TRUCK CROPS
FOR SOUTH MISSISSIPPI

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Truck Crops for South Mississippi

Introduction.—The growing of fruits and vegetables on the cut-over lands of South Mississippi should at some future time reach enormous proportions. The soils of this section of the state are naturally well suited to this class of farming, being sandy loams that drain well, dry out, and warm up very early in the spring, and, therefore, bring the crops grown on them to development much earlier than stiffer lands would do even under the same climatic conditions. However, this section of Mississippi is the most undeveloped portion of the state, with a citizenship composed largely, up to this time, of people who have followed other pursuits, such as lumbering and kindred industries, and who have taken up agriculture only since the timber has been so largely removed. It is not to be expected that people so trained should from the beginning be very successful in any branch of farming, particularly in such a specialized business as the growing of truck for northern markets.

The McNeill Experiment Station began active work in 1902 and for a number of years conducted a large number of experiments and demonstrations in growing truck crops on these cut-over lands and for as many years did everything within its power to encourage the people all over the section, where conditions would permit, to take up trucking in a small way and gradually work up to larger proportions. At that time a number of places organized truck growers' associations, and these were all united into a Truckers' League, which sent an agent to the principal trucking point, Cincinnati, to look after the interests of its members. But, as is usually the case with such organizations, all of these went to pieces, some of the places entirely stopped growing truck, and others grew and marketed their truck independently of any organization.

The people are again awakening to the possibilities of trucking, and the object of this bulletin is to put before them the results of experiments that have been made at McNeill, with a number of truck crops. We also desire to inform them that this Station has a great deal of information not only about the growing, but about the marketing, of truck crops, which information it stands ready to give them both in the form of printed matter and by means of personal talks to individuals and associations.

Our advice to communities expecting to begin this work is that each community should specialize on some particular truck crop to the exclusion of all others, especially in the beginning. There are several reasons for this; namely, the people will the sooner be able to
have enough of some crop to justify buyers to come to them and pur-
chase these crops at their station; a number of small growers can plant
only a few acres each of any crop and still be able to ship by freight
in car lots; and also they will establish a reputation for some one crop
much quicker than they can for a large number.

The people of our community have grown very largely snap beans
in the spring and sweet potatoes in the summer and fall, the two crops
maturing well on the same land in a single season. In this way the
neighboring towns of McNeill and Carriere have developed to the
point where these two crops bring in more ready money to the farmers
than all their other crops combined. In these communities nearly
every small farmer plants one or more acres of beans and sweet po-
tatoes and depends very largely on them as money crops.

A great many people have been led to expect too much from truck
crops. Before going into such work it would be well to realize that
average returns from any crop will fall far short of the profits about
which we read. It is the exceptional result that we usually read about
and frequently hear discussed by lecturers. Such things are pleasing
to hear and attract attentive audiences, but farmers or truckers who
go into this work expecting such results will nearly always fail, for
they are bound to feel they have fallen far short of what they believe
others might have done. From an acre of sweet potatoes grown at
the McNeill Station the writer has shipped for two years in succession
more than 240 bushels of potatoes; but in larger acreages during the
same years, the yields have averaged no more than one hundred bushels
per acre. The big returns about which we read are often the result
of extraordinarily favorable conditions, and at best are only to be att-
tained on soils much more highly developed than the average soil of
South Mississippi.

There are several things that go to determine whether or not a
given community may reasonably be expected to engage in truck
growing successfully. These may be considered under the heads of
soils, climatic conditions, transportation facilities, labor, and fertilizers.
The first consideration is the soil, for before beginning work of this
nature we must remember that there is a vast territory on all sides
of us in this extensive country of ours with which we must come into
competition, and that we would be inviting disaster to begin such work
on soils naturally unsuited to it. In general, sandy loam soils that
drain well and dry out and warm up early in the spring are best adapted
to growing truck crops, not that they will make as large yields as
heavier lands might do, but that they will bring perhaps smaller yields
to maturity from a few days to a few weeks earlier than the stiffer
lands would do, earliness in maturity frequently making the difference between success and failure in a truck crop. The cut-over lands have ideal soils physically for such crops, but in their natural state before being built up and fertilized, they will no more produce profitably than would the Desert of Sahara. The rainfall of this section is very heavy and is divided into four seasons, of which the spring and fall months are usually dry and the winter and summer months are practically always very wet. The temperature of the section is fairly equable, much more so than that of the state as a whole. The winters are mild enough to grow all the hardier vegetables, such as beets, cabbage, onions, etc., out of doors, and the summers are not so hot but that these same crops may be sown in the open field in summer and be left in place to grow and develop in the fall and winter.

The success of a trucking community is entirely dependent on its facilities for getting produce promptly on the markets to the north of it. This means that unless it is on a railroad having quick and direct access to the large markets of the country, it cannot possibly compete with other places of equal natural advantages that are so situated. As a rule, railroads that run north and south, or nearly so, have a decided advantage over roads that run east and west for any considerable part of the way; because for every disadvantage the north-and-south line has in being fourteen miles away from a given market, it has a corresponding advantage in having its crops mature one day earlier in the season, while the east-and-west line has not this compensating advantage. It is also very important that the railroad serving a trucking community should run into the large cities independent of any other line so that express shipments will not have to break bulk and there will be no delays due to missing connections. Some railroads, too, specialize in the handling of perishable products, and such are always to be preferred to other lines which may have equally good facilities but which lack the organization necessary to handle perishable freight. Of all the Southern roads the Illinois Central apparently offers the best facilities for handling truck crops, and it is to be noted that the best trucking communities in Mississippi and Louisiana are located on this road. However, there are several other railroads in Mississippi that could with a little effort serve a very large part of the cut-over lands as distributors of truck crops.

