



WINTERING WINE GRAPES IN MINNESOTA

By David A. Bailly (1978)

For the last several years, there has been an earnest attempt to grow premium wine grapes in Minnesota. Currently, there are 22 members of The Minnesota Grape Growers Association and an estimated 40 - 50 acres of vineyards. Two commercial wineries now operate in the state, literally begging for good quality grapes. All indications are that Minnesota's climate is compatible with the growing of fine wine grapes with the single exception of our extreme winters. To date, no wine grape has shown an ability to survive our winters unprotected. At Alexis Bailly Vineyard, we have tried many types of winter protection from complete cover to no cover whatsoever. Our five years of experience has convinced us that the added time and expense of good winter protection is absolutely necessary for anyone hoping to have a commercial vineyard of wine grapes in Minnesota, at least until such time as new hardier hybrids are developed.

Currently, there are two types of mulch being used for protection, soil and a vegetable mulch of hay, straw or corn choppings. In terms of quality of protection, either seems to work equally well. A comparison of minimum winter temperatures under 4 - 6 inches of soil as opposed to 6 - 10 inches of straw, hay or corn choppings have been surprisingly similar, running between 5°F and -2° F depending upon the severity of the winter and the amount of snow cover. Last year, for example, our minimum thermometer under 4 - 6 inches of soil registered a -2°F while at the Eisert Vineyard, some eight miles away, it registered identically the same temperature under 6 - 10 inches of corn choppings. In both vineyards, the ambient temperature had reached lower than -40°F. Thus, the selection of a particular mulch is more a factor of ease of application, ease of removal, availability and cost.

Elmer Swenson, a research technician with the University of Minnesota's Department of Horticulture and Landscape Architecture at their research station in Chaska, has been using winter mulch for vines for many years. His theory was that the new canes containing next year's fruit buds were the tenderest part of the vine and needed the most protection. After pruning the vines in the fall, he would bend the trunk of the vine so as to put the head and new wood in contact with the soil. Mulch would be applied to the head and cane. The trunk would be exposed to the elements. For relatively mild winters, this method seemed to work reasonably well with no more than a 10 - 20% trunk damage in any given year. However, the -40°F of 1976 - 77 resulted in as much as total loss of all trunks in some vineyards using this method.

A second method of training vines has been in use for several years in at least one Minnesota vineyard. This employs the cordon type trunk. The main trunk of the vine is trained laterally about a foot or so from the ground on a low wire. Several short canes are retained each year off the main trunk. The vines are pruned in the fall, cut off the wire and mulched. This method results in a total mulching of the vine but has some disadvantages. The low training of the vine is disadvantageous for picking, pruning and most other vineyard operations. In addition, a good share of the fruit comes in contact with the ground and has a tendency to rot before ripening.

For several years, various growers have been experimenting with a new training method, especially oriented to provide complete winter cover for vines. Known as the Alma Method, it attempts to combine both of the above systems. The trunk is trained by allowing a shoot from the base of the vine to grow laterally along the ground for several feet and then gradually up a rope guide to the first wire, some three to five feet off the ground. At this wire, a head is developed in a normal fashion with one or two long canes. After pruning in the fall and when cut from the wire, the vine has a natural tendency to lay flat on the ground. Mulch can then be applied to the entire plant for full winter protection.

A description of two cultural practices with the Alma Method will give a good insight into how various machinery and mulches are used to provide complete cover for the vines. In 1977, we at Alexis Bailly Vineyard, covered all parts of our vines with from 4 - 6" of soil. As soon as the leaves dropped, a shallow trench 3" deep was turned as close to the vines as practical down each row with a commercial hydraulic grape hoe. As the vines were pruned, they were laid into the trench and held in place with a shovel or two of soil. The blade on the grape hoe was then reversed and the trench was closed. A second pass with the grape hoe mounded soil as much as 6" over the vine. In the spring, the majority of the soil will be turned back by the mechanical hoe, but each plant will still have to be hand dug out and reset on the trellis. The light, sandy loam soil at our vineyard is quite pliable, allowing us to move the soil over and away from the plant readily.

At the Eisert Vineyard, a corn stalk mulch is employed without trenching. Vines are laid under the trellis and secured to the ground with a wire staple. Corn stalks are chopped with a common farm chopper and blown into a screened enclosed trailer. From there, an auger is used to spread the corn choppings over the vines in mounds 6 - 10" deep.



The relative merits of each system is not easily appraisable .

As one uses a particular system more and more, one develops a greater proficiency, efficiency and confidence in it. However, a few statements can be made about each system. The use of hay, straw or corn greatly increases the cost of mulching. Time studies have shown that after pruning, the added cost to put the vine down and secure it is about 10 - 15 cents per vine (based on \$4.00 per hour labor charge). Tractor time in turning the soil over the plants is negligible while covering with straw, hay or corn mulch is not only more time consuming but will add another 10 cents per vine for material. Loose mulch has a tendency to blow away in open areas.

On the other hand, the use of soil as a mulch requires that you get all of your work done before freeze-up. Uncovering the vines in the spring is considerably more difficult with soil. Also, a good hay or corn mulch does much to add organic matter and aeration when turned into the soil in the spring.

The biggest problem of total winter protection is one of time and expense. From a "cost of production" point of view, winter cover is cheap. At a yield of 15 pounds per vine, the cost of winter protection adds no more than 1 - 1.5 cents per pound to the price of the grapes. For this small price, the grower is assured that his vines will get through the winter and get him maximum yield the following year. In addition, he can grow the best French hybrids, thus, commanding a top price for his fruit. However, it necessitates the consumption of a good deal of time (or money for labor) during a very short period. In most wine growing districts, pruning can be spread out during the entire winter. Here, it must be done in 4 - 6 weeks with the added labor and cost of putting the vines down during the same period. Our studies show that in an eight hour day, you cannot expect a knowledgeable worker to prune and put down more than 150 plants.

Thus, a ten acre vineyard will require some 350 man hours between mid October and Thanksgiving, or two full-time men for one month. However, well-trained, high-school boys are good workers and can usually be obtained for much less than \$4.00 an hour.

After working with a complete winter protection system for a year or so, you will find that it is not difficult to do. The Alma Method of vine training lends itself well to winter mulch and with a little care, you will find your vines will survive the winter exceedingly well.