2007 Ohio Grape & Wine Conference

February 12-13, 2007

Shisler Conference Center
Ohio Agricultural Research and Development Center
Wooster, OH

Conference Materials & Abstracts

Jointly organized by:

OSU Viticulture and Enology Program
Ohio Grape Industries Committee
Ohio Wine Producers Association
Ohio Grape & Wine Conference

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Editors:
Imed Dami and Todd Steiner

Preparation and Layout:
Anton Prajitna

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Ohio Wine Producers Association
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Welcome to the 2007 Ohio Grape and Wine Conference!

The Ohio Grape & Wine Conference (OGWC) will take place on February 12 and 13, 2007 at the Shisler Conference Center - OARDC in Wooster, OH. The conference is jointly organized by the Ohio Grape Industries Committee (OGIC), Ohio Wine Producers Association (OWPA), and the Viticulture & Enology Program (VEP) at OSU.

The Conference will feature an overall improved program. Following feedback and suggestions from our industry leaders, producers, and educators in the past four years, we decided to implement changes to the conference in 2007. The name of the conference reflects the new era associated with this annual educational event. Formerly known as the “Ohio Grape-Wine Short Course” it is now called the “Ohio Grape and Wine Conference”. The new format will emphasize quality and affordability of the event. The conference is now held for 2 rather than 3 days with more technical sessions and cost of registration has been dramatically reduced thanks to the generous sponsorship provided by OGIC and exhibitors.

There will be 4 general and 6 concurrent sessions covering a wide range of topics for grape growers, vintners, and wine marketers. Along with the technical sessions, a two-day Trade Show with both vineyard and winery equipment and services will be featured. We encourage you to visit the Trade Show during breaks. Featured speakers from across the country will join the conference to share their knowledge and experience in current topics in viticulture, enology, and marketing. We have also several panels of producers to share their experience and do’s and don’t for successful businesses. Special events will include the Ohio Wine Reception featuring a taste of Ohio’s versatile wines and the Monday Banquet featuring Randy Ullom, Winemaster at Kendall Jackson. Please let us know if you like the new face of the conference and if it is worth the price by filling out an evaluation form. Hope you enjoy the conference!

Sincerely,

Conference Organizing Committee:

OSU: Imed Dami, Todd Steiner
OGIC: Mike Widner, Christy Eckstein
OWPA: Donnie Winchell, Jim Arbaczewski
Shisler Conference Center: Tom Cole, Hannah Roscoe-Metzger
Local vineyard/winery representative: Andy Troutman
Thank you to the following sponsors for supporting the 2007 Ohio Grape & Wine Conference

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Kaufman Container

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Slimline Manufacturing
Ohio Grape and Wine Conference  
12-13 February, 2007, Shisler Center-OARDC, Wooster

**Monday February 12**

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<tr>
<th>Time</th>
<th>General Session</th>
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</thead>
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<tr>
<td>8:30 a.m.</td>
<td>Registration and Coffee</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Welcome - Dr. Bill Randle</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>What is sustainable viticulture and how do you practice it? Dr. Cliff Ohmart</td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Sustainable viticulture in the East - special challenges and opportunities, Dr. Tim Martinson</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>The Stratus project: from philosophy to awards, J-L Groux</td>
</tr>
<tr>
<td>Noon</td>
<td>Lunch and Visit Trade Show</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>Chardonnay winemaking techniques, Randy Ullom</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Ohio Quality Wine (OQW), Mike Widner</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Break and Visit Trade Show - Refreshments and Chips</td>
</tr>
</tbody>
</table>

**Concurrent Sessions**

<table>
<thead>
<tr>
<th>Time</th>
<th>Viticulture</th>
<th>Enology</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 p.m.</td>
<td>Sustainable agriculture in Ohio, Alan Sundermeier</td>
<td>3:00 p.m. Winery design &amp; layout, Kristopher Sperry</td>
<td>Off-premise wine sales panel: Duke Bixler and Claudio Salvador</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Sustainable disease management Dr. Mike Ellis</td>
<td>3:45 p.m. Cabernet Sauvignon building blocks, Randy Ullom</td>
<td></td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>Sustainability and pest management Dr. Roger Williams</td>
<td>4:15 p.m. Malolactic studies at OARDC, Todd Steiner</td>
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</tr>
<tr>
<td></td>
<td>Conference Evaluation</td>
<td>Conference Evaluation</td>
<td>Conference Evaluation</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>Ohio Wine Producers Association (OWPA) Business Meeting</td>
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<tr>
<td>6:00 p.m.</td>
<td>Adjourn</td>
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<tr>
<td>6:45 p.m.</td>
<td>Ohio Wine Reception</td>
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<tr>
<td>7:30 p.m.</td>
<td>Banquet (Keynote speaker: Randy Ullom, Winemaster at Kendall Jackson)</td>
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</table>
## Ohio Grape and Wine Conference

**12-13 February, 2007, Shisler Center-OARDC, Wooster**

### Tuesday February 13

<table>
<thead>
<tr>
<th>Time</th>
<th>General Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td><strong>Continental Breakfast in Trade Show</strong></td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Strategies of selling wines in the next decade, Jane Baxter Lynn</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>OSU Extension: An evolving organization, Dr. Keith Smith</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>Results of the Ohio grape and wine industry survey, Dr. Imed Dami</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>Characterization of aroma profiles of Traminette grape grown in different climatic regions, Dr. Taeyhun Ji</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>Overview of Ohio grape-wine producers' trip to wine regions in Germany, Mike Widner/Greg Johns/Andy Troutman</td>
</tr>
<tr>
<td>Noon</td>
<td><strong>Lunch with Wines and Visit Trade Show</strong></td>
</tr>
</tbody>
</table>

#### Concurrent Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th><strong>Viticulture</strong> Mod: D. Scurlock</th>
<th><strong>Enology</strong> Mod: L. Klingshirn</th>
<th><strong>Marketing</strong> Mod: M. Widner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>IPM in vineyards, Dr. Cliff Ohmart</td>
<td>Making good wines great - Tasting, J-L Groux</td>
<td>Branding, Jane Baxter Lynn</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Sustainable weed management, Dr. Doug Doohan</td>
<td>Use of tannins in vinification, Russ Robbins</td>
<td>Free money panel: Deborah Rausch; Michelle Bakan; Christy Eckstein</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Nitrogen management, Dr. Tim Martinson</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td><strong>Break - Refreshments and Cookies</strong></td>
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</tr>
</tbody>
</table>

#### General Session

<table>
<thead>
<tr>
<th>Time</th>
<th><strong>Moderator: M. Brown</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3:15 p.m.</td>
<td>Sustainable practices and organics - Producer's experience panel: John Santos, Hazlitt Winery; Ken Tarsitano, Tarsitano Winery; and Patti Iubelt, Maple Ridge Vineyards</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>&quot;Ask the Experts&quot; panel: Viticulture/Enology/Marketing - Dami, Doohan, Ellis, Steiner, Widner, Williams, Winchell</td>
</tr>
<tr>
<td>4:25 p.m.</td>
<td>Conference Evaluation</td>
</tr>
<tr>
<td>5:30 p.m.</td>
<td>Conference closes</td>
</tr>
</tbody>
</table>
About Our Featured Speakers and Special Guests

Jean-Laurent Groux

Born in France and raised in the famous French wine-producing region of the Loire Valley, Mr. Groux studied winemaking in Burgundy and continued his studies at the University of Bordeaux. He traveled around the world to learn more about winemaking styles – a trip that eventually brought him to the Niagara region in the early 1980’s.

Inspired by the ideal natural growing climate of the Niagara region in Canada and intrigued by how Hillebrand Estates Winery differed from the vineyards in Loire Valley to which he was accustomed, Mr. Groux saw an opportunity to develop his own particular art form. Working with Hillebrand’s state-of-the-art winemaking equipment and extensive barrel aging facilities and in close partnership with local grape growers, J-L consistently produces a broad array of award winning wines.

When J-L Groux joined Hillebrand Estates Winery in 1989, he saw it as a unique opportunity for a winemaker – a chance to experiment with grape varieties, winemaking techniques and grape growing practices.

In 1998, J-L was honored with the title of Winemaker of the Year by the Air Ontario Wine Awards. Since 2004, JL is heading the winemaking at the new and innovative LEED certified Stratus Vineyards as well in Niagara. The winery is built to make super premium wine and do not use pumps from grapes to bottles.

Jane Baxter Lynn

Ms. Baxter Lynn has a strategic marketing and communications consulting business (www.jblprstrategies.com), specializing in the travel & tourism and wine industries. The company provides services on a global, national and regional level. Ms. Baxter Lynn has extensive experience in building brand identities and working with companies to increase business. Through her work with the World Travel & Tourism Council and the Long Island Wine Council (New York) and Washington wine regions, Jane has gained unique insights into the burgeoning wine tourism market.

Dr. Tim Martinson

Dr. Martinson is currently Senior Extension Associate in Viticulture and Statewide Coordinator of Viticulture Extension at Cornell University. From 1997 to 2006 he served as Area Educator with the Finger Lakes Grape Program, with a clientele of 230 grape growers and 80 wineries producing a wide range of Labrusca, Hybrid, and vinifera grapes on 10,000 acres of vineyard in the Finger Lakes. In addition to writing a weekly e-mail update and monthly newsletter, *Finger Lakes Vineyard Notes*, Tim participates in several cooperative research projects annually with area growers and researchers at Cornell University. Recent projects have included editing and coauthoring the New York Sustainable Vineyard Practices Workbook for Growers, use of cane burial to protect fruiting potential of cold-tender varieties, irrigation and foliar nitrogen to prevent Atypical Aging (ATA) of white wines, and a survey of Finger Lakes vineyards for grapevine leafroll virus.
**Dr. Bobby D. Moser**

As Vice President for Agricultural Administration and University Outreach at The Ohio State University, Bobby Moser oversees one of the largest adult, continuing education and extension programs in the nation. Bobby Moser became the head administrator of Ohio State’s College of Food, Agricultural, and Environmental Sciences in 1991.

