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Performance of Pinot noir and Chardonnay Clones

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Pinot noir and Chardonnay are the two main varieties in Oregon. Together they comprise 60% of the Oregon winegrape acreage, and 61% of the total production for a value of $8,906 (66%). Clonal selection of Pinot noir and Chardonnay have made available a wide range of productivity and quality levels. In the Champagne region, clones were selected for increased yields; in Burgundy, the main criterion was quality; and in Switzerland, Mariafeld was selected for disease resistance.

Vines in the Woodhall Vineyard Pinot noir and Chardonnay clonal trials were in the sixth leaf this last summer. It is now evident that there are considerable differences in vine vigor among clones, and that some take longer to establish than others. Some of the clones were extremely weak due to light pruning in the previous season. This past winter, we balanced pruned the two clonal trials in an attempt to recover vine vigor to acceptable levels.

MATERIALS AND METHODS

The Pinot noir and Chardonnay clonal trials were balance pruned in February 1995 using the formula P10-10 (10 nodes retained for the first 0.45 kg of one-year-old wood plus 10 nodes for each additional 0.45 kg). The crop was harvested on October 4 for the Pinot noir clones and October 5 for the Chardonnay clones. A sample of five clusters per replicate was used to estimate berry weights and number of berries per cluster. A sample of 25 clusters per replicate was crushed for determination of soluble solids, pH and titratable acidity. Cluster weight was calculated averaging the pooled 30 cluster sample. Sugar per vine was calculated multiplying must sugar content in *Brix (equivalent to percentage by weight of sucrose) by total yield per vine. For the Chardonnay clones, the fruit of each replicate was separated into two groups: first quality (sound) and second quality (affected with powdery mildew).

RESULTS AND DISCUSSION

Pinot noir clones

The Colmar clone 538 and Dijon clone 10/18 were standouts among the fertile types, as well as among all 20 clones (Tables 1 and 2). These two clones had high yields, number of shoots per vine, clusters per vine, and sugar per vine. Both had intermediate soluble solids in the juice. The Dijon clone 10/18 had the highest pH, and titratable acidity. Colmar 538 was intermediate in pH and titratable acidity, and had the highest pruning weight and cane weight. The other fertile types had low to intermediate yields, and were intermediate in most other characteristics.

The upright FPMS clone 22 (Gamay Beaujolais) also was high yielding with the highest cluster weight,

produced the most sugar per vine, had high pruning and cane weights, but had low soluble solids, low pH, and high titratable acidity. The other two upright clones, Espiquette 374, and Dijon 60 were relatively high yielding, and intermediate in most other aspects of their performance, except for having low soluble solids.

The Dijon clone 115, one of the Pinot fin types, was among the lowest yielding clones with low shoot number per vine, low cluster weight, low berry number per cluster, but had the highest soluble solids, relatively high pH, and the lowest titratable acidity. This clone is the most propagated Pinot noir clone in France. Three other Pinot fin types, the Dijon clones 113 and 114, and FPMS 29 performed similarly to Dijon clone 115. The other four Pinot fin types, FPMS 2A, FPMS 4, FPMS 10, and FPMS 16, had considerably higher yields, shoot number per vine, clusters per vine, higher pruning weights, but a similar range of soluble solids, pH, titratable acidity, and higher sugar produced per vine.

The Mariafeld types FPMS clones 17 and 23 were lowest yielding, had the lowest shoot number and cluster number per vine, low cluster weights, low pruning and cane weights, low sugar per vine, and had intermediate soluble solids, pH and titratable acidity.

Chardonnay clones

The Chardonnay clones Dijon 75 and Espiquette 352 had the highest yields among the group (Table 3). The Martini clone FPMS 14 and the Prosser clone (FPMS 15) had low vigor vines that had to be pruned back to fewer nodes in the winter of 1995. The 108 clones (FPMS 4 and 5) had moderate yields with FPMS 5 having the largest cluster size of all clones. Differences in fruit composition were not as evident as in the Pinot noir clones (Table 4). There were no significant differences in must soluble solids. The juice pH was highest for the Prosser clones (FPMS 15). Titratable acidity was highest for FPMS 5 (108) and lowest for the Dijon 96. The most efficient clones in terms of total sugar produced per vine were the Dijon 75 and Espiquette 352 which produced high yields of good quality. The Martini clone FPMS 6 was the most sensitive to powdery mildew. The clones Dijon 96, FPMS 14 and 15 were the least affected by powdery mildew.

