry moth and other insect pests occur later in the season are of little benefit as they do not coincide with early flea beetle activity. When flea beetles are common and injury to the small buds is observed, a spray timed at bud swell will provide control.

6. Spring Viticulture Field Day 2008 at the University of Kentucky by S. Kaan Kurtural

The Spring Viticulture Field Day was held at the ES Good Barn Conference Facility at the UK Campus in Lexington, KY with over 80 growers attending. We were very happy that Kentucky Vineyard Society agreed to sponsor this event. The Field Day focused on spring operations in vineyards. Dr. Dewayne Ingram, our Department Chair welcomed the attendees to our campus. Mr. Harkey Edwards the Treasurer of Kentucky Vineyard Society also made remarks about the importance of coordinating the needs of the industry by educational outreach efforts by the University, and emphasized the broad membership base of the Kentucky Vineyard Society. Dr. Annemiek Schilder from Michigan State University was gracious enough to drive to Lexington and give a lecture on spring disease control strategies to our growers. Dr. Ric Bessin of UK Entomology also gave a lecture on insect control strategies. After a hearty lunch we took a bus to UK Horticulture Research Farm where Dr. Joe Masabni gave a presentation on pre-emergence weed control strategies in vineyards, Mr. Brandon O'Daniel demonstrated the balanced pruning of dormant grapevines on different training systems. Mr. Chris Smigell gave a presentation on the importance of personal protective equipment for vineyard spraying, and also demonstrated the calibration of axial flow air-blast sprayers. The day ended with a structured tasting of wines by Ms. Patsy Wilson.

