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Reducing Insecticide Use in New York Vineyards: Will it Lead to Serious Problems with Grape Leafhopper?

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Figure 1. Grapevine leaf injury caused by the Eastern grape leafhopper. (Article begins on page 2.)

Reducing Insecticide Use in New York Vineyards: Will it Lead to Serious Problems with Grape Leafhopper?

Many factors acting together have heightened the interest that grape producers have in evaluating alternatives to the use of calendar-based spray schedules for controlling pests of vines. Right or wrong, the fact is that the American public, in arguably indiscriminate fashion, has called for reduced pesticide residues in agricultural products. As a direct result of this public pressure, New York grape growers find themselves dealing with increasingly complex regulations governing pesticide use, including regulations focusing on pesticide-related damage to ground water and wildlife, and exposure of farm workers. While taking this public mandate very seriously, we anticipate that the imperatives of modern agriculture will, for the foreseeable future, continue to necessitate use of moderate amounts of conventional, toxic pesticides to prevent crop losses. However, it is equally clear that we can greatly reduce the amount of toxicants used on our crops and that we have some new pest control technologies that are much safer than our conventional toxicants.

The overall objective of our research is to reduce insecticide use in New York vineyards without resulting in economic losses to growers. We believe that it is reasonable to strive for a greater-than 50% reduction in per-acre insecticide applications made by New York growers in the 1990's relative to the 1980's. Five years of field experiments with grape berry moth indicated that this reduction could be achieved solely through implementation of the grape berry moth risk assessment program. If, in addition to GBM risk assessment, the grape berry moth pheromone, called Isomate-GBM®, achieves a significant degree of acceptance by growers, we could achieve reductions much in excess of 50%. Both risk assessment and mating disruption with Isomate-GBM® are presently in implementation programs of the Cornell Integrated Pest Management Program and interested growers will be able to obtain assistance in putting these to work in their vineyards during the coming year.

This anticipated reduction in insecticide use in New York vineyards sounded very positive to those feeling the anti-pesticide pressure of the public, but to many growers it raised some understandable fears. Some growers cooperating with us on the risk assessment program found that pests that were usually eliminated by routine GBM sprays were showing up in their vineyards. Most importantly, growers were finding Eastern grape leafhopper (*Erythroneura comes*) showing up much more frequently and earlier in the season in some vineyards. Growers asked the reasonable question, "What is the point of going to the effort to eliminate two sprays for berry moth by using the risk assessment procedure if this will result in the need for treatments for leafhoppers to be made later in the season?" Typical grape leafhopper injury is shown in Fig. 1.

Our response to this was, "Good question!" We had valuable research results from Dr. Taschenberg and Dr. Jubb showing that even extreme

leafhopper damage resulted in essentially no revenue loss to the grower of balanced pruned 'Concord' vines. Also, excellent research conducted in the Lake Erie region during the turn of the century (i.e., before conventional pesticides were available) showed that leafhoppers caused serious problems only once or twice every ten years. Armed with this information we set out to evaluate, under the current viticultural practices, the severity of the threat posed to New York viticulture by the Eastern grape leafhopper.

Conclusions of 1989 and 1990 Research

We aimed our research over the past two years at answering the questions, "How often are leafhoppers a pest in insecticide-free vineyards?" and, "How much damage do leafhoppers cause to 'Concord' yield and quality?" The following summarizes the most practical aspects of our findings:

- Five nymphs per leaf is a very conservative threshold to be used with our provisional leafhopper sampling procedure.
- Eastern grape leafhopper populations are highly variable from year to year but, even in a 'bad' leafhopper year such as 1990, only 25-40% of vineyards that had received no insecticide will require a single insecticide treatment to control leafhoppers (Fig 2).
- We will concentrate on two critical periods each season when growers should sample their vineyards for grape leafhopper.

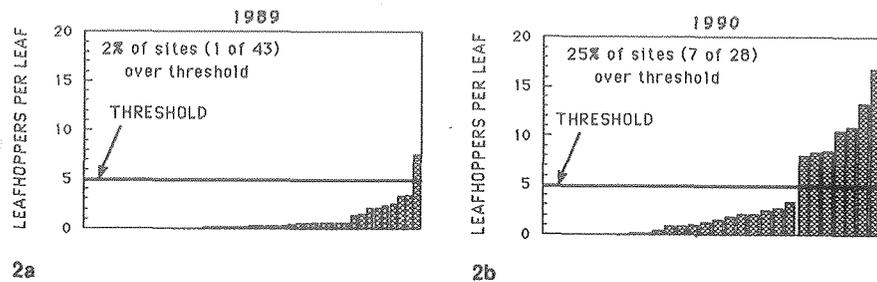


Figure 2. Harvest-time data from a number of New York vineyards illustrating how widely the buildup of leafhoppers differed in 1989 (2a) versus 1990 (2b). Note that even in a 'bad' year for leafhoppers, like 1990, fully 75% of vineyards sampled had damage levels below the conservative threshold of 5 leafhopper nymphs/leaf at harvest.

