FINGER LAKES

VINEYARD NOTES

Newsletter 8 August 8, 2001

Cornell Cooperative Extension

Finger Lakes Grape Program

IN THIS ISSUE . . .

PETIOLE TESTING IN 2001

Timothy E. Martinson

As we move into August, it is time to plan for nutritional analyses to determine your fertilizer needs. Petiole analysis is the most reliable method for determining the status of most major nutrients in grapevines. While soil tests, when used together with petiole tests, can be helpful in making fertilizer recommendations, they are not as reliable for indicating nutrient status of the plant. Here are some guidelines:

What tests are available?

Complete analyses (including nitrogen) and no-nitrogen petiole tests are available through our office. We generally recommend the no-nitrogen test, for several reasons. Fall foliar analysis of nitrogen is not considered to be a reliable indicator of nitrogen needs and status. Nitrogen tests may be useful in comparing weak and strong vineyard sections, or for testing the effects of different rates on a particular variety. However, bloom-time samples are considered to be better for these purposes. Shoot growth and trellis fill are considered to be the most practical indicators of N status in the field.

When should samples be collected?

More than 70 days (10 weeks) after bloom. Samples can be taken later, as long as leaves remain in good condition, but should be collected before harvest. This year (Here in the Finger Lakes) that puts us into the third week in August for Aurore, and early September for other varieties.

What blocks should I sample?

- Accuracy of the recommendations depends on the representative sample. Thus a sample taken from a particular block may not necessarily apply to another block of the same variety, or even another part of the vineyard block, if it is large. Generally one sample should not be expected to provide useful information for more than 10 acres.

- Sample different varieties separately.

- For young vines just coming into bearing, sample every year for a few years. Production generally changes rapidly during the first few crops, and fertilizer needs also change.

- For mature vines that have had no major additions of fertilizer, sample every 2 to 3 years. If high rates of fertilizers were made over the past few years to improve the nutrient status of the vines, collect samples yearly to track changes in the vines, and to determine if additional amendments are needed.

- For nonbearing vines or lightly-cropped vines, samples may not be useful unless distinct visual symptoms or obvious problems appear. Without crop stress, most nonbearing and lightly cropped vines have higher levels of nutrients.

- For problem areas in vineyards, collect two samples - one in the area showing the problem, and one in a 'normal' area. Doing so and comparing samples will allow you to diagnose whether or not the problem is related to nutrient status of the vine.

- Soil tests are recommended every 3 to 5 years, and prior to planting new blocks.

Where do I get petiole and soil test kits?

Petiole and soil test kits are available through the Finger Lakes Grape Program office. Show up in person between 8:00 AM and 4:30 PM to pick them up, or send a request to the program through the mail. Kits are paid for at the time they are picked up or mailed out after payment has been received in our office. Make checks payable to: Finger Lakes Grape Program. Fees are as follows:

$19 for no-nitrogen petiole analysis

$25 for complete petiole analysis

$13 for soil test kit

DRY WEATHER AND CONCORD VINE WATER STATUS IN FREDONIA

Dr. Terry Bates
Dept. Horticultural Sciences
Fredonia Vineyard Laboratory

[Ed. Note – This article appeared in the Lake Erie Regional Grape Program's e-mail Crop Updates on August 3. Finger Lakes growers should note that Western NY did not receive as much rain in June as we did – TEM]

I do not need to tell most of you that we are experiencing a bit of dry weather this summer. The question is: How are the grapevines responding to this dry weather?

At the Vineyard Lab in Fredonia, we measure soil moisture, leaf water potential, and leaf photosynthetic rate to monitor how the vines are responding to the dry weather conditions. For leaf water potential we use a device called a pressure bomb to measure vine water status. For this measurement, a leaf is cut from the vine and placed in a sealed chamber and the air pressure is increased in the chamber until water is seen coming out of the petiole. In this case, you have to think of the leaf as a sponge. When you squeeze a sponge that is saturated with water, it takes very little pressure to get water to drip from the sponge. It takes more pressure to get water to drip out of a damp sponge and a lot more pressure to get water from a dry sponge. The pressure bomb does the same thing to a grape leaf. A vine with good water status has low pressure bomb readings (it takes low pressure to squeeze out the water). A vine under water stress has higher pressure bomb readings.

