

LAKE ERIE REGIONAL GRAPE PROGRAM- *Vineyard Notes*



July 2015

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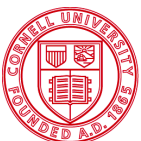
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Cornell University
Cooperative Extension





2015 Coffee Pot Meeting Schedule

May 6- 10:00am-Dan Sprague- 12435 Versailles Rd. Irving NY 14081

May 13- 10:00am- Phillip Baideme- 7935 Route 5, Westfield NY 14787

May 20- 10:00am- CLEREL, 6592 West Main Rd. Portland NY 14769

May 27- 10:00am-Nick Mobilia- Arrowhead Winery 12073 East Main Rd. North East PA

3:00pm-Evan Schiedel/Roy Orton- 10646 West Main Rd. Ripley NY 14775

June 3- 10:00am- Bob & Dawn Betts- 7365 East Route 20, Westfield NY 14787

3:00pm- North East Lab-662 N Cemetery Rd. North East PA 16428

June 10- 10:00am- Peter Loretto-10854 Versailles Plank Rd. North Collins NY 14111

3:00pm- Dave Nichols-1906 Ridge Rd. Lewiston NY 14092

June 17- 10:00am-Tom Tower 759 Lockport Rd. Youngstown NY 14174

3:00pm-Leo Hans-10929 West Perrysburg Rd. Perrysburg NY 14129

June 24- 10:00am- Kirk Hutchinson-4720 West Main Rd. Fredonia NY 14063

3:00pm- Brant Town Hall- 1294 Brant North Collins Rd. Brant NY 14027

July 1- 10:00am-Ted Byham 9207 West Lake Rd. Lake City PA 16423

3:00pm-Alicia Munch-761 Bradley Rd. Hanover NY 14136

July 8- 10:00am- Rosemary & Brenda Hayes- 6151 Route 5 Brocton NY 14716

July 15- 10:00am-Szklenski Farms- 8601 Slade Rd. Harborcreek PA 16421

July 22- 10:00am- Paul Bencal-2645 Albright Rd. Ransomville NY 14131

A Detailed Cash Flow Model

Cash Flow Issues

When surveyed, 160 of 600 Lake Erie Growers indicated that they've already had to take steps to modify their business or production practices in order to have adequate cash flow to operate through harvest. Keep in mind; this does not indicate growers that have decided to reduce production investments because of price. These growers report that the cash flow is here, now, even before low prices have really taken hold. I do take a portion of these results with a degree of skepticism; on average most growers are fairly pessimistic. However, the majority of growers are solving cash flow problems by acquiring and refinancing debt. To me this indicates a grower has an awareness of his financial situation. To me this indicates that at least 25% of our growers were unable to adequately prepare for multiple years of low prices and potential disasters.

Cash flow challenges already hitting growers may be the result of 2012 frost damage and mostly moderate grape prices throughout the high bulk price period. Whatever the cause of early cash flow challenges, if 2013 did not allow an operation to build significant equity or cash reserves that operation may not be sustainable.

Crop Insurance

I know growers are tired of hearing about crop insurance. I actually assumed growers that did not carry crop insurance owned mature businesses and decided to self-insure with equity in their farm.

To the contrary, the same survey indicates that growers without high levels of crop insurance actually have less equity in their farm. Over 50% of surveyed growers carry high levels of crop insurance. Growers that report cash flow concerns are much more likely to be carrying no crop insurance.

The silver lining on crop insurance is that more growers have obtained policies over the years. Further, growers that get crop insurance are getting fairly robust policies. These policies will prevent cash flow problems for most growers.

Unusual Challenges for Mature Businesses

Businesses can be challenged by a lack of cash flow for various reasons. New businesses, regardless of competitive advantage and profit margins can be challenged by cash flow. Historically, Lake Erie vineyard operations do not typically face issues relating to cash flow. The businesses tend to be mature, conservatively investing capital and usually not growing.

The previous period of high prices was quite long. For most growers, prices never did exceed \$300 per ton. Reaching that threshold allows most growers to quickly build equity and cash reserves. Other challenges, like the 2012 frost, provided additional setbacks. As a result, we are likely seeing something unusual, cash flow challenges for mature businesses.

