



**FINGER LAKES VINEYARD NOTES**  
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**ORGANIC GRAPE GROWERS  
MEETING**

David Peterson

With a number of growers converting Finger Lakes vineyards to organic practices this year, I am organizing a meeting on May 16 at 10:00 a.m. in the conference room in the Yates County Cooperative Extension Office, to help growers who are currently organic or are considering converting to organic practices. My plan for the initial meeting is to find out what issues growers need assistance with, to discuss how growers can help each other and how the Finger Lakes Grape Program can be of assistance. For this year, I see the potential for monthly field meetings of the group at various vineyard locations. Topics can vary according to the interests of the group.

For those who are unaware, much of the increased interest in converting to organic practices has been spurred by Cornell's 5 year Experiment with converting to organic practices, combined with interest from a juice processor (Blue Mountain Natural Products) in purchasing organically grown grapes from the Finger Lakes. At the time of this printing, Blue Mountain was still looking for some additional acreage of Concord. There is also increasing interest from several local wineries in purchasing organically grown grapes. For more information about organic practices, market options, etc., please contact my office, or come to the meeting on May 16.

If you are planning to attend the meeting on May 16, please RSVP by calling my office at (315) 536-5134.

*Helping You Put Knowledge to Work*

## **ORGANIC GRAPE AND WINE PRODUCTION SYMPOSIUM PROCEEDINGS AVAILABLE**

To order the proceedings from the Organic Grape and Wine Production Symposium held on March 21-22 at Geneva, send \$10 (checks payable to "Cornell University") to:

Beverly Dunham  
Bulletin Office  
NYSAES  
Jordan Hall  
Geneva, NY 14456

Request: 3rd Nelson J. Shaulis Symposium: Organic Grape and Wine Production. Special Report #69, March 1995.

The proceedings includes printed manuscripts from all talks given at the symposium. Speakers were from Germany, Japan, California, as well as New York. Presentations included results of Cornell's 5 year study of converting 5 acres each of Concord, Elvira and Seyval to organic practices.

### **DISEASE CONTROL PROGRAMS FOR FINGER LAKES WINE GRAPES**

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As the season gets ready to start, it may be worthwhile to review a few basics concerning disease control programs. Recognizing the diversity of the industry, I'd like to put my own "spin" on programs for each of the five major diseases, then finally cut to the chase and suggest some different options for rolling these into a single package. I also recognize that I haven't been through a full season with you yet, so you'll have to balance this lack of direct experience vs. a fresh perspective. Nevertheless, much of the following should sound pretty familiar.

### **POWDERY MILDEW**

Although powdery mildew (PM) was discussed in detail at the Finger Lakes Grape Growers Convention in March and in the recent

issue of the NY Grape Research News, its severity last year justifies some review. Two main points to remember: (1) All other things being equal, if disease was severe last year, you'll need to start control programs earlier (and run them more tightly) this season than when following a "normal" year. (2) Good PM control through fruit set makes the summer program relatively easy, but poor control early makes you to play catch-up the rest of the year. Now the details.

**Biology.** Recall that the powdery mildew fungus overwinters in small, black fruiting structures on the canes, which release infective ascospores during rainy periods from bud break through bloom. These ascospores initiate the disease cycle by causing PRIMARY infections if the temperature is above a minimum of 45-50°F during and after the rain.

As each mildew colony develops, it produces many thousands of individual powdery "summer" spores, which cause repeating generations of SECONDARY infections throughout the rest of the year. Thus, one primary infection can produce enough spores to cause a thousand secondary infections, each of which can cause another thousand infections, etc. In this way, once PM becomes established it can "explode" under favorable temperatures. For instance, the generation time for PM (i.e., the time after an infective spore lands on a leaf until it produces a new colony with thousands of additional spores) is 32 days at 46°F; 18 days at 50°F; but only 5-7 days at 61-81°F (average day + night temperatures).

