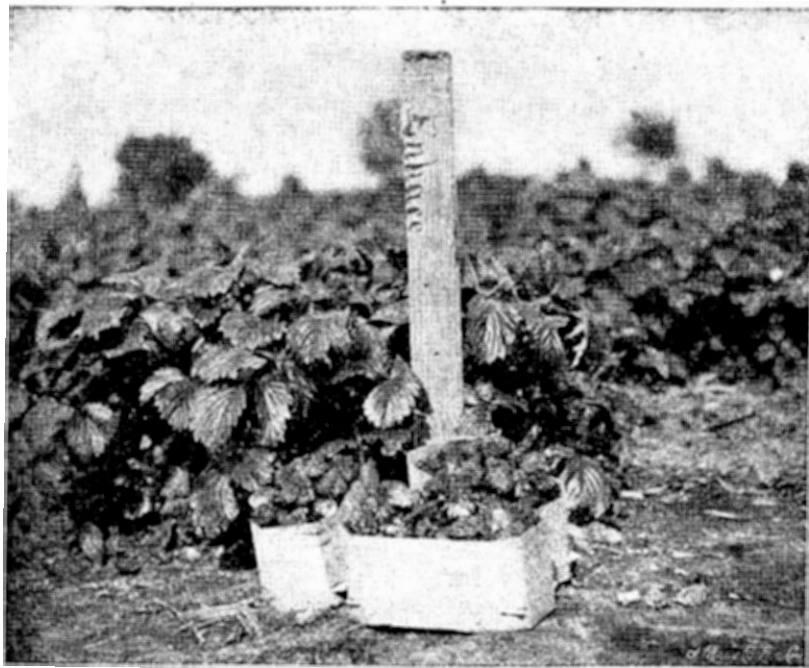


OKLAHOMA  
AGRICULTURAL EXPERIMENT STATION

Bulletin No. 31—February, 1898.



STRAWBERRIES.      GRAPES.  
STIMULATING AND HOLDING FRUIT BUDS.

HENRY E. GLAZIER,  
Vice Director and Horticulturist.

Bulletins of this Station are Sent Free to Residents of the Territory on Request

STILLWATER, OKLAHOMA.

OKLAHOMA

AGRICULTURAL AND MECHANICAL COLLEGE.

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## Strawberries.

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The success of this division of fruit culture, under somewhat adverse conditions, to us appears to be no longer an experiment at the Station. Twenty-five varieties have been tested, the majority showing marked success. The first planting was done November 15, 1895. Some planting was finished March 12, 1896. The fruiting in 1896 was small, but the fall setting showed a marked contrast in favor of fall over spring setting. The location selected was not an ideal plat, but the best suited at our command, the surface being very flat, and impregnated largely with alkali, to such an extent that an excess of water forced the alkali to the surface in no small quantities. A reference is here made to the soil conditions for the two-fold purpose, first to demonstrate if possible what may be accomplished under unfavorable conditions, and what may be accomplished under normal conditions.

Again, reference is here made to the soil conditions because of the adverse criticism indulged in by many, attesting favorably one fact: that success at the Station may mean success to the great majority of the farmers of the Territory, and that failure at the Station does not of necessity mean failure with the practical farmer, under more favorable conditions. Up to and including the fall of 1895, the growing of this delicious fruit on the Station grounds was supposed to be a lost art, former efforts having proved total failures. It was supposed that the climatic influence would operate as an embargo against not only the fruitfulness of the vine but the life of the vine. Confronted with the past experience of others we undertook the growing of the strawberry with some misgivings, if not trepidation. Hence we have confined our labors to the growing of a few of the old standard varieties. Succession in ripening was an objective point. The question of soil frequently enters into the interrogatories so often propounded to us, that we will here state that we believe that a soil that will raise or grow good corn, cotton, or vegetables, will grow strawberries, everything else being equal. We would suggest that good results

have been obtained from a loam underlaid with clay subsoil. A green fertilizer is often preferred to barnyard manure, from the fact that barnyard manure is most too fruitful with weed seeds. The surface should be undulating to the extent of carrying off the surface water, as water should not remain standing upon the vines.

#### SOIL PREPARATION.

Too much attention can hardly be given to the preparation of the soil bed for the plants. The soil should not be impoverished, neither should fertilization be excessive. For fall setting the ground should be plowed early and deep. This plat was plowed early in summer to a depth of 10 inches, with a subsoil attachment breaking the subsoil 4 inches deeper. The surface was immediately thereafter firmed down with a smoothing board, and received frequent shallow cultivation during the summer months, that prevented the soil from crusting, thereby conserving the moisture. In this connection it should be understood that deep plowing should be resorted to where or when sufficient time can be had to admit of the ground settling before planting time. Intense pulverizing should be the object sought if retention of moisture is secured. For spring planting we would suggest deep fall plowing, and frequent working of the surface, especially very soon after a falling of the storm waters, thereby preventing evaporation by capillary attraction. Having presumedly made timely and proper preparation, we will consider when to plant.

