

ROOTSTOCK GRAFTING PROJECT REPORT

#18-13-124

SCHILLINGBRIDGE WINERY

**PREPARED BY
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**for
NEBRASKA GRAPE AND WINERY BOARD
Fiscal year 2010-2011**

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1.Need. The Nebraska grape and winegrowing industry is relatively young. Early vineyard plantings focused on hardy cultivars (varieties) that were considered “easy” to grow in our continental climate. Many vineyards consist of small numbers of several different cultivars. Unfortunately many of these cultivars have fruit characteristics that make it difficult to produce quality wine. When the industry started, the novelty of a “Nebraska Wine” was adequate to sell the product, but as the industry matures wine quality will be the driving force in expanding market share. This will require cultivars better suited to the demands of the market place. The time is rapidly approaching when many of these early cultivars will have to be replaced with cultivars that have greater value to the winery and the consumer. Pulling up and replanting an existing vineyard would involve considerable labor and input costs as well as going through three or four years of lost production as the new vines are trained. Grafting onto the mature root systems of existing vines to change cultivars may be more practical with less input cost and a more rapid return to an income producing crop.

2.Approach. This study evaluates the suitability of this practice in our Midwest environment using established vines of the cultivars deChaunac and Lacrosse as the rootstock and cleft grafting Pinot Gris and Riesling respectively as the scion cultivars. The study also seeks to quantify the costs involved in making this conversion and supply an educational venue for interested grape growers.

This project is being conducted in the vineyard of SchillingBridge Winery, Pawnee City, in the southeast corner of Nebraska. Row 24 consisting of 62 deChaunac vines, 2 off type vines and 3 blank spaces, was selected to graft to the scion cultivar Pinot Gris. Row 25 consisting of 67 Lacrosse vines was selected to graft to the scion Riesling. Both rows of vines were own rooted, had been planted in 2002, and cropped in 2005, 2006, 2007 and 2008.

3.Procedures. Grafting was done on May 11 and May 12, 2009. Pinot Gris was grafted to deChaunac and Riesling grafted to Lacrosse. At the end of the 2009 growing season, a total of 34 Pinot Gris/deChaunac vines and 40 Riesling/Lacrosse vines had established new growth from the scion buds. On November 30, for winter protection, the graft unions of these vines were covered with soil from within the row to a depth above the first two nodes of the scion. This soil was removed on April 9, 2010. The grafts received additional protection during the winter of 2009-2010 from snow cover through most of the winter. 33 of 34 Pinot Gris/deChaunac and 40 of 40 Riesling/Lacrosse grafts survived the first winter. The trunks and cordons of the rootstock cultivars that had been left during the first season were pruned to the same bud density as adjacent rows. Were grafts had not taken and replacement shoots of the rootstock cultivar were present, they were trained to the fruiting wire of the trellis. New shoots of the scion cultivar were trained to the fruiting wire of the trellis as they developed. Suckers that developed below the graft union were removed periodically during the spring rapid growth phase. On June 14, 2010 a field day was held in the vineyard to educate and share with growers what we had observed from this project to date. On August 25, 2010 fruit was harvested from the Lacrosse vines that remained. On September 10, 2010 the deChaunac vines were harvested. November 10, 2010 the graft unions were covered with soil from within the row to protect them from winter injury. In early December of 2010 cutting of Riesling and Pinot Gris were collected and placed into cold storage to be used as budwood for grafting the remaining trunks in the spring of 2011. On April 18, 2011 soil covering the

graft unions was removed. April 28 & 29 and May 3 & 4 of 2011 Pinot Gris and Riesling were grafted onto the remaining deChaunac and Lacrosse trunks in the same manner as the original grafts in 2009. On May 10,11&12 Edelweiss scions were grafted to 127 Traminette vines to apply what we have learned to date and help to meet our demand for Edelweiss grapes.

4. Results. In 2012 twenty-four ungrafted Lacrosse vines produced 623 lbs of fruit @ 25.9 lbs/vine compared to a vineyard average of 19.4 lbs per Lacrosse vine. Seventeen deChaunac vines produced 116 lbs of fruit @ 6.8 lbs/vine compared to a vineyard average of 9.3 lbs per deChaunac vine.

