



FINGER LAKES VINEYARD NOTES

Newsletter #7
June 25, 1998

Written by Tim Martinson, Area Grape Extension Educator, Finger Lakes Grape Program (315) 536-5134 and Tim Weigle, Area Extension Grape Pest Management Specialist for the Finger Lakes and Lake Erie Grape Programs (716) 672-6830. Edited by Tim Martinson.

IN THIS ISSUE

Current Situation

How Eastern Grape Leafhopper Affects Yield of Concord Grapes

Roundup® for Row Middle Management

Upcoming Events

- Canopy Management for Vinifera Grapes Field Meeting
- Eastern section American Society of Enology and Viticulture (ASEV) Meeting
- Grape Production Research Fund Summer Tour

CURRENT SITUATION

Timothy E. Martinson

I want to start off this newsletter with just a few brief comments about the extended bloom, and probable effect on berry set and return bloom for next year. First I would like to remind you that bloom time is important not only to this year's crop, but also to next year's crop. This is because buds for next year are initiated around bloom time. The folklore is that cool, cloudy and rainy bloom periods reduce the number of buds that produce flowers the next year, because this is the time of the year when next year's buds begin formation. The second piece of folklore is that extended bloom reduces fruit set. It's no secret that this year's bloom has been one of the most extended - having started (for natives) around June 2, and extending for almost 2 weeks thereafter. As a result, I am seeing whole ranges of berry development - from pea-size to stragglers just coming out of bloom. The less developed clusters tend to be farther out on the shoot tips, but there is considerable variation

from shoot to shoot within individual vines. I talked to our resident grape anatomy researcher, Martin Goffinet about some of these issues. He suggested that with the moderate to low number of clusters (this is not a high cluster number year) present, there should be minimal effect on fruitfulness of next year's buds. This is because less crop this year means less competition of 1999 buds with this year's developing clusters. On the question of what will happen to the straggling clusters just coming out of bloom: The answer is that they probably won't set much fruit - particularly compared to those clusters that already have pea-sized berries.

HOW EASTERN GRAPE LEAFHOPPER AFFECTS YIELD OF CONCORD GRAPES

Timothy E. Martinson

One of the goals of integrated pest management (IPM) is to better match the frequency of pesticide applications with the actual injury (yield or quality effects) caused by pests. The

basic idea is that the cost of eliminating the pest (e.g. through an insecticide application) should be more than 'paid off' by the increase in yield (or loss of yield prevented) that results. This is where the idea of 'Economic Injury Level' comes in. Like medicine, food, or poisons - the size of the effect depends on the dose taken - or in the case of insects, the number of insects that are feeding on your vines. The pest numbers at which minor injury turns into economic loss for growers are of great interest to entomologists - and of practical interest to growers.

Finding out what those numbers really are, however, is not a trivial matter. For pests like Grape Berry Moth and banded grape bug that feed directly on grape clusters, the answer is pretty straightforward: 2% berry injury for Concord grapes at harvest is an industry standard for processing grapes. For banded grape bug (which also feeds directly on grape clusters), we (Greg English-Loeb, Rick Dunst, Ted Taft, Danielle Bernard and I) were able to run a spray trial, harvest grapes from treated and untreated areas, and count bugs on the affected vines. This allowed us to calculate that each individual bug destroyed 1/4 lb of grapes, that multiplied over an acre of vines the yield loss would amount to about 1/10 Ton per acre. At \$250 per ton there would be a loss of \$25 per acre for each bug / vine present in the vineyard.

For pests that feed on leaves (like leafhoppers), however, a similar answer is harder to come by. For one thing, leaf injury during a growing season does not directly affect how many clusters or berries you have at harvest that same year. The effects may show up in the following year, or in the sugar levels at harvest, or in the winter hardiness of your vines. For another, does having a low number of leafhoppers feeding all year have the same effect as having a lot of leafhoppers feeding for just a few weeks? These are just a few of the reasons why it is difficult to make a statement like: "Five leafhoppers per leaf on Concord grapes will reduce yield by 2%" -or 1/2 T/acre, or whatever.

