Subject: New England Grape Notes, Vol. 6, No. 6
From: Sonia Schloemann <sgs@umext.umass.edu>
Date: 5/24/11 1:11 PM
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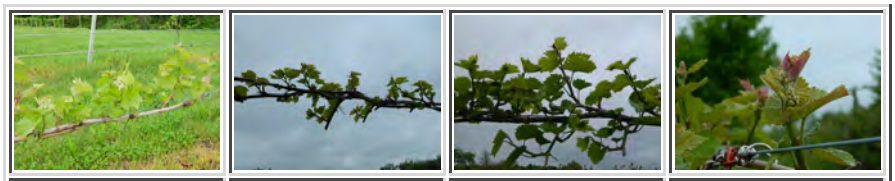
New England Grape Notes

May 23, 2011, Vol. 6, No. 6

Phenology: 3-5" shoot growth, pre-bloom
See http://fruit.cfans.umn.edu/grape/IPM/appendixa.htm for good chart on growth stages



Marquis	Noiret	Marquette	Reliance

photos taken 5/20/2011 at UMass Cold Spring Orchard, Belchertown, MA

Meetings: June 8, 2011, Twilight Meeting with Justine Vanden Heuvel and Anna Katherine Mansfield. Focus is on canopy management practices on hybrid varieties and review of winemaking considerations for hybrid varieties. **Location**: UMass Cold Spring Orchard Research and Education Center, 391 Sabin Street, Belchertown, MA 01007. 5:00pm - 8:00pm. Donation of $10 requested to help support meeting costs. Co-sponsored by the Massachusetts Farm Winery and Growers Association.

Resources: Check out the University of Vermont Cold Climate Grape Vineyard 'Blog' at: http://pss.uvm.edu/grape/UVMvineyard/UVM2011Blog/UVM2011Blog.html

How do you know that your sprayer is delivering the right spray pattern to your vine? One way to find out is to use a **patternator** to evaluate spray distribution. Click here to learn more about a NE-SARE funded project on this.

Insect Management:

GRAPES 101
Grape Berry Moth Management
By Tim Weigle, Cornell University

Grapes 101 is a series of brief articles highlighting the fundamentals of cool climate grape and wine production.

The grape berry moth (GBM), *Paralobesia viteana*, is the primary insect pest of grapes grown in the eastern United States. The female GBM typically lays her eggs directly on the berry. When the eggs hatch, the larvae are in the perfect location to immediately begin feeding directly on the grape berries. Their feeding causes both crop loss and contamination, and damage from late season feeding creates an entryway into the berry for the complex of late season rots. Most growing regions can expect two to three generations of GBM each year. Over the past 30 years, GBM management recommendations have been driven by changes in grape prices, government insecticide regulations and canopy management practices. The latest model incorporates both weather data and an understanding of insect biology to improve risk assessment and inform spray schedules.

Grape Berry Moth Risk Assessment Protocol
Early systems were based on the application of three insecticides, using a timing that was based both on the grapevine's growth stage and the calendar. In response to dropping grape prices in the 1980s,the

Grape Berry Moth Risk Assessment Protocol was developed, based on the vineyard's history of grape berry moth damage, climate (i.e. winter low temperatures plus snow cover) and proximity to woods. This protocol provided growers with a roadmap for GBM management by specifying the timing of scouting and insecticide applications using the vineyard's risk classification. It was a significant step forward compared to the calendar-based insecticide program of the past, but its calendar-based mid- and late-season scouting and insecticide timings were not effective in controlling late-season GBM damage, which was on the increase due to the government's decertification of many broad-spectrum insecticides, new training systems that created larger, denser canopies (primarily in the Concord industry), and overall warmer temperatures throughout the growing and dormant seasons.

Phenology-Based Degree-Day Model
In response to the breakdown of the GBM RA Protocol, research and extension staff from Cornell, Penn State and Michigan State University sought alternative management strategies for GBM that replaced calendar-based scouting and insecticide sprays with a growing degree-day model to predict the peak of the damaging larval phase of each GBM generation. Because insect development is driven by temperature, the warmer the temperatures over a period of time the more quickly a grape berry moth will complete its life cycle. GBM typically completes two to three generations per year in New York state. Conversely, cooler temperatures will delay GBM development, requiring more time to complete a life cycle. Research showed that 810 degree days are required for grape berry moth to complete a generation, so in the model, a base temperature of 47.14°F is used.