This explains what happened in many vineyards last year. In 1994, an average of six primary infection periods (defined as at least 0.1" rain and 50°F) occurred throughout the Finger Lakes before bloom. Then, once primary infections became established, conditions were ideal for rapid secondary spread: during the prebloom through fruit set period of June 11-26, the average day + night temperature was 72°F, or enough time for THREE FULL GENERATIONS of the PM fungus to multiply. This spelled trouble where control programs weren't strong.

**When do berries become diseased?** Not only was the weather extremely favorable for

mildew development during the prebloom through fruit set period last year, but it also appears that this period is the "window of vulnerability" for cultivars that are not normally bothered by fruit infections. For instance, research conducted by David Gadoury at Geneva last season showed that when Concord clusters were inoculated on June 8th (prebloom) or 22nd (fruit set), about 40-50% of the berry surfaces became infected, whereas those inoculated on July 6th (1/4-inch fruit) or later developed almost no disease. Fruit of *vinifera* and susceptible hybrid cultivars are considered to remain susceptible until veraison, but it's possible that they are "extra susceptible" while very young. This phenomenon has been noted for diseases of other fruit crops, e.g., McIntosh apples are highly susceptible to apple scab all season, but are most susceptible during the bloom and early fruit set period.

**When to use sterol-inhibitor (SI) fungicides?** As mentioned above, primary infections of PM occur between bud break and bloom. Thus, programs designed to use SI's primarily in the summer are designed to control secondary spread, that is, to put out the fire once it's started. This is not only inefficient, **BUT IT'S A GOOD WAY TO BUILD UP RESISTANCE** (more on this next month).

In contrast, it makes much more sense to concentrate on SI sprays during the early season, up to and including the first postbloom (fruit set) spray. This provides good control of primary infections, protects the fruit during a period of high susceptibility, and is a good anti-resistance strategy. Also, because thorough coverage is critical for SI's (for good control AND resistance management), they'll perform most efficiently if used before a rapidly expanding canopy makes coverage difficult.

In many vineyards and many years, a prebloom SI application followed by a second one 2 weeks later gives adequate protection on Concord and similar cultivars. In these blocks, you'll probably benefit from an additional application before the prebloom spray (around 6-10" of shoot growth) if PM was bad last year, particularly if the weather is relatively warm. In *vinifera* and highly susceptible

hybrid blocks, don't delay past 3-5" shoot growth (especially if PM was bad in '94) unless you haven't had any infection period (rain and 50°F) since bud break.

**Which SI to use?** As most people know, Bayleton resistance has caused control problems in more than one Finger Lakes vineyard. In several vineyards where this has been studied, Nova and Rubigan have continued to provide control after Bayleton first fails. (NOTE: these materials might still work in such cases, but they're at risk, so use with caution--full rates, good coverage, intervals no greater than 14 days, don't use during mid-summer). At recommended rates, Bayleton and Nova are similarly priced and control the same diseases (PM and black rot). On average then, I see an economic risk in choosing Bayleton over Nova, with no compensating benefit. Of course, if you've got Bayleton in the barn and haven't had a problem or you just plain like it, keep using it, but keep an eye on things. Rubigan and Nova have provided comparable control of PM at recommended rates. Rubigan's significantly cheaper, but has two negatives: no control of black rot, and no label until 12-inch shoot growth. Thus, which of these two is "better" depends on what you need or want.

**What about sulfur?** Cheap and effective under the proper conditions: short spray intervals and warmer temperatures. Much of its activity results from vaporization, thus sulfur's effectiveness is significantly reduced at temperatures below 65°F. These things don't always read the book, so if you've gotten good results with early season sprays, who's to say you're wrong? Just recognize the limitations: at 50-65°, powdery mildew is pretty active but sulfur isn't.

**What about JMS Stylet Oil?** A highly refined food grade mineral oil registered for control of PM on grapes; it should be available through a local distributor this season. It's not cheap (at the minimum recommended rate of 1 gal/A, cost is close to 6 oz of Rubigan or 3 oz of Nova), but unlike other PM materials, it kills (eradicates) active mildew colonies **IF IT HITS THEM**. Thus, it's the best option as a "rescue" treatment if you get in trouble, although you're still better off preventing the PM in the first

place. Because it requires direct contact with the mildew colony for activity, THOROUGH coverage is CRITICAL (high volume applications). No significant control of other diseases.

