Grape production and distribution in Western Iowa

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Grape Production and Distribution in Western Iowa

A typical hillside vineyard in western Iowa.

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

C. F. Curtiss, Director

POMOLOGY SECTION

AMES, IOWA
Grape Production and Distribution in Western Iowa

By T. J. Maney

Commercial grape growing is unusually successful in the vicinity of Council Bluffs, not merely because this district is naturally adapted to this industry, but also largely because of the influence of the excellent cooperative marketing organization known as the Council Bluffs Grape Growers' Association. This organization has for many years provided satisfactory markets for grapes at the best possible prices to growers and at a low cost of marketing, besides handling other fruits and buying supplies for its members. Due to its influence, grape growing near Council Bluffs is generally better organized and managed than elsewhere in Iowa.

The practices of the grape growers in the Council Bluffs district and their marketing methods have been carefully studied by the Pomology Section of the Iowa Agricultural Experiment Station and the facts secured are presented in this bulletin for the information of growers in other districts in Iowa where similar success might be secured.

In so far as possible, the material was secured from the "pool books," ledgers, etc., of the sales agencies. In some instances this was not possible and then the information secured is a careful estimate made by the managers and later checked by estimates from other sources.

No attempt is made to compare the prices or profits in the different steps of distribution or to note their prevailing trend in any but a general way. It would be very difficult to secure accurate information in regard to the wholesale and retail prices throughout the season. At its best such information would vary from season to season. No attempt was made to learn the relative amounts distributed in the channels of trade beyond the carlot wholesaler.

BEGINNINGS OF THE INDUSTRY

Grape growing began in the Council Bluffs district as early as 1857, when A. S. Bonham settled near Council Bluffs and set out a vineyard on the hills about one and one-half miles from the present court house. The older settlers state that returning sol-
Fig. 1. First vineyard set in the Council Bluffs section. Planted in 1857; still vigorous and productive.

Soldiers of the Civil War paid as high as one dollar for a ten-pound basket of grapes from this vineyard.

The industry seems to have developed but slowly, and generally as a home vineyard proposition. As late as 1893, when the Council Bluffs Grape Growers' Association was organized, the vineyard area of this district was estimated to be only 100 acres. However, the stabilizing effect which this association had upon the marketing of the fruit soon led to an expansion of the vineyard area. At the present time there are approximately 500 acres of bearing vineyard and 200 acres of younger vines.

**NATURAL ADVANTAGES**

The Council Bluffs grape district is rather favorably located in regard to climate and is also situated on a fertile soil which is well adapted to the production of fruit.

**CLIMATE**

Iowa is noted for the rigor of its winters, yet in only a few seasons has there been any serious damage to the vineyards of this district because of the extreme cold. Located as the district is, in the southwestern part of the state, along the Missouri river, the temperatures are favorable enough so that it is not a general practice for the growers even to remove the vines from the trellis
and lay them down and cover them for winter protection. It is a common practice to offer a partial protection to the root system by plowing furrows toward the vines late in the fall.

A large part of the annual rainfall comes during the growing season, but the soil is of such a nature that the excess rainfall is readily absorbed and little damage results either from erosion or from conditions of moisture favorable to the development of fungous diseases.

SOIL

According to Stevenson, the very deep soil known as the Missouri loess, which occurs along the Missouri river from Sioux City to the Missouri boundary, in a belt from five to ten miles in width, is a deposit which in nature and origin is similar to the loess of the valleys of the Rhine and Moselle in Germany, which are world-famous for their vineyards.

This soil is a very fine-grained, wind-formed type. Near the Missouri river it is perhaps 100 feet in depth. It extends eastward into the state at a gradually lessening depth for a distance of 50 to 80 miles. Analysis by Brown show a relatively high percentage of plant food and lime content. Experiments demonstrate its excellent water-holding capacity. The high absorptive and retentive characters of this soil tend to keep the surface earth relatively dry in the vineyards, even after a season of abundant rainfall, yet the vines are supplied with sufficient moisture during the entire growing season.

FREEDOM FROM INSECTS AND DISEASES

The topography of this region is very rough and is characterized by many sharply contoured, bluff-like hills and relatively narrow valleys. For the most part, the vineyards are situated along the sides or on the crowns of these bluffs on the southerly and easterly exposures. Such locations provide good soil drainage and maximum exposure to sunlight, and the narrow, open valleys aid in supplying the desired air drainage.

These factors, combined with the above mentioned soil properties, produce conditions which in a large measure are unfavorable to the development of fungous diseases. In fact, outbreaks of black rot (Guignardia bidwellii) or downy mildew (Plasmopara viticola) are almost unknown. The growers commonly do not practice spraying the grapes in any manner.