Table 1: Yield, yield components, and pruning weights of Pinot noir clones at the OSU Woodhall

	Yield (kg/m2)	±	Shoots/ vine	±	Clusters/ vine	±	Cluster wt. (g)	±
Pinot fin								
FPMS2A	0.33	0.04	16	1	21	2	79.1	8.7
FPMS4	0.37	0.10	15	2	21	4	85.9	6.8
FPMS10	0.32	0.07	15	1	20	3	76.3	7.1
FPMS16	0.40	0.05	16	1	21	2	96.5	3.1
FPMS29	0.18	0.08	11	1	12	4	65.1	9.9
DJN113	0.21	0.09	12	3	14	6	67.0	8.4
DJN114	0.26	0.07	13	3	19	5	68.7	3.3
DJN115	0.15	0.06	11	1	12	2	56.6	10.7
Mariafeld								
FPMS17	0.15	0.06	8	1	10	2	71.5	14.8
FPMS23	0.15	0.04	9	1	10	2	74.3	8.1
Upright								
FPMS22	0.56	0.03	18	1	25	2	112.7	3.9
ESP374	0.43	0.18	14	3	19	6	99.3	15.9
DJN60	0.40	0.06	16	1	19	3	104.1	4.3
Fertile								
FPMS31	0.35	0.10	12	1	17	4	97.6	12.2
FPMS32	0.35	0.04	13	1	18	1	99.2	3.8
FPMS33	0.28	0.06	13	2	16	3	84.5	4.4
ESP236	0.28	0.04	11	0	14	1	99.3	8.2
DJN375	0.28	0.06	12	2	15	2	88.4	7.6
DJN10/18	0.49	0.07	16	1	23	2	105.6	6.4
COL538	0.52	0.08	19	1	26	4	98.0	5.1
Significant F	***[2]		***		***		***	

Vineyard.

	Berry wt. (g)	±	Berries/ cluster	±	Pruning wt. (kg/m2)[1]	±	Cane wt. (g)[1]	±
Pinot fin								
FPMS2A	1.1	0.1	72	7	0.14	0.01	40.5	2.7
FPMS4	1.0	0.1	91	10	0.14	0.02	39.9	3.9
FPMS10	0.9	0.0	87	6	0.13	0.01	34.7	4.0
FPMS16	1.0	0.1	95	8	0.14	0.02	41.1	4.6
FPMS29	0.9	0.0	70	10	0.10	0.01	32.8	4.3
DJN113	0.9	0.1	73	9	0.10	0.03	36.8	8.8
DJN114	1.0	0.0	69	2	0.12	0.02	38.5	6.2
DJN115	0.9	0.1	63	10	0.09	0.01	27.7	3.9
Mariafeld								
FPMS17	1.0	0.1	70	8	0.07	0.01	27.8	3.7
FPMS23	1.0	0.1	72	5	0.08	0.01	28.0	2.2
Upright								
FPMS22	1.1	0.0	107	2	0.17	0.01	49.6	3.7
ESP374	1.0	0.1	102	11	0.13	0.03	40.6	7.4
DJN60	1.0	0.2	108	13	0.14	0.01	43.5	1.6
Fertile								
FPMS31	0.9	0.1	106	16	0.13	0.02	35.7	3.9
FPMS32	1.1	0.1	91	6	0.12	0.01	37.9	1.7
FPMS33	1.0	0.1	83	8	0.11	0.02	31.4	3.1
ESP236	1.0	0.0	101	8	0.09	0.00	26.9	2.3
DJN375	1.0	0.0	90	8	0.10	0.02	31.7	5.2
DJN10/18	1.0	0.0	105	5	0.14	0.01	36.7	3.7
COL538	0.9	0.1	110	11	0.18	0.02	49.9	2.8
Significant F	ns		***		***		***	

[1]Pruning weight from February 1995.

[2]ns and *** indicate not significant, and statistically significant at the 0.001 levels of probability, respectively.

Table 2: Fruit composition of Pinot noir clones at the OSU Woodhall Vineyard.

	Soluble solids (°Brix)	±	pH	±	Titratable acidity	±	Sugar/ vine (kg)	±
Pinot fin								
FPMS2A	24.4	0.3	2.98	0.03	7.48	0.48	0.41	0.05
FPMS4	23.3	0.5	3.13	0.03	6.09	0.39	0.42	0.10
FPMS10	24.2	0.3	3.12	0.05	5.89	0.45	0.38	0.08
FPMS16	23.5	0.2	3.02	0.03	6.91	0.40	0.47	0.06
FPMS29	23.9	0.3	3.14	0.03	6.14	0.45	0.21	0.09
DJN113	24.1	0.2	3.16	0.05	5.81	0.50	0.25	0.11
DJN114	24.0	0.3	3.08	0.06	6.14	0.31	0.31	0.08
DJN115	24.5	0.4	3.16	0.05	5.49	0.41	0.19	0.08
Mariafeld								
FPMS17	23.6	0.6	3.05	0.07	6.91	0.42	0.18	0.07
FPMS23	23.2	0.3	3.07	0.04	6.88	0.12	0.18	0.05
Upright								
FPMS22	22.8	0.6	2.94	0.01	7.58	0.18	0.63	0.02
ESP374	22.5	0.5	3.06	0.07	7.03	0.60	0.48	0.19
DJN60	22.5	0.4	3.02	0.04	6.93	0.18	0.46	0.06
Fertile								
FPMS31	23.7	0.2	3.04	0.05	7.10	0.49	0.42	0.12
FPMS32	24.1	0.2	3.09	0.04	5.84	0.19	0.43	0.04
FPMS33	23.2	0.4	3.14	0.01	6.51	0.19	0.32	0.07
ESP236	23.9	0.3	3.08	0.06	6.98	0.32	0.33	0.05
DJN375	23.6	0.3	3.03	0.07	6.86	0.32	0.33	0.07
DJN10/18	23.1	0.5	3.23	0.25	7.36	0.34	0.57	0.08
COL538	23.3	0.3	3.10	0.02	6.56	0.42	0.60	0.09
Significant F	**[1]		ns		***		***	

[1]ns, **, and *** indicate not significant, and statistically significant at the 0.01, and 0.001 levels of probability, respectively.

