

THE VINEYARD.

California Vines and Wines.

The latest contribution to the literature of the grape is entitled "American Grape Growing and Wine Making," by Prof. George Husmann, of Missouri; published by Orange Judd Co., of New York city. There is perhaps no one better posted upon the general subject of grape-growing in the United States than Prof. Husmann, and his treatise is as good a one as could be written when such a broad subject is compressed into the limits of an available handbook, as this is. It will not, of course, meet all the local requirements of California, but it is far better than any former book which has been written even on this ground, and, so far as it goes, must be counted trustworthy, because the chapters relating to Californian viticulture are written by three practical grape growers, resident in three of our leading vineyard counties. Upon the general principles underlying the growth of the vine and the arts by which it is shaped to meet desired ends, the book is trustworthy and will be of general interest to all. It is well illustrated.

With a view of presenting certain phases of California grape-growing to our readers, who may not be familiar with them, we shall quote from the California chapters of the work, as follows:—

Fresno County Viticulture.

Gustaf Eisen, of the Eisen vineyard, writes:—

California takes, already, a prominent place among grape-growing countries, and furnishes within its limited area so many different climates and localities that nearly every kind or variety of grapes will flourish here. For example, in the hills of Sonoma we meet with the most perfect Riesling, producing wines of a light delicate cast, and 200 miles further south in Fresno county, the summer is both warm and long enough to produce such wines as port and sherry, which, according to such experts as Rev. I. Bleasdale, in Melbourne, equal some of the very finest Portuguese wines. Only six or seven years ago, Fresno county was generally considered as a barren waste, a desert in fact, where the dry, and during the summer, cracked soil, was thought to indicate the utmost poverty. Our plain extends 100 miles at least in every direction. On the north side it is bordered by the large San Joaquin river, and on the east and on the south by an equally large stream, King's river. The fact that water for irrigation was to be found so near at hand caused several to suspect that the land was not altogether so worthless as generally believed. The Southern Pacific railroad was drawn through the county, the water was taken out from the rivers and made to flow through the plains, and to-day, only six years after settlement, we pride ourselves on having the finest vineyards in the State, and the brightest prospects for the future.

Grapes, as well as everything else, have to be grown with irrigation. The land must be leveled, and so prepared that it can be flooded whenever needed. The soil is very variable, but consists principally of three varieties. First, a red clay soil; this is the best for grapes. Second, a white, ashy-alluvial soil, evidently made up mostly of pumice-stone, the original beds of which can yet be seen at the foot-hills; this soil is much poorer, both for grapes and other plants. Third, a sandy, yellow soil, poor in organic matters, and always occurring on elevated places; this soil is worthless for grapes.

My brother's vineyard consists, principally, of the first named soil. The first year the land had to be flooded six or seven times during the summer, to make the cuttings grow, but now the whole country seems to be filled up with water, and one irrigation during the winter is enough. Cuttings planted directly in the vineyard last year needed only two irrigations during the summer, and will after this need only one every winter. The first year we found water at a depth of 65 feet. Last summer we found it at a depth of 6 feet below the surface. We have found that the best way of starting a vineyard is to plant cuttings directly in the ground where they are to remain. Generally we plant the cuttings say 2 feet deep, but for a trial I planted some 5 feet deep, and the latter at one year old were several times larger than the former, and bore quite a crop the first summer. Our soil is deep and loose, and free from stones. This enables us to plant all the grapes with a crowbar, taking care to fill the holes well. Of course we plant all the cuttings straight up and down. Two men can, in this way, comfortably plant 1,200 cuttings a day, and sometimes more. We plant the cuttings 8 by 8 feet apart, leaving a road at every twenty rows of vines.

I have found that the best way is to have the grapes planted in checks or squares, of say 3½ acres, having a good solid bank of earth all round the same. Near to, and on these banks, no grapes should be planted, because they must be free to receive the prunings every winter, and which prunings must be burned on these banks every spring, so as to kill all the weeds and insects injurious to the grapes. In this way a good deal of hoeing is saved. I plow 4

inches deep and cultivate crossways, and keep cultivating the whole summer. Some parts of the vineyard I cultivated as much as seventeen times last summer.

In December, or as soon as the vintage is over, I begin to prune the vines. I cut off all the superfluous wood, taking care not to touch those canes which are to bear the next year's crop. Those I leave altogether until the middle of April, when I trim them back to two or three eyes as required. The reason for this is, that we nearly always have heavy frosts between the 6th and 12th of April, and if then the fruit buds have started they are sure to be lost. By leaving long canes, however, I manage to keep them dormant until after the frosty season. Between February and April we have no frost. The trunk on our vines is generally kept to 2 feet, and many of the superior grapes rest on the ground and mature there. We use neither stakes nor trellis.