So what is the pressure bomb telling us? Around July 16th, our pressure bomb readings were around 6-7, indicating no water stress. Around July 23rd, pressure bomb readings were in the 8's, indicating that the vines were just starting to experience some water stress. On July 31 and Aug 1, the readings were between 9 and 11, indicating water problems and reduced leaf photosynthesis. The good news is that with all of our dry weather, the vines are just recently showing signs of reduced photosynthesis. The bad news is that if we do not get some significant rain soon, lower photosynthesis will translate into lower vine production - most likely in the form of reduced vine size or vine capacity for next year.

Photosynthesis and water stress at the Fredonia laboratory. At the lab, we have different viticulture treatments that deal with conserving soil moisture (weed control), improving soil moisture (irrigation), or improving the root systems' ability to get water (rootstocks, good soil fertility).

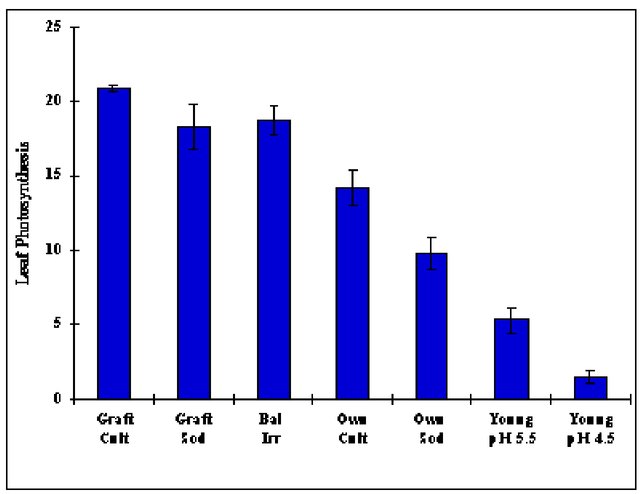


Figure 1. Concord Leaf Photosynthesis on August 1, 2001 in experimental plots at Fredonia Laboratory.

This figure shows leaf photosynthesis on August 1 on some of the different treatments at the Fredonia lab. Starting at the left, mature Concord vines grafted onto C3309 rootstock, either under cultivation or sod row middles, have good photosynthetic rates. C3309 roots are phylloxera resistant and very deep, which helps the vines maintain good water relations during dry years. The problem with grafted vines is that they can be over-vigorous in wet years and they require slightly different management than own rooted vines. Moving to the right, irrigating own rooted vines also helps maintain good water relations during dry weather. Vines with a lot of leaf area and large crops, such as high bud number vines, are more susceptible to water stress and require more irrigation than smaller, moderately cropped vines. Bars 4 and 5 look at water conservation through weed control, the most common water management tool in the belt. Own rooted vines with good chemical or mechanical weed control at bloom are starting to show more water stress with photosynthesis reduced by about 25% from the maximum potential photosynthesis. Own rooted vines with poor weed control (own sod) have photosynthesis reduced by almost 50%. Young (3 year old) vines are under even more water stress because their root systems are more shallow and less extensive than mature vines. In addition, young vines that have poor mineral nutrition because of low soil pH have even more restricted roots, higher water stress, and very low leaf photosynthesis.

Water availability and root function are starting to affect vine photosynthesis this season and will have an impact on vine capacity for next season. For most of you that have own rooted, un-irrigated vines that used weed control at bloom, the best thing to do is to pray for rain. Additional weed control at this time is a risky option. There is little soil moisture left to conserve so additional weed control might not do anything for you; however, we could argue that any rain that we do get could be made available to the vines if the weeds were absent. We have seen increased vine size with a second row middle herbicide application in dry years like '98 and '99. However, those years were wet early and dry late so the second herbicide application conserved the water that was there. This year is dry early and soil moisture is already low. The decision for additional weed control must be weighed against cost, the low crop situation, and the possibility that the rain could turn on and turn a cover free vineyard into a sloppy mess at harvest.

