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BULLETIN NO. 4.

NEW SERIES.

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**Agricultural Experiment Station,**

OF THE

**Agricultural and Mechanical College,**

**Auburn, Ala. - - - February, 1889.**

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**STRAWBERRY CULTURE.**

**GRAPE CULTURE AND PRUNING.**

**RASPBERRY CULTURE.**

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BULLETIN NO. 4,

Agricultural Experiment Station,

Agricultural and Mechanical College,

AUBURN, ALA. - - - - - FEBRUARY, 1889.

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In response to numerous inquiries from those who have been induced by the work of this Station to begin fruit culture, and for the purpose of instructing local experimenters who receive plants from this Station for experiment purposes, the following practical instructions are given. A complete treatise is not attempted, but simply practical suggestions to the beginner, that he may avoid mistakes in the outset that may lead to disappointment and discouragement. Homes in the country can not be made attractive to the young without fruits and flowers. Nothing will attach the young to their homes more than a cultivated taste for these. Nothing will contribute more to health, refinement and happiness.

### STRAWBERRIES.

It is not a little remarkable that so few homes are supplied with this delicious fruit. Being the first to ripen in the spring, so convenient, so delicious and so easily grown, there is no excuse for failure to have an abundant supply for family consumption and some to sell if desirable. It is not only surprising that so few grow strawberries, but equally so that so few know anything about their propagation, fertilization, cultivation and handling.

Many homes even that have pretentious orchards of apples, peaches and pears from which they gather crops, probably one year in five, neglect entirely the strawberry, grape and raspberry, which yield without fail, if properly cared for, annual crops of the most delicious fruit.

### PROPAGATION.

The strawberry is propagated by "sets" which form upon what are called "runners," which are woody stems starting from the base of the crown and reaching out in different directions, having at intervals two to three plants upon each runner. These plants take root from their base where they come in contact with the surface of the soil. These runners usually start into activity in the latter part of the fruiting season, and, in some varieties, cover the ground between the rows with new plants.

If the maximum fruitage is desired, the runners should be removed as fast as they form, since they tend to diminish the vigor of the parent plant and prevent the development of fruit-buds for the new crop. The buds which produce the fruit stalk are formed during the growth of the previous season, and hence anything which hinders the healthful growth of the plants this year will reduce the yield of the first crop of the next season. The plants which form upon the runners are used to start new beds.

They may be transplanted upon well prepared soil at any time from October to April, if the soil is moist and the temperature not below forty degrees Far., giving the preference to January or February. The yield of fruit the first season will depend more upon whether the plants formed in the early part of the previous season, and were surrounded by favorable conditions, than upon the time of transplanting. Plants which set in May will form more fruit buds than those which start in August.

We said plants were propagated by sets. This is the only method by which we can propagate them true to variety. They may be propagated by seed, but without assurance of perpetuating the variety from which the seed are taken. This method is employed only to originate new varieties.

#### TRANSPLANTING.

The sets should be taken up with a garden trowel or pointed garden hoe, with as little mutilation of the roots as practicable.

Portions of the runners left attached to the plants should be cut, not pulled, from them before planting.

If the roots are long and straggling, or have partly died in being transported, cut them back to within three inches of the crown.

If in garden culture in which the hoe will be used to the exclusion of the plow, check the rows two feet each way, open the soil at the checks sufficiently to allow the roots to be spread in as nearly a natural position as possible, insert the roots, draw pulverized soil upon them and press firmly. On soils naturally well drained plant on level surface with-

out bedding. If on soil in which the drainage is not good, plant on flat beds.

If the plants are to be cultivated with the plow, plant in checks three feet by two. This will admit the plow one way and leave ample room between the crowns the other way to facilitate hoeing.

#### SELECTION AND PREPARATION OF THE SOIL.

Strawberries are so readily and injuriously affected by drouth, especially during the bearing season, that in locating a bed selection should be made of a soil which is naturally or artificially well drained, and yet one which will readily absorb and hold moisture. A rich loam with abundant supply of vegetable matter will prove most satisfactory. Deep and thorough preparation and liberal fertilization of the soil are necessary to secure maximum results. The roots will penetrate as deeply as the soil is prepared, and thus be rendered less liable to injury from drouth.

Only a small area is needed to supply a family with these delicious berries, and any one can afford to spend the time and money necessary to insure the maximum production upon so small an area. Indeed, the husband will find ample compensation for any reasonable expenditure of time and money, in observing the pride and pleasure with which the wife presents her neighbors with boxes of choice berries, and the satisfaction which she derives from the conscious independence arising from the daily contributions from the strawberry bed to her own table.