It is important to look at your individual financial situation and not rely on the advice of other growers. The collective knowledge of the industry can be overwhelmingly helpful. In this situation, however, individual variables dramatically change the cash flow picture from operation to operation.

How to React

It is hard to provide general advice on the best way to react to cash flow problems. Some general guidelines follow, but ultimately this is a personal decision based on personal circumstances.

Exiting via Business Transfer

If a grower has the means to avoid bankruptcy and put food on the table but is already seeing significant cash flow challenges, an exit plan should be crafted. For Welch growers, this may be easier. There are growers that do not have cash flow problems; they also don't have a market. The sale of a contract is a critical part of an exit strategy.

Bankruptcy

Lots of famous businesses emerge from bankruptcy and realize success. With that in mind, as painful as the process is, it does work for some. The time it takes to build equity in farming is extremely long. This avenue would be more appropriate for growers that simply do not have a sustainable exit strategy other than bankruptcy. With some hard work, you might emerge with a higher standard of living. However, it is fairly likely you will no longer be growing grapes.

Low Cost Production

Growers do have flexibility in reducing business costs. Operating costs, excluding debt service, represent between 20% and 50% of total cost. Growers that operate between 30% and 40% are the most sustainable. It does take planning and innovative production practices to obtain those benchmarks. If you've put yourself in a position to maximize flexibility, you may be in a position to survive. A low cost producer needs to have the reliable equipment necessary to operate efficiently with low labor and debt service costs.

Over-Estimating Costs

Before you go sell the farm and move your family to New York City, I would really make sure the vineyard operations were not sustainable. In particular, if I didn't have a highly motivated buyer, I would make sure I actually had a cash flow problem.

Revenue

Between 15% and 20% of all acreage will receive no revenue payments between now and their scheduled 2015 harvest advance. Most growers will have at least some revenue between now and harvest advance. As current payments by most cooperatives indicate, these payments will not be in line with long-term historical performance. As a general rule, monthly and quarterly payments are about 50% of recent years. These growers market grapes to the cash market and Westfield Maid Cooperative. Other Cooperative members will continue to receive payments quarterly or monthly. Some growers may have meaningful custom service fees for taking care of neighboring farms. If these fees happen to be significant, most are not until harvest, make sure billing is timely.

Expense

If you have made it this far with your checking account, you do not have far to go. Most growers have already applied the immediate post-bloom spray. For a nimble and conservative operation this leaves berry moth as the primary remaining expense. High-risk sites may need to budget \$60 per acre. Moderate risk sites should budget at least \$20 per acre. If you've already done an excellent job, another \$20 - \$40 should be adequate to cover all other insect and diseases.

Post emergent weed spray programs should be used when cash flow is a concern. However, part of the challenge this year is renewing with suckers. If a pre-emergent program was used, hopefully most of the costs have already been realized. Growers should target less than \$15 per acre when applying post-emergent programs. Overuse of more expensive post-emergent materials undermines the economic advantage of roundup and gramoxone.

The cost of renewal work for the grower with cash flow problems presents an issue. Growers should expect to spend between \$1.50 and \$2.00 per vine. TAP is a wildcard that will take a couple of years before a payment is made, if a payment is ever made. Growers with more than 35% trunk death should consider vineyard removal to minimize the impact renewals have on cash flow. When considering which strategy to take, budget at least \$100 per acre for renewals this year when trunks are dead.

Leveraged and Salary Expenditures

Debt and salary draw really limit the financial flexibility of an operation. Many growers that do not have a need for debt service payments or a salary draw really should be able to avoid cash flow issues as long as they concentrate on investments that sustain long-term average yields.

As mentioned in an article in 2012 a salary draw may not be avoidable for some farm businesses. We see a decreasing number of growers relying on salary draw to maintain their lifestyle. Unfortunately, the business typically needs more flexibility than a rigid monthly draw allows. It can be possible for larger growers, when debt service is minimal.

Even a highly leveraged grower of one hundred acres probably does not have more than five hundred thousand in debt. Interest payments for the year should total between twenty and thirty thousand. Principle payments may be adjusted, depending on the lender. Total loan expenses should not exceed 35,000 on this type of farm. This kind of leveraging allows a younger grower to enter the business. The cash flow budget reveals the additional risk realized with higher debt levels. Again, this is a reason to consider high levels of crop insurance. Without it, the typical grower would have to increase debt (if possible) to make it through the year.

