

Breeding Grapes for the Northern Great Plains*

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Grape breeding has been a major part of the fruit breeding program at the South Dakota Agricultural Experiment Station since 1953. Eastern grape varieties are poorly adapted in most areas of South Dakota. However, native grapes (*Vitis riparia*) are found along streams in scattered areas throughout the state, and are also found in North Dakota and eastern Montana.

Objectives of the South Dakota grape breeding program are to develop hardy, early-maturing, table and juice varieties of high quality. They should also be productive, and have large, well filled clusters. Seedlessness is being sought, but is not a primary consideration.

It appears that good varieties, well adapted to the northern plains, might be developed more easily in the grape than in many other fruits. South Dakota generally has rather warm, dry summers with a low relative humidity. These are conditions to which *Vitis vinifera*, the European grape, is adapted. However, fluctuating winter temperatures, during which there may be little or no snow and temperatures may drop to -40° F, are not tolerated by *V. vinifera* or most eastern grape varieties. The short growing season encountered in most of the state is also inadequate for maturing most grape varieties. Characteristics of the native *V. riparia* complement *V. vinifera* very well, providing a source of germ plasm adapted to the extremes

of temperature, lack of moisture, and short growing season of the northern plains.

The grape breeding program in South Dakota has been based on hybridizing *V. riparia* with high quality commercial varieties of other species. In planning the breeding program it was believed that F_1 vines would be somewhat lacking in both hardiness and desirable fruit characters. However, it was expected that a few vines possessing ample hardiness and desirable fruit qualities could be selected from the second generation of seedlings. Selected F_1 vines have been crossed with other selected F_1 vines, and also self-pollinated to produce segregating second generation populations from which outstanding vines might be selected as possible varieties.

Two sources of *V. riparia* were used in the breeding work. Selected *V. riparia* vines grown from seed gathered near Bismarck, North Dakota, were much superior to *V. riparia* vines native near Brookings, South Dakota, in transmitting early maturity and quality to their progenies. Slightly greater hardiness has also been observed in progenies of the North Dakota wild grape. Therefore, selected North Dakota *V. riparia* vines and selections from their F_1 progenies are being used almost exclusively in the present breeding work.

Commercial varieties used in hybridizing with *V. riparia* have included *V. vinifera* varieties, French

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hybrid varieties, and eastern varieties of both the *vinifera* and *labrusca* types. Golden Muscat has been one of the better parents. Seedlings in the F_1 progeny of Golden Muscat x *V. riparia* possess surprising quality and productivity, produce fairly well filled clusters of moderate size, and are moderately hardy. A small F_1 progeny of *V. riparia* x Pearl of Csaba indicates that Pearl of Csaba is a good parent in transmitting quality. Seedlings in the F_1 progeny of *V. riparia* x Seibel 10096 are generally very productive and remarkably hardy. The clusters are exceptionally large and often shouldered, but frequently they fail to fill well. Occasional vines bear large well filled clusters. (See Figure 1)

Several F_1 vines resulting from crossing *V. riparia* with California varieties of *V. vinifera* bore fruit for the first time in 1962. A few vines bearing seedless grapes were observed. No F_1 vines having eastern varieties of the *labrusca* type as the quality parent have yet reached bearing age.



Fig. 1. Large well-filled clusters typical of a selection which is an F_1 hybrid of *V. riparia* x Seibel 10096.

The winter of 1961-62 proved to be a severe test of winter hardiness in grapes. Several F_1 grape vines that normally have been hardy suffered moderate to severe winter injury.

Second generation seedlings were planted in two vineyard sites in 1961. One site is somewhat protected. The other site is very exposed, subjecting seedling vines to desiccating conditions typical of the open plains. Of 1,200 seedlings planted on the exposed site, only 221 of the surviving vines showed moderate to good vigor in the summer of 1962. These great losses were expected, and it is likely that only a few of the surviving vines will prove to be reliably hardy. No second generation seedlings have yet borne fruit.

Peach and Apple Trends in Arkansas

The apple variety trend in Arkansas, according to R. C. Rom, of University of Arkansas, is toward Golden Delicious, and the red sports of Jonathan and Delicious for fresh market. Golden Delicious, Grimes Golden, Cortland, Jonathan and Winesap are favored for processing.

Dr. Rom anticipates an increasing demand in Arkansas for large, non-melting, yellow-fleshed, clingstone peaches for processing. The numbered Babygold varieties (5 through 9) from New Jersey are of this type, and appear very promising. Several hundred acres of these, along with Ambergem, another clingstone from New Jersey, have been planted recently in Arkansas. Suncling, from Michigan, is also promising.