The element of labor enters more largely into growing truck crops successfully than it does into any other branch of farming. Not only must the owner of the farm be a man of intelligence and judgment, but he is compelled to obtain a great deal of labor at certain seasons
when his crops are being marketed. If the trucking operations of
any man or community are extensive enough, this additional labor
for the gathering period may usually be had in nearby towns or cities
and can be temporarily taken care of in tents, if houses are not avail-
able. In many of the trucking communities elsewhere a transient
body of labor will frequently follow up the crops as they are ready for
market, beginning at the south and following the crops as they come
in farther north. No other kind of crop production requires a more
intelligent or skillful class of labor or a keener insight into the field
of production and distribution on the part of the owner or manager.
To expect absolute success from the beginning from people who have
had no previous experience in such work is almost out of the question,
yet this should not deter new communities from going carefully into
such work with the advice and assistance of some one who has had
experience. A great deal of the labor required in growing truck crops
can be done by women and children, and in communities where large
families are the rule, such as is generally the case with us, we may
expect enough surplus help to handle several acres of truck crops to
the family, and the aggregate of many families might easily build up
a large trucking community with no outside help necessary.

A good soil is an important consideration in any branch of farming;
in fact, it is the most important thing of all, and it is doubly important
in trucking. Not only should a trucking soil have plenty of plant
food in it, but such food should be readily available and easily taken
up by the plant roots. The quality, as well as the quantity, of a
truck crop is affected by the richness of the soil, and no man ever grew
good crisp vegetables on land where development was retarded by
the lack of available plant food. Commercial fertilizers must be
used in liberal quantity, but in no case must we expect them to take
the place of humus and organic matter. There is no fertilizer that
will equal animal manures in building up a good truck soil, and the
writer knows of no way of obtaining these manures so cheaply or so
doubtedly as by the keeping of a few dairy cattle. In fact, dairying
and trucking should be companion occupations, as they fit in together
in many ways and work out to the good of the farmer. Dairy cattle
will not only furnish the manure to enrich the lands on which to grow
the truck, but they will furnish a market for a part of all crops that
will not pay the expense of crating and freighting. They will also
provide a market for the numerous leguminous crops so necessary in
keeping up the humus in the soil and in supplying the high priced
nitrogen that truck crops must have in large quantities. It is this
increased quantity of nitrogen in vegetable fertilizers that makes
them cost the farmer so much more per ton than do the average cotton and corn fertilizers. The shipping facilities that will enable one to market truck crops successfully will also enable him to market his dairy products as sweet milk or cream, and at a price twice as great as he could get for the same products made into butter. The same degree of intelligence and skill will be necessary with the dairyman as with the trucker, and on the whole we feel safe in saying that no two occupations ever fitted so well together. The manure from any kind of live stock will, however, do practically as well as that from dairy cattle, if produced from the same class of feeds. This station has had good results from buying the manure from livery and sales stables in New Orleans and having it shipped out in cars. The cost of handling such manure and of hauling to the farm prevents the paying of any considerable price for it in the city.

This station has conducted hundreds of tests with fertilizers under all classes of truck crops, and the following sums up our opinion as to the need of the average truck crop grown on these soils: such crops require rather high percentages of nitrogen and this should be furnished in part by nitrate of soda, which is immediately available, and in part by some nitrogen carrier like cottonseed meal or sulphate of ammonia, not so readily available, which will feed the plants after the nitrate of soda has been used up. With the truck crops occupying land a considerable time, such as cabbage or Irish potatoes, it is usually best to apply the nitrate of soda as a top dressing to the growing crop. On all the soils of the long-leaf pine belt liberal applications of phosphorus should be applied, and in nearly all instances we recommend acid phosphate as the source of this phosphorus. Such applications of acid phosphate may be made some time in advance of planting, as there is little danger of its leaching out of the soil if there is a fair amount of clay in the subsoil. If the land is rolling, however, there is danger of its washing off over the surface. The majority of experiments conducted at the McNeill Station have not shown the need of potash under truck crops and we do not advise its general use. We will say, however, that this is contrary to the teaching of most agriculturists, and we suggest that each individual grower satisfy himself as to the need of potash on his soils by conducting simple field tests with fertilizers with and without potash in them. At this station we have usually obtained good results by applying to the grosser feeding truck crops, like cabbage, turnips, beets, Irish potatoes, asparagus and onions, a mixture of 500 pounds of acid phosphate and 250 pounds of cottonseed meal before planting or setting, using about one hundred pounds of nitrate of soda as a top dressing.
later. For plants like snap beans, tomatoes, and sweet potatoes, one-half these quantities is sufficient, to be applied in much the same way.

Insect pests and fungous diseases are very bad in this section, and there has been no crop tried here that has been entirely free from some trouble of this kind. Our mild winters and extremely wet summers are very favorable to both, and the most difficult part of the whole problem is that frequent rains make spraying against these pests very unreliable. San Jose scale is pretty well distributed throughout the section, and two years’ experience here in spraying against this trouble convinces us that it is impossible to kill it out entirely and that to grow fruit will require annual spraying. The curculio is also very destructive here, and if not successfully combatted it will frequently ruin every peach or plum in an entire orchard. Also, the peach tree borer is likely to ruin the peach and plum trees unless constantly fought, and even then it will do serious damage. On the whole, experience at the McNeill Station has been rather discouraging to the growing of tree fruits with the exception of figs, oranges, pecans, and certain varieties of pears. Grapes have done only fairly well, but may be made to succeed with moderate spraying with Bordeaux mixture to keep down black rot and other fungous diseases. The scuppernong does remarkably well and has shown no pronounced tendency to trouble of any kind. We have had serious trouble here with nematodes on the roots of both fruits and vegetables, and we have never been able to do anything to control it further than to change the crop.

**Apples.**—Soon after it was established this station set out an experimental orchard for testing varieties of apples, pears, peaches, and plums. While the apple trees lived for several years and bore some fruit, not a variety promised to be worth any thing, and the trees, having become infested with scale, were finally destroyed. Evidently we are too far south for the apple to thrive. These apple trees grew very slowly and always appeared stunted, while peach trees grown on the same character of soil and just a few steps away made a remarkably good growth.

