

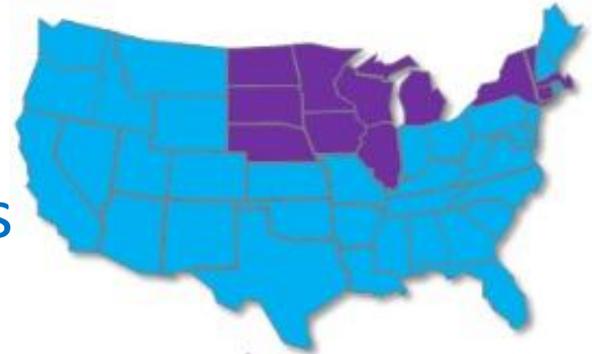


Viticulture, enology and marketing for cold-hardy grapes

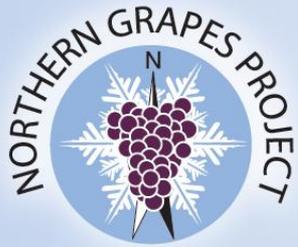


Northern Grapes: Integrating viticulture, winemaking, and marketing of new cold hardy cultivars supporting new and growing rural wineries

- 5 Year Coordinated Ag Project
- 12 Institutions
- 34 Research/Extension Scientists
- 18 Industry Associations
- \$2.5M Funded (2 yr) USDA (\$6.1M 5 yr budget)
- Matched > 25 Organizations and Individuals



The Northern Grapes Project is funded by the USDA's Specialty Crops Research Initiative Program of the National Institute for Food and Agriculture, Project #2011-51181-30850

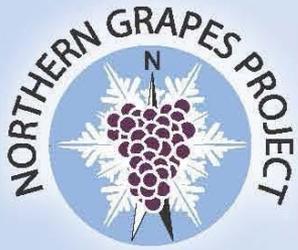


Our Vision

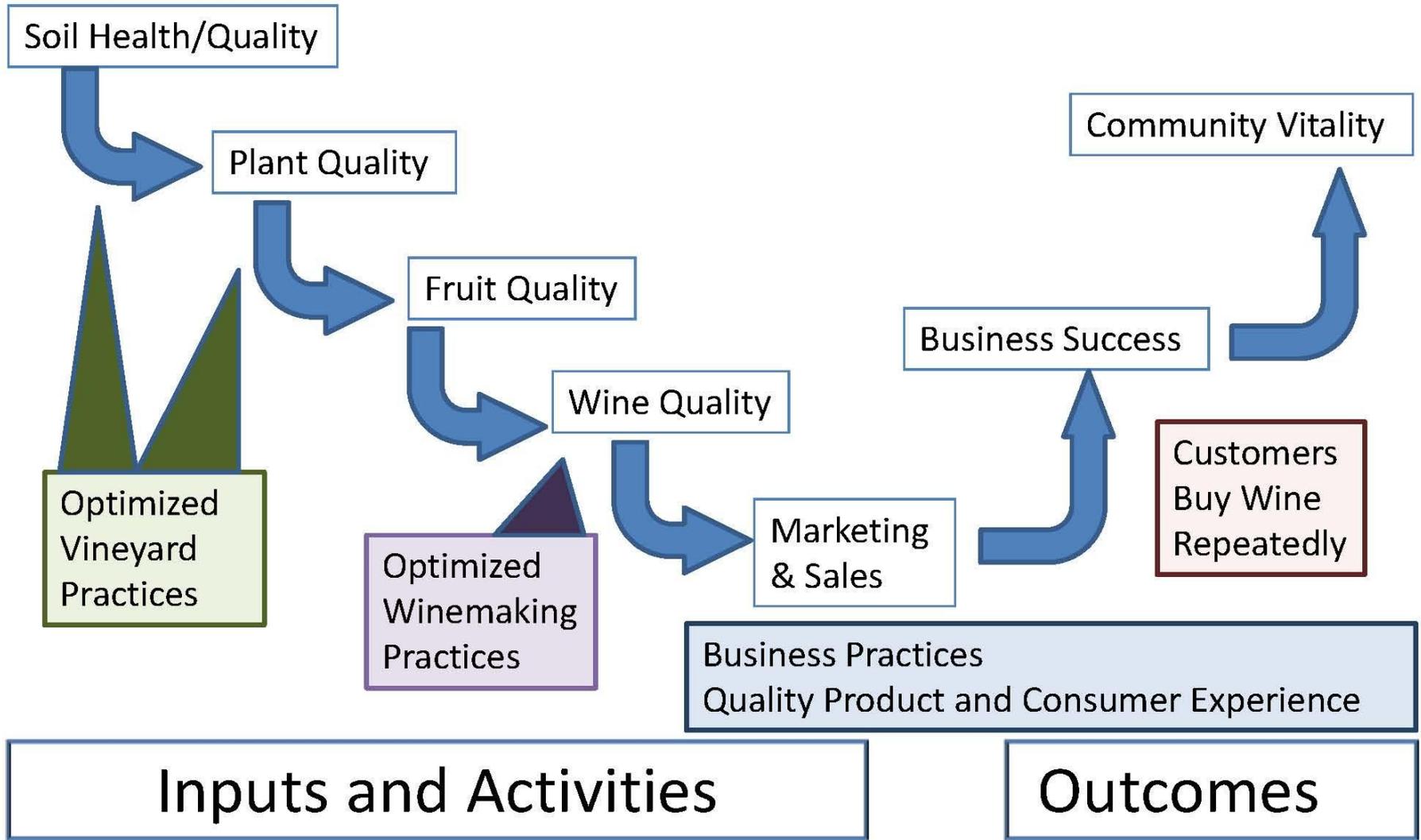
From Proposal



“...To develop grape production, winemaking, and marketing practices suited to the unique characteristics of V. riparia-based [Northern Grape] cultivars marketed through retail tasting rooms and their niche in the US wine market.”



Vision for a Successful Cold-Climate Wine Industry





Multi-Disciplinary Studies

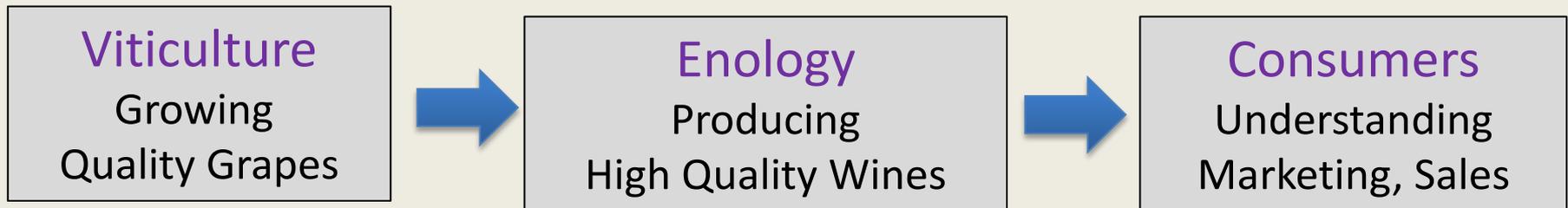
Address



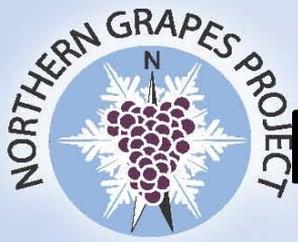
- **Varietal performance** and resulting fruit and wine flavor attributes in different climates The Vine
- Applying appropriate **viticultural practices** to achieve consistent fruit characteristics for ripening The Vineyard
- Applying **winemaking practices** to their unique fruit composition to produce distinctive wines that consumers will like and purchase The Wines
- Understanding consumer preferences, individual/regional **marketing strategies** to increase sales and sustained profitability of wineries and vineyards. The Tasting Room



The Model



= Profitable, Vibrant Industry



Northern Grapes Webinars

- 6 (November-April)
 - 40+ states
 - 1400 unique e-mail addresses in pre-registrations
 - almost twice as many view recordings
- ‘Pesticide Drift Workshop’
 - Nov. 3, 2012: Co-sponsored with Nebraska Winery and Grape Growers Assn.
- Archived at:
www.northerngrapesproject.org



Viticulture, enology and marketing
for cold-hardy grapes

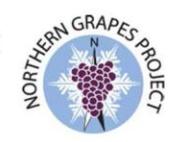


COLD CLIMATE CONFERENCE
2012
MINNESOTA GRAPE GROWERS ASSOCIATION
ANNUAL GRAPE & WINE CONFERENCE

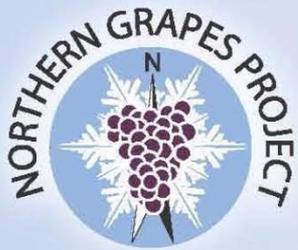
A Cut Above:
How the Northern Grapes Project will Foster Growth and
Development of the Cold-Climate Wine Industry



Tim Martinson
Sr. Extension Associate
Cornell University



The Northern Grapes Project is funded by the USDA's Specialty Crops Research Initiative Program of the National Institute for Food and Agriculture, Project #2011-51181-30850



Northern Grapes Publications



- Cold Climate-targeted information and practices
- “Northern Grapes News” Electronic Newsletter
- www.eViticulture.org

www.northerngrapesproject.org



February 23, 2012

Vol 1, Issue 1

Introducing the Northern Grapes Project

By Tim Martinson, Cornell University

A collaborative effort involving twelve universities, with the support of 19 producer groups ranging from Nebraska to New Hampshire has resulted in a new research and extension project that we are calling the *Northern Grapes Project*.

