

NGWB GRANT FINAL REPORT – FY 2014-2015

Contract Number 18-13-257

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Issue of Interest: The overall goal of the University of Nebraska Viticulture Program (UNVP) is to provide science-based research information that will assist the development of the Nebraska grape and wine industry in a sustainable and profitable manner, thus enhancing the economic viability of Nebraska communities. Improving performance of grapes grown in Nebraska vineyards leading to excellent quality wine production is part of this goal. Evaluation and selection of grape cultivars and their efficient management in Nebraska vineyards, along with educational programs that add to the overall capability of grape growers and winemakers are also included in this overall goal.

Approach to the Problem: Research vineyards managed by the UNVP and those of grower-cooperators are employed to pursue scientifically designed and implemented research projects. These experiments are continuing and have already resulted in information useful to the Nebraska growers and wineries; they have been communicated to the clientele by field days, workshops, seminars and the Annual Nebraska Winery and Grape Growers Forum and Trade Show, in addition to via electronic communications such as the Nebraska VineLines electronic newsletter which reaches over 300 email addresses and the UNVP web site <http://viticulture.unl.edu>

Goals/Achievement of Goals: The UNVP has evaluated nearly 100 cultivars and genotypes, leading to recommendations useful to growers starting new vineyards, changing cultivars, grafting over or adding to existing vineyards. Results from canopy management and other practical vineyard management studies have led to recommendations resulting from this project's research. Cooperation with a commercial vineyard (Eric Nelson, Oak Creek Vineyards) has led to initiation of vineyard research on water use efficiency and potential of ground covers for newly established plantings.

Cultivar and new genotype evaluation: Cold-hardiness has continued to be a focus, together with yield and fruit quality determinations. Chambourcin and Norton offer surprisingly good options in the milder parts of Nebraska and growers are embracing these cultivars in those areas, producing excellent quality red wines. As the UNVP plantings have begun to mature, Norton has out-paced many standard cultivars in terms of yield, so where this cultivar is reasonably hardy, it is an option not earlier considered viable. Noiret, Corot Noir, Bianca, Marquette and Petite Pearl are among the newer genotypes that are demonstrating potential.

Northern Grapes and NE-1020 Projects: Herbicide drift incidents have hampered both the NE-1020 and Northern Grapes project research. However, these problems have provided opportunities to evaluate herbicide tolerance of selected genotypes, especially in the NE-1020 planting. For example, MN1258, MN 1220, Seyval Blanc, Chambourcin and Vidal Blanc have appeared to perform moderately well following herbicide drift incidents. It is not clear whether the latter three cultivars “escaped” damage by virtue of later bud break or if they are exhibiting a degree of moderate tolerance (evaluation of these possibilities is continuing.)

Ground cover research and use of under-row mulches is continuing, but some growers are adopting or considering use of mulches and possibly in-row ground covers. More results are expected in the next 3 to 5 years and will be discussed in future reports to the NWGB.

Stability of Frontenac sports: Attempts to determine differences in the L1, L2 and L3 layers (these layers often provide insights anatomically when evaluating mutants in apples, for instance) among Frontenac, Frontenac Gris and Frontenac Blanc yielded inconsistent results, so molecular methods have been initiated to attempt to determine potential genetic differences in these genotypes.

Cold Hardiness: Evaluation of over 40 genotypes has led to data acquisition on winter hardiness, spring bud break and fall susceptibility to cold has taken place over a period of approximately 16 years. These data have been reported at UNVP educational programs and at national and international symposia. Tables reporting some of this information can be found on the UNVP web site <http://viticulture.unl.edu>

UNVP Educational Programs:

- Field Day – July 10, 2014 – Nissen Vineyards, Hartington, NE. Grafting-over was a feature of this field day with Ed Swanson, Cuthills Vineyards demonstrating. Over 20 attended this field day, including growers from South Dakota.
- Field Day – July 17, 2014 – Miletta Vist Winery, St. Paul, NE. Mr. Mick McDowell showcased the new features of his renovated winery, following the disastrous fire that destroyed his winery in the previous year. Additional emphasis was placed on the trellis systems and nutrient management systems practiced in the Miletta Vista vineyards. Over 35 people attended.
- Field Day – July 23, 2014 at Mac’s Creek Winery, Lexington, NE. Cold damage and replanting of cold-damaged vines was discussed, along with a special emphasis on disease management. The new technology of ozonated water as a potential replacement for conventional fungicide sprays was also a hot topic. (15 in attendance)
- Disease management and netting for hail exclusion were topics presented at the Fall Workshop held in Lincoln, NE on November 8, 2014. Guest discussants were Dr. Gerard Adams, UNL Professor of Plant Pathology, and a student of Professor Amauri Bogo, Catarina State University, Florianopolis, Brazil, in addition to UNVP personnel and Nebraska growers. 45 attendees
- The 18th Annual Nebraska Winery and Grape Growers Forum and Trade Show took place March 5-7, 2015 in Omaha NE. Evaluations by attendees indicated overwhelmingly that they had gained knowledge and were planning to implement knowledge gained in their respective enterprises. This was the first time that this event was held in Omaha, with over 160 in attendance. Winemaking practices, fundamental viticulture practices, cultivar selection, vineyard floor management, sustainable vineyard practices, wine filtration and marketing sessions were among topics addressed.
- The Nebraska VineLines was published electronically to over 300 email addresses throughout FY 2014-2015. Northern Grapes Project webinars, upcoming events and good viticultural and winemaking practices were presented in six periodical issues. Changing to this electronic format

elicited compliments from recipients indicating their appreciation of the potential for spontaneity and provision of up-to-date information.