JMS Stylet Oil is compatible with mancozeb, but NOT with captan, sulfur, Kelthane, Vendex, and some other materials, which can complicate things in the summer. Generally, there's about a 2 week waiting period for these materials on either side of an oil application, but check the oil label for specifics. It's labeled for 14-21 day intervals, but in high disease pressure trials at Geneva and Dresden the last couple of years, even a 14 day interval was stretching things.

**Summer control?** Assuming you've gotten good control up through and including the fruit set spray, summer control should be relatively easy. On Concords and other less susceptible cultivars, additional control shouldn't be necessary, but keep an eye on things. On *vinifera* and susceptible hybrids that require continued protection, now's when sulfur really fits. If PM is established and you need something stronger, try to fit in Stylet Oil rather than SI's.

### **BLACK ROT**

Another disease with a primary phase caused by overwintering inoculum (mummies, for the most part) and a secondary phase caused mostly by new leaf and cane infections. Again, the strategy is to control the primary phase and then let up. In general, good control through the first postbloom spray means you're done.

The season for primary black rot (BR) is very similar to that for primary PM--bud break through fruit set. In blocks with good BR control last year (most, from what I hear), control in the early part of this period is not as important as in the middle and late parts. This is because (a) only a small percentage of the overwintering inoculum supply is mature during the first couple of weeks following bud break, and a small percentage of a little is a very little; and (b) the BR fungus is a warm weather beast, needing relatively long wet periods once average temperatures get below 60°F.

As you know, the fungicides of choice are mancozeb, Carbamate (ferbam), Nova, and Bayleton; if using Rubigan for PM, you'll need to tank mix something for BR. There's been talk about using Bayleton as the mixing partner, but this doesn't make sense to me if mancozeb's an option--mancozeb's cheaper and also provides control of downy mildew (DM) and Phomopsis. As I see it, if you want an SI program that will also control BR (longer period of activity, including postinfection capabilities), use Nova; if you want to use Rubigan for PM, tank mix with a contact fungicide. Although ferbam is a good material for black rot, there is no reason to select it over mancozeb unless the 66 days to harvest interval for mancozeb has passed (or if your processor has post-bloom mancozeb restrictions). Mancozeb gives good control of both downy mildew and Phomopsis, while ferbam has little effectiveness against either.

### **DOWNY MILDEW**

Another problem last year. Another disease with a primary and secondary phase. Primary infections originate from spores produced in last year's infected leaves that have overwintered on the vineyard floor. The primary infection season usually begins about 1-2 weeks before bloom and continues until about 3 weeks after bloom. As with PM, numerous secondary spores are produced from each primary infection, and can cause the disease to "explode" if it gets established and conditions remain favorable (periods with warm, wet nights are ideal).

Recognize that the late season downy mildew (DM) lesions that sometimes seem to come out of nowhere are actually secondary infections that have suddenly built up to observable levels. Last year, bloom weather was warm and wet--absolutely ideal for establishing primary DM infections. These generally went on hold in July, then took off throughout the region during a couple of periods good for secondary spread later in the summer.

As with PM and BR, the easiest way to control late season infections (secondary) is to prevent the early season ones (primary) from becoming established in the first place. Because overwintering inoculum levels are relatively high this year (due to last year's infections), it

will be more important than usual to maintain good control prebloom through the first two postbloom sprays, particularly if weather is favorable for the disease. Mancozeb and captan are both highly effective.

Some growers have used Carbamate (ferbam) in mid-summer hoping to control downy mildew. Unfortunately, ferbam is extremely weak against downy mildew, and it would not be expected to provide control unless the pressure were so weak that damage would be unlikely to be significant anyway. If mancozeb and captan can not be used because of label or processor restrictions, consider using copper/lime for mid-summer sprays. Keep in mind, however, that several varieties are sensitive to copper injury, and that copper/lime is not compatible with several fungicides and insecticides. (see the *1995 New York and Pennsylvania Pest Management Recommendations for Grapes* for more information.)