#### MANURING.

We often read instructions as to strawberry culture, written by Northern men, in which they recommend covering the ground with stable manure two or three inches deep, and Southern readers have been led astray by such advice. We will guarantee failure upon beds so treated in our climate. Such treatment will insure vigorous growth of plants in early spring, but the fruitage will be small and the plants will wither and die under the effects of hot sun and drouth.

Our best results have been obtained from applications of ashes and raw bone accompanied with mulch of straw be-

tween and around the plants, from Gossypium Phospho applied before planting and during the growth of the plants, from light dressings of cotton seed meal in early spring, and from heavy mulching around the plants with green cotton seed applied in December. Most satisfactory results have been attained from all these methods of treatment. Acid phosphate will answer in the place of the raw bone, though not so permanent in its effects. The largest berries I have ever grown were produced by an application of Gossypium Phospho broadcast, before planting, at the rate of 1,600 pounds per acre, followed the next winter by mulch of green cotton seed applied at the rate of 100 bushels per acre. The most abundant crop, however, resulted from an application of wood ashes and super-phosphate.

#### CULTIVATION.

Strawberries should be cultivated as thoroughly as cotton, and in the same manner. The cultivation should be entirely on the surface, to avoid as far as practicable any injury to the roots. They require cultivation during the entire growing season to secure satisfactory results. Many persons remand their strawberry beds to the tender mercy of the grass and weeds as soon as the crop has been gathered. This ensures failure. To secure best results, both as to appearance of the bed and the yield of fruit, no sets should be allowed to take root, but the single crown system pursued. The largest and finest berries are obtained by this system, but a larger quantity of berries may be grown per acre by what is known as the "matted row" system. By this method new plants are allowed to remain between the plants in the drill until there is a continuous row of plants, and these of different ages.

Under the single crown system the beds need renewing every three years, because only the original plants are allowed to grow, and all become too old for profitable fruitage at the same time, while under the matted row plan the old plants are renewed by the sets which take root in the row from year to year, and thus the bed to some extent renews itself. The single crown system will prove most satisfactory in the size and quality of the fruit, and is more easily kept clear of weeds and grass. It is a good plan to set a new

bed every winter and destroy one that has borne two full crops. The plants for the new bed are allowed to grow upon the one to be destroyed after the crop of fruit has been gathered.

#### MULCHING.

In cold climates the crowns are covered with straw in the fall and left thus protected during the winter. This is neither necessary nor desirable in our climate. We need the mulch in spring and summer to protect the plants from injurious effects of drouth, and to protect the berries from the soil. Mulch, however, delays fruitage by preventing the heat of the sun from warming into activity the roots of the plants in early spring. The mulch prolongs the bearing season. It is, therefore, a good plan to mulch half the bed and leave half unmulched. In no case, however, must the crowns be covered with the mulch in our warm climate. Wheat or oat straw that has been tramped by cattle serves an admirable purpose. Green cotton seed applied around the plants in November protect the roots from freezes, keep the berries clean in spring, retain moisture about the roots, and as they gradually decay, supply food to the plants.

#### VARIETIES.

It is always best for the amateur to plant standard varieties that have stood the test and proved reliable. The Sharpless is to-day the most popular berry on account of its large size and good flavor. The Wilson is the most hardy, and hence should occupy a part of every garden bed. It is a little too acid until thoroughly ripe, and hence taxes the patience of the grower when craving fruit in early spring.

The old Agriculturist resembles the Wilson very closely, is not so acid nor quite so prolific. Cumberland Triumph, Crescent, Kentucky, Parry, Triumph de Gand, and others, are popular, but the three first mentioned will give entire satisfaction. If fine flavor is to take precedence of all other qualities, the Henderson will be selected. It is the best in flavor of fifty-three varieties tested.

#### GATHERING THE BERRIES.

Though the utmost care may be used to prevent it, more or less grit will adhere to some of the berries, and hence

the manner of picking assumes some degree of importance. The berries should not be handled at all, but the stem of the ripe berry grasped between the thumb and forefinger and, after giving it a twist to expose the lower side of the berry, pinched off if the berry is sufficiently ripe. The surface of berries often appear quite ripe when they are still white underneath.

#### PISTILLATE VARIETIES.

These have imperfect flowers and consequently will not bear unless planted near staminate varieties. The Crescent, one of the most prolific varieties, is of this character. It is claimed by some growers of strawberries that the size and quality of the berries grown upon pistillate varieties are influenced by the staminate variety employed to fertilize them.