One of the goals of this phase of the study was to determine the rate of graft survival. All 40 of the Riesling/Lacrosse grafts and 33 of 34 Pinot Gris grafts survived the first winter, and developed new growth above the graft union in the spring of 2010. The winter of 2010-11 was not as cold as the previous winter, but was much drier with very little or no snow cover most of the time. Starting February 14, an eight-day period of warm weather with an average high temp of 59F was followed by a 54F degree drop in temperature on February 21 with lows of 10F four of the next 5 days. The de-acclimation triggered by eight warm days, followed by a hard freeze, caused more damage to buds, trunks and grafts than was experienced during the previous winter. Twenty-nine of the 33 Pinot Gris grafts survived the winter with 10 producing shoots above the winter protection. Thirty-six of the 40 Riesling grafts survived the winter with 16 producing shoots above the winter protection. Some of these Riesling vines have set a small crop of grapes for the 2011 season.

April 28 & 29 the remaining deChaunac trunks were grafted to Pinot Gris and May 3 & 4 the remaining Lacrosse trunks were grafted to Riesling. Cleft grafts at ground level to enable winter protection were used in the same manner as the original grafts in 2009. On the mornings of May 16 and 17, well past what is considered our frost-free date we had low temperatures measured at 38F. However there was heavy frost at ground level from thermal convection, which killed the buds on the new grafts, many of which were pushing new shoots at the time. Suckers will be trained up from these plants to be grafted in the future. Because of this frost damage we did not schedule a field day for 2011.

We also grafted seven and six vines each of two experimental cultivars into the vineyard for evaluation onto deChaunac trunks trained on VSP with fruiting wires at 30 inches. These were grafted before the Pinot Gris and Riesling. They were grafted at about 14 inches high because they are expected to be cold hardy and not need winter protection. These also were frozen back, however 7 of 7 of one cultivar recovered and produced shoots from secondary buds, while only one 1 of 6 of the second cultivar produced a new shoot after the frost. We additionally grafted 127 Traminette vines to Edelweiss on May 10-12. These were trained to a single high cordon and were grafted at about 42 inches off the ground. They had not started to push buds at the time of the frost event and suffered no damage from it. Currently 93 are pushing or have shoots for a rate 73%.

Inputs for the 2010-2011 fiscal year were grafting supplies, budwood and labor. Budwood was collected in the SchillingBridge vineyard 12/2/2010 from the 2009 grafts, and stored in the winery cooler @ 38 degrees F. Budwood for the Edelweiss grafts was collected in the Doves Landing Vineyard, Lincoln, NE in February 2011, and also stored in the winery cooler. Grafting supplies used including grafting tape, Treekote grafting compound and grafting tools were carried over from the 2009 grafting. Labor was the

main expense charged to this grant. Following is a breakdown of that expense. Labor was calculated at \$20.00/hour.

Grafting project expenses fiscal year 7/1/2010-6/30/2011

Labor		
Graft & grow tube protection	5hrs	\$100.00
Data collection	11.5 hrs	\$230.00
Training vines & sucker removal	36 hrs	\$720.00
Grafting	43.5hrs	\$870.00
Budwood collection	<u>10 hrs</u>	<u>\$200.00</u>
Total labor cost	106 hrs	\$2120.00

Total cost 7/1/2010-6/30/2011 \$2120.00

The total cost incurred from July 1, 2010 through June 30, 2011 was \$2120. The portion of the cost covered by Grape and Winery Board Grant funds was \$1060.00 as follows,

Labor	53.0hrs	\$1060.00
Total costs covered by grant funds		\$1060.00

5. Progress toward the long-term outcome. A long term goal of this project is to determine the suitability of hardy hybrid wine grapes (deChaunac and Lacrosse) that may have lower demand because of fruit quality issues related to wine quality, to act as rootstock for higher value scion cultivars. The first growing season proved that deChaunac and Lacrosse roots do accept grafts of scion cultivars. The second year of the study demonstrated graft survival through winter with adequate vigor to develop cordons for future fruit production. The field day helped to raise the level of awareness within the Nebraska grape and wine industry of the potential value of this practice in our pursuit of quality fruit and wine. The freeze damage and late frost of 2011 has been a setback to this project. However it did demonstrate the value of winter protection for the graft unions when working with cold tender cultivars. Without this practice the loss of established grafts would have been higher. By grafting Edelweiss, a cultivar with strong demand onto Traminette, of which we have an excess supply, we are applying this concept in the manner that was originally envisioned.

Overall this has been a very interesting and educational project. I would like to thank the Nebraska Grape and Winery Board for their support.

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