## ALEXIS BAILLY VINEYARD

"WHERE THE GRAPES CAN SUFFER"



## Wine Grape Maturity in Minnesota

By David A. Bailly (1980)

In the early part of the last decade, analysis of Minnesota climate led a number of people to conclude that certain of the French hybrids could be successfully grown in Minnesota if they could somehow be protected from our severe winters. Frost-free days, heat summation and rainfall appeared to be adequate for at least the early ripening varieties. Since that time, dozens of small vineyards have sprung up in the southern one-half of the state.

The concentration and emphasis has been on the winter problem. We know now that no French hybrids can survive in Minnesota without winter protection. We have learned to train trunks along the ground for a foot or so and then up to the first trellis wire in a broad gradual arc. After pruning in the fall, the vine can be cut off the trellis and it will have a natural tendency to lie flat on the ground, permitting easy cover by dirt, straw or other mulch. This system known as the Alma Method has eliminated the hazards of winter kill.

To date, nothing has been written on how well fruit grown under this system has matured or what quality wine can be expected from these climatic conditions. Over the last five years, we at Alexis Bailly Vineyard have kept a number of records that give some insight into these ultimate questions. Located in Dakota County, in south central Minnesota, we have been growing the hybrids Maréchal Foch and Léon Millot (Foster clone) since 1973. We have fruit and wine records since 1975.

The Foch and Millot were selected for planting based on their reputation for early ripening, disease resistance, good quality wine and relative winter hardiness. We were looking for a grape that could consistently reach 23% sugar and produce a light fruity wine of .6% acid or less. The sister seedlings, Foch and Millot, have shown very similar results with the only real difference being that the Millot has consistently made preferable wine. Figure 1 shows spring frost records at the vineyard for the 5 year period.

Bud break dates were not recorded, but generally, swelling started the last week of April with actual leafing out the first week of May.

Color change varied from July 31 to August 8 and picking varied from September 6 to September 24. This was well before any killing fall frost and consistent with the thirty year average, which puts the first frost well into the first week of October and a killing frost close to the middle of the month.

Figure 2 shows degree days for each year up to the beginning of picking, together with the sugar and acid of the crushed fruit. The acid was 1.00% in the must and .5% in the finished wine. In 1977, in a neighboring vineyard, vines of Léon MIllot were left on the vine for four weeks after picking. Acidity dropped from .935% to .83%. However, as the .935% acid fruit made finished wine under .5%, it appears not advantageous to wait for the lowest possible acid levels.

Over 2200 degree days appears to be necessary to produce Foch and Millot of adequate sugar/acid levels for good wine. Only in 1979 was this total not reached. On the basis of the 30 year average, 1940 - 1970, it will be reached by September 20, well before frost dangers. This is particularly interesting because the period 1940 - 1970 was a colder period than the period 1900 - 1950 and more like the last Minnesota cold period of 1870 - 1900. Thus, on the basis of frost free days, total degree days, brix and acidity, the Maréchal Foch and Léon Millot seem well adaptable to the southern one-third of Minnesota. However, it should be noted that both of these hybrids are considered early ripening. In contrast, the Adimar de Chaunac ripened some three weeks later and has been picked after the first fall frost in 50% of the years.

The third weather factor, rain, seems to be more related to the final sensory qualtiy of the wines than to brix/acid composition of the fresh must. Figure 3 shows a five year breakdown of rainfall at two weather stations less than ten miles from the vineyard.

Refractometer readings and titration tests of random picked berries had a higher ratio than final crushed fruit and thus, the later figures were used.

The ability of the fruit to reach 23 brix was never in doubt in any of the five years. Even in 1979 when picking started on September

Figure 1. Spring Frost

April							May																							
Year	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1975	27°																													
1976						26°		30°							27°		30°	30°												
1977																														
1978												28°	28°																	
1979							28°		31°		29°		31°		28°								30°							
Ave. last																														
frost 1940 1970	-											X																		

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24 with brix at 22.5, the must reached 24 brix by the end of picking on September 29.

The average acidity of 1.09% over the five year period seems high for red must, but in reality was, if anything, low. After malo-lactic fermentation, finished wine in all years was under .6%. In the hotter years, it was reduced almost to the point where the addition of acid would probably be necessary for long time aging. Artificial acid reduction has yet to be used.

With such high percentage of malic acid, one would suspect that the fruit was not fully ripe. However, in 1976 the fruit was literally falling off the stems when picked at 26 brix.

The figures tell little more than that rainfall appears to be well within the range considered acceptable for viticultural areas - 16 - 20 " during the growing season. When the rain falls, over how long a period it falls, to what extent it does or does not reduce sunshine and soil composition are factors that must be taken into consideration in evaluating the extent to which any given

amount of rainfall will add or distract from final wine quality. The conclusion we have reached is that on our light soil we seem to make better wine with less than 16" of total rainfall.

Under these climate conditions, we have made consistently palatable wine. The two commercial vintages which have been released to date (1977 and 1987) have compared very well with their counter parts in other states as well as with wines generally. They have ranked high in national competition and have been given good reviews by both east and west coast critics. There is little doubt that the Millot produces consistently better wine. However, the lighter, softer Foch may be a more widely accepted variety. In conclusion, with good winter mulch, Foch and Millot will give the Minnesota wine maker consistently good fruit from which he can make red wine readily acceptable to the U.S. palates.

Figure 2. Degree Days

Year	Мау	June	July	Aug.	Sept.*	Total	Picking Date	Brix	Acidity **
1975	353	522	731	585	95	2290	Sept. 13	23.5	1.15
1976	235	578	741	638	161	2243	Sept 11	26.0	1.0
1977	511	534	740	465	50	2300	Sept 6	23.0	.93
1978	324	537	632	605	174	2246	Sept. 9	22.5	1.45
1979	140	501	644	542	290	2117	Sept. 24	22.5	1.45
5 yr	312	534	698	567	154	2240	Sept. 13	23.6	1.09
Ave									
1940-1970	240	520	675	625	100	2160	Sept 13		
*To picking dat	e, total for mo	onth of Septemb	er is 235	•	•	•			•
**Foch figures.	Millot is sligh	tly lower.							

Figure 3. Rainfall

Year	Мау	June	July	Aug.	Sept*	Total	Picking Date	Brix	Acidity
1975	4.72	7.29	2.18	5.84	1.04	21.07	Sept. 13	23.5	1.15
1976	.74	2.67	2.03	1.78	.25	7.47	Sept. 11	26.0	1.0
1977	4.01	4.05	2.97	4.16	1.0	16.19	Sept. 6	23.0	.93
1978	4.39	4.84	5.0	5.72	.00	19.94	Sept. 9	23.0	.94
1979	3.45	5.40	3.0	6.50	2.44	20.79	Sept. 24	22.5	1.45
5 yr Ave.	3.46	4.85	3.04	4.80	.95	17.10	Sept. 13	23.6	1.09
1940-1970	3.93	4.60	4.0	3.70	1.43	17.66	Sept 13		
*To picking da	te. Total for mo	onth of Septemb	er is 3.24 aver	age.					