**Peaches.**—Some thirty odd varieties of peach trees were set out on the station farm, and in addition to these, one hundred trees were used to test the fertilizer requirements of the crop. We have never seen trees grow more rapidly or have a healthier appearance than these peach trees for the first three years. They appeared to be doing so well that an additional orchard of one thousand peach trees was started. About this time San Jose scale appeared in a neighbor’s orchard two
miles away and within a year appeared in ours. The trees were sprayed
thoroughly for two winters, but frequent rains made it very unsatis-
factory. Even tho we tried to spray when the weather appeared to
be favorable, it would nearly always rain within twenty-four hours
and largely wash the mixture off. A number of these trees were
killed outright by scale and nematodes, together with what appeared
to be crown gall. These troubles, along with borers, so weakened
the trees that fully half of them died outright, and the rest were pulled
up and burned. General experience of others in this section is that
peach trees grow off rapidly, do well for a few years, and then gradu-
ally die down. The writer has seen a few seedling orchards that have
attained considerable age, but the fruit from such orchards could
be used only for home consumption and not as a market crop.

Plums.—Almost the same work done with peaches was carried
on with plums with practically the same results. In addition to the
troubles of the peach, the plums were badly damaged by the cur-
culio. A variety orchard of some fifty plum trees and a commercial
orchard of five hundred trees had to be destroyed after a large per-
centage of them had died. In isolated cases the writer has seen some
very fine plum trees in this community which have born perfect fruit
of the best quality.

Pears.—Certain varieties of pears do fairly well here, and the
fruit seems to have fewer enemies than peaches and plums. Blight
is a serious trouble, but is apparently no worse than in other sections
of the state. A number of small pear orchards are to be found here
that have attained considerable age, and even with the neglect that
they usually receive, have continued to live and bear fairly good fruit.

Figs.—This section is the natural home of the fig. The crop
generally does remarkably well when grown under back-yard condi-
tions, but very poorly when cultivated in orchards. This is evidently
due to some insect or disease affecting the roots of the fig which thrives
when the ground is kept soft around the trees, but which is retarded
by the packed conditions of the soil in yards or similar places. In
thickly settled communities there is no reason why the fig crop should
not be made to pay handsomely in this section for canning purposes,
but the fruit is rather too perishable to be shipped for any considerable
distance. Along the coast a good many figs are canned and the price
paid for the fruit ought to make the production of it profitable.

Grapes.—Several varieties of grapes are now being grown at the
station and have done fairly well. We believe that in the hands of
experienced growers this crop can be produced successfully, but, as
in other parts of the country and state, it will be necessary to spray.
A fairly good quality of this fruit has been grown here this year without spraying, but such fruit would hardly sell on the markets in competition with grapes of other sections. Scuppernongs grow here perfectly and require no spraying, but we have found that pruning is quite as helpful to them as to other grapes.

**Pecans.**—Several varieties of pecan trees were set out at this station in December, 1902, and while a number of them have died, there are now growing several very fine trees that have made an immense growth. The trees planted were budded and of good size to begin with. The best of these trees bore a few nuts in 1911 but not enough to be of any commercial value. None of the trees bore at all in 1912, nor have we been able to find any fruit on these trees up to the first of August, 1913. These trees were planted on a plat of ground that seven years later had to be used as a pasture for cattle, and the trees were scarred up somewhat by the cattle, but not enough to injure the growth apparently. If the time required for these trees to begin profitable bearing is indicative of what is to be expected from commercial orchards, the benefits to be expected from a pecan orchard here, even though good in the end, will partake of the nature of a life insurance policy. A seedling pecan orchard owned by a neighbor of ours was large enough ten years ago to prevent the cultivation of the land on which the trees were growing, and while this orchard has produced some fruit every year since that time, there has never been enough to pay interest on the investment. This experience and observation make us hesitate to recommend pecans to persons compelled to have an income on their investments for current needs, but even the poorest man should have some pecan trees around his premises to serve as shade, with the final hope of their being a producer of revenue. No tree makes a better or prettier shade, and they grow here to perfection.

**Mulberries.**—While the mulberry has no market value and could hardly be classed as a truck crop, it grows here remarkably well and continues to bear throughout the months of spring and early summer, furnishing an appetizing fruit for the family and a good supplementary feed for chickens and hogs. The trees, too, furnish a good shade and have no serious insect enemies that we have observed, a thing in itself remarkable.

**Strawberries.**—We regard the strawberry as the most reliable of all the small fruits for this section, and experience at this station in growing them for several years has been, on the whole, quite satisfactory. In fact, some of the best berry sections of the entire South are on lands similar to ours, in the country along the Illinois Central
railroad, in the Florida parishes of Louisiana. In that section the strawberry crop alone brings in annually more than one million dollars and is produced very largely by Italians. So far as we are able to judge the lands of this section should grow as good berries as the Louisiana lands, if not better, for the reason that our land is better drained. The picking of a berry crop requires a great deal of labor that should be trained for the work, for success depends largely on the picking and packing of the fruit. Suitable labor has been the most serious obstacle to growing the crop at this station, and the difference between the berries picked from the same rows by good pickers and bad pickers has frequently been greater than one would think. In fact, we know of no crop the success of which depends so largely on labor as does the strawberry, and for this reason our population will have to change materially before it becomes a popular crop with us.

This station has conducted a large number of experiments with fertilizers under strawberries, and with varieties as well, and has given results from time to time in its annual reports. The strawberry does not require a very rich soil, as compared with other truck crops, and it should by all means be grown on land free from such grasses as bermuda, coco, and crab grass. The plants are hard to clean at best, and for some time during the picking season they cannot be cultivated at all on account of the danger of ruining the fruit with sand or grit. If such grasses are plentiful the cultivation of the plants will be both expensive and damaging to the stand. An ideal preparatory treatment for land in this section on which strawberries are to be grown is to plant on it the season before a crop of cowpeas or velvet beans, which would shade out crab grass and leave the land free of the seed. Even freshly cleared lands here have been used with marked success, depending on commercial fertilizers entirely to furnish the plant food required. Old fields that have been lying out for several years and have come up to lespedeza are ideal places in which to plant strawberries.