Dr. Moser heads the College’s resident instruction program, Ohio State University Extension, the Ohio Agricultural Research and Developmental Center, and the Agricultural Technical Institute at Wooster. He oversees 2,200 faculty and staff statewide and 3,200 agricultural and natural resource students in the undergraduate, graduate, and two-year programs within the College of Food, Agricultural, and Environmental Sciences.

Under Moser’s leadership, in 2005 the college received an $11.6 million Third Frontier award to create the Ohio BioProducts Innovation Center, which will work to develop specialty chemicals and products from raw materials grown in the state, including corn and soybeans. That same year, the college also received a $1.5 million Third Frontier Wright Project grant for the creation of an innovative bio-energy research facility to turn various agricultural and food-processing wastes into energy.

Moser is nationally recognized and is credited with the development of scientifically sound and sustainable programs, while incorporating ecological ethics and technological innovations. His developments in the field continue to influence and drive the future of agriculture in the United States and around the world.

Prior to becoming Vice President, Moser was director of OSU Extension from 1988-1991. He came to Ohio after seven years at the University of Missouri, where he served as chair of the Department of Animal Sciences and later as the associate dean of Agriculture, and Agriculture Extension program director. Prior to that, he chaired the Department of Animal Science at Missouri and was on the animal science faculty at the University of Nebraska.

Born in Cyril, Oklahoma, Bobby Moser earned his B.S. and M.S. degrees in Animal Science and Nutrition at Oklahoma State University in 1965 and 1969, respectively. He earned a Ph.D. in Animal Nutrition at the University of Nebraska in 1972.

He and his wife, Pat, live in Dublin, Ohio.

**Dr. Cliff Ohmart**

Dr. Ohmart has a B.Sc. degree in forest biology from the SUNY College of Environmental Science and Forestry and a Ph.D. in entomology from the University of California Berkeley. He was a principal research scientist for CSIRO Division of Forest Research in Australia for 13 years where he did basic research on insect pests of Monterey pine and Eucalyptus. From 1989 to 1995 he worked as a private consultant for Scientific Methods, Inc. in Chico, California helping growers develop IPM programs for almonds, walnuts, prunes, and pistachios. He is currently the Research/IPM Director for the Lodi-Woodbridge Winegrape Commission where he is helping winegrape growers implement sustainable farming practices in their vineyards. He has authored and co-authored many publications in international research journals. His most recent
publications are as co-editor of the *Code of Sustainable Winegrowing Practices Self-Assessment Workbook* published in 2002 by the Wine Institute and California Association of Winegrowers, senior author of *Lodi-Winegrower's Workbook: A self-assessment of integrated farming practices*, published in 2000 by the Lodi-Woodbridge Winegrape Commission. He has presented over 300 seminars, conference papers and symposia papers at Universities, government research organizations, and grower groups throughout the US, Canada, Australia, New Zealand, Sweden and Finland and is very active at the county, state and national level in pest management and wine industry affairs.

**Dr. Bill Randle**

Dr. Randle is the new Chair of HCS department at OSU. Prior to joining OSU on 1 November 2006, Dr. Randle was a faculty at the Department of Horticulture at the University of Georgia. Formally trained in plant breeding and genetics, Dr. Randle has worked with most of the 28 major vegetables produced in the United States. He has experience and expertise in plant biochemistry and plant secondary metabolic activity, especially as it relates to flavor and therapeutic compound accumulation. Since 1989 when he first arrived at the University of Georgia (UGA), Dr. Randle has worked with the Vidalia onion industry, seeking solutions to help grower produce the sweet and mild Vidalia onion. His work has developed an international following and he has been asked to speak in such distant places as Argentina, New Zealand, Australia, China, Hungary, Peru, and the UK. Early in his career Randle was a sweet potato and tomato breeder at Louisiana State University. He is the breeder of record for the 'Beauregard' potato, which continues to be the most popular sweet potato cultivar grown and consumed in the United States. Randle also brings industry experience to his record through plant breeder experience as the Director of Variety Development for Basic American Foods in California. Dr. Randle earned his bachelor's degree at the University of Arizona, master's at Michigan State University and doctorate from the University of Minnesota.

**Russell Robbins**

Mr. Robbins is currently the enologist and manager for Laffort Oenologie in North America. He received a master’s degree in Enology from UC Davis and a BS degree in Chemistry. Mr. Robbins is also a consulting winemaker in the Napa Valley and has worked for Kent Rasmussen Winery, Opus One, Domaine Carneros and Etude.

**John Santos**

John Santos graduated from Cornell University with a Bachelor of Science in Natural Resources in December of 1989. His love for zymurgy led him to pursue a job in the wine industry. In the winter and spring of 1990 he worked at Herman J. Wiemer Vineyards as a cellar hand. In August of the same year he moved to Hazlitt 1852 Vineyards were he worked in all aspects of the business. In the winter of 1992/93 John Santos joined the vineyard crew at the Knapp Winery. He was employed there until after the 1994 harvest when he returned to Hazlitt 1852 Vineyards to become their Vineyard Manager. He has spoken at Wineries Unlimited and the Waterloo Grape Convention. He has also written several articles for Vineyard and Winery Management Magazine.
Dr. Steven Slack
Dr. Slack has been at the Ohio State University since 1999 as Associate Vice President for Agricultural Administration and Director of the Ohio Agricultural Research and Development Center. Dr. Slack received his B.S. and M.S. degrees from the University of Arkansas - Fayetteville and his Ph.D. degree from the University of California - Davis. In 1975, he joined the faculty of the Plant Pathology Department at the University of Wisconsin at Madison and in 1988 he joined the Cornell University faculty as the Henry and Mildred Uihlein Professor of Plant Pathology and was department chair from 1995 - 1999. He is a fellow and past President of the American Phytopathological Society, an honorary life member and past President of the Potato Association of America, and a fellow of the American Association for the Advancement of Science (AAAS). Honors include a USDA Group Honor Award for Excellence in 1995 for work on a non-pesticidal control strategy for the potato golden nematode, the Outstanding Alumnus award from the Dale Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas in 1996, and the meritorious service award for research by the National Potato Council in 1997.

Dr. Keith Smith
Dr. Smith became the Director of Ohio State University Extension and Associate Dean of the College of Food, Agricultural, and Environmental Sciences at The Ohio State University (OSU) on July 1, 1992, was last reappointed in 2004. On July 23, 1998, Dr. Smith was named as Associate Vice President for Agricultural Administration, and on July 1, 2006, he was appointed as Gist Chair in Extension Education and Leadership within the Department of Human and Community Resource Development (HCRD).

With over a $65 million budget, OSU Extension is an organization with nearly 1,000 faculty and support staff, who design and deliver educational programs to the more than 11 million citizens of Ohio. The programs focus on agriculture and natural resources, family and consumer sciences, youth development and community development. As Director, Dr. Smith is responsible for the entire operation of the OSU Extension organization, including budget development and management, legislative contacts on resources and programs, personnel policy development, and coordination with other agencies.

As Associate Vice President for Agricultural Administration, Dr. Smith extends his duties beyond the college as he interacts with the university and community at large as a representative of the Vice President. In his role as Associate Dean, he is responsible for recommendations to the Vice President for Agricultural Administration and Dean of the college concerning allocation of funds, selection, promotion, and remuneration of Extension personnel, and provides leadership in both program and policy development.

As Gist Chair in Extension Education and Leadership, he collaborates with Extension Education faculty in mentoring faculty, and designing and conducting research and scholarship, especially in the area of leadership. He is also responsible for creating graduate and in-service programs for Extension to attract participants from across the nation and for developing seminal literature that will influence Extension Education practice throughout the country.
A native of Utah, Dr. Smith received his bachelor’s and master’s degrees in Agricultural Education from Utah State University in 1974 and 1976, respectively, and his Ph.D. degree in Agricultural Education from Iowa State University in 1980. Dr. Smith began his career in 1973 as an agriculture science teacher in Brigham City, Utah, followed by two years as a vocational agriculture teacher in Orem, Utah. He joined the Utah Cooperative Extension Service in 1976 as a county agent in Cache County, Utah. In 1978, he moved to Iowa State University as an instructor and Extension associate while working on his Ph.D. He came to OSU in 1980 as Extension Leader for Personnel Development and Assistant Professor in the Department of Agricultural Education. In 1989, he became Associate Director for Extension.

Dr. Smith is a professor in the department of HCRD at OSU. He has authored/co-authored numerous refereed articles and papers in the areas of leadership, teaching and program development. He has served on copious university, college, professional, regional and national committees. Dr. Smith was nominated and received the National Distinguished Service Ruby Award, Epsilon Sigma Phi (Cooperative Extension Professionals’ Organization). He served as chair for the national Extension Committee on Organization and Policy (ECOP) for the year 2003-2004. Most recently, Dr. Smith participated as a fellow in the Kellogg Food Systems Leadership Institute – a training ground for future high-profile leaders in the university setting.

**Randy Ullom**

A native of Ann Arbor, Michigan, Randy became interested in wine during a three-year stay in Chile, while on sabbatical from college in the early 1970s. His stay inspired a cross-country trek through Chile's vast wine-growing regions. On his return to the United States, he entered Ohio State University to study crop production with a specialty in Viticulture and Enology and received his degree in 1975.

After six years as a vineyard manager and Winemaker in Ohio and upstate New York, Randy moved to California to become associate Winemaker at De Loach Vineyards in Sonoma County. He was promoted to Winemaker and Vice President in 1991. The wines produced during his tenure were consistent gold medal winners at wine competitions.

Hired by Jess Jackson in 1993 as Winemaker for some of our smaller and international vineyards, Randy was handed his most prestigious assignment in 1997 – Winemaster for Kendall-Jackson Winery. This has been followed recently, fall of 2006, by the additional appointment of Ullom to Chief Operating Officer of Kendall Jackson Wine Estates.

"I look at all of the vineyards we own, and all of the individual lots of wines that we make, and the thousands of barrels we have sitting in our cellar and sometimes I think, you gotta be kidding me! After I've sufficiently recovered from my daily panic attack, I take off my coat, dig in my heels and take it one barrel at a time. It's a rewarding job that I love."
What is Sustainable Viticulture and How Do You Practice It?

