

**Summary of Grape Variety
and
Rootstock Performance Data
Oklahoma Fruit and Pecan Research Station
Perkins, OK**

2003-2004

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January 10, 2005

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INTRODUCTION

Variety selection is one of the most important aspects of vineyard establishment. Varieties vary in their yield potential, fruit quality and adaptability under Oklahoma conditions. Localized comparative test results of variety performance are important as Oklahoma growers make vineyard establishment decisions.

Grapes can be grown on their own roots, i.e. rooted cuttings, or grafted onto rootstocks. Various rootstocks can offer benefits such as pest resistance, tolerance of certain soil characteristics and tolerance of salts and salinity. In areas where winter freeze injury is prevalent, rootstocks impart additional risk to the vineyard since vines frozen back below the graft union must be replaced or re-grafted.

Rootstocks commonly used are either selections from hardy native species or plants resulting from crosses of various native species. Vines resulting from crosses would be expected to exhibit traits from one or both of the parents of the cross.

METHODS

Replicated Variety Trial:

This trial consisting of 13 varieties on 1103 Paulsen rootstock was established in May, 2001. Vines were planted in rows 12' apart with vines 8' apart within row. The vines were trained to a high cordon trellis. Plots were organized in a randomized complete block design with 5 replications and two vines per plot. In May, 2002 two additional vines grown on their own roots were added to each plot to allow comparison of grafted vs. own rooted vines. Data collection began in 2003 including bud break according to Eichorn-Lorenz rating scale, vigor, fruit yield and quality.

Observational Variety Trial:

Plantings of various new varieties/lines of interest continue to be made.

Rootstock Trial:

The rootstock evaluation trial was planted in May, 2001. Grafted vines of 'Chardonnay' and 'Cabernet Franc' in rootstock combinations listed below were planted in rows 12' apart and 8' apart within row and trained to a Geneva Double Curtain trellis. Variety/Rootstock combinations are as follows: 'Chardonnay' – own roots, 1103P, 140R, 3309C, 5BB Kober, Freedom, St. George. 'Cabernet Franc' – 1103P, 110R, 3309C, St. George

Data collection began in 2003 including bud break, vigor, fruit yield and quality.

RESULTS:

Results are summarized in the following tables:

Table 1A. Effect of Cultivar on Fruit Yield and Quality from Grafted (1103P) Grape Vines, Perkins, OK 2004

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
Ruby Cabernet ²	8-Sep	20,623	20.1	151.3	4.12	0.42	23.58
Cabernet Franc ²	30-Aug	18,960	16.3	141.6	4.30	0.35	23.53
Shiraz ²	31-Aug	18,652	17.6	135.2	4.11	0.54	20.88
Viognier ¹	11-Aug	17,361	15.8	170.0	3.75	0.54	17.21
Merlot ²	7-Sep	15,595	15.3	155.3	4.38	0.30	25.20
Sangiovese ²	7-Sep	13,318	24.7	174.8	3.82	0.42	22.26
Petit Verdot ²	1-Sep	12,797	11.8	92.0	3.93	0.55	23.03
Chardonnay ¹	13-Aug	11,993	15.8	182.5	3.81	0.61	20.77
Pinot Gris ²	11-Aug	10,193	14.2	92.9	3.87	0.50	19.34
Cabernet Sauvignon ²	5-Sep	9,196	14.2	88.4	3.89	0.50	22.45
Malbec ²	2-Sep	7,475	23.3	91.0	4.13	0.53	21.57
Cynthiana ³	20-Aug	3,601	10.7	56.1	3.61	1.15	21.03

Variety Type - 1-Vinifera, white; 2-Vinifera, red; 3-American, red;
Planted 2001; High cordon trellis; vine spacing 8x12

Table 1B. Effect of Cultivar on Fruit Yield and Quality from Grafted (1103P) Grape Vines. Perkins, OK 2003

