

# FINGER LAKES

# VINEYARD NOTES

NEWSLETTER NO. 4

April 5, 2000

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## COFFEE BREAK MEETINGS: WAYNE WILCOX ON DISEASE MANAGEMENT

*Tim Martinson*

There are a lot of changes in disease management options for 2000 (see article this issue)! To help you sort through it all, we have scheduled coffee break meetings with Dr. Wayne Wilcox at three locations on April 18 & 19. Wayne will present information from last years trials and answer your questions. We anticipate 1.5 pesticide recertification credits for this meeting (Bring your card and ID number). **Please preregister by calling our office at 315-536-5134.** Coffee and refreshments will be served, and space at some locations will be limited. Please specify one of the following locations:

**April 18. Hector Fire Hall,** 10:00 - 11:30 AM, Rte 414, next to Hazlitt 1852 Vineyards.

**April 18. Anthony Road Winery,** 3:00 - 4:30 PM, Rt. 14 and Anthony Rd.

**April 19. Pulteney Town Hall,** 10:00 - 11:30 AM, S. of Post office on East side of road.

Please note that this meeting will be *in addition to* the traditional *Spring Pest Management Update Meeting* at Lance Fullager's Vineyard Supply, scheduled this year for *Tuesday May 23, from 3-6 pm*, followed by a barbecue.

## DISEASE CONTROL PROGRAMS FOR FINGER LAKES GRAPES

*Wayne Wilcox*

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Time for the annual review of new developments and various options on the disease-control front. Once again, my sincere appreciation goes out to an outstanding team of technicians (Duane Riegel, take a bow), graduate students, postdoctoral associate, and faculty colleagues (D. Gadoury, R. Seem), whose research efforts are the basis for most of the following conclusions.

## FUNGICIDE CHANGES & NEWS

1. Vanguard (cyprodinil). The federal label specifically calls for one application at early bloom and a second application at either berry touch, veraison, or preharvest. In order to provide more flexibility in timing of the applications, we helped obtain a "Special Local Needs" registration for New York, which permits two seasonal applications at any combination of these four developmental timings. More discussion on the timing of sprays under the Botrytis section later on.

Last year was the first season for commercial use of Vanguard in NY, and it looked very good. In fact, Alice Wise on Long Island compared various two-spray programs of Vanguard with programs incorporating up to four sprays of Rovral. Bottom line: Vanguard provided excellent control, Rovral provided little or no control (probably due to fungicide resistance).

Remember that Vanguard itself is highly prone to resistance development, and therefore is labeled for a maximum of two applications per season. If you're applying "only" two Botrytis sprays per season, I'd rather see Vanguard used just once in rotation with something else (i.e., don't use Vanguard as the only Botrytis fungicide year after year, this is a good way to burn it out). Fortunately, we're starting to get new

Botrytis fungicides, so rotation is getting more feasible. And backing off on Rovral use may even bring it back to life where it's having problems (discussed later).

2. Elevate (fenhexamid). Elevate is a new Botrytis fungicide that received federal registration late last year; a decision on New York registration is due in late June. Like Vangard, it has been classified by the EPA as a "reduced risk" fungicide (good environmental and toxicology characteristics). It is not related to any other fungicide on the market, so can be used in rotational programs for resistance management purposes once it's registered here. Elevate has provided generally good control of Botrytis in our Finger Lakes tests, but not quite as good as Vangard. It does not control any other grape diseases.

3. Elite (tebuconazole). Elite now has NY registration. Recall that it's a sterol inhibitor fungicide in the same chemical family as Nova. In repeated trials, Elite at 4 oz/A (the only labeled rate) and Nova at 4 oz/A have given us equal control of both black rot and powdery mildew. I'd choose one over the other on the basis of price. Although the company has data showing some suppression of Botrytis by Elite, we saw no activity in our trial last year (the only time we've looked at Botrytis control with this material).

4. Strobilurin fungicides. Strobilurins are the group of fungicides first represented by Abound. Two new "strobies", Sovran and Flint, will be available to NY grape growers this season. These are by far the most important group of fungicides to come along since the SIs, so let's review how they work and compare them.

a. General characteristics. Recognize that Abound, Sovran, and Flint have their own individual strengths and weaknesses, but they also share a number of general characteristics. All are excellent inhibitors of spore germination; thus, they are excellent protectant fungicides. They are retained primarily within the waxy cuticle of leaves and fruit, which means that they are more rainfast than traditional protectants like mancozeb and captan. The fungicides diffuse throughout this waxy layer to provide a relatively uniform dose across the surface. Also, a small portion of the total dose diffuses through the leaf from the sprayed surface and, after a few days, enough accumulates on the other side so that it offers fungicidal protection on that side even if it was unsprayed. (We've done our own green-house tests to support this claim of the manufacturers). This combined "package" of fungicide retention and movement is unique to the strobilurins, and different manufacturers have made up their own trademarked names to describe it, e.g., "surface systemic" for Sovran and

"mesosystemic" for Flint. You'll be seeing these terms in the advertisements, maybe Abound's manufacturer will feel compelled to make one up also.