Dr. Clifford P. Ohmart  
Research/IPM Director  
Lodi-Woodbridge Winegrape Commission  
2545 West Turner Rd.  
Lodi, CA 95242  
Contact: (209) 367 4727 or cliff@lodiwine.com

There are three major challenges in sustainable viticulture: 1) Defining it; 2) Implementing it in the vineyard; 3) Measuring its effects. I will describe how the Lodi growers are meeting these challenges and how their success has influenced the California wine industry.

The word ‘sustainable’ is being discussed by more and more people and agriculture is no exception. One of the biggest challenges in dealing with sustainability issues is to define what sustainability is. One of the best ways to do this is to trace the history of sustainable agriculture, which I will briefly do in my presentation. Once there is consensus on its definition the next challenge is to put theory into practice. In other words how does a winegrape grower practice sustainable viticulture? In 2000 the Lodi-Woodbridge Winegrape Commission published the Lodi Winegrower’s Workbook: A self-assessment of integrated farming practices which is a tool to help a winegrape grower implement sustainable farming practices in their vineyards. I will describe how and why the workbook was created, how it was used in the Lodi region, and how it has influenced the California wine industry, as well as other US winegrowing regions. Finally, measuring the effects of implementing sustainable winegrowing practices is critical. There is an old business adage, ‘If you can’t measure it you can’t manage it’. I will describe how the self-assessment workbook is used to measure implementation of sustainable viticulture and how this can be done over time. I will end my presentation by describing how the Lodi-Woodbridge Winegrape Commission has used its experience with the Lodi Winegrower’s Workbook to develop California’s first third party-certified sustainable winegrowing program that is being used to market Lodi wines.

Notes
Sustainable Viticulture in the East - Special Challenges and Opportunities

Dr. Timothy E. Martinson
Senior Extension Associate in Viticulture
Finger Lakes Grape Program
Cornell Cooperative Extension
tem2@cornell.edu
http://flg.cce.cornell.edu

Coauthors: Alice Wise, Long Island Grape Program, Cornell Cooperative Extension of Suffolk County, Tim Weigle, Lake Erie Regional Grape Program, Jamie Hawk, Finger Lakes Grape Program

Sustainable Viticulture programs, such as the Lodi- Woodbridge program described by Cliff Ohmart in the previous talk, have taken hold in Western states. These programs have been driven by 1) the need to demonstrate to suburban neighbors and environmental groups that growers and wineries are using environmentally sensitive production practices and 2) the potential for ‘green marketing’ of wines produced using sustainable production practices. They aim to 1) define what ‘sustainable practices’ are; 2) help growers assess how they are doing in applying these practices (through workbooks); and 3) encourage adoption of more sustainable practices through use of ‘action plans’. Major practices encouraged by the Lodi program include: monitoring pests; Planting cover crops; leaf-pulling; use of organic fertilizers; owl boxes and raptor perches; reducing pre-emergent herbicide use; release of mite predators; use of a powdery mildew model; drip irrigation; and ‘soft pesticides’ and reduced rates.

In developing a program for New York, we used programs developed in the West as a model. But we also realized that the Northeast and Midwest have special challenges not encountered in arid, irrigated production areas in the West. Our cool, rainy climate with potential winter injury involve a host of issues not encountered in California, Oregon, and Washington. Growers in the east manage 5 major diseases, deal with a high potential for soil erosion and drainage problems, and apply special practices for winter injury protection. Moreover, our program deals with a wider range of cultivars—from bulk Concord juice grapes to hybrid varieties to high-end Merlot and Riesling—each with unique training systems and production practices. Our draft Sustainable Practices workbook includes nearly all of the areas mentioned above, plus sections on issues unique to the East.

Our program in New York includes: 1) development of a Sustainable Practices workbook; 2) Grower outreach; 3) Supplemental ‘Sustainable Viticulture in the Northeast’ newsletter including specific ‘sustainability concepts’, ‘best management practices’, and ‘grower sidebars’ for different production areas to help growers apply these concepts on their farms, and 4) linkage with the State Soil and Water Conservation Committee’s Agricultural Environmental Management program (AEM) to connect growers with cost-sharing programs to assist them in adopting sustainable production practices. I’ll describe how industry led and provided input to developing this program, what the benefits are for growers, and how growers have reacted to this program in New York.
The Stratus Project: From Philosophy to Awards

Jean-Laurent Groux  
Winemaker  
Stratus Vineyards  
2059 Niagara Stone Road  
Niagara-on-the-Lake ON L0S 1J0  
Contact: 905.468.1806 X 222 or jlgroux@stratuswines.com

- Overall winemaking philosophy  
  o The future of traditions  
  o The art of assemblage  
  o Diversity for Complexity  
  o Crafting by attention to details

- Vineyard is #1  
  o 18 French, Italian and Spanish varieties in cool climate style  
  o Low yield Scott Henry canopy (< than one bunch per shoot) – Average of 3 T/A  
  o 44 blocs on 54 acres (ex: 6 blocs of Cab Sauv) = Diversity for complexity.  
  o Not organic but sustainable ex: Use of hoeing and weed burner instead of chemicals  
  o Wind machine for improved quality by ripening longer in fall. Frost control as well  
  o Vines as old as 20 years and new planting with selected low yield clones grafted on Riparia a low vigour rootstock native from Niagara.  
  o Drained every row or other row.  
  o Lots of hand labour from hoeing to picking in small boxes

- Winery  
  o Designed totally to make super premium wines. Not an agro tourism center Not a Bordeaux Château look.  
  o It is a small winery. It looks large because we use gravity and a lot of barrels. Current capacity is 10 000 cases. With additional oak fermenters and tanks the capacity will be 16 000 cases.  
  o Barrels capacity: 1000 barrels  
  o Unique grapes cascading flexible reception system  
  o True gravity No use of trucks or pump except for tank cleaning  
  o We bring the equipment to the grapes/must/wine. No processing area  
  o Grapes and wines take lifts and we take stairs!  
  o Use of gases for gentle handling instead of mechanical actions.  
  o Elaborate QC program  
  o High hygiene standards  
  o 22000 ft² (2000 m²) with winery 14000 ft², Mezzanine Grape reception 5800 ft² and Store 2400 ft². The winery is 30 ft tall, 150ft long and 100ft large- The store is 50 ft by 50 ft  
  o Environmentally friendly  
    ▪ Pending LEED certification  
    ▪ Geothermy energy to heat and cool.
• Durable material
• Recycling of grapes by-products to grape seed oil, and organic matter for the vineyards
• Use of mechanical action to clean and ozone to sanitise to minimise chemical use

• Winemaking techniques
  o Hand picked and double sorting
  o No pump winemaking
  o Use of elevator tanks
  o White grapes maceration and hyper oxidation
  o Rack and return and pulse air on reds grapes
  o Three to six weeks maceration on red varieties
  o Micro oxidation
  o Yeast and bacteria strains adapted to each variety
  o Aging on lees for red wines as well as white wines
  o Keep wines in the same barrel for 1.5 to 2 years = Diversity for complexity
  o Late assemblage to make the best choices.

Notes
Chardonnay Winemaking Techniques

Randy Ullom
Winemaster, Chief Operating Officer,
Kendall Jackson Wine Estates
PO Box 2129
Healdsburg, CA, 95448

Brief discussion of the history, climate, winegrowing, viticultural cycles and winemaking of Chardonnay – followed by a component winemaking tasting

Notes
Ohio Quality Wine: A New Wine Quality Assurance Program

Michelle Widner
Program Manager
Ohio Grape Industries Program
Ohio Department of Agriculture
8995 East Main
Reynoldsburg, OH 43068
Contact: (614) 728-4216

The Ohio Grape Industries Committee (OGIC) and the Viticulture and Enology Program in the Department of Horticulture and Crop Science at OSU have worked for over three years to develop a wine quality assurance program that will establish quality as the signature for Ohio wines.

The upcoming program is voluntary and open to Ohio A-2 permit holders. Wine must be made from not less than 90% Ohio grown fruit. All wines made from vinifera or hybrid grapes are eligible. Native grapes may only be used in ports and sherries. The program hopes that by increasing the demand for Ohio fruits, it will in turn encourage expanding vineyard acres with high quality wine grapes.

Judging for Ohio Quality Wines will coincide with the Ohio Wine Competition (OWC) with additional judges as required by the industry. The Enology Group at OARDC will continue to run the Ohio Wine Competition and seek out credible judges with experience in Eastern section wines.

The Ohio Grape Industries Committee will provide specific marketing materials including but not limited to: seals for bottles, neck hangers, shelf talkers, posters, and signage. Only wines that seek and earn the quality seal will receive these materials. As an example, there were approximately 40 wines from the 2006 OWC that would have met eligibility criteria for the Ohio Quality Wine program.

The presentation will allow for comments and questions from the audience.

Notes
The goal of the OSU Sustainable Agriculture Team is to coordinate and enhance research, teaching and education outreach efforts on behalf of the University in the area of sustainable agriculture. Research and outreach efforts have currently impacted several commodity areas in Ohio including agronomic crops, vegetable and fruit production, animal industry, greenhouse, floriculture, forages, organic, and sustainable enterprises.

Notes
Sustainable Disease Management

Dr. Mike Ellis
Professor
Department of Plant Pathology, OARDC
1680 Madison Avenue
Wooster, Ohio 44691
Contact: 330-263-3849 or ellis.7@osu.edu

In 2006, several growers experienced severe damage due to cluster infections by the powdery mildew fungus. The most critical period for controlling clusters infections by powdery mildew with fungicides is from immediate pre bloom through 3 to 4 weeks after bloom. Spring frosts killed many primary buds in several vineyards resulting in fruit being produced from secondary or tertiary buds. This extended the bloom period in some vineyards, increasing the length of time that fruit remained susceptible to powdery mildew infection. This is partially responsible for high levels of fruit infection in some vineyards. Dr. Ellis, will review the critical period for controlling fruit rots in Ohio and discuss the potential effects of spring frost damage on this critical period. He will also provide an update on new developments for grape disease management in 2007.

