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RAPE SEARCH NEWS



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INCREASING THE POSITIVE AND DECREASING THE NEGATIVE IMPACTS OF VINE SPRAYING PRACTICES

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Sprayers remain one of the most important vineyard pest management tools. Biological, organic, or other pesticide formulations must be applied properly if they are to be effective at managing pests. Even before the spray application method is considered, pest assessment, pesticide selection, and the timing of the application are critical to the effectiveness of the application.

There are several ways of applying chemicals to grapevines. While each method may be able to provide the desired pest management, they will differ in their efficiency of operation.

The key to achieving the desired biological impact is to deposit the level of chemical required to have the intended effect in the area where it will be most effective. Fungicide and some insecticide applications, particularly those

involving bacterial toxins (*Bt*'s), require good spray coverage to provide the maximum amount of protection. The amount of spray coverage is determined by the volume of water used in the application and the size of the spray droplets. Table 1 shows the theoretical spray coverage that is provided by various droplet sizes and application rates for some typical hollow cone, air blast sprayer nozzles.

Application rates may be reduced to save operating time; however, nozzles and pressure should be adjusted to maintain spray coverage levels as application rates are changed.

In 1993, sprayer evaluations in an Aurore vineyard showed droplet size and spray volume could be adjusted to maintain coverage without significantly changing disease control.

Table 1. Theoretical spray coverage for different nozzles and application rates.

Nozzle	Pressure (psi)	Drop Size (microns)	Application Rate (gal per acre)	Coverage (%)
D2-23	200	115	40	49
D2-25	100	205	20	14
D2-25	100	205	40	27
D2-25	200	140	50	50
D3-25	200	155	50	45
D3-45	200	175	50	40
D4-45	200	190	50	37

Table 2 shows the actual spray coverage measured on leaves taken from the Aurore grape canopy (August) treated by three different sprayer set-ups. Coverage provided by the lower volume, over-the-row treatment, was at least as good as, if not better than, the other sprayers, even without the aid of air assistance.

directing the spray into the canopy, by reducing the air speed when the canopy density is light, or by using hooded or tunnel spraying systems.

The sprayer must be managed as carefully as any other part of the grape production system to ensure efficient operation. Taking time to properly set-up and calibrate the sprayer as well as to monitor spray coverage with water sensitive paper can help reduce pesticide usage and minimize spray drift.

While smaller droplets can make more efficient use of the spray water, they must be directed properly into the canopy without using too much air assistance. In the most comprehensive vineyard drift evaluations, German air blast sprayer studies showed that about 1%–5% of the original rate of active ingredient was deposited 25 feet downwind from where the spray was applied to the vineyard. This decreased to 0.1%–0.5% at 75 feet downwind from the vineyard. The environmental and health risks posed by this off-target pesticide movement depends on many factors. It is important for equipment operators to realize there may be significant levels of material wasted and moving off-target. Spray drift can be reduced by

Table 2. Spray coverage observed on Aurore grape leaves (August, 1993).

Sprayer	Nozzle	Application Rate (gal per acre)	Pressure (psi)	Percent Leaf Coverage	
				Upper Side	Lower Side
Air blast	D5-45	50	30	13	9
Over-the-row	TX-10	50	80	17	12
Over-the-row	D2-25	80	120	15	15



FROM THE EDITOR

Martin Goffinet

As this issue goes to press the snow is falling and Thanksgiving Day is imminent. Another season is behind us and the juice and wine is in the tank. It appears that the year has been a good one for most growers and vintners, as quality grapes were seen throughout the region. As always there were "trouble spots," but, all things considered, the wine vintage promises to be of high quality.

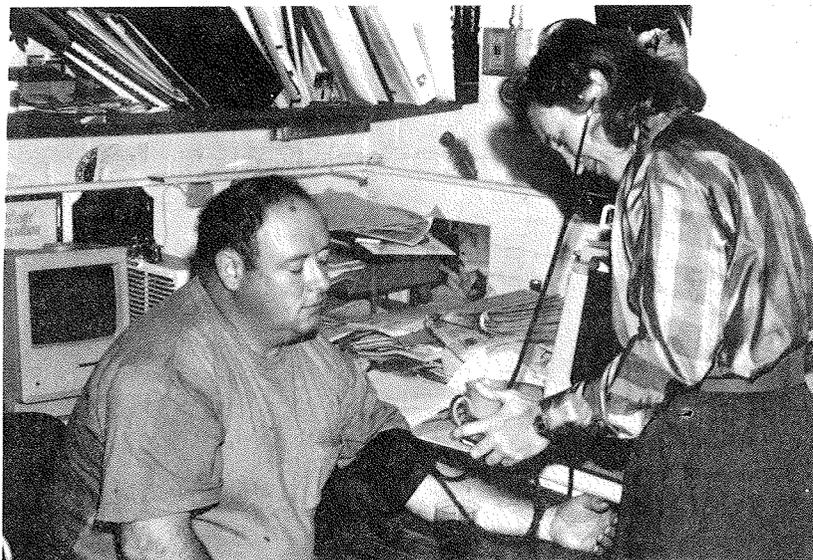
I have always included a research article on juice or wine-related matters in the "News" at or after the annual grape harvest. In this issue Dr. Gil Stoewsand, Professor Emeritus of Food Toxicology in the Department of Food Science & Technology at the New York State Agricultural Experiment Station in Geneva, NY, reports on his findings of blood pressure changes after consuming wine. His findings are of personal interest because I was one of the test monkeys for the study.

