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# Maturation of Recently Released Cold Hardy Wine Grap Cultivars in Iowa: Corot noir, Frontenac Gris, La Crescent, Marquette, and Noiret

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# Maturation of Recently Released Cold Hardy Wine Grape Cultivars in Iowa: Corot noir, Frontenac Gris, La Crescent, Marquette, and Noiret

## **Abstract**

Many new wine grape cultivars have been released from breeding programs developed for cold hardiness in the Midwest. Iowa State University has been observing the growing habits of selected new cultivars throughout Iowa to expand the growing wine industry. Five of the cultivars that have shown promise include Corot noir (released by Cornell University in 2006), Frontenac Gris (released by the Univ. of Minnesota in 2003), La Crescent (released by the University of Minnesota in 2002), Marquette (released by the University of Minnesota in 2006), and Noiret (released by Cornell University in 2006). The objective of this study was to monitor the general trend of the soluble solids concentration (SSC)/°Brix, initial pH, titratable acidity, and average berry weight after the onset of veraison until grape berry maturity.

## **Keywords**

Horticulture

## **Disciplines**

Agricultural Science | Agriculture | Horticulture

# Maturation of Recently Released Cold Hardy Wine Grape Cultivars in Iowa: Corot noir, Frontenac Gris, La Crescent, Marquette, and Noiret

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(48 berries/cultivar) on a weekly basis. Collections were taken one week after berry quality indices stopped changing. Sampling continued after maturity to show how grape quality changed after the ideal harvest time had passed.

## Introduction

Many new wine grape cultivars have been released from breeding programs developed for cold hardiness in the Midwest. Iowa State University has been observing the growing habits of selected new cultivars throughout Iowa to expand the growing wine industry. Five of the cultivars that have shown promise include Corot noir (released by Cornell University in 2006), Frontenac Gris (released by the Univ. of Minnesota in 2003), La Crescent (released by the University of Minnesota in 2002), Marquette (released by the University of Minnesota in 2006), and Noiret (released by Cornell University in 2006). The objective of this study was to monitor the general trend of the soluble solids concentration (SSC)°Brix, initial pH, titratable acidity, and average berry weight after the onset of veraison until grape berry maturity.

Grape berry samples were analyzed by crushing the berries in a plastic bag and straining the juice and pulp through two layers of cheese-cloth. SSC/°Brix data was determined from the juice with a hand held refractometer (Vee Gee Scientific, Janesville, WI). Initial pH of the juice was determined from the juice with a bench-top pH meter (IQ Scientific Instruments, Carlsbad, CA). Titratable acidity was determined by the amount of 0.1 N NaOH added to the grape juice to a pH endpoint of 8.2. Titratable acidity was calculated as grams tartaric acid per liter:

$$\frac{(\text{ml of NaOH added}) \times (0.1 \text{ N NaOH}) \times (75 \text{ tartaric acid})}{(\text{grams of 5 ml of juice})}$$

## Results and Discussion

Titratable acid (TA) showed considerable loss in all the cultivars, with the most drastic losses occurring a few weeks after veraison (Figure 1). Corot noir and Noiret had relatively low TAs at harvest, although Frontenac gris, and La Crescent exhibited relatively high TAs as are characteristic of many *Vitis riparia* hybrids. Marquette was intermediate between the New York and other Minnesota cultivars from veraison to harvest. The SSC/°Brix of all the cultivars increased at an exponential rate (Figure 2). The New York cultivars (Corot noir and Noiret), which had lower SSC/°Brix, held a near constant level for about four weeks prior to harvest, which

## Materials and Methods

The study was conducted at the Horticulture Research Station, Ames, IA, in a vineyard established in 2003. Blocks of three vines were planted in a randomized block design and replicated four times. Within each block of the specified cultivars, 12 grape clusters were marked for sampling just prior to veraison, which helped ensure consistency during maturity observations. From veraison to harvest, one berry was selected at random/cluster

could be helpful when waiting for the TA to drop to an acceptable level. The SSC/°Brix of the Minnesota cultivars (Frontenac gris, La Crescent and Marquette) reached relatively high levels as is characteristic of many *Vitis riparia* hybrids. Initial pH increased for all cultivars after veraison, and they reached an appropriate range for wine production at harvest (Figure 3). In previous years, high initial pH has been a problem. However, the 2008 growing season was much cooler than normal. Fruit maturation was delayed and a

high initial pH was not a problem before an acceptable level of SSC/°Brix or TA was reached.

### Acknowledgements

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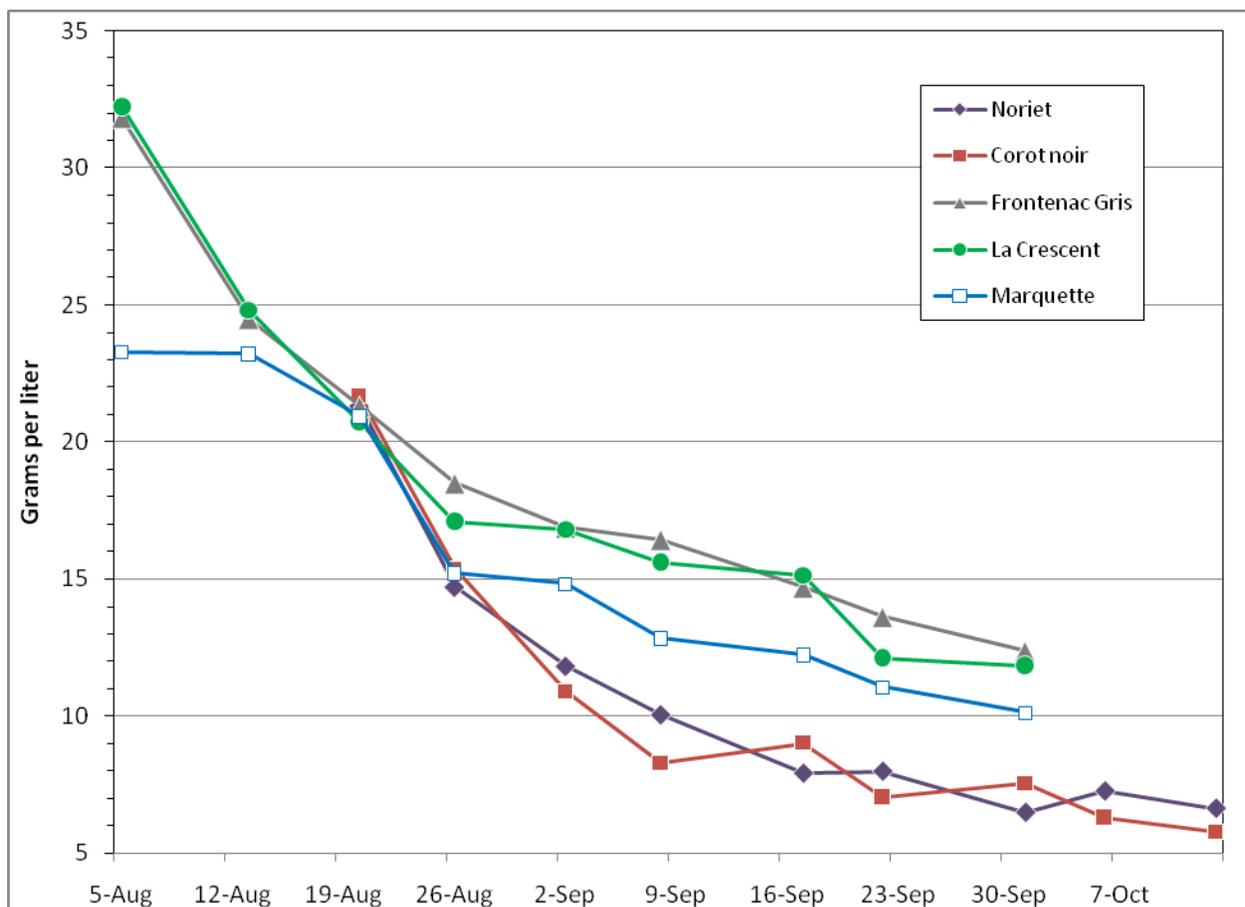


Figure 1. Changes in titratable acidity from veraison to harvest for five wine grape cultivars in central Iowa.

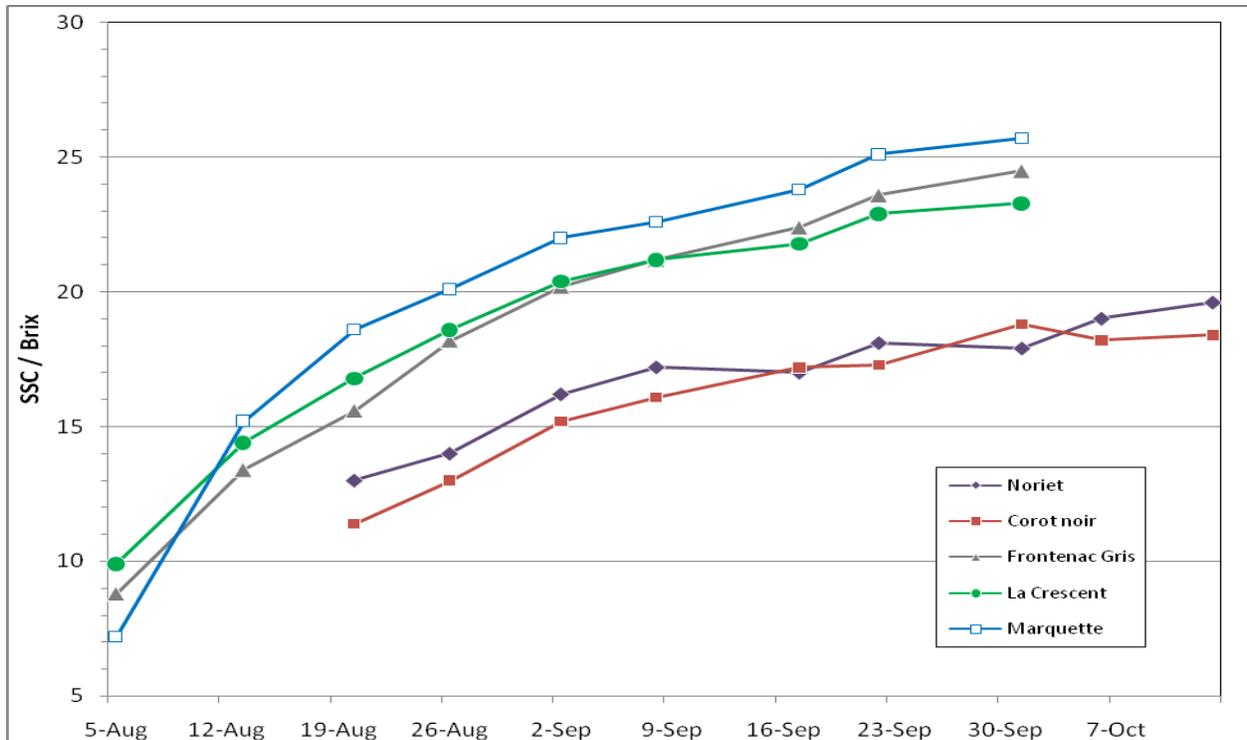


Figure 2. Changes in soluble solids concentration (SSC/°Brix) from veraison to harvest for five wine grape cultivars in central Iowa.

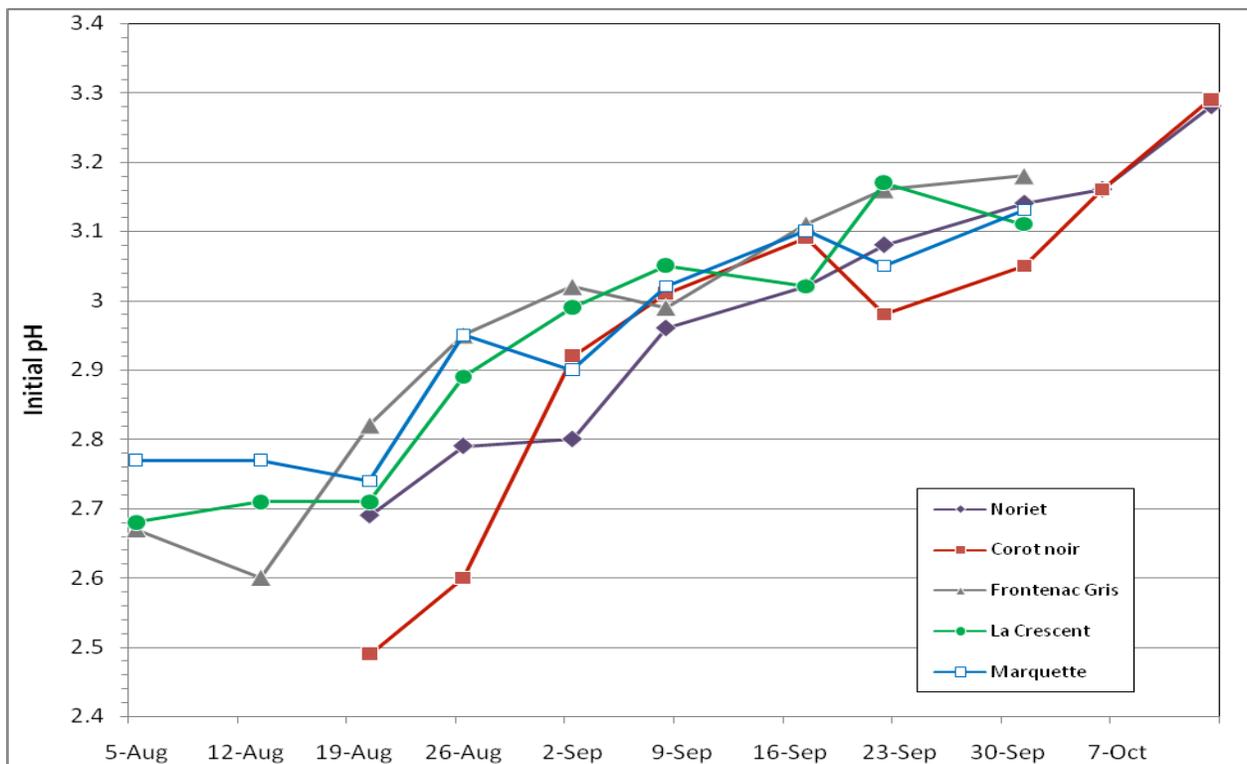


Figure 3. Changes in initial pH from veraison to harvest for five wine grape cultivars in central Iowa.