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
Sangiovese ²	26-Aug	16,068	21.3	303.9	3.85	0.61	18.91
Ruby Cabernet ²	26-Aug	13,874	16.7	202.4	4.13	0.53	21.74
Shiraz ²	25-Aug	13,148	15.6	246.0	4.17	0.58	22.39
Cabernet Franc ²	28-Aug	12,903	16.1	177.6	4.28	0.43	22.53
Cabernet Sauvignon ²	26-Aug	10,930	12.0	137.8	4.01	0.54	21.87
Merlot ²	22-Aug	10,035	15.2	197.5	4.04	0.52	22.28
Viognier ¹	8-Aug	9,096	13.8	217.8	4.01	0.61	19.38
Petit Verdot ²	21-Aug	7,172	13.1	125.8	4.07	0.61	22.89
Malbec ²	25-Aug	6,583	20.0	104.5	4.18	0.54	20.86
Chardonnay ¹	14-Aug	6,073	14.5	171.1	3.96	0.66	21.01
Pinot Gris ²	13-Aug	3,508	11.7	109.3	4.44	0.57	24.27
Cynthiana ³	19-Aug	2,382	7.6	47.9	3.76	1.25	23.69

Variety Type - 1-Vinifera, white; 2-Vinifera, red; 3-American, red;
Planted 2001; High cordon trellis; vine spacing 8x12

Table 1C. Average Effect of Cultivar on Fruit Yield and Quality From Grafted (1103P) Grape Vines, Perkins, OK 2003-2004

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
Ruby Cabernet ²	2-Sep	17,248	18.4	176.8	4.12	0.47	22.66
Cabernet Franc ²	29-Aug	15,931	16.2	159.6	4.29	0.39	23.03
Shiraz ²	28-Aug	15,900	16.6	190.6	4.14	0.56	21.63
Sangiovese ²	1-Sep	14,693	23.0	239.3	3.84	0.51	20.58
Viognier ¹	10-Aug	13,229	14.8	193.9	3.88	0.58	18.29
Merlot ²	30-Aug	12,815	15.3	176.4	4.21	0.41	23.74
Cabernet Sauvignon ²	31-Aug	10,063	13.1	113.1	3.95	0.52	22.16
Petit Verdot ²	26-Aug	9,984	12.5	108.9	4.00	0.58	22.96
Chardonnay ¹	13-Aug	9,033	15.2	176.8	3.88	0.64	20.89
Malbec ²	29-Aug	7,029	21.7	97.8	4.16	0.54	21.22
Pinot Gris ²	12-Aug	6,850	12.9	101.1	4.15	0.53	21.80
Cynthiana ³	19-Aug	2,991	9.2	52.0	3.68	1.20	22.36

Variety Type - 1-Vinifera, white; 2-Vinifera, red; 3-American, red; Planted 2001; High cordon trellis; vine spacing 8x12

Table 2. Effect of Cultivar on Fruit Yield and Quality From Own Rooted Grape Vines, Perkins, OK 2004

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
Chambourcin ⁵	20-Aug	16,852	25.1	212.8	3.81	0.55	21.52
Merlot ²	7-Sep	12,458	14.5	132.4	4.33	0.29	25.08
Malbec ²	2-Sep	7,361	20.0	86.2	4.15	0.48	22.05
Viognier ¹	11-Aug	6,795	15.0	164.8	3.78	0.52	16.81
Cabernet Sauvignon ²	5-Sep	6,489	14.6	97.1	4.03	0.38	22.95
Ruby Cabernet ²	8-Sep	6,441	14.8	99.3	4.11	0.32	23.70
Sangiovese ²	7-Sep	5,625	23.6	140.4			
Cabernet Franc ²	30-Aug	5,014	16.5	148.4	4.23	0.32	23.60
Pinot Gris ²	11-Aug	4,632	14.3	86.2	3.80	0.49	18.76
Chardonnay ¹	13-Aug	3,751	15.4	167.0	3.79	0.64	20.45
Shiraz ²	31-Aug	2,850	17.9	128.9	4.14	0.40	21.18
Cynthiana ³	20-Aug	2,752	9.7	49.6	3.61	1.07	21.08
Petit Verdot ²	1-Sep	849	11.9	58.4	4.21	0.37	23.50

Variety Type - 1-Vinifera, white; 2-Vinifera, red; 3-American, red; 5- Hybrid, red; Own rooted planted 2002; High cordon trellis; vine spacing 8x12

