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BULLETIN NO. 10.

NEW SERIES.

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Agricultural Experiment Station,

OF THE

Agricultural and Mechanical College,

AUBURN, ALA. - - JANUARY, 1890.

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GRAPE CULTURE.

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 The Bulletins of this Station will be sent free to any farmer in the State who desires them.

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## SOME FACTS FROM THE STATION VI VINEYARD.

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[By J. S. NEWMAN, AGRICULTURIST.]

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### LOCATION AND EXPOSURE.

In order to satisfy the skeptics who did not believe grapes could be grown successfully on this soil, a most unprepossessing north hill side, of what was known as "worn out" land, was selected for a vineyard. The remark was often heard, "If you can grow grapes there they will grow anywhere." Three large gullies, from three to four feet deep and from six to ten feet wide extended through a part of the acre selected for the experiment vineyard, and from another portion the soil had been so completely washed off that the surface was entirely bare of vegetation. Such was the unpromising area upon which the reputation of the Experiment Station was risked in grape growing.

### FILLING THE GULLIES.

In February, 1886, the reclamation of this waste land was commenced by filling the gullies with brush and plowing down their sides.

The horizontal lines for terraces were then laid off and the spaces between the gullies broken between the lines.

The soil thus loosened, was drawn into the gullies with a railroad scrape, until they were sufficiently filled to allow mules to cross them, taking the soil mainly from the upper part of the terrace spaces.

With a two-horse hill side plow, the terrace spaces were broken three times, turning the surface down hill each time until the terrace lines were built up two feet high.

### PREPARATION FOR PLANTING.

Early in March, furrows were marked off eight feet apart,

following the lines of the terraces. The land was then sub-soiled for a space of two feet on each side of these furrows and a ton of compost per acre thoroughly incorporated with the soil over these areas four feet in width.

In the centre of these spaces deep and wide furrows were opened for the reception of the vines, which were planted, six of a variety, eight feet apart in the rows. In the space of four feet in the middles not fertilized for the grapes, two rows of peas were planted at the proper season. To these two hundred pounds per acre of cotton seed meal and acid phosphate, mixed in equal parts, were applied in the drill.

#### CULTIVATION AND PRUNING.

The grapes and peas were cultivated shallow with heel scrape, until the pea vines covered the ground.

Only one cane was allowed to grow upon each vine. This was tied to a stake and pinched back when three feet long, to induce a more stocky growth. The next winter these were cut back to three eyes or buds.

In February following, the dead pea vines were raked into the row of grapes as a mulch, and the intermediate space plowed with hill side plow, set to run just two inches in depth, throwing a little soil over the mulch. Again peas were planted in the middles, and fertilized as before. Posts were planted sixteen feet apart in the grape rows and two strans of No. 12 wire stretched tightly upon them for trellis. One wire is two feet from the ground and the other four feet.

Unless the vines were unusually strong only two canes were allowed to grow the second season. On very vigorous vines three were left. As soon as long enough these were trained to the wires and all bunches of fruit clipped off to devote all the energies of the plant to its establishment and development. When four feet long the canes were pinched to induce stocky growth and to stimulate the growth of laterals. If three canes were left, one was trained to the top wire.

The vines have now had two years in which to establish

themselves preparatory to bearing fruit, and the next pruning must look to that end.

The renewal and spur systems have been combined with very satisfactory results.

We have now either two or three very vigorous canes well supplied with laterals. To secure plenty of new wood for next year's fruiting, one cane is cut back to three or four eyes and the others to four feet, and the laterals to one eye each.

The new canes which grow from these laterals thus "spurred" will each produce three bunches of grapes the next season. The number of bunches to be produced may therefore be estimated with a considerable degree of accuracy in advance.

To supply the means of greatest fruitfulness, a ton of compost, two hundred pounds of cotton seed meal, two hundred pounds of acid phosphate, and two hundred pounds of cotton seed hull ashes, were sown broadcast and turned in two inches deep with hill side plow. No peas were planted the third year, but the middles kept free from grass and mulched with loose earth by frequent stirring with heel scrape. It should have been stated that during the first two years enough peas were gathered to pay for the manure and cultivation, and the vines and roots left to feed the grape vines.

The standard varieties, such as Concord, Ives and Perkins, produced the third year an average of twelve pounds per vine or four tons per acre.

From one Perkins vine fifty-six pounds of marketable grapes were picked and sold at five cents per pound. Many of the new canes grew twenty feet in length during this the third season.