Degree-day calculation example: To calculate degree-days, the high and low temperature for a 24-hour period—usually midnight to midnight or 8 a.m. to 8 a.m.—are recorded. The high and low temperatures for the day are added and then divided by two to calculate the average daily temperature. The base temperature —which in the case of the GBM model is 47.14°F —is then subtracted from the daily average to give the degree day accumulation for that day. An example is provided below for a day with a high temperature of 84°F and a low of 56°F.

- 84 (high temp) + 56 (low temp) = 140
- 140/2 = 70 average temperature
- 70 (avg. temp) – 47.14 (base temp) = 22.86 degree days for that day

Degree-days are then added to get accumulated degree-days over days or weeks. If the average temperature is ever lower than the base temperature, zero degree-days are recorded for the day. There is never a negative accumulation of degree-days.

The research and extension team conducted trials to examine scouting and insecticide applications based on GBM life cycle development using degree-day accumulation rather than the calendar. Work continues on how to determine the best method for starting the accumulation of degree-days. Current research uses the date of wild grape bloom as the biofix, or starting date, because GBM development and wild grape phenology are closely linked early in the year. Other ideas for developing biofix dates are male pheromone trap catch results and degree-day accumulations with a January 1 start date. Research shows potential for a reduction in the use of insecticides using the phenology-based degree-day model without increased crop loss.

Using the Model: The model is available on the Network for Environment and Weather Applications (NEWA) website. NEWA downloads weather parameters from weather stations across the state, so most grape growers are able to access results specific to their region. Growers are able to choose the weather station location and a biofix date (based on the timing of wild grape bloom near their vineyard) to automatically generate predictions for their area. As the research projects continue into the implementation and demonstration phases, the potential for a new industry standard in GBM management is on the horizon.

Further Information
Martinson, T. E. and T. J. Dennehy. 1991. Risk Assessment of Grape Berry Moth and Guidelines for

Management of the Eastern Grape Leafhopper, New York's Food and Life Science's Bulletin 138. New York State Agricultural Experiment Station, Cornell University.
Riedl H. and E. F. Taschenberg. 1984. Grape Berry Moth, Endopiza viteana, New York State Grape IPM Factsheet, Cornell University.
Weigle, T. 2010. Grape Berry Moth YouTube video
(***Source**: Appellation Cornell, Issue 6 April 2011*)

GUIDE TO STAGES

STAGE	TIMING	WHERE TO LOOK
Adult (1st flight)	Late May (before bloom) until mid-July	Pheromone traps
Adult (2nd flight)	Late July until early Sept	Pheromone traps
Eggs (1st generation)	Late May until mid-July	On stems, blossom buds, or newly set berries; later only on berries
Eggs (2nd generation)	Late July until early Sept	On berries
Larvae (1st generation)	Early June until late July	First on stems, blossom buds or newly set berries; blossoms and small berries often webbed together; later only in berries
Larvae (2nd generation)	Early Aug. until end of Sept	In berries
Pupae (1st generation)	Late June until Aug	On leaves on the vine
Pupae (overwintering)	Aug. until late May of following year	On fallen leaves on the ground

Disease Management:

New Fungicide Chemistries for Grapes

Annemiek Schilder, Michigan State University

There are various trends in crop protection worldwide that are changing the landscape for grape fungicides. We have seen an overall increase in new fungicide registrations over the past two years. One distinct trend is that there are more downy mildew fungicides on the market due to outbreaks of cucurbit downy mildew in the United States. Since these fungicides also work well against downy mildew in grapes, we are now seeing a range of new products for grapes, e.g., Presidio, Revus, Tanos, Forum, Reason and Ranman. Some of these have yet to be evaluated in Michigan. The threat of soybean rust, an invasive disease of soybeans, has speeded up the review of sterol inhibitor fungicides by the EPA and led to the registration of several new SI products for grapes, including Mettle and Inspire Super. Growers may also have noticed that commonly used fungicides, like mancozeb and copper have become more expensive – one of the reasons is the increasing price of copper worldwide. Furthermore, the number of natural fungicide products, including biological control agents and plant extracts (e.g., Regalia), has been steadily increasing. This has increased the number of disease control options for organic grapes.