The grapes ripen generally in the middle of August, and the vintage can then begin. Some varieties, however, have been known to be ripe in favorable years as early as the 4th of July. The percentage of sugar is generally very large, average 14° to 16°, but sometimes as high as 16° on Baume's saccharometer, when at the same time pure water shows 2° on the same scale.

The Eisen vineyard comprises at present 160 acres, and every year about 20 acres are added, the bulk of the grapes being Zinfandel, Malvoisie and Fahirzozos, the former two, producing claret and port, the latter, white wine. The Zinfandel is here considered the best grape; its color is excellent, and its flavor and acid splendid. The vines average 25 lbs. each of grapes, but as much as 50 lbs. have often been raised on certain varieties, such as Chasselas, Rose of Peru, and others. A peculiar trait of some grapes is that they do not color. The Rose of Peru, elsewhere considered one of the finest black grapes, loses its color here entirely, while the Zinfandel always retains its dark color. In Stockton, 150 miles from here, the contrary takes place. There, the Rose of Peru is always of a dark, black color, while the Zinfandel turns nearly white.

Sonoma Valley Vineyards.

Julius Dresel, of Sonoma, writes as follows:—

When the first American emigrants came to California, they found vines already planted in many places, especially around the religious colonies, or missions, established by the Jesuit Fathers. From this fact was derived the name for that vigorous, but rather coarse, originally Spanish, red grape, which soon spread over the whole State, and has ever since provided the market with the California hock, claret, port and angelica wines. Soon, however, the best European varieties from Hungary, Germany and France were introduced. They grew equally well nearly everywhere, and were designated as "Foreigns." Some of these foreign varieties are mainly raised for table use, as flaming Tokay, black Hamburg, muscat of Alexandria and many others, or to be turned into raisins; but our best white wines are now principally made from the Riesling, Gutedel (Chasselas), Muscatel, Burger, and the red, by preference, from the Zinfandel.

As labor was too high to allow of the use of the hoe, our vineyards had to be cultivated by the plow, and consequently the vines were planted 8 feet, sometimes 6 feet, and lately 7 feet apart each way, allowing the single plow as well as a two-horse team to pass both ways. The ground is laid out with the chain, every 7 feet being marked by a small white stick, and the cuttings, or better, rootlings, are planted; these are 20 inches long and placed slantingly, in holes dug by the spade, about 2 feet deep. The stick is, two years later, replaced by a strong stake 3½ to 4 feet long, to which to tie the vine until the stem, commonly 18 inches to 2 feet high, is big enough (after about six years) to support its fruit and umbrella-like foliage by itself.

Pruning is done in winter, but in the lower places as late as possible, to retard the starting of the vines, as there is danger of the morning frosts, which sometimes set in even as late as the 15th of May. We allow the grown vines from five to nine spurs of two eyes each, according to age and size, except the Riesling, which has been found to bear more if left with long spurs of four eyes and some short spurs besides. During spring the plowing, harrowing and weeding with the cultivator are done. After the beginning of May no more work is needed, as the constant sunshine will not permit any weeds to grow; only about blossoming time, during the first weeks of June, flower of sulphur is applied with bellows, as a preventive of or cure for mildew, which prevails in certain localities. Towards the end of September the grapes are ready for picking, and the harvest continues through October and may be finished as well in November, the sun shining all the while. Occasionally indeed, some rain falls in October, but very seldom any damage is done.

Entire failures in the crop, as well as great difference in the quality of the fruit, are unknown here; but though there have been 50 pounds of grapes seen on one vine, and whole vineyards of the Mission grape averaging 36 pounds, it would not be a safe calculation to put the average yield of one vine at more than about half a gallon. The devastations of phylloxera, which will hereafter have to be taken into account, can be effectively met by grafting on phylloxera proof American stock of frost grape, or *riparia* species; for instance, on Taylor and Elvira. The experiments in this direction that have been tried in France have also been successful here so far.

Regarding the quality of the wines of California, they have been rated as too rich in alcohol and rather deficient in acid. They carry, indeed, from 10 to 13 per cent. of alcohol; but then there are, happily, those years when the grape, in its superabundance of juice, develops less saccharine matter; and besides, we have, luckily, varieties which, even up to maturity, retain an agreeable acidity, and are invaluable not only in themselves, as Zinfandel, but also for cutting purposes, as Burger, to impart more acidity to the Mission or its superiors, the Gutedel, Muscatel, Riesling and others.