In a few of the vineyards there are indications of the grape root worm (Fidia viticida), but as yet no serious damage has resulted. The practice of the growers in plowing up to the grapes in the fall and throwing away the furrows in the spring tends to
control this insect. The grape cane borer (*Schistocerus hematus*, Fabr.) is noted by Maney⁴ in some vineyards, especially where the spur and high renewal system of pruning is practiced. The general adoption of a comparatively low renewal, long-cane system of pruning, and the burning of the prunings, have overcome in a large measure the depredations of this insect. A few other insects are found, but none others as yet are considered troublesome. Probably no other grape-growing region in the United States enjoys such complete freedom from the attacks of insects and diseases.

**VINEYARD PRACTICES**

**VARIETIES**

The Concord grape is the main variety grown in this district and growers estimate that it comprises over 90 percent of the acreage. Other well-known varieties used are Worden, Moore Early, and Niagara.

The Moore Early comprises only a small percent of the total acreage. It is largely marketed in four-pound baskets and in less than carload quantities. In average years about 4,000 of the four-pound baskets are sold. In addition to these, a few carloads of this variety, the first loaded each season, are put up in six-pound baskets.

But relatively few Niagara grapes are grown, as the demand for white grapes is very limited. They do not sell well on the local market and it is not desirable to include them in shipments

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of the black varieties, as such shipments may at times be rejected or the price of the black grapes reduced by as much as one-half cent a basket thru such a practice.

The Worden is little grown. In some instances it is intermixed with the Concord vineyards, but only a few growers make any distinction between these two varieties at harvest time. The selling agencies consider them all as Concords. The Worden ripens a few days ahead of the Concord. It is not popular, due to the fact that it has a tendency to crack and consequently is not as good a shipper as the Concord.

MANAGEMENT METHODS

In the early period of grape growing in this district the vines were pruned according to the low-headed fan system. This enabled the growers to "lay down the vines" over the winter. As experience later showed such a practice to be unnecessary for the main varieties, it was discontinued and more and more old wood was left on the vines. In time, a high renewal, spur system of pruning was evolved and became the prevailing type of training. As a result of experiments conducted by the Pomology Section of the Iowa Agricultural Experiment Station in recent years the low-headed system has been largely discontinued.

In 1914 the writer started some cooperative pruning experiments in this locality in which a comparison was made of this high renewal spur system with a long-cane system. The results were so overwhelmingly in favor of the latter system that many
of the more progressive growers adopted it the following season, and practically all of the vineyards of over three acres in size are now being pruned according to this system.

Pruning is done principally during February and March, though a few growers begin in the fall immediately after the leaves have dropped. Five to six canes of eight to ten buds each are left to a vine. These are arranged on the trellis in the shape of a fan and are tied to the wires with a soft jute twine.

Usually, a two-wire trellis is used, with supporting posts between every third vine. The lower wire is 24 to 30 inches from the ground and the top wire approximately 20 inches higher. The posts used are of various kinds. Some of those noted in use are oak, osage orange, locust, iron pipe, angle irons and galvanized pipe. In a portion of two vineyards, cement posts have been used entirely, while in several others the end posts are of cement.

Planting distances are usually 8 feet in the row and rows 8 feet apart, with a 10-foot width between every four rows for a driveway. In some vineyards, however, the vines are only 6 feet apart in the row, and, on very steep hillsides, the rows are often only 7 feet apart.

The more progressive growers practice a system of clean cultivation where the topography of the land will permit them to do so. The vineyard is plowed early in June and disced or harrowed during the summer to maintain a dust mulch. The vines are also hoed at least once and often twice during the season and are kept free from all large weeds.

The average grower, more especially the small vineyardist, does not follow such good practices. Far too commonly, he limits cultivation to one plowing, half-done, together with one hoeing and the mowing of the weeds in August. In a later discussion it will be noted that the differences in yields are directly comparable to the variation in area of vineyards and the methods of cultivation.

Under the present practices vineyards laid out on the steepest hillsides are subject to erosion. There is need for careful study of this problem. Much of the washing may be stopped by the use of cover crops and heavy applications of coarse manure. Some vineyardists have partially solved this problem by keeping rows at intervals in permanent sod.

**HARVESTING**

The grape bunches are clipped and packed directly into the selling basket by the picker. These baskets are then set along the rows nearest the driveways and are gathered frequently and hauled in a light spring wagon to a packing shed. Here the top is properly faced, the lid added and stamped with the grower’s name and the association brand, and the baskets are ready for delivery to the sales agencies.
Fig. 5. This type of soil erosion on steep hillsides can be prevented by proper cultural practices.
The pickers are largely neighbors, or women and children from the city. They receive about 1 1/2 to 2 cents a six-pound basket for their work. The packages used are the four-pound basket for the very earliest grapes and the six-pound climax basket for the bulk of the shipments.

**VINEYARD STATISTICS**

The vineyards of this district are located largely within three miles and almost entirely within five miles of the city. Only a small proportion of the suitable land is planted to vines. The district is really just beginning to develop its grape industry.

There are approximately 500 acres of bearing vineyard distributed among over 200 growers, so the average size of the vineyards is less than two and one-half acres. In fact, as is shown in table I, a very large number of growers have vineyard yields of less than 2,000 baskets. With good growers, the yield may run from 1,000 to 1,200 baskets per acre.