- Modernization and restructuring of the UNVP web site has been an ongoing project for UNVP personnel and Department of Agronomy technical staff.

Results, Conclusions and Lessons Learned: Highly valuable information has been derived from this project that is proving to be useful to Nebraska's grape and wine industry. Examples:

- Stephen Gamet (Research Technologist) continues to provide outstanding service in supporting the UNVP projects. He maintains our three research vineyards and the East Campus Demonstration Vineyard, assists with conducting research and acquisition of data generated by this research, while providing excellent leadership in training student employees. He also assists with the UNVP educational programs and helps with classes on campus. His exceptional service was recognized by the Nebraska Winery and Grape Growers Association (NWGGA) which presented him with the NWGGA "Friend of the Nebraska Wine Industry" award.
- Canopy management. From the research noted earlier it is clear that a high cordon system for growing grape cultivars such as Frontenac, Saint Croix and Marquette is the preferred trellis system. Geneva Double Curtain (GDC) or a bi-cordon high wire system have been demonstrated to be superior to a Vertical Shoot Positioning (VSP) system. (See publication: Bavougian, Christina, Paul E. Read, Vicki L. Schlegel and Kathryn Hanford. 2013. Canopy light effects in multiple training systems on yield, soluble solids, acidity, phenol and flavonoid concentration of 'Frontenac' grapes. HortTechnology 23:1-7.)
- Cold Hardiness and growing degree days (GDD). Both of these topics were discussed at the 18th Annual Forum and at the American Society of Enology and Viticulture annual conference. More data, especially regarding GDD will be required and is an ongoing thrust of this project.
- NE-1020 Project. As noted earlier, herbicide drift damage limited the value of this research planting. It is being conducted in concert with similar plantings by researchers in several other states in the northern and northeast parts of the USA, with results being shared on an annual basis. These results and those from the Northern Grapes Project will be presented

in future professional conferences and communicated via the Nebraska VineLines and the UNVP web site. Regrowth from the herbicide-affected vines has been sporadic and will be evaluated in the 2015 and 2016 growing seasons.

- Cultivar evaluation. A strong emphasis on new cultivars and ones considered as questionable for Nebraska is ongoing. It is clear that Norton and Petite Pearl are worth considering for the milder parts of Nebraska, with Marquette, Noiret, Corot Noir, Bianca, Aromella and Arandell showing promise. As a result of the UNVP evaluations and encouraging results from nearby states (NE-1020 and Northern Grapes Project collaborators), several growers have initiated plantings of these promising genotypes. The UNVP program can provide further insights into cultivar choice for those interested in vineyard expansion, vine replacement or planting a new vineyard (contact pread@unl.edu or sgamet@unl.edu).
- Ground covers and mulches. Our studies have shown that prairie hay, black landscape fabric, distillers dried grains and crushed glass offer promise for in-row mulching (limited availability and cost will probably preclude use of crushed glass, however). Creeping red fescue and existing native grasses appear to be appropriate options for between-row (“alley-way”) plantings.

Progress Achieved According to Outcome Measures: UNVP research and educational programs conducted under the aegis of this project have offered significant benefits to the Nebraska and Midwest grape and wine industries. In 1994, Nebraska had only one winery and approximately 15 acres of commercial vineyards, but now has grown to 33 licensed wineries, 125 to 150 growers and an estimated 400 or more acres of commercial vineyards. Perhaps more importantly, Nebraska wines are garnering significant accolades in national and international competitions. Since the Nebraska Farm Wineries Act requires a Nebraska Farm Winery’s production to be based upon a minimum of 75% Nebraska produce, these awards are reflective of Nebraska growers producing grapes of high standard. Many of Nebraska’s grape grower and winery start-ups have done so, at least in part, based upon science-based recommendations from the University of Nebraska Viticulture Program. It should also be noted that collaboration with the Nebraska Winery and Grape Growers Association has been synergistic in assisting the growing Nebraska grape and wine industry.

Financial Report

The budget submitted in the request for funding and included on the contract has been followed, with minimal changes. Support for the Viticulture Technologist's half salary and benefits enabled delivery of educational programs and exceptional maintenance of the UNVP research vineyards. Expenditures for supplies, fuel and vehicle rental were as noted in the contract. Trellis renovations have continued while making use of donated materials which were utilized to supplement the NGWB budget.

The usual 10% overhead charge mandated by the University of Nebraska and per agreement with the Nebraska Department of Agriculture was included in the contract.

Note: Additional funding and support has been provided by the Northern Grapes Project (a multi-state SCRI grant-funded project) and the University of Nebraska's Agricultural Research Division.

Specific details can be provided if desired, along with a list of presentations and publications emanating from this Nebraska Grape and Wine Board supported project.