#### SETTING THE PLANTS.

Too much attention cannot be given to setting the roots. Three methods have been practiced; only one can be said to be correct. Plants set too deep will smother and die, as plants set too shallow wither and dry out, also perish. We would suggest the better plan would be, first, to clip off the ends of the roots, remove all dead roots and runners, make a sufficient excavation to receive the roots spread out as in their normal condition, then firm the earth down around the roots, leaving the plant the same depth as originally standing in the earth. No danger will result from firming the soil severely around the roots, as it will be impossible to get the earth as firm as they originally stood in the ground before they were removed from

their bed. Fall planting is the most desirable, when we have sufficient humidity to keep the roots alive. If the roots become sufficiently established in the fall a small crop will be insured the coming spring. Ordinarily after the first of October in this latitude it may be considered safe to set plants. A light frost does the plant no injury, and may insure a more vigorous root growth. The distance in the rows, and distance between the rows, are questions that address themselves to conditions, and whether field or garden, hills or rows are desired. For field culture we would unhesitatingly say: plant in rows not less than 4 feet apart and 2 feet in the row. For garden you may plant in rows 2 feet apart, 18 inches in the row. If runners are permitted, the rows even at 4 feet will become matted in two years. Again, if runners are permitted the crop will be much reduced both in size and quantity of berries.

#### MULCHING.

The vines should be carefully mulched, as soon as the winter sets in, with compost. Decayed prairie hay has been found to be very good, as it lays very close to the ground, and is not easily moved by the wind. The mulching should remain all winter, and the vines should come up through the mulching. The mulching conserves the moisture and protects the berries from coming in contact with the ground, and prevents their soiling. Barnyard manure is frequently objectionable, because of the weed seeds contained therein. If vines are set before the hot weather has passed, a covering of brush will furnish considerable of shade, and at the same time will enable the grower to water them with ease, or by natural precipitation. Intense cultivation, in the matter of strawberries as in everything else, is the sure road to success. Some have gone so far as to claim 45,000 quarts of berries per acre. We would be content with one-half that many, as this would furnish more revenue than one could expect from any other source. It should be remembered right here that in the luxuries of life the supply creates the demand, where in the staples of life the demand is governed by the supplies. Hence there can hardly be an over-supply in choice fruits, whether in small or large. The successful fruit grower will secure the early and the late fruit in succession, whether strawberries, peaches, grapes, or apples.

The extremely early and the very late will always find a market, when medium fruit goes a-begging, too often. It may be said by some that the want of sufficient humidity will prevent the development of late varieties. A small irrigation plant will remove all doubts, and will be the great money maker to the one who perseveres. Our success has been secured without artificial watering of the plant, but we believe we could have secured a much heavier crop had we been provided with a supply of water. We dust-mulched by continuous cultivation or shallow cultivation. We are not prepared to say that small fruit cannot be grown fairly successfully without water, but we are well convinced that a little water at the proper time will show wonderful results. A visit to Mr. Charles King's farm, situated two miles west of Enid, disclosed the following results: Plants set in September, furnished with a good supply of water, were in bloom on the 19th of November. There can be no doubt but that the spring of 1898 will show a marvel in the growth of his berries.

#### PERFECT AND IMPERFECT FLOWERS.

Many there are who understand that a pistillate flower must be fertilized, but they are lost when they try to make the application. They will attempt to fertilize an early bloomer with a late bloomer, or they think it necessary to alternate the pistillate with the staminate. The question is frequently asked why use an imperfect flower? Why not always plant a bisexual plant? We answer that we get a more prolific plant, usually a better shipper, and often more certain bearer, consequently a commercial berry. It is well to notice that a staminate flower will fertilize the sterile flower, if placed within 10 to 15 feet of the latter.

#### THE FIGURED PLATES

Figures Nos. 1, 2, and 3 represent different plants, and at different periods. Figure No. 1, the Enhance, was photographed May 12. The figure shows a strong, rampant grower, and only a medium bearer, also medium late. Figure No. 2 exemplifies a medium early variety—in fact one of the earliest varieties grown at the Station—the Charles Downing, which ripened along with the Crescent. Figure No. 3 represents the Captain Jack, a late medium. Some conscientious fruit growers have



FIGURE 2.



FIGURE 3.

recommended the Captain Jack as a fertilizer for the Crescent. It does not require an argument to show the fallacy, as well as the cause of so many failures among berry growers.

In selecting a fertilizer, select a flower that blooms as near the same time as the sterile flower to be fertilized, and no mistake will be made. We have attempted to emphasize the question of fertilization, and introduced the object lessons to better illustrate this important subject.

The following table gives names of varieties, date of bloom, date of ripening, date of first picking, date of last picking, and number of quarts picked from each variety:

STRAWBERRIES.