Notes
Sustainability and Pest Management in Viticulture

Dr. Roger N. Williams and Dan S. Fickle
Professor
Dept. of Entomology, OARDC/OSU
1680 Madison Avenue
Wooster, Ohio 44691
Contact: 330 263 3731 or williams.14@osu.edu

Sustainable pest management in viticulture means utilizing pest control methods that, (1) maintain vine health, (2) reduce crop loss, (3) minimize human risk, (4) lessen environmental impact and (5) Improve vineyard economics. In this presentation we will be discussing how the development of new pesticides along with new technologies and a better understanding of pest biology and behavior are paving the way for growers to obtain the goals of sustainable pest management in the 21st century. We will also be presenting a brief look back at where we have progressed from.

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Winery Design and Layout

Kristopher Sperry  
Owner/Winemaker  
Myrddin Winery  
3020 Scenic Ave.  
Berlin Center, OH 44401  
Contact: (330) 654 9181

We will spend our time together in three (3) "chapters". The first will be a case study showing the decision tree of a start up winery. The second will be a discussion about the expansion of an existing facility. The third will be a collection of "tips and tricks" that I have collected in my travels and want to share with you.

Notes
Cabernet Sauvignon Building Blocks

Randy Ullom
Winemaster, Chief Operating Officer,
Kendall Jackson Wine Estates
PO Box 2129
Healdsburg, CA, 95448
e-mail: rullom@kjmail.com

An overview on Cabernet Sauvignon and its history, the importance of terroir, the desired flavor profile and attainment thereof. Additionally, an example of a California blend will be discussed – followed by the preferred vinification and aging practices of Cabernet Sauvignon.

Notes
A Brief Overview of Several Malolactic Fermentation Studies at OARDC

Todd Steiner
Enologist
Department of Horticulture and Crop Science
The Ohio State University/OARDC
1680 Madison Avenue
Wooster, OH 44691
Contact: (330) 263-3881 or steiner.4@osu.edu

This presentation will deliver a brief overview of several malolactic fermentation studies ongoing at the OARDC examining a few direct inoculation (MBR) bacterial strains and the relationship that pH, SO₂ and temperature play in the successful completion of MLF.

Malolactic fermentation (MLF) refers to the conversion of L-malic acid to L-lactic acid and carbon dioxide by certain lactic acid bacteria. This secondary fermentation generally occurs after the primary fermentation and results in reduced wine acidity. Due to the cool climate and short growing season, grapes grown in Ohio may produce wines of high acidity. For this reason MLF is often encouraged in certain Ohio wines as a natural deacidification practice. Malolactic fermentation may also aid in complexity benefiting certain wine varieties in both flavor and aroma profile. Another positive attribute of completing a MLF is by providing an unfavorable environment for other microbial instability problems. Although it is desirable, initiation of MLF is often difficult due to many factors inhibiting this secondary fermentation. In addition to bacterial strain differences, several factors such as pH, SO₂ levels, and temperature are critical in the development of a complete and successful MLF profile.

The Influence of Several Direct Inoculation Malolactic Bacterial Strains on the Quality of Cabernet Franc and Chambourcin Wines

A study evaluating several direct inoculation malolactic bacterial strains were performed on 2000 Cabernet Franc and 2001 Chambourcin wines for observed differences in wine chemistry, fermentation rates and sensory preferences. Five lots of seven were inoculated with a commercial malolactic bacteria strain: Enoferm Provino, Enoferm D, MBR EQ54, MBR OSU, and Vinoflora Oenos. As expected, chemical analysis indicated that the control wines held at 35°F with no MLF occurring was highest in total acidity and lowest in wine pH. The control held at 70°F for the 2000 Cabernet Franc and 2001 Chambourcin completing a natural MLF were similar in wine chemistry data as the inoculated MLF strains. In regards to color, results showed that the natural and inoculated MLF strains contained less color intensity and expressed a shift in hue. These changes were probably related to the higher pH values of the wines completing MLF then the control wine at (35°F).

Bacterial strain showed an influence on the rate of MLF. Although a natural MLF occurred in the control at 70°F for the 2000 Cabernet Franc and 2001 Chambourcin at 24 and 36 days respectively, the rates were considerably slower then the inoculated strains. For the inoculated strains, Enoferm D completed MLF in the shortest time of 3 days for the 2000 Cabernet Franc
wines with both Enoferm D and Enoferm Provino completing MLF first (7 days) for the 2001 Chambourcin wines.

Paired sensory evaluation data indicate a preference of all direct inoculation strains over the control held at 35°F. In both the 2000 Cabernet Franc and 2001 Chambourcin wines, panelist chose Enoferm D most in preference to the control at 35°F. Even though the natural MLF control held at 70°F was also chosen in preference over the 35°F control, it was chosen the least amount of times from panelists in preference when compared to the inoculated strains over the 35°F control.

The Effect of pH and SO$_2$ on the Rate and Completion of MLF in Pinot Gris Wines

Pinot Gris juice in 2004 was adjusted to pH levels of 3.0, 3.2, 3.4, and 3.6 and added SO$_2$ levels of 0, 20, 40 and 60 ppm for each pH level. The juice was inoculated with a commercially available yeast strain (Wadenswil 27) and allowed to ferment until dryness. The wines were then inoculated with Viniflora® CH-35 malolactic bacteria and monitored for completion of MLF by paper chromatography. Overall, a correlation was observed between must pH and SO$_2$ and their influence on both the rate and completion of MLF was evident. Results indicate that a must pH value of 3.6 finished MLF quickest over all SO$_2$ levels. As SO$_2$ concentration increased, a direct correlation was observed with increasing the number of days to complete MLF at all pH levels. It is important to note that the must treatment at pH 3.0 did not finish MLF across all SO$_2$ treatment levels.

The Effect of pH and Temperature on the Rate and Completion of MLF in Chardonnay Wines

Chardonnay juice was adjusted to pH levels of 2.95, 3.15, 3.30, and 3.5, inoculated with a commercially available yeast strain (Wadenswil 27) and allowed to ferment until dryness. The resulting wines were analyzed for pH and reported at 3.12, 3.31, 3.45, and 3.65 respectively going into MLF. The wines were then inoculated with Viniflora® CH-35 and placed in separate temperate treatments of 55, 63, 70, and 80°F for MLF. Wines were monitored for completion of MLF by paper chromatography. In observing data related to wine pH, MLF occurred at a faster rate in the pH 3.45 and 3.65 wines with similar results across all temperature treatments. Wines at pH 3.12 took the longest to complete MLF across all temperature treatments. In looking at the effects of temperature, it is clear to see that the wines subjected to a temperature of 55°F took significantly longer to complete MLF for all pH treatments. Even though MLF occurred relatively quick at a temperature of 80°F except in the 3.12 pH treatment, the observed sensory evaluation indicated a drop in varietal aroma and flavor profile in addition to an increased acetaldehyde perception.
Off-Premise Wine Sales Panel

John Switzer, Ken Bement

The Gateway Place
14875 Navarre Rd SW
Wilmot, OH
Contact: (330) 359-5535

Whet Your Whistle Wine Store
6663 N. Ridge Rd.
Madison, OH. 44057
Phone: (440) 428-5339

John Switzer of the Gateway Place in Wilmont -- a lovely shop in a beautiful Victorian house and barn that includes a huge selection of Ohio wines representing 36 wineries from the Buckeye state. John will address why he made the decision to establish an all Ohio presence, and how the 'all Ohio' wine selection works in his shop. He will discuss how Ohio wineries can do a better job of selling their wines in an establishment like his and also talk about how this concept can be translated to other regions of the state.

Ken Bement, a sought after wine judge and owner of the Wet Your Whistle Wine Shop in Madison -- a traditional beverage carry out that offers an excellent selection of wines from around the world. Ken's store is located in heart of the eastern Lake Erie wine region and he offers a wide selection of Ohio wines. He will discuss how the Ohio component fits into his overall marketing plan. He will also talk about his relationship with direct sales from wineries and through distributors.

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OSU Extension: An Evolving Organization

Dr. Keith Smith
Associate Vice President, Agricultural Administration;
Associate Dean, College of Food, Agricultural and Environmental Sciences;
Director, Ohio State University Extension; and
Gist Chair in Extension Education and Leadership

Extension’s early roots were founded in Agriculture and Home Economics. Today, Extension has a focus more broad and inclusive for the citizens in which it serves. We maintain the ideal we were founded upon, to make lives better, continue to educate the public on Agriculture and Family and Consumer Sciences, and have expanded early on to also educate our youth with 4-H Youth Development and later to improve communities with our Community Development program. While 4-H has been in existence for over 100 years, the range of projects has grown and allowed more youth to become involved in this remarkable program. As our programming has evolved, our culture of funding has too. Funding for programs has become more competitive at all levels of government, and thus, Extension’s funding is often leveled or cut while our costs of providing programming continues to rise - a reality all organizations are facing. To counterbalance this trend, Extension has implemented cost recovery. In order to continue offering programs for the public good at little or no cost, programming for the private good now comes at a cost. Our organization has become more entrepreneurial. We actively seek out grant and contract dollars to maintain and expand our programming to its fullest extent, and we are increasingly successful in this endeavor. By continuing this momentum, seeking out competitive dollars that align with our core goals and remaining adaptable to a changing environment, Extension’s relevance for the citizens of Ohio will continue to grow.

Notes
Results of the Ohio Grape and Wine Industry Survey

Dr. Imed Dami, Todd Steiner, and Dr. Taehyun Ji
Department of Horticulture and Crop Science
Ohio Agricultural Research and Development Center
The Ohio State University
1680 Madison Avenue,
Wooster, OH 44691
Contact: (330) 263-3882 or dami.1@osu.edu

The Ohio grape and wine industry has experienced a remarkable expansion in number of wineries and wine production in the past 10 years. With growth, comes new challenges both in vineyards and wineries. In order for the grape and wine industry to remain competitive regionally, nationally, and internationally, emerging and unforeseen production challenges need to be overcome and addressed by research and education. The objectives of the survey were: 1) To determine grape acreage and production in 2004; 2) To assess fruit quality control practices in vineyards; 3) To identify the major vineyard practice issues; 4) To determine wine production in 2004 and assess wine quality control in wineries; 5) To identify and rank research priorities; and 6) To identify and rank extension priorities.