Because the strobies are primarily retained in the waxy surfaces, they are not good postinfection fungicides. That is, they do not get down into the body of the leaves and fruit where most fungi do their dirty work after they establish an infection. However, the strobies are powerful antisporulants. That is, when applied beyond their period of true postinfection activity, they allow lesions to develop but inhibit the production of a new round of secondary spores from the lesions. This is particularly significant for powdery mildew, downy mildew, and black rot, where most disease losses result from repeated infection cycles caused by the secondary spores produced on infected tissues during a single season.

b. Resistance risk. Resistance to strobilurins has already appeared in powdery mildews of cereal grains and cucurbit crops in Europe and Asia, as well as in *Botrytis* of greenhouse crops. Thus, resistance is a very real concern, and resistance management must be taken seriously.

To date, strobilurin resistance appears to follow the "Benlate model", that is, resistant isolates are virtually immune to the fungicides and multiply rapidly if they are not controlled by some other material. Furthermore, a fungal strain that is resistant to one of the strobies will be resistant to all of the others. Therefore, all three companies have agreed on identical labeling which requires use patterns that incorporate basic resistance-management principles: Do not make more than four sprays per season of any strobilurin on wine or table grapes, with a maximum of three applications in a row; on juice grapes (or those for other purposes), do not make more than three applications per season. **NOTE THAT THESE RESTRICTIONS ARE DIFFERENT FROM THOSE ON THE PREVIOUS ABOUND LABEL** (which allowed six seasonal sprays, but no more than two in a row).

These restrictions are designed to (i) minimize the selection of resistant strains, by limiting the number of selection events (sprays); and (ii) limit the opportunity for resistant strains to multiply, by using unrelated fungicides in rotation. So, even though a Concord grower could legally apply three strobie sprays each year and nothing else, s/he would be asking for trouble due to the lack of rotation with unrelated chemistries. Pricing will discourage the reckless overuse of these materials, but employ common sense as well to help prolong their useful lives.

c. Sovran (kresoxim-methyl). Sovran received federal registration last season and NY registration last month. We've tested Sovran pretty intensively since 1995 and Flint since 1998. Based on our experience and what I've seen from other locations, I view all three strobies as equal versus (i) black rot (very good, a bit better than mancozeb/ferbam/ziram but not quite as good as Nova/Elite); (ii) Phomopsis (only fair); and (iii) Botrytis (none are labeled for this disease, but they've provided fair to good control in our limited tests under moderate pressure).

The differences among the three materials come with respect to control of powdery and downy mildews. At commercial rates, Sovran (3.2 - 4.0 oz/A) has been a little stronger than Abound (11-12 fl oz/A) versus powdery, but not as strong versus downy. Note that the company recommends a rate of 4.0 - 6.4 oz/A for downy control by Sovran, which is not cost competitive with Abound above the 4.0 oz rate. Commercial experience will tell the tale, but my feeling is that the 3.2 - 4.0 oz/A rate of Sovran should provide adequate downy protection on moderately resistant varieties (e.g., Concord) and even on susceptible varieties under moderate pressure; however, I wouldn't count on it for *viniferas* under pressure.

Sovran is phytotoxic to a select group of sweet cherry varieties when sprayed directly onto the foliage; however, manufacturer representatives have stated that concentrations resulting from drift or spray tank residues will not cause damage. Sovran is not known to have any other phytotoxicity problems. It is registered for use on apples.

d. Flint (trifloxystrobin). Flint is the newest of the strobies, seemingly coming from out of nowhere only 2 yr before it gained federal registration last fall (NY registration was granted last month). Although experience is necessarily limited, Flint at commercial rates (1.5 - 2.0 oz/A) appears to be the strongest of the three strobies versus powdery but the weakest versus downy. In fact, Flint is labeled only for "suppression" of downy, and at the economically-prohibitive rate of 4 oz/A. Bottom line: If using Flint, boost it by tank mixing with an effective downy fungicide (e.g., a half-rate of mancozeb) where control of this disease is needed.

**FLINT IS PHYTOTOXIC TO CONCORD GRAPES AND CANNOT BE USED ON THIS VARIETY.** Manufacturer representatives have stated that concentrations resulting from drift or spray tank residues will not cause damage. Flint is not known to have any other phyto problems. It is registered for use on apples.

Finally, note that--surprise!--prices for the three strobies will be "competitive" with one another within the commercial ranges given above.

6.Monopotassium phosphate (eKsPunge, Nutrol). Now labeled as a powdery mildew fungicide in NY, the trade name of "eKsPunge" is being changed to "Nutrol". We've been looking at this "dual purpose" material (foliar nutrient plus powdery mildew fungicide) since 1996. Last spring, we found out that it functions poorly as a protectant (when applied before inoculation with powdery mildew spores), but does a good job as a "curative" spray when applied within 3-5 days after exposure to the spores. This suggested that more frequent applications (i.e., a greater number of "curative" sprays) might be more effective than our standard 2-wk schedule, since PM spores are almost always present during the growing season. So, we compared 8 lb/A on a 14-day schedule versus 4 lb/A on a 7-day schedule (same amount of product per season, but different numbers of potentially-curative applications). Sure enough, the 7-day schedule was significantly more effective.