Starting point. The basic premise behind the project is that new grape varieties – both from the University of Minnesota and private breeders – have made it possible to produce grapes in regions previously considered too cold to support grape production. Since the late 90s, these cultivars have spawned a new industry. Based on our survey of producer organizations, over 3,000 acres of cold-hardy grapes are spread across the upper Midwest and New England, most under 10 years old. Conservatively, the cold-climate cultivars support over 330 small wineries in twelve northern states.



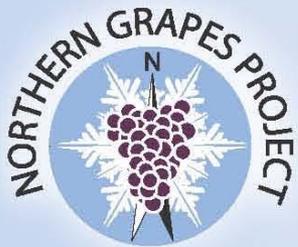
Participants in a Cornell University Wine Analysis Workshop are learning to measure sulfur dioxide in wine. Similar workshops will be held during the course of the Northern Grapes Project.
photo courtesy Cornell University, Chris Gerling

Minnesota in 2010 with representation from regional grower organizations and university researchers to hear about industry needs and ways in which they can be addressed

'Frontenac', released in 1996, was the first of the cold-hardy cultivars from



The screenshot shows the eVITICULTURE website interface. At the top, there is a search bar with the text "eVITICULTURE where science and practice connect". Below the search bar is a navigation menu with links: Home, About eViticulture, For Grape Producers, For Extension, States, and Articles in Spanish. The main content area features a video player with a play button and a video thumbnail showing two men in a vineyard. To the right of the video is a text box asking "Are you satisfied with eViticulture.org? Tell us by taking our survey!". Below the video is a section titled "The Grape Doctor" with the text "Coming soon! The Grape Doctor™ is an interactive tool to assist with diagnosis of grapevine problems." At the bottom, there are sections for "Resources by State" and "Upcoming Events" which lists "Weather & Crop Protection Workshop".



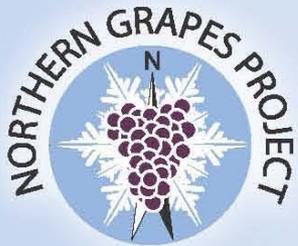
Objective 1



Document cold climate varietal performance in variable climates and understanding the resulting sensory characteristics of the fruit and wines.

Obj. 1a. Evaluate cold climate cultivar performance under a wide range of climates throughout the Upper Midwest and Northeast to match cultivar with site.

- A collaboration with the NE-1020 project “Multi-state evaluation of winegrape cultivars and clones”.
- **Viticulture Team:**
 - Field performance of northern hybrid cultivars (Frontenac, Marquette, St. Croix, Frontenac gris, La Crescent)
 - Collect climatic data at the sites.
- **Enology Team:**
 - Fruit chemistry
 - Winemaking
 - Sensory profile analysis



Viticulture Team

Objective 1a



Harlene
Hatterman-Valenti



Rebecca
Harbut



Paolo Sabbatini



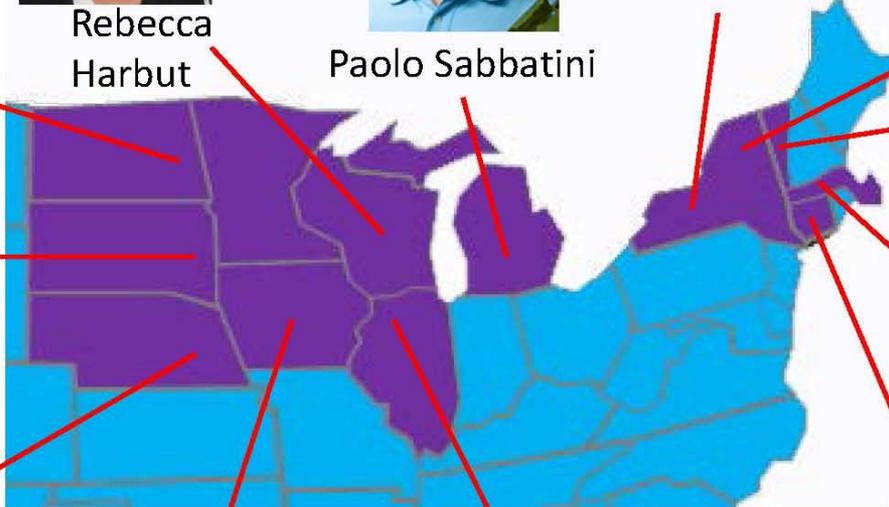
Tim Martinson*



Kevin
Lungerman



Anne
Fennell



Lorraine Berkett



Sonia
Schloemann

Paul Read



Paul Domoto

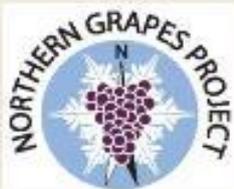


Bill Shoemaker

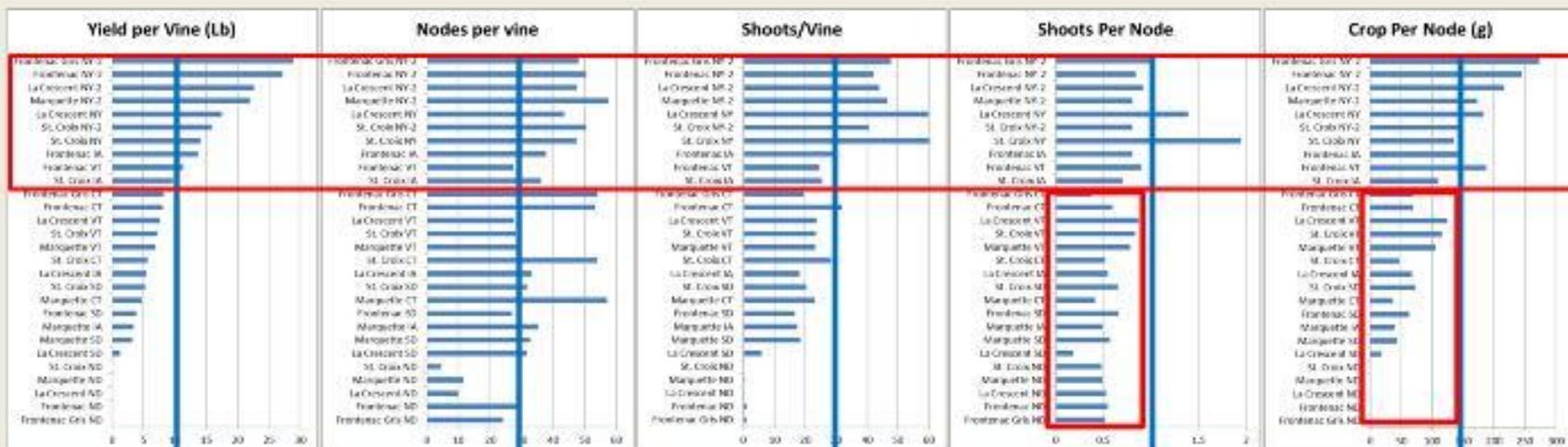


Bill Nail





Yield and Retained Nodes



10 lb/vine

30 nodes/vine

30 shoots/vine

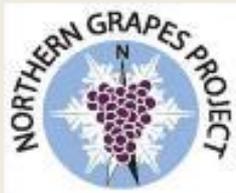
1 shoot/node

150 g/node

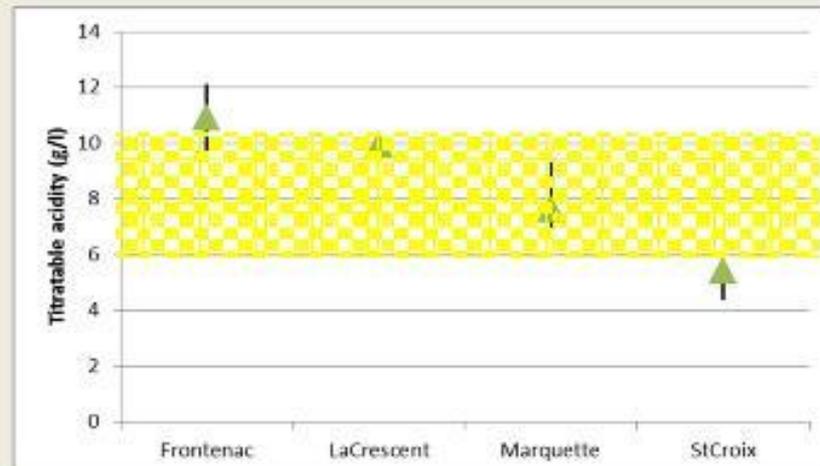
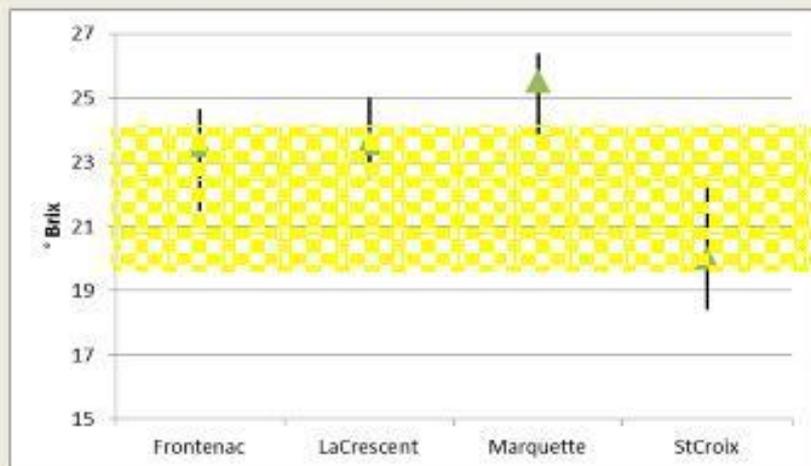
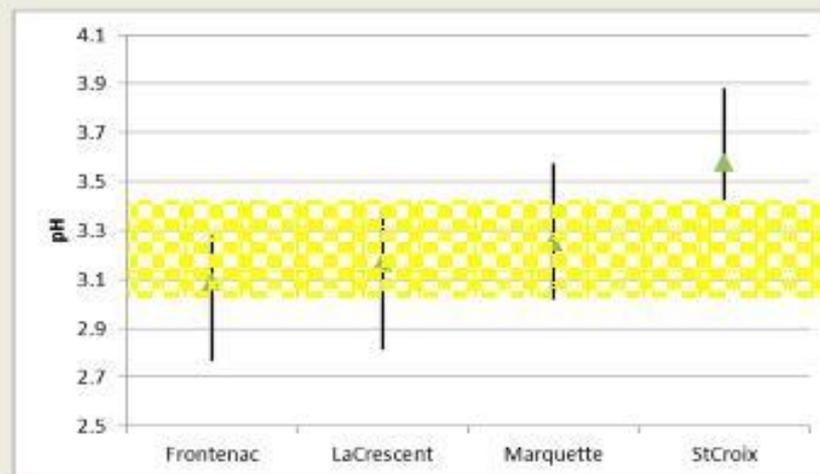
= 4 T/acre
6ft x 9ft
spacing