- Leafhoppers have a strong tendency to build up on interior (shaded) leaves. They move onto exposed leaves only later in the season or when population densities get very high.
- Eastern grape leafhopper demonstrates strong preferences between varieties of grapes.

Direction of 1991-92 Research

Since our findings have illustrated unquestionably that, even in 'bad' years of grape leafhopper damage, at least 60 percent of vineyards need no insecticide for controlling leafhoppers, the next step is to develop better tools for allowing growers to identify the vineyards that do need treatment. To do this we will develop simple methods enabling growers to sample vineyards for leafhoppers and to use simple criteria for deciding whether or not to spray. This latter subject requires continuation of the work on leafhopper thresholds and involves measuring the long- and short-term effects of leafhopper populations on 'Concord' yield and quality. Our target is to merge grape berry moth risk assessment and leafhopper sampling so that growers assess populations in vineyards with a minimum amount of time and obtain the needed level of control of both pests with a minimum amount of insecticide. ■

- Leaf function (photosynthesis) is reduced in proportion to visible leafhopper damage (Fig. 3a). In other words, lots of visible damage translates into severe reduction of photosynthetic capability of the leaf. However, this finding must be balanced by an understanding that, except at high densities, leafhoppers do their feeding on interior leaves which are much less photosynthetically active than exterior leaves (Fig 3b).
- Adult leafhoppers move out of the woods early in the spring and then back into the woods in the late fall. Though there are edge effects in adult distribution when adults are moving into or out of the vineyards, adults and immature leafhoppers do not show significant edge effects during the growing season.
- Leafhoppers do not move much from vine-to-vine or block-to-block in vineyards (Your neighbor's mess is unlikely to cause you any difficulty with this pest).

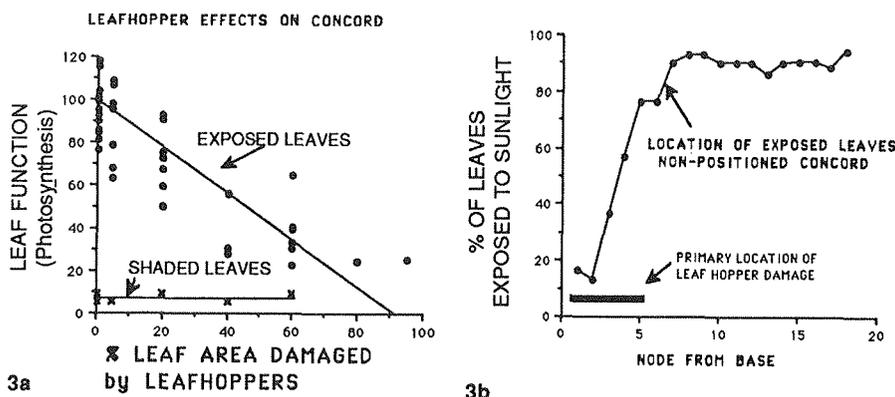
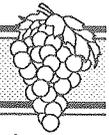


Figure 3. Physiological aspects of grapevines relative to leafhopper activity. (3a) Reduction of leaf photosynthesis relative to visible leafhopper damage on leaves. This figure shows that the amount of visible damage provides a good indication of the reduction in leaf function. (3b) Distribution of leafhopper damage relative to shaded versus exposed position of leaves. This demonstrates that, at the densities evaluated, leafhopper damage was concentrated on leaves that had very low photosynthetic output due to shading.

This research was made possible by funding provided by the New York Wine and Grape Foundation.

*Martin Goffinet*

As the New York State budget grows tighter, all state programs and institutions have to do some belt tightening. Cornell University's Statutory Colleges are not exceptions. Thus, the College of Agriculture and Life Sciences, must also make some concerted efforts to streamline its many programs. Viticultural and enological research programs, and programs that impinge on them, for example agricultural engineering, will also come under examination for means of cost reductions.

I have asked Dr. James Hunter, Director of the New York State Agricultural Experiment Station at Geneva, NY, to shed some light on the state budget constraints as it might impact on Geneva-based grape research and extension efforts. I'll let his message serve as this issue's editorial.

