

# Characteristics of the Red Wine Grape Cultivar 'Chelois' as Grown in Erie County, PA<sup>1, 2</sup>

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The cultivar (cv) 'Chelois', formerly 'Seibel 10878', was a moderately productive red wine grape in France (8) where it is authorized in the Le Cher and Vendee' districts. Vines budded late and, therefore, were less subject to late spring frosts. In Ontario (5) 'Chelois' is recommended on a limited basis. It was sensitive to dead arm (*Phomopsis viticola*, Pine) and crown gall (*Agrobacterium tumefaciens*, Smith and Town Conn.). Overbearing was the primary problem with 'Chelois' in Ohio (6). However, when yield was properly controlled vine vigor and crop size were satisfactory. Vines were moderately hardy when exposed to low temperature conditions. Fruits ripened in mid-season and were rather low in % soluble solids. According to Gallander and Stetson (9) wines were slightly fruity, fine flavored and good. Robinson *et al.* (13) indicated that 'Chelois' vines were vigorous and moderately hardy in N. Y. Musts were low in % soluble solids. Wines were slightly herbaceous and possessed a

berry-like fruitiness. This study was conducted to determine whether or not vines of the cv 'Chelois' could be grown commercially in the major grape area of Pennsylvania.

## Materials and Methods

One-year rooted cuttings of 'Chelois' grapevines were planted at The Pennsylvania State University Field Research Laboratory located in North East, Pennsylvania in May 1967. Vines were set six feet apart in rows spaced nine feet apart. The remaining methods have been described in earlier reports (10, 11).

## Results

Yield ranged from a high of 24.4 metric tons per hectare (t-ha) in 1971 to 15.3 t-ha in 1972 (Table 1). The six-year mean was 18.1 t-ha. Low yield in 1972 was attributed to high production in 1971 coupled with unfavorable fruit setting conditions in 1972. Temperatures were unusually low (17.2° C) and were accompanied

Table 1. Vine and must characteristics of the wine grape cultivar 'Chelois' grown in Erie County, PA. (1970-1975).

Year	Yield (t-ha)	Clusters per vine (no.)	Cluster wt (g)	Berry wt (g)	Yield per node (g)	Soluble solids (%)	acidity Total (g/100g)	Pruning wt (kg/v)
1970	16.3	64	115.6	1.63	213.0	19.8	1.05	1.3
1971	24.4	123	98.5	1.78	251.3	18.0	1.04	0.8
1972	15.3	103	73.5	1.39	205.3	19.1	1.07	0.6
1973	18.1	79	114.9	1.63	264.8	19.0	1.11	1.0
1974	17.4	98	88.5	1.43	200.3	20.0	1.12	0.6
1975	16.9	119	70.4	1.65	245.7	19.4	1.01	0.6
Mean	18.1	100	89.9	1.59	230.1	19.2	1.07	0.8

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by heavy rainfall during bloom. As with the other cvs (10, 11), insufficient knowledge of the bearing potential of 'Chelois' vines resulted in overcropping and poor vine vigor in some years (Table 1). These data differed from observations by Galet (8) and Robinson *et al.* (13), but supported those reported in Ohio (6).

**Number of clusters** per vine varied considerably from season to season (Table 1). Relationship between the no. of clusters per vine and yield per ha was not as strong as with some wine grape cvs (10, 11) because the vines were cluster-thinned according to their capacity (vigor) and their productivity per node. Prior to thinning, the no. of clusters varied from 2-4 per shoot. However, only a few vines contained four clusters per shoot.

**Cluster weights** varied considerably from year to year, reflecting an inconsistent fruit set (Table 1). Cluster wt ranged from a low of 70.4 g in 1975 to a high of 115.6 g in 1970. There was an apparent relationship between cluster wt and fruit set, as fruit set was abnormally low in 1975 and highest in 1970. The poor set in 1975 could not be explained by unfavorable weather during the bloom period. Mean daily temperature was 21.3° C and rainfall amounted to 2.92 cm between June 10 and June 23, 1975.

**Berry weights** ranged from a low of 1.39 g in 1972 to a high of 1.78 g in 1971 (Table 1). Therefore, berries of

this cv ranged from small to medium in size. Fruit were round to round-oblately in shape and jet black in color when fully mature. Bloom of the fruit was light.

**Vine vigor** was low when compared to standard cvs grown in this area (14). Cane wood wts ranged from 0.6 kg/vine to 1.3 kg/vine and averaged 0.8 kg/v. Therefore, these vines were not inherently vigorous. In fact, vine cropping had to be controlled properly in order to maintain adequate vine vigor.

**Yield of fruit per retained node** ranged from 200.3 g in 1974 to 264.8 g in 1973 (Table 1). The mean value for the 6-year duration was 230.1 g. Coefficient of variation among years was fairly high (22.3%) and was similar to that for yield (21.0%).

**Soluble solids** content of the must averaged 19.2% and, except for 1971, was quite consistent (Table 1). Yield, also, was highest in 1971 (24.4 t/ha). However, the relationship between yield and must quality did not appear to be as strong as with Vidal 256 (10). Average soluble solids percentage for the 6-year duration was similar to that reported from other areas (6, 13).

**Total acidity** of the must, expressed as tartaric acid, averaged 1.07 g/100 g of must and varied only slightly from year to year. Total acidity values were lower than anticipated. Values ranged from 1.01 g/100 g to 1.12 g/100 g. Although those were acceptable levels

**Table 2.** Mean values for 10 essential mineral elements in the most recently expanded leaves of bearing grape vines of the 'Chelois' cultivar (1970-1975).

