

## Breeding Hardy Grapes

By A. F. YEAGER, *North Dakota Agricultural Experiment Station, Fargo, N. D.*

FROM the standpoint of this paper hardiness means something far more than is ordinarily thought of in connection with grapes. Varieties such as Concord, Worden, Delaware, Brighton and the other well known varieties of Eastern United States would be listed as tender in our classification. Named varieties which have sufficient hardiness to live and ripen a crop a reasonable percentage of the years at Fargo, North Dakota, are limited to such ones as Beta, Alpha, Monitor, Dakota and Hungarian. Even these can hardly be classed as wholly satisfactory, inasmuch as in many years they kill to the ground at Fargo, and farther west in the State rarely produce a crop. It is evident, therefore, that for this territory we must have hardier grapes than these.

Fortunately, *Vitis vulpina* is native to North Dakota and withstands the winters without injury. Plants of this species have been found as far north as the Riding Mountains of Manitoba. This material would therefore seem to supply the needed hardiness. Hedrick says that, "*riparia*<sup>1</sup> has always been considered of great promise in the evolution of American grapes. It can hardly be said that it fulfilled expectations" (3). Nevertheless, among the leading varieties described in "The Grapes of New York," 32 are claimed to have it as an ancestor. This is not a bad record when it is realized that these varieties gained a foothold in regions where *labrusca* is hardy.

Since Beta was claimed to be a cross between Concord and the wild grape of Minnesota, and Alpha is nearly identical, a considerable number of seedlings of these were raised at the North Dakota Agricultural Experiment Station hoping that their seedlings might provide the needed combination of hardiness and quality. However, all of the seedlings of both Beta and Alpha proved to be very similar to these varieties and did not show segregation into the various types that might be expected if Beta was actually a cross. W. H. Alderman reports similar results at Minnesota.

Controlled crosses were next made between native *Vitis vulpina* and the cultivated varieties Concord and Eclipse. From these crosses the F<sub>1</sub> generation was intermediate in fruit. The plants were hardy enough to live through part of our winters without cover. None, however, proved to have any commercial value. An F<sub>2</sub> generation was therefore grown. Following the winter of 1935-36, one of the coldest on record, 139 of these plants set fruit. Of this number more than half lost their crop in the record breaking heat of the summer of 1936, leaving 67 to mature. Unlike Alpha and Beta seedlings, these varied widely in important respects. The colors of the fruit were purple and white; size ranged from that of the common wild *vulpina* to that of Eclipse, which is only slightly smaller than Concord; the flavor varied from very acid to

mild and sweet; and bunches varied from compact to extremely open. None of those which ripened fruits had foliage other than glabrous or nearly so. In fact, few plants, fruiting or not, showed much pubescence. From a genetic standpoint it is realized that this material does not lend itself to careful analysis because nearly half the plants were winter killed and had disappeared before reaching bearing age. Many more were hurt so badly that they did not bloom. Nevertheless, the variability of the progeny follows what might be expected with a normal Mendelian segregation. The fact that seedlings of Beta failed to show segregation, though the reputed parentage of Beta is the same, leads one to agree with Hedrick (2), and with Brierley and Alderman (1) that Beta is probably not a hybrid.

From among the 67 fruiting survivors of the *vulpina* x *labrusca* hybrids, several selections were made which would seem to have some possibility as worthwhile horticultural varieties. Whether they may be adapted to more unfavorable conditions than our present recommended commercial varieties, remains to be proven. Again whether these particular seedlings are of value or not is of much less importance than the fact that they indicate the probability that with a larger number of seedlings desirable combinations may be secured which will permit grape growing over a wider area.

Whether Alpha (the wild seedling of Brother William, Collegeville, Minnesota); or Beta, Monitor, Suelter and Dakota (the products of Louis Suelter, Carver, Minnesota) (4) are *Vitis vulpina* may perhaps be worthy of investigation. The flavor of the fresh fruit and its cooked products do not indicate *vulpina*. Alpha and Beta, while of different origins, are nearly identical in fruit and plant. Both come from the same general region in Minnesota. These facts suggest the possibility that they may be representatives of a distinct species, or if not that, then perhaps a botanical variety of *vulpina*.

As a source of seedlings from named varieties, Hungarian is suggested as offering possibilities. While it is reported to have come from Hungary, according to a letter from H. P. Gould of Washington, the plants growing on the North Dakota Agricultural Experiment Station grounds give unmistakable evidence of *labrusca* ancestry in plant and fruit characteristics, and its hardiness suggests *vulpina* parentage. Its resemblance to Janesville, a Wisconsin *labrusca-vulpina* hybrid, is striking. They may perhaps be identical.

### LITERATURE CITED

1. BRIERLEY, W. G., and ALDERMAN, W. H. Grape growing in Minnesota. *Minn. Agr. Exp. Sta. Bul.* 297. 1934.
2. HEDRICK, U. P. *Cyclopedia of Hardy Fruits.* Macmillan. 1922.
3. ——— *et al.* The Grapes of New York. *N. Y. Dept. of Agr.* 1908.
4. PFAENDER, WM. The Beta grape and its origin. Paper for *Minn. Hort. Soc. Meeting*, December 5, 1911. (Copy supplied by W. G. Brierley.)

<sup>1</sup>*Vulpina* has since superseded *riparia* as a name of this species.