The Relationship Between Grape Prices and Wine Prices

Amir Hefetz and Jerry White
Department of Applied Economics and Management

We surveyed 14 wineries in the Finger Lakes in the fall of 1998. The objective of this research was to determine the relationship between local grape growers and wineries. Excluding the one large winery in the survey, the wineries purchased on average 17 per cent of their *Vitis vinifera* varieties, 61 percent of their French American hybrid varieties, and 22 percent of the native varieties, making them highly dependent upon purchased grapes.

There has been, since the late '70's or early 1980's, a pricing rule of thumb (attributed to Robert Mondavi). This rule of thumb, or pricing guideline for *V. vinifera* grapes, states that the price of grapes should be $100 per ton for each $1 dollar per bottle (retail price) that is expected when the wine is ready for sale. This formula has simplicity, as well as a logical basis, in that it recognizes the mutual interests shared by wineries and the growers from whom they source their grape supply. The formula implies that if growers take the utmost care in producing quality grapes, they will be rewarded by the buyers. The formula thus gives an incentive for growers to perform whatever vineyard practices the winery designates as contributing to the requisite quality to attain the target price.

We asked the management of the 13 small wineries about what factors affected the prices of the Chardonnay and Seyval grapes that they purchased. The expected price for a bottle of wine was ranked as the second most important factor for Chardonnay, given a high ranking by nine of the respondents (second to the prices your competitors would pay, given a high ranking by 10 of the purchasing wineries). Eight of 10 wineries that purchased Seyval grapes mentioned the expected price for a bottle of wine as the most important factor affecting grape prices for that variety.

We then tested quantitatively to what extent the prices paid by purchasing wineries were consistent with the "rule of thumb." Eleven of the wineries had price quotations by variety listed in the Finger Lakes Vineyard Notes from the years 1995, 1996, and 1997. These same wineries provided retail wine price lists for these vintages. We matched wine prices per bottle with the prices offered for grapes (by variety) by the purchasing wineries. There were 81 observations, of which 55 were for *V. vinifera*, 20 for French-American hybrids, and six for native varieties.

Table 1 indicates price distributions and averages for the wine prices and grape prices, by the three major categories of varieties. Looking at the average prices, the overall grape price average of $920 compares to a $10.02 average price per bottle of wine, indicating that about $92 was received per ton of grapes for each $1 in bottle price. The data fit better for *V. vinifera* ($102 per ton of grapes for each $1 in bottle price) than it does for French-American hybrids ($57 per ton for each $1 in bottle price) and native varieties ($46 per ton for each $1 in bottle price).

Table 1: Price Distribution, Retail prices, and Grape Prices

	Minimum	Maximum	Mean	Std. Error
Price per bottle				
All Varieties	$5.49	$17.99	$10.02	$.36
Vinifera	$5.94	$17.99	$11.42	$.40
French American Hybrids	$6.00	$8.50	$7.25	$.18
Native American	$5.49	$7.99	$6.49	$.39
Price per ton grapes (l ton = 907 kg)				
All Varieties	$260	$1,600	$920	$47
Vinifera	$375	$1,600	$1170	$34
French American Hybrids	$320	$500	$410	$10
Native American	$260	$350	$300	$13