In November 2004, a total of 158 Surveys were mailed to Ohio grape and wine producers representing 83 vineyards, 60 wineries-vineyards, and 15 wineries. Sixty seven (67) surveys were returned or a 46% response rate. The results of the survey were summarized in an OARDC Special Circular #198 published in December 2006. Based on the results of the survey, the Viticulture and Enology Program (VEP) has adjusted its research and extension priorities to take into account the evolving needs of the Ohio grape and wine industry. A summary of research and extension priorities and major accomplishments by VEP will be presented. The VEP Team is grateful for the financial support provided by the Ohio Grape Industries Committee (OGIC) to support research and educational programs.

Notes
Characterization of Aroma Profiles of Traminette Grape Grown in Different Climatic Regions

Dr. Taehyun Ji and Dr. Imed Dami
Department of Horticulture and Crop Science
Ohio Agricultural Research and Development Center
The Ohio State University
1680 Madison Avenue, Wooster, OH 44691
Contact: (330) 2633814 or ji.16@osu.edu

Traminette, an American hybrid cultivar, has been one of the most planted cultivars among hybrids in Ohio, Midwestern and eastern states. Its moderate cold hardiness and disease-resistance make Traminette a better alternative to Vitis vinifera cultivars in cold and disease-prone regions. Ohio is geographically divided into roughly three climatic regions based on length of growing season and heat unit accumulation. Traminette has been grown successfully in northern (cooler) and southern (warmer) climates of Eastern and Midwestern regions.

Although Traminette grape produces superior quality of wine, studies on its aroma and flavor profiles have not been reported. The objectives of our study were to characterize a standard aroma profile for the fruit of Traminette and compare to other white cultivars commonly grown in the East, and to determine whether regional climatic differences influence its aromatic profile.

A rapid method of determining aromatic compounds in grape berries was developed using gas chromatography-mass spectrometry (GC-MS) with headspace-solid phase micro extraction (HS-SPME). Our study showed that Traminette is rich in free volatile compounds more than any other cultivars we tested. Specifically, Traminette berries are mainly composed of hexanal, trans-2-hexenal, 1-hexanol, cis-2-hexen-1-ol, linalool, nonanal, α-terpineol, decanal, nerol, and geraniol. The predominant and common volatile monopropene in Traminette and Gewürztraminer is geraniol. Free volatile compounds of Traminette varied depending where the vines were grown.

Notes
Overview of Trip to Wine Regions in Germany

Michelle Widner, Greg Johns, Andy Troutman

Ohio Grape Industries
Program
8995 East Main
Reynoldsburg, OH 43068
Contact: (614) 728-4216

Ashtabula Agricultural
Research Station
Contact: (440) 224 0273
or johns.1@osu.edu

Troutman Vineyard
4243 Columbus Rd
Wooster, OH 44691
Contact: (330)2634345

Greg Johns
The history of Germanic winegrowing began around 100 B.C. when Romans first brought cuttings into these territories. This makes what is now Germany, one of the oldest winegrowing regions of Europe. In addition, it is also one of the most northerly viticultural climes.

Out of climatic necessity, early winegrowing efforts have focused on increasing fruit ripeness by; capturing heat and sun through planting on south and south-west slopes, planting along its many reflective rivers, breeding and selection of earlier ripening cultivars and clones, improving viticultural practices.

In this session we will discuss battles confronting today’s German winegrower and what they’re doing about it. Topics include rising labor costs, vineyard economics, and the ever-changing world palate, just to name a few.

Andy Troutman
In March of 2006 the Ohio Grape Industries program organized a trip to the wine regions of Germany. The trip was hosted by the German Wine Academy and was attended by twenty (I'm estimating) individuals representing the Ohio wine industry. Andy will talk about the trip to Germany and share his highlights and insights from the experience.

Notes
Integrated Pest Management (IPM) in Vineyards

Dr. Clifford P. Ohmart
Research/IPM Director
Lodi-Woodbridge Winegrape Commission
2545 West Turner Rd.
Lodi, CA 95242
Contact: (209) 367 4727 or cliff@lodiwine.com

The concept of Integrated Pest Management (IPM) has been around for almost 60 years and yet many people still talk about it as if it were a relatively new approach to managing pests. Moreover, if you ask several people to give you their definition of IPM you are likely to get several different ones. I feel this is in part due to the fact that Universities and agricultural pest management consultants and advisors have not done a good job educating growers about IPM. IPM is not a laundry list of practices to implement but is an approach to managing pests. It is easy to get lost in the details of specific pest management practices and lose focus on what IPM really is and how to apply it to one's own pest problems. To help the audience better appreciate this I will quickly trace the history of pest control from the use of cultural practices and a few heavy metal-based pesticides, through the invention of synthetic, carbon-based pesticides, to the development of IPM to solve the problems the overuse of synthetic pesticides created. I will then present the definition of IPM we use in Lodi, describe the five basic components that make up an IPM program, and share some thoughts on why IPM implementation is a challenge. I will end by discussing IPM programs for a few important vineyard pests in California to illustrate how the five components of an IPM program fit together to solve important pest problems while minimizing economic, environmental and health risks.

Notes
Sustainable Weed Management in the Vineyard

Dr. Doug Doohan
Department of Horticulture and Crop Science
Ohio Agricultural Research and Development Center
The Ohio State University
1680 Madison Avenue,
Wooster, OH 44691
Contact: 330 202 3593 or doohan.1@osu.edu

Sustained suppression of weeds to low levels that do not affect yield, quality, or harvestability occurs when appropriate practices and tactics are utilized in a well thought-out program. The program must consider biological, economic and environmental realities of the vineyard. Moreover, the overall approach used to suppress weeds is, by definition, one that conserves and protects environmental resources within the vineyard and minimizes the use of off-farm inputs.

The first step in sustainable weed management is to completely eliminate perennial weeds before planting grapevines. This must be done the year before planting. Growers who neglect this step pay later with inevitably less than satisfying results. A program to eliminate perennial weeds before planting that includes herbicides will be more effective and economical than one that relies primarily on tillage, and may be more environmentally benign. Regardless of the tactic, herbicide or tillage, the approach is to use tillage to stimulate growth of underground rhizomes and rootstocks (propagules) and then kill the above-ground sprouts along with the propagules. A single application of glyphosate (Roundup and other brands) to regrowth in mid- to late-fall will kill most (but not all) of the underground propagules. This can be followed by tillage, cover crops and additional applications of glyphosate (if needed) to rid the soil of all perennial weeds. Crop rotation, tillage and cover crops can be used without herbicides to kill perennial weed propagules but the success rate is not as high because various factors (often weather related) affect the ability of the grower to implement tactics in a timely sequence. Should tillage be the primary method, it is essential to not only stimulate growth but to regularly drag propagules to the surface where they can be killed by dessication and removed from the field. Timing is very critical when tillage alone is used to kill propagules. Missing just one tillage operation may allow the propagules to recover, negating all previous efforts.

The goal of weed control after grape vines are planted is to kill seedling annual grasses and broadleaf weeds when they are very small and never allow weeds to go to seed. Cultivation can be used very effectively but timeliness of operation is important. Shallow stirring of the soil will kill seedling weeds that are less than 0.5 inches tall; whereas, weeds that are 3 or more inches tall may survive relatively deep cultivation. Thermal weed control using LPG gas effectively controls a broad range of weeds. This method is used in annual row crops and should be adaptable to the grape vineyard. Mulching with organic materials such as straw or wood chips and bark will augment weed control and help conserve moisture. Weed growth will be most intense in the spring (April – June) and in autumn (September – November), thus control practices should be particularly intense and rigorous during those seasons. Perennial weeds may reestablish from seed during these periods and these must be removed from the vineyard.
before vegetative propagules are formed. Herbicides can greatly simplify control of weeds in the vineyard but should never be considered as a cure-all. Cultivation and hand weeding are required to remove species that tolerate herbicides.

Notes
Understanding Seasonal Patterns of Nitrogen Supply and Demand in Managing your Vineyard

Dr. Timothy E. Martinson  
Senior Extension Associate in Viticulture  
Finger Lakes Grape Program  
Cornell Cooperative Extension  
Contact: tem2@cornell.edu


In grapevines and other perennial plants, nitrogen is stored, mobilized, and remobilized to support growth and provide reserves to support the next season’s growth. Understanding seasonal patterns of supply and demand is important in developing soil and nutrient management plans for your vineyard. Nitrogen availability to fruit and vines is also affected by water availability, and drought-induced nitrogen deficiencies can contribute to a wine defect known as Atypical Aging.

In this talk, I’ll draw on two different research projects completed in New York to provide information on nitrogen cycling and on the use of foliar nitrogen applications to reduce or delay appearance of atypical aging (ATA) defects in wine.

In the first project, researchers Terry Bates, Lailiang Cheng, Martin Goffinet and Alan Lakso dug up mature ‘Concord’ vines at different times in the annual growth cycle to measure nitrogen content of various tissues, including labeled N-15 that allowed them to estimate amount of N derived from fertilizers. This provides information on where nitrogen is stored, how it moves around the vines during the growing season, and when demand from the soil is highest.

In the second study, we used irrigation and supplemental nitrogen applied to foliage to try to reduce or delay the appearance of Atypical Aging (ATA) flavors in white wines. ATA is a vineyard-related wine defect that is more prevalent in dry years, and is thought to be associated with drought-induced nitrogen deficiencies in fruit. Wines with ATA taste fine at bottling, but within six months to a year develop off flavors described as ‘lack of varietal character’, ‘furniture polish’, and ‘dirty dishrag’. In our study, both irrigation and foliar N was able to reduce or delay appearance of these symptoms in wines.