= 5 per Ft
at 6 Ft
In-row
spacing

= 4.5 KG/vine
= 9.9lb/vine
30 shoots/vine



Fruit Composition at Harvest (Brix, pH, TA)



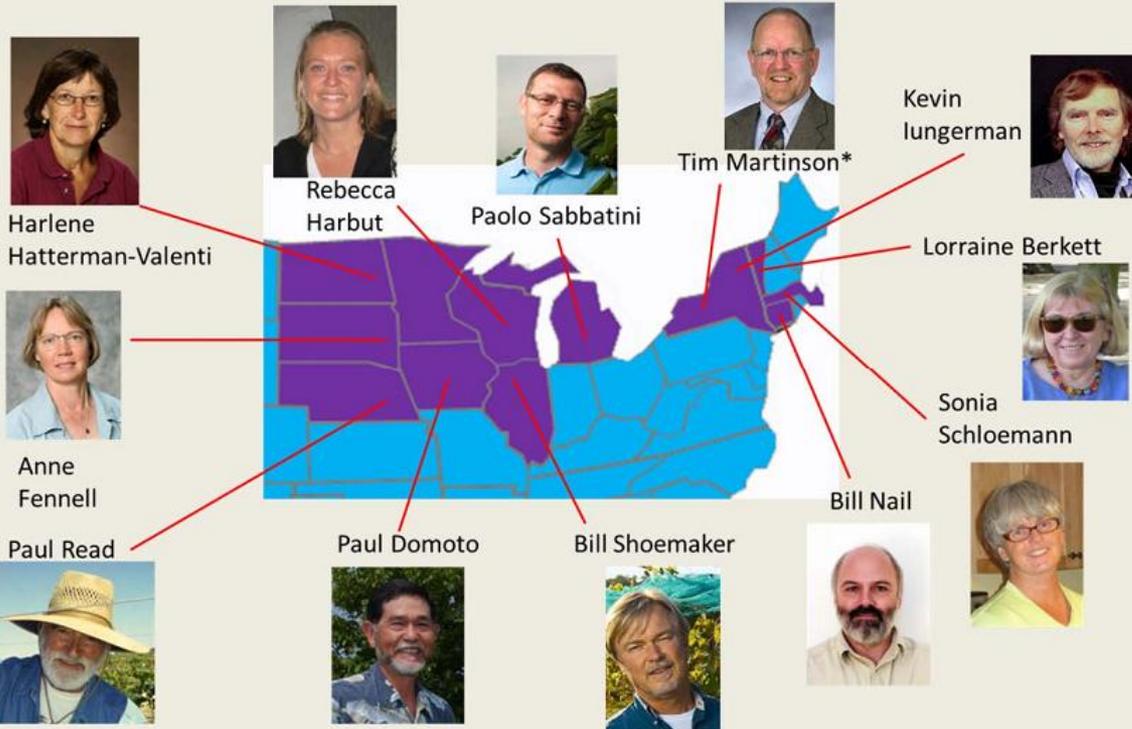


NE-1020 Coordinated Variety Trials



How does environment affect Flavors?

Climate and standard maturity indices



Vine performance and climate

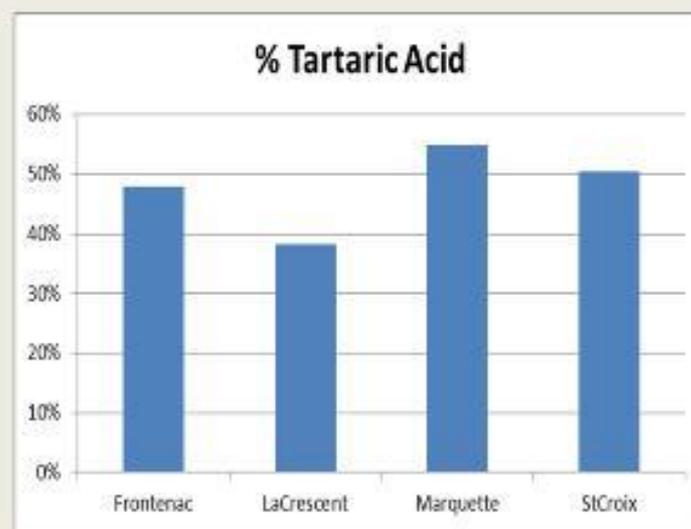
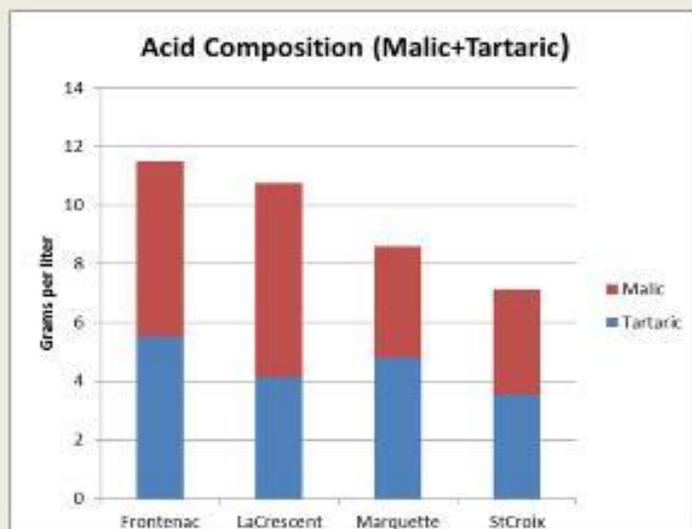
- Eval: Yield and quality vs. climate indices
- Data from 3-9 sites/variety

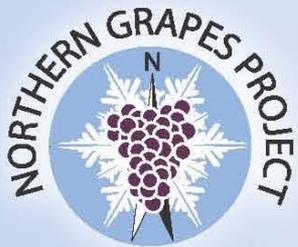


Acid Composition



Murli Dharmadhikari
Iowa State University





Objective 2a

Approaches



i. Identify training systems suited to cold climate grape cultivars.

- Will compare vine performance, yield, light interception, disease incidence, and fruit composition in replicated trials.

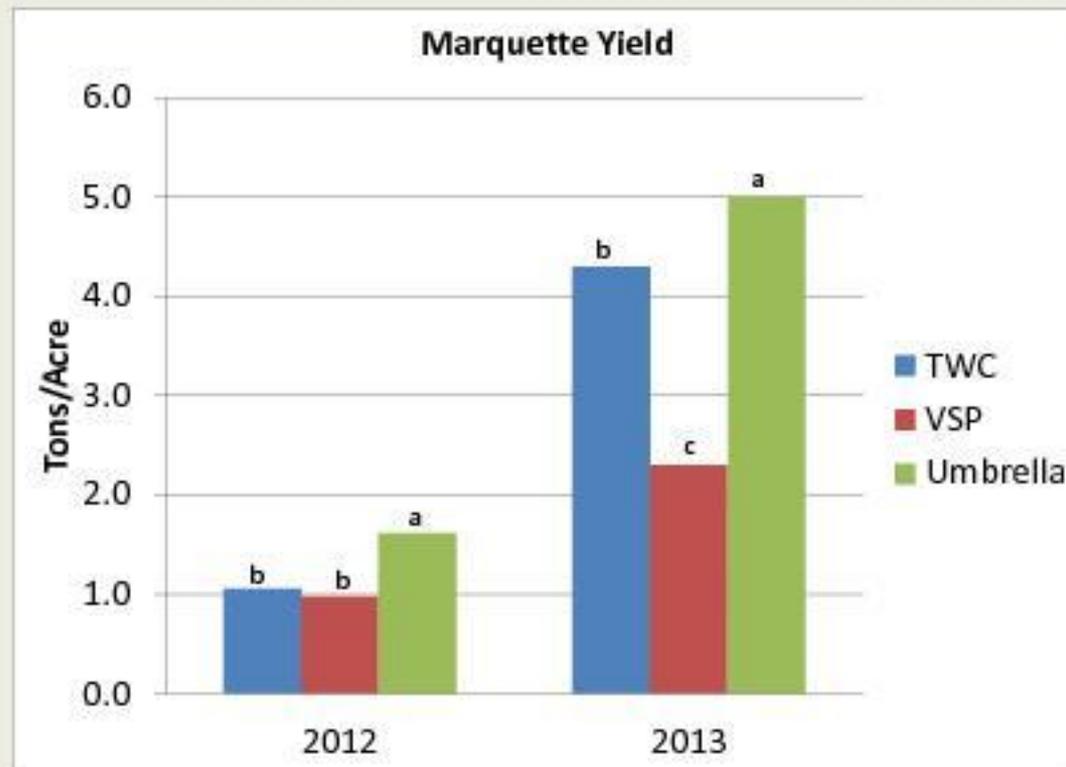
State	CT	NY	IA	NE
Cooperator	Bill Nail	Tim Martinson	Gail Nonnecke Paul Domoto	Paul Read
Training systems	HWC MWC/VSP GDC Smart-Dyson	HWC MWC/VSP Umbrella Kniffin	HWC MWC/VSP GDC Scott Henry	HWC MWC/VSP GDC Smart-Dyson Scott Henry
Cultivars	St. Croix	Frontenac Marquette La Crescent	Frontenac Marquette La Crescent	Frontenac St. Croix