Other cash flow variations

While a great number of variables can slightly change cash flow, the previously considered capture most variation. Of an important note, of course is the baseline. The purpose of a cash flow budget is not to determine profitability. It does not determine the long-term sustainability of your operation.

The largest variability that cannot be assessed across the industry, only on individual farms, is the amount of cash on hand prior to the beginning of 2015 crop payments and 2015 crop expenses. If one had a crop loan larger than the value of the crop, it is entirely possible a farm entered the 2015 crop year with negative cash.

Outlook

The last cash flow oriented newsletter was written in 2012. At the time, the industry had a lot to be optimistic about. 2012 actually turned out better than forecast. 2013 was an excellent year. For growers that had a market, 2014 was still an above average year. For this reason, the self-reported cash flow problem has me concerned. There are fewer reasons to have short-term optimism going into 2015 and 2016 harvest. It is particularly challenging to be optimistic if cash reserves on your operation were not built up in 2013 and even 2014.

In 2012 I thought, optimistically, that most growers would be able to easily withstand the frost. With so many growers diversifying household income across multiple income streams, the necessity of grapes to hit every year has passed. For growers that struggled through 2013 and 2014, it may make more sense to keep those other sources of income for yourself, rather than funding a grape operation. If low prices continue into 2017, cash flow challenges may justify increasing debt load. If declining equity and increasing debt load is already a significant challenge in 2015, an exit strategy should be part of your plan. It may just not be sustainable to continue until a time prices recover.

High and Low Crop Levels Make Concord Crop Estimations Important in 2015

Luke Haggerty and Dr. Terry Bates

Extreme cold weather in February and attempts to compensate for damage have left a large variation of cropping level across the Lake Erie grape belt. Hardest hit ‘Concords’ were either in low line areas that have a tendency to hold excess water or vineyards with health issues. Other vineyards had little to no damage to buds or trunks. The damage found was mainly to the primary buds leaving the less fruitful secondary buds. To compensate for this type of damage, many growers left more buds than they typically do. Growers who were able to estimate the anticipated damage by conducting dormant bud assessments and adjusted pruning levels accordingly. However, a representative bud assessment for every ‘Concord’ block within the area is not feasible. A common approach to pruning after the Feb. 16th deep freeze was to leave up more buds and adjust cropping level later if needed. After bud break it was apparent that some blocks are at risk of over-cropping and others are under-cropped, making crop estimation extremely important this year.

Crop estimation is a vital tool for all grape growers to assist in making predictions of potential yields before harvest. Estimating potential crop allows growers to let their buyers know how much fruit to expect, provides time to adjust crop load to meet quality targets, and will dictate how the vineyard is managed the remainder of the growing season. For many Concord growers crop estimation has become a common practice to help make these decisions. This article will summarize Concord phenology data and address how to use the crop estimation chart based on Concord berry weight.

Floret and berry counts completed by Kelly Link on our standard phenology vines at CLEREL and the Fredonia Lab indicate slightly above average floret counts, but below average for berries per cluster and percent berry set (Table 1). It is difficult to determine if these results reflect the rest of the region. However, with adequate water during cell division the area may have larger than average berry size/weight.

Location Pruning	Historical Berries/Cluster	2015 Berries/Cluster	Historical % Set	2015 % Set
Fredonia Balanced 30+10	40	35	36%	24%
Protalnd Balanced 20+20	30	37	33%	35%
Protalnd 90 Nodes		31		29%
Protalnd 120 Nodes	34	26	34%	27%
Protalnd Minimal		27		25%
Portland over all average	31	30	32%	29%

Table 1. Concord Berries/ Cluster and % Set at CLEREL and Fredonia Lab.

Steps for using the Concord Crop Estimation Chart

The “Crop Estimation Chart” referred to in these steps can be found on the last page of the article.

Bloom date and days after bloom:

The “Crop Estimation Chart” system is based on bloom date, and in order to increase accuracy you need to know when your grapes were at 50% bloom. In Portland and Fredonia, 50% bloom occurred on June 10th; four days before the 50 year average of June 14th. Count off starting at your bloom date and accrue the respectable days-after-bloom (DAB). On the chart the DAB is found in the shaded “Time of Season” and not to be confused with “% of Final Berry Weight” directly below.