Year	% dry wt					ppm of dry wt				
	N	P	K	Ca	Mg	Mn	Fe	Cu	B	Zn
1970	3.06	0.26	1.50	1.31	0.30	97	80	9	30	20
1971	3.25	0.23	1.34	1.79	0.39	122	203	9	24	22
1972	3.24	0.22	1.60	1.41	0.38	137	130	9	25	16
1973	2.94	0.24	1.05	1.67	0.47	151	113	10	22	16
1974	3.34	0.24	1.33	1.57	0.37	158	103	12	24	23
1975	3.44	0.19	1.03	1.63	0.52	177	116	9	20	17
Mean	3.21	0.23	1.31	1.56	0.40	140	124	10	24	19

for total acidity, they were not ideal and were slightly higher than those reported from southern Ohio (6).

**Nutritional status** of the vines for 10 essential mineral elements for six growing seasons is presented in Table 2. Levels of many of the ten elements were similar to those reported for 'DeChaunac' and 'Vidal 256' (10, 11). Principal differences were noted for the elements potassium (K), magnesium (Mg) and zinc (Zn). Lower values were obtained for K and Zn in 'Chelois' vines than reported for 'DeChaunac' and 'Vidal 256' vines (10, 11). Magnesium values, however, were higher in 'Chelois' vines than reported for the other two cvs in Pennsylvania (10, 11). Also, nitrogen values for 'Chelois' vines were higher than reported by Smith *et al.* (14) for 'Concord' vines. The principal reason for this variance was elucidated in other reports (10, 11). Therefore, these data establish a base for determining standard values for ten essential mineral elements for the cv 'Chelois' in Pennsylvania. Shot berries, however, were evident in fruit clusters of 'Chelois' which may lend support to the hypothesis that leaf B content might be more desirable at a higher level than reflected by the data in Table 2. Also, boron nutrition has been associated with fruit set in other reports (7).

Observations on manifestation of low temperature injury, incidence of insects and diseases, commencement and time of occurrence of various growth stages and time of harvest were also made. Vine growth was upright spreading. Canes were rather short and not particularly large in diameter. In addition, shoot tip die-back was evident every season. Although trunk injury had been noticed in some 'Chelois' vineyards, it was not evident in these vines. Sucker occurrence was fairly profuse, but was not as evident as with 'DeChaunac' vines (11). Tendrils were thin, small, and not nearly as strong as those of 'Vidal

256' vines (10). Susceptibility of 'Chelois' vines to low winter temperatures was moderate. However, susceptibility to late spring frosts was minimal as bud break was late. Peak bloom generally occurred around June 20-25, just slightly later than 'Concord' vines. Harvest normally ranged between October 10-20 or about 115-120 days after peak bloom. Vines in this trial were relatively free of insect and disease problems. Phomopsis leaf spot (*Phomopsis viticola*, Pine) and bunch rot (*Botrytis cinerea* Fr.) were noted in some years. Although aerial infestations of phylloxera [*Daktulosphaira vitifoliae* (Fitch)] were not observed, Jubb (12) reported that 'Chelois' vines were quite susceptible to this insect. Fruit loss due to bird depredation was minimal.

Beelman (1, 2) and Beelman and McArdle (3, 4) reported that wine fermented from musts of 'Chelois' was consistently rated as one of the better red wine cvs evaluated for manifesting a "vinifera-like" character. Based on the observations in Erie County, vines of the cv, 'Chelois', can be grown commercially in the major grape area of Pennsylvania.

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## The National Fruit and Nut Germplasm Repository System<sup>1</sup>

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At the APS-ASHS Symposium on Fruit Germplasm in Guelph in 1974,<sup>3</sup> a group of the scientists of this Society spoke out on the need for a system of national repositories, and presented concepts of the way in which these might be organized. It is my intent here to speak to you in my capacity as Chairman of the National Plant Germplasm Committee to bring you up-to-date on the happenings on this subject which have occurred since 1975. At the same time, I will dwell somewhat on the events leading up to the 1975 Symposium, and do some projection on developments which we anticipate in the year ahead. Please be assured at this point that I will try to lay a foundation in this presentation for what I hope will be a useful open discussion of the aspects of the program.

In 1958, the National Coordinating Committee on New Crops asked three ASHS members—John Einset, Freeman Howlett, and Quentin Zielenski

—to prepare a report on the status of fruit germplasm collections. This report brought out strongly the jeopardy in which fruit germplasm collections were placed in this country without national oversight. Specific examples were given of both State Station and USDA actions which resulted in diminished resources. Basically, the report was a compelling plea that a national system of repositories be developed. The National Coordinating Committee took this report and embarked on an effort to get State, USDA, and industry leaders interested in developing a plan. What it had was a concept with which many agreed, but the effort fell short because there was no well-thought-out plan for implementation. We know now that the National Coordinating Committee itself did not take the steps it could have in getting such a plan organized.

In 1974, the National Plant Germplasm Committee was formed. This

<sup>1</sup>Text of a talk presented to the Fruit Breeding Working Group of the American Society for Horticultural Science at the 74th Annual Meeting, Salt Lake City, Utah.

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<sup>3</sup>"Future Germplasm Reserves in Fruit and Nut Crops." *Fruit Varieties Journal*, V. 28, Oct. 1974, 74-99.