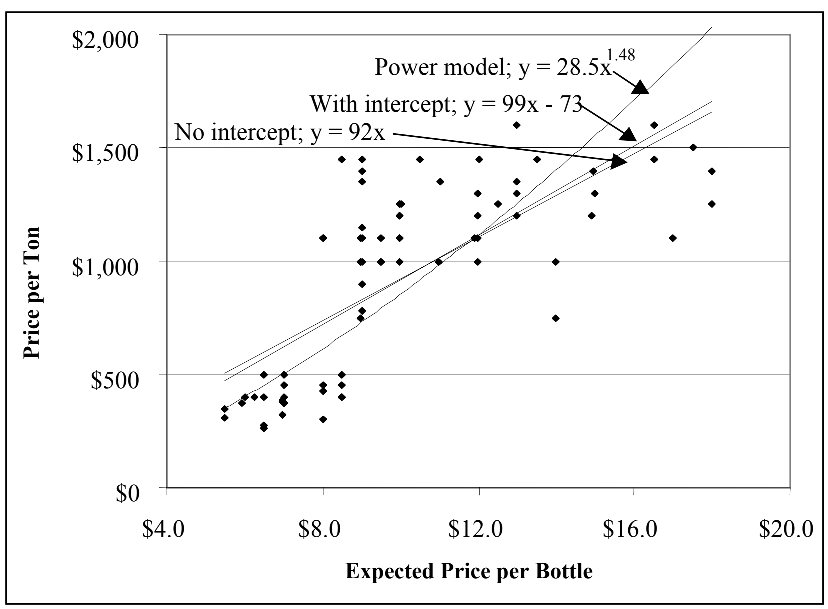
Sources: (1.) 1998, Finger Lakes winery price lists. (2.) 1995-1999 Finger Lakes Vineyard Notes, Finger Lakes Regional Grape Program, Penn Yan, NY.

A plot of the relationship between prices per ton of grapes and price per bottle of wine is shown in Figure 1, along with 3 different equations describing the relationship. The best fit is the equation Y=92X, which indicates that the price per ton of grapes changes $92 for each one dollar in bottle price. This model explained 93 per cent of the variation in grape prices. A more intuitively correct model, in that it has an intercept indicating that there is a fixed cost for the bottle, the cork, and the label, was described by the equation Y=99X-73. This model (which explained 55 per cent of the variation in grape prices) indicated that the marginal effect of price per bottle is $99. The fact that costs for the bottle, cork and label make up a lower portion of the total cost of a bottle of *vinifera* than for French American and native varietals, probably explains why the pricing guide does not fit as well for varieties other than *V. vinifera*.

These relationships indicate that there is a fairly good fit for the "rule of thumb" in grape pricing for *V. vinifera*. These statistics, however, describe the relationship between grape prices and bottle prices that were observed. A pricing rule of thumb needs to correlate today's grape prices with tomorrow's bottle prices—hence the price the winery management <u>expects</u> to receive for the wine made from a given lot of grapes. In reality, winery management will probably look at today's bottle price to gauge the future. But if the wine maker wants to upgrade the quality offering, thus raising the price of a bottle of wine, the quality of grapes being purchased may need to increase as well. Supplying growers might be asked to perform practices that increase costs per ton (e. g. leaf pulling, limiting yields). The "rule of thumb" could give vintners (who have in mind a target price for a *vinifera* varietal wine) a guideline in developing price offerings that would encourage growers to produce the requisite quality by sharing the rewards of higher bottle prices.

Although the relationship seems to fit for the vintages we examined, we did not find strong support among the vintners we interviewed for an incentive system such as is implied by

Figure 1: Regression Models vs. Actual Data



Sources: (1.) 1998, Finger Lakes winery price lists. (2.) 1995-1999 Finger Lakes Vineyard Notes, Finger Lakes Regional Grape Program, Penn Yan, NY.

the “rule of thumb.” However, as there is increasing emphasis in raising the quality and price points for the Finger Lakes product offering, both wineries and growers need to understand that cooperation about quality starts in the vineyard and is a long term investment.

Amir Hefetz is a Graduate Research Assistant in the Department of Rural Sociology and Jerry White is Professor, Department of Applied Economics and Management, Cornell University.

PIERCE’S DISEASE AND CALIFORNIA GRAPES

Timothy E. Martinson

Pierce’s disease has emerged as a major threat to grape production in some of the premium (and bulk) wine grape growing areas of California. As a result, over 10 million dollars has been allocated by the California Department of Food and Agriculture for research on prevention and a ‘cure’. Despite this level of funding, prospects for immediate relief are dim. Because of the potential impact to California, I thought it would be of interest to area growers to summarize information about the disease from the latest *California Agriculture,* which devoted much of the current issue to the topic.