To prevent over-bearing, as soon as sufficient growth was made in spring to make the selection, the feeble canes were rubbed off leaving only the vigorous ones either to bear fruit or produce bearing wood for the next season.

This brings us to the third winter, preceding the fourth growing or the second bearing season, when the vines may be permitted to bear a full crop. To enable them to do this the substance removed in the crop of the previous

season, and that taken in the vines, removed by pruning, must be restored and additional provision made for the tax of a still larger crop.

For this purpose, after the pruning was finished and before plowing, an application of three hundred and fifty pounds of cotton seed meal, 700 pounds acid phosphate, and 350 pounds cotton seed hull ashes per acre, was made broadcast.

In pruning more bearing wood was left than before, bearing canes being now trained to both wires in each direction from the vine. This nearly doubled the bearing area, but owing to an unfavorable spring did not double the yield.

Early in June an additional supply of plant food was given in a mixture of two hundred pounds each of acid phosphate and kainit per acre. This was sown broadcast between the rows and mixed with the soil by a heel scrape run very shallow. Notwithstanding the fact that some of the varieties under experiment were not prolific, nearly seven tons of grapes were gathered, besides those destroyed by birds, which cannot be estimated. This is a brief history of the Experiment Vineyard during the four years since planting. In view of the unfavorable conditions under which it was commenced, the results are quite satisfactory. It has been given in detail in response to a popular demand for facts concerning the management of vineyards. There has been much interest excited in grape-growing by the work of this station, that at Uniontown, and by a few progressive gentlemen, especially at Greenville and Huntsville. No home is complete without its vineyard. Nothing will afford greater pleasure or profit in proportion to the labor and expense bestowed. Much of the work can be done by those incapable of severe labor. A large portion of Alabama is well adapted to grape culture. It is now oppressed by unfriendly legislation. There are millions of acres in the State better suited for vineyards than that on which the one just described is planted. Success need not be expected upon lands not well drained, either naturally or artificially. Alabama is capable of producing from vineyards, values equal to those now realized from her cotton fields.

## SOME ENEMIES TO BE OVERCOME.

The principal enemies to the grape are birds, insects, mildew and black rot. The grapes may be protected from these by covering the bunches with paper bags as soon as the berries are well set, at a cost of six-tenths of one cent. per lb. Except for extra large bunches, the ordinary two pound bag used by retail merchants is used. These are slipped over the bunches, the corners folded and pinned around the stem of the bunch. A boy twelve years old can pin on fifteen hundred per day if the vines are properly trained on the trellis. The bags cost \$1.20 per thousand, and if carefully removed from the ripe bunches may be used the second time. The bags are put in packages of five hundred each, and these in fifties. Before opening these packages an opening should be made in the bottom of each bag by driving a sharp chisel through the ends of the packages of fifties. With one stroke of the mallet the openings are thus made in fifty bags. The object of making this opening is to allow the escape of any water which may find access to the bags. A large number of bags have been used during the last two seasons upon many varieties for the purpose of eliciting the following information :

- (a) Will the bags protect from birds, insects and fungi ?
- (b) Will the use of bags prolong the marketing season ?
- (c) What varieties are profitably bagged ?
- (d) Will bagging pay on a commercial scale ?
- (e) When is the proper time to put on the bags ?
- (f) Will it pay to use them the second time ?

We have found the protection complete if they are applied just after the berries set upon the bunches. If not applied until the berries are nearly grown, they do not protect against black rot, but do protect against birds and insects.

The results of observations upon the second question, made in 1888, have already been published. The price was increased from  $4\frac{1}{2}$  cents to ten.

In 1889 the difference was still greater. This is especially true of the Ives variety. The third question will be answered in the discussion of the varieties.

The fungicides protect from the rot and mildew but not

against birds and insects; the bags against all. It is not profitable, however, to bag any except the choice bunches.

After two years' fruiting of the varieties under observation, a reasonably fair estimate can be made of their comparative merits and their adaptation to particular purposes. The following classification will convey to the inexperienced the information necessary to guide them in making a selection of varieties :

#### NOTES ON VARIETIES OF GRAPES.

*Agawam*.—(Rogers No. 15), Hybrid—black rot on leaf May 31st—on berries June 29th—vines vigorous but not prolific—ripe July 25—bunch medium and irregular berries large, dark-red—good, kept well in bags—rotted and mildewed without—many better varieties ripe at the same time and hence not needed.