**YIELDS**

The average acre yield of grapes in this district varies largely with the extent of vineyard area under each individual management. The column in table I, giving the assumed area of the vineyards, was calculated as follows: The acreage of a few growers in each class was determined from a survey report and their total

### TABLE I. RELATION BETWEEN NUMBER OF GROWERS, AVERAGE VINEYARD PRODUCTION AND TOTAL DISTRICT PRODUCTION.

<table>
<thead>
<tr>
<th>No. of growers</th>
<th>Percentage of total production</th>
<th>Limit of production per vineyard (6-pound baskets)</th>
<th>Average production per vineyard (6-pound baskets)</th>
<th>Assumed area of vineyard (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>6.7</td>
<td>23-669</td>
<td>269</td>
<td>1</td>
</tr>
<tr>
<td>68</td>
<td>22.9</td>
<td>700-2220</td>
<td>1324</td>
<td>1 to 3</td>
</tr>
<tr>
<td>22</td>
<td>17.4</td>
<td>2374-4073</td>
<td>3163</td>
<td>3 to 5</td>
</tr>
<tr>
<td>21</td>
<td>28.5</td>
<td>4146-7068</td>
<td>6326</td>
<td>5 to 8</td>
</tr>
<tr>
<td>6</td>
<td>15.0</td>
<td>8155-11593</td>
<td>9852</td>
<td>8 to 12</td>
</tr>
<tr>
<td>2**</td>
<td>9.5</td>
<td>14847-22217</td>
<td>15 to 26</td>
<td></td>
</tr>
</tbody>
</table>

*This table does not include the few growers who sell direct to the local consumer or upon the Omaha public market.

**In 1921 these two vineyards will have 40 and 50 acres, respectively, in bearing.
production was secured from their delivery receipts at the sales agencies. Their acre yield was calculated from these records and the average of the few growers in each class formed the basis for the assumed acreage of the growers within the limits of production, as listed in the first and third columns. From the average of the assumed acreages and the average vineyard production, the average acre yield for each class was computed and appears approximately as follows:

Vineyards less than 1 acre yielded at rate of 612 6-lb. baskets.
Vineyards less than 3 acres yielded at rate of 758 6-lb. baskets.
Vineyards less than 5 acres yielded at rate of 776 6-lb. baskets.
Vineyards less than 8 acres yielded at rate of 816 6-lb. baskets.
Vineyards less than 15 and up yielded at rate of 986 6-lb. baskets.

The differences in rate of yield between the smaller and larger vineyards is very marked and is similar to what one would expect to find after a close comparison of the types and systems of pruning, the cultivation practices and the management methods of the average grower in each class.

**COST OF PRODUCTION**

Only one grower was found who kept anything like accurate cost accounts of the various operations in growing a crop of grapes. The accompanying table (table II) is offered only as a very careful estimate of the cost of such operations. It is based on estimates of growers who operate more than three acres of bearing vineyard. The costs are an average of pre-war and war prices and are fairly indicative of the prices which will probably hold for the next few years. Further than this, the costs and prices are entirely problematical.

In this table, no account is taken of the cost of growing the vineyard to bearing age, except as to the increase in the item of interest due to increased value of the land. The best land for vineyard sites may at present be secured for $200 to $300 an acre.

**TABLE II. ESTIMATED ACRE COST OF PRODUCTION OF GRAPES IN THE COUNCIL BLUFFS DISTRICT.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on investment ($400 at 6%)</td>
<td>$24.00</td>
</tr>
<tr>
<td>Renewal of posts and wire tightening</td>
<td>1.50</td>
</tr>
<tr>
<td>Pruning</td>
<td>9.00</td>
</tr>
<tr>
<td>Removing brush</td>
<td>1.50</td>
</tr>
<tr>
<td>Twine for tying</td>
<td>1.50</td>
</tr>
<tr>
<td>Tying vines to trellis</td>
<td>7.00</td>
</tr>
<tr>
<td>Plowing and cultivating</td>
<td>7.00</td>
</tr>
<tr>
<td>Hoeing</td>
<td>3.25</td>
</tr>
<tr>
<td>900 baskets (6 lbs. climax and wire handles @ $40 per M)</td>
<td>36.00</td>
</tr>
<tr>
<td>Picking</td>
<td>20.00</td>
</tr>
<tr>
<td>Delivering</td>
<td>9.00</td>
</tr>
<tr>
<td>Extra labor</td>
<td>4.00</td>
</tr>
<tr>
<td>Commission less rebate</td>
<td>18.00</td>
</tr>
<tr>
<td>Icing charges</td>
<td>6.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$143.75</strong></td>
</tr>
</tbody>
</table>

**Receipts:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 baskets @ 29c each</td>
<td>$261.00</td>
</tr>
<tr>
<td><strong>Total expense</strong></td>
<td><strong>143.75</strong></td>
</tr>
<tr>
<td><strong>Profit per acre</strong></td>
<td><strong>$117.25</strong></td>
</tr>
</tbody>
</table>
depending largely on the location and size of the tract desired. There is a large acreage of suitable land for vineyards which may be had at lower prices. From the figures of the one grower who keeps accurate cost records, the cost of bringing a 10-acre vineyard into bearing was determined quite accurately. The land on which this vineyard was planted was valued at $300 per acre. The grapes were planted in 1918 and will be in full bearing in 1921. During the season of 1920, the 10 acres produced 2,004 baskets. The total cost of establishing this vineyard was $218 per acre. The costs, which were all incurred under abnormal conditions due to the war, could perhaps be reduced 25 percent in normal times.