Generic fungicides are now becoming more common since the patents have run out on a number of older fungicides. Examples of these are Legion, Nevado, Orius, TebuStar, AgriStar Sonoma and Tebuzol. In order to extend fungicide patents, companies have also started developing pre-mixes of different fungicide active ingredients. These pre-mixes have a broader spectrum of activity than single-ingredient products and are convenient to use. An example is Adament, which is a pre-mix of Flint and Elite. Pre-mixes are available for specific disease complexes, for instance powdery mildew and downy mildew or powdery mildew and Botrytis bunch rot. That way, these products can be tailored to specific cultivars or times of the growing season.

Below are a number of new(er) grape fungicides described that you may or may not have heard of. Those fungicides that have shown at least moderately good activity in field trials in Michigan are given an efficacy rating in the grape section of E-154 (Michigan Fruit Management Guide). Those that have not been tested in Michigan (yet) or showed poor efficacy in trials are simply listed here for your information. More products are in the pipeline and may become available this season. You will be updated on new grape fungicides as they get registered for use in Michigan. For fungicide labels and material safety data sheets, go to the following website: www.cdms.net (look under the "Services" tab, then "Labels/MSDS").

Adament (tebuconazole and trifloxystrobin) is a mixture of a systemic (tebuconazole) and surface-systemic (trifloxystrobin) fungicide. It is a broad-spectrum fungicide that is labeled for control of multiple diseases on grapes, cherries, peaches, and nectarines. Adament is rainfast when dry, generally within 2 hours. Adament is effective against cherry leaf spot, brown rot, and powdery mildew on cherries, and powdery mildew in grapes. It has excellent efficacy against powdery mildew (where fungicide resistance is not present) and black rot, and is moderately effective against Botrytis bunch rot. Adament is best used as a protectant. Do not apply this product on Concord grapes, as crop injury may result due to the trifloxystrobin (Flint) component. Do not make more than two consecutive applications or a total of six applications in grapes per season.

Forum (dimethomorph) is a new, systemic fungicide for control of downy mildew in grapes. Use Forum as a preventive application before infection occurs. The minimum application interval is 7 days. Performance may be improved by using Forum in a tank mix with another fungicide. The addition of a spreading/ penetrating adjuvant is prohibited. Do not make more than 5 applications per year, and no more than one application before switching to a fungicide with a different mode of action. The REI is 12 hours and the PHI is 28 days. Forum will be evaluated for disease control in Michigan this summer.

Inspire Super (difenoconazole and cyprodinil) is labeled for control of powdery mildew, Botrytis bunch rot, black rot and anthracnose. It has preventative, systemic, and curative properties against. Difenoconazole belongs to the sterol inhibitor class of fungicides, whereas cyprodinil is active ingredient in Vangard. The application rate is 16-20 fl oz per acre. For all diseases, apply before the onset of disease. Apply on a 10-14 day schedule, with no more than 2 consecutive applications before alternating to a fungicide with a different mode of action. Do not apply more than 80 fl oz of Inspire Super per acre per season and no more than 0.46 lb a.i. difenoconazole and 1.4 lb a.i. cyprodinil. Avoid spray overlap as crop injury may occur. The PHI is 14 days, and the REI is 12 hours.

Mettle (tetraconazole) is a new sterol inhibitor fungicide. It is a systemic fungicide labeled for control of powdery mildew and black rot in grapes. When a post-infection application is used for black rot, it is recommended within 72 hours of an infection period. Mettle is absorbed quickly into the plant tissue and is rainfast within 2 hours of application. Do not make more than two applications of Mettle to grapes per year. The maximum amount of Mettle allowed per season is 10 fluid ounces and there must be at least 14 days between applications. Do not apply Mettle through any kind of irrigation system. The REI of Mettle is 12 hours and the PHI is 14 days. Mettle had performed similarly to Elite in Michigan trials.