Abbreviations: HWC= high wire cordon; MWC=mid-wire cordon; GDC= Geneva double curtain

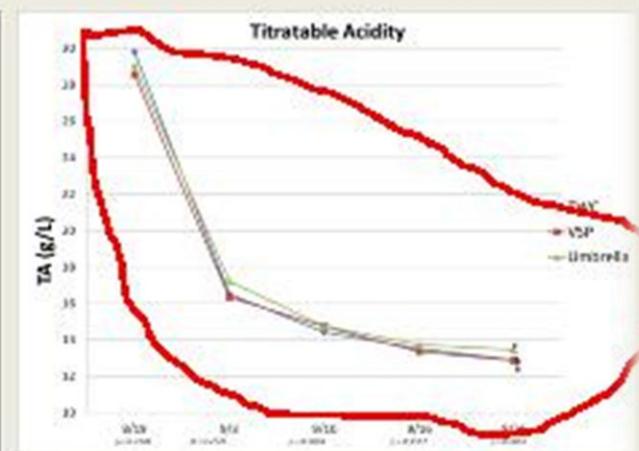
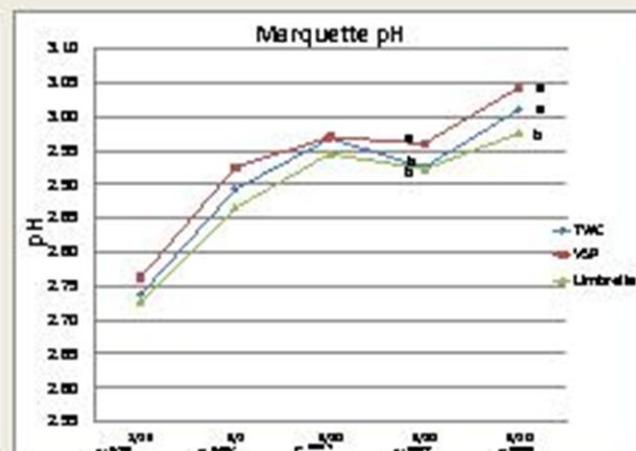
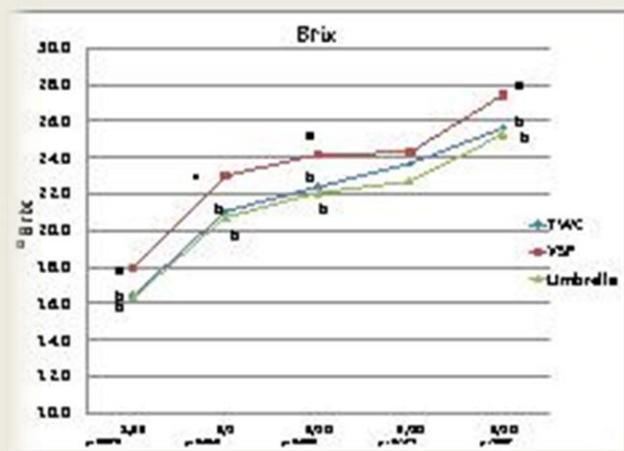
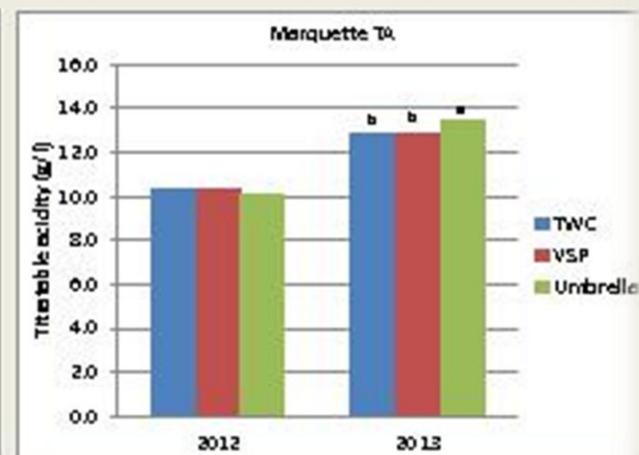
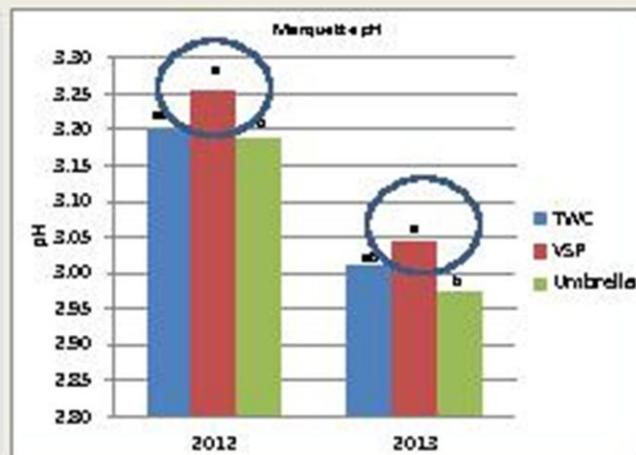
Marquette 2013

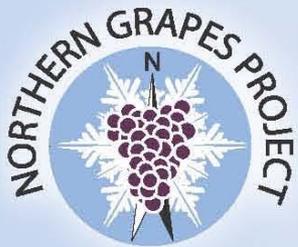
Yield

Treatment	Yield (T/A)	Yield (lb/vine)	Clusters Per Vine	Cluster wt. (g)	Berries per cluster	Berry wt. (g)	Adj. # of shoots	Yield (g) per shoot (adj)	Clusters Per shoot (adj)
TWC	4.3 b	13.8	83.5 b	76.6 a	63.2 a	1.21 ab	36.9 b	178.1 a	2.3 a
VSP	2.3 c	7.4	69.4 c	49.2 b	43.4 b	1.13 b	36.3 b	94.2 b	1.9 b
Umbrella	5.0 a	16.1	101.3 a	72.5 a	59.2 a	1.23 a	41.0 a	178.8 a	2.5 a



Marquette Fruit Composition





Objective 2a

Approaches



ii. Canopy management.

Will modifying the light environment through canopy management practices improve fruit and wine making characteristics?

- Shoot thinning
- Shoot positioning
- Summer hedging
- Leaf removal

Team: Gail Nonnecke & Paul Domoto (IA)