#### **What about the Ridomil products?**

These are truly the Cadillac DM materials, in terms of both performance and price. Ridomil provides both protectant and some limited postinfection activity, allowing longer spray intervals than with mancozeb or captan. A prebloom application of Ridomil MZ followed by a postbloom spray 14 days later should give excellent control of primary DM in blocks where a combination of cultivar susceptibility, disease pressure (weather, inoculum carryover from last year), and crop value justify the cost. Alternatively, mancozeb prebloom and a Ridomil product in the first postbloom spray (which utilizes some of its activity to reach back into the late bloom period) is somewhat more economical, and should give very good control of primary DM in the vast majority of situations. Again, consider cultivar susceptibility, disease pressure, and crop value in the economic equation.

One last detail for the record: the 1995 Recommends states that Ridomil MZ is labeled for only a single, prebloom application (with Ridomil Copper labeled postbloom). This was true in 1994, but the 1995 label also allows postbloom usage of the MZ formulation for up to three additional postbloom sprays.

#### **PHOMOPSIS**

Phomopsis is a bit of a mystery disease--it's there, but how much economic damage does it cause? There are two phases of this disease, leaf/shoot and rachis/fruit. The leaf/shoot phase is important mostly because it can produce new inoculum that threatens rachis/fruit infections, which is where the economic losses occur. Fruit infections are a significant threat only if weather is wet for several consecutive days during the prebloom through fruit set period. Fruit infections normally occur during this time but stay latent (dormant) until just before harvest; thus, it's possible that the late season "black rot" infections that sometimes appear are really Phomopsis infections that occurred during bloom and are finally expressing themselves. Therefore, it's possible that some Phomopsis losses may not be recognized by the casual observer.

Mancozeb is the preferred material for control, but when should it be applied? Based on discussions with several individuals, here's how I see it: Unless the block has a history of severe Phomopsis (Ph), save the mancozeb until rachises and fruit need protecting (you'll get more bang for the mancozeb buck against BR and DM then also). This means concentrating on the immediate prebloom spray, and maybe the one before it if the weather's wet and/or the block is in a high risk category (disease history, hedged or minimally pruned).

#### **BOTRYTIS BUNCH ROT**

Roger Pearson developed reams of data showing that a spray of Rovral at veraison and 2 weeks later did as good a job against Botrytis as did traditional recommendations that also included sprays at bloom and bunch closing. However, last year was the exception: the warm, wet weather during bloom was ideal for Botrytis (average day + night temps of 60-80°F are ideal), and adding a bloom spray significantly improved control.

Botrytis is extremely dependent on highly humid microclimates around tissues before it can infect. This is why leaf pulling, pruning/training, site selection, and other horticultural practices are so important and beneficial for its control. Roger's data suggest

that in most years, conditions aren't suitable for bloom time infections, but last year shows that sometimes they can be. One more thing: I don't think any of the tests that failed to show benefit of bloom sprays were conducted on Pinot Noir or other notorious "super-problem" varieties. On other fruits (strawberries, raspberries), bloom sprays are critical for control of this same organism, which makes me wonder if we've downplayed their importance on some of our problem grapes.

Bottom line: don't fix it if it ain't broke. However, recognize that bloom sprays may be useful if weather is wet. Also, if previous programs have not been satisfactory, experiment with an application during the bloom period if conditions seem to warrant it. Trials at Dresden have consistently shown that captan does nothing for Botrytis under high pressure situations, so the only real option is Rovral. It's certainly desirable to limit Rovral use to two sprays per year (economics AND resistance management), but if a third spray is needed in the odd year, it won't suddenly drive things over the edge.

### PUTTING IT ALL TOGETHER

There are many good programs for controlling these diseases. I'll present some of my thoughts arranged by crop development, but ultimately each grower and advisor has to make his/her own determination based on a number of individual vineyard block and personal factors.