The method of preparation and planting as pursued at this station is about as follows: Thoroughly break and harrow the land some time in advance of setting out the plants; lay off into rows about three and one-half feet apart and two-furrow these with turn plow; place on top of this list one-half the annual application of commercial fertilizer; mix this thoroughly with the soil by running over it with a top harrow of some kind; complete the beds with two or more furrows from turn plow and knock down with harrow or implement of some kind to where the beds are only slightly higher than the average of the field. The land is then ready for the plants, which may be set
any time during fall or winter. Plants shipped from a distance will have to go into winter quarters before it will be safe to ship them, on account of their heating badly while still sappy. Plants that do not have to be closely packed may be moved much earlier, and when plentiful, may even be set out in summer and be expected to bear the following spring. Ordinarily a crop of berries cannot be expected the spring following planting. When the picking season is over in the spring, the rows are barred off so as to leave only enough plants to grow through the summer and make new plants for the succeeding year's crop. The plants are then fertilized with one-half the annual application and the middles thrown out after hoeing. After this they are cultivated pretty much as you would cotton and allowed to make new plants. In the fall, if the plants have done well, there will be many more on the land than will be best to leave, and these should be taken for planting additional land or for marketing. The method described is known as the matted-row system and is the only one we have tried here.

Experience at this station has been that raw ground bone is one of the best fertilizers for berries. This furnishes nitrogen and phosphorus in about the proper proportions, and being slowly available, comes into solution gradually and feeds the plants as they need it. The following table gives results of several years' work here with fertilizers under berries. This work was carefully done and daily pickings of berries measured for weeks during each picking season:

<table>
<thead>
<tr>
<th>Plat.</th>
<th>Cotton Seed Meal</th>
<th>Acid Phosphate</th>
<th>Kainit</th>
<th>Lime</th>
<th>Yield of Berries in Quarts per Acre.</th>
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<tbody>
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<td>1904</td>
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<tr>
<td>1</td>
<td>210</td>
<td>228</td>
<td>96</td>
<td>0</td>
<td>3980</td>
</tr>
<tr>
<td>2</td>
<td>210</td>
<td>228</td>
<td>96</td>
<td>200</td>
<td>4000</td>
</tr>
<tr>
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<td>0</td>
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<tr>
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<td>210</td>
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<td>0</td>
<td>0</td>
<td>3930</td>
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<tr>
<td>6</td>
<td>210</td>
<td>0</td>
<td>96</td>
<td>0</td>
<td>3550</td>
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</tbody>
</table>

Berries have been grown here for four years in succession on the same land, and have been marketed largely in the towns along the New Orleans and North Eastern railroad at prices quite remunerative. A few shipments to Birmingham, Chattanooga, and Cincinnati were marketed profitably, but having been grown in less than car lots, shipments so far away are likely to reach the markets in bad condition. Unless berries can be grown in quantities sufficient to ship in car lots under refrigeration, we cannot recommend them as a money crop except under such conditions as confronted us here when the station
was first established. At that time local growers around the nearby towns had not begun to supply their home markets.

**Oranges.**—In January, 1908, four varieties of citranges were sent here by the U. S. Department of Agriculture to be tested. They have made a fairly good growth, but have never borne any fruit of any consequence and have only a few oranges on them this year. In the fall of 1911, some two hundred and fifty orange trees were put out, including seven different varieties and a large number of satsumas. These trees are growing well, and some of the better grown ones among them have set some fruit this year. Already we note serious trouble with sooty fungus, especially on the citrange trees, which indicates that to grow the fruit successfully they must be sprayed. The writer has seen some as nice oranges as were ever shipped to McNeill growing on trees in this community, and the fruit should be generally grown for home use if not for market. The winters here are seldom cold enough to kill the trees, and such a degree of cold has not occurred here since the station was established. Even if the temperature should go low enough to kill the trees, they can be banked in winter so as to protect the lower part of the trunk, from which new growth would spring and soon replace the part killed.

**Other Small Fruits.**—Dewberries, blackberries, and raspberries have been grown at this station in a small way. The first two grow wild in great quantities, and we see no reason why they should not prove important market crops; but varieties suitable to the section would have to be selected, as the kinds we tried did not do so well as native kinds. We had almost no success with raspberries. Doubtless in the hands of a good plant breeder native blackberries and dewberries could be developed and improved to the point of being important market crops for this country. Dewberry culture in some sections of North Carolina ranks with strawberry culture.

**Asparagus.**—If it were not for the fact that several years are required to get money returns from an asparagus crop, it is one that should appeal to the small truckers of this section. It grows fairly well, and requires little attention except during the shipping season. Being light and relatively high priced, it is almost always shipped by express, so that any quantity may be grown and marketed in competition with more favorably situated places. It is a crop that requires a rich soil to begin with and expensive fertilization every year. In our long growing season the crowns will grow large enough in a single season for planting in the permanent rows. At this station we have grown these crowns from the seed with pronounced success. A single year’s growth in this section will develop crowns fully as large as the
two-year-old crowns of the north. Land on which asparagus is grown should be prepared very deeply so that the crowns may set sufficiently under the ground to prevent their growing to the surface in a few years, as they will do if planted shallow. At this place the permanent rows have been put about four and one-half feet apart and have been opened with several furrows from a large turn plow followed by a middle burster. Even after these operations it is well to follow with shovels and get out the loose dirt. The fertilizer used should be placed in the bottom of this furrow, and with the plow mixed well with the soil. The crowns are then placed in the bottom of the furrows from twelve to fifteen inches apart, properly spread out and covered with turn plows. This should be done in the fall, and the succeeding year’s growth will usually develop the crowns to the point where they will be strong enough to produce marketable grass the succeeding spring. During the shipping season these stems must be cut every day, and tied into bundles. The bundles are placed twenty in a case and shipped to the market, where it usually brings fancy prices for several weeks. Nearly all the asparagus grown at this station has been shipped to Chicago, at which point it brings as good prices as asparagus from any other place in the south. In the winter of each year, just before the crowns begin to send out shoots, the rows are barred off and given an application of fertilizer.