Row Spacing:

Like bloom date, you need to know your vine spacing. Row spacing determines the length of a row that will equal 1/100th of an acre and the length needed to be cleaned picked and weighed. The wider the row is, the shorter the sampling length will be. For example, sampling a block with a 10’ row you will need to clean pick 45.9 feet. Narrow rows that are at 7.5’ spacing, need 85.1 feet clean picked. With a 9-foot row spacing and panels at 24 feet, the math is easy. Clean pick two panels (48.4 feet). It is best to determine your row spacing and cut a length of rope to guide your sampling lengths rather than rely on post lengths that have been changed out over the years.



Sampling:

Once the row spacing and sample distance are calculated, clean pick and weigh the samples. Accuracy will increase with the number of samples taken. It also helps to take samples from areas of known variation across the vineyard. For example, take 2-3 samples from high vigor, medium vigor, and low vigor sections across the vineyard and apply your predictions

appropriately to those sections. If you are using a harvester to clean pick panels walk behind afterwards to assess how many grapes are still on the vine/or that are on the ground.

Using the Chart:

Once you have the sample, the chart does the rest of the work for you. Follow the corresponding DAB down and the respective weight over and you have the estimated tons/acre at harvest. For example, let's say it is July 9th or 30 DAB (bloom on June 10th) or 50% of the final berry weight and the sample weighed 60 pounds. I would have an estimated 6.0 tons/acre potential crop.

Things to keep in mind:

- If you have an accurate bloom date for your vineyard, follow the crop estimation chart to predict final harvest weight. If you don't and you are using the actual berry weight samples to come up with your multiplication factor, be reasonable in what you think your final berry weight will be. A final berry weight of 3.2 -3.6g for 2015 is a reasonable start for this wet season. Some vineyards tend to have smaller average weights and others tend to be larger – and you should have an idea where your vineyard fits.
- Getting it right is important. Underestimating crop potential can lead to delayed harvest waiting for the grape to ripen and the BRIX to rise. Overestimating a crop load may result in unwanted thinning or unnecessary expensive chemicals being used to care for a crop that is not there. Accuracy will increase with the number of samples. With practice and experience comes efficacy.



Weighing green Concord clean picked from 1/100th of an acre

Dr. Terry Bates: Crop Estimation and Thinning Table: 7/16/2003

Pounds of Fruit Removed in 1/100th of an Acre		Time of Season																Harvest	
		20DAB		25DAB		30DAB		40DAB		50DAB		Veraison		Harvest					
		% of Final Berry Weight																	
		20	25	30	35	40	45	50	55	60	65	70	75	80	90	100			
10		2.5	2.0	1.7	1.4	1.3	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5			
20		5.0	4.0	3.3	2.9	2.5	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.3	1.1	1.0			
30		7.5	6.0	5.0	4.3	3.8	3.3	3.0	2.7	2.5	2.3	2.1	2.0	1.9	1.7	1.5			
40		10.0	8.0	6.7	5.7	5.0	4.4	4.0	3.6	3.3	3.1	2.9	2.7	2.5	2.2	2.0			
50		12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2	3.8	3.6	3.3	3.1	2.8	2.5			
60		15.0	12.0	10.0	8.6	7.5	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.3	3.0			
70		17.5	14.0	11.7	10.0	8.8	7.8	7.0	6.4	5.8	5.4	5.0	4.7	4.4	3.9	3.5			
80	→	20.0	16.0	13.3	11.4	10.0	8.9	8.0	7.3	6.7	6.2	5.7	5.3	5.0	4.4	4.0			
90		22.5	18.0	15.0	12.9	11.3	10.0	9.0	8.2	7.5	6.9	6.4	6.0	5.6	5.0	4.5			
100		25.0	20.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.7	6.3	5.6	5.0			
110		27.5	22.0	18.3	15.7	13.8	12.2	11.0	10.0	9.2	8.5	7.9	7.3	6.9	6.1	5.5			
120		30.0	24.0	20.0	17.1	15.0	13.3	12.0	10.9	10.0	9.2	8.6	8.0	7.5	6.7	6.0			
130		32.5	26.0	21.7	18.6	16.3	14.4	13.0	11.8	10.8	10.0	9.3	8.7	8.1	7.2	6.5			
140		35.0	28.0	23.3	20.0	17.5	15.6	14.0	12.7	11.7	10.8	10.0	9.3	8.8	7.8	7.0			
150		37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5	11.5	10.7	10.0	9.4	8.3	7.5			
160		40.0	32.0	26.7	22.9	20.0	17.8	16.0	14.5	13.3	12.3	11.4	10.7	10.0	8.9	8.0			
170		42.5	34.0	28.3	24.3	21.3	18.9	17.0	15.5	14.2	13.1	12.1	11.3	10.6	9.4	8.5			
180		45.0	36.0	30.0	25.7	22.5	20.0	18.0	16.4	15.0	13.8	12.9	12.0	11.3	10.0	9.0			
190		47.5	38.0	31.7	27.1	23.8	21.1	19.0	17.3	15.8	14.6	13.6	12.7	11.9	10.6	9.5			
200		50.0	40.0	33.3	28.6	25.0	22.2	20.0	18.2	16.7	15.4	14.3	13.3	12.5	11.1	10.0			