Table 3A. Effect of Rootstock on Cabernet Franc Yield and Quality, Perkins, OK 2004

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
1103P	30-Aug	19,513	15.7	135.8	4.17	0.38	24.50
110R	1-Sep	19,490	16.2	140.5	4.22	0.32	24.18
St George	3-Sep	17,146	16.4	120.6	4.35	0.36	23.00
3309C	30-Aug	12,313	15.5	119.8	4.26	0.30	24.11

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 3B. Effect of Rootstock on Cabernet Franc Yield and Quality, Perkins, OK 2003

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
110R	28-Aug	11,964	16.2	157.1	4.16	0.44	22.07
3309C	28-Aug	8,164	16.8	164.1	4.21	0.42	22.55
St George	28-Aug	7,543	15.6	147.9	4.23	0.43	21.88
1103P	28-Aug	7,185	16.8	180.3	4.25	0.35	21.70

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 3C. Average Effect of Rootstock on Cabernet Franc Yield and Quality, Perkins, OK 2003/2004

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
110R	30-Aug	15,727	148.8	16.2	4.19	0.38	23.13
1103P	29-Aug	13,349	158.1	16.0	4.21	0.37	23.10
St. George	1-Sep	12,344	134.3	16.0	4.29	0.39	22.44
3309C	29-Aug	10,243	141.9	16.1	4.24	0.36	23.33

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 4A. Effect of Rootstock on Chardonnay Yield and Quality. Perkins, OK 2004

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
St George	17-Aug	22,537	14.7	138.1	3.66	0.72	21.49
140R	18-Aug	19,037	16.1	135.6	3.67	0.64	21.83
Freedom	17-Aug	18,460	16.4	186.7	3.72	0.67	21.96
3309C	11-Aug	18,177	16.2	193.1	3.79	0.54	20.99
5BBK	17-Aug	16,467	16.2	171.0	3.72	0.68	22.19
1103P	16-Aug	13,515	16.6	163.6	3.73	0.61	21.78
Own	16-Aug	7,939	15.6	160.6	3.70	0.66	22.15

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 4B. Effect of Rootstock on Chardonnay Yield and Quality. Perkins, OK 2003

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
140R	14-Aug	10,534	15.2	216.8	3.96	0.60	20.84
Freedom	14-Aug	9,832	15.6	224.0	3.97	0.58	20.45
St George	14-Aug	9,704	15.3	173.1	3.96	0.64	21.28
5BBK	14-Aug	7,225	15.8	202.8	4.01	0.60	20.98
3309C	14-Aug	5,388	15.7	182.7	4.00	0.60	21.74
Own	14-Aug	3,990	15.3	152.9	3.98	0.65	21.43
1103P	14-Aug	3,454	15.8	162.1	3.95	0.59	20.90

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 4C. Average Effect of Rootstock on Chardonnay Yield and Quality. Perkins, OK 2003/2004

Rootstock	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
St George	15-Aug	16,120	15.0	155.6	3.81	0.68	21.38
140R	16-Aug	14,786	15.6	176.2	3.81	0.62	21.33
Freedom	15-Aug	14,146	16.0	205.3	3.85	0.63	21.21
5BBK	15-Aug	11,846	16.0	186.9	3.86	0.64	21.59
3309C	13-Aug	11,782	16.0	187.9	3.89	0.57	21.37
1103P	15-Aug	8,484	16.2	162.9	3.84	0.60	21.34
Own	15-Aug	5,965	15.4	156.7	3.84	0.66	21.79

Planted 2001; Geneva Double curtain trellis; vine spacing 8x12

Table 5A. Yield and Quality of selected varieties/lines, Observational Grape Variety Trial. Perkins, OK 2004