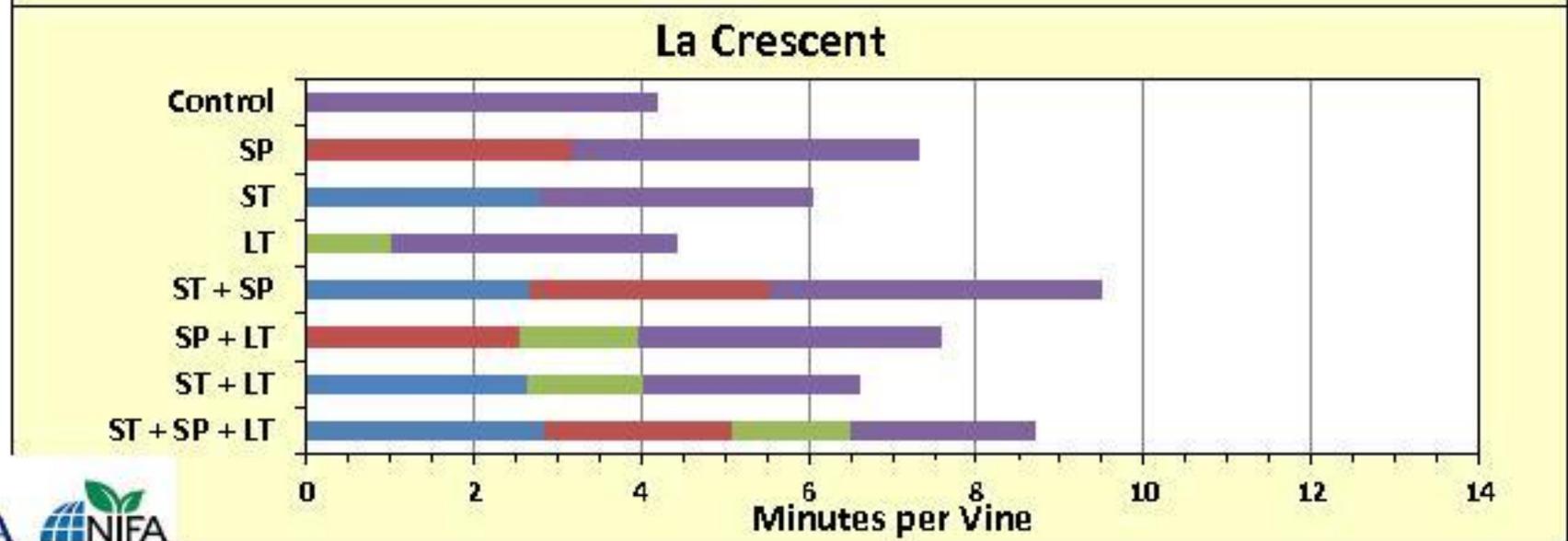
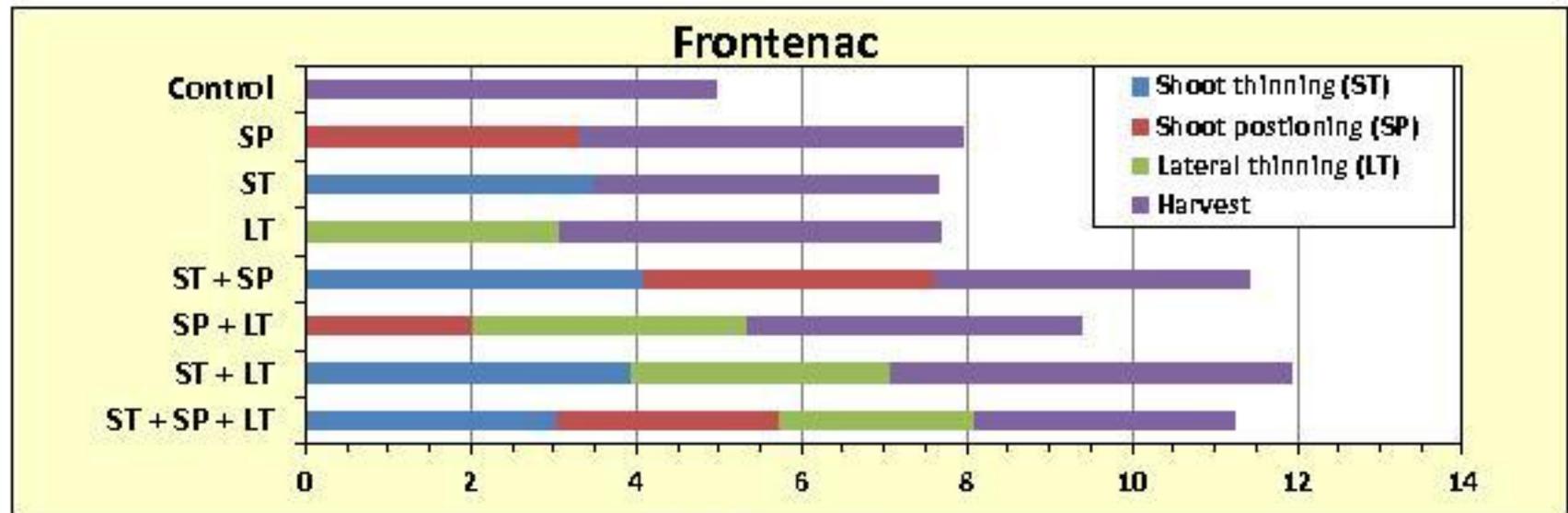
Tim Martinson (NY)

Rebecca Harbut (WI)



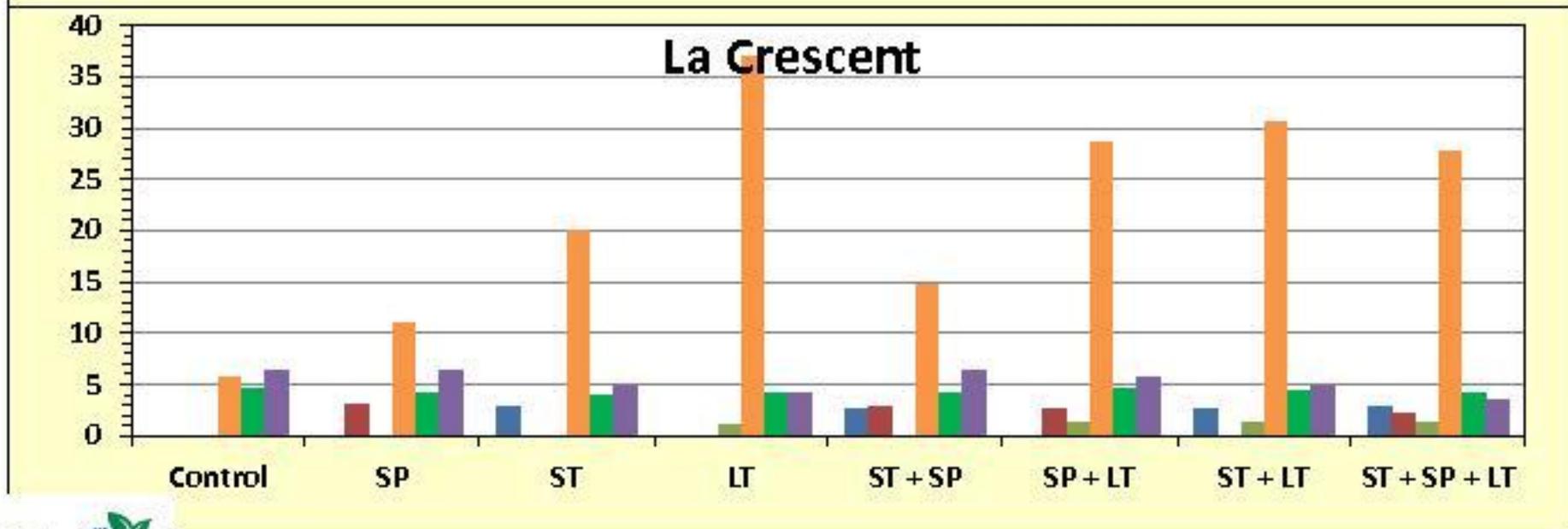
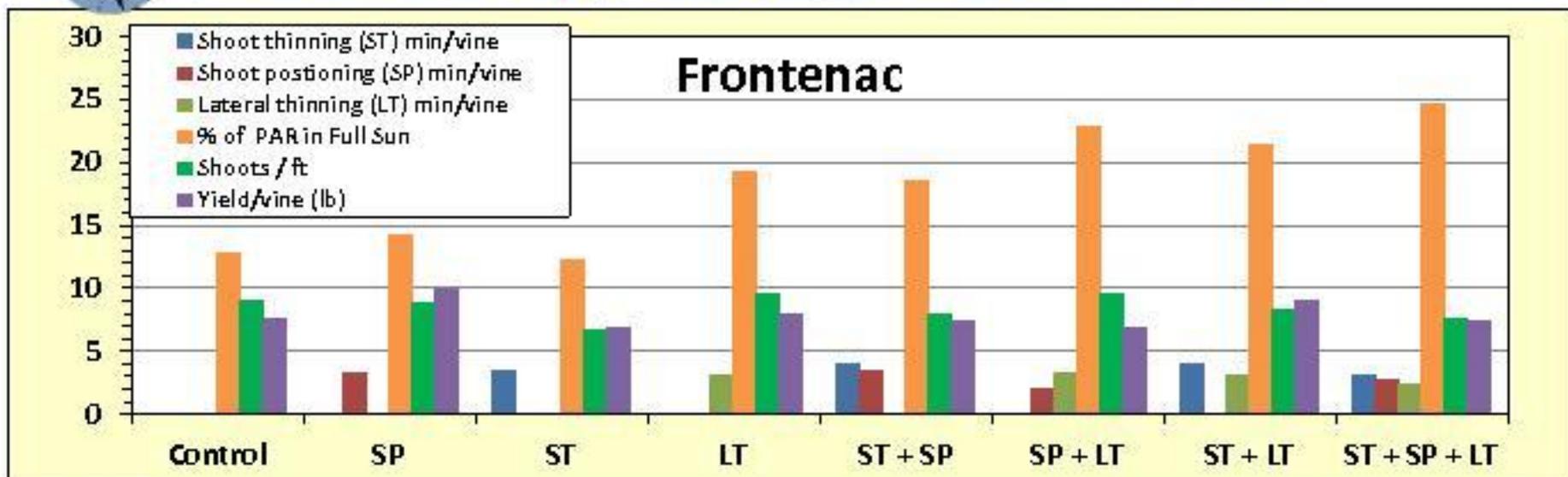
Iowa Canopy Management

Time to perform tasks





Iowa Canopy Management – % PAR





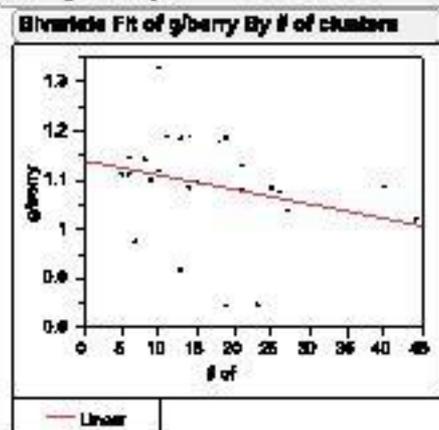
Objective 2a

iii. Cropping level management.