I’ll close the talk by discussing how growers can use information on soil organic matter, and information on vine demand to better tailor N application rates and timing to vine demand, thereby minimizing excess nitrogen use and the potential for N leaching into ground and surface waters. Most NY growers have been able to significantly reduce N inputs without sacrificing yield or quality.
Optimizing Nitrogen Use in Vineyards

Jamie Hawk
Timothy E. Martinson

Nitrogen and the Environment

Excess nutrients can enter ground and surface waters, reducing water quality and promoting detrimental, excessive production in our aquatic habitats—a process known as eutrophication. As a general rule, production in freshwater habitats tends to be limited by phosphorus, while estuarine (where fresh and salt water meet) and marine ecosystems are nitrogen limited.

When nitrogen-rich fresh water enters estuaries, it stimulates extremely high rates of production. The majority of this growth sinks out of the water column, leading to high rates of decomposition at depth. This bacterial breakdown consumes all of the oxygen in the water creating huge areas devoid of life, i.e. dead zones. On a regional level, concerns about nitrogen loading are what led to the creation of Agricultural Environmental Management (AEM) in New York. This voluntary approach seeks to reduce N runoff by encouraging farmers to adopt Best Management Practices (BMPs) to limit nitrogen runoff from agricultural sources.

Nitrogen is mobile in the soil, and excess nitrates can contaminate groundwater and wells. Regulatory agencies have set a limit of 10 ppm for nitrate-N in drinking water, though health risks have been found at lower levels than this standard. Ingestion of nitrate in water has been linked to reproductive problems and higher cancer risks in adults and an interference with blood oxygen levels in infants.

Problems associated with nitrogen runoff and leaching involve many agricultural, industrial and municipal sources. Although grape production is a relatively small contributor to the overall problem, growers can reduce their impact through careful management and planning. It is the combined effort of individuals making responsible decisions about nitrogen use throughout the state that can lead to significant reductions in the nitrogen loading to our environment.

Sustainability Concepts:

Nitrogen is the most commonly applied fertilizer in agriculture. Excess nitrogen contributes to the contamination of both ground and surface waters, leading to potential health risks for humans and environmental degradation of our coastal habitats. Furthermore, the cost of nitrogen fertilizers (tied directly to natural gas prices) is rising. By matching nitrogen supply with vine nitrogen demand and adjusting the rates and timing of supplemental fertilizers, growers can modify nitrogen inputs, often reducing rates without sacrificing yield and quality.

Best Management Practices for Nitrogen Fertilization:

- Delay first application until 2-3 weeks pre-bloom.
- Split the total amount of nitrogen applied into pre-bloom and post-bloom applications.
- Track soil characteristics to assess natural nitrogen supply and vine demand.
- Evaluate vine vigor and adjust rates accordingly.
- Tailor application rates to vine demand on a block-by-block basis.
- Use fertigation to apply nitrogen in irrigated vineyards.
- Optimize soil pH levels.
- Raise soil organic matter levels to increase nitrogen supply from natural sources.
- Maintain detailed records on nitrogen inputs, soil organic matter, vine vigor and yield.

Nitrogen Cost. Ammonium nitrate costs have climbed above $300/ton. The production costs of nitrogen fertilizers are tied to natural gas prices. Producing one ton of anhydrous ammonia (from which ammonium nitrate, urea and solution liquid fertilizer are produced) consumes 33,500 cubic feet of natural gas. As natural gas prices rise, nitrogen fertilizer prices rise in parallel. Efficient, tailored nitrogen use is the key to minimizing cost as prices escalate.
Nitrogen in the Vineyard

Growers that modify the timing, rate and form of nitrogen applied can greatly limit the loss of nitrogen from their farms. In many vineyards, nitrogen application rates can be dramatically reduced without affecting yield or vine size, but doing so requires an understanding of nitrogen sources, seasonal variations in vine demand, and an ability to use data on soils and vine vigor to estimate nitrogen needs within vineyard blocks.

The Nitrogen Cycle. Nitrogen gas (N\textsubscript{2}) makes up 78% of our atmosphere, yet this form is unavailable to vines. Instead, N\textsubscript{2} is converted to ammonium (NH\textsubscript{4}\textsuperscript{+}) by nitrogen-fixing bacteria. Decomposition of organic matter also releases ammonium to the soil, and soil bacteria further transform ammonium to nitrite (NO\textsubscript{2}\textsuperscript{-}) and nitrate (NO\textsubscript{3}\textsuperscript{-}) ions through a process called nitrification. Nitrate is the most biologically desirable form of nitrogen, though it is susceptible to loss through leaching (via water movement through the soil) and denitrification (to N\textsubscript{2} by bacteria under anaerobic [low oxygen] conditions). Loss of nitrogen to the atmosphere can also occur via volatilization, especially during dry periods following fertilizer application.

Nitrogen Sources. Nitrogen is supplied naturally in the soils through the breakdown of organic matter (major source) and the weathering of soil minerals (very minor source). The level of available nitrogen is also affected by the cation exchange capacity (CEC) of the soil. Soils carry a net negative ionic charge which attracts and holds positively charged ions (cations: such as NH\textsubscript{4}\textsuperscript{+}, Ca\textsuperscript{2+}, Mg\textsuperscript{2+}, and K\textsuperscript{+}) in the soil, preventing them from being lost through leaching and maintaining their availability to the vines.

Nitrogen in the Soil. Soil microbes transform the nitrogen compounds in the soil, and their rates of activity are driven by temperature. During the winter months, relatively little decomposition occurs, but as the soils warm in the spring and early summer, microbial activity increases, releasing ammonium from organic matter breakdown and nitrifying the ammonium to nitrate for vine uptake. Moisture conditions also influence soil nitrogen levels. Repeated heavy rainfalls, particularly during spring and early summer when the bulk of nitrogen fertilizers are applied, may promote leaching. During periods of drought, leaching is less common, but vine uptake of nitrogen is diminished unless supplemental irrigation is used.

In strongly acidic soils, aluminum (Al\textsuperscript{3+}) becomes soluble and displaces the essential nutrient cations from the cation exchange sites. Raising the pH back into the optimal range for grape production (5.5-6.5) forces the aluminum to precipitate out, opening the cation exchange sites to the desired cations and restoring the soils’ potential to hold nutrients. Soil pH also affects the activity of bacteria in the soil, impacting rates of nitrogen fixation, nitrification, and organic matter breakdown.

Nitrogen in the Vines. Research on Concord has shown that the majority (about 75%) of stored nitrogen in dormant vines is found in the roots, with the remainder stored in trunks and canes (Bates et al. 2002). These stored reserves supply the nitrogen for most of the vines’ pre-bloom growth. Uptake of nitrogen from the soil doesn’t begin in earnest until midway between budbreak and bloom, as soils warm and new root tips develop. Peak nitrogen demand is split into two distinct periods: the 2-3 weeks prior to bloom and about a month-long stretch (the majority of the canopy development stage) starting 2 weeks after bloom (Figure 1). Overall, the annual nitrogen requirement of Concord vines corresponds to about 50 lb/acre, with a portion derived from the breakdown of organic matter and the remainder supplied by the grower. After harvest, the vines sequester the remaining available nitrogen (found in the soil, leaves and shoots) into their roots and canes in preparation for the next growing season.

![Figure 1. Total vine uptake of fertilizer N by mature Concord vines fertilized with 50 lb N as \textsuperscript{15}N-enriched ammonium nitrate at budbreak. Redrawn from Cheng et al. 2004.](image-url)
Managing Nitrogen Fertilization Sustainably

The ultimate goals of a sustainable nitrogen fertilization program are to:

1. Provide grapevines with sufficient nitrogen to meet quality and yield goals.
2. Match nitrogen supply and demand through use of tailored rates and timing of applications.
4. Minimize nitrogen losses from leaching, volatilization, and run-off.

While there is no magic formula for determining how much nitrogen to apply, there is a strong case to be made for tailoring application rates and timing to the needs of individual vineyard blocks, rather than uniformly applying a standard rate to all of your vineyards. Doing so involves consideration of the leachability, organic matter content and water holding capacity of your soils, careful observation of vine vigor, and your management goals for the vineyard.

Concords and bulk hybrid varieties are generally managed to maximize cropping level and production, and their responses to N fertilization are well understood. *V. vinifera* grapes and premium hybrids are managed for moderate yields and wine quality, generally at less than their maximum cropping capacity. Therefore, rates for Concord production represent the high end of N requirements in NY vineyards.

Upper Limits. For soils with at least 2% organic matter, there is no yield or vine size response to more than 50 lb/acre of nitrogen. A long-term experiment called the 'West Tier Factorial' has measured the impact of rootstock, cover crops, nitrogen fertilization, and training system on Concord yield and quality over the past 40 years. Three N fertilization rates (0, 50 and 100 lb/acre of actual N) were used on deep, gravelly soils at the Fredonia Vineyard Laboratory. Yield and vine size (as measured by pruning weights) increased with 50 lb/acre of actual nitrogen, but increasing the rate to 100 lb/acre had no effect on yield and increased pruning weight by only 0.1 lb per vine.

More recently, direct measurement of nitrogen in mature Concord vines indicated that each vine incorporates about 40 grams of N into each season's growth - equivalent to about 53 lb/acre (Bates et al. 2002). In the same study it was found that of the 50 lb/acre actual N applied, about 12 lb/acre was derived from the fertilizer, with the remainder supplied by the 2% organic matter in the soil.

Nitrogen and Vine Size. Although nitrogen promotes vine growth and can lead to excess vigor, it doesn't follow that applying more nitrogen will automatically increase vine size. Inadequate water supply, rooting depth, or drainage, disease and insect infestations, inappropriate cropping levels (too much fruit), low soil pH or other nutrient deficiencies can limit vine size, and applying excess nitrogen won't overcome other factors that limit vigor.

On the other hand, excess vigor caused by overapplication of nitrogen promotes shaded canopies, reducing fruit quality, promoting disease development, and reducing bud fruitfulness.