Row Spacing determines length of 1/100th of an acre
 10.0 feet row spacing = 43.5 feet = 1/100th of an acre
 9.5 feet = 45.9 feet = 1/100th of an acre
 9.0 feet = 48.4 feet = 1/100th of an acre
 8.5 feet = 51.2 feet = 1/100th of an acre
 8.0 feet = 54.45 feet = 1/100th of an acre
 7.5 feet = 58.1 feet = 1/100th of an acre

Calculation
 43, 560 square feet per acre
 Divide by row spacing and then
 divide by 100 to get 1/100th of an acre

Example:
 A grower has 9 foot row spacing and clean picks 48.4 feet at 25 days after bloom.
 The fruit weighs 80 pounds and the grower estimates that the berries are between 35% and 40% of final berry weight. According to the table, the crop estimate is between 10.0 and 11.4 tons per acre.

Disclaimer:
 This table gives the relationship between time of season and % final berry weight on an average year. Year to year variability in weather related berry growth adds error to this table. Information on current year berry growth can be obtained from the Fredonia Vineyard Lab (or) it is strongly suggested that individual growers start collecting berry weight information from their own individual vineyard blocks.

Weather

Lake Erie Grape Region NEWA Weather Data

Location	Date	Avg. temp F (June 1-30)	Precip.Past 7 days (in)	Precip. June total
North East Lab, PA	7/1/15	65	1.42	6.08
Harborcreek, PA	7/1/15	66	1.94	5.63
North East Escarpment	7/1/15	65	1.55	5.52
Ripley	7/1/15	66	1.58	5.37
Portland Route 5	7/1/15	66	2.03	6.01
Portland CLEREL	7/1/15	65	NA	NA
Portland Escarpment	7/1/15	65	1.98	4.75
Dunkirk	7/1/15	65	1.2	3.61
Silver Creek	7/1/15	65	1.36	3.94
Sheridan	7/1/15	66	NA	NA
Versailles	7/1/15	65	NA	NA
Appleton	7/1/15	62	2.47	5.49
Somerset	7/1/15	64	2.67	5.90
Lockport	7/1/15	65	NA	NA

Note: All Weather data reported as of 7/1/2015. NA=Sensor Malfunction

DATE/YEAR	HIGH	LOW	DAILY PRECIP	GDDs	TOTAL APRIL GDDs	TOTAL JAN GDDs
Week of 6/11/2015	78.3	57.00	0.11	123.5	640.5	640.5
Week of 6/18/2015	79.9	60.90	0.30	142.5	783	783
Week of 6/25/2015	76.1	61.00	0.24	130	913	913
Week of 7/2/2015	71.4	56.90	0.25	99	1012	1012
Average(from 1964)	78.9	60.70	0.12	138.7	885.1	910
July Precip- Wk 1=.55						
Total Precip: June = 7.07"						

Grape Rootworm - Exploring New Strategies for Managing an Old Foe

Grape rootworm, *Fidia viticida* (Walsh), was once considered to be the primary insect pest of grapes in the eastern United States. Traditionally, growers were told to scout on the 4th of July weekend to see if grape rootworm adult feeding was present on the foliage in their vineyards. The distinctive chain-like feeding pattern of grape rootworm typically starts on the sucker leaves and then into the canopy as the season progresses. If grape rootworm foliar feeding was detected, then an application of Sevin (the only insecticide that was labeled in New York for grape rootworm) was applied.