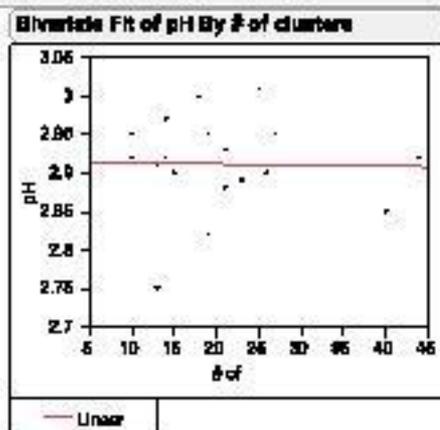
New York Thinning Study at Coyote Moon:

- La Crescent 'Crop Load' August 13 2012

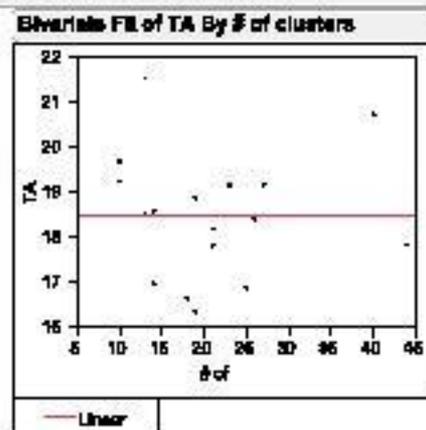
Fit Y by X Group



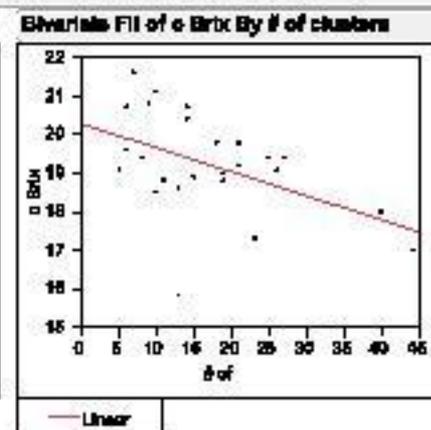
Berry wt.
VS
of Clusters



pH
VS
of Clusters



TA
VS
of Clusters

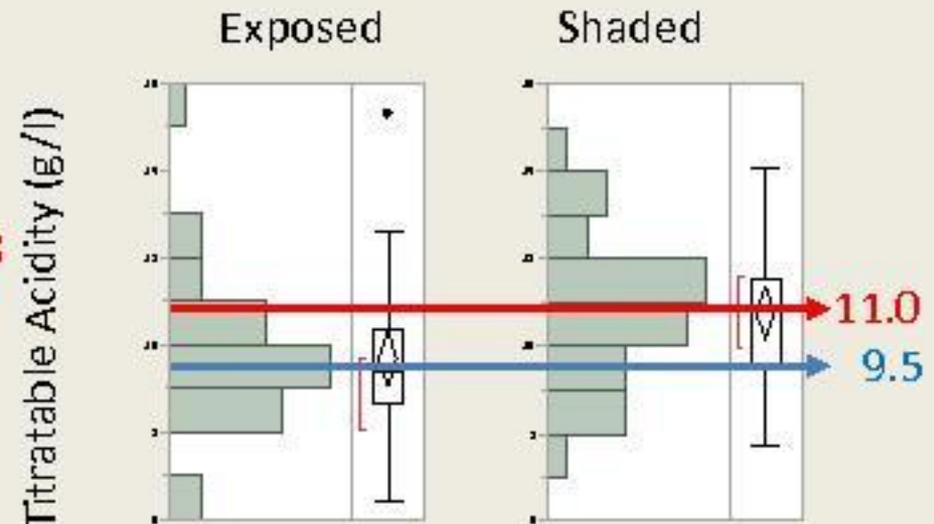
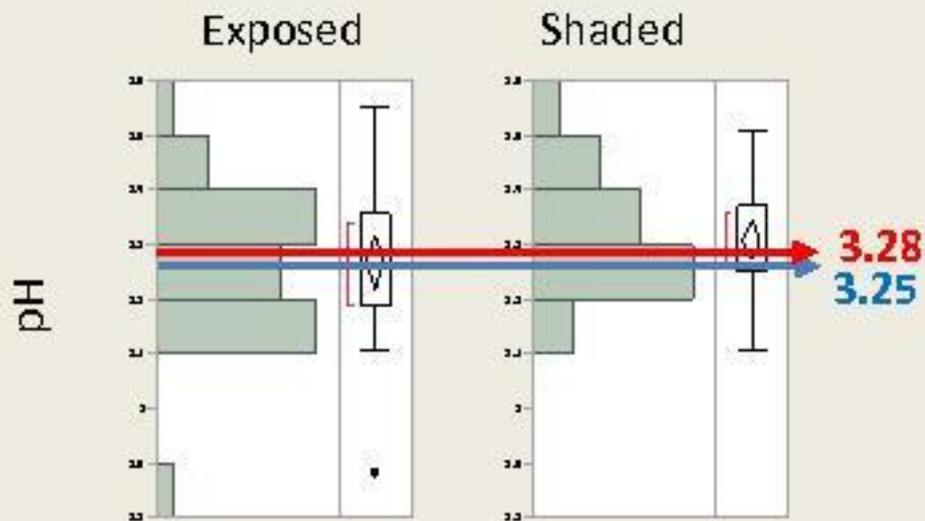
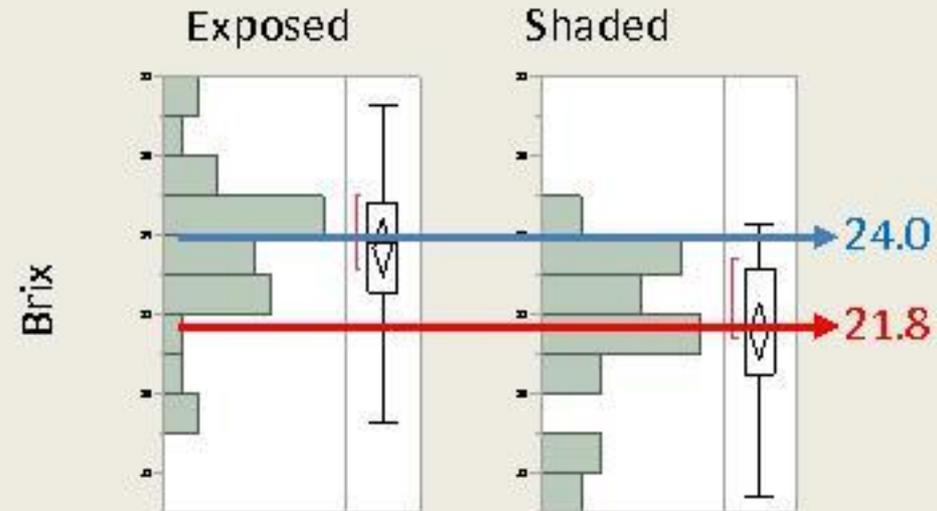


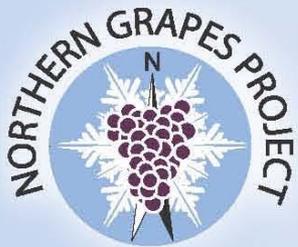
°Brix
VS
of Clusters

Shaded vs Exposed Clusters

Marquette 2014

- 6 vines
- 5 exposed and 5 shaded
- Individual Brix, pH, TA





Objective 2b

Approach



Study will be conducted in grower vineyards representing different soil types.

Sites: MN (4), IA (4), SD (3), ND (2), NY (1)

- i. Annual soil sampling.
- ii. Nutritional profiling of cold climate cultivars.
 - Petiole and leaf blade samples will be collected 3 times during the growing season (Full bloom, Pre-veraison, Veraison)
- iii. Correlation with yield, vine and fruit parameters.
 - Pruning weights
 - Yield
 - Fruit composition (SS, pH, TA, yeast assimilable N)

Team: Carl Rosen* (MN), Paul Domoto & Gail Nonnecke (IA), Rhoda Burrows (SD), Harlene Hatterman-Valenti (ND), Tim Martinson (NY)



Normal Nutrient Ranges for Grapes Based on Petiole Analysis

Nutrient	At Bloom <i>(for American hybrids) *</i>	Mid-July to Mid-Aug.** <i>(Fertilizing Fruit Crops. OSU Bull. 458)</i>
Nitrogen (N)	1.6 to 2.8 %	0.9 to 1.3 %
Phosphorous (P)	0.20 to 0.60 % ?	0.16 to 0.29 %
Potassium (K)	? 1.50 to 5.00 % ?	1.50 to 2.50 % ?
Calcium (Ca)	0.40 to 2.50 % ?	1.20 to 1.80 %
Magnesium (Mg)	0.13 to 0.40 %	0.26 to 0.45 %
Sulfur (S)	<i>No data (>0.1%)</i>	<i>No data (>0.1%)</i>
Manganese (Mn)	18 to 100 ppm	31 to 150 ppm
Iron (Fe)	40 to 180 ppm	31 to 50 (200) ppm
Boron (B)	25 to 50 ppm	25 to 50 ppm
Copper (Cu)	5 to 10 ppm	5 to 15 ppm
Zinc (Zn)	20 to 100 ppm	30 to 50 ppm
Molybdenum (Mo)	0.2 to 0.4 ppm	0.3 to 1.5 ppm

* Mills, H.A. and J.B. Jones. 1996. *Plant Analysis Handbook II*. MicroMacro Publishing

** With exception of Mo, ranges are published in the *Midwest Grape Production Guide*, OSU Bull. 919, & the *Midwest Small Fruit Pest Management Handbook*, OSU Bull. 861.