Also, in this issue, Dr. Rich Derksen, Department of Agricultural & Biological Engineering at Cornell University in Ithaca, NY, reports on some of his work on vineyard spray applications that will help readers understand how sprayer adjustments can maximize sprayer efficiency while minimizing non-target loss of spray materials.

As this issue goes to press, I want to remind readers that it is the New York Wine & Grape Foundation that supports the cost of production of "Grape Research News" and also supports funding of grape-related research via a matching-grants program backed by the New York State legislature. Membership in the Foundation therefore helps support research and, as importantly, communication of research results to our growers. The Foundation is currently having its annual membership drive. To assist you and the Foundation in this drive, a membership application form is included in this issue.

BLOOD PRESSURE CHANGES IN MEN AND WOMEN AFTER A SINGLE GLASS OF WINE

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age was associated with a lower risk of stroke (Lindenstrom et al., 1993).

Our study indicates that wine constituents besides, or in concert with, alcohol may be effective in a two-hour reduction of systolic blood pressure rates in healthy, older men. Younger men and women in both age groups also showed lowered systolic blood pressure trends after one glass of wine but these were not significantly different than trends after other drinks, including water.

Acknowledgments: This study was supported in part by the New York Wine and Grape Foundation. I am grateful to Ms. Judy Anderson for help in all aspects of this study and to Mrs. Bernie Reed for taking blood pressures.

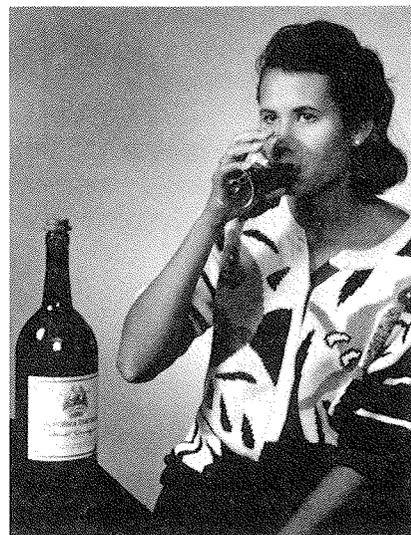
Reference: E. Lindenstrom, G. Boysen and J. Nyboe. (1993) Risk factors for stroke in Copenhagen Denmark. II. Life style factors. *Neuroepidemiology* Vol. 12, pp. 43-50.

Wine, especially at moderate intake levels, seems to indicate a lowered blood pressure response as compared to beer and spirits in both men and women. In order to take a more critical look at this response, we measured the blood pressure rate changes in individual, healthy, volunteer men and women after a single four-ounce drink of either Cabernet Sauvignon wine, Cabernet Sauvignon non-alcoholic wine, neutral spirits or water.

Blood pressures (mm Hg) were taken, and duplicated, with a portable sphygmomanometer at each subject's office or laboratory at the New York State Agricultural Experiment Station in Geneva. Readings were taken at zero time (i.e., prior to each drink that was consumed over a five-minute period) and then at 15, 30, 60 and 120 minutes after consuming the drink. The individual negative or positive blood pressure rates per minute were calculated by a computer program.

The zero-time mean systolic (when the heart contracts or the high value) and diastolic (heart relaxed or low value) blood pressures were: men over 40 years, 129/81; men under 40 years, 121/76; women over 40 years, 118/75; and women under 40 years, 109/68. In the study, body weights appeared to have little effect on blood pressure rate changes.