Since the repeated application of any single pesticide is not a good idea, this program, in conjunction with Greg Loeb, Professor, Department of Entomology, NYSAES, conducted two replicated spray trials using 4 insecticides currently registered for use on grapes in New York State (Admire Pro, Danitol 2.4 EC, Leverage 360 and Sniper) These trials were conducted in grower vineyards in the Lake Erie region. The materials in these trials were chosen in part due to their mode of action being different from the material currently labeled for grape rootworm. This helps to ensure that materials will be available for use in a resistance management program, with the result being all the materials being effective against the pest for a much longer time.

All four materials used in the spray trials were found to be effective against grape rootworm. Armed with this information, Dr. Loeb applied for, and was granted, a FIFRA2 (ee) for each of the 4 insecticides tested. The FIFRA 2(ee) recommendation allows grape growers to use a material against an unlabeled pest (in this case, grape rootworm) in NY vineyards. The FIFRA 2 (ee) recommendations will provide access to materials needed to effectively manage this pest for years to come, by implementing a resistance management strategy of rotating effective materials with different modes of action.

The FIFRA 2(ee) recommendation must be in the possession of the user at the time of application. A copy of the FIFRA 2(ee) recommendation for Admire Pro Systemic Protectant, Danitol 2.4 EC Spray, Leverage 360 Insecticide and Sniper can be obtained from the LERGP offices at CLEREL or on the LERGP website.

It is interesting to note that the foliar feeding by the adult stage of the grape rootworm rarely reaches a level where it causes economic damage. However, this pest spends most of its life as larvae, living life underground and feeding on the roots of the grapevine. This feeding, if left unchecked, can cause a rapid decline in vine vigor. Managing this pest is confounded by the fact that the only materials labeled for use against grape rootworm are for the adult stage.

It is interesting that whenever we talk about grape rootworm it seems that the question about the use of Montana insecticide for grape rootworm (both the 2F and 4F formulations are registered for use in grapes in NYS and PA) as a tank-mix during herbicide applications comes up. And since Montana insecticide is an imidacloprid, just like the Admire Pro used in our 2014 study, it seems like it should work, right?

This is where reading the label comes in. First, grape rootworm is not on the label, so using it for this purpose is an illegal application. Second, tank mixing with an herbicide is not on the label, again making this method of application illegal. And while illegal is bad, the most important problem for a grower is, you are more than likely wasting your money by applying it in this manner. Evidenced by reading the

label, and confirmed in conversations with Greg Loeb, the need for copious amounts of water to move the material into the soil is needed for the material to be effective. Below is the portion of the Montana 4F label speaking to soil application of the material. Under the Applications section you can see that it can be applied through chemigation (through irrigation), being side-dress shanked into the root-zone (followed by irrigation) or applied in a hill drench (followed by irrigation). While we have had numerous rain events this June, none of them could be considered irrigation

Over the years, it appears that the traditional timing for scouting of vineyards was no longer as accurate as it could be. Grape rootworm has been shown in the laboratory to have either a very short (a few weeks) or a very long (up to 14 weeks) time of emergence. In an attempt to develop a better scouting protocol, we are again working with Greg Loeb and area growers to do large scale scouting and spray trials to manage this pest. We have been scouting 10 vineyard blocks with a history of grape rootworm weekly starting on June 9. The earliest emergence was found on June 17 with a significant population found in 3 of the 10 blocks. In the weeks following we have found grape rootworm feeding in all but one block.

If you have areas where you feel the vine size is declining for no reason, take the time to scout for feeding by the grape rootworm. If you do not see damage, or populations appear too low to spray for, continue to scout as grape rootworm emergence can occur over a number of weeks. Grape rootworm adults are very sensitive to vibration and will often fall onto the ground as you approach. One method we use to determine if adults are still present in a vineyard is to make a 2-foot square catching frame covered in white fabric. We throw the frame under a vine and shake the top wire and then examine the catching frame to see if any grape rootworm adults have fallen.