We'll continue to investigate this phenomenon further. However, my guess is that the same general principle will apply to any of the "alternative" PM control products (e.g., salts such as monopotassium phosphate or potassium bicarbonate, oils such as JMS or Trilogy, dilute solutions of hydrogen peroxide), which appear to function via topical application to new or existing PM colonies. In other words, use them at fairly short intervals or to stretch out the effective period of a standard product (e.g., by controlling new infections that start to bleed through as the standard material poops out), but don't count on long residual control after the application.

Because monopotassium phosphate is an acidifying agent (lowers pH of the spray water), it should not be used with copper products until more experience with this combination is obtained.

### **POWDERY MILDEW (PM) NEWS AND REMINDERS**

*1. Most berry infection occurs during the first few weeks after the start of bloom. Disease that you see on the berries later in the season usually is caused by a combination of favorable weather and problems with the spray program during that time.*

You're getting tired of hearing this, but it doesn't make it any less true. Remember that Concord berries become virtually immune within 3-4 weeks after bloom starts. *Vinifera* berries lose most of their susceptibility at this same time, although they do not become fully immune until considerably later. Susceptible hybrids seem to act like *viniferas*, e.g., on

'Rosette', we typically get 90% control of berry infection from just the prebloom plus first postbloom sprays, whereas we get nearly 100% control on ConCORDS.

Leaves also lose susceptibility as they mature, but new susceptible tissue is constantly being produced so long as the shoots keep growing. On *vinifera* and susceptible hybrid varieties, there's a direct relationship between control of PM on the foliage and fruit quality at harvest. Maintaining a healthy, functional canopy should also improve winter hardiness. In contrast, Concord fruit are remarkably unaffected by foliar infection at moderate cropping levels, although Brix and other quality factors are decreased by foliar PM at higher cropping levels (e.g., 10 tons/A and above).

Bottom line, one more time: The first few weeks after the start of bloom is not the time to economize on PM control programs. Use your best fungicides (generally, one of the strobilurins), spray every row, and take the time to do it right. Keep the fruit and foliage clean afterwards to an extent appropriate to the variety and crop value. See next item.

2. *Failure to control inconspicuous PM infections on the berries can increase the severity of Botrytis (gray mold) at harvest.* This unanticipated association was noticed by David Gadoury on Pinot noir berries in 1998 and was confirmed by him on additional *vinifera* varieties in 1999. In experiments designed to study how berries become more resistant to PM as they age, David noted that clean fruit inoculated with PM spores about 4 wk after the start of bloom developed sparse, inconspicuous infections that were barely visible to the naked eye. He also noted that these same fruit had much higher levels of gray mold at harvest than did berries on which such infections were controlled. Seeing such things happen in one vineyard in one year is "interesting"; seeing it happen two years in a row, in different vineyards and on different varieties, convinces me that something real is going on.

The "why" of this phenomenon is being investigated. What to do is simple: on the fruit of varieties susceptible to Botrytis, be sure to maintain an excellent PM control program at least through bunch closure.

3. *The SI fungicides don't work like they used to, but they're not dead.* Those of you for whom the SI fungicides still do work like they used to are lucky, but you're still bound by the same laws of nature as everyone else. The efficacy of these materials will erode over time. The question is not "if", but rather, "when". And it's the "when" part that we have some control over.

If using the SIs, a primary objective (after disease control!) should be to maintain the effectiveness that they still have. Ideally, we can continue to use these materials as effective components in rotational programs with the strobilurins, thereby helping to keep both groups alive.

Below are the annual reminders with respect to SI resistance management:

(i) Limit SI use, preferably a maximum of three sprays per year, and rotate with unrelated fungicides.

(ii) **Recommended rates and thorough spray coverage are CRITICAL for adequate performance and resistance management.** The surest way to encourage SI resistance is to use low rates of these fungicides. The surest way to provide low rates to certain parts of the vineyard is to provide uneven spray coverage. It's still just that simple.

(iii) The SIs will perform much better, and less resistance will develop, when they're used to combat a small PM population rather than a large one. Position them early in the season (conveniently, not an optimal time for using the strobies) or use them to maintain a clean vineyard mid-season. You're just asking for trouble if you try to use these materials to clean up or slow down a PM problem that's already developed (this is true for the strobies, also).

## BLACK ROT (BR) NEWS AND REMINDERS

1. *As with powdery mildew, berries are highly susceptible to BR from bloom through the early fruit set period, but they become highly resistant approximately 4-6 wk after the start of bloom.* We've seen this in all three years of a trial in which berries of Cayuga White, Chardonnay, Concord, and Riesling were inoculated at weekly intervals after bloom. Similarly, in two commercial Finger Lakes vineyards and local research plots, we've noted much higher BR levels in years when this period was wet versus those when it was dry. So, be extra vigilant with your BR control practices if conditions are wet in late June and early July; relax a bit if they're dry.