NAMES OF VARIETIES.	Date of Bloom.	Date of Ripening.	Date of First Picking.	Date of Last Picking.	Quantity in Quarts	No. of Vines.
Charles Downing.....	April 7...	April 29...	May 3...	May 31...	76	120
Crescent.....	April 8...	May 1...	May 4...	June 2...	30	60
Wilson.....	April 8...	May 1...	May 4...	June 2...	30	60
Bederwood.....	April 9...	May 2...	May 5...	June 4...	50	70
Jesse.....	April 10...	May 2...	May 5...	June 5...	40	100
Jesse Strang.....	April 12...	May 4...	May 6...	June 4...	36	90
Candy.....	April 15...	May 7...	May 11...	June 5...	24	60
Windsor Chief.....	April 15...	May 8...	May 12...	June 6...	38	70
Lovet.....	April 20...	May 9...	May 12...	June 3...	22	70
Sandovai.....	April 20...	May 9...	May 12...	May 31...	11	60
Eureka.....	April 21...	May 10...	May 11...	June 4...	29	70
Enhance.....	April 22...	May 12...	May 14...	June 2...	22	75
Tennessee Prolific.....	April 22...	May 10...	May 16...	May 31...	19	50
Captain Jack.....	April 24...	May 14...	May 18...	June 2...	37	110
Beecher.....	April 24...	May 14...	May 20...	May 26...	9	55
Isabella.....	April 24...	May 15...	May 20...	June 2...	9	50
Columbia.....	April 24...	May 16...	May 21...	May 29...	10	75
Robinson.....	April 25...	May 16...	May 21...	June 10...	35	75
Bismark.....	April 25...	May 16...	May 21...	June 4...	11	50

Parker Earle, Bubach No. 5, Glen Mary, and Shuckless were set in the spring of 1897. Parker Earle and Bubach No. 5

bloomed quite profusely. The Parker Earle is a strong grower, and bore a number of berries. The Bubach gave some encouragement; the Glen Mary and Shuckless have not shown as good growth, neither did they show the fruit.

NOTES.

It will be seen that the Charles Downing was the earliest, and most prolific, and withal a very good berry. Crescent and Wilson in close succession as to time and quantity. Bederwood good bearer, early medium, in close succession to Downing. Jesse a fairly good producer, large, showy, scarlet, and somewhat flattened. Jesse Strang, next in succession as to time, resembles Jesse; season a few days shorter. Windsor Chief, an excellent berry, a little more prolific, a few days earlier in ripening, and holding on nearly as long as the Robinson. Gandy only a fair producer, and very short season. Enhance a strong vine but a shy bearer. The Lovet, Sandoval, Isabella, Beecher, Columbia, and Bismark did not pay rent. The Eureka and Tennessee Prolific may succeed better under more favorable conditions. The Robinson, being the latest, would be a very profitable berry where water can be had. The last dish of fruit will taste nearly as good as the first.

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## Vitis (Grape) Culture.

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The cultivation of the grape, since the days of Noah, has occupied the attention of eminent men and women in all ages and parts of the world, to the extent that it has been estimated that Europe and America have developed over 3,000 varieties of the Vitis. The European varieties (the Vitis Vinifera) have been propagated, or attempted propagation, in different portions of the United States for the last two hundred years, with some degree of success, principally on the western slope, as we use the term. While east of the Rockies, efforts to grow the Vitis Vinifera upon its own stock, have not



only failed in the United States, but in Europe, because of the effects of the phylloxera, an aphid, or louse, that works upon the roots and leaves. We invite the reader's attention to this fact because of the many inquiries made of this department concerning the cultivation of the European grape. On the Pacific slope the *Vitis Vineferia* has received much attention, and succeeds well where grown upon our own stock. This same rule applies as well in Europe, as only the American stock is known to be a phylloxera resister. But fortunately for us we have indigenous species that have developed some of the most favored varieties, as the foreigner, especially where cross-fertilization has been had with the *Vitis Vineferia*. To the end that we may better understand the causes of often failures with some of our older varieties, we wish to call attention to some of the difficulties found in growing very many of the *Labruscæ* (or Northern Fox grape). The "fox" as has often been applied, it is claimed of late is a misnomer. It must be observed that, first, the *Labrusca* is a good ways from home, away out here in the great southwest. Again, the *Labrusca* is a shallow rooter, an objection very difficult to overcome. Again, its broad, downy leaves evaporate too much of its sap waters by exhalation through its leaves. We have as much admiration for the old Concord grape, that enjoys the parentage, possibly, of a larger progeny than any other known vine, but we raise the question, is it not too far away from home to resist the hot rays of the sun, and the roots too shallow growers to reach the moist earth during the dry months likely to occur at fruiting season? We have noticed the habits and foliage, that the leaves exhale an excessive amount of the sap waters that should be retained for fruit ripening; as a consequence the Concord fails to ripen up even; again, the fruit does not set as solidly on the stem in this climate as it is wont to do in its native heath. We realize that we are walking upon fighting ground when we attack the old favorite Concord grape. We will admit that there are some few *Labrusca* crosses that have shown up fairly well, and while that is true, there are superior fruiters grown on the *Lincecumii* (the post oak) indigenous to this climate. This is one of the deep rooting varieties, that can be said to be great drouth resisters, smaller leaves that exhale less moisture, consequently this quality should rec-

commend them if for no other. It has been claimed by some that the hardiness of the Concord was its redeeming quality. This question will hardly enter into grape culture in central and southern Oklahoma, as the climatic influence obviates any danger of loss by freezing. The *Æstivalis* (the summer, and great wine producer of the south and west) has proven to be a stock producer; when crossed with hybrids of very many varieties is superior to the *Labrusca* stock.