Organic Matter and Nitrogen Supply. The breakdown of organic matter is a major source of nitrogen. It is important to measure the percentage of soil organic matter in each block of your vineyard, as every 1% supplies 15 to 20 lb/acre/year of nitrogen. This nitrogen is released slowly, and its rate of production increases as soils warm-up and microbial activity increases. Table 1 illustrates the relative contribution of different organic matter levels to N needs. Note that above 3% organic matter, the soil's nitrogen-supplying ability exceeds annual vine demand, though during peak canopy development, a small supplemental application (as low as 10 lb/acre) may still be necessary to match demand.

As inorganic nitrogen costs continue to rise, deriving a greater share of nutrients from organic sources makes good business sense. Pomace, mulch, cover crops, cane prunings and herbaceous plant tissues can all improve soil organic matter over time; the amount of these materials to be applied or utilized will depend upon availability and desired level of amendment.

Timing. From budburst to bloom, vines support the majority of new growth by mobilizing nitrogen and carbohydrates stored in roots, canes, and trunks. It is not necessary nor is it desirable to apply fertilizer nitrogen early. It's better to apply it just ahead of when the vine's demand starts to increase. Delaying soil application until a few weeks before bloom is likely to improve N availability at the time vines start to need...
it. In New York State, this would correspond to a 2-week window between 15 May and June 1. For heavier soils with adequate depth and high silt and clay content, a single application should be sufficient.

**Split Applications, Soil Texture and Leaching.** Soil texture influences both the leaching and water holding capacity of soils. Coarse-textured, excessively well-drained soils, such as gravelly loams and sandy soils suffer more N losses via leaching than heavier soils. Split applications, with 1/3 to 1/2 of the total amount applied before bloom and 1/2 to 2/3 applied 1-2 weeks after bloom, should provide extended uptake while limiting losses to leaching.

**Adjusting for Cropping Level:** Premium *V. vinifera* and hybrid wine varieties are often managed for a moderate crop to maximize quality. These vines will take less nitrogen to maintain vine size than heavily cropped natives and bulk hybrids. Thirty lb N/acre or less is generally a good starting point for premium varieties. Also, growers can omit nitrogen for vines with a small crop due to winter injury.

**Post-harvest Application.** After harvest, nitrogen taken up by vines is translocated to roots and canes and stored until growth resumes in the spring. In a few situations, a light application of N post-harvest can improve reserve N content to support better spring growth. This is best suited to early ripening varieties that still maintain a green, functioning canopy in the post-harvest period.

**Observing Vine Nitrogen Status.** Direct observation of vine growth is an important indicator of vine nitrogen status and the need for supplemental nitrogen. Growers need to recognize the signs of both excessive nitrogen uptake and nitrogen deficiency and use these signs to plan their N fertilization programs. Visual symptoms for evaluating vine N status are summarized in Table 2. It’s important to note that excess or inadequate vine vigor may or may not be related to vine nitrogen status, as detailed in an earlier section.

**Soil and Petiole Tests.** Soil samples and grape tissue tests can be tools for determining soil N status or the vine tissue N content, but they have important limitations. Soil nitrate levels can change between sample collection and analysis, due to microbial activity, and may not be good indicators of available nitrogen. Petiole samples, taken at bloom from petioles in the cluster zone, can give some indication of vine N status, but are best used to compare problem areas within vineyards to more ‘normal’ vines. Many factors, including whether samples are collected on a sunny or cloudy day, cause N content in petioles to fluctuate. Petiole samples collected at 70 days post-bloom are not good indicators of vine nitrogen status. Sampling soils and tissues should always be accompanied by visual estimates of vine vigor.

**Adjusting N Fertilization.** If excess shoot vigor is observed, it should be safe to omit nitrogen for one year and observe the vines’ response. In subsequent years, observe vines and

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Table 2. Evaluating the Nitrogen Status of Vines

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Deficient</th>
<th>Adequate</th>
<th>Excessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trellis fill</td>
<td>Poor trellis fill throughout season</td>
<td>Good trellis fill by 1 August</td>
<td>Crowded, with excessive shoot density; fill by mid-July</td>
</tr>
<tr>
<td>Cane Pruning Weight</td>
<td>&lt;0.25 lb/foot of canopy</td>
<td>0.3 to 0.4 lb/foot of canopy</td>
<td>&gt;0.4 lb/foot of canopy</td>
</tr>
<tr>
<td>Foliage color and leaf size</td>
<td>Pale green or yellowish, leaves small</td>
<td>Green; leaf size characteristic of variety</td>
<td>Dark Green; mature leaves large</td>
</tr>
<tr>
<td>Shoot growth</td>
<td>Slow with short internodes; slows in early July</td>
<td>Moderate, with 4-6 inch internodes; shoot growth slows by early August</td>
<td>Fast, with long internodes (&gt;6 in); shoot growth continues into fall</td>
</tr>
<tr>
<td>Fruit yields</td>
<td>Low, due to small vine size</td>
<td>Adequate</td>
<td>Low due to excessive shading and low number clusters per node</td>
</tr>
<tr>
<td>Ripening and fruit quality</td>
<td>Poor fruit quality, red varieties with poor pigmentation</td>
<td>Maturity characteristic of variety, harvest not delayed</td>
<td>Ripening delayed, poor or variable pigmentation of red varieties</td>
</tr>
<tr>
<td>Bloom petiole N concentration</td>
<td>&lt;1.0</td>
<td>1.2-2.0</td>
<td>&gt;2.5</td>
</tr>
</tbody>
</table>
gradually increase N in 10 to 15 lb increments as necessary. When correcting visible nitrogen deficiency, a good starting point is to apply 30-50 lb N per acre for Concord, <10 lb/acre for vinifera in heavier soils, or 10-20 lb/acre for vinifera in sandy soils. Carefully observe results over the following two years. Response may be delayed until the year following first application because of the vines' reliance on stored reserves during early shoot growth.

Fertigation in Irrigated Vineyards. Drip irrigation permits efficient application of fertilizer directly to the root zone. Fertigation avoids the labor expense and nitrogen losses associated with ground-applied materials. Particularly during the summer, ground applied nitrogen is dependent on rainfall for incorporation. Without incorporation, losses to volatilization may be significant.

Foliar-applied N. Small amounts of foliar-applied nitrogen may help growers react to nitrogen deficiencies, particularly under drought conditions when N uptake from the soil might be limited. In dry years, foliar urea (5 lb urea per 100 gal water) applied around veraison can increase available nitrogen in the fruit. This can help wineries avoid stuck fermentations and may also delay the appearance of the atypical aging wine defect in white wines.

Reducing Supplemental Nitrogen Use over the Long Term. Soils in many older vineyards have been depleted of organic matter and subjected to soil compaction. Adding organic matter to soils via cover crops (particularly legumes) or surface application of straw mulch or compost may be an effective strategy for reducing reliance on expensive fertilizer nitrogen. It may take a few years to start seeing significant results, but adding organic matter, much like liming soils, can have long-term benefits in improving many soil characteristics. In addition to its nutritive value, organic matter improves soil structure, enhances soil water holding capacity, buffers soil pH and raises soil CEC.

Summary

The key to sustainably managing nitrogen is understanding the needs of your vines. Fifty lb actual N per acre should be considered an upper limit for N fertilizer use in heavily cropped Concord vines. Moderately cropped premium wine varieties will need less. Organic matter is an important source of nitrogen, and the soil's N-supplying ability should be used to reduce fertilizer N rates. Every grower should test their soils periodically (3-5 years) to determine organic matter content and soil pH and amend as necessary. Nitrogen applications should be split in vineyards with high leaching potential. Vine vigor should be evaluated and used to modify nitrogen rates. Fertigation offers the most efficient delivery of N in irrigated vineyards, and allows growers to make multiple applications at low doses with a minimum of additional labor. Adding organic matter to vineyard soils may reduce dependence on N fertilizers while improving many soil characteristics.

Maintaining detailed records of inputs, soil organic matter, growth and yields through successive years will narrow the focus on the most efficient nitrogen application rates for individual blocks. Strive to minimize inputs (through tailoring rates, incorporating organic matter, etc.) and minimize the loss of inputs (through proper timing and split of application, elimination of surface run-off, etc.). Incorporating the ideals of sustainability into your nitrogen fertilization programs will be cost effective, improve water quality, and reduce health risks to you, your workers, and your communities.

Acknowledgements. We thank Alice Wise of the Long Island grape program, Terry Bates, Dept. of Horticultural Sciences, Tim Weigle of the Lake Erie Regional Grape Program, and Lailiang Cheng, Dept. of Horticulture, Cornell University, for detailed review and comments on this manuscript.

References


Modifying Nitrogen Use at Centerra Wine Company

Jamie Hawk

Centerra Vineyard
Manager,
Matt Doyle

Under the weight of skyrocketing nitrogen fertilizer costs, New York grape growers are rethinking their nitrogen application practices. Led by vineyard manager Matt Doyle, Centerra Wine is working with a vineyard consultant (ACS) to tailor their fertilization program on a block-by-block basis. This spring begins their third consecutive year of intensive soil sampling using GPS (Global Positioning System) to ensure consistency. "Soil samples are taken at the same place and time every year so we can manage how our soil is changing," explains Doyle, "and we're managing our soils, not necessarily the vines — we're kind of getting away from petiole testing. We do some petioles for comparison, but we're really doing intensive soil sampling."

So far their efforts have focused primarily on two aspects of the results of the soil analyses: pH and soil organic matter. "We have pH problems with some of the farms, so we're trying to get the pH up with lime to better balance our soils," notes Doyle. Both pH and organic matter have profound effects upon vine nutrition: low pH reduces the availability of potassium, magnesium, and calcium to the vines, while the breakdown of organic matter provides nitrogen for uptake. "Typically in the past, we'd always done blanket nitrogen applications using the same rate everywhere across the board. Now we want to tailor it more to what the vines need using our soil samples." Sites with soil organic matter at or above about 4% are receiving less inorganic nitrogen. "For sections that had high organic matter, we're just lowering the rate, doing a half rate instead of a full [about 27 lbs/acre actual vs. 55 lbs/acre]. For the sections that have low organic matter, we're going to build it up so we can get away from adding the nitrogen."