The disease. Pierce’s disease (PD) is caused by the bacterium *Xylella fastidiosa.* It reproduces within the grapevine and plugs water-conducting xylem tissues, causing water stress. Infected vines show marginal leaf yellowing and browning that proceeds progressively inward. Infected vines die within two years of acquiring the disease. PD is not new to California; the disease has been present in Napa and Sonoma, as well as other coastal areas, since the 1880’s. The disease’s spread through a vineyard, however, was limited, because native insects that transmit the bacterium had a limited range of movement. Typically a few vines on the edge of vineyards next to streams (harboring the insect vector) would be affected. The problem was manageable. This has all changed with the introduction of a new insect into California.

The insect vector. The new insect vector, Glassy Winged Sharpshooter (GWSS), is a native of the southeastern US. It became established in California around 5 years ago. Following its introduction in the Temecula area, just north of San Diego, 500 acres of grapes were infected and died. Since then, the insect has been detected in the San Joaquin valley and further north. It probably moved into and around California on ornamental nursery plants. The presence of GWSS and PD is the reason why only Muscadine grapes (naturally resistant to PD) are grown in many parts of the south.

GWSS moves extensively while feeding, unlike the blue-green sharpshooter present in Napa. The native blue-green sharpshooter (that transmitted PD) fed on only young tissue close to shoot tips. Because of this, it could only transmit PD early in the season (April and May). GWSS, in contrast, feeds on woody tissue at the base of the canes, which means it can transmit the disease during the entire growing season. It also feeds on many wild and cultivated hosts, such as citrus, almonds, and alfalfa. The combination of the GWSS’s mobility, ability to transmit the disease during the entire season, and wide host range have converted PD from a manageable nuisance to a major threat.

Short-term control strategies. There is no cure, nor any immediate prospects for one. Short-term efforts are aimed at preventing the spread of the vector and disease. Options include:

- **Quarantine and inspection.** Nursery ornamentals, widely transported between regions, can harbor GWSS eggs. Inspection of nursery stock and shipping restrictions have been imposed in grape growing areas to reduce the chance of transporting GWSS out of areas where it is established.

- **Insecticides.** The short-term answer is to limit the spread of GWSS and PD through insecticides. The best insecticides tested controlled 90-95% of GWSS in field trials. But this level of control (5-10% of the population surviving) is not enough to prevent transmission of the disease. Transmission studies, however, showed that GWSS needs to feed for several hours on the same vine to acquire or transmit the bacterium. Insecticides that reduce feeding time may limit spread of the disease by reducing transmission of the bacterium. Soil-applied Admire (another form of imidacloprid, or Provado, registered here in NY) can apparently decrease feeding over several months, and offers one potential solution.

- **Biocontrol.** Several tiny stingless wasps parasitize GWSS eggs in their native southeastern habitat. Several are being imported and established in California. It is unknown whether or not these biocontrol agents will survive California winters and become established permanently.

- **Foliar-applied micronutrients.** Zinc, manganese, and copper are toxic to the PD bacterium in the laboratory. Combining these micronutrients with amino acids in foliar sprays may allow for uptake and transport through the xylem (water-conducting tissue), where the PD bacterium lives. This tactic, while attractive, has not yet been proven in the field.

Long-term solutions: Over the longer term, many scientists feel that genetic manipulation, either through conventional breeding or genetic engineering offers the best hope for combating PD. Traditional breeding programs are looking at transferring traits that make muscadine grapes resistant to PD to *Vitis* cultivars. (All other grape species in the US are members of the genus *Vitis)*. This task is challenging, because muscadine grapes are only distantly related to *Vitis,* which makes them difficult to cross. Breeding focuses on table and raisin varieties only at this time.