2. *Most, if not all, commercial control comes from the immediate prebloom and first two postbloom sprays.* In fact, all of the control obtained in eight out of 10 spray timing trials that we've conducted since 1995 has come from these three sprays (i.e., additional sprays applied earlier and/or later provided no additional benefit). Thus, even when early leaf infections have been left uncontrolled in these vineyards, we've gotten complete control of berry infection with thorough coverage of the fruit during their early stages of development. This and other observations suggest that serious black rot losses are

caused primarily by spread of the disease within infected clusters (i.e., from new spores produced on berries infected shortly after bloom), more so than by spores produced in early leaf infections.

However, this is not to say that leaf infections cannot be important. Trials conducted in a Finger Lakes vineyard with a history of extensive black rot losses (thus, very high inoculum levels from year to year) showed that in this case, an additional spray 2 wk before the immediate prebloom application provided an additional measure of control. Bottom line: bloom and early postbloom sprays should be adequate in relatively "clean" vineyards, but sprays may need to start earlier in blocks with significant BR the previous year.

3. *Mummies retained in the canopy provide more pressure for BR development than those dropped to the ground.* This should be a no-brainer, but it's been striking to see how much such a simple practice contributed to disease control when we examined it over the last 2 years. That is, when we went into a machine-pruned vineyard where mummies had been retained in the canopy after hedging, then hand-pruned them to the ground in certain plots, we ended up with much less BR than in comparison plots where the mummies were left hanging. Don't ignore this aspect of sanitation if you're having trouble with BR control.

No major news with respect to BR fungicides: (i) Nova and Elite are still the "kings"; (ii) mancozeb, ferbam, and ziram will provide good control under most commercial conditions; (iii) Abound, Sovran and Flint have been equal to or better than mancozeb and ziram in our tests (they're less likely to wash off, and probably retard secondary spread due to their antispore activity). Captan, Rubigan, and Procure are fair. Copper is poor.

### **DOWNY MILDEW (DM) REMINDERS**

No real news. Recall that inoculum overwinters in last year's infected leaves on the vineyard floor. The first spores become mature about 2 to 3 weeks before bloom, and cause infection during rainy periods when temperatures are 50°F or higher. These primary infections can continue to occur until about 2 weeks after bloom (we think).

The destructive phase of the disease is caused when spores produced from primary infections blow through the vineyard and cause repeated cycles of secondary infections if humid nights are followed by rainy days. At optimum temperatures of approximately 60 to 80° F, this cycle can repeat itself every 4 or 5 days, allowing an "explosive" disease epidemic when favorable weather conditions persist.

Young fruit are highly susceptible to infection, but appear to lose susceptibility quite quickly with age, much as with PM and BR. In our test block, we traditionally quit spraying 'Chancellor' (ridiculously susceptible fruit) 4 wk after the start of bloom, and clean fruit remain that way until harvest, even when they're surrounded by unsprayed vines that are absolutely clobbered.

General control strategies are: (i) DM sprays should start on highly susceptible varieties about the 10-inch shoot growth stage (i.e., 2 to 3 weeks before bloom) unless the vineyard was *very* clean last year or you're *sure* it won't rain before the next spray.

(ii) All but the most resistant vineyards should receive a DM fungicide in the immediate prebloom and first postbloom sprays unless the weather is bone dry. This is the critical time to protect against fruit infection.

(iii) By the time the first postbloom spray wears off, primary inoculum is pretty well shot and the need for additional treatments should be based on the usual array of factors: presence or absence of established disease in the vineyard, weather, and variety. Typically, DM "goes on vacation" during much of July (many of the spores that spread the disease are killed by the spate of hotter, dry weather that we usually get at that time), then it reactivates as days get shorter and nights get dewier in August.

Ridomil remains the best downy mildew fungicide ever developed for use on grapes, but its cost and lack of activity against other diseases limit its general usage. Which is probably good, since resistance can develop rather quickly if the material is used heavily. In our trials, Abound has consistently been excellent, equal to mancozeb in some trials and better in others (e.g., when the first spray was applied late or in high rainfall years). As noted above, Sovran has been somewhat weaker than Abound, typically providing 80-85% control (relative to the unsprayed vines) versus 95-100% control for Abound. Flint looked very good in 1999 (dry) and pretty bad in 1998 (wet). Copper, mancozeb, and captan are old standards for a good reason: they work.

### **BOTRYTIS NEWS AND REMINDERS**

1. *Rovral's not alone anymore, but don't throw it out just yet.* After having Ronilan and then Rovral (closely related dicarboximides) as the only effective Botrytis fungicides for nearly 20 years, this picture is changing rapidly. It's very good news to have new fungicides in the bag of tricks, but never forget that even the best Botrytis fungicide is only a complement to various cultural control practices that pro-

mote air movement around the clusters and help to expose the fruit.

First, a word about Rovral. The bad news is that resistance to the dicarboximides occurs pretty easily, and at least some anecdotal reports of inconsistent performance in commercial NY vineyards probably reflect this fact. The aforementioned failure of Rovral in a Long Island trial where Vanguard provided excellent control is an even more concrete, if unproven, example. The good news is that Rovral resistance is not stable, i.e., resistant individuals of the Botrytis fungus do not survive from one season to the next as well as susceptible individuals do. Thus, there are reports that even in a resistant vineyard, the first Rovral spray of the year provides relatively good control (most of the overwintering population is susceptible), but subsequent sprays become progressively less effective as the resistant individuals selectively survive and multiply.