Effect of Budget Cuts on Grape and Wine Research and Extension Programs

James E. Hunter, Director
Cornell University
New York State Agricultural Experiment Station
Geneva, NY 14456

Cutbacks in state funds for the Geneva Experiment Station during the current fiscal year that ends March 31, 1991, total \$418,000 plus \$151,800 in delayed wages for employees. This follows a pattern of continual decline of funds for over 15 years. During this time the number of state-funded employees has dropped by 73. This includes 11 faculty—the leaders of research and extension projects—who have left for various reasons but who have not been replaced because of lack of funds.

Support for the Station's wine and grape programs has been hurt by this erosion of State support. But, fortunately, the Geneva Experiment Station still has all faculty positions in this area filled and, in fact, has added an Extension Associate position responsible for coordinating grape extension efforts. Also, with support from the New York Wine & Grape Foundation, a wine analytical laboratory and wine data bank has been established which assists wineries in analysis of juice and wine. The data bank allows wine extension to give better advice to wineries while also serving as an essential part of viticulture and wine research. Thanks to special funding from the State, a grape IPM extension specialist has been added to the staff at the Vineyard Laboratory in Fredonia.

None of these programs can be carried out effectively without technical help and operating funds. This is where the effect of annual reductions in state budgets has hurt grape research programs. The level of technical support available to faculty, especially those involved with viticultural research, grape breeding, and grape entomology, has been reduced. This has reduced needed efforts in these programs. Additionally, all programs suffer from the lack of state funds needed for supplies, equipment, and

temporary labor. In spite of this, the overall level of assistance provided to the grape and wine industry by the Geneva Experiment Station and the College of Agriculture and Life Sciences remains strong. A great deal of credit for the current level of non-state funding belongs to the faculty who have been able to obtain grants to help support their research.

State support is absolutely essential in maintaining research and extension programs—especially for long-term research on perennial crops such as grapes. But the State budget picture does not look good for the coming year, and if this leads to further reductions in support for research and extension programs, it will be hard to maintain the current level of support for the grape and wine industry. The financial support presently provided by the industry and the Wine and Grape Foundation is critical, and this will become increasingly important. With the industry and state working together to fund programs, we expect the Station and the College to be able to continue to help the grape and wine industry grow and to contribute even more to the economy and the quality of life in rural New York state. ■



New York Approves use of Pheromone Ties for Grape Berry Moth Control

The state has approved the use of Isomate-GBM® for use in vineyards to disrupt the mating behavior of the grape berry moth. The product is distributed by Microflo Co., and is a registered trademark of Pacific Biocontrol, Ltd. Information on its use will be given in the 1991 Pest Management Recommendations for Grapes, when that publication is released later this winter. Those interested in using this product will find it available through pesticide dealers.

The description and use of the pheromone, which is slowly released from oversized "twist-ties" applied to the trellis, and its application to risk assessment approaches to berry moth control are covered in a new publication, "Pheromonal Control of the Grape Berry Moth: An Effective Alternative to Conventional Insecticides." Single copies of this publication will be available free after mid-February from the Bulletin Room, Jordan Hall, New York State Agricultural Experiment Station, Geneva, NY 14456.

Long Island Viticulture Position Filled

Alice Wise, former Suffolk County Fruit Extension Agent, has accepted the position of Suffolk County Viticultural Research Specialist. As such, her duties will be to coordinate a program of applied research on grapes and to serve the grape extension needs of the industry. In her research role, Alice will be in close contact with the grape research community at Cornell University in Geneva and Ithaca. She is setting up office at the Long Island Horticultural Research Laboratory, 39 Sound Ave., Riverhead, NY 11901.

The Virginia Chardonnay Conference has been set for March 23-25. More information is available from: Dr. Bruce W. Zoecklein, Department of Horticulture, Virginia Polytechnic Institute, Blacksburg, VA 24061

The 1991 Wine Industry Workshop will be held on April 10-11, at the New York State Agricultural Experiment Station, Geneva. Topics will include viticulture and enology research projects ongoing at the station, a checklist for winemakers for necessary analysis before bottling of wine, adequate SO₂, sorbic acid, sterility, pH/TA control, and fining for improvement of the product. The use of information provided by the Wine Analytical Laboratory will be discussed for quality control in wine production. Talks on winemaking techniques will focus on Pinot noir and late harvest wines. The program will include a tasting of New York and other Eastern wines and a banquet. For information and registration materials contact: Thomas Henick-Kling, Department of Food Science & Technology, New York State Agricultural Experiment Station, Geneva, NY 14456. Phone: 315-787-2277.