*Beauty*.—*Labrusca* type—rot slight on leaf May 30th, but did not attack the berry. Vines vigorous and prolific, ripe August 10th—bunch medium, compact—berry medium size, light purple color. Improved in color and size in bags—no rot—quality *very good*. A desirable variety for amateur culture. The grapes have a bouquet peculiarly their own.

*Berckman's*.—Hybrid—no rot—vine vigorous and prolific—ripe July 22d. Bunch and berry medium and both very similar to Delaware, one of its parents; no rot with or without bags—quality best. A very promising new variety—grapes nearly as good as Delaware and the vine much more vigorous.

*Brighton*.—*Labrusca* type—Black rot on leaf May 31st, but none on berry until July—vines moderately vigorous and prolific—ripe July 22d—bunches large, compact and very showy—berry large, red—greatly improved by the bags—some rot on those not bagged—quality best. A desirable variety for amateur culture, but not reliable without bags.

*Catawba*.—*Lab.* Vines vigorous and prolific—ripe August 20th—bunches medium, open—berry medium, red, not benefitted by the bags—no rot—quality very good—not reliable—disposed to shed its leaves before the berries ripen. Superior for market, table and wine if successfully grown.

*Champion*.—Lab. Vigorous and prolific—ripe July 12th; bunches large, compact, berries black, large. Improved by bags—no rot—quality good—not needed, as other and better varieties ripen with it.

*Concord*.—Lab. Very vigorous and prolific—ripe July 25th—bunches very large and compact, shouldered—berries very large—blue-black, with bloom—skin very thin and cracks easily, benefitted by bags—no rot but badly attacked by birds and insects unless bagged—very good. This is one of the most reliable standard varieties, which succeeds under conditions fatal to many others.

*Delaware*.—Hybr. Lab. Not vigorous but exceedingly prolific—ripe July 25th—bunches medium, very compact, and generally shouldered on one side—berries medium, red, best. This is the standard of excellence—a standard, reliable variety for market, table and wine. Requires rich or highly fertilized soil and severe pruning. Without the latter the vines are injured by over bearing. Not benefitted by bags in prolonging the season—as soon as ripe the stems die and the berries shrivel in the bags—the benefit of the bags ceases as soon as the berries ripen.

*Duchess*.—Hyb.—rot on leaves May 14th—on leaf—stalks and stems of bunches May 31st—on berries, not bagged, June 29th. Vines not vigorous, but prolific—ripe August 10th—bunches large, compact and shouldered—berries medium, white. Very fine and showey in bags—rotted badly without—quality best. A delicious grape, suited for amateur culture—*must be bagged*—blooms late.

*Eldorado*.—Hybr. Vines vigorous but not prolific—ripe August 1st. Bunches large, compact, shouldered, and very showey—berries above medium—white, very tender—quality best—beautiful in bags—all rotted without. Suitable for amateur culture only.

*Elk Eagle*.—Æstivalis type. Black rot on leaves May 14th, when in full bloom—rot on berries June 29th—very vigorous and prolific. Ripe July 31st—bunches very long and open. Fertilization of the flowers seems imperfect—berries very large, black, skin thin. Well preserved in bags, all not bagged rotted—quality very good. The best black grape in the list. Bunches so long that 6 lb. bags were re-

quired to cover them. Desirable for amateur culture only.

*Goethe*.—(Rogers' No. 1.) Hybr. Rot on leaf May 30th, on berries June 29th—vines vigorous and prolific—ripe August 15th—bunches medium—berries very large, oblong, light red—ripen irregularly on the bunch—much benefited by bags—some rot and mildew without—quality best. Desirable on account of ripening late and superior quality. Valuable for local market and amateur culture.

*Grein's Golden*.—Riparia. Vigorous and prolific—ripe August 10th—bunches small and compact, berries above medium, golden yellow, pulpy—wilted in bags as soon as thoroughly ripe—rotted and mildewed without, quality good. Not needed on our catalogues.

*Hartford*.—Lab. Vigorous and prolific—ripe July 10th—bunch medium, rarely shouldered—berries large, black—season prolonged by bags—rotted some without. (In 1888 all unbagged rotted). Quality good. Berries drop from the bunch in shipping. Valuable mainly on account of its earliness—superseded by Moore's Early and Perkins.

*Iona*.—Lab. Berries attacked by rot June 29th—neither vigorous nor prolific—ripe July 30th—bunch, medium, compact, berries large, red, well protected by bags, rotted without—quality very good—recommended for amateur culture only.