Napa County Viticulture.

H. W. Crabb, of Oakville, Napa county, writes:—

The cultivation of the vine in this State was commenced by the Mission Fathers three-quarters of a century ago, with a single variety. The history of its origin is not known, further than that it is identical with the Pisco vine I imported from Chile—one of the oldest varieties in cultivation there, and is the brandy grape of that country, as the Mission grape has become of this. It is a vigorous grower and a good bearer, containing a high per cent. of sugar and a small degree of acid, and is well adapted for sherry, Madeira, and angelica wines, and for brandy.

The Riesling, White Pineau and Chasselas stand at the head of the list for dry, white wines, on account of their lightness, fineness and delicacy of flavor. Black Burgundy, Zinfandel and Charboneau are our best varieties for claret. The first makes a dark, full-bodied and richly-flavored wine; the second has a fine raspberry flavor, but rather an excess of acid, and is a little light, both in body and color. The last one, like the Tinto, has but one characteristic color. Black Malvoisie is our best port wine grape. The large white Muscatel makes the finest raisins and the white Malaga the next best; while the raisins of the seedless Sultana are the *ne plus ultra* for culinary purposes.

In planting and grafting, only the cuttings of bearing canes are used, and are worth from \$2 to \$5 per thousand. In planting, I plow the ground twice, sub-soiling it the last time, then harrow well and roll it. Make a chain of No. 12 or 14 steel wire, 165 feet long, and put on it a drop of solder every 6½ feet, beginning 15 inches from one end, which serves to make a loop for an iron pin 18 inches long, to stick in the ground to hold the chain. Square the ground, chain along one side, setting a small peg or stake at each drop on the chain, then stretch the chain at right angles across the end, and chain back from the other end of the chain, setting a peg at each drop as before, which marks out one block. Now stretch the chain across the block, and plant 24 rows, leaving the rows of pegs for avenues. Make a dibble out of a piece of 1½-inch gas-pipe, by welding and sharpening one end and putting a pin near the other for the hands and one for the foot. Make a hole with this and insert the cutting and tighten it by shoving the dibble down by one side and pressing the ground against it. I use cuttings 16 inches long, leaving two buds above the surface. If rooted vines are used, cut the roots back close to the stock. We set about 500 per day to the man, 1,000 to the acre. From four to eight men work on a chain, and we can work from two to four chains or gangs on a block. This plan is very simple, speedy and accurate, and any kind of help can do the work correctly; it is equally well adapted to planting small fruits and trees after the holes are dug. We usually plant the last of March and first of April. The loss is from 5% to 10%.

Among the various methods of grafting, I have had the best success by sawing off the vine from 4 to 6 inches below the surface of the ground, making a clean cut with a razor a little diagonally, and inserting one or two scions, covering the cleft or cut with a piece of cloth, and filling up with fine earth. The graft must be staked and kept well tied up the first season, and a fair crop of grapes may be expected the next. Grafting should be done here in February and March. Two men can graft about 100 vines per day.

I prune with low heads and short spurs of two fruit buds each. Any variety that will not yield from four to six tons per acre is pruned in this manner: I leave from two to four canes of two feet each, and about as many short spurs of two buds each, for long canes the next year, when the long ones are to be entirely removed. The Riesling, Muscatel and some others will yield twice as much by this method of pruning as the other. Occasionally there are instances reported of a single variety, or a small vineyard, yielding 10, 12, 14 and even 20 tons on irrigated lands, but such crops are a positive injury to both fruit and vine. My vineyard of 120 acres yielded, in 1878, 5½ tons per acre, on 30 acres of which the vines were only three years old; but this season, on account of cold rains, alternated by extreme heat, while the vines were in bloom, the same vineyard only had an average of 4 tons. The crop throughout the State is about one-fourth short.

The Grape Interest of the State.

