A Study of the Soils of Macon County, Alabama, and Their Adaptability to Certain Crops

Bulletin No. 25, 1913

By George W. Carver, M.S. Agr.
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A Study of the Soils of Macon County, Alabama and their Adaptability to Certain Crops

By G. W. Carver, M. S. Agr., Director

LOCATION AND BOUNDARIES

Macon County, "the garden-spot of Alabama," lies near the eastern boundary of the State, about 135 miles north of the Florida-Alabama line. It has an area of 621 square miles, embodying 397,440 acres. It is 34 miles in extent from east to west, and 24 ½ miles from north to south. The northern and western boundary lines are quite irregular.

COUNTY SEAT

Tuskegee, the county-seat, was laid out in 1833, and has grown steadily since the removal of the Indians in 1836. It is located in the north central part of the county, and is noted for its commanding location, beautiful surroundings, and the purity of its waters. Indeed, mineral water of no mean composition has been found here and there within its borders.

HISTORY

Macon County was named in honor of the illustrious North Carolina statesman, Nathaniel Macon, and was established as a county December 18, 1832, by act of the General Assembly of the State of Alabama.

CLIMATE

In this we have a condition that is well-nigh ideal, situated as we are in the Gulf--Costal plain. We have mild winters and hot summers, or the most favorable conditions for agricultural pursuits. The average growing season is about 251 days, wholly free from frost.

The following table, which covers a period of 13 years, gives the maximum (the highest) and minimum (the lowest) temperatures, together with the total rainfall, for each month, with the grand total for the year, bringing out the following interesting facts regarding the climate:

1. The mildness of our winters. (At no time during the 13 years has the thermometer fallen to the zero mark.)
2. There are about three instances only when the thermometer has risen higher than the 104-degree mark and at such times the whole country was suffering from a depressing heat wave. I have never heard of a prostration from heat within the county.
3. The rainfall has been remarkably constant in quantity, and
widely enough distributed throughout the month to make agricultural activities a success even in the hands of the intelligent amateur.

A study of the meteorological table, I feel sure, will prove interesting, as the data was taken right here at Tuskegee.

Situated as we are, crops often suffer for water, especially where scientific methods are not applied; but where the ground has been prepared good and deep, fertilized well with manure containing plenty of vegetable matter, and the crop followed by frequent and shallow cultivations, the crop can be tided over with little injury to it during the ordinary drought period.

SOILS

The soils of the county are exceedingly variable, and nearly every soil specialist has his own system of classification; but in the end they mean practically the same thing. I have, however, adopted the following as coming from the best authorities on this subject:

MULATTO, OR ORANGEBURG SANDY LOAM

This type of soil constitutes the major portion in and about Tuskegee, including the soils of Tuskegee Institute, with outcroppings of coarse sand, gravel, and numerous iron concretions. In some places indeed it blends into Norfolk coarse sand, especially in the vicinity of Tuskegee Institute and westward. I found the largest area to begin just south of the town of Tuskegee and continue to the western border of the county. Twenty-seven and five-tenths percent of the total area, or 110,144 acres, are of the above type.

SUBSOIL

The subsoil is quite variable, ranging from the intense oxide reds to yellow, purple, mottled, brown, etc. Quartz and gneiss stones abound in some places, and rather extensive ochre beds are not infrequent.

AGRICULTURAL POSSIBILITIES

Where the land is rolling (and most of it is) it washes badly, and constant care must be exercised to keep it from literally sloughing away and leaving great ditches, gutters, and bald places at the end of almost every hard rain. The prevention of this is best effected by the following methods:

(a) Properly constructed terraces to distribute the excess of water and cause it to spread over the ground in sheets rather than all rush to one or a few places which means more or less destructive washing.

(b) Put plenty of vegetable matter into the soil, such as leaves, straw, muck from the swamp, barnyard manure, in fact, all manure from the farmyard.

This causes the land to hold more water by absorbing it like a sponge. It also holds the soil particles together and takes up and holds the plant food put into the soil in the form of fertilizers, manures, etc. It further permits the air to circulate more freely through
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**Killing frost may be followed by spring-kill after March 15th. Fail an early November 16th.**

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the soil, encouraging the growth of soil bacteria, without which a successful crop could not be produced.