Nutrol (monopotassium phosphate; 50% P_2O_5 and 32% K_2O) is a water-soluble fertilizer (0-52-32) as well as a fungicide against powdery mildew. This product is labeled for control of powdery mildew in apples, stone fruits, and grapes. It is a salt and acts primarily as a contact fungicide. Nutrol will not cause phytotoxicity, even at high concentrations. Nutrol is a non-toxic, environmentally friendly product that is exempt from residue tolerances. It can also be used as a pH buffer to prevent alkaline hydrolysis of pesticides. A 1% solution will have a pH between 4.5 and 6.0. Nutrol is compatible with most commonly used agricultural chemicals. The PHI is 0-days. This product has not been evaluated in Michigan.

Presidio (fluopicolide) is a new systemic fungicide which is active against diseases caused by downy mildews and other oomycetes in grapes. This fungicide has a novel mode of action and has protective, curative, eradicative, and antisporulant properties. Presidio is locally systemic and translaminar and moves systemically via xylem tissue. Furthermore, Presidio is compatible with many fungicides and

insecticides and is rainfast in 2 hours. The PHI for grapes is 21 days; no more than two sequential applications are allowed. A tankmix with another fungicide with a different mode of action must be used with Presidio for resistance management. Presidio has worked well against downy mildew in trials in Michigan.

Quadris Top (azoxystrobin and difenoconazole) is labeled for control of powdery mildew, downy mildew, black rot, anthracnose, and minor foliar diseases; and suppression of Botrytis bunch rot. It is systemic and has preventative, systemic and curative properties. This fungicide has not been evaluated yet in Michigan, but the individual components have, and efficacy is expected to be excellent. It will be evaluated this growing season. Quadris Top can be applied at 10-14 fl oz per acre on a 10-14 day schedule. No more than two consecutive sprays are allowed and a total of 56 fl oz per acre per season. The PHI is 14 days and the REI is 12 hours. Due to the azoxystrobin component, Quadris Top is extremely phototoxic to certain apple varieties.

Ranman (cyazofamid) is a new fungicide for control of downy mildew in grapes. Ranman has limited systemic activity, so should be applied in a preventive mode. Make fungicide applications on a 10-14 day schedule when conditions are favorable for disease development. Do not apply more than 6 sprays of Ranman per season and no more than 3 consecutive sprays before switching to fungicides with different modes of action for the next three applications. Do not use any surfactant with Ranman. Application water volumes for ground application should at least be 100 gal per acre. Ranman may be applied through irrigation systems with restrictions (for instructions see the label). The REI is 12 hours and the PHI is 30 days. This product has not been evaluated for disease control in Michigan.

Reason (fenamidone) is a new systemic fungicide for control of downy mildew in grapes. Reason is related to the strobilurins (Group 11), which means that cross- resistance may occur. Reason can be applied at 10-14- day intervals during periods of disease susceptibility. Do not make more than one application of Reason before switching to a fungicide with a different mode of action. Do not apply more than 8.1 fl oz of Reason per acre per growing season. The REI is 12 hours. Do not apply within 30 days of harvest. Reason has not been evaluated in Michigan yet, but has shown good control of downy mildew in other states.

Regalia (extract of Reynoutria sachalinensis = giant knotweed) is a plant extract-based biofungicide that is OMRI approved for organic production. It is labeled for broad-spectrum disease control in grapes. The proposed mode of action is by increasing the plant's natural defenses. This induced resistance is not systemic throughout the plant but limited to the leaf it is applied to. The resistance reaction takes 1 to 2 days to develop. Light is required for best results. Regalia should therefore be used as a preventative treatment. Applications have to be repeated every 7-14 days to protect new growth. Regalia is labeled for control of in grapes. Regalia has a 0-day PHI and a 4-hour REI. In past trials in grapes with a different formulation, Regalia showed moderate to good control of powdery mildew and moderate control of downy mildew and Botrytis bunch rot. Regalia will be evaluated this year in grape trials in Michigan.

Revus (mandipropamid) is a new systemic fungicide for control of downy mildew in grapes. It has preventative and limited curative properties. A maximum of four sprays and two sequential sprays is allowed. The addition of a spreading/penetrating type adjuvant such as a non-ionic based surfactant or crop oil concentrate is recommended. The PHI is 14 days for grapes. This product has shown good efficacy against downy mildew in grape trials in Michigan. Revus is also available in a pre-mix called Revus Top with difenoconazole (a sterol inhibitor).