The charges for commission less rebate seem low, but during the past ten years the selling charges of the members of the Council Bluffs Grape Growers' Association have averaged only 6.1 percent.

The total cost of production appears high, and undoubtedly it is higher than most growers would estimate, as all operations are charged at the normal prices of labor. Most growers consider that many of the operations are done at odd times and should not be charged at such a high rate.

With the cost of production of $143.75, it might be assumed that the small vineyardist makes no profit, but it must be remembered that his cost of growing is much less because of his inattention to many of the profitable practices of pruning and cultivation which are followed by the larger growers.

**DISTRIBUTION**

In the disposal of the Council Bluffs grape crop, the following factors are considered of more or less importance: Transportation facilities; geographical location; ripening season and yield of competing grape districts; competition with other varieties of fruit; fixed charges of transportation.

**TRANSPORTATION FACILITIES**

The Council Bluffs grape district is unusually well located in regard to the facilities for distribution. Nine main or trunk line railroads pass thru the city and their connections reach into the entire territory from the Mississippi river to the Rocky Mountains.

- Six main lines cover the territory eastward towards Chicago.
- Three cover the region south to Kansas City and St. Louis.
- Two extend southwest into Kansas and Oklahoma.
- Three cover the region west to Denver and the Rocky Mountains.
- Three extend northwest into the Dakotas and Montana.
- Four cover the territory north into Minnesota.
Fig. 6. Map showing distribution of grapes from Council Bluffs section 1912-1920. One dot indicates 1 carload.
Over 200 freight trains daily leave Council Bluffs over these lines, providing the grape growers in western Iowa with exceptional facilities for the rapid distribution of their products.

GEOGRAPHICAL LOCATION

Situated as this district is on the west and northern limits of the Mississippi Valley fruit region, it has a great advantage over other competitors for the grape consuming trade of the Great Plains area. (See fig. 6.) Not only is proximity to a market an advantage, but the difference in transportation charges on western shipments is considerable. Freight rates are computed on the basis of the Missouri river classification, rather than on the Mississippi river rates.

RIPENING SEASON AND YIELD OF COMPETING GRAPE DISTRICTS

During normal seasons, the destination of the carlot shipments from Council Bluffs should not be greatly influenced by this factor. However, seasons are more often abnormal in some locality, and this reacts in one way or another upon the Council Bluffs carlot market. There are only a few districts that at any time offer serious competition to the Council Bluffs region. These districts are located as follows: (See fig. 7.)

1. Wathena, in northeastern Kansas along the Missouri river.
2. Omaha and Florence, Nebraska, along the Missouri river.
3. Nauvoo, Illinois, along the Mississippi river.

Wathena District—The Wathena district produces on the average about 50 carloads of grapes each season. The varieties grown are principally Moore Early and Concord and the ripening period is normally two weeks earlier than the Council Bluffs district. Some years, however, the two districts are on the market at the same season. During such years the Council Bluffs grapes do not go into Kansas until late in the season.

Omaha District—The Omaha district is located quite close to Council Bluffs on the Nebraska side of the river. It has the same shipping facilities, and, until 1911, the product of the Omaha district was largely marketed thru the Council Bluffs Grape Growers’ Association. The two districts even yet cooperate in their marketing to eliminate price-cutting competition.

Up to 1917 the total production for each of the two districts was quite comparable. About 80 percent of the district production on the Nebraska side was sold thru the Omaha Fruit Growers’ Association. In 1916 this association shipped 81 cars of grapes, and for the five years previous it handled an average of 75 cars annually. Since the severe winter of 1916-17, when a large acreage of vineyards in the vicinity was winter-killed, the
vineyard industry on the Nebraska side has been neglected. However, the growers are replanting to a considerable extent and four to five years should bring the production back to normal. In addition to these shipments, this district almost entirely supplied the local trade in Omaha. The varieties and ripening season are practically the same as the Council Bluffs district and the carload shipments are sent to practically the same territory.

Nauvoo District—Near Nauvoo, Illinois, is a grape district comprising about 250 acres of Concord and 50 acres of Moore Early. All grapes from this district are ferried across the river and marketed from Montrose, Iowa. A full crop is considered as about 50 cars, which are shipped into the West and Southwest and north into Minnesota. Minneapolis and St. Paul are very large consuming cities for grapes from this district.