In practical terms, this means that we might be able to “bring Rovral back”, even where it’s not working so well anymore, by (i) taking it out of the picture for a year, (ii) allowing most (?) of the resistant individuals to die out, then (iii) reintegrating it into a rotational program with other botryticides, using a maximum of one application per year. Because our new Botryticides are also susceptible to resistance development, we need to keep all effective materials alive and in rotation with each other.

*2. Infections at bloom and bunch closing can be important.* Traditionally, NY recommendations for timing Botrytis sprays have emphasized the importance of the veraison and the preharvest periods. Whereas these recommendations were based on sound field data, they tended to ignore the potential importance of infections occurring during the bloom and/or bunch closure periods, which are considered to be important in many other parts of the world.

We have found a benefit from applying sprays during bloom and bunch closing in 4 of our last 6 years of field trials in the Finger Lakes; when directly compared in 1998 and 1999, these two sprays were as effective as the veraison plus preharvest combination. In the aforementioned Long Island trial, Alice Wise had only 6% infection of Chardonnay clusters when Vanguard was applied at bloom plus bunch closing, versus 46% infection in unsprayed plots. (This even though there were only three rain events totaling 1.0 inch from the bloom spray through 2 weeks after the bunch closure spray, versus eight rain events totaling 9.7 inches between veraison and harvest). Furthermore, when we inoculated Pinot noir clusters in Geneva at 90% bloom, the pea-sized berry stage, or at bunch closing last year, virtually all ber-

ries developed latent (dormant) infections, and 14-20% of them activated into visible gray mold at harvest.

Collectively, these data suggest that we probably have underemphasized the importance of early-season Botrytis infections, although there is still a lot of mystery as to when and why such latent infections turn into rotten berries at harvest. Nobody wants to spray four times per year to control Botrytis, for obvious reasons. Nevertheless, it appears that fungicidal protection during the bloom through bunch closure period may be appropriate under “certain conditions” (Which ones? We’re working on it.) Currently, we’re hoping that perhaps the strobilurin fungicides might provide enough protection during this period to allow us to save the Botrytis-specific materials (Vanguard, Rovral, Elevate) for the traditional period at and after veraison. See below.

*3. The strobilurins appear to have significant activity against Botrytis (but how much?).* Take this with a big grain of salt, because we haven’t tested the strobies in a pressure situation yet. Nevertheless, we’ve seen pretty impressive control from all three materials in both our 1998 and 1999 trials in the Finger Lakes. It would be nice if their activity turns out to be adequate during the bloom and early postbloom period (their best timing fit for control of other diseases), especially if they’re helped along with better Botryticides later on. Remember, though, this is a work in progress and may fall flat under pressure. If I had a Pinot noir block with perennial Botrytis problems and it was wet and warm during bloom or bunch closure, I’d try a shot of Vanguard until I knew otherwise.

### **PHOMOPSIS (Ph) REMINDERS**

No real news here. The incidence of Phomopsis shoot infections seemed to be increasing in the Finger Lakes region for several years, then it forgot to rain last spring (and summer) and the problem seemed to disappear. Nevertheless, inoculum is still present in blocks that have had Phomopsis recently, and over the long run it’s worth controlling this phase of the disease in many vineyards if rainy weather is forecast during the early shoot growth period.

Recall that fruit become infected by Phomopsis when intense and/or frequent rainfall occurs during the bloom through pea-sized berry period, although infected fruit do not show symptoms until near harvest (symptoms resemble those of black rot, and the two diseases are difficult to tell apart on the fruit). The most consistent economic losses from Phomopsis appear to be caused by infections of the rachises

(cluster stems). Although not well studied, rachises appear to be susceptible to infection from the early period of cluster emergence until several weeks after bloom.

The risk of Phomopsis losses (and the relative need to control them) can be judged to some extent by (i) the recent history of the disease (an indication of how much inoculum is in the vineyard); (ii) the pruning and training system (shoots, rachises, and fruit that develop beneath old spurs and pruning stubs are at greatest risk, whereas those trained to grow above these spore sources are least vulnerable); and (iii) the weather (frequent and/or prolonged rains).

Mancozeb, captan, and ziram have all provided good control of the basal shoot infections in our fungicide trials. Abound, Sovran, and Flint have all been mediocre. We have had only one fair test of the strobies against rachis infections; they provided significant control, but not as good as that provided by the traditional (and cheaper) protectant fungicides.

### PUTTING IT ALL TOGETHER

We all know that there are many good programs for controlling these diseases. Here are a few considerations. As always, just because it isn't listed here doesn't mean it's a bad idea. Only products currently labeled in NY State are listed. Readers in other states have the option of substituting Elevate into the mix for Botrytis control.