In spite of these difficulties, we (the grape entomology program at Geneva and the staff at the Vineyard Laboratory in Fredonia) set out to do just that - to conduct a study that would allow us to put numbers on the effect of leafhopper injury on yield and quality of Concord grapes. By the time we were finished, we had collected yield (and quality) data for 6 growing seasons (1990-1995) on 3 separate experiments on vines with 3 different pruning levels - 22 separate sets of harvest data comparing vines with leafhopper injury and vines without leafhopper injury. Here are the main points that came out of these studies:

- Early +Moderate leafhopper injury +water stress = trouble. The clearest indication of significant, lasting effects on yield came from the experiment conducted at a commercial vineyard outside of Fredonia, from 1991-1995. This vineyard was machine-pruned to about 120-150 buds, and was located on deep, gravelly, coarse soil. In 1991 (exceptionally warm, dry year), leafhopper populations peaked in late June - damage occurred early, and population levels reached about 6 per leaf (in June). Leaf area injured by the end of the season was estimated at about 20%. In subsequent years (1992-1994), low leafhopper populations were present, and leaf area injured was 3-6%. In 1991, vines with and without leafhopper injury suffered severe water stress - but those with leafhopper injury yielded 2 T/acre less - all due to lower berry size. However, effects carried over into the next two years. In 1992, yield was 2 T lower on the 'unsprayed' vines - which had fewer clusters and smaller clusters than the vines without leafhopper injury in 1991. In 1993, yield differences narrowed to 0.5 T between sprayed and unsprayed blocks. Significantly - the crop weight per bud retained was lower in 1992 and 1993. By 1994 there was no difference between the two blocks.

- Moderate leafhopper injury without water stress = no problem. In a minimal-pruned vineyard block at the Vineyard laboratory, we ran a similar experiment from 1990-1994. As with the commercial block (described above), we had significant amounts of leafhopper injury in 1991 (28% leaf injury; peak populations of 5-6 nymphs (August) per leaf, and little injury in 1992-1994. However, we found no yield differences between sprayed vines without leafhoppers and unsprayed vines with leafhoppers in any year of the experiment. The difference between the vineyard laboratory and the commercial vineyard was that the vineyard laboratory block had more water available in 1991 - the vines weren't wilting in the middle of the day during July as in the other block.
- Results from other blocks and years are variable. Results from other blocks, with peak populations of 6-15 leafhoppers per leaf and more consistent leafhopper injury from 1991-1995, varied. Yield was sometimes reduced by roughly 0.5 - 1 T/acre, but the difference resulted from fewer shoots and clusters per vine. Crop weight per bud was not reduced as in the other experiment.
- Leafhopper injury did not affect soluble solids (Brix). Over all blocks, sugar level at harvest was not affected, when adjusted for yield. Interestingly, a similar experiment (same years) in which powdery mildew was either controlled or allowed to develop (conducted by Roger Pearson, David Gadoury, and Wayne Wilcox) showed the opposite effect - powdery mildew infections decreased soluble solids, but had no effect on yield.
- Overall results: Over the 22 cropping cycles in these experiments, the average difference in yield was 1.2 T/acre. The range was -0.7 (higher in leafhopper-injured vines) to 3.5 T/acre difference in yield.

What does this mean for your operation? I think there are three main points: 1) Be cautious in dry years. Water stress plus leafhopper injury can depress yields. It can have carryover effects in subsequent years. 2) With adequate soil moisture and healthy vines, vines can tolerate more leafhopper injury. In cooler, wet years, leafhopper injury often has little effect on yield. 3) Early-season damage is probably worse than late season damage. In warm seasons, leafhoppers develop faster, and the leaf injury starts earlier and lasts longer. Hot years tend to be dry years, as well.

Keep in mind that most injury occurs in the latter half of the growing season, that the damage tends to occur on shaded leaves (leafhoppers like the shade), and that leafhopper populations often don't reach levels of more than 1-2 per leaf, even in unsprayed vineyards. Leafhopper populations generally increase slowly, are easy to see (unlike spider mites), and give you plenty of time to react - if you monitor your vineyards regularly. There are a couple of different ways to monitor your vineyard and to decide whether you need to control leafhoppers:

- Early season: Until about 2 weeks after bloom, only adults are present in the vineyard. They are hard to count. The best method for assessing the need for an insecticide at this time is: 1) look for stippling on the basal leaves of the shoot. If you see moderate amounts of stippling (by this I mean more than just a few spots but less than 10% of the leaf area) on basal leaves, you probably should spray. 2) Shake a few vines vigorously and see what flies out. If you see more than 2 or 3 leafhoppers, you should spray. If you see no adults and no stippling, you probably will not have any leafhopper for the rest of the year.
- Mid-season: Look for moderate injury on leaves 3-7 (around the cluster area) - this injury should appear as white lines adjacent to the main leaf veins - ignore leaves with a

few isolated white spots. Apply an insecticide if you see moderate injury on more than 10% of the basal leaves AND nymphs (immature leafhopper) on the underside of the leaves. [A sampling procedure for evaluating leafhopper injury is described in Grape IPM in the Northeast, available through our office.]

Treatment timing. Timing of treatment is not critical for leafhopper. This is particularly true for insecticides with longer residual action, such as Sevin*, PennCap-M* and Provado*. However, if you make an early application with a short-residual insecticide (such as Lannate*), wait until you see a mixture of medium-sized and small nymphs (immature leafhoppers) on the underside of leaves. Leafhoppers are protected from spray residues in the egg stage for about 10 days, so waiting until nymphs appear will allow short-residual insecticides to hit more of the target population before the residues dissipate. This timing will generally coincide with the first or second postbloom fungicide spray.

ROUNDUP® FOR ROW MIDDLE APPLICATIONS

David Peterson

[Note: This article is reprinted from Vineyard notes #6, 1996 - TEM]

With the wet early season, few growers have been concerned about potential water stress to vines. Although water is unlikely to be currently limiting growth of vines at this point, most vineyards have dried out considerably. Therefore, growers may wish to consider applying Roundup® to row middles within the next month. Keep in mind that Roundup® applications may now be made after bloom, although you should be aware that the risk of significant vine damage from drift onto green vine parts increases after bloom. Prior to or near bloom (when shoot growth is relatively rapid), drift onto green vine parts generally only

damages the growth contacted. Later in the season, as growth slows down, glyphosate is more likely to be translocated to other parts of the vine. Therefore, injury may show up on the entire vine rather than just the leaves contacted.

Roundup® applications to vineyards have become a practical, cost effective, and common approach to controlling weeds in row middles in the Finger Lakes. When properly timed, one application can take the place of numerous passes that would be required for cultivation or mowing. The erosion hazard is also greatly reduced as compared to cultivation, and competition for water and nutrients is less than with a permanent sod cover. The savings in time and wear and tear on equipment and the benefit to the vines makes it easy to understand why this practice has become so popular.

Proper timing depends on a number of factors including stage of weed development, type of weeds present, and weather conditions. A new supplemental label for Roundup® extends the legal time of application past the end of grape bloom, as it had been listed in previous years. The material must be absorbed by mature weed leaves to obtain maximum effectiveness, which explains why some growers have been frustrated with the level of control they have gotten when the application was made too early. The exception is with perennial grasses (quackgrass, orchardgrass) or some winter annuals that have green mature leaves very early in the spring. Since most vineyards are faced with pressure from a large number of different weed species, however, it is often advisable to wait until early to mid June in the Finger Lakes (close to bloom) to obtain maximum effectiveness and to avoid excessive regrowth. If existing weed growth is much greater than 6 inches tall, mowing prior to Roundup® application is desirable. Weather at the time of application should also be considered. The material should not be applied if rain is predicted within 6 hours of application, if heavy dew is present on the leaves, or if the wind speed is greater than 5 mph. Roundup® also works more slowly and may be less

effective on weeds stressed by drought, or excessive heat or cold.

A low water volume approach (10 gallons water per sprayed acre surface) has generally been adapted by most growers, although it may be used with up to 40 gallons water per acre. The low water volume concentrate sprays also allow a lower rate of Roundup® per acre to be used. The rate of Roundup® depends on the weed species to be controlled and the level of control desired. As low as 1 quart Roundup per acre in 10 gallons of water provides good control of many weeds and at least partial suppression of most others. Hard to kill perennials (field bindweed, for example) generally require higher rates of Roundup®. Extremely hard to kill vegetation such as poison ivy is probably best handled with a separate spot application with a higher concentration. Factors discussed in the previous paragraph should also be considered in the decision.