*Ives*.—Lab. Very vigorous, hardy and prolific—ripe July 20th—bunches, large, very compact and shouldered on one side—berries large, black, with thick skin—season prolonged four to six weeks by bags—no rot but great loss by birds. This is one of the standard varieties for market and wine. The berries have the habit of turning black two weeks before they are ripe and are usually marketed before edible. This has injured the reputation of this valuable variety. Sold from bags at 10 cents per pound the last two seasons after the local crop was exhausted. The vines have a tendency to grow most vigorously from the extremities of the old canes, and thus, unless properly pruned, making the bearing wood too far from the root. Though not of first quality the Ives should have a place in every vineyard.

*Irving*.—Lab. Black rot on berries July 29th—not vigorous nor prolific—ripe July 30th—bunches very large and

compact—very showey—berries large, white—very fine in bags—rot and mildew without—quality very good. Desirable for amateur culture—must be bagged.

*Jefferson.*—Hyb. Vigorous and prolific—ripe August 1st—bunches large and compact—berries large, red with decided individuality of flavor—improved by bagging until ripe—then injured—no rot—quality very good—desirable for amateur culture.

*Lady Washington.*—Hyb. Black rot on leaf 14th May—on leaves and stem of bunch May 31st, and on berries June 29th—vines not vigorous but prolific—ripe August 10th—bunches very large, shouldered and compact—berries medium, white—kept well in bags making very showey bunches—both rot and mildew without bags, quality very good, canes disposed to die back in winter—desirable for amateur culture only.

*Lindley.*—(Roger's No. 9). Hyb. Neither vigorous nor prolific—ripe August 1st—bunches long, open—berries bright red and very showey—beautiful in bags—some rot and mildew without—very good. This variety emphasizes the ripe persimmon flavor peculiar to Roger's Hybrids—first flavor delicious but "farewell" suggests persimmon. Desirable for amateur culture—very ornamental for table use.

*Martha.*—Lab. Not very vigorous but prolific—ripe last of July—bunches small, compact—berries medium, white, not profited by bagging—wilted in bags when fully ripe—improved in appearance until ripe—no rot, quality very good. This is a seedling of the Concord—for amateur culture desirable.

*Mason's Renting.*—Lab. Vigorous and prolific—ripe August 10th—bunches medium, compact—berries medium, white, well preserved in bags and improved in color—good without and no rot—quality good—a meaty berry—amateur culture only.

*Maxatawney.*—Lab. Neither vigorous nor prolific—blooms late—ripe 1st August—bunches small and open—berries medium, oblong, amber—benefited by bagging—rot and mildew without—quality best. A desirable variety for amateurs—canes die back in winter.

*Meno.*—Vigorous and very prolific—rot appeared on leaves last of May—ripe August 10th—bunches small and compact, berries medium, amber—well protected by bags—rotted and mildewed without—quality good—not a desirable variety.

*Merimac.*—(Rogers' 19.) Hyb. Leaves and stem of bunches badly affected by rot May 31st, and June 29th on berries—neither vigorous nor prolific—ripe July 30th—bunches small, open, berries very large, black—well protected in bags—without, both rot and mildew—quality good—amateur culture, but less desirable than others which ripen with it.

*Moore's Early.*—Lab. Vigorous and prolific—ripe July 10th—bunches small, compact—berries large, black, protected and season prolonged by use of bags—no rot—quality good. Best early, black, market variety. Takes place of Hartford prolific on account of better shipping qualities and less liability to rot.

*Niagara.*—Lab. Vigorous and prolific—ripe August 1st—bunches large, shouldered, compact—very showey—berries large, white—no rot—appearance improved by bags—quality good—promises to become a standard white market variety.

*Norton's Va. Aestivalis.*—Exceedingly vigorous and prolific—ripe August 10th—bunches large, shouldered, compact, berries small, black with bloom, no rot—very much improved by bags—those without bags destroyed by birds, quality good—standard red wine grape—is not readily propagated by cuttings—wood very hard—layering usually practiced to propagate. This makes an ornamental vine trained on veranda of dwelling.

*Pearl.*—Riparia. Vigorous and prolific—ripe 10th August—bunches small and compact—berries medium, amber—not benefitted by bags enough to justify their use—rotted and mildewed—good—not worthy of cultivation.