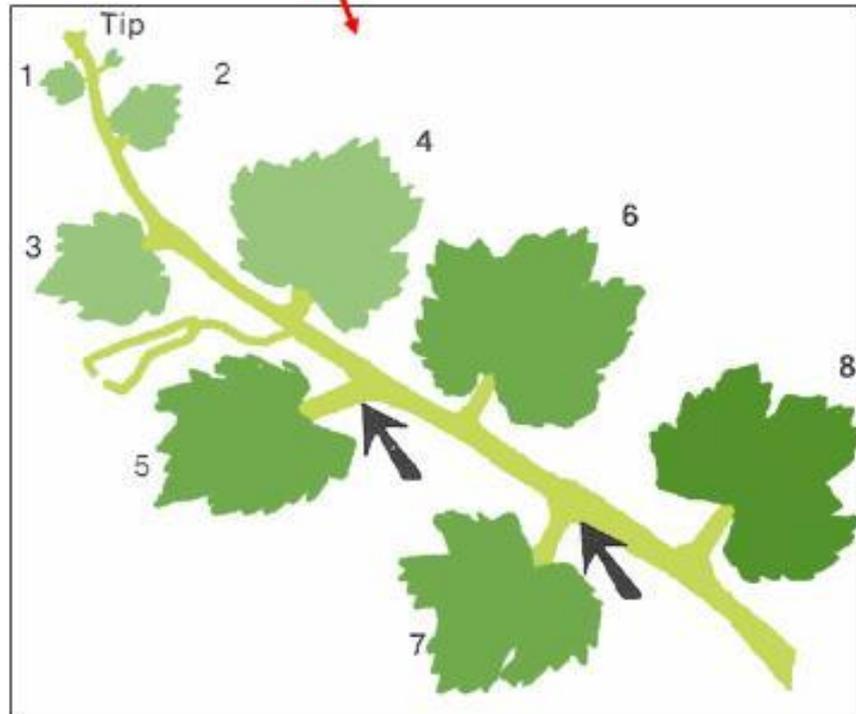




Full Bloom vs Mid-Summer

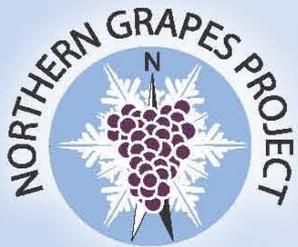


Opposite of the first cluster.



Most recently fully expanded leaf.

Figures adapted from: *Grapevine Nutrition and Fertilization in the San Joaquin Valley*. 1978 Univ. of California publ. 4087



Objective 2c

Approach



- 1. Characterize the disease and insect susceptibility of cold climate grape cultivars.**
- 2. Determine the sensitivities of cold climate grape cultivars to copper- and sulfur-based fungicides.**

Procedure: Replicated cultivar trials in

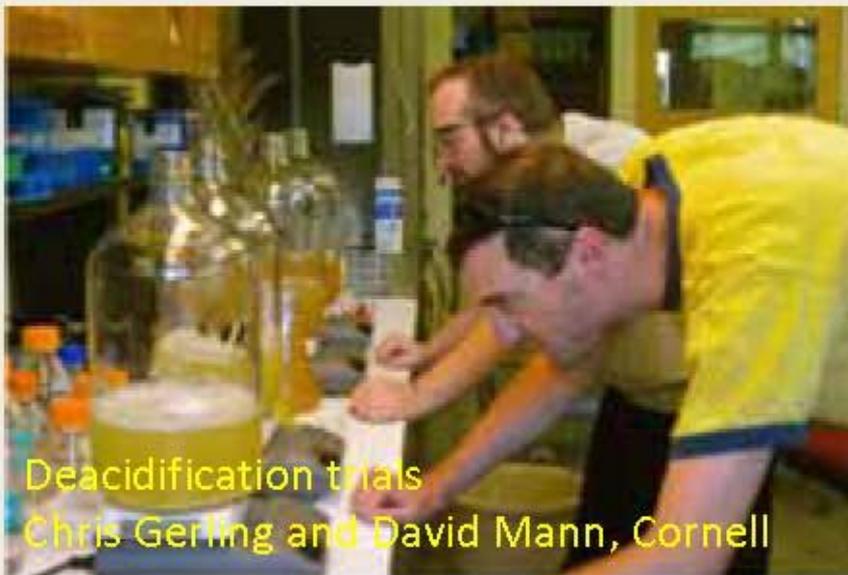
- VT (Lorraine Berkett)
- WI (Patty McManus* & Rebecca Harbut).

Objective 3: Applying winemaking practices to their unique fruit composition to produce distinctive wines



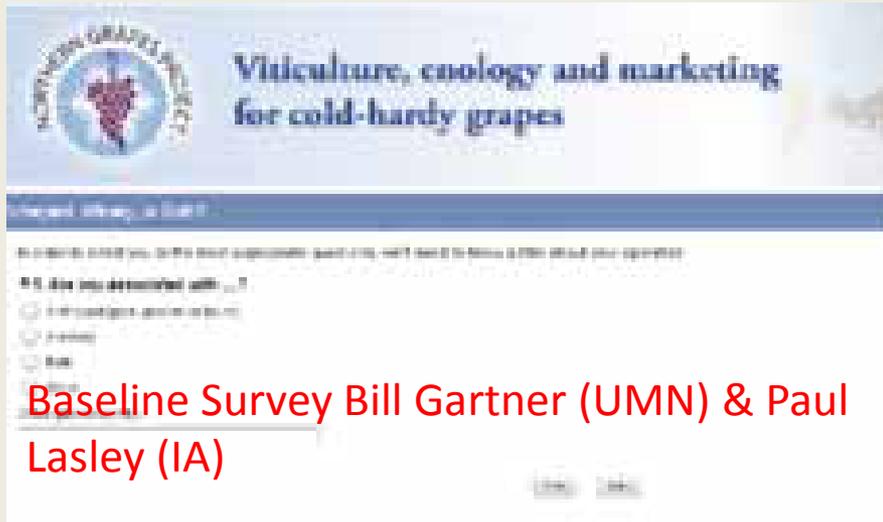
Fermentation Lots
Katie Cook, Univ. Minnesota

- 209 Fermentations
 - IA, MN, NY
- Yeast strain evaluations
 - 48 wine lots, 4 cultivars
- Deacidification methods
 - 52 wine lots, 6 methods
- Enological Tannins
 - 36 wine lots, 2 cultivars, 6 treatments
- Yeast-Assimilable N
 - Survey of cultivars



Deacidification trials
Chris Gerling and David Mann, Cornell

Obj. 4: Understanding consumer preferences, individual & regional **marketing strategies** to increase sales, profitability