To further increase the efficiency of their nitrogen use, Doyle has modified the timing of application as well as the form of nitrogen applied. "Before, we put our nitrogen on with our preemergent herbicides early in the spring, and I don't think it did much for the vines. Now we're trying to apply it closer to bloom so the vines are actually using the nitrogen we put on. And we've gone from liquid to granular forms — we feel we don't get as much loss to the atmosphere with the granular."

This month they've begun their next step, adding composted pomace to the blocks to raise the level of organic matter, which is especially important in those areas where soil analysis indicates a deficiency. "We're going to put our first trial blockdown this year; the pomace compost has a lot of nitrogen and potash in it, so we're thinking it'll be a good slow-release product. Over time, as organic matter increases in the soil, we'll do less and less nitrogen. And we are seeing in our soil sampling that pH is definitely coming up where we've added lime, and that will help a lot." In regard to the expected time frame to reach their goals, Doyle states, "I think we're looking at 4 or 5 years down the road to be more balanced on everything. We'll track our organic matter continually, and because we have so many acres that are low, it's going to take us a while to get to where we need to be." And the cost of this remediation program? "Actually, what ACS is charging us for the soil samples is not much more than what it would cost us to do it ourselves."

For New York State grape growers, it's time to rethink nitrogen application practices and to specifically tailor rates to individual vineyard blocks. "The price of nitrogen is going through the roof," Doyle stresses, "and for us to keep our budget inputs the same, we either had to cut our rates or try to do it differently. Our struggle is to try to stay efficient and get all our work done, and at the same time be innovative and cost effective too. And we're trying to be sustainable in terms of our vineyards and the environment — if nitrogen isn't necessary, then you shouldn't put it on just because that is what you've always done."
Making Good Wines Great: The Art of Assemblage at Stratus

Jean-Laurent Groux
Winemaker
Stratus Vineyards
2059 Niagara Stone Road
Niagara-on-the-Lake ON LOS 1J0
Contact: 905.468.1806 X 222 or jlgroux@stratuswines.com

• Assemblage? A smart word for blending?
• Short history of assemblage
• Assemblage: Not to do list
• Assemblage techniques at Stratus
• Marketing assemblage wines
• Tasting of wines made as assemblage

Notes
New Theory and Research on Tannins, Proteins and Their Relationship to Color Stabilization and Sensory Effects in Red Wine

Russell Robbins  
Enologist and Manager  
Laffort Oenologie  
405 St. Andrews Drive  
Napa, California 94558  
Contact: (707) 815-0225 or russell.robbins@laffort.com

A novel and intuitive theory has been offered to explain the observable phenomenon during red winemaking that accounts for, reduced color loss and improved sensory effects when using exogenous tannins.

This theory indicates a possible mechanism for the use of specific enological tannins causing the precipitation endogenous proteins thus protecting the naturally occurring (skin) tannins and allowing them to remain in the wine. Higher concentrations of tannins in the initial period of soaking or fermentation provide increased probability of binding with anthocyanins with a result improved color protection.

Notes
Cost Share Marketing and Promotion Program

Christy Eckstein  
Assistant Program Manager  
Ohio Grape Industries Committee  
8995 East Main Street  
Reynoldsburg, OH 43068  
Contact: (614) 728-6438

In order to increase consumer awareness of Ohio wines, the Ohio Grape Industries Committee implemented the Cost Share Marketing and Promotion program in January 2005. This program allows all Ohio wineries holding valid Ohio A2 liquor permits and who make at least one wine using Ohio grapes or grape products to receive reimbursement for 45% of their eligible expenses for marketing and promotion of Ohio wines and grape products. In order to receive reimbursement under the cost share program all projects must display the Ohio wines logo in accordance with the established logo guidelines. The sum of reimbursements for any one winery or group of wineries cannot exceed $1,500 per fiscal period.

Nineteen Ohio wineries participated or are currently participating in the cost share marketing and promotion program in FY07 with reimbursements for the program averaging $1,275 per winery. The money was or will used towards the creation and printing of numerous projects such as rack cards, winery brochures, newspaper, radio and billboard advertisements, as well as in-store displays, wine glasses for tastings, and web site creation and maintenance.

Notes

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43
John Santos
Sustainable Soil Management
I will be discussing the development of sustainable viticulture in the U.S. and the E3 concept developed at Fetzer Vineyards. I will then talk about the development of a sustainable viticulture workbook for New York State. After this introduction to the concept I will discuss some of the practices we engage in to meet the goals set forth in a sustainable viticulture program. Finally I will discuss my method for producing compost at Hazlitt 1852 Vineyards including the feed stock used creation of the windrows and site layout, analysis of the finished product and its application in our vineyards.

Patti Lubelt
Maple Ridge Vineyard's 5-varietal vitis vinifera grapes have been certified organic since 1997 and a SARE grant awarded in 2003 caused us to focus on using aerobic compost tea sprays to achieve a higher level of sustainability in our 3-acre vineyard by reducing the volume of sulfur and copper. This presentation describes the specific activities which support our ongoing efforts to be both organic and sustainable while carefully monitoring soil and foliar samples to insure proper nutrient mix to achieve maximum fruit quality. Included in this presentation is the spray schedule we use on our vineyard during the growing season.

Notes
List of Speakers

Duke Bixler  
Breitenbach Wine Cellars

Michele Bakan  
Maize Valley Winery

Dr. Doug Doohan  
Associate Professor  
Department of Horticulture and Crop Science, OARDC

Dr. Imed Dami  
Assistant Professor  
Department of Horticulture and Crop Science, OARDC

Christy Eckstein  
Assistant Program Manager  
Ohio Grape Industries Committee

Dr. Mike Ellis  
Professor  
Department of Plant Pathology, OARDC

Jean-Laurent Groux  
Winemaker  
Stratus Vineyards

Patti Lubelt  
President and Winemaker  
Maple Ridge Vineyard

Dr. Taehyun Ji  
Research Associate  
Department of Horticulture and Crop Science, OARDC

Greg Johns  
Manager  
Ashtabula Agricultural Research Station

Jane Baxter Lynn  
JBL Public Relations Strategies

Dr. Timothy E. Martinson  
Senior Extension Associate in Viticulture  
Finger Lakes Grape Program

Dr. Bobby D. Moser  
Vice President for Agricultural Administration and  
Dean Vice President for University Outreach  
College of Food, Agricultural, and Environmental Sciences, OSU

Dr. Clifford P. Ohmart  
Research/IPM Director  
Lodi-Woodbridge Winegrape Commission

Dr. Bill Randle  
Department Chair  
Department of Horticulture and Crop Science, OSU

Deborah Rausch  
USDA

Russell Robbins  
Enologist and Manager  
Laffort Oenologie

Claudio Salvador  
Firelands Winery

John Santos  
Vineyard Manager  
Hazlitt Vineyards

Dr. Steve Slack  
Director, OARDC

Dr. Keith Smith  
Associate Dean  
College of Food, Agricultural and Environmental Sciences, OSU
Christopher Sperri
Myrddin Winery

Todd Steiner
Enologist/Program Manager
Department of Horticulture and Crop Science, OARDC

Alan Sundermeier
Wood County Extension Educator
Ohio State University

Ken Tarsitano
Tarsitano Winery

Andy Troutman
Troutman Vineyards and The Winery at Wolfcreek

Randy Ullom
Winemaster
Kendall Jackson

Michelle Widner
Program Manager
Ohio Grape Industries Committee

Dr. Roger N. Williams
Professor
Department of Entomology, OARDC/OSU

Donnie Winchell
Ohio Wine Producers Association
List of Exhibitors

ACI Cork USA
2870 Cordelia Road, Ste 150
Fairfield, CA 94534
Natural cork closures

Arton Glass & Ceramic Imprinters
Imprinted wine glasses

BDI Machinery Sales Co.
430 East Main Street
Macungie PA 18062
Sprayers

Brick Packaging
P.O. Box 1645
Traverse City MI 49685-1645
231-947-4950
danbrick@brickpackaging.com
Bottles, corks, capsules, barrels

Corktec
17 Middle River Drive
Stafford Springs CT 06076
860-851-9417
sales@corktec.com
Natural cork bottle stoppers

Criveller Company
6935 Oakwood Drive
Niagara Falls OH L2E6S5
Processing equipment

Double A. Vineyards
10277 Christy Road
Fredoria NY 14063
716-672-8493
jgloss@netsync.net
Grapevines, grow tubes, literature

Green Hoe Co., Inc.
6645 West Main Road
Portland NY 14769
716-792-9433
Green grape hoe, vine auger, earth anchors

H&W Equipment
824 Line 4, RR#2
Niagara on the Lake
ON L0S1J0
Spraying equipment

Kaufman Container
1000 Keystone Pkwy, Ste 100
Cleveland OH 44135
Bottles, packaging, closures

Ohio Department of Commerce
Division of Liquor Control
6606 Tusking Road
P.O. Box 4005
Reynoldsburg, OH 43068-9005
State alcohol regulations

The Ohio State University
1680 Madison Ave
Wooster, OH 44691
330-263-3878
OSU publications

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Pleasantville, NY 10570
(914) 769-6252
Brochures & catalogues

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501 Lakeshore Road East
Port Credit ON L56-1H9
905-271-5700
Bottles

Scott Laboratories
PO Box 4559
Petaluma CA 94955-4559
707-765-6666
jeffh@scottlab.com
Cellar supplies, packaging, processing
Slimline Manufacturing
559 Okanagan Ave., East
Penticton BC V2A 3K4
Turbomist sprayer

Susan Jaeger Graphic Designer
6030 Laskey Road
Rome OH 44085
Graphic arts

Tobacco Tax and Trade Bureau (TTB)
U.S. Treasury Department, Alcohol and Tobacco Tax and Trade Bureau
27476 Detroit Rd., Suite 103
Westlake, OH 44145
Federal alcohol regulations

The Wine Buzz
3105 Lincoln Blvd.
Cleveland Heights OH 44118
Magazines
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