**1-INCH SHOOT GROWTH.** A **Ph** spray may be warranted if wet weather is forecast and the training system or recent block history suggests high risk. Option A: Nothing. Option B: Captan or mancozeb.

**3-5 INCH SHOOT GROWTH.** A traditional time to control **Ph** shoot infections; early rachis infections also can be important under rainy conditions, once clusters emerge. Time to start control of **PM** on *vinifera* varieties if temps consistently remain above 50°F; also in highly susceptible hybrid blocks if crop value justifies it. A possible time to experiment with "alternative" PM materials (salts, oils) if you're so inclined. **BR** control is seldom justified unless you're trying to clean up a problem block AND weather is wet. Option A: Nothing. Option B: Mancozeb (BR, Ph). Will also control angular leaf scorch (**ALS**) on susceptible varieties if very wet. Option C: Captan (Ph). Easier on predator mites than mancozeb (or ziram), but not as effective against BR (not usually an issue this early). Option D: Nova or Elite (PM, BR). Use 3 oz/A for economy with so little foliage now. Option E: Rubigan (PM). At 2 fl oz/A, cost is only about \$4. Cheaper than Nova and Elite, especially if BR control isn't an issue. Option F: Sulfur (PM). Not very active at temps below

60°F, but neither is the PM fungus. Doesn't control other diseases. Option G: JMS Stylet Oil (PM). Should eradicate young infections IF thorough coverage is provided. Can use with mancozeb (or ziram), but not with captan (phytotoxicity). Option H: eKsPunge (PM). Should eradicate young infections IF thorough coverage is provided. Option I: One of the PM products plus mancozeb or captan for Ph.

**10-INCH SHOOT GROWTH.** Traditionally, we've recommended not to wait any longer to control **BR**. Continued experience tells us that this recommendation is conservative (the spray generally isn't needed) unless BR was a problem last year and/or weather is unusually wet. Don't wait any longer to control **PM** on susceptible varieties (but wait until immediate prebloom on Concord). One of the best times to use an SI, but these aren't the only options. **DM** control will be needed on highly susceptible varieties if disease was prevalent last year and rains of at least 0.1 inches at temps >50°F occur. Rachis infections by **Ph** are a possibility, particularly if weather is wet and inoculum is present. Option A: Abound, Sovran, or Flint (PM, BR, some Ph; also, variable DM [Abound, excellent; Sovran, fair to good; Flint, poor to fair]). Not the most efficient time to apply these expensive and limited-use materials unless disease pressure is high. Option B: Mancozeb (BR, Ph, DM, ALS). A broad spectrum, economical choice if PM isn't a serious concern. Or tank mix a PM material. Option C: Nova or Elite (PM, BR). Option D: Rubigan (PM). No BR but cheaper than Nova and Elite. Option E: JMS Stylet Oil (PM). *If (and only if) coverage is thorough*, this spray should eradicate early PM colonies that may be starting because previous PM sprays were omitted. At a retail cost of \$11/gal, a use rate of 1% (1 gal oil /100 gal water), and 50 gal/A spray volume, cost is about \$5.50/A. But don't waste your money if you can't cover thoroughly. Also may help with mites. Option F: sulfur (PM). Reduced activity at low temperatures is still an issue at this time of year. Option G: eKsPunge (PM). Short residual activity, but has eradicated activity against recent infections. Same need for thorough coverage as JMS Stylet Oil. Option H: Mancozeb (BR, Ph, DM, ALS) + a PM material (SI fungicide, sulfur, JMS Stylet Oil, eKsPunge). Choose PM material based on previously-discussed characteristics and cost.

**IMMEDIATE PREBLOOM (OR VERY EARLY BLOOM).** A **critical time for PM, BR, DM, and Ph (rachis and fruit infections)**. Also important for ALS on susceptible varieties. A good time to use a strobilurin on PM susceptible varieties. **This and the first postbloom spray are the most critical sprays of the season--DON'T CHEAT ON**

**MATERIALS, RATE, OR COVERAGE!** Option A: Abound, Sovran, or Flint (PM, BR, some Ph; also, variable DM [Abound, excellent; Sovran, fair to good; Flint, poor to fair]). The best choice if SIs have been for a number of years against PM, particularly if multiple disease control is needed. May provide some Botrytis control if a wet bloom period. Option B: Nova, Elite, or Rubigan + mancozeb (PM, BR, Ph, DM). Nova and Elite are the biggest guns against BR, so might be the best choice if pressure is high and BR control is more important than PM. Nova and Elite provide postinfection activity against BR if significant unprotected infection periods occurred within the previous 4 days. Rubigan is (was?) cheaper than Nova or Elite, but doesn't provide the same BR control; however, mancozeb should be adequate if postinfection control isn't required. Option C: Mancozeb + sulfur (PM, BR, Ph, DM). Cheap and reasonably effective but not the strongest choice at a time when the strongest choice is most justified.

**BLOOM.** Rovral or Vangard for Botrytis control may be beneficial in certain years, particularly in problem blocks if weather is persistently wet. Abound, Sovran, or Flint applied recently may be adequate.