In 1876 the business dragged heavily, nearly bankrupting numbers. Wines were in large stock and had to be sold to distillers and vinegar factories, at 10 to 15 cents per gallon. Savings banks refused to make loans on vineyard property, considering that vines added no value to the land whatever. Even many small vineyards were dug out. Mission grapes sold from \$8 to \$10 per ton. I could only get an offer of \$13 per ton for a lot of 300 tons of grapes of choice foreign varieties, delivered at the cellar, and

payable in three, six and nine months. There was no market for our wines; they were in bad repute, due mainly to adulterating processes, which were carried on to a very great extent in the interest of importers, and for the purpose of crushing the wine and brandy manufacture here. But since that time the business has steadily increased. The report of the Surveyor General of the State for the year 1876 gave 33,000 acres of vineyards; the next year 41,000; the next 77,000; and this year may be estimated at from 85,000 to 90,000 acres, making an average increase of about 35% for the last four years. In 1876 we exported by sea and rail 1,115,000 gallons wine, and 59,000 gallons brandy. In 1878 the exports were, of wine, 1,812,000 gallons, and of brandy 129,000 gallons; and this year the estimates are 2,224,000 gallons of wine, and 160,000 gallons of brandy. The French wine imports have decreased from 7,000,000 gallons in 1872 to 2,486,000 in 1877. About an average of 30% per year. This increase and reversion of trade may be attributed to our protective tariff, the ravages of the phylloxera in Europe, and to the genuineness and acknowledged merit of our wines. The last report of the Surveyor General gives the product of the State as 7,790,000 gallons, or about 50% of the entire production of the United States.

The crop of raisins cured annually is valued at from \$60,000 to \$80,000. This year's yield is probably 600 tons, or 60,000 boxes of 20 pounds each, worth at wholesale from \$1.50 to \$2 per box. This branch of the grape interest is increasing rapidly. The present active demand and advance in price, with a partial failure of the crop in Spain, will give a lively stimulus to the business.

There are now about \$30,000,000 of capital invested here in the grape and wine interest, and it gives employment to more than 12,000 persons.

Many new vineyards, and large additions to old ones, will be planted this year. In fact, I believe there will be as many planted this season as there were in the last three years. Grapes have steadily advanced in price since 1876 at the rate of \$2 per ton each year, bringing the last season from \$15 to \$25 per ton, and large cellars of wine have been sold at 25 cents per gallon.

The phylloxera, as yet, is not found outside of Sonoma county, where a few vineyards have been more or less injured. It does not make the rapid progress ascribed to it in Europe, and I believe has not yet appeared here in the winged form. I believe it is attributable to old age, bed-rock or hard-pan near the surface and exhausted soil, whereby the vine becomes impoverished, and in that condition it is just as natural for it to be attacked by some parasite or insect as an impoverished animal is to become covered with vermin.

It is estimated that there are 40,000,000 acres of land in this State well adapted to viticulture, and the time is not far distant when the vineyard product will exceed all the other resources of the State combined.

If the industry be not stifled by Congressional legislation, whoever lives half a century hence will find the grapes of California in every city of the Union; her raisins supplying the whole western hemisphere; her wines in every mart of the globe; and then, with her golden shores, her sunny clime, her vine-clad hills and plains, will California, indeed, be the vineland of the world.

Hints on Vine Planting.

S. C. Henry, of Fresno, gives the *Republican* of that place some of his conclusions on the subject of vine planting. He says:

In importance, selecting the ground ranks first. Rich, warm soil is preferred, the richer the better. There is a general impression among farmers that any soil, however poor, is good enough for grapes. To be sure the vine will grow and produce fruit in very poor soil, but its lack of richness will result in a small product, and that will be of very inferior quality. We want a large yield, and the quality superior, and to insure this we must give the vine a rich soil. A sandy loam is the best. The sand will prevent baking after being irrigated and keeps the soil warm. Above all do not plant where the hardpan is near the surface. It does not hold moisture long enough in this climate to mature a crop of grapes, even if irrigated in June, which is as late as we can irrigate to insure a thin-skinned raisin. The root of the vine in good soil will run to a depth of 25 feet to reach surface water, but where the hardpan exists, they are kept near the top and require more water. The time of planting ranges from the first of January to the middle of March, February being the best time. Next comes the preparation for planting. If uneven, the land should be leveled so the water will be but a few inches deep in any place to flood the entire check. Plow deep, and smooth with a boat or roller, and it is ready for marking out. For raisins plant 8x10 feet. My plan for laying out is this: Measure each side of the field, making marks the distance apart required for each row; two men each with a shovel and long rope, one on each side of the field; stretch the two ropes, parallel, in the places designed for the rows; letting the ropes lie on the ground, each man with his shovel makes a mark near the rope, advancing to the center of the field until they meet, when the next rope is followed back to starting point; repeat until it is all marked off. Mark crosswise in same manner, and your

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