In 1916, the Nauvoo district had only about a half crop and in 1915, only a three-quarter crop, with a full crop in 1914. No Council Bluffs grapes went into Minnesota in 1914, while in 1915 and 1916 there were 12 and 15 cars, respectively, consigned to Minnesota points. The yield of this district, therefore, does to a considerable extent influence the destination of the Council Bluffs grapes. This no doubt is due largely to the difference in ripening period of the two districts. The Nauvoo district ripens from August 12 to September 15, which is normally ten days or two weeks earlier than the Council Bluffs district.
Michigan District—A very extensive grape district is located in southern Michigan. A yield of 50,000 to 60,000 tons is a normal crop for this region, but a considerable proportion of this amount is utilized by the grape juice factories. The grapes normally ripen later than the Council Bluffs district, or are just arriving on the market at the time the Council Bluffs season is at its height.

Missouri District—The grape industry in Missouri is not yet extensive enough to ship in carload quantities from very many localities. A few cars are sent from each of several towns, but these are usually consigned to mining towns within the state. A considerable acreage has been developed near Hermann, but so far the grapes produced have been used locally.

Other Districts—The grape regions of Ohio, New York and Pennsylvania are even later than the Michigan district and do not often have much influence on the marketing of the Council Bluffs grapes.

COMPETITION WITH OTHER VARIETIES OF FRUIT

This factor does not seem to be of much importance in determining the destination of the Council Bluffs grapes. Colorado, for instance (fig. 6), is a heavy purchaser of grapes, even tho the peach season is at its height during the same period.

Inquiry among the carlot wholesalers in a few of the consuming cities shows that pears, peaches, plums, California grapes and apples are in the market at the same season as the Concord grapes. No doubt there is competition among these fruits for the consumer's money, but he demands a choice of fruit and selects the kind which he can best afford to purchase, or which gives him a desirable variety. For instance, in Sioux City, where the Concord grapes retail at 40 to 50 cents a six-pound basket, the consumer is largely the average wage earner. In El Paso, Texas, where such grapes retail at 65 to 75 cents, the purchasers are chiefly salaried people who formerly lived in the north and east. A little competition, perhaps, is desirable, as it gives the consumer a seasonable choice of fruit and undoubtedly stimulates an increase in the total consumption.

FIXED CHARGES OF TRANSPORTATION

These costs are items of freight and refrigeration, and for long distances they amount to a considerable sum. For instance, from Council Bluffs to El Paso, Texas, is a distance of about 1,100 miles by railroad. The refrigeration cost per car is $80 and the freight charges amount to $402 on each carload (see table III). A car to this point contains about 4,000 climax six-pound

baskets of grapes. The carlot wholesaler estimates an average loss of 5 percent thru breakage in transit, so that only 3,800 baskets are in a salable condition on arrival. This makes a charge of 2.1 cents a basket for refrigeration and 10.6 cents a basket freight charge. The item of breakage may be largely eliminated by following the directions for loading suggested by the Bureau of Markets. If the grapes cost 40 cents a basket at Council Bluffs, which was the f. o. b. price for 1920, they cost the carlot wholesaler at least 53 cents laid down at El Paso. The cost to the consumer of necessity is high, or approximately 65 to 75 cents a basket, at which price the demand for such a product must be rather limited.

A glance at fig. 6 shows that the greater part of the grape crop is destined to cities within a radius of 600 miles from Council Bluffs. This does not mean that grapes cannot be shipped further under good refrigeration, for on this map we note shipments to Kalispell, Montana, a distance of over 1,300 miles; to Missoula, Montana, which is 1,250 miles away, and to a few other points that are over 600 miles from Council Bluffs. The actual distance is not as important as the time required en route. Some main line city, such as Denver, is much nearer to Council Bluffs in this respect than some of the smaller Nebraska towns, situated on a branch line, are at half the distance. For this reason, direct routing is very important in diminishing the time en route and in lowering freight charges.

Table III gives a comparison of freight rates in effect in 1916 with those of 1920. The present rates are out of proportion to the value of the product in transportation. A typical example of this is a car containing 3,667 six-pound baskets of grapes, shipped from Council Bluffs to El Paso, Texas, during the 1920 season. This car sold at 40 cents per basket f. o. b. Council Bluffs, or $1,466.80. The icing charges on this car were $80, and the freight was $402, making a total fixed charge of $482, or about one-third the selling price of the car.

The initial icing of a car of grapes varies in cost, but averages between $12 and $15, depending on the amount of ice desired for cooling out the car before loading. This charge is borne by the grower and amounts to approximately one-half cent a six-pound basket.

Before rolling, the ice bunkers are again filled, and this cost, together with whatever icing is done while en route, is assessed against the consignee. The bunkers are supposedly examined at every icing station en route and the necessary ice added.

Ordinarily the refrigerator bunkers hold from six to eight tons of ice, but for grapes these are not always entirely filled. The charge for ice varies from $3 to $5 a ton, with a small additional

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### TABLE III. COMPARISON OF FREIGHT RATES ON BASKET GRAPES IN CARLOAD LOTS TO REPRESENTATIVE POINTS OF DISTRIBUTION.