Men over 40 years showed a significant lowered (-3.1 mm Hg per hour) systolic blood pressure rate response after the glass of wine as compared to their almost unchanged systolic rate after the spirits drink that contained the same amount of alcohol. Women over 40 years exhibited twice as great a negative systolic rate after drinking spirits as compared to wine, but their diastolic rate after wine intake was lowered to a comparatively greater extent than the other wine-treated groups. Studies in Denmark indicate that daily alcohol intake in people over 35 years of





ANNOUNCEMENTS



ACTIVITIES IN CORNELL'S GRAPE-RELATED PROGRAMS AT GENEVA, NEW YORK

Department of Horticultural Sciences

The Viticulture Program:

Steven Lerch joined the viticulture program of Professor Robert Pool as Research Support Specialist II this past August. Lerch will provide professional level technical support for Pool's various programs, including technical supervision, statistical analysis, scientific and popular writing, and public speaking. Primary duties include conducting vineyard experiments, maintaining the vineyards in which those experiments take place, and collecting, recording, and maintaining data records from those plots. Prior to his appointment, Lerch had been associated with field programs of both the Department of Horticultural Sciences and the Geneva Experiment Station's Field Research Unit over the last 18 years.

The Grape Breeding Program:

Michael Striem a postdoctoral associate from Israel, has completed his studies in Professor Bruce Reisch's grape breeding and genetics program in the Department of Horticultural Sciences at the state experiment station in Geneva and has returned to work on grapes and citrus in Israel. Michael's work at the Geneva station was of great importance to the development of grapevine genetic engineering techniques. From his experiments, it is hoped that the first disease-resistant Merlot vines may be identified. **Dr. Julie Kikkert**, a research associate who has pioneered genetic engineering techniques with Dr. John Sanford's biolistic gene delivery laboratory in the Department of Horticultural Sciences, has taken up the genetic engineering research in the Reisch program. Kikkert graduated with a Ph.D. from the University of Wisconsin's program in plant breeding and genetics. Assisting her will be Pat Wallace. Both Kikkert and

Department of Food Science & Technology

Dr. Donald Splittstoesser Retires. Don Splittstoesser, Professor of Microbiology in the Department of Food Science & Technology at the New York State Agricultural Experiment Station in Geneva, NY, retired from Cornell University on August 30, 1995. He joined the station faculty in 1958, after serving two years as a first lieutenant in the army Medical Service Corps. His graduate degrees in microbiology were from the University of Wisconsin at Madison. During the period of 1982-89, he served as chairman of the Department of Food Science & Technology.

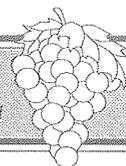
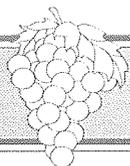
Splittstoesser's research has involved a number of problems related to grape juice and wines. In the early sixties he collaborated with agricultural engineers, viticulturists and other food scientists in studies on the mechanical harvesting of grapes. His particular concern was preventing fermentation of the fruit before it could be processed into juice or wine.

Other research has been concerned with the heat resistant molds that spoil pasteurized grape juice. His studies determined the incidence of fungal ascospores in New York vineyards and orchards, and showed the effect of juice composition on the spores' heat resistance.

His studies on food preservatives were concerned with the effect of different compounds on the microorganisms that spoil wines. The interaction between ethanol and sorbic acid against acetic acid bacteria, wild yeasts, and lactic bacteria was just one of the areas that were investigated.

Splittstoesser is a charter member of the Eastern Section of the American Society for Enology and Viticulture and has served in a number of offices in that organization. He was chairman of the Eastern Section in 1979, and for the past six years has been the Section's treasurer. In 1991, he received its Outstanding Achievement Award.

Markus Keller is working as a Swiss National Science Foundation Postdoctoral Fellow in the Department of Food Science and Technology at Cornell University's Agricultural Experiment Station in Geneva, NY. He joined the department in March and is working with Professors Geza Hrazdina, Robert Pool and Thomas Henick-Kling for one year. His research focuses on the effects of cultural practices and environmental impacts on grape and wine quality, with special emphasis on anthocyanins and other phenolics. Dr. Keller received his B.S. in agriculture, M.S. in plant science and Ph.D. in viticulture, all from the Swiss Federal Institute of Technology at Zurich, Switzerland. During his Ph.D. he worked with Dr. Werner Koblet at the Swiss Federal Research Institute in Wädenswil, Switzerland on grapevine stress physiology. Simultaneously he established the first commercial cold-hardy kiwifruit plantation in Switzerland and was presented with the "Swiss Agro Award" by the Swiss Farmers Association in recognition of innovative contributions to Swiss agriculture.



Wallace had worked cooperatively in 1992 with Dr. Dominique Hebert, a visiting scientist from France in Dr. Reisch's lab. Dr. Hebert developed the successful gene transfer system now in use in Geneva's grape genetics lab. The program is fortunate to again have access to the expertise of Kikkert and Wallace as they begin to focus on grapevine transformation for the improvement of disease resistance.