Tests with fertilizers under this crop have been carried on at McNeill for years, and the following table gives the results of this work:

<table>
<thead>
<tr>
<th>Fertilizer—Pounds per Acre.</th>
<th>Yield of Asparagus per Acre.</th>
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</thead>
<tbody>
<tr>
<td>Plats</td>
<td>Cottonseed Meal</td>
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<tr>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>256</td>
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<tr>
<td>2</td>
<td>256</td>
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<tr>
<td>3</td>
<td>128</td>
</tr>
<tr>
<td>4</td>
<td>256</td>
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<tr>
<td>5</td>
<td>512</td>
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<tr>
<td>6</td>
<td>0</td>
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The above tests were conducted on six plats of land of one-sixteenth acre each, which, in January, 1904, had been broken and subsoiled to a depth of eighteen inches, and laid off into plats one foot apart. There were two rows to the plat and these were opened to a depth of eight inches, fertilized, and Palmetto asparagus crowns, grown from seed planted here the fall before, were placed fifteen inches apart in the drill. When planted this asparagus was fertilized with
cotton seed and cottonseed meal, but the next year this was changed so as to give the same amount of nitrogen in the form of cottonseed meal and nitrate of soda. Evidently the blank plat above, No. 6, got some fertilizer from the other plats, for it is not possible that asparagus planted here in a field to itself and never fertilized would make any thing at all. As a matter of fact the quality of the crop grown on this blank plat was very poor and so stringy as to be worth very little. During the last few years asparagus rust was very bad on this crop, and this, together with the crowns coming too close to the surface, caused us to plow up the patch the present year.

**Beans.**—Perhaps the least expensive and the most easily grown of all truck crops is the snap bean. It does well on soils of medium fertility and does not require heavy applications of fertilizers, though it responds as readily as most other crops to good soils. This crop occupies the land only about seventy-five days from the time of planting, and since about the first of March is the average date of planting in this section, it can be grown and marketed in plenty of time to grow afterwards first-class crops of potatoes, corn, cowpeas, and other field crops. The seed are rather inexpensive, and no great skill is required to grow and market the crop. This station has done a lot of experimental work with beans and has also grown the crop for demonstration. A special pamphlet has been issued on the subject as Bulletin No. 131, which can be had for the asking. While by no means a complete treatise on the subject, it is complete enough to meet the requirements of the average trucker.

**Beets.**—Beets sown in this section in the fall and allowed to grow in the open field in fall and winter have proven a fairly reliable truck crop. On October 10th, 1906, one-third of an acre of land of medium fertility was planted to Egyptian Blood Turnip Beet seeds in rows three feet apart. The weather being dry, the ground was thoroughly rolled to induce germination. About half of these seed came up promptly, but the other half lay dormant in the soil and did not germinate until six weeks later, after a rain had fallen. Old and young plants grew off well, though the difference in age caused the marketing period to be unduly extended. The cold weather interfered little with these beets, and we began shipping on January 15, realizing from the one-third acre, $70.76, after paying express and commission. The beet requires a rich soil, and like most other truck crops, it does not pay to grow them except on good land.

**Cabbage.**—The cabbage is one of the staple truck crops grown almost universally in trucking communities, besides occupying a prominent place in all the home gardens. It is an extremely old vegetable,
with an origin possibly in southern Europe, where it is found growing now in a wild state." So much has been written about the cabbage that the writer can hope to add little to the sum total of knowledge concerning it, but hopes here to condense the essential facts about its growth into convenient form for the benefit of any one who may grow the crop in South Mississippi. The information here given is derived from various sources, but is based largely on results with this crop at the McNeill Experiment Station during the past eleven years.

The cabbage is quite a hardy plant, but is a gross feeder. It will stand abuse if in the end it finds an abundance of plant food and a damp cool climate in which to develop. The crop will not stand very much hot dry weather, and whether grown as a winter or spring vegetable, it should be developed chiefly in the cool months of the year. It will stand a great deal of cold, especially when the plants are of good size and have been gradually hardened to it. A very slight freeze will kill hot-bed cabbage, but a temperature of twelve to thirteen degrees below freezing has not injured the crop in this section when the plants have been developed in the open field.

The McNeill Experiment Station has grown cabbage every year since it was established in 1902, frequently raising both a winter and an early spring crop, and has conducted a number of tests with them largely to determine the fertilizer best suited to the crop. Like all truck crops, it has failed at times to be profitable. There are years when, after the crop is made, it will fail to pay the cost of cutting and shipping, and when, unless there is livestock on the place to consume it, the crop will prove an expense to get off the land. Such an undesirable conclusion is much more apt to happen here with the spring than with the winter crop. In addition to the bad effects of the hot spring days on the growth of the crop, droughts are then more prevalent and insect pests much more active.

The method usually followed in propagating cabbage is to plant the seed in hot bed or cold frame some weeks in advance of the time the plants are to be set in the field. For the spring crop this is done to protect the tender plants against cold, and for the winter crop, to protect them from the scorching rays of the sun. Our most successful crops of fall and winter cabbage have been made by planting the seed directly in the field where they are to grow, afterwards thinning the plants to a stand just as you would cotton or corn, and using the surplus plants if necessary to set out additional land or to sell if a market can be found. In this way the crop is not set back by transplanting, and the laborious task of setting them out is at least partially avoided. Cabbage seed planted in cold frame, or in some spot that may be
shaded, in late August will be ready for transplanting in early October, or, if planted in hot bed or cold frame in November, it should be ready for transplanting early in January. In the mild winters of this section cabbage plants may be developed in the open field at a very small cost, and we see no reason why we might not compete successfully with the coast country of South Carolina in growing frost proof cabbage plants for market. In fact, we have grown such plants here for several years, but have sold them only in the local market.