For more information on grape rootworm, as well as photos of both the adult and the feeding damage, please use this link to access the NYS IPM Program factsheet. <http://www.nysipm.cornell.edu/factsheets/grapes/pests/grw/grw.pdf>

Growth Regulator Herbicides and Grapes Don't Mix

Andy Muza, LERGP Extension Team, Penn State – Erie County

All herbicides registered for grapes have the potential to cause herbicide injury in vineyards if not applied according to the pesticide label. Over the years, I have observed phytotoxicity in vineyards due to improper applications of simazine (Princep), diuron (Karmex), paraquat (Gramoxone) and most notably, glyphosate products (Roundup, Touchdown, etc.). However, of much greater concern for growers are certain herbicides not registered for grapes which are applied to unwanted vegetation in other crops/non crop areas in proximity to vineyards.

Herbicide Classification

Herbicides are grouped, by the Herbicide Resistance Action Committee and the Weed Science Society of America, according to their Mode of Action. Within these groups, herbicides are further classified according to their Chemical Family.

Grapes are extremely sensitive to very low concentrations of herbicides containing 2,4-D. 2,4-D is classified in the Family of phenoxy-carboxylic-acids which are within the Growth Regulator mode of action group. In addition to 2,4-D other Growth Regulator (GR) herbicides which have been documented as causing injury to grapes include dicamba (Banvel, Clarity, etc.), picloram (Tordon) and triclopyr (Garlon). However, all of the GR herbicides should be considered to have the potential to cause injury to grapes. Therefore, their use around vineyards should be discouraged.

GR herbicides are commonly applied to lawns, turf, pasture, agronomic crops (e.g., corn, cereals, sorghum) and noncropland (e.g., roadsides, right of ways). There is a wide variety of GR herbicides and for a partial listing of product trade names refer to **References** 1 and 2 below. Also, be aware that many prepackaged mixes may contain a GR herbicide.

How Growth Regulator Herbicides Work

Auxins are plant hormones which regulate growth and development in the plant and are in the highest concentrations in the growing tips. Growth regulator (GR) herbicides mimic these plant hormones. These herbicides are systemic and translocate from absorption sites (leaves or roots) to areas of rapid growth. Abnormal growth results due to disruption in the hormonal balance of the plant. The youngest terminal growth is most severely affected.

2,4-D

The most severe cases of injury to grapevines, that I have seen, have been caused by herbicides which contain 2,4-D. There are numerous products on the market with various trade names and these are available for both homeowner and commercial use.

Grape is considered one of the crops most susceptible to injury. Although all grape varieties are susceptible to 2,4-D injury there are differences among cultivars (refer to **Reference 3** below).

Drift – is defined as the movement of a pesticide from the intended application site to an unintended site (i.e., off target movement). **Spray drift** results when fine spray droplets move in wind currents to non-target areas. **Vapor drift** occurs when spray material evaporates from the application site and vapors are moved to off target areas. Vapor may be generated under high temperatures during and after application.

2,4-D Formulations - products are formulated as both esters and amines. Most ester formulations available today are much less volatile than previous products. However, there is still a greater risk of vapor drift with ester formulations than with amine formulations. Amine salt formulations are safer to use, especially at temperatures greater than 80 degrees Fahrenheit.

2,4-D Injury - has been reported to occur 5 miles or more downwind of where herbicide applications were applied. However, the most extensively injured vineyards are usually within closer proximity of the herbicide application. The severity of injury depends on: the amount of herbicide absorbed by the vines; growth stage of the vines at time of exposure; age of vines; and variety. Vines exhibit the most extensive injury if exposed to 2,4-D earlier in the season, during the period of rapid shoot growth (bud break through bloom). Young vines are more likely to be killed than older vines. Depending on the severity of the injury vines may not recover for 2 years or more.

Shoots - shoot tips may stop growing or exhibit twisted growth with deformed leaves. (**Figures 1 - 2:** 2,4-D injury on Concord shoots).



Leaves - a variety of leaf distortions may occur such as: small, narrow leaves with numerous, thick white veins and pointy leaf margins; fan shaped, puckered leaves with pointed leaf margins. (Figures 3 - 6: 2,4-D injury on Concord leaves).



