

2010

# Experimental Wine Making

Murli R. Dharmadhikari  
*Iowa State University*, [murli@iastate.edu](mailto:murli@iastate.edu)

Sebastian Donner  
*Iowa State University*

Jennifer Hansen  
*Iowa State University*

Follow this and additional works at: [http://lib.dr.iastate.edu/farms\\_reports](http://lib.dr.iastate.edu/farms_reports)



Part of the [Agricultural Science Commons](#), and the [Agriculture Commons](#)

---

## Recommended Citation

Dharmadhikari, Murli R.; Donner, Sebastian; and Hansen, Jennifer, "Experimental Wine Making" (2010). *Iowa State Research Farm Progress Reports*. 332.  
[http://lib.dr.iastate.edu/farms\\_reports/332](http://lib.dr.iastate.edu/farms_reports/332)

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact [digirep@iastate.edu](mailto:digirep@iastate.edu).

---

# Experimental Wine Making

## **Abstract**

The substantial growth of the Iowa grape and wine industry over the past decade resulted in the establishment of the Midwest Grape and Wine Industry Institute to investigate various cold climate grape cultivars and their potential for wine making. Unfortunately, due to the climate encountered in Iowa, we are not able to simply adopt wine making practices used in other parts of the world to achieve the best quality wines possible for our region. The project described herein focused on the production of small batches of experimental wine to evaluate cold climate cultivars and the impact of conditions on the composition of the final wines.

## **Keywords**

RFR A9066, Midwest Grape and Wine Industry Institute

## **Disciplines**

Agricultural Science | Agriculture

# Experimental Wine Making

## RFR-A9066

Murli Dharmadhikari, director  
Sebastian Donner, assistant scientist  
Jennifer Hansen, research associate  
Midwest Grape and Wine Industry Institute

### Introduction

The substantial growth of the Iowa grape and wine industry over the past decade resulted in the establishment of the Midwest Grape and Wine Industry Institute to investigate various cold climate grape cultivars and their potential for wine making. Unfortunately, due to the climate encountered in Iowa, we are not able to simply adopt wine making practices used in other parts of the world to achieve the best quality wines possible for our region. The project described herein focused on the production of small batches of experimental wine to evaluate cold climate cultivars and the impact of conditions on the composition of the final wines.

### Materials and Methods

The majority of grapes used in this project originated from the Horticulture Research Station, Ames, IA. The remaining grapes originated from the Armstrong Research Farm, Lewis, IA; Southeast Research Farm, Crawfordsville, IA; and Northeast Research Farm, Nashua, IA. Details on the grapes themselves can be found in the viticulture sections of this Annual Research Report. Treatment products listed herein (except Acidex) were provided by Scott Laboratories.

*Varieties.* Red varieties fermented on the skins for this project were Chambourcin, Chancellor, Corot Noir (NY 70), DeChaunac, Frontenac, GR 7, Leon Millot, Maréchal Foch, Marquette, Noiret (NY 73), and St Croix. White varieties, or grapes pressed and fermented without skins, included Brianna,

Edelweiss, Esprit, Frontenac Gris (grey grapes, but treated as white for this study), LaCrescent, LaCrosse, Prairie Star, Seyval Blanc, Traminette, and Vignoles.

*Pre-fermentation treatments.* All red grapes were destemmed, crushed, and treated with 30 mg/L SO<sub>2</sub> (sulfur dioxide in potassium metabisulfite form) and 200 mg/L diamonium phosphate. If necessary, sugar was added to obtain 23° brix. Three batches of Frontenac were treated according to the manufacturer's instructions with ProMalic® yeast 4 hours prior to inoculation with EC 1118 yeast. Three batches of St Croix were treated with 400 mg/L, 800 mg/L, and 1,200 mg/L of tannin supplement VR Supra®. Three batches of Marquette were treated with 1,000 mg/L VR Supra®. Control batches for Frontenac, St Croix, Marquette and the other reds did not receive any further treatment prior to inoculation.

Select white varieties (Esprit, Frontenac Gris, LaCrescent, Traminette, and Vignoles) were frozen and then pressed (whole clusters) to produce concentrated juice. This juice was used to make ice wine. Some white varieties (Brianna, Edelweiss, Esprit, LaCrescent, LaCrosse, Prairie Star, and Seyval Blanc) were destemmed, crushed, and pressed without freezing. All white juices were treated with 30 mg/L SO<sub>2</sub>, 200 mg/L diamonium phosphate and 0.1 g/L Lafazym Press. The juices were racked after 24 hours to minimize solids.

*Fermentation conditions.* All wines were fermented using standard wine making procedures using EC1118 yeast. Reds were fermented at room temperature until dry. Whites were fermented at 14°C to dryness with the exception of ice wines. For ice wines, sugar and alcohol levels were monitored

throughout fermentation. Once the alcohol level reached 10.5%, fermentation was stopped by moving the wines to a -5°C freezer.

*Post-fermentation treatments.* Reds were pressed and treated with 50 mg/L SO<sub>2</sub>. Reds were racked after two to eight weeks to remove more solids. Several batches of St Croix were treated with varying amounts of post-fermentation tannin additions. These products included Biotan, Tanin Galalcool, Tan'Cor, Tan'Cor Grand Cru, Quertanin, and Tanin Plus.

Whites were racked after completion of fermentation and 50 mg/L SO<sub>2</sub> was added. White wines were treated with different clarifiers, including Argilact (bentonite and casein), Casei Plus (casein), Gecoll Supra and Gelarom (liquid gelatins), Ichtyocelle (isinglass), polyvinyl polypyrrolidone (PVPP), Poly lact (PVPP and casein), and hot mix Sparkolloid.

Various post-fermentation deacidification techniques, such as using Acidex, calcium carbonate, or potassium carbonate to lower the acidity, were and will be employed to determine their effect on the organic acid profile and palatability of wines. Chemical analysis was performed throughout the process and included hydrogen ion concentration (pH), titratable acidity, volatile acidity, organic acid profile, alcohol, and sugar. Sulfur dioxide concentrations were monitored and adjusted as necessary to prevent oxidation. All wines were coarse filtered prior to bottling. Wines with residual sugar (ice wines) were treated with 250 mg/L potassium sorbate just prior to bottling.

## **Results and Discussion**

Batches prepared have been and will be used for trainings and workshops. Additional post-fermentation treatments will be performed to address the training needs. Due to the nature of wine and its consumption, this project does not necessarily focus on positive and negative outcomes. The goal is to give winemakers the knowledge and experience to develop their own styles by providing examples of how different cultivars and techniques can influence the final product.

## **Acknowledgements**

These research efforts are supported by the Iowa Department of Agriculture and Land Stewardship, the Leopold Center for Sustainable Agriculture, the Iowa Board of Regents, Iowa State University College of Agriculture and Life Sciences, Department of Food Science and Human Nutrition, and ISU Extension. Treatment products were in part donated through Mike Jones by Scott Laboratories. The highly valued in-kind support by the Horticulture Research Station and staff, primarily superintendent Nick Howell and agricultural specialist Dennis Portz, also is greatly appreciated.