The cabbage and its closely related species, such as cauliflower, collards, kale, kohlrabi, rape, and turnips,—all of which are successfully grown here,—require very rich soils, and while commercial fertilizers must be used under them, we should not make the mistake of depending entirely on purchasing in a sack the plant food they require. Humus is more important in crops of this class than it is with most others, and it cannot be economically added to a soil with commercial fertilizers. Land on which such crops are to be grown should preferably first be built up with heavy applications of animal manures, obtained either by penning cattle on the land or by hauling the manure to the field. In addition to this, frequent crops of cowpeas or velvet beans should be grown on the land and turned into the soil to supply additional humus. The quickest way by which we have ever been able to build up these soils is to grow a crop of corn and velvet beans, gather the corn, graze off the beans after frost with dairy cattle, turn under the litter and droppings from these cattle, and then on the succeeding crop use a fertilizer rich in phosphorus. In this way land which had a productive capacity of only twenty bushels of corn per acre was built up in one year to produce more than sixty bushels per acre. Besides, the grazing off of the beans was worth eight dollars an acre to the cattle. A number of tests have been made at this station, to determine the fertilizer requirements of cabbage, and as good results as we ever had were got from a mixture of 500 lbs. of acid phosphate and 250 lbs. of cotton seed meal applied just before the cabbage were planted, and supplemented by about 150 lbs. of nitrate of soda, given in two applications during the growing season and worked into the soil as the cabbage were being hoed or cultivated.

As a concrete illustration of what may be expected in this station from a crop of winter cabbage we give the results of one year's experience in growing the crop as reported in bulletin No. 158 of this station.

In 1909, land where strawberries had grown in the spring and early summer was well prepared when the berries were plowed up, and kept in good tilth for several weeks in advance of planting the cabbage. On August 25th this land was laid off into three-foot rows.
These were two-furrowed, and a mixture of acid phosphate and cottonseed meal applied on top of this list and harrowed in with an orchard harrow. The beds were then completed by throwing out the middles with a turn plow and immediately harrowing down until the heads were only slightly higher than the average of the field. These rows were then opened with a garden plow, and Charleston Wakefield cabbage seed were sown by hand on August 27th and covered by hand with garden rakes. The field was then rolled with a two-horse land roller, and this was followed by a weeder to leave a light dust mulch. One and one-quarter acres were sown in this way and the seed soon came up to a perfect stand. On October 8th these cabbage were thinned out to a stand, and the surplus plants were used to set out additional land. There were enough of them to plant an additional one and three-quarter acres. The land on which the plants were set was not nearly so well improved as was the land planted in seed, and produced considerably less than half the total yield of the entire patch. We began cutting these cabbage on December 9th and continued to cut them up to March 11th. From the three acres there were sold 294 standard crates for shippers, yielding net returns of about $340.00. A good many of the poorer stalks and the lower leaves and stalks from the heads that were shipped were hauled out from time to time and fed to dairy cattle, perceptibly increasing the milk flow. The winter of 1909-10 was as cold as the average winter in this section, the thermometer going below freezing a number of times and as low as 20 degrees during the latter part of December, yet not one of these cabbages was killed by the cold. Considerable quantities of winter cabbage have been grown at this station several times since this experiment. We found top dressings of nitrate of soda very helpful to all these cabbage.

On the whole, we believe the winter crop of cabbage is more reliable in this section than the spring crop. It requires less work, insect pests are not so bad, droughts are not so damaging, and we believe the markets for them are more reliable. A good many winter cabbage may be marketed in the towns of our own state at better average prices than the cities of the North will pay. The cabbage worms are very destructive to spring cabbage, and they will sometimes get pretty bad on the fall crop before cold weather begins, but usually they disappear when winter sets in. These insects can be controlled by dusting a mixture of one part Paris green to sixteen parts of flour over the cabbage while the dew is on. After the crop begins to head use a mixture of about two parts flour and one part powdered white hellebore. However, they are difficult insects to
combat successfully, as they work between the leaves of the cabbage in such a way that poisons cannot reach them. The Harlequin cabbage bug sometimes becomes very bad in this section on the spring crop. While there are a number of ways that are recommended to combat him, we have never been able to fight him very successfully except by hand picking, and this is very costly. Remedies for controlling all the insect pests and fungous diseases that are destructive to crops in this section may be had from special bulletins dealing with these subjects, written by practical men who have studied the problem here with us. These bulletins may be had from the Mississippi Experiment Station for the asking, and should by all means be in the hands of all persons who attempt to grow truck in southern Mississippi.

**Irish Potato.**—The potato is closely related to several poisonous plants, such as henbane and belladonna, as well as to such edible plants as the tomato and egg plant. At certain stages of its growth, notably when exposed to the direct rays of the sun and allowed to green over, it develops a poisonous substance that may be used to kill vermin. The potato is of American origin, having been introduced first into England and then into Ireland some time after the discovery of the New World. In Ireland, it became so necessary a food product that it soon took the name of Irish potato, by which it is almost entirely known to us. The potato is propagated altogether from cuttings of the tuber, but many new varieties have been originated from the seed, which, however, will by no means reproduce the parent plant with any degree of certainty. It is more universally grown than any other vegetable or food crop, and we seldom find a farm or homestead that does not produce potatoes in a small way at least. The potato adapts itself to a wide range of soil conditions, the best potato soils being sandy or clay loams, always with clay subsoils. The sand loam soils, such as the ones of this section, while frequently less productive than heavier lands, are more conducive to early development, and therefore to growing this crop for early markets.

The potato is a deep feeding plant and naturally the land on which it is grown should be plowed deep, four inches being about the depth at which the seed potatoes should be planted. This does not necessarily mean that the land should be subsoiled. On the contrary results at this station indicate that it does not pay to subsoil these lands even for the potato. But the soil should be plowed as deep as it will stand with an implement that pulverizes it thoroughly. At the same time some kind of organic matter should be turned under to decay and form humus. In this section we do not believe a better preparatory treatment of the soil for potatoes could be given than to
plant a crop of velvet beans, graze it off with cattle, cut up the remaining litter and droppings from the cattle with a disc harrow, and turn it all under with a disc plow at least an inch deeper than the land was ever plowed before. Such treatment will give life to the soil as deep as the plow goes, and is good for potatoes as well as for any other crop.