<table>
<thead>
<tr>
<th>COUNCIL BLUFFS TO</th>
<th>Minimum capacity of car (pounds)</th>
<th>Freight rate per 100 pounds</th>
<th>1916</th>
<th>1920</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aberdeen, S. Dak.</td>
<td>20,000</td>
<td>$ .61</td>
<td>$1.035</td>
<td>$1.085</td>
<td>$.050</td>
</tr>
<tr>
<td>Albert Lea, Minn.</td>
<td>20,000</td>
<td>1.035</td>
<td>1.085</td>
<td>1.135</td>
<td>.050</td>
</tr>
<tr>
<td>Billings, Mont.</td>
<td>24,000</td>
<td>1.25</td>
<td>2.085</td>
<td>2.125</td>
<td>.075</td>
</tr>
<tr>
<td>Butte, Mont.</td>
<td>24,000</td>
<td>1.74</td>
<td>2.845</td>
<td>2.905</td>
<td>.060</td>
</tr>
<tr>
<td>Colorado Springs, Colo.</td>
<td>24,000</td>
<td>1.74</td>
<td>2.845</td>
<td>2.905</td>
<td>.060</td>
</tr>
<tr>
<td>Denver, Colo.</td>
<td>24,000</td>
<td>2.00</td>
<td>3.085</td>
<td>3.125</td>
<td>.040</td>
</tr>
<tr>
<td>El Paso, Texas</td>
<td>24,000</td>
<td>1.00</td>
<td>1.675</td>
<td>1.725</td>
<td>.050</td>
</tr>
<tr>
<td>Fargo, N. Dak.</td>
<td>20,000</td>
<td>.82</td>
<td>1.385</td>
<td>1.455</td>
<td>.070</td>
</tr>
<tr>
<td>Ft. Dodge, Iowa</td>
<td>20,000</td>
<td>.35</td>
<td>.715</td>
<td>.785</td>
<td>.070</td>
</tr>
<tr>
<td>Great Falls, Mont.</td>
<td>24,000</td>
<td>1.50</td>
<td>2.085</td>
<td>2.145</td>
<td>.060</td>
</tr>
<tr>
<td>Grand Island, Nebr.</td>
<td>20,000</td>
<td>.50</td>
<td>.615</td>
<td>.675</td>
<td>.060</td>
</tr>
<tr>
<td>Helena, Mont.</td>
<td>24,000</td>
<td>1.25</td>
<td>2.085</td>
<td>2.145</td>
<td>.060</td>
</tr>
<tr>
<td>Huron, S. Dak.</td>
<td>20,000</td>
<td>.53</td>
<td>.90</td>
<td>.975</td>
<td>.075</td>
</tr>
<tr>
<td>Kansas City, Mo.</td>
<td>20,000</td>
<td>.35</td>
<td>.595</td>
<td>.665</td>
<td>.070</td>
</tr>
<tr>
<td>Lincoln, Nebr.</td>
<td>20,000</td>
<td>.25</td>
<td>.41</td>
<td>.485</td>
<td>.035</td>
</tr>
<tr>
<td>Mitchell, S. Dak.</td>
<td>20,000</td>
<td>.41</td>
<td>.755</td>
<td>.825</td>
<td>.070</td>
</tr>
<tr>
<td>Minneapolis, Minn.</td>
<td>20,000</td>
<td>.45</td>
<td>.765</td>
<td>.835</td>
<td>.070</td>
</tr>
<tr>
<td>Ogden, Utah</td>
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<td>1.50</td>
<td>2.085</td>
<td>2.145</td>
<td>.060</td>
</tr>
<tr>
<td>Oelwein, Iowa</td>
<td>20,000</td>
<td>.272</td>
<td>.46</td>
<td>.535</td>
<td>.065</td>
</tr>
<tr>
<td>Pueblo, Colo.</td>
<td>24,000</td>
<td>.74</td>
<td>.845</td>
<td>.915</td>
<td>.070</td>
</tr>
<tr>
<td>Sioux City, Iowa</td>
<td>20,000</td>
<td>.199</td>
<td>.325</td>
<td>.395</td>
<td>.070</td>
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<tr>
<td>Sioux Falls, S. Dak.</td>
<td>20,000</td>
<td>.39</td>
<td>.66</td>
<td>.735</td>
<td>.075</td>
</tr>
<tr>
<td>Topeka, Kans.</td>
<td>20,000</td>
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<td>.695</td>
<td>.765</td>
<td>.070</td>
</tr>
<tr>
<td>Tulsa, Okla.</td>
<td>20,000</td>
<td>.60</td>
<td>.945</td>
<td>1.015</td>
<td>.070</td>
</tr>
</tbody>
</table>

In certain centers the initial icing is performed by the railroad company, who charge the grower at the rate of $3.75 for each 12 hours the car is held in loading.

### AGENCIES OF DISTRIBUTION

In the Council Bluffs district there are three types or classes of agents that act in the first step of the distribution of the grape crop from the producer to the consumer. These may be grouped as follows:

1. Agencies of a cooperative nature.
2. Agencies of a private or commercial nature.
3. Agencies of a public or direct-to-consumer nature.