If you are using Roundup® Ultra, you do not need to add any additional surfactant, as it is contained in the product. Addition of a nonionic surfactant will enhance effectiveness of other glyphosate products or older formulations of Roundup®, however.. For surfactants containing more than 50% active ingredient, use 2 quarts per 100 gallons spray solution. For surfactants containing less than 50% active ingredient, use 4 quarts per 100 gallons spray solution.

The width of the boom and spray pattern depends on the row width and the width of the band sprayed under the trellis. Flat fan or low pressure nozzles arranged to obtain 30-50% spray overlap is desired. Some overlap of the under the trellis spray band is also recommended if much under the trellis vegetation is present.

The active ingredient in Roundup® is glyphosate. Other glyphosate products were on the market in the past few years, but not all carry a label for grapes. Be sure to check the label to

be sure that the glyphosate product that you purchase is labeled for use in vineyards.

UPCOMING EVENTS

June 30. Canopy Management for Vinifera Grapes Field Meeting. 2:30 PM, Starting at Sawmill Creek Vineyards (1/2 mi N of Hector on Rte 414). More and more vinifera growers are converting their vineyards to training systems that allow greater fruit exposure, reduce disease problems, and improve wine quality. Join us for an afternoon tour of East Seneca Lake vineyards. Learn about cane-pruned and cordon-trained vertical shoot positioning (VSP), the Scott-Henry vertically-divided canopy, and managing existing top-wire vineyards to maximize light penetration and improve fruit quality. The tour will feature Jim Hazlitt's Sawmill Creek Vineyards (cane-pruned VSP and Scott-Henry), and will stop at Mark Wagner's Lamareaux Landing vineyards (cordon/spur trained VSP) and John & Bill Wagner's Wagner Vineyards (cordon/spur trained VSP). Fred Smith, from Innovative Fence, Inc. will talk about trellis design and construction at Wagner Winery. The tour will end at Lamareaux Landing Winery, with brief discussions by area winemakers on how canopy management affects wine quality, and an overview of Lamareaux Landing Winery. Wine tasting and light refreshments will be served.

July 22-24. Eastern section American Society of Enology and Viticulture (ASEV) Meeting, Crowne Plaza Hotel, Grand Rapids, Michigan. This program has two major sections. Issues in Sparkling Wine Production: An International Symposium (22-23 July) includes tasting, viticulture, and enology aspects of sparkling wine production. The Technical Program (23-24 July) includes research presentations on Enology and Viticulture, a trade show, and a regional wine showcase. Contact Ellen Harkness, 745-494-6704 (phone) or 745-494-

7953 (fax), or harkness @foodsci.purdue.edu for registration information.

July 28. Grape Production Research Fund Summer Tour. 10:00 AM to 6:00 PM. All growers are invited to the annual tour for Grape Production Research Fund members. The tour will feature visits to field plots and commercial vineyards to highlight innovative grower practices. Informal talks (by Cornell researchers and growers) will cover: Grape nutrition, disease control and pathology, the grape nutrition project, crown gall research, new varieties, spider mite research, and row middle management. The tour will start at 10:00 AM in Branchport, passing through Glenora (Lunch) and East Seneca Lake, and will end up at Swedish Hill Winery with a grower-to-grower barbecue. Cost is \$15 and includes lunch and dinner. Please preregister by July 20th by

sending a check made payable to Finger Lakes Grape Program to our office or calling our office at 315-536-5134.



Timothy E. Martinson
Area Extension Educator
Finger Lakes Grape Program

Cornell Cooperative Extension and its employees assume no liability for the effectiveness or results of any product. No endorsement of products is made or implied. When using any recommendation, check the product label which is the final word with respect to product usage, or check with the manufacturer or supplier for updated information."

PEST MANAGEMENT FIELD MEETING

Name _____ Names _____

Name _____ Names _____

Farm _____

Address _____

Telephone No. _____

Please mail to: Finger Lakes Grape Program, 110 Court Street, Penn Yan, NY 14527

Please pay \$10 per person if NOT enrolled in the Finger Lakes Grape Program (make checks payable to the “Finger Lakes Grape Program”). If a farm is enrolled, all employees of the farm are considered as enrolled, and therefore, may attend free of charge.