Our consideration of the grape will be confined to the varieties grown at the Station, some of which will be new to many of the readers of this Bulletin. Two hundred and seventy-five varieties were grown, including nearly all of the old varieties, and very many of new, showing no merit here. We assume that some place, and perhaps under more favorable conditions, the vines that we will here indicate as shy bearers have shown merit elsewhere. One hundred and thirty-four varieties of three canes each were set in the fall of 1892, seventy varieties in the spring of 1894, twenty-one varieties in the spring of 1895, and fifty-two varieties in the spring of 1896. Three canes of each variety were set, except the seventy varieties that were set in the spring of 1894; in this setting there were only two canes of a variety planted. Some having died, have been replaced, so that with few exceptions the classes were full. To say that some were shy growers, and shy bearers as well, while others were rampant growers, and shy bearers; still others that were good fruiterers, and poor viners, not having sufficient foliage to cover the fruit from the burning sun. The ideal vine is the one that is a moderate grower, deep rooter, medium leaf, medium early, and prolific, ripening evenly. A commercial vineyard should contain varieties ripening in succession, some of the earlier and later varieties are better for the market; as we say sometimes, better for the other fellow to eat. In noting our successes and failures here but feebly evidences what may be done in many other parts of the Territory, under more favorable conditions. The location of the vineyard at the Station was made without regard to drainage, either surface or subsoil. The ground receives the seepage from grounds of higher altitude adjoining, consequently it is often either too wet or too dry for the good of the vines and fruit. The trellis used is what is known as the "Munson trellis system," or his "canopy

top." Cross bar four feet from ground, with a small portion six feet from the ground; the latter we think too high for this windy country. We think that a wire about two feet from the ground is a great help to stay the vine. Again, we heartily endorse Mr. Munson's theory in setting the rows of the grape in a variation from southwest to northeast. Where the sun would strike them parallel, about half past two o'clock, about the month of June (this is as near the German rule as we can hit), the vines thus set will protect the ground from the hot rays of the sun, and prevent the fruit from being cooked by the increased heat from the mother earth. This will also avoid the necessity of sowing a green covering to save your fruit, also avoid sacking the bunches.

Having briefly referred to some of the principal thoughts involved in the growth, as well as the major questions of resisting and non-resisting roots of drouth, and the much dreaded phylloxera, we will incidentally call attention to a few minor points, such as pruning, location of the grape. The practice of many of continuing the old rule of February pruning in this latitude we think should be discontinued, as the same causes which prevail in a more northern climate do not exist with us. We refer to the destruction of the canes by winter freezing. As our vines mature here sufficiently to withstand the severity of the winter, we can with impunity prune as soon as the leaves drop from the vines; by so doing we preserve and conserve food for the coming year's wood and fruit that would otherwise be lost in the canes cut off and cast away. It has been urged by some that fall pruning will force earlier bloom in the coming spring, and thereby increase the danger of late spring frost. To this we say that if vineyards are placed upon proper altitudes, where they rightly belong, they will not suffer from late frost. Location of the grape, briefly stated, should occupy an altitude free from seepage or standing water, having a deep, alluvial soil; unless the "Riparian," or, more properly, the "Vulpina" (their habitat may be said to be close to streams of water in order that their roots may reach the water)—when this stock is used, then a loose subsoil where the roots could reach the water should be selected, if possible. Shelter from the ravages of the hot wind should also be secured; this can be done by planting wind breaks.

The subjoined table shows variety, stock, time of ripening, color of the grape, quantity.

GRAPES.