Commercial fertilizers will of course have to be used to supplement the manures and restorative crops. The general impression has always been that potatoes require a fertilizer with a high percentage of nitrogen and potash and a relatively low percentage of phosphoric acid. Numerous experiments here have so far gone to show that the addition of potash to a fertilizer for potatoes has not materially increased the yield, and we believe similar results were obtained at the East Texas station. Evidently, therefore, the soils of South Mississippi and East Texas differ from those of the states farther east, since nearly all of these recommend for all vegetable crops, and especially for potatoes, a fertilizer with a high percentage of potash. For potatoes fresh animal manures are likely to prove harmful, as they are conducive to the growth and spread of scab, though they do not cause it. Such manures should be applied to a previous crop or sufficiently in advance of planting the potatoes to allow it to rot thoroughly. This station has conducted a number of experiments with fertilizers under potatoes, the work having been done before the soils were improved to any extent by restorative crops and before they had received any animal manures. The following table gives these results in detail, calculated in pounds of fertilizer per acre and in bushels of potatoes, though the plats were actually one-twentieth acre in size:

<table>
<thead>
<tr>
<th>Fertilizer—Pounds per Acre.</th>
<th>Yield in Bushels per Acre.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1903</td>
</tr>
<tr>
<td>1</td>
<td>214</td>
</tr>
<tr>
<td>2</td>
<td>107</td>
</tr>
<tr>
<td>3</td>
<td>107</td>
</tr>
<tr>
<td>4</td>
<td>214</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>107</td>
</tr>
<tr>
<td>7</td>
<td>214</td>
</tr>
<tr>
<td>8</td>
<td>107</td>
</tr>
</tbody>
</table>

The Bliss Triumph is about the quickest maturing of all the varieties of Irish potatoes that do well in this section. It more nearly
meets the demands of the northern markets for which they are grown on account of their red color, but really they are not so good either in flavor or in yielding qualities as some of the other varieties that mature a few days later. Results here have shown the Peerless and Burbank decidedly better yielders, as will be seen from the following table. As a rule the Triumph should be ready for market in from one hundred to one hundred and ten days after planting, the Peerless and Burbank perhaps two weeks later, and the Early Rose and Early Ohio between these dates. The time of planting varies with the season and the latitude, of course, but in this latitude we have found that the potatoes will mature as early when planted the first of February as if planted a month earlier.

The following table gives the name and the yield of potatoes calculated in bushels per acre, the work having been done on plats of one-twentieth acre each:

<table>
<thead>
<tr>
<th>NAME</th>
<th>Yield 1904</th>
<th>Yield 1905</th>
<th>Yield 1906</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peerless</td>
<td>163</td>
<td>103</td>
<td>119</td>
</tr>
<tr>
<td>Tennessee Triumph</td>
<td>146</td>
<td></td>
<td>52</td>
</tr>
<tr>
<td>Burbank</td>
<td>182</td>
<td>166</td>
<td>111</td>
</tr>
<tr>
<td>Early Ohio</td>
<td>127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Rose</td>
<td>137</td>
<td>73</td>
<td>113</td>
</tr>
<tr>
<td>Hebron</td>
<td></td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Rural New Yorker</td>
<td></td>
<td>197</td>
<td></td>
</tr>
</tbody>
</table>

We prefer always in spring to cut the seed potatoes before planting even though they are quite small, for experience at this station has shown that the cut potatoes sprout from one to two weeks quicker than whole potatoes. The size of the seed piece planted is also quite an important item. While the smallest piece will sprout well, the young plant has to depend for some time on the food stored in the mother potato; and if these are small, the young plant necessarily suffers. Reference to the table following will show that at McNeile we have gotten increased yields for every increase in the size of the seed piece; and from these results and other observations in growing the crop, we have concluded that eight or ten bushels about represents the most economical quantity of seed for planting an acre.

<table>
<thead>
<tr>
<th>Year</th>
<th>Size of Seed Piece</th>
<th>Pounds Required to Plant Acre</th>
<th>Yield Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1904</td>
<td>One-quarter (size guinea egg)</td>
<td>140</td>
<td>69</td>
</tr>
<tr>
<td>1904</td>
<td>One-half (size guinea egg)</td>
<td>310</td>
<td>80</td>
</tr>
<tr>
<td>1904</td>
<td>Three-quarters (size guinea egg)</td>
<td>540</td>
<td>97</td>
</tr>
<tr>
<td>1904</td>
<td>Whole potato (size guinea egg)</td>
<td>1200</td>
<td>108</td>
</tr>
<tr>
<td>1905</td>
<td>One-eighth (size hen egg)</td>
<td>350</td>
<td>97</td>
</tr>
<tr>
<td>1905</td>
<td>One-quarter (size hen egg)</td>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>1905</td>
<td>One-half (size hen egg)</td>
<td>860</td>
<td>137</td>
</tr>
<tr>
<td>1905</td>
<td>Whole potato (size hen egg)</td>
<td>1560</td>
<td>140</td>
</tr>
</tbody>
</table>
In tests here with home grown seed as compared to seed grown in Tennessee we have found that the potatoes grown farther north sprout quicker when planted and usually make better yields. The better yield may, however, have been due more to the fact that they got an earlier start than to their having been grown farther north, as the seasons in this latitude are usually more favorable in the earlier part of the growing season. Every crop of potatoes grown at this station has been attacked by the Colorado potato beetle. These beetles usually become much worse as the season advances, and while they may be controlled by arsenical dusts and sprays, these applications nearly always affect the foliage more or less.

Potatoes may be successfully grown in this section in the fall if the seed planted are first sprouted. This may easily be done by spreading them out in thin layers some weeks in advance of the time of planting, covering them lightly with sand, and keeping them damp for about two weeks before planting time. Fall potatoes should be planted here between the first and the fifteenth of July, or even up to the first of August. The potatoes from the spring crop that were too small to market make excellent seed for the fall crop. Irish potatoes grown in the fall are easily kept through the winter and are much less subject to rot than are the sweet potatoes.