**3-5 INCH SHOOT GROWTH.** Time to start control of PM in *vinifera* and in some hybrid blocks with bad PM last year. May also be necessary to control BR and/or Ph in blocks with those problems last year. Not as necessary to control BR now if Nova will be used in the next spray at 10-inch shoot, since the Nova will provide some reach-back activity. Option A: Nova (PM, BR). Option B: sulfur (PM). Probably a poor option if weather is relatively cool, but gets the cobwebs out of the sprayer. Option C: mancozeb (BR, Ph). Option D: B + C (PM, DM, BR, Ph). Again, not the best program in cool weather. EDITORS NOTE: If Angular Leaf Scorch has historically been a problem (usually most problematic in Rougeon and Ventura), mancozeb should be included in this spray.

**10-INCH SHOOT GROWTH.** Don't wait any longer to control BR. Don't wait any longer to control PM on susceptible cultivars; may be a good idea on Concord, etc. if PM was bad last year. DM control may be needed on susceptible cultivars, especially if weather is favorable and disease was prevalent last year. Rachis infections by Ph are a possibility. Option A: Mancozeb (BR, Ph, DM). A broad spectrum, economical choice if PM isn't a serious concern. Option B: Nova (PM, BR). Must be at least 14 days after previous Nova spray. Option C: Nova + mancozeb (PM, BR, Ph, DM). Note that Rubigan isn't labeled for use until 12-inch shoot growth. Option D: sulfur + mancozeb (PM, BR, Ph, DM). Not as effective as Option C, but cheaper.

**PREBLOOM.** A critical time for PM, BR, and DM. Time to protect against potential fruit infections of Ph if weather's favorable. Option A: Nova + mancozeb (PM, BR, Ph, DM). Provides postinfection activity against BR infections, which Option B doesn't. Option B: Rubigan + mancozeb (PM, BR, Ph, DM). Cheaper than Option A. Option C: Nova + Ridomil MZ (PM, BR, DM). Pretty expensive, but the most effective option for DM under severe disease pressure.

**BLOOM.** Rovral for Botrytis control may be needed infrequently. See previous discussion.

**FIRST POSTBLOOM.** Still a critical time for PM, BR, and DM. Ph fruit infections still possible if very wet. Same Options A, B, and C as under PREBLOOM.

**SECOND POSTBLOOM.** BR danger should be over if you've maintained good control until now. Primary PM is over, maintain control of secondary infections on susceptible cultivars. Ph danger is over. Primary DM is still a threat if weather is favorable, particularly if the disease was prevalent last year. Option A: sulfur (PM). Option B: mancozeb (DM, BR if it's still needed) or captan (DM). Option C: A + B (PM, DM, BR if needed) Option D: Include Ridomil MZ (DM) in one of the preceding if disease pressure/economics say so.

**SUMMER SPRAYS.** Check the vineyard regularly to see what's needed. The goal has been to keep SI's out of the program, for resistance management. On *vinifera* and other cultivars requiring continued PM control, use sulfur or Sylet Oil (especially if problems start to develop). If BR is present, control through 8°Brix, using Carbamate or mancozeb (66 day PHI). For DM, there's copper/lime; captan; or mancozeb, Ridomil MZ, or Ridomil Copper (each of the last three with a 66 day PHI). We discourage use of Ridomil products to bail out of an emergency situation--they're the most effective option, but this will hasten resistance development. However, how big an emergency is it? How much will the industry rely on this material in the future?

## VINEYARD PEST MANAGEMENT CALENDAR

Tim Weigle

In an effort to help growers sort out the timing of vineyard pest management practices, I have put together a calendar of pest events. I would like your input to determine if this is useful or not, how it can be improved, etc. If you have any questions or comments please give me a call at (716) 672-6830.

### DORMANT

**Worker Protection Standard.** Make sure you have done what is needed to comply.

**Weather equipment set up.** Have weather equipment operating by April 1 if it will be used to determine growing degree days for crop reduction.

**Grape Berry Moth Risk Assessment Protocol.** Assign risk categories to vineyards to help determine scouting requirements later in the season.