VARIETY	ORIGINAL STOCK	Time of Ripening	Color	No. Lbs.
Admirable	Lincecumii, Aestivalis	Aug. 25	Black	12.36
Alvey	Aestavalis, Hybr.	July 31	Black	3.21
Amanda	Labrusca	Sept. 3	Black	10.15
Amber	Riparia, Labrusca	Aug. 25	Amber	4.15
Amber Queen	Labrusca, Hybr.	Aug. 27	Amber	2.75
America	Lincecumii, and Rupestris	Aug. 25	Black	9.27
Aminia	Labrusca, Hybr.	Aug. 6	Dark purple	3.95
Antoinette	Labrusca	Aug. 7	White	7.75
Agawam	Labrusca, Hybr.	Aug. 14	Reddish	6.12
August Giant	Riparia, Hybr.	Aug. 6	Black	10.75
Autuchon	Riparia, Hybr.	Aug. 9	White	4.12
Bacchus	Riparia	Aug. 3	Black	9.85
Bailey	Linc. Triumph	Aug. 15	Red	10.65
Barry	Labr. and Hybr.	Aug. 12	Black	7.10
Beacon	Linc. and Concord	Aug. 29	Black	6.45
Beauty	Aest. and Hybr.	Sept. 3	Red	1.75
Beckman	Ripa. and Hybr.	Aug. 27	Red	9.85
Bell	Elvira and Delaware	Aug. 14	White	19.45
Big Extra	Linc. and Triumph	Sept. 1	Black	5.95
Big Hope	Linc. and Triumph	Sept. 5	Black	10.75
Black Defiance	Labr. Hybr.	Sept. 3	Black	2.10
Black Eagle	Labr. Hybr.	Aug. 12	Black	1.10
Black Hawk	Labr.	Aug. 12	Black	.95
Black Herbemont	Aestivalis	Sept. 1	Black	20.10
Black Pearl	Riparia	Aug. 25	Black	3.10
Bottsi	Aestivalis	Aug. 29	Black	2.75
Brant	Riparia Hybr.	Aug. 25	Black	2.05
Brighton	Labrusca, and Vineferia	Sept. 3	Maroon	.75
Brilliant	Labrusca Hybr.	Aug. 30	Red	2.45
Bumper		Sept. 3		12.10
Cambridge	Labrusca	Aug. 12	Black	14.25
Campbell	Labrusca, Hybr.		White	10.05
Carman	Lincecumii, Aestivalis	Aug. 12	Black	5.05
Carolina, North	Labrusca	Aug. 9	Black	7.45
Catawba	Labrusca	Sept. 6	Red	7.10
Centennial	Aest. Labr. Hybr.	Sept. 1	White	12.25
Challenge	Labrusca, Hybr.		White	2.95
Champion	Labrusca	Sept. 1	Black	11.95
Clinton	Riparia	Aug. 16	Black	4.75
Collier, Dr.	Lincecumii, Concord	Aug. 7	White	3.05
Concord	Labrusca	Aug. 24	Black	20.25
Coneloa	Misnomer, and no good.			
Conquer	Labrusca, Hybr.	Aug. 3	Black	4.10
Cornicopia	Riparia, Hybr.		Black	3.25
Cottage	Labrusca	Aug. 12	Black	4.85
Creveling	Labr. Hybr.	Aug. 15	Black	3.45
Cunningham	Aest.	Oct. 1	Brownish Black	24.75
Cynthiana	Aest.	Aug. 25	Black	2.45
Delaware	Aest. Labr. Vineferia	Aug. 9	Red	3.75
Devereaux	Aest.	Aug. 17	Black	18.75
Diana	Labr.	Aug. 16	Red	5.05
Dracut Amber	Labr.	Aug. 30	Red	8.45
Duchess	Labr. Hybr.	Aug. 7	Greenish yellow	1.95
Early Ohio	Labr. Hybr.	July 20	Black	2.20
Early Victor	Labr. Delaware	July 28	Black	3.85
Early Wine	Linc. Rupestris	July 26	Black	4.95
Eaton	Labr.	Aug. 24	Black. No good.	
El Dorado	Labr. Hybr.	Aug. 22	White	4.10
Elsinburgh	Aest.	July 21	Black	2.12
Elsmere	Not known	Sept. 1	Black	6.10
Elvican	Candacan, Elvira	Aug. 20	Red	3.10
Elvira	Riparia, Hybr.	Aug. 16	Green	12.25
Empire State	Labr. Riparia	Aug. 7	White	19.75
Etta	Riparian	Aug. 27	Green	3.05
Eumelan	Aestivalis	July 29	Black	2.05
Eva	Labr.	Aug. 30	White	1.97
Faith	Riparia, and cross U. K.	Aug. 7	Amber	5.20
Fern Munson	Linc. Hybr.	Sept. 9	Dark purple	5.35

GRAPES—CONTINUED.