Genetic engineering (direct transfer of genes) offers a faster path towards incorporating resistance into classic wine varieties. Florida scientists have identified and patented genes that they believe will protect *Vitis* grapevines from Pierce's Disease. They expect to have commercially-available plants within 5 to 8 years (We'll see).

Will it come to New York? No. Pierce's disease is present in the southeastern states as far north as North Carolina. The PD bacterium does not survive the winter in the Northeast, so chances of PD being established in the Finger Lakes are extremely remote.

Implications. In the space of a few years, Pierce's disease destroyed a thriving (but small) wine grape growing region in southern California. As the insect vector moves north through the central valley, the industry is concerned that the disease could do the same thing to the major growing areas in the state. Many of the alternatives for control are unpalatable to consumers and the general public. Widespread mandatory insecticide applications within GWSS zones are facing significant opposition. Experience suggests that efforts to stop the insect's spread will ultimately only slow, not stop, its movement.

Genetic modification through breeding or genetic engineering faces two problems. The first is public opposition to genetically modified organisms (GMO's). Even if scientists can insert genes to make PD resistant Chardonnay, the public may not want to buy it. The second is varietal names- even with public acceptance, the wineries probably won't be able to call it 'Chardonnay'. Resistant varieties made through conventional breeding will face the same problem as other new wine varieties – it takes time to get a new name established, and producers are unlikely to be able to command $30 a bottle for it.

The best-case scenario is that quarantine and containment will succeed, or the insect (or disease) will encounter ecological barriers that prevent its spread into major production areas. The worst-case scenario is that GWSS and Pierce's disease will make grape growing unprofitable in major production areas. Regardless of its ultimate impact, the glassy-winged sharpshooter and Pierce's disease have injected a note of uncertainty into a very successful and economically significant industry. That's why $10 million in emergency funding is there, and the pressure is on for researchers to come up with viable solutions.

MARKET FOCUS: CHARDONNAY

Timothy E. Martinson

Chardonnay is the most popular white wine consumed in the US. Recent figures from *Wine Business Monthly* (*Growers take note: This monthly publication is available for a free subscription to qualified persons in the US. If you grow wine grapes, you are probably qualified*) showed that Chardonnay accounts for 24% of table wine sold in grocery and drug store sales in the US (excluding NY, of course, where wine is not sold in grocery stores), and a whopping 60% of all white wine sold. Chardonnay is also the most widely planted *V. vinifera* variety in the Finger Lakes, with 375 acres vs. about 260 for Riesling (96 acreage survey). A recent article from *Vineyard and Winery Management* (referenced at end of the article) showed some startling trends from 1990 to 2000:

- Acreage of Chardonnay in Europe has increased by 25%, from 30-40,000 hectares.

- In the New World (everywhere except Europe) acreage has tripled from 60-180,000 HA. In

Chile, plantings have increased 9-fold, in Australia/NZ 3-fold, and in Argentina 4-fold

- In California, 17% of the total crush is Chardonnay, and 60% of recent growth in wine production in California has been Chardonnay. The size of the Chardonnay market is more than that of Merlot and Cabernet Sauvignon combined.

- 43 million cases of California Chardonnay were produced in 2000; about 6.5 million more cases will be on the market by 2004.

- Bulk Chilean Chardonnay wine is available for $1.80 per gallon.

Clearly, strong consumer demand for Chardonnay has sparked the growth in acreage. But the article cited signs that consumption is leveling off. The result is that California growers in the Central Valley and Central Coast are seeing prices drop, and significant quantities of bulk wine from the 1999 and 2000 vintages are piling up. While the market for Chardonnay continues to grow (especially at popular price points), world supply is undoubtedly outpacing growth in consumption.

What does this mean for the Finger Lakes? Chardonnay continues to be a mainstay of the local wine market, with many Finger Lakes wineries successfully marketing and selling high quality wines to appreciative consumers. Sales at area wineries should remain strong, because consumers like the wine. But don't expect much growth in markets external to the Finger lakes. Winery owners tell me that distributors and liquour stores are receptive to many Finger Lakes wines, but most aren't looking to stock 'another Chardonnay'. To my knowledge, very little Chardonnay is being planted in the Finger Lakes. Appropriately, growers are upgrading management of existing blocks to produce a better product. Those who are planning startup wineries are more likely to be considering new plantings. If you are in that situation, I would urge you to think long and hard about exploiting existing supplies before investing in planting Chardonnay.