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
H2 - #211 ³	31-Aug	2265	42.8	71.4	3.89	0.66	19.90
H3 - Cimarron ³	31-Aug	1359	17.2	55.1	3.37	1.14	14.50
H5 - #125 ³	31-Aug	3284	38.8	126.0	3.84	0.52	19.85
H1 - #249 ³	25-Aug	5549	51.8	91.8	4.10	0.46	18.50
H6 - #17-347 ³	31-Aug	5096	41.6	132.4	4.27	0.51	19.40
*Rubiyat ³	31-Aug	9513	19.2	104.7	4.18	0.48	20.05
Sunbelt ³	9-Sep	5181	38.6	89.0	3.74	0.50	20.80
H4 - #12-375 ⁴	30-Aug	20838	30.6	159.6	3.97	0.52	23.30
Chambourcin ⁵	20-Aug	5555	25.3	202.7	3.76	0.58	21.55
*Frontenac ⁵	26-Jul	11913	11.5	131.3	3.43	1.13	20.15
Chardone ⁶	24-Jul	6075	21.9	295.2	3.41	0.80	20.67
Vignoles ⁶	24-Jul	5986	15.7	113.3	3.36	1.04	21.67
Sauvignon Blanc ¹	3-Aug	5983	16.5	132.6	3.57	0.67	19.45
*White Reisling ¹	18-Aug	6653	14.4	91.9	3.40	0.64	19.35
**Montepulciano ²	1-Sep	1586	17.2	61.8	3.85	0.48	22.60
Zinfandel ²	14-Aug	5502	29.5	144.8	3.41	0.79	15.78

Variety Type - 1-Vinifera, white; 2-Vinifera,red; 3-American, red; 4-American, white; 5- Hybrid, red; 6- Hybrid,white

Planted in 2001, * planted in 2002; vine spacing 8x12; High cordon trellis;

Own rooted plants, ** NJ110R rootstock

Table 5B. Yield and Quality of Selected Varieties/lines, Observational Grape Variety Trial, Perkins, OK 2003

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
H2 - #211 ³	27-Aug	9,551	24.4	205.3	3.93	0.53	21.55
H3 – Cimarron ³	21-Aug	7,366	16.2	83.4	4.37	0.39	23.75
H5 - #125 ³	27-Aug	7,289	33.7	273.5	4.06	0.58	20.00
H1 - #249 ³	27-Aug	6,795	39.5	98.6	4.03	0.57	18.65
H6 - #17-347 ³	27-Aug	5,947	33.9	156.6	3.94	0.64	17.90
*Rubiyat ³	21-Aug	1,257	20.6	126.0	4.40	0.50	22.15
Sunbelt ³	.	.	.	.	.	.	.
H4 - #12-375 ⁴	21-Aug	10,419	20.8	202.2	3.92	0.75	21.90
Chambourcin ⁵	19-Aug	7,723	19.4	123.0	3.90	0.73	23.46
*Frontenac ⁵	23-Jul	1,812	8.9	87.3	3.56	0.98	24.15
Chardonef ⁶	8-Aug	3,709	16.3	159.8	3.76	0.80	24.15
Vignoles ⁶	1-Aug	3,142	12.0	105.7	4.06	0.58	21.79
Sauvignon Blanc ¹	15-Aug	6,356	14.6	113.6	4.08	0.52	19.85
*White Reisling ¹	27-Aug	906	13.6	90.6	3.85	0.62	20.15
**Montepulciano ²	.	.	.	.	.	.	.
Zinfandel ²	27-Aug	5,899	22.6	300.0	3.92	0.57	17.95

Variety Type - 1-Vinifera, white; 2-Vinifera,red; 3-American, red; 4-American, white; 5- Hybrid, red; 6- Hybrid,white

Planted in 2001, * planted in 2002; vine spacing 8x12; High cordon trellis;

Own rooted plants, ** NJ110R rootstock

Table 5C. Average Yield and Quality of Selected Varieties/lines, Observational Grape Variety Trial, Perkins, OK 2003/2004