VARIETY	ORIGINAL STOCK	Time of Ripening	Color	No. Lbs.
Gazelle	Hybr. unknown	Aug. 20	White	2.55
Goethe	Labr. Hybr.	Sept. 1	Yellowish green	10.05
Gold Coin	Aest. Hybr.	Aug. 12	Golden	9.10
Golden Gem	Aest. Hybr.	Aug. 2	Golden	9.37
Governor Ross	Labr. Hybr.	Aug. 21	White	13.75
Green Mountain	Labr.	July 20	Greenish white	7.75
Green's Golden	Riparia. Hybr.	Aug. 27	Golden	2.15
Hartford	Labr.	July 28	Black	1.75
Hayes, F. B.	Labr.	Aug. 25	White	.95
Herbemont	Aest.	Sept. 6	Black	10.75
Herbert	Labr. Hybr.	July 27	Black	3.95
Herman	Aest.	Aug. 10	Black	3.45
Herman Jaeger	Aest. and Linc.	Aug. 25	Dark purple	25.85
Highland	Labr. Hybr.	Sept. 6	Black	2.75
Hopkins	Linc. Aest.	Aug. 16	Black	4.10
Humboldt	Ripr. Hybr.	Aug. 27	Green	8.95
Iona	Labr.	Aug. 19	White	5.85
Iowa Excelsior	Labr. Hybr.	Aug. 30	Red	4.45
Iron Clad	Riparia, Labr.	July 31	Black	9.15
Irving	Labr. Hybr.	Aug. 10	Yellowish white	10.20
Israella	Labr.	Aug. 27	Black	4.05
Isabella	Labr.	Sept. 6	Dark purple	5.05
Ives	Labr.	July 20	Black	4.35
Jagers	Linc. Hybr.	July 30	Greenish white	7.25
Janesville	Labr. Riparia	July 10	Black	14.45
Jaquer	Unknown	Aug. 9	Black	8.05
Jaquez	Synonym of Lenoir	Aug. 16	Black	3.10
Jessica	Vineferia	Aug. 14	White	1.95
Lady	Labr.	Aug. 25	Greenish yellow	4.55
Lady Washington	Labr. Hybr.	Aug. 21	Amber	11.50
Lausell	Linc. on Gold Coin	Sept. 6	White	10.20
Lenoir	Aest.	Aug. 10	Black	9.05
Lindley	Labr. Hybr.	Aug. 19	Brick red	2.75
Lindherb	Lindley Hybr.	Aug. 30	Black	2.95
Louisiana	Aest.	Aug. 10	Black	4.10
Luckey	Not known	Aug. 30	Black	4.05
Lutie	Labr.	Aug. 6	Dark red	3.67
Mallon	Unknown	Aug. 12	Black	4.15
Maxatawney	Labrusca	Aug. 27	Yellow	3.50
Marion	Riparia, cross	July 31	Black	14.75
Martha	Labrusca	Aug. 6	Greenish white	6.23
May Ann	Labrusca	July 1	Black	10.41
Marguerite	Linc. Aest.	Aug. 1	Black	15.19
Mason's	Labrusca	Aug. 7	Greenish white	1.02
Massasoit	Labr. Hybr.	Aug. 19	Dark red	6.63
Merrimac	Labr. Hybr.	Aug. 25	Black	5.06
Mills	Labr. Hybr.	Aug. 12	Black	1.43
Missouri Reslin	Ripr. Not known	Aug. 27	Greenish white	26.91
Montefiore	Ripr. Not known	Aug. 9	Black	10.94
Moore's Early	Labrusca	July 31	Black	2.80
Moyer	Aest. Hybr.	July 30	Red	4.21
Muench	Neosho Heber	Sept. 2	Black	21.55
Munson, Mrs.	Neosho Heber	Sept. 2	Black	6.56
Munson, R. W.	Post-Oak Triumph	Aug. 4	Black	19.79
Munson, W. B.	Post-Oak Triumph	Sept. 6	Black	24.21
Naomie, Virginia	Virginia (not known)	Aug. 16	White	19.50
Naomi	Ripr. Hybr.	Aug. 30	White	9.10
Neosho	Aest.	Sept. 2	Black	4.47
New Haven	Labr.	Aug. 12	Black	5.75
Newman	Linc. Hybr.	Aug. 15	Black	6.35
Neva Munson	Hybr.	Sept. 10	Black	3.95
Niagara	Labr.	Aug. 20	White	3.05
Noah	Ripr.	Aug. 9	White	10.12
Norfolk	Labr. Hybr.	Aug. 19	Red	13.75
Northern Muscadine	Labr.	Sept. 10	Red	5.10
Norton's Virginia	Aest.	Aug. 25	Black	10.05
Onderdonk	Aest.	Aug. 25	Greenish yellow	9.10
Opal	Labr. Hybr.	Aug. 16	White	3.05
Oporto	Ripr.	Aug. 1	Black	2.25
Oriole	Linc. Aest.	Aug. 12	White	14.75
Othello	Ripr. Hybr.	Sept. 3	Black	3.10
Peabody	Ripr.	Aug. 10	Black	4.05
Pearl	Ripr. Hybr.	Aug. 4	White	11.20

GRAPES—CONCLUDED.