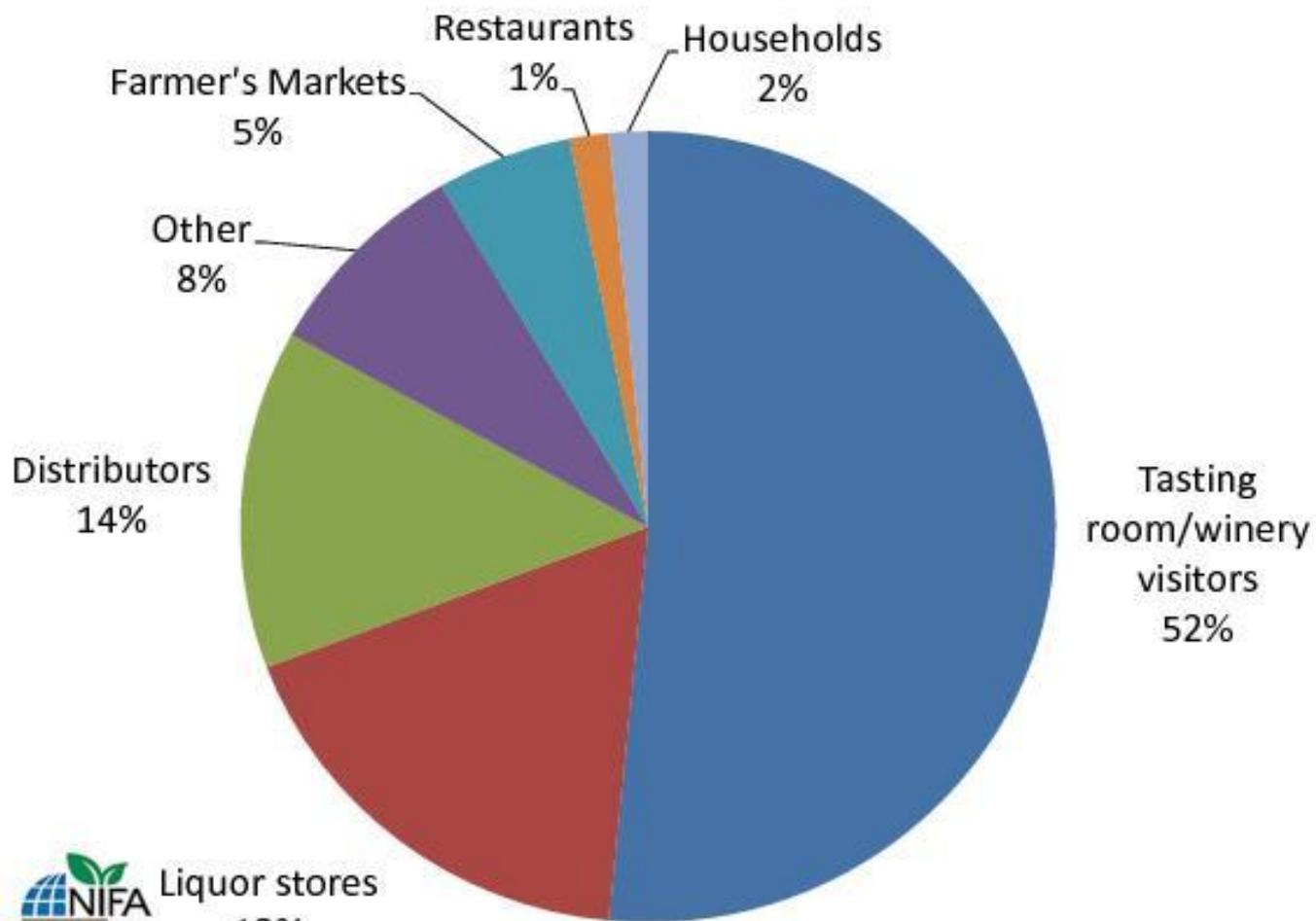


- **Baseline/Economic Impact Survey** – 600 responses
- **State Winery Policy Survey** – (see Northern Grapes News #2)
- **Tasting Room 'Customer Satisfaction' survey** – 6 wineries (IA and NY) – Collected by tasting room staff
- **Consumer profiles and tourism characteristics** – 15 wineries (MI) – 930 surveys





Percent of Wine Sales n=130

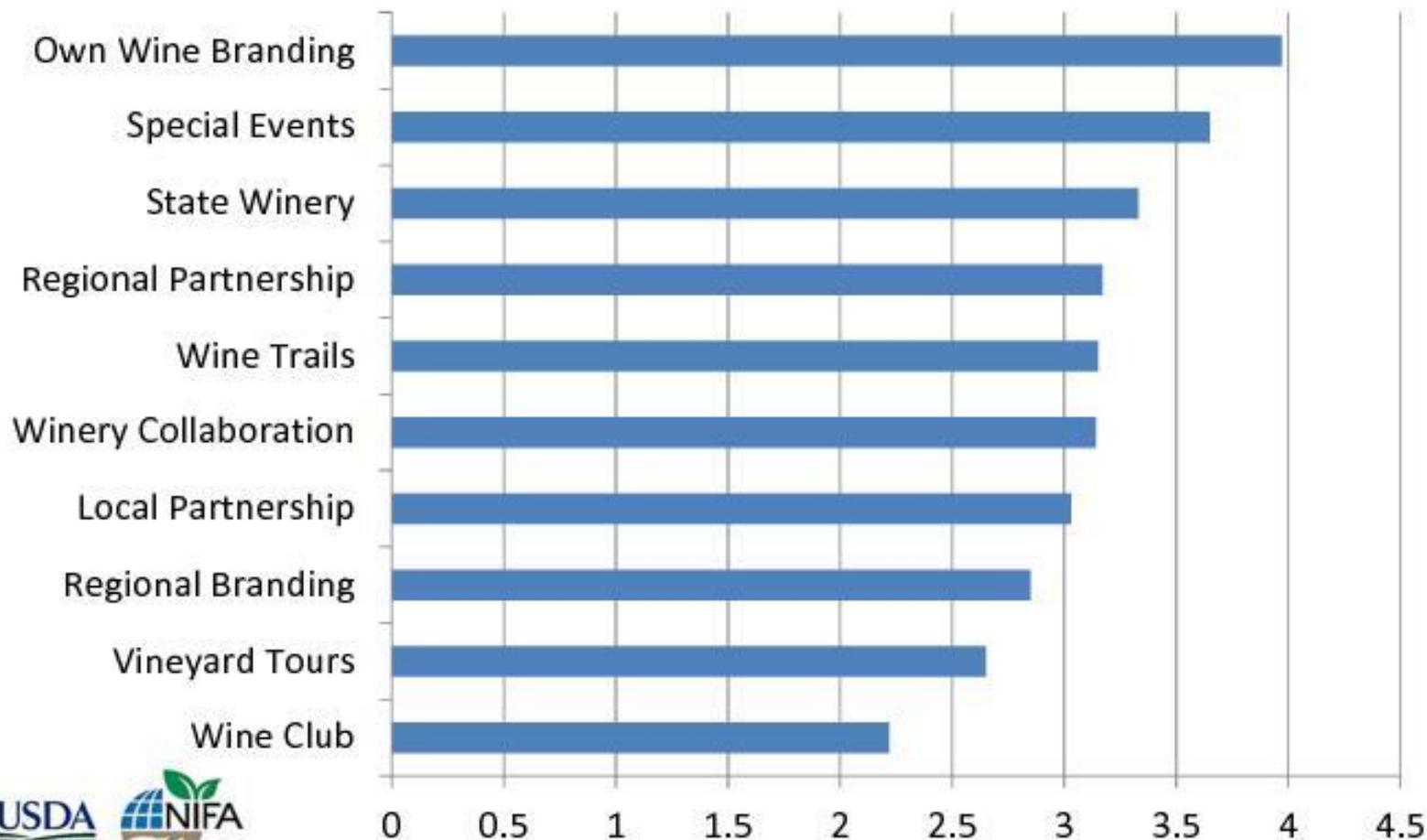


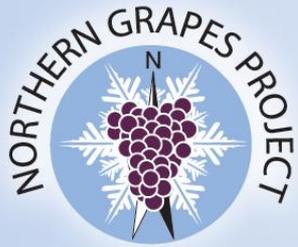


Importance in Overall Marketing Strategy

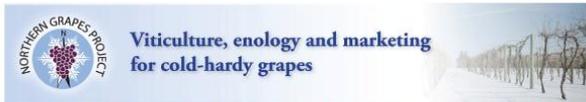
(1 = Unimportant, 5 = Very Important):

n=135





Project Partnership



Who's Who of the Northern Grapes Project

Connecticut Agricultural Experiment Station



Bill Nail

Assistant Scientist, Department of Forestry and Horticulture

Bill is a scientist who conducts applied viticulture research in support of the winegrape industry in Connecticut and greater New England. Current studies include cultivar selection, rootstocks, training methods, and graft union height. His contribution to the Northern Grape Project is to examine the effects of training system, spacing, and pruning on the productivity and fruit quality of northern winegrapes.

Cornell University



Chris Gerling

Extension Associate, Department of Food Science

Chris Gerling is an Extension Associate in the Food Science Department of Cornell University. He works with the New York wine industry to create educational programs that support the growth and improved quality of premium wines throughout the state. His role in the Northern Grapes project will be to assist in outreach.



Miguel I. Gómez

Assistant Professor, Charles H. Dyson School of Applied Economics and Management

Miguel is an economist who specializes in marketing and food distribution, pricing and price analysis, and quantitative methods. His contribution to the Northern Grapes Project is the identification of marketing strategies for the success of tasting rooms and to examine the benefits of the development of grape-wine clusters for the local economies where these clusters are located.



Kevin Jurgeman

Extension Associate, Cooperative Extension

Kevin has been involved with commercial grower outreach and on-farm cold climate IPM, apple production, and wine grape cultivar evaluation research in the Champlain and Upper Hudson regions of Northeastern NY for nearly 20 years. Projects have included crop management, fruit quality and storage improvement, rootstock and production systems evaluation, IPM and predatory mite introduction, real-time integration of weather data and pest/disease predictive systems.



Anna Katharine Mansfield

Assistant Professor, Department of Food Science

Anna Katharine is an assistant professor of enology at Cornell's NYSAES. She first worked in the wine industry in North Carolina's Yadkin Valley and received graduate degrees at Virginia Tech and the University of Minnesota. Anna Katharine currently focuses her efforts in aiding small regional wineries through enology extension, wine sensory evaluation, and defining regional identity in developing winegrowing areas. She is the leader of the enology team for the Northern Grapes Project.

Partnering Industry Associations

Connecticut Vineyard and Winery Assn.

Illinois Grape Growers and Vintners Assn.

Iowa Wine Growers Assn.

Lake Champlain Wines

Massachusetts Farm Wineries and Growers Assn.

Michigan Grape and Wine Industry Council

Minnesota Grape Growers Assn.

Nebraska Winery and Grape Growers Assn.

New Hampshire Winery Assn.

New York Wine and Grape Foundation

North Dakota Grape Growers Association

Northern Illinois Wine Growers

Northern New York Wine Grape Growers

Scenic Rivers Grape and Wine Association (Iowa & Illinois)

South Dakota Specialty Producers Assn.

Upper Hudson Valley Wine and Grape Assn.

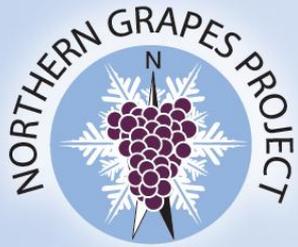
Vermont Grape and Wine Council

Western Iowa Grape Growers Assn

Wisconsin Grape Growers Assn.



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More Information



<http://northerngrapesproject.org/>



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