The Nelson J. Shaulis Viticulture Symposium will take place on March 5 and 6, 1991, at the New York State Agricultural Experiment Station, Geneva, NY. The title of the symposium is "Integrated Pest Management of Grape Diseases: Present and Future Strategies." Credits for pesticide applicators will be given, although at this writing it is not known how many. Brochures are now available which give the daily program, registration fees, banquet costs and local motel information. Brochures can be obtained from regional grape extension offices, or contact Martin Goffinet, Grape Extension Coordinator, at the New York State Agricultural Experiment Station, Geneva, NY 14456. Phone: 315-787-2392. Registration deadline is February 20.

ERRATUM

The authors of the article, "Mechanical Shoot Positioning: How can it help me grow American grapes profitably?", were inadvertently left out of the Fall 1990 issue (page 4) of *Grape Research News*. These authors are:

*Bob Pool and Richard Dunst
Professor and Superintendent
Vineyard Laboratory, respectively
Department of Horticultural Sciences
Cornell University
New York State Agricultural Experiment Station
Geneva, NY 14456* ■

Help Keep



This newsletter and the extensive grape research it is based on are made possible by funding from the **New York Wine & Grape Foundation**. The Foundation's budget depends totally on private sector contributions which are matched by the State of New York. And now extensive cuts in State funding have made these private sector contributions more vital than ever.

If the Foundation's research and promotional programs are to continue, we need your support through modest dues—a rate schedule and membership application are below. (Wineries and juice manufacturers have already made financial contributions of up to \$15,000 each to support the effort.) Please join your neighbors and industry associates in forging a more productive and profitable future. (Join using this form and we'll send you a "Best of the Bunch!" T-shirt.)

APPLICATION FOR GRAPE GROWER MEMBERSHIP
New York Wine & Grape Foundation

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NAME _____

NAME OF VINEYARD (If applicable) _____

STREET, P.O. OR R.D. ADDRESS _____

COUNTY _____

CITY (Town) _____ ZIP _____

TELEPHONE (_____) _____

TOTAL GRAPE ACREAGE (Optional) _____ ACRES

ANNUAL DUES (Circle Appropriate Amount)

Dues (circle)

- \$25
- \$50
- \$100

Acres (circle)

- 0-30
- 31-60
- Over 60



After completing this form, please send it and a check for the appropriate amount payable to the **New York Wine & Grape Foundation**, 350 Elm St., Penn Yan, NY 14527. **THANK YOU!**

DISTINGUISHED CONTRIBUTORS TO NEW YORK INDUSTRY HONORED

At its annual meeting in January in Rochester, New York, The New York State Wine & Grape Foundation presented awards to three individuals who have made distinguished contributions to the New York industry.

Dr. Emil "Fred" Taschenberg was cited for his extraordinary contributions to viticultural research. Taschenberg, an entomologist, joined the staff of the New York State Agricultural Experiment Station in 1939, and devoted his entire career to the study of insect problems of New York's grape and wine industry at the Station's Vineyard Research Laboratory in Fredonia. He retired in 1983.

Seaton "Zeke" Mendall was honored for his major achievements in promoting unity in the industry. Mendall served the Taylor Wine Company from 1943 until 1979, when he retired as Vice President of Grower Relations. He was an expert vineyardist and wrote several articles and manuals on tying, trimming, selection and planting of sites. In the 60s Mendall was instrumental in forming the New York State Wine Grape Growers, served as its first Secretary/Treasurer and, in 1984, as its President.

Jaunita Spence was recognized for her outstanding dedication and service to New York's wine and grape industry. She became Office Manager of the New York State Wine Grape Growers in 1980 and played a major role in creating Women for New York State Wines, a volunteer promotional group conducting professional tastings of and education about, New York Wine and juice products. Spence joined the New York Wine Council in 1983 and helped to shape the framework that led to the creation of the New York Wine & Grape Foundation in 1985. ■

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Question: _____

Gratitude is expressed to those organizations whose support makes possible ongoing and valuable research activities for the benefit of the State's grape industry. Major funding is provided by the **New York State Wine & Grape Foundation; the Grape Production Research Fund, Inc.;** and, the **J.M. Kaplan Vineyard Research Program.**

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Got A Question? We are trying to address the many questions from grape growers and processors that come to Cornell's grape research community. We invite you to write to us at *Grape Research News* to bring to our attention any questions you have about grapes. We will see to it that those questions are answered by someone knowledgeable in the area of your concern.
Save yourself a long distance phone call. Put it in writing on the back of form below, cut it out, and send it to us.

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