Revus Top (mandipropamid + difenoconazole) is labeled for control of downy mildew, powdery mildew, Phomopsis, black rot, anthracnose, and minor foliar diseases. It has preventative, systemic and curative properties. In Michigan trials, Revus Top gave excellent control of powdery mildew, downy mildew, and black rot; and moderate control of Phomopsis. For powdery mildew control, Revus Top can be applied on a 10-21 day interval. For downy mildew control, a 10-14 day interval should be used. Revus Top rapidly bonds to the wax layer on the plant and is rainfast as soon as the droplets have dried. Addition of a non-ionic surfactant, crop oil concentrate, or blend is recommended. No more than two sequential

applications should be made before alternating with a fungicide with a different mode of action. Do not apply more than 28 fl oz/acre (= four applications) of Revus Top per season. The PHI is 14 days and the REI 12 hours. Due to the risk of phytotoxicity, Revus Top is not recommended for Concord, Concord Seedless, and Thomcord grapes. Precaution is advised on other Labrusca-type grapes and Labrusca hybrids, as adjuvants or other components in the tank-mix may increase phytotoxicity potential. The risk of phytotoxicity may be enhanced during rapid growth which may result in tender tissues and a thin wax layer on leaves.

Sonata (Bacillus pumilis QST 2808) is a protectant biofungicide that is OMRI listed and therefore can be used in organic production. Sonata is labeled for use against powdery mildew in grapes. Sonata has a 0-day pre-harvest interval and a 4-hour re-entry interval. Adding a terpene-based spray adjuvant, such as Nu- Film-P can improve coverage and control. If disease pressure is high, alternate or tank mix this product with other effective fungicides. Sonata has shown moderate to good efficacy (when tank-mixed with Nu-Film-P) against powdery mildew, downy mildew, and Phomopsis in grape trials in Michigan.

Sporan (rosemary oil, clove oil, thyme oil, wintergreen oil, lecithin, butyl lactate) is a broad-spectrum protectant fungicide for use in grapes. Sporan is OMRI listed so it can be used in organic production. Sporan has no re-entry interval and a 0-day pre-harvest interval. Diseases listed on the label are: powdery mildew, downy mildew, black rot, Botrytis bunch rot, and Eutypa dieback in grapes. In trials in Michigan, Sporan gave fair control of downy mildew and black rot.

Tanos (famoxadone and cymoxanil) is a new, broad- spectrum fungicide for control of downy mildew in grapes. It has curative and locally systemic properties against downy mildews. Tanos rapidly penetrates into plant tissues and is rainfast within 1 hour of application. It must be tank-mixed with a contact fungicide labeled for that crop (e.g., mancozeb, captan or copper). A maximum of 9 applications of Tanos including other group 11 (strobilurin) fungicides is allowed per season. The PHI is 30 days for grapes. Tanos will be evaluated in Michigan this growing season.

Vivando (metrafenone) is a fungicide with a new and unique mode of action and the first in its chemical class. No cross-resistance is known with other fungicides but its specific mode of action not known. It is labeled for powdery mildew control and is a good choice in vineyards with (suspected) fungicide-resistant strains. In a Michigan trial in 2010, Vivando had excellent activity against powdery mildew and also suppressed black rot and downy mildew (these diseases are not on the label, however). This fungicide prevents infections and limits fungal growth, sporulation, and spore viability. Since Vivando does not have curative activity it should be applied preventively. It can be applied at 10-15 fl oz any time after budbreak on a 14-day or 21-day schedule. With longer spray intervals, a higher dose should be used. Vivando is rainfast within 1 hour and redistributes across the plant surface, providing improved coverage.

Use of a silicone-based surfactant is recommended. A maximum of two consecutive and a total of three sprays is allowed. The PHI is 14 days and the REI 12 hours.

GENERIC FUNGICIDE OPTIONS

In the past few years, patents have run out on a number of proprietary fungicide products and “generic” versions are now available for some common fungicides. Generic products by law have to have the same amount of active ingredient as the original fungicides. However, they may have different inert ingredients or different formulations.