### AGENCIES OF A COOPERATIVE NATURE

In this district there is but one cooperative organization, viz., the Council Bluffs Grape Growers' Association. This association was organized and incorporated in 1893 by 21 of the larger growers of the district. In its early years it had considerable trouble because of a lack of cooperative spirit among its members, but these difficulties have all been overcome and today it is one of the most successful cooperative organizations of the middle west. The association was re-organized in 1907 and the capitalization increased from $1,000 to $35,000, but the price of the shares has always remained at $10.

There are approximately 207 grape growers in the district, and of this number, 113 are association members, 66 others sell thru the association, while the remaining 28 growers consign thru the commission firms or sell direct to the local consumer.
The tendency of the grower toward membership in the cooperative association varies directly in proportion to the size of his vineyard. Table IV shows this point quite clearly.

The cooperative association handles about 89 percent of the total district production and has secured an average price of 29 cents per basket over a period of 20 years. The basket materials are purchased in large quantities at a considerable saving to the grower. The making up of this material furnishes work for the association employees during the winter months.

All fruit is sold f. o. b. Council Bluffs, so that the buyer, rather than the grower, runs the risk of a consuming market at the destination point of each shipment.

The association has in reality established the grape industry in this section by providing a stable market for the fruit produced. Since its organization in 1893, the vineyard area has increased from 100 to about 700 acres in 1920.

TABLE IV. THE RELATION OF VINEYARD AREA TO MEMBERSHIP IN THE COOPERATIVE ASSOCIATION.

<table>
<thead>
<tr>
<th>Assumed acreage</th>
<th>Total No. of growers</th>
<th>Association members</th>
<th>Non-members selling thru association</th>
<th>Consignors to the commission firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>88</td>
<td>19</td>
<td>55</td>
<td>14</td>
</tr>
<tr>
<td>1-3</td>
<td>68</td>
<td>49</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>3-5</td>
<td>22</td>
<td>18</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5-8</td>
<td>21</td>
<td>19</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>8-12</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-40</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>207</td>
<td>113</td>
<td>66</td>
<td>28</td>
</tr>
</tbody>
</table>
A standard package (six-pound climax basket) is used for marketing the grapes and the association stands back of its guarantee as to the quality of fruit and the weight of the package. As each basket is branded with the association brand and stamped with the grower's name, it is not difficult to trace back a poor grade of fruit should any such pass by the association inspector.

A charge of 10 percent is assessed the grower for selling the fruit and also an icing charge of one-half cent a basket. As the average selling costs of the association amount to approximately 6 percent, the remaining balance is returned, on the basis of the fruit sold, as a refund to the association members.

Winter killing during the winter of 1916-17 is chiefly responsible for reducing the production in 1917 and 1918. This injury was most severe on the very old and poorly managed vineyards. The well-cared-for vineyards came thru the next season in good shape and are now in good bearing condition. A large acreage of new vineyards is being set out to replace those which have been removed.

**TABLE V. STATEMENT OF COMPARATIVE VOLUME OF BASKETS OF BLACK GRAPE FROM COUNCIL BLUFFS DISTRICT SOLD THRU THE DIFFERENT AGENCIES.**

<table>
<thead>
<tr>
<th>Type of Agency</th>
<th>1912*</th>
<th>1913*</th>
<th>1914*</th>
<th>1915*</th>
<th>1916*</th>
<th>1917†</th>
<th>1918†</th>
<th>1919†</th>
<th>1920†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
<td>378,625</td>
<td>207,750</td>
<td>237,284</td>
<td>266,026</td>
<td>304,288</td>
<td>150,000</td>
<td>120,000</td>
<td>200,718</td>
<td>154,195</td>
</tr>
<tr>
<td>Private corpor-</td>
<td>43,203</td>
<td>30,156</td>
<td>31,709</td>
<td>30,174</td>
<td>33,125</td>
<td>20,000</td>
<td>18,000</td>
<td>30,000</td>
<td>30,000</td>
</tr>
<tr>
<td>ations**</td>
<td>4,200</td>
<td>2,400</td>
<td>2,700</td>
<td>2,900</td>
<td>3,300</td>
<td>3,000</td>
<td>2,500</td>
<td>3,500</td>
<td>25,000</td>
</tr>
<tr>
<td>Public†</td>
<td>426,028</td>
<td>240,306</td>
<td>271,693</td>
<td>299,100</td>
<td>340,713</td>
<td>173,000</td>
<td>140,500</td>
<td>234,218</td>
<td>209,195</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1912-1916 Grapes shipped in 8-pound baskets.
†1917-1920 Grapes shipped in 6-pound baskets.
‡Estimated, after careful consideration of the practices of the growers and other factors involved.
AGENCIES OF A PRIVATE OR COMMERCIAL NATURE

There are several fruit and produce commission firms in Council Bluffs, which act as sales agents for some of the grape growers of this district. These firms handle about 10 percent of the district production. A commission of 10 percent, and in addition, a small icing cost, is charged the grower. All fruit is sold on consignment and these firms merely act as agents. These commission firms dispose of the grapes either in carload lots, less carlot shipments to retailers in surrounding towns, or to local retailers. No inspection or standardization of pack or package is required and the fruit is disposed of for whatever price it will bring. The prices received by the grower are comparable to the cooperative association when the above items are considered.

AGENCIES OF A PUBLIC OR DIRECT TO CONSUMER NATURE

The public market in Omaha offers an opportunity for the grower to sell direct to the consumer at a very low cost. However, prices fluctuate a great deal on such a market, because of the variations between supply and demand, and the average grower does not care to utilize his time in selling his fruit in this manner. The truck grower with a small vineyard most profitably markets his product in this way.

A few growers sell or trade their grapes direct to some of the local retail stores, or sell to the individual consumer.

The amount of the combined local and public market sales is very small and is estimated at approximately 3 percent of the district production.

STATISTICS IN REGARD TO DISTRIBUTION

A very high percentage of the district production is shipped in carload quantities. The number of baskets in a car varies according to the distance, destination and the minimum capacity of the car. A small car is considered as 2,500 to 3,000 baskets, a medium or standard as 3,500 baskets, and a large car as over 4,000 baskets.

During an average year, a total of about 100 carloads is shipped from the Council Bluffs district to various points, as shown in plate V. These cars represent about 90 percent of the total district production. This is perhaps higher than the average of carlot shipments, but there seems to be a growing tendency for the Grape Growers' Association to market in carload quantities. In fact, their local sales and less than carlot shipments are almost nothing, except at the beginning and end of the season, or at such times as the daily receipts will not permit of carload shipments. The less than carlot shipments normally amount to approximately 7 percent of the district production, while the entire amount of local sales is about 3 percent of the total production.
Conditions due to prohibition have increased the local demand for grapes for juice purposes. A large outlet for grapes is thus provided in addition to the carlot shipments. During the season of 1920, the orders for grapes in carlots was three times greater than the amount produced.

SUMMARY

1. Grape growing as a commercial proposition in western Iowa, started in the vicinity of Council Bluffs as early as 1857. The Council Bluffs district has about 500 acres of bearing vines and 200 acres on non-bearing age, or a total of about 700 acres.

2. The natural advantages which this district enjoys with respect to climate, soil and freedom from insects and disease, make it a grape region of unlimited possibilities.

3. The Concord grape comprises over 90 percent of the vineyard acreage.

4. The acre cost of production in a commercial vineyard is estimated at $143.75 and the gross receipts at $261.40. The profits, based on these estimates, from an acre of vineyard are $117.25.

5. Vineyard management practice has not kept pace with the marketing organization. Closer attention on the part of growers to the improvement of cultural practices should result in higher and more economical production.

6. The average acre yield varies, according to the size of the vineyard, from about 612 six-pound baskets in smaller vineyards, to from 986 to 1,000 baskets in the larger aereages. The small growers are not securing maximum yields and should more closely follow the management practices of the larger vineyardists.

7. The Council Bluffs district has an unusually favorable location as regards transportation facilities and accessibility to a large consuming territory.

8. A total of 90 percent of the district production is marketed in carload quantities.

9. The method of selling all grapes f. o. b. Council Bluffs relieves the grower of all risk of a change in the demands of the consuming market while a car is en route.

10. Carlot wholesalers estimate an average of 100 to 150 baskets of grapes are unfit for sale on arrival at far distant points. This loss is due largely to the crushing of the baskets because of the weight above, and shifting of the load, and may be prevented by proper loading.

11. An earlier ripening season, together with the percentage of an average crop in either the Wathena or Nauvoo districts, influences to a considerable extent the destination of carload shipments of grapes from Council Bluffs from year to year.

12. No grapes are shipped southeast from Council Bluffs, and only a relatively few cars go east into Iowa. This is probably
due to shipments from the Nauvoo district, and also to the fact that the western district has developed a demand for the Iowa grapes.

13. In disposing of the present production of grapes from this region, there seems to be no very serious competition with other varieties of fruit.

14. Railroad mileage is not as important in the shipping of grapes as is the attention or lack of attention given to the loading, routing, and icing of the car while en route.

15. The Council Bluffs Grape Growers’ Association is a very efficient sales agency. It handles about 89 percent of the total production of the district. The selling cost to its members has averaged only 6.1 percent during the past ten years.

16. The commission firms probably offer a desirable outlet of marketing for growers who desire to pack their fruit above the average or in an extra fancy way. The daily pooling method of the association permits no premium for those who pack their fruit above the the standard of the association requirements. However, only a very few growers pack their grapes enough above the association requirements to entitle them to a premium in price.

The commission firms also offer an outlet for those growers who do not care to prepare their fruit according to association inspection requirements.

17. During the years 1912-20, the date of the first grape picking has varied from August 3 in 1914, to August 29 in 1915. The closing dates have varied from September 21 in 1914, to October 14 in 1913.