Tomatoes.—During the first few years after this station was established a lot of work was done here with tomatoes, but on account of our excessively damp climate, particularly during the summer time, we found that rots and other troubles made the crop unprofitable. This would not apply to the entire long-leaf pine belt, but only to that part of it so near the coast as we are, about thirty-five miles. Records of the U. S. Weather Bureau show that a small strip of country extending along the Gulf coast from New Orleans to Mobile has a heavier rainfall than any other part of the United States except a certain part of Washington state along Puget Sound. In such a section as ours it looks a little like fighting nature to attempt to grow a crop so sensitive to fungous troubles as is the tomato, for such troubles are aggravated by damp weather. The tomato does fairly well here when planted on land rich in vegetable mold and fertilized with a substance with a high content of phosphoric acid; but even then the first and highest priced fruits will likely be destroyed by black rot, or what is generally known as blossom end rot. We have successfully controlled this trouble here by spraying with Bordeaux mixture, but this is expensive, and besides frequent showers interfere so seriously with its application and wash it off so badly when applied that we found this unreliable.
Onions.—The onion is one of the most reliable truck crops that can be grown in this section. It is comparatively free from insect pests and fungous diseases and can be grown during the fall and winter, when other farm operations are not so pressing. The crop requires a very rich soil and one particularly well supplied with humus. In fact, the best onion soils of the world are reclaimed marsh lands that are properly drained and are composed very largely of decayed organic matter. As for so many of the other vegetables mentioned here, the best preparatory treatment to be given a soil in this section for onions is to grow first a crop of velvet beans on the land and turn these under, then a crop of cowpeas during the early part of the succeeding year, either to be turned under or grazed off by cattle. The land for onions should be broken thoroughly several times during August and September and put in the very best mechanical condition. The onion seed should then be planted in the open field during the latter part of September in rows about thirty inches to three feet apart, after the land has been fertilized well with a heavy application of cottonseed meal and acid phosphate. Many more plants will come up than can grow on the land. These should be pulled out to a stand when they reach the size of a lead pencil, and may be used to set additional land. The young plants should be carefully cultivated and given an occasional dressing of nitrate of soda. They should reach full development about the latter part of April. They should then be gathered and stored or marketed as circumstances will determine. A good way to store them is to place them in regular onion crates which are piled so as to admit plenty of air and allow free circulation in a place as cool as possible. A potato house with double walls is a good place to store onions in summer. The white or yellow wax and the crystal wax are varieties that have done well in this section. Mr. J. J. Scarborough, of Poplarville, Miss., has been very successful in growing onions by the method just described.

Squash.—The squash is a crop that grows well in this section. A good many squashes have been grown in this part of the state and shipped along with beans to markets north of us where they have brought remunerative prices. The express rates are too high for such a bulky vegetable, so the crop has to be shipped by freight.

Cucumbers.—First-class cucumbers have been grown at this station repeatedly, but they have never been marketed at a profit, because the markets have been overstocked with greenhouse cucumbers grown in other places, particularly New Orleans. For pickling, this crop can be grown here at a profit. A large pickle factory has been started at Wiggins to handle the cucumbers grown in that com-
munity, but growing them for northern markets is quite different from growing them for pickling, and requires considerable expertness on the part of the producer. They are frequently badly injured in this section by a worm that bores into the fruit and ruins it for market.

**Melons.**—Several attempts have been made at this station to grow cantaloupes. Occasionally they have done well so far as the quality of the melons was concerned, but they have never been grown in quantities sufficient to ship by refrigerated freight, and the crop is relatively too cheap and heavy to be shipped at a profit by express. Besides, we have often failed completely to grow a cantaloupe that would sell at all on a discriminating market on account of worms that bore into the melon and cause it to decay. So bad have these worms been at times that we have failed to get a single cantaloupe fit to eat on the home table. These worms are very hard to combat successfully. At times we have failed utterly to keep them down, even when we resorted to all kinds of schemes to poison them, and even to hand-picking and to putting the melon when it formed into a paper bag. We certainly could not recommend such a crop as reliable for market, but it should be grown in the home garden.

Watermelons do well in this section. They have no serious insect enemies except the striped cucumber beetle, which at times injures the foliage considerably. There is no reason why melons might not be grown in this section and shipped in car lots to other markets, but it is a heavy crop and frequently will not pay the cost of moving, especially when they happen to come in a few days too late to catch the best markets. The writer believes that there is an opportunity in South Mississippi to grow a medium late crop of melons to be sold on southern markets after the crops of Florida and South Georgia have been sold. We know of a few men who have done fairly well with late melons which have been sold on southern markets. The water melon is generally grown in this section, but is sold entirely on local markets.

**Lettuce and Radishes.**—Both these crops may be grown in South Mississippi during the winter months, and a profitable industry has been built up along the Gulf coast at Long Beach and other points where the growers specialize on these two crops. We have grown these two crops and spinach at the station with marked success, but were never able to market them at a profit. There were several reasons for this: One was a lack of experience, but the main reason was that our place had no reputation on the markets, and the crops were grown in too small quantities to justify any systematic effort at finding suitable markets. The growing of all truck crops is attended with
considerable risks, for while the profits may be large, the losses too may be equally great. This is particularly the case in growing crops like lettuce and radishes in winter, when freezes are apt at any time to destroy them, and also where the profit or loss depends so largely on the kind of market on which they are sold. We could not recommend these crops to growers generally.

Conclusion.—The man who goes heavily into trucking and depends on it entirely is assuming a great risk, and a great many such men fail utterly in the end. At best it is a hazardous business, but when entered into in moderation and used along with other things to help out the farmer’s income, it can be made a profitable line of farming. Truck crops should be grown only on the best land and in an intensive way, but enough people should engage in it in a trucking community to enable them to ship largely in car lots, and if possible to induce buyers to come among them and purchase their products right on the ground. This is better than having an agent on the markets to sell their products for them after they are shipped. Trucking can be carried along with the production of staple crops. As a rule some crop can always be grown on the land after the truck crop is removed, so that if the first crop fails the second one may still be depended on. Where conditions favor trucking so far as shipping facilities go, they are apt in this section to favor dairying, and as has been said, no two lines of work ever fitted together so well as do these two. A great many truck crops may be grown in South Mississippi during the fall and winter, when the land might otherwise be idle and when the help in the dairy is not at work growing feeds for the cattle. But the man who begins such work expecting to make profits of one hundred dollars and more per acre, had best confine his operations to a few acres, or his volume of business will prove disastrous to him.