Generic products may be more economical than brand name products, but most have not have been separately evaluated in Michigan and may not be specifically recommended in the E-154 Fruit Management Guide. However, they are described in the “Fungicides and Bactericides for Fruit Crops” section. For more information on individual products, you can check out their labels and material safety data sheets on the following website: www.cdms.net. Generic products are expected to be similar in disease control efficacy to their brand name counterparts. However, there may be minor variations in efficacy, behavior or even potential phytotoxicity due to different formulations.

Read the fungicide label carefully as you would for any new product. Do not assume that the labels of generic products are exactly the same as the brand name fungicides that you are used to. Sometimes there are differences in the crops that the product is labeled for or in the label instructions or restrictions. An example of this is Iprodione, which is labeled for blueberries, whereas the brand name product Rovral is not. The table below lists generic products of common fungicides.

Brand Name Product	Active Ingredient	Generic Products
Aliette	fosetyl-Al	Legion
Aliette	phosphites (same breakdown product as fosetyl-Al)	ProPhyt, Phostrol, Agri-Fos, Rampart, Fosphite, Fugi-Phite, Topaz
Elite	tebuconazole	Orius, Tebuzol, TebuStar
Rally	myclobutanil	AgriStar Sonoma
Rovral	iprodione	Iprodione, Nevado
Topsin M	thiophanate methyl	Thiophanate Methyl

(***Source**: Michigan Grapes & Wine, April 21, 2011*)

Weed Management:

Demonstrating a Postemergence Vineyard Weed Management Program (I)
T. Weigle, R. Dunst, J. Bixby, NY State IPM Program

The authors wish to thank the following growers: Ed Barger and Joel Rammelt of Westfield, NY for providing vineyards, equipment, herbicides and labor toward this project.

INTRODUCTION
Under the row weed management in Lake Erie vineyards have traditionally relied on the use of a pre-emergence herbicide application in the spring followed by an application of a postemergence herbicide in June (or around grape bloom). Concerns over the potential for ground water contamination through the use of pre-emergence herbicides applied directly to the soil, the persistence of these herbicides in the soil and the need to increase the rates of these herbicides to achieve reliable weed management caused researchers to examine other weed management options.

Research conducted by R. Dunst, et al., indicated that two properly timed applications of a broad spectrum, postemergence herbicide (early June and mid-late July) could be as effective as a conventional weed management program using persistent pre-emergence herbicides. In these experiments, the postemergence program selected for low growing winter annuals and managed annual grasses along with annual and perennial broadleaf weeds to an acceptable level.

The goal of this project was to move the results of this research into growers' fields to determine if: 1) it fit into a growers schedule of production practices, 2) was economically feasible, and 3) any persistent weed problems would result from yearly use of a postemergence weed management program.

METHODS
Four vineyard blocks were used in this experiment. Each block contained two treatments: 1) the growers conventional weed management program and 2) the postemergence weed management program. Three of the plots were in Westfield, NY in Chautauqua County, with the fourth located near Lewiston, NY in Niagara County. Each grower was asked to provide at least two rows for the postemergence program

with remaining rows in the block to be treated with their conventional weed management program of pre-emergence and postemergence herbicides. Three of the vineyards were selected due to the growers' description of persistent problem weeds. Two vineyards had a problem managing foxtail with their conventional program, one vineyard had persistent velvetleaf, and the vineyard in Niagara county had patchy problem areas of perennial weeds such as field bindweed and poison ivy. Growers were instructed to apply one of the postemergence herbicides (Roundup, Gramoxone, or Rely) when first weeds were 4-6 inches in height. Research conducted by Dunst reported that this typically occurred during the first week in June. A second application was to be made when the weed regrowth reached a height of 4-6-inches, typically in mid-July. All growers involved with this project chose Rely as the herbicide to use in the postemergence blocks.

Weed ratings were conducted in both the conventional and postemergence plots prior to the first postemergent application, three weeks after the first application, and three weeks after the second application. A final evaluation was conducted in mid-September prior to harvest. The assessment involved identification of weed species present and the percent of ground cover each species represented. A total percent ground cover was then determined.