VARIETY	ORIGINAL STOCK	Time of Ripening	Color	No. Lbs.
Perkins	Labr.	Aug 30	Red	5.05
Perry	Linc. and Aest.	Sept. 12	Black	7.10
Peter Willie	Labr. Hybr.	Aug. 21	Red	6.95
Pocklington	Labr.	Aug. 27	White	8.10
Poughkeepsie	Labr. Hybr.	Aug. 15	Red	2.75
Prentiss	Labr.	Aug 21	White	2.05
Ragan	Linc. and Aest.	Aug. 21	Black	4.75
Rentz	Labr.	Aug. 20	Black	2.10
Requa	Labr. Hybr.	Aug. 25	Black	1.95
Rochester	Labr.	Aug 20	Red	3.10
Rodgers No. 2	Labr.	Aug. 3	Black	8.65
Rommel	Ripr. Hybr.	Aug. 14	White	14.75
Salem	Labr. Hybr.	Aug. 19	Red	5.95
Secretary	Ripr. Hybr.	Aug. 16	Black	6.75
Taylor's Bullet	Ripr. and Labr.	Aug. 16	White	4.10
Telegraph	Labr. (Colors up)	July 26	Black	20.05
Transparent	Ripr.	Aug. 14	White	2.25
Triumph	Campbell's Concord, Hybr.	Aug. 1	White	4.60
Ulster	Labr.	Aug. 30	Red	5.10
Unknown	Unknown	Aug. 4	Red	6.25
Uhland	Ripr	Aug 10	White	9.25
Vergennes	Labr.	Sept. 1	Red	2.10
Venango	Labr.	Aug. 30	Red	1.95
Vinita	Linc. and Herbemont	Aug. 20	Black	3.10
Walter	Aest. and Labr.	Aug. 19	Black	2.05
Warder Dr.	Labr.	Aug. 3	Black	8.10
Whitehall	Labr.	Aug. 10	Black	3.75
Wilder Dr.	Ripr and Labr.	Aug. 16	Black	2.85
Wilding	Ripr. and Labr.	Aug 4	White	6.05
Willder	Labr. and Hybr.	Aug. 24	Black	5.95
Woodruff's Red	Labr.	Aug. 30	Red	3.05
Worden's Seedling	Labr.	Aug. 4	Black	8.25
Wyoming	Labr.	Aug. 25	Red	12.10
York, Maderia	Unknown	Aug. 3	Black	2.05

The foregoing will be of value to the growers of grapes in the Territory, in so far as the conditions are similar, and may throw some light upon the important question, to-wit: deep rooters. In some instances the Labrusca stock has shown fairly good yields, as in the Concord, and some others, but our complaint rests largely in the fault of uneven ripening, as is the case at the Station. As will be observed, very many varieties have not been reported on, because we did not find them worthy of space.

## Stimulating and Holding Fruit Buds.

It has been the work of not only this Station, but of very many others, to offer some suggestions to the fruit grower of Prunis fruits who are attempting to grow pitted fruits on low altitudes. It must be admitted that very few only succeed in one out of five years, and when they succeed everyone else also succeeds.

To the grower who has been able to secure an altitude, and utilizes it, these lines are not intended, but to aid the less fortunate has been largely the work of this department. It must be admitted that our dangers are augmented by what we call our Italian climate. Again it must be further admitted that deciduous trees that drop their foliage early in the fall store up organic food material in greater quantities than deciduous trees that hold their foliage until late winter. We conclude, as the earliest budders and bloomers in the spring are the first to drop their foliage in the fall, and that in very many cases where the trunk and branches receive proper temperature, the trees will bloom and set fruit when their roots are encased in ice. Especially is this true with the prunus fruits, and with the grape. Many devices have been resorted to by the horticulturists of the different Stations for the purpose of aiding the farmers or fruit growers in stimulating and holding back fruit buds, as well as the bloom.

Professor J. C. Whitten, horticulturist of Missouri Station, recommends shading or whitening of the tree. The shading may be done by walls, boards, or blanketing the tree with straw or other covering that will exclude rays of the sun during the winter months. The whitening is performed by spraying the trees with whitewash. The spraying should be done or commenced in early winter or late fall, and if the rain should wash the lime off, it should be repeated. We have received considerable encouragement under our system of root pruning. The practice of laying down trees has not proved to have been a desirable practice, any further than the increased induction of deeper root growth, which is desirable in this latitude. By

cutting the lateral roots in early fall we affect the operation of the conduit, stimulate bud action, and in consequence the sap water that passes up through the sap wood is checked to a certain degree. Another fact is that trees do not rest during the winter period as in a more frigid temperature. Figure No. 4