Clusters – injury to clusters can include: flower abortion; fruit set reduction; reduction of fruit size (shot berries intermingled with normal size berries); delayed ripening; and reduction in fruit quality. (Figures 7 - 8: 2,4-D injury on Concord clusters).



Proactive Approach to Minimize Problems

It is always easier (and less costly) to take steps to prevent injury than to deal with the problem after the fact. Homeowners, other farmers and commercial applicators (e.g., lawn care companies and county/state highway departments) are often not aware that commonly used GR herbicides can cause serious injury to grapevines. Therefore, grape growers should inform them about their vineyard locations. The **Applicator Practices** and **References** listed below can be used to educate neighbors and commercial applicators about the hazards of using Growth Regulator herbicides near vineyards.

Applicator Practices to Reduce Risk of Growth Regulator Herbicide Injury

Be aware of vineyards in close proximity of herbicide applications.

- Read the herbicide label and follow precautions concerning spray drift.
- Avoid application of growth regulator herbicides near vineyards from bud break through fruit set.
- Use less volatile Amine formulations of GR herbicides.
- Monitor weather conditions (wind speed and direction, temperature). Avoid spraying when wind speed is likely to cause spray droplets to drift. Spray when wind direction is moving away from vineyard. Avoid applications if a temperature inversion exists.

Remember, high temperatures during and a few days after application increase the risk of vapor drift.

- Use nozzles (e.g., air induction nozzles) that reduce drift by increasing droplet size.
- Keep spray pressure at lower end of pressure range and boom height as close as possible to target.
- Consider using a drift reducing additive.

References

1. Preventing Herbicide Drift and Injury to Grapes

<https://catalog.extension.oregonstate.edu/files/project/pdf/em8860.pdf>

2. Preventing Hormonal -Type Herbicide Damage to Kansas Grapes

http://www.agmrc.org/media/cms/s142_a7a8702475b22.pdf

3. Questions and Answers about Vineyard Injury from Herbicide Drift

<http://www.bookstore.ksre.ksu.edu/Item.aspx?catId=237&pubId=1105>

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From the North East Lab

Bryan Hed-Research Assistant
Lake Erie Regional Grape Research and Extension Center

Weather: We had measurable rainfall on 16 of the 30 days of June and recorded 6.08 inches of rainfall during that month, almost twice our average. We gained 456 growing degree days during June, below our average of 513 at our site. However, our gdd accumulation since April 1 is still a bit ahead of average (by about 22 gdds).

Vine development and disease: Here at our location by the lake, we are about 2-3 weeks after bloom and Concord berries are about pea-sized. This is about when we can assume that Concord fruit are no longer susceptible to new infections of powdery mildew. At this point, powdery mildew sprays for leaves are going to depend on crop load and weather. Work by Wayne Wilcox has shown that Concord vineyards with an average to below average size crop will generally not require additional sprays for mildew beyond that needed to keep fruit clean (unless ripening conditions are poor), whereas more heavily cropped vines will benefit from continued management of powdery mildew on leaves to ensure proper ripening.

The frequent rainfall continues to make downy mildew and black rot serious threats for susceptible varieties. Downy mildew and black rot are now showing up on unprotected Concord clusters here at the lab, and are not difficult to find. Concord fruit remain susceptible to black rot for 2-3 more weeks. Therefore, vineyards where black rot has begun showing up on leaves and clusters should receive another spray for black rot. You can choose to take your chances over the next spray as the weather appears to be clearing up over the next week, but we all know how a forecast can change. For example, looking at Accuweather yesterday showed clear and sunny through next Wednesday. Today that forecast is clear only through next Monday. Before you know it, it'll be raining again! More intense management of diseases may be warranted this year, especially where relatively large crops can be found and disease is already present. You can easily lose more crop to disease than what it would cost to control it.

Failures in that critical interval between the pre and post bloom spray should be evident on fruit and leaves now. We have had at least 5-6 infection periods for downy mildew and black rot since the beginning of bloom, when fruit of all varieties are most susceptible. Continue to scout your vineyards to know what's out there.

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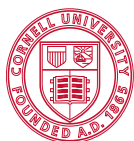
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