#### GRAPE CULTURE.

There are varieties of grapes which are profitably grown upon nearly every character of soil in the cotton States.

Of fifty-four varieties planted at this Station four years since, forty-four have done reasonably well and a majority of them have proved most satisfactory. No farm in Alabama should be without a vineyard sufficient at least to supply the table of its owner, while there are large areas upon which grape growing may be made very profitable as a market crop.

To grow grapes successfully the soil must be thoroughly drained, either naturally or artificially.

The idea, imported from Europe, that the land must be trenched three or four feet deep to produce grapes successfully has long since been exploded. The preparation of the soil, however, should be as deep and thorough as practicable by the use of plow and harrow. If not already fertile, it should be liberally fertilized with manures of a permanent character, such as bone and animal manures. If these are not available, cotton seed or cotton seed meal, acid phosphate, and potash in some form, such as kainit or cotton seed hull ash or wood ashes may be employed. These should be applied broad cast and thoroughly incorporated with the soil before planting.

Deep furrows should be opened in the line of the proposed row of grapes. In these a thoroughly rotted compost should be applied at the rate of not less than one thousand pounds per acre. After applying the compost, mingle it with the soil and subsoil by using in the furrow long plows run as deeply as possible.

#### PLANTING.

Grapes are usually planted eight feet apart each way. Cut back the vines of the young plants to three buds, dip the roots in water and set as deep as they stood in the nursery row. Spread the roots in their natural position and press the fine soil firmly upon them. If well rooted plants are properly set, every vine should grow.

At the time of planting drive in a stake four feet long by every vine and write the name of each variety and the number of plants of each upon a stout label to be placed by the first plant of the variety. In addition to this, record the names of the varieties, their location and the number of each in the vineyard in a book kept for this purpose. If this is neglected, much of the pleasure to be derived from the vineyard will be lost. A mulch of some partly decayed vegetation placed around the plants will prove very beneficial. During the growing season the grape vines should be cultivated with the same care that would be bestowed upon a crop of cotton, avoiding at all times such cultivation as will break the roots of the plants.

A row of field peas, of a bunch variety, may be planted between the rows of vines and carefully cultivated to prevent the growth of grass and weeds.

Enough peas will be made to pay for the cultivation of the grapes and the vines left upon the soil will improve its fertility. The following method of training the vine has been used on this station with most gratifying results :

When the buds start into growth in the spring the most vigorous is selected to remain and the others rubbed off. Tie the single cane to a stake and when it reaches a length of three feet pinch the bud to arrest longitudinal and promote lateral growth, i. e., increase in size rather than length of cane. Soon after the bud has been pinched branches will put forth at the axils of the leaves. When these are a foot long pinch back to two leaves. All sprouts that put forth from the body of the cane must be rubbed off as they appear.

When the new canes commence to grow the next spring now the second year of the vine, select the two most vigorous and rub off the others. By this time the wire trellis

should be ready and the canes as soon as long enough, tied to the first wire. The first wire should be two feet and the second four feet from the ground.

The canes must not be tied so tightly as to risk injury from binding. To avoid this, pass the middle of the pieces of twine, already cut in foot lengths, around the cane below the leaf, cross the ends and tie to the wire.

When these canes attain three feet in length pinch back to increase their size as explained for the first year. Only the two canes should be allowed to grow and the laterals upon these pinched back to one foot or less. If bunches of grapes appear upon these canes they must be removed, except perhaps, upon a few extra strong vines on which one or two bunches may be allowed to ripen. Occasionally three canes can be left upon extra vigorous vines, two of which may be trained along the lower, and one tied to the top wire. Any adventitious buds which put forth from the main stem should be rubbed off as soon as they appear, so as to direct the entire growth into the canes selected as above.

The soil should be repeatedly stirred between and around the vines for the double purpose of aeration and to prevent the growth of weeds and grass.

The next pruning which prepares for the third year's growth of vine and fruit production, we have to start with either two or three vigorous canes which, if they have been properly fertilized and cultivated, will be from one-half to three-fourths of an inch in diameter with short laterals at the joints. Vigorous growers, like the concord, perkins, etc., may be pruned upon the spur or the renewal system. If on the former plan, cut alternate spurs or laterals close to the main cane and on the remainder leave one or two eyes. The principal canes should be cut back to two or three feet according to the vigor of the vine and its habit of growth.