(c) Deep plowing, to let the water into the soil; to turn up to the surface and within reach of the plant much fertility that has sunken below the depth to which the roots of our ordinary farm plants penetrate. It also is a great insect destroyer—by turning under the eggs of hibernating (resting) insects deposited in the stems of weeds, under leaves, stones, trash, etc., of various kinds, deep down into the soil, where they perish. Likewise it turns to the surface many insects that hide away in the ground. This reverses Nature's process, and they, too, perish likewise.

**PREPARATION OF THE SOIL**

It is especially essential that this soil be properly prepared. In nearly all Southern soils we must recognize, as a rule both physical and chemical deficiency, the former being of quite as much, and often of greater, importance than the latter.

All plowing should be ultimately from 8 to 12 inches; and since any extreme is more or less dangerous, this depth should be reached gradually unless we have plenty of barnyard manure or its equivalent in vegetable matter, supplemented by the proper commercial fertilizers. Where land has been plowed real shallow, say 3 or 4 inches, it will pay to broadcast a liberal coating of leaves, straw, muck, and barnyard manure upon it. Plow this under four inches; run over it several times with a disc harrow; spread another application of manure on, the same as the first; plow under four inches deeper, making eight inches in all; harrow in the same way; put the commercial fertilizer in the drill as usual. If this has been thoroughly done a good crop may be expected. The soil can be deepened to advantage a little more next year. In using commercial mixtures aim at the following:

- 2 per cent nitrogen,
- 2.3 per cent ammonia,
- 8.0 per cent available phosphoric acid, and
- 2.3 per cent potash,

approximately requiring from—

- 80 to 120 lbs. cotton seed meal per acre,
- 40 to 60 lbs kainit per acre,
- 160 to 240 lbs acid phosphate per acre.

It is a good plan to feed the plants as they need it—by dividing the commercial mixture into two parts, putting half down at the time of planting, and the other when the crop is about half grown. This is easily and quickly done with a fertilizer distributor.

The farmer must never lose sight of the fact that nothing will build up the soil as quickly and permanently as barnyard manure; so therefore arrange to save just as much as possible. It is further important that the rows for planting are not run directly up and
down hillsides but so the furrows will catch and hold the water from a medium shower and check that of a heavier one.

CROP ADAPTATIONS

These soils are rather quick and responsive, and for the most part give up their water readily; and as rule the planting should be flat and the cultivation frequent and shallow (not more than two inches.)

The following crops seem to be especially adapted to this type of land. In arrangement I have placed them in accordance with their special adaptation to the soil the first named being those crops that most readily adjust themselves to the above type of soil:

FIELD CROPS.—Cow peas, sweet potatoes, corn, cotton, sorghum, German millet, peanuts, oats, barley, rye, wheat (not a sure crop), crimson clover, velvet beans, Lyon beans, hairy vetch, smooth vetch, white clover, yellow hop clover, Japan clover, cat-tail millet, teosinte, burr clover, alfalfa (an encouraging possibility), also brown corn and sweet clover.

GARDEN CROPS.—Onions, watermelons, cantaloupes, okra, squash, beets, lettuce, radishes, beans, English peas, turnips, rutabagas, kale, rape, cabbage, mustard, petsai, Swiss chard, endive, artichokes, cucumbers, white potatoes, cauliflower, peppers, asparagus, parsley, kohlrabi, leeks.

FRUIT CROPS.—Peaches—Early varieties: Mayflower, Sneed, Greensboro. Following these are: Carman, Camelia, Mamie Ross, Belle of Georgia, Chinese, Burke, Stonewall Jackson, Elberta, Matthew's Beauty, Lyndon Cling, Salway, and Stinson's.

APPLES.—In this section I found no apples that seemed at all promising except the Red June, Early Harvest, and Grim's Golden in the heavier soils.

PEARS.—Pears do well on these soils, except that some varieties blight seriously, both the blossoms and the twigs. Those that I found freest from blight were the Keiffer, Garber, Magnolia, Bartlet, Koonce, and Early Harvest.

The Duchess and LeConte are fine large pears, but they blight so seriously in this section that