References:

Wine Business Monthly, June 2001, *Wine Retailing News, p. 40* **Vineyard and Winery Management,** July/August 2001, *Why Chardonnay hasn't attained the status of Cabernet, p. 68-76*

ALIETTE WDG FUNGICIDE REGISTERED IN NEW YORK

Wayne Wilcox
NYSAES Geneva

I received word recently that Aliette WDG fungicide received NYS registration for use on grapes. I have no experience with Aliette on grapes, and the company that makes it has offered no support or even information on grape uses during the 6 years that I've run the grape fungicide evaluation program. Within this context, I'll briefly tell you what I do know and think about it.

Aliette has been registered in the U.S. since the 1980's, primarily to control root rots and downy mildews on various fruit and vegetable crops. The only significant grape disease that Aliette is likely to control is downy mildew. It (or similar products) has been used for this purpose over a number of years in other parts of the world. Once in the plant, Aliette breaks down into phosphorous acid, which apparently is the active entity of the product. Note that <u>phosphorOUS</u> acid is a different chemical than <u>phosphorIC</u> acid, which is the phosphate form of P found in most commercial fertilizers. This distinction is important, because phosphorous acid controls downy mildew and related fungi but provides very little P to the plant, whereas phosphoric acid provides P in a form that the plant can assimilate but does not control downy mildews, etc.

Because phosphorous acid (PA) is a relatively inexpensive chemical, several companies have formulated PA products in an attempt to take Aliette's market niche at a lower cost. Predictably, there have been plenty of lawsuits over the issue, but the Australians have been selling and using PA products for this purpose for nearly 15 years, and several similar products are being developed for the U.S. market. I've tested PA formulations in my downy mildew trials over several years, and they've provided very good control.

Bottom line: Aliette should do a good job for downy mildew control, but at a labeled rate of 3 to 5 lb/A and a cost of approximately $11/lb, it's not even close to being price-competitive, particularly since it only controls this one disease. I'll be a lot more excited if some of the PA products hit the market at more reasonable prices.

Upcoming Events

August 15, 2001 Cornell Fruit Field Day 8:00 am - 5:00 pm Ithaca, NY. The fruit team at Cornell University is hosting a field day on August 15, 2001 at the experimental farms near Ithaca to view research and demonstration plantings involving tree fruits and berries, and to learn about postharvest and spray application technologies for these crops. The field day will start at 8:00 am, lunch will be served at the beautiful Cornell Plantations, and transportation will be provided to the Lansing orchard located along Cayuga Lake. The cost for the event is $20.00. Attendees must pre-register or make a reservation. Call 607-255-5439 or email Max at mw45@cornell.edu to reserve your spot.

August 23, 2001, Summer Vineyard Walk Around. 8AM-5PM, sponsored by Southeast Grape Industry Association of Pennsylvania (SEGA) and Penn State Cooperative Extension. The Walk Around will feature a tour of Seven Valleys Vineyard (Glen Rock, PA, York County), and will feature presentations by Lucie Morton and Kevin Ker focussed on vineyard health and nutrition. The program includes lunch, snacks and a wine tasting of regional wines, including Maryland. Pre-registration is due by August 16. Contact Mark Chien (mlc12@psu.edu or 717 394-6851) for information.

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Ontario, Schuyler, Seneca, Steuben, and Yates Counties
County Office Building
110 Court Street • Penn Yan, NY 14527
Comments may be directed to

Timothy E. Martinson
Area Extension Educator
Finger Lakes Grape Program
315-536-5134
tem2@cornell.edu

Cornell Cooperative Extension

Finger Lakes Grape Program

110 Court Street
Penn Yan, NY 14527