RESULTS & DISCUSSION

The postemergence weed management strategy was successfully implemented in two of the four vineyard blocks in this project. In the remaining two blocks the second application was not applied until early September. The final preharvest evaluation, conducted the week of September 13 - 17, showed nearly 100% ground cover in both blocks. In the first block the primary weed species was foxtail, approximately 12-inches in height, which had been killed by the herbicide application. In the second block there was a wide range of weed species present which had not yet been affected by the September application. Weed height in the second block ranged from the low growing weed species to grasses which were approximately 12-inches in height.

Table 1. Comparisons of Weed Species and Percent Ground Cover in Conventional and Postemergence Vineyard Weed Management Programs.

Weed Species	**Westfield** Conventional	**Westfield** Post Emergence	**Niagara** Conventional	**Niagara** Post Emergence
Crabgrass	9.8	0.5	0.21	0.0
Groundsel	5.7	0.2	0.0	0.0
Foxtail	2.6	0.2	0.0	0.0
Dandelion	2.2	0.6	0.6	0.6
Wild Carrot	1.8	0.0	0.9	0.14
Buckhorn Plantain	1.5	0.02	0.04	0.02
Velvetleaf	0.7	0.01	0.0	0.0
Fescue	0.6	0.0	0.0	0.0
Barnyard Grass	0.5	0.2	0.0	0.0
Pigweed	0.4	0.0	0.1	0.1
Horse Nettle	0.3	0.0	0.0	0.0
Broadleaf Plantain	0.3	0.0	0.06	0.0
Smartweed	0.1	0.02	0.04	0.0
Poison Ivy	0.1	0.0	0.0	0.0
Sumac	0.1	0.0	0.0	0.0
Chickweed	0.02	1.0	0.3	0.09
Bluegrass	0.0	0.8	0.0	0.02
Burdock	0.0	0.1	0.2	0.4
Johnson Grass	0.0	0.0	0.04	0.02

Milkweed	0.0	0.0	0.02	0.0
Field Bindweed	0.0	0.0	1.85	2.11
Vetch	0.0	0.0	0.0	0.02
Virginia Creeper	0.0	0.0	0.0	0.05
Total Weed Cover	**26.72**	**3.02**	**4.37**	**3.57**

* Percent ground cover calculated over entire treatment block.

Table 1 shows the results of the preharvest weed evaluation in the two blocks in which the program was fully implemented. In these blocks the postemergence weed management program compared favorably with the traditional pre-emergence herbicide approach. Weed growth covered approximately 27% of the under row herbicide strip with the conventional program in Westfield as compared to 3% weed cover in the postemergence program. Weed management was comparable in both blocks of the Niagara county vineyard with the conventional program having approximately 4 % ground covered with weeds as compared to 3.5% in the postemergence block.

Growers involved with the program were satisfied with the results obtained by using the postemergence herbicide program. The grower in Niagara county was particularly happy with the performance of the postemergence program and the reduction in his weed management costs. Due to a dry period during mid-late summer, regrowth of weeds after the first Rely application in June was delayed. This resulted in season long weed control with just one application. As is the case with most production practices, if the economics don't support the practice, it will not be adopted. Table 2 shows the spray programs, along with costs in the two vineyards which fully implemented the postemergence program.

Table 2. Comparison of Herbicide Costs of a Preemergence and Postemergence Herbicide Program in Lake Erie Vineyards.

Treatment	Date	Herbicide	Rate/Acre	Cost of Herbicide*	Total Cost of Program
Niagara	May 22	Karmex 80DF	4 lbs	$7.92	
Conventional	May 22	Gramoxone	3 pts	$6.00	
	July 1	Gramoxone	3 pts	$6.00	$19.92
Niagara					
Niagara	June 9	Rely	3 Qt	$16.02	$16.02
Post-emergent					
Westfield	April 11	Princep	4 lbs	$6.24	
Conventional	April 11	Karmex	4 lbs	$7.92	
	June 15	Roundup	1 Qt	$5.70	$19.86
Westfield	June 9	Rely	1 Gal	$21.36	
Post-emergent	July 20	Rely	1 Gal	$21.36	$42.72

* Per acre sprayed

The Niagara costs really show the potential for savings using the postemergence herbicide program in years with summer dry spells which delay weed growth. Not only was the weed management comparable to the conventional program but the cost was almost $4 an acre less in materials alone. Figuring in labor and equipment costs for the second spray needed with the conventional program would increase per acre savings to approximately $11. The Westfield area received ample to excessive rainfall during the summer months and a second postemergence herbicide application was necessary. As shown in Table 2, this increased the cost of materials to over twice that of the conventional program. However, the postemergence program using Rely resulted in only 3% total ground cover under the row from weeds as compared to approximately 27% for the conventional as stated earlier, a reduction in ground cover of approximately 90%.