**FIRST POSTBLOOM** (10-14 days after immediate prebloom spray). **Still in the most critical period for PM, BR, DM, and Ph (rachis and fruit).** Same considerations and options as detailed under **IMMEDIATE PREBLOOM.** Juice grape growers can substitute Ziram (very good BR and Ph, only fair DM) for mancozeb if necessary.

**SECOND POSTBLOOM.** **BR** control still may be needed if disease was present last year and a spray is strongly recommended if berry infections are evident this year, particularly if weather is wet. Fruit are less susceptible to **PM** now, but *vinifera* varieties (and susceptible hybrids?) still need PM protection, particularly on varieties susceptible to Botrytis. Rachises and foliage remain susceptible to **PM**. Avoid SI fungicides if more than a little **PM** is easily visible. **Ph** danger is mostly over unless very wet. Primary **DM** should be over, but continued protection may be needed on susceptible varieties if weather is wet, especially if disease already is established. Option A: Abound, Sovran, or Flint (PM, BR, some Ph; also, variable DM [Abound, excellent; Sovran, fair to good; Flint, poor to fair]). Provides good residual control of the listed diseases if used now. May provide some Botrytis control as bunch closure approaches. Option B: Nova or Elite (BR, PM) + captan or mancozeb (66-day preharvest restriction) if DM and Ph control are needed. Option C: Rubigan (PM) + either (a) mancozeb (if more

than 66 days before harvest) for BR, DM, and Ph; or (b) captan (DM, Ph, some BR); or (c) ziram (BR, Ph, some DM). Option D: Sulfur (PM) + either (a) mancozeb (if still allowed) or (b) captan. In most years, lessening disease pressure makes this economical option increasingly practical as the season progresses. Option D: Copper + lime (PM, DM). Adequate for Concords, not enough PM control for *vinifera* and susceptible hybrid varieties.

**ADDITIONAL SUMMER SPRAYS.** Check the vineyard regularly to see what's needed, the main issues will be **PM** and **DM**. On *vinifera* and other cultivars requiring continued **PM** control, use sulfur as an economical choice to maintain control; SIs and strobilurins are options if they haven't been overused earlier AND little disease is evident. Both provide the advantage of longer residual activity than sulfur, especially in wet weather. Copper + lime will work for Concords. For **DM**, copper + lime or captan are economical standards; Abound is a viable option if general disease pressure or other conveniences justify its cost; Ridomil can be used in case of emergency. **BR** should not be an issue after the second post-bloom spray, except in unusual circumstances (disease is established in the clusters, wet weather is forecast, and it's possible to direct sprays onto the clusters). **Ph** should not be an issue. See previous discussion for **Botrytis** at bunch closing, veraison, and preharvest.

## FINGER LAKES VINEYARD UPDATE RESUMES APRIL 10

*Timothy E. Martinson*

Starting Monday, April 10, I will resume weekly e-mail and code-a-phone (answering machine message) *Finger Lakes Vineyard Updates*. These messages cover current growing conditions, vine development, weather, growing degree days and insect/disease alerts. They will be updated weekly through mid-May on Mondays. From mid-May through mid-July messages will be updated twice weekly on Mondays and Thursdays. Thereafter they will revert to once weekly until harvest.

To access the recorded phone message, call **315-536-5549**. The e-mail version is open to all program enrollees and subscribers to *Vineyard Notes*. To be put on the e-mail distribution list, please send me an e-mail message at [tem2@cornell.edu](mailto:tem2@cornell.edu). If you listed your e-mail address on county enrollment forms, you should be already on the list.

## GARY HOWARD REMEMBERED

*Joe Ogrodnick*

Communications Services  
NYS Agric. Exper. Sta.

GENEVA, NY: Gary Howard died on Friday, March 24, at his home in North Rose, NY, after an extended illness. He graduated from Cornell University in 1951 with a B.S. in agriculture and a focus in pomology, was a veteran of the Korean War and worked in many areas of agriculture before coming to the New York State Agricultural Experiment Station in Geneva, NY, in 1968 as an experimentalist. It was at the Station, according to Robert Pool, Cornell University professor of viticulture, that "he found his real home."

Howard retired from the Station in 1992 as a research support specialist. He was born on April 4, 1929, and grew up on an apple farm on the Niagara frontier where his family had lived for many generations.

"Gary loved nature, the outdoors, and hands-on work," Pool went on to say. "He loved to teach and he loved to preach. He was a great mentor to the graduate students in the grape research program. He was an institution at the grape grower meetings where his enthusiasm and raconteurial skills allowed him to educate while entertaining. His ability to communicate with humor made him the most demanded toastmaster in the grape industry and at the Experiment Station."

According to Pool, "Gary loved understanding his vines and learning ways to help our growers produce better grapes and wine." Of the many things Pool appreciated about Howard, Howard's dedication and honesty were the most important. "He taught me much about grape growing, and he taught me about friendship. He was an inspiration to many, but was indispensable to the success of Cornell's effort to improve New York wine quality," said Pool.

Howard came to the Station in 1968 to work with esteemed Cornell viticulturist Nelson Shaulis as an experimentalist, replacing Herman Amberg, who left to work at his own business. At the time, Howard had served as the contractor for PepsiCo's subsidiary, Empire State Sugar Co., and was well versed in sugar beet production and processing.