**Weed management programs.** Determine and implement .

### BUD SWELL - BUD BREAK

**Grape Flea Beetle (Steely beetle), Climbing Cutworm.** Both are considered secondary pests and do not generally require insecticide applications for management. Check buds at bud swell for feeding damage to

determine if an insecticide application is necessary. The slow bud development this spring increases the chances of having damage from Grape Flea Beetle. Vineyards should be monitored for feeding damage.

### 1-INCH SHOOT GROWTH

**Monitor weather** for infection periods of black rot (BR) or powdery mildew (PM)  
**Start post-infection (PI) disease program** for varieties which are highly susceptible to black rot and powdery mildew.

### 3-6-INCH SHOOT GROWTH

**Continue to monitor weather** for infection periods of BR and PM.  
**Start PI disease program** for moderately susceptible varieties or in years with high levels of overwintering inoculum.

### 10 to 12-INCH SHOOT GROWTH

**Continue to monitor weather** for infection periods of BR and PM.  
**Start PI disease program** in 'Concord' vineyards with low or no levels of overwintering inoculum.

We'll cover more of the growing season in the next newsletter.

## WORKER PROTECTION STANDARD IN EFFECT

Tim Weigle

Worker Protection Standard (WPS) - After being delayed last year the WPS is being implemented in 1995 and growers will need to be in compliance with the standard prior to the application of any pesticide in the vineyard. The term *pesticide* includes: insecticides, herbicides, fungicides, miticides, etc.. To determine what you, as a grower, need to comply with the WPS, read the EPA publication *The Worker Protection Standard for Agricultural Pesticides- How To Comply*. This manual is fairly easy to read, and understand, and is available free of charge at your local Cornell Cooperative Extension Office.

If the training of hired help is required, the Cornell Cooperative Extension office in your county has materials available (video tapes, flip charts, manuals etc.) which allow any certified

pesticide applicator to train workers and handlers. They would be happy to loan these materials to you.

The WPS makes it even more important to read the pesticide label before application of any pesticide. The new labels refer to the WPS manual so it becomes part of the label. There are specific references to the types of personal protective equipment that must be used when: mixing pesticides, loading pesticides into the sprayer, cleaning the sprayer, application of the pesticides and when workers enter the area during the restricted entry interval.

The Worker Protection Standard is now in effect and I would urge growers to do their best to comply with it. If, after reading the manual, you have questions on how to comply, please give Tim Weigle a call at (716) 672-6830.

#### UPCOMING MEETINGS

May 16. ORGANIC GRAPE GROWERS MEETING. Cornell Cooperative Extension - Yates County Conference Room. Details in this newsletter.

June 20-21. INTERNATIONAL SYMPOSIUM ON CLONAL SELECTION. Oregon Convention Center, Portland Oregon. In conjunction with the American Society for Enology and Viticulture Annual Meeting on June 22-24 (see below). Contact: American Society for Enology and Viticulture, P.O. Box 1855, Davis, CA 95617.

June 22-24 AMERICAN SOCIETY FOR ENOLOGY AND VITICULTURE ANNUAL MEETING. Oregon Convention Center, Portland Oregon. Contact: American Society for Enology and Viticulture, P.O. Box 1855, Davis, CA 95617.

July 19-20. "ALTERNATIVE WINEGRAPE VARIETIES" SYMPOSIUM (Features Viognier, Sangiovese, Chardonnay, Norton and other "alternative" varieties). In conjunction with the American Society for Enology and Viticulture/Eastern Section Annual Meeting on July 21-22. Omni Hotel, Charlottesville, Virginia. Contact: Dr. Tony Wolf, Virginia Tech, 695 Laurel Grove Road, Winchester, VA 22602 Tel: (703) 869-2560, or Dr. Don

Splittstoesser, Dept. of Food Science and Technology, NYSAES, Geneva, NY 14456-0462.

July 21-22. AMERICAN SOCIETY FOR ENOLOGY AND VITICULTURE/EASTERN SECTION ANNUAL MEETING. Omni Hotel, Charlottesville, Virginia. Contact: Dr. Don Splittstoesser, Dept. of Food Science and Technology, NYSAES, Geneva, NY 14456-0462.



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