The failure to fully implement the postemergent herbicide program in two vineyards (second application of Rely was delayed until September) was due more to the small size of the treatment blocks than in the difficulty of implementing the practice. It is felt by the grower involved that an entire block treated with the postemergence program would be more of a priority and would be accomplished in a timely manner. With three- and four-row vineyard plots in the project, the herbicide application became a "when I have the time" priority.

There are several ways to evaluate the use of pesticides in vineyards. One common method is to examine the amount of active ingredient applied for the total pesticide program. The postemergence weed management program greatly reduced the amount of active ingredients applied to vineyards in the project. In the Westfield vineyard examined in Tables 1 & 2 the total amount of active ingredient applied due to herbicide use was over 400% lower with the postemergence program when compared with the growers traditional herbicide program (2.1 lb a.i./acre sprayed vs. 8.2 lbs a.i./acre sprayed). It is important to realize that that the term per acre sprayed is used due to herbicide applications being made only to the herbicide strip under the vine. The total area covered by the herbicide strip, in a particular acre, will vary due to width of the strip and the distance between rows. In general, a grower in the Lake Erie region will cover 2.5 to 3 acres of vineyard before applying herbicide to an area equal to an actual acre of land. The vineyard in Niagara county which used only one application in the postemergence program produced a decrease of approximately 670% with the postemergence weed management program (0.75 lb a.i./acre vs 5.06 lb a.i./acre). One of the newer methods of looking at pesticide is the Environmental Impact Quotient developed by Kovach, et al. (New York's Food and Life Sciences Bulletin Number 139). Unfortunately, Rely is a relatively new material and therefore its EIQ has not been developed at this time.

The first year's results of this program are very encouraging. Not only did we see exceptional weed management using the postemergence program in two of the blocks, there was an example of the cost-saving possibilities of this program in some years. The reduction in the amount of active ingredient applied directly to the soil is also very encouraging. However, with only one years results it is still too early to determine the long-term success of the postemergence program. Growers participating in this project have expressed an interest to continue this project next year. It is hoped that the size of demonstration blocks can be expanded to help reduce any variation in weed stand between treatments. (***Source**: The Lake Erie Regional Grape IPM Program, May 23, 2011*)

Weather data: (Source: UMass Landscape IPM Message #12, May 20, 2011)

Region/Location	2011 Growing Degree Days (base 50° from March 1, 2011)	
	1-week gain	total accumulation for 2011
Cape Cod	26	170
Southeast MA	23	185
East MA	20	189
Metro West MA	36	191
Central MA	28	172
Pioneer Valley MA	39	192

Berkshires MA	70	245

Additional Weather Data is available form the following sites:

- UMass Cold Spring Orchard (Belchertown MA), Tougas Family Farm (Northboro MA), and Clarkdale Fruit Farm (Deerfield MA) at http://www.umass.edu/fruitadvisor/hrcweather/index.html
- University of Vermont Weather Data from several sites around the state at http://pss.uvm.edu/grape/2010DDAccumulationGrape.html
- New Hampshire Growing Degree Days at http://extension.unh.edu/Agric/GDDays/GDDays.htm
- Connecticut Disease Risk Model Results at http://www.hort.uconn.edu/ipm/
- Network for Environment and Weather Applications program run by the Cornell IPM team at http://newa.cornell.edu/. This will include the ability to run disease and insect development models for a wider area. Stay tuned.

FYI – check out the newly formed Massachusetts Farm Winery and Growers Association and New Hampshire Winery Association and the Vermont Grape and Wine Council. These associations are of, by and for you! Join today!!

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University of Vermont's Cold Climate Grape Growers' Newsletter
UConn Grape IPM Scouting Report

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