Howard was new to grapes at that time, but, by all accounts, learned well and quickly. He was soon trained in all aspects of viticultural research: pruning

and training, weed control, rootstock evaluation, evaluation of vinifera grape varieties, and maintaining research trials across the state, from Long Island to Fredonia. About the time Shaulis retired in 1978, Howard was promoted from experimentalist to research support specialist and soon moved into Robert Pool's viticulture program, at which time his duties were expanded to include giving presentations to a host of audiences.

Howard spoke at grape meetings for two reasons: One, he had a firm grasp of the topics, and two, he had the world's best delivery and presentation style. For years following his retirement in 1992, surveys taken after extension meetings inevitably contained the plea, 'Put Gary Howard on the program!'

Howard is survived by his wife, Nancy Smith of North Rose; two children, Susan, who lives in Long Island, and Mitchell in Rochester; one sister, Judy (Ben) Moss of Medina; nieces and nephews-and his buddy and hunting companion, Max, his dog.

## CHANGES IN DEC REGULATIONS FOR PESTICIDE APPLICATORS

*Tim Weigle*

Senior Area Extension Educator  
Grape IPM

Many, if not all of you have received a yellow booklet from the Department of Environmental Conservation (DEC) entitled: Part 325, Rules and Regulations Relating to the Application of Pesticides. This booklet contains several important revisions of which anyone who applies pesticides should be aware.

After several unsuccessful attempts to glean any significant changes from the booklet, I attended a meeting where a representative from the DEC provided a handout listing the important revisions. This handout appears below.

### **PART 325 REVISION HIGHLIGHTS**

1/26/2000

#### **Uncertified Applicators:**

- Can apply general use pesticides with off-site supervision (the certified applicator must be reachable within 30 minutes)
- Can apply Federally restricted use pesticides only with on site Supervision.

- Cannot apply restricted fumigants at all.

**New Categories** (formally known as commodities):

- Must be certified in every MAJOR category as needed. Must have one year growing season's experience to get certified.

- 1) Agricultural Plant (inc. field & forage, fruit, vegetable, greenhouse & florist, nursery & ornamentals)
- 2) Agricultural Animal (includes companion animal)
- 3) Aquatic - now required to treat farm ponds over 1 acre in size with an outlet on property owned by the applicator.

**Certification Renewals** - Occurs every three years. Only a payment due. IF expired more than two years you must retake the exams.

**Recertification** - Occurs every six years (every second renewal). You must **build up enough credits to recertify by attending accredited recertification courses.**

Credits needed:

- Agricultural Plant - now 12 credits
- Agricultural Animal - 10 credits
- Aquatics - 10 credits

Credits must be:

- 1) Obtained over more than one year
- 2) 25% must be category specific

Applicators must keep track of their own credits and send original certificates to Albany when time to recertify.

**Certified and Uncertified Applicators must have a copy of the pesticide label in their custody when applying the product.**

Many of these changes will not have a major affect on you. And many of the topics on this sheet are not really changes. You have always been responsible for keeping track of your own certificates. You will be able to pick up credits at extension meetings and farm supply dealer meetings just as you have in the past. The changes that will impact you the most are picking up two more credits in a six year period, and the last item where you are responsible for having the labels for the pesticides you are applying in your possession at the time of application.

Another bit of information that is not contained on the sheet, but was shared with the group, is that the DEC has been asked by the federal government to step up their enforcement of the Worker Protection Standard. In the past there was little chance you would see an agent from the DEC unless there was a complaint lodged against you. With the new push from the federal government, there has been an increase in the number of inspection calls in the past year, especially in the Lake Ontario Counties of Western New York. To aid in the enforcement effort, Conservation Officers have also been given the task of WPS enforcement in New York State.

Just a warning that if you haven't started to become compliant with the Worker Protection Standard, now is the time to start. As always, if you have any questions please do not hesitate to call me at (716) 672-6830 or e-mail me at thw4@cornell.edu

## UPCOMING EVENTS

**April 17&18.** *Coffee break meeting : Wayne Wilcox on Disease Management Options.* Hector Fire Hall, Anthony Rd Winery, and Pulteney Town Hall. Times and details listed elsewhere in this newsletter. Pesticide recertification credits available. Please preregister by calling 315-536-5134 during office hours.

**May 23.** *Spring Pest Management Update, 3:00-6:00 PM, Lance Fullager Vineyard Supplies, Old Bath Rd, Penn Yan.* Program will include updates by University and Industry participants, changes in recertification, an update on the Food Quality Protection Act, and equipment demonstration organized by Andrew Landers. Barbecue to follow. Meeting will be hosted by Tim Weigle. Pesticide recertification credits available. *Details will be published in the next issue of vineyard notes.*

**July 19-21.** *Annual American Society of Enology and Viticulture Eastern Section Symposium and Meeting.* Clarion Hotel, Ithaca, NY. Symposium will focus on 'Synergy of Wine and Food', followed by technical sessions.

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