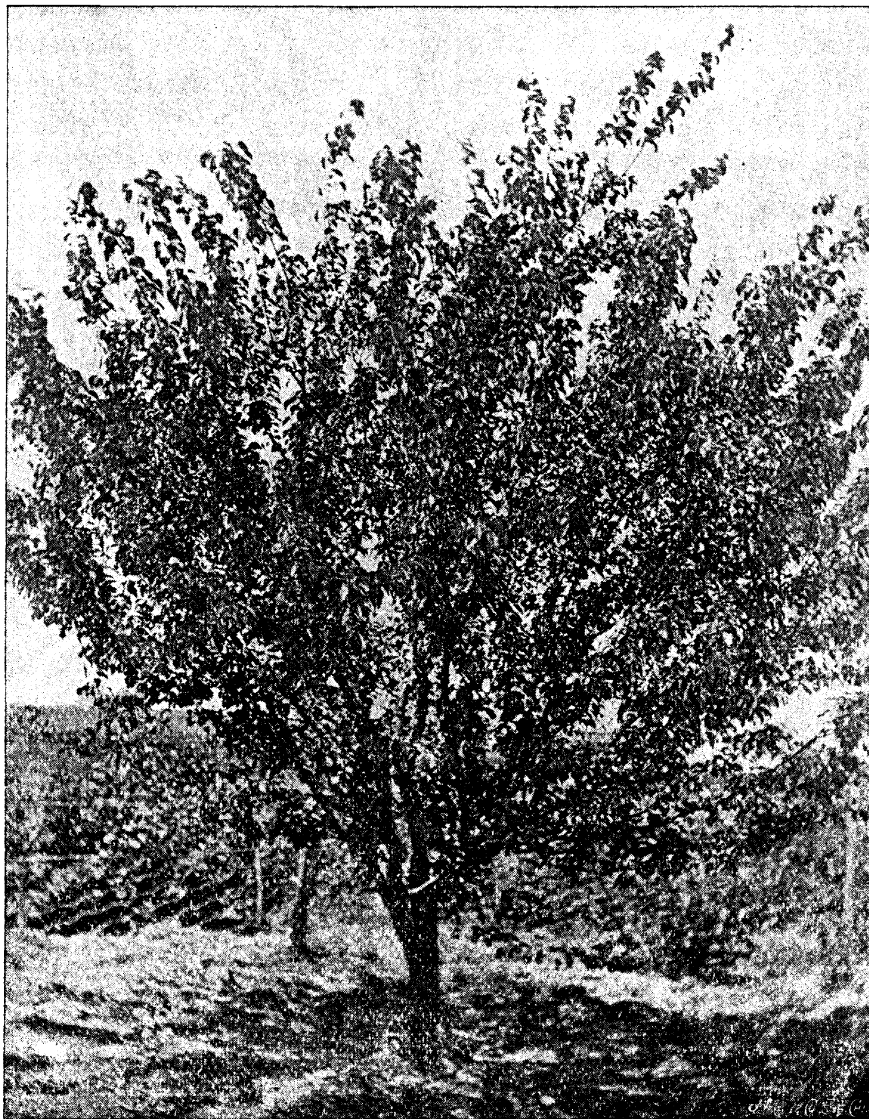


FIGURE 4

represents an apricot tree that was treated by root pruning. The laterals were cut on all sides of the tree by having a trench cut around the tree; as the roots extend further from the tree on the south side of the tree than on the north side, care must be given in this. The tree must be approached nearer to the



trunk on the north side to secure the roots. The ditch should be left open all winter to receive the storm waters, and filled by degrees in the spring. The ends that were cut heal over and in the early spring and summer throw out innumerable fibrous roots. The fruit buds will set on the terminal branches



FIGURE 5.

and as they do not contain as much sap water as trees not treated, will resist a greater degree of cold than trees containing a full supply of sap water. The leaf buds will be less numerous than trees not treated. Our experiment further disclosed that the trees receiving treatment showed an increased growth within the year over trees not treated. Figure No. 5 represents

a tree not treated. The photographs of both trees were taken at the same time, June 1. A photograph taken October 1 would have shown a marked difference in favor of the treated tree as to growth. The root pruned tree developed a little more than three times as much fruit as the tree not root pruned. The bloom was not retarded appreciably, more than about 30 hours, but blooms made their appearance on spurs near the trunk on the lower limbs from 10 to 12 days later. The fruit that was retained on the trees not treated was invariably found on spurs on the lower limbs. The laterals were free from fruit, and the bloom was also conspicuous by their absence on the laterals as well. The cost of root pruning can be made comparatively small, as the work can be largely done with the plow; to make the work complete some little work should be done with the spade at the angles. We are not prepared to say just how long this treatment can be kept up with profit to the grower. When the trees are sufficiently large to furnish shade to their neighbors the necessity will not be as great as when young. However, a tree that is aged can be rejuvenated by judicious root pruning.

#### NOTES.

Select high altitudes, especially for pitted fruits, having a cold air drain, thereby avoid the necessity of artificial methods.

In your vineyard selections take varieties grown upon stock that is indigenous to this climate. Deep rooters are always the most desirable.

Plant or set your rows from southwest to northeast, that the vines may better shade the ground during the hottest portion of the day. The trellis should not be over three and one half to four feet to the top wire.

The canopy top trellis offers better protection to the fruit by increasing the shade not only to the ground but to the fruit.

Pruning of the grape should be done in this climate in the fall. Summer pruning should be done with the thumb and fingers, by pinching back the runners.

Set your strawberries in the fall as soon as the rains set in. Mulch after the ground has frozen with half rotted prairie hay, if possible; barnyard compost will make good mulching, but you are more liable to introduce weed seeds. Set varieties that will ripen in succession. Use fertilizers that bloom at the same time the pistillate blooms.

Remember that the strawberry is the great money maker. Every garden should contain a good strawberry bed.



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