Variety	Harvest Date	Wt/acre (lbs) 453 plt/a	Avg Berry Wt (g)	Avg Cluster wt (g)	Avg. pH	Titrateable Acidity (% Tartaric Acid)	°Brix Avg S.S.
Chambourcin ⁵	19-Aug	6639	22.3	162.9	3.83	0.65	22.51
Chardonef ⁶	31-Jul	4892	19.1	227.5	3.59	0.80	22.41
*Frontenac ⁵	24-Jul	6863	10.2	109.3	3.49	1.05	22.15
H1 - #249 ³	26-Aug	6172	45.6	95.2	4.06	0.52	18.58
H2 - #211 ³	29-Aug	5908	33.6	138.3	3.91	0.59	20.73
H3 – Cimarron ³	26-Aug	4362	16.7	69.2	3.87	0.76	19.13
H4 - #12-375 ⁴	25-Aug	15629	25.7	180.9	3.94	0.64	22.60
H5 - #125 ³	29-Aug	5286	36.2	199.7	3.95	0.55	19.93
H6 - #17-347 ³	29-Aug	5522	37.8	144.5	4.10	0.58	18.65
*Rubiyat ³	26-Aug	5385	19.9	115.3	4.29	0.49	21.10
Sauvignon Blanc ¹	9-Aug	6170	15.5	123.1	3.82	0.59	19.65
Vignoles ⁶	28-Jul	4564	13.9	109.5	3.71	0.81	21.73
*White Reisling ¹	22-Aug	3780	14.0	91.2	3.62	0.63	19.75
Zinfandel ²	20-Aug	5701	26.1	222.4	3.66	0.68	16.87

Variety Type - 1-Vinifera, white; 2-Vinifera,red; 3-American, red; 4-American, white; 5- Hybrid, red; 6- Hybrid,white

Planted in 2001, * planted in 2002; vine spacing 8x12; High cordon trellis; Own rooted plants,

Table 6. Effect of Variety on Average Budbreak Date - Replicated Wine Grape Variety Trial – Perkins, OK, 2003-2004

Variety	Average Budbreak	Budbreak for 2003	Budbreak for 2004
Chardonnay ¹	29-Mar	1-Apr	27-Mar
Sangiovese ²	3-Apr	7-Apr	30-Mar
Viognier ¹	3-Apr	7-Apr	30-Mar
Cabernet Franc ²	4-Apr	7-Apr	2-Apr
Merlot ²	4-Apr	9-Apr	31-Mar
Shiraz ²	5-Apr	4-Apr	6-Apr
Malbec ²	7-Apr	9-Apr	5-Apr
Pinot Gris ²	7-Apr	7-Apr	8-Apr
Petit Verdot ²	8-Apr	11-Apr	5-Apr
Cynthiana ³	9-Apr	14-Apr	5-Apr
Ruby Cabernet ²	10-Apr	13-Apr	7-Apr
Cabernet sauvignon ²	12-Apr	12-Apr	12-Apr

Table 7. Effect of Variety on Average Budbreak Date – Observational Grape Planting Perkins, OK 2003-2004

Variety	Average Budbreak	Budbreak for 2003	Budbreak for 2004
Chardone ⁶	2-Apr	4-Apr	31-Mar
H2 - #211 ³	3-Apr	7-Apr	30-Mar
H3 – Cimarron ³	3-Apr	7-Apr	31-Mar
H6 - #17-347 ³	3-Apr	7-Apr	31-Mar
H4 - #12-375 ⁴	4-Apr	4-Apr	5-Apr
H5 - #125 ³	5-Apr	7-Apr	4-Apr
Sunbelt ³	5-Apr	7-Apr	4-Apr
Neptune	6-Apr	12-Apr	31-Mar
White Reisling ¹	6-Apr	9-Apr	3-Apr
Sauvignon Blanc ¹	7-Apr	12-Apr	3-Apr
Frontenac ⁵	8-Apr	11-Apr	5-Apr
Chambourcin ⁵	8-Apr	12-Apr	5-Apr
H1 - #249 ³	8-Apr	13-Apr	4-Apr
Zinfandel ²	8-Apr	13-Apr	4-Apr
Vignoles ⁶	11-Apr	14-Apr	8-Apr
Montepulciano ²	12-Apr	12-Apr	12-Apr
Rubiyat ³	16-Apr	16-Apr	17-Apr

Variety Type - 1-Vinifera, white; 2-Vinifera, red; 3-American, red; 4-American, white; 5- Hybrid, red; 6- Hybrid, white