UPCOMING GRAPE/WINE-RELATED EVENTS

11–12 January, 1996, The Long Island Agricultural Forum. This annual event features a grape-related program on Jan 12 that will detail weed management strategies, living and non-living mulches, industry news, and updates on grapevine crown gall and viral and fungal diseases. A general session on Jan 12 will cover the area of soils and fertilizers. The forum will take place at Suffolk County Community College, Riverhead, NY. Contact Alice Wise, Long Island Horticultural Research Laboratory, Phone: 516-727-3595; Fax: 516-369-5944.

3 February 1996, Annual Finger Lakes Grape Grower Conference

The Holiday Inn, Waterloo, New York. This annual conference includes presentations from the Cornell grape research faculty and staff, industry representatives, and also a trade show featuring grape production and wine-related exhibitions. The show concludes with a regional wine and juice showcase/tasting featuring Finger Lakes products. For further information contact Dave Peterson, Finger Lakes Regional Grape Program Office, Phone 315-536-5134.

22 February 1996 (Tentative), Annual Lake Erie Regional Grape

Grower Conference. This annual event is now being organized by the Lake Erie Regional Grape Program at press time. Readers can get more information on the time, place and events of the program by contacting Ms. Linda Aures, Lake Erie Regional Grape Program, 412 East Main St., Fredonia, NY 14063. Phone: 716-672-2191.

3–4 April 1996, The 25th New York Wine Industry Workshop

Jordan Hall, New York State Agricultural Experiment Station, Geneva, New York. For information on registration forms and fees, contact: Thomas Henick-Kling, Department of Food Science & Technology, NYSAES, Geneva, NY 14456. Phone: 315-787-2277; Fax: 315-787-2397.

17-20 July 1996, Fourth International Symposium on Cool-Climate Viticulture & Enology: "Applying Current Viticulture and Winemaking Technologies to Maximize Wine Quality." Riverside Convention Center, Rochester, New York U.S.A. **This symposium is in conjunction with the 21st Annual Meeting of the Eastern Section of the American Society for Enology & Viticulture.**

The Cool-Climate symposium will present the world's best current technical and scientific data on issues in grape and wine production in cool climates, emphasizing practical applications. Hosted by the American Society for Enology & Viticulture/Eastern Section. Sponsored by the International Society for Horticultural Science, and the American Society for Enology and Viticulture. The program will include keynote speakers, oral and poster presentations, workshops, and a trade exhibition.

Symposium Program Areas: Adaptation to Regional Environments; Vine Stress Physiology; Ecologically Sound Grape and Wine Production Methods; Wine Sensory Attributes—Techniques of Measurement; Flavor Production in the Vineyard; Flavor Production during Fermentation; Understanding the Genetic Basis for Grape and Wine Production; and Economics and Marketing.

Workshops: Wine Aroma Defects; Wine Evaluation; Winery Sanitation; Sparkling Wine Production; Yeast and Bacterial Starter Cultures; BATF Compliance; Assessing Cold Injury in Grapevines.

Seminars: Information Management; Vineyard Mechanization; Integrated Pest Management; Flavor Adjustment in the Vineyard; Wine Marketing.

Trade Show and Exhibitor Seminars:

Two full days of trade exhibits (July 18 and 19) and exhibitor presentations. In addition, there will be day passes that will allow one-day entrance for those who have specific parts of the program or trade show in mind. Tours to area attractions are also available, as are a welcome dinner and an awards banquet.

The program committee also seeks contributions for its oral and poster sessions. Those interested in contributing a 20-minute oral presentation or a poster should submit by 15 January 1996 a one-paragraph abstract of the presentation to the technical sessions chair, Dr. Tony Wolf, Virginia Tech, 595 Laurel Grove Rd., Winchester, VA 22602 USA. Phone: 540-896-2560; Fax: 540-869-0862.

To receive a 12-page mailed brochure, with abstract submission form, and all other particulars of the meeting, accommodations, etc., contact: American Society for Enology and Viticulture/Eastern Section, Department of Food Science and Technology, New York State Agricultural Experiment Station, Geneva, New York 14456-0462 USA. Fax: USA-315-787-2397.

NEW YORK GRAPES

The Best of the Bunch!

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. Extensive cuts in State funding have made these private sector contributions more vital than ever.

If the Foundation's research and promotion programs are to continue, we need your support through modest dues — a rate schedule and membership application are given below. (Wineries and juice manufacturers have already made financial contributions up to \$15,000 each to support the effort.) Please join your neighbors and industry associates in forging a more productive and profitable future.

APPLICATION FOR GRAPE GROWER MEMBERSHIP New York Wine & Grape Foundation

Please **print** all information legibly.

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 Approximate Amount)	
Dues (circle)	Acres (circle)
\$25	0-30
\$50	31-60
\$100	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!

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.**

New York Wine & Grape Foundation
350 Elm Street
Penn Yan, NY 14527

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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.

----- CUT HERE -----

Name

Address

.....

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Mail to:

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