*Perkins.*—Lab. Very vigoros and prolific—ripe July 12th—bunch large and very compact—berries large, pale red—not benefitted by bags in prolonging the season, but color is improved by them—should be consumed before thoroughly ripe—too foxy when fully ripe—no rot or mildew—quality good. One of the standard, hardy and relia-

ble varieties—very showy and sells well—ripe with Moore's Early, but more attractive and sells better.

*Pocklington.*—Lab. Not worthy of cultivation—does not ripen before the leaves fall.

*Prentiss.*—Lab. Not vigorous nor prolific—ripe July 31st—bunches small and compact—berries medium, white—beautiful in bags—no rot, quality best. This is a choice variety for amateur culture—has a pleasant cherry flavor.

*Rogers' No. 11.*—Hyb. Very subject to both rot and mildew. Should be discarded.

*Telegraph.*—Lab. Vigorous and prolific—ripe August 1st—bunches small with very short stems, and very compact—berries medium, black—no rot—some mildew—difficult to bag on account of short stem—benefited by them—quality very good. Better varieties ripen at the same time.

*Triumph.*—Hyb. Not vigorous nor prolific—ripe July 30th—bunches very large, compact, showy—berries large, white—well protected by bags till ripe, berries then wilt—quality very good. A superior variety for amateur culture.

*Vergenes.*—Lab. Rot on leaf May 31—on berries June 29th—very vigorous and prolific—ripe July 31st—bunches medium, open—berries large, red—perfectly protected by bags—both rot and mildew on those not bagged—very good. A superior variety for amateur culture.

*Wilder.*—(Rogers' No. 4), Hyb. Rot appeared on leaves as early as May 14th—May 31st badly on leaves and stems of bunch, and June 29th on berries—vigorous but not prolific—ripe August 1st—bunches small, open—berries very large, black—perfectly protected by bags but mildewed and rotted without—quality very good. For amateur culture only.

*Warden.*—Lab. Vigorous and prolific—very similar to Concord, its parent, but not quite so well flavored and ripens five days later. Fruit catalogues say it ripens earlier, but it ripened later here for the last two seasons. It is so nearly like the Concord with less merit, there seems to be no room for it. It has inherited the bad habit of its parent in having perfectly green berries on ripe bunches.

*Wyoming red.*—Lab. Not vigorous but very prolific—ripe July 12th—bunch small, moderately compact—berries

medium, red—no rot—benefited by bags—lost some leaves by mildew—quality best—but little inferior to Delaware—sweeter with less bouquet. It is by far the best early grape for market and table use. Like Delaware, it should be liberally fed and severely pruned. Will produce nearly as much as Moore's Early and sell better.

#### PROPAGATION.

All of these varieties have been propagated on the grounds of this station successfully, except the Norton. This is a hard wood variety, which, while it may be grown from cuttings under favorable circumstances, is better grown by layering.

Delaware does not grow so readily as other varieties, but we have had as much as sixty per cent. of the cuttings planted to make vines. We have found that the cuttings take root much more certainly if cut just below a bud at the lower end and just above at the upper end. The cuttings are then placed erect in the soil and entirely covered with earth to reduce evaporation. The top bud will burst through an inch of soil, and if thus covered there will be but one cane from each cutting. This saves much labor in handling the vines the first year. Only one cane should be allowed to grow.

A mulch of straw that has been trampled by stock, applied in March will prove beneficial in preventing bad effects of spring drouth. If no mulch is used the soil should be kept constantly stirred among the cuttings.

Many make the mistake of ordering vines, from the nursery, two years old. A one-year vine is better because it can be removed with more fibrous roots attached than those that are older.

#### TREATMENT OF ROTUNDIFOLIA (OR MUSCADINE TYPE.)

Seven varieties of this type of grapes were planted in 1886 and have been trained on a wire trellis and regularly pruned. Two objects were had in view:

(a) To have the vines in more convenient shape for gathering the fruit.

(b) To give better exposure of fruiting parts of the vine to air and sunlight, and, while concentrating the energies of the vine upon a smaller area, to improve the quality of the berries and size of the bunches.

The fruiting this season sustained the anticipated results.

The vines of this class must be pruned as promptly as practicable after the leaves fall. If delayed until winter they will bleed severely and often cause death.

The vines are trained upon wire trellis, which has four instead of two wires, as for the other types. The laterals are spurred back in a manner somewhat similar to that used on other types. While vines of this type propagate readily by layers—the usual method—we have succeeded nearly as well with cuttings as with other types—better than with the Norton. The Scuppernong is a variety of this type.