Table 3: Yield, yield components, and pruning weights of Chardonnay clones at the OSU Woodhall

Clone	Yield (kg/m2)	±	Shoots/ vine	±	Clusters/ vine	±	Cluster wt. (g)
DJN 75	0.39	0.04	14	1	18	3	102.3
DJN 76	0.32	0.06	14	1	17	2	97.0
DJN 78	0.28	0.05	15	1	18	2	93.3
DJN 96	0.17	0.02	12	1	11	1	99.3
ESP 352	0.39	0.10	15	2	21	3	100.8
FPMS 4	0.18	0.07	10	1	11	1	91.7
FPMS 5	0.24	0.05	11	1	10	2	146.0
FPMS 6	0.29	0.06	12	4	16	7	95.8
FPMS 14	0.13	0.03	6	1	6	1	124.3
FPMS 15	0.03	0.01	5	0	4	1	58.3
Significant F	***[2]		**		**		**

Vineyard.

Clone	Yield (kg/m2)	±	Shoots/ vine	±	Clusters/ vine	±	Cluster wt. (g)	±	Berry wt. (g)	±	Berries/ cluster	±	Pruning wt. (Kg/m2)[1]	±	Cane wt. (g)[1]	±
DJN 75	0.39	0.04	14	1	18	3	102.3	9.9	1.15	0.06	89	8	0.30	0.01	43.9	2.2
DJN 76	0.32	0.06	14	1	17	2	97.0	4.7	1.12	0.03	86	2	0.32	0.04	43.1	1.7
DJN 78	0.28	0.05	15	1	18	2	93.3	4.7	1.24	0.05	76	6	0.31	0.03	45.0	2.4
DJN 96	0.17	0.02	12	1	11	1	99.3	2.3	1.08	0.08	93	7	0.24	0.04	34.6	4.5
ESP 352	0.39	0.10	15	2	21	3	100.8	6.9	1.28	0.05	78	4	0.34	0.04	42.8	5.4
FPMS 4	0.18	0.07	10	1	11	1	91.7	48.0	1.17	0.05	75	39	0.25	0.03	31.7	2.8
FPMS 5	0.24	0.05	11	1	10	2	146.0	10.9	1.29	0.05	115	12	0.21	0.05	31.9	6.1
FPMS 6	0.29	0.06	12	4	16	7	95.8	8.4	1.24	0.06	78	8	0.45	0.05	52.4	0.4
FPMS 14	0.13	0.03	6	1	6	1	124.3	4.6	1.15	0.03	108	2	0.10	0.02	23.4	4.0
FPMS 15	0.03	0.01	5	0	4	1	58.3	3.1	1.66	0.04	35	2	0.11	0.01	25.5	2.2
Significant F	***[2]		**		**		**		***		**		***		***	

[1]Pruning weight from February 1995.

[2]ns, **, and *** indicate not significant, and statistically significant at the 0.01 and 0.001 levels of probability, respectively.

Table 4: Fruit composition and soundness of Chardonney clones at the OSU Woodhall Vineyard.

Clone	Soluble solids °Brix	±	pH	±	Titratable acidity (g/L)	±	Sugar/ vine(kg)	±	Diseased fruit (% of total)	±
DJN 75	23.2	0.1	3.11	0.02	6.28	0.22	0.46	0.04	0.4	0.4
DJN 76	23.2	0.2	3.08	0.01	6.78	0.53	0.38	0.07	0.2	0.1
DJN 78	23.2	0.2	3.11	0.01	6.69	0.28	0.33	0.06	0.2	0.2
DJN 96	23.0	0.1	3.10	0.02	5.76	0.11	0.20	0.03	0.0	0.0
ESP 352	23.1	0.3	3.08	0.04	6.99	0.22	0.46	0.12	0.8	0.8
FPMS 4	22.7	0.2	3.09	0.03	8.13	0.59	0.22	0.08	0.2	0.2
FPMS 5	22.7	0.2	3.05	0.02	7.65	0.29	0.28	0.06	0.3	0.3
FPMS 6	22.9	0.2	3.08	0.04	7.69	0.78	0.34	0.07	4.4	2.0
FPMS 14	23.2	0.2	3.10	0.03	6.79	0.23	0.16	0.03	0.0	0.0
FPMS 15	22.9	0.3	3.26	0.02	6.38	0.52	0.04	0.01	0.0	0.0
Significant F	ns		***		**		***		**	

[1]Pruning weight from February 1995.

[2]ns, **, and *** indicate not significant, and statistically significant at the 0.01 and 0.001 levels of probability, respectively.