The best eyes are on the laterals, since these were formed from the principal buds on the leading canes, leaving only the stipular buds undeveloped on the latter. If all the spurs are cut off close to the canes only the stipular or small secondary buds are left and these may not produce vigorous canes.

If the renewal system is adopted, one-half of the vine is pruned on the spur system, and the other cut back to good buds for wood production for the next year. On those canes which grow from the side cut severely back, no fruit should be allowed to grow, all being produced upon that half pruned on the spur plan.

The next year the canes which bore the fruit are cut back for wood production, and the new canes of the previous

year's growth pruned for fruit. The spring pruning is very important in the economy of the vine. It consists in removing all feeble and surplus canes soon after growth commences, and, a little later, pinching back the fruiting canes two leaves beyond the last bunch of grapes. On vigorous young canes three bunches may be expected. The number of bunches likely to be produced may, therefore, be calculated in advance by multiplying the number of plump buds left by three. As soon as the new canes are well established, so that they can be handled without risk of breaking at the base, they should be tied to the wires separately to give proper exposure, to air the bunches of grapes and to facilitate gathering when ripe.

#### PROTECTING WITH PAPER OR CLOTH SACKS.

As soon as the grapes have set in the spring small sacks of either cloth or paper may be slipped over the bunch and the mouth folded and pinned. If paper is used, a small puncture should be made in the bottom of the sack to allow any water, which may enter, to escape. An active man or boy can put on 1,500 to 2,000 of these in a day, the number depending much upon the manner in which the vines are tied upon the trellis. These bags protect the grapes from attacks of mildew and rot, and from birds and insects when ripe. They remain fresh upon the vines four to six weeks after the exposed bunches have been consumed or destroyed.

Any arrangement by which the season for such delicious fruit may be prolonged a month beyond its ordinary limits is well worth adopting.

Some facts showing the effects of bagging the bunches were given in Bulletin No. 3, of this station.

The bunch grapes may be pruned at any time after growth has entirely ceased and before the buds begin to swell towards spring. It is well to prune part of the vineyard very early in the fall and leave half till February.

The canes pruned early will put forth early in spring and, if not killed by frost, will ripen fruit earlier than those pruned later. The later pruning insures against injury by frost and prolongs the fruiting season.

The muscadine or rotundifolia type will not bear pruning during the winter, and hence the prevalent opinion that they will not admit of it at all. They may be pruned with perfect impunity immediately after the leaves are shed in the fall.

Cuttings made at this season grow almost as readily as those made from the bunch grapes during winter.

A number of cuttings of the scuppernon planted in Octo-

ber, 1887, made vigorous growth last year. The scuppernong vines should not be planted nearer than fifty feet each way, if intended to be grown upon arbors. If grown on trellis and pruned annually the rows need not be more than ten feet apart, and the vines thirty or forty feet in the row. The top bud of cuttings should be covered with an inch of soil to secure the most satisfactory results.

### RASPBERRY CULTURE.

The impression prevails with many that the raspberry cannot be successfully grown in the cotton states.

There is some difficulty in growing the black cap type on account of liability of the canes to be sun scalded where they bend over, and their failure, in field culture, to propagate. They propagate by layering at the tips of the new canes in the late fall. If our seasons are dry they often fail to take root. The plants, however, bear abundantly, and may be grown for propagation in partially shaded positions such as the north or west sides of fences.

Twenty-five varieties have been grown for three years in the horticultural grounds of this station, upon high sandy soil, with results showing that the red varieties, and some of the hybrids, propagate as readily as briars, bear as abundantly and endure our long summers equally as well. This is especially true of the Turner and Cuthbert, two exceedingly hardy and productive varieties, producing berries of exquisite beauty and delicious flavor. Golden Queen, a hybrid variety of superior quality, has given entire satisfaction. Schaffer's Colossal, a cap variety, propagates readily by cuttings, produces abundant crops of very large berries of an unattractive purple tinge, and is especially desirable on account of its lateness in ripening, commencing just as the earlier varieties finish bearing and thus prolonging the season. The red varieties propagate by root cuttings and hence should be planted not nearer than four feet each way.

The soil should be made rich for best results with raspberries and kept so by annual top dressings of well rotted compost or a mixture of cotton seed meal, phosphate and kaint, applied in early spring and forked in.

The old canes which have borne fruit must be removed, in winter, from all types. The canes grow one year, bear fruit the next, and die.

The red varieties should have the new canes cut back to two feet in June or July to cause them to branch and become stocky and self-supporting. The cap varieties must not be cut back until winter if plants are desired to be formed at the tips of the vines.