
Kathleen Delate, assistant professor
Andrea McKern, research assistant
Departments of Horticulture and Agronomy
Bob Burcham, ag specialist

Introduction
In 1899, Iowa ranked 11th in the United States in grape production and sixth in 1919. When the focus was shifted to corn and soybean production in the 1930s and 1940s, grape production decreased and with the introduction of the corn herbicide 2,4-D, damage sustained from herbicide drift in the remaining Iowa vineyards was significant enough to cause a great decline in Iowa grape production. In 2003, Iowa had an estimated 200-250 acres of grapes planted, and continues to grow (Domoto, 2003).

Materials and Methods
On May 25, 2001, four cultivars of grapes (six vines per cultivar) were planted at the Neely-Kinyon Research Farm: Bluebell, Edelweiss, Foch, and Frontenac. Vines were planted 7 feet apart with 9 feet between rows. The vineyard, after the last vine planting, measures 50 feet by 72 feet.

At planting, all vines received a 5-lb application of composted turkey litter (Ultra-Gro®, Ellsworth, IA) with a chemical analysis of 2.2-2.8-1.5 (N-P-K), and a 6-in. layer of straw mulch applied to the base of each vine. In 2007, 5 lb of hoophouse compost was applied to established vines and worked into the surrounding soil on May 30. Straw mulch was reapplied to the base of the established vines after weeding to maintain a 6-in layer on May 30, 2007. Kentucky bluegrass was planted in the late spring of 2002 between vine rows to maintain a ground cover in vineyard middles. The ground cover was maintained by mowing

Results and Discussion
Yields were significantly impacted in 2007 by freezing weather early in the season, herbicide spray drift, which reduced leaf area and grape production, and higher humidity and increased incidence of anthracnose and black rot. Poor flower and fruit set was followed by high disease pressure and animal predation. As an example, yields were reduced from 1.4 tons/acre in the Frontenac cultivar in 2006 to 0.14 tons/acre in 2007 to (Table 1). Yields were greatest in ‘Foch’ (0.8 tons/acre). Grape cluster
weight averaged 10 g/cluster, significantly lower than in 2006, when clusters averaged 35 g. There was a significantly greater cluster weight in the Edelweiss compared with the other varieties (Table 1). Grape cluster number was also down from an average of 78 to 46/vine in 2007 (Table 1), but ‘Foch’ vines had a significantly greater number of clusters at 110 clusters/vine. Brix levels averaged 17° and were highest in ‘Foch’ grapes (20.3°), followed by ‘Bluebell’ and ‘Frontenac’ (Table 1). Juice and jelly made from organic grapes was of high quality despite low yields.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (ton/ac)</th>
<th>Brix (°)</th>
<th>Productivity (clusters/vine)</th>
<th>Average cluster weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluebell</td>
<td>0.16b</td>
<td>17.12b</td>
<td>35.00b</td>
<td>7.15b</td>
</tr>
<tr>
<td>Edelweiss</td>
<td>0.15b</td>
<td>15.16c</td>
<td>11.17c</td>
<td>17.52a</td>
</tr>
<tr>
<td>Foch</td>
<td>0.76a</td>
<td>20.29a</td>
<td>110.00a</td>
<td>10.53b</td>
</tr>
<tr>
<td>Frontenac</td>
<td>0.14b</td>
<td>15.85bc</td>
<td>27.33bc</td>
<td>6.83b</td>
</tr>
<tr>
<td>LSD 0.05</td>
<td>0.31</td>
<td>1.40</td>
<td>22.24</td>
<td>5.96</td>
</tr>
</tbody>
</table>

References
Domoto, P. 2007. ISU Viticulture webpage <http://viticulture.hort.iastate.edu>

Acknowledgments
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Table 1. Plant performance in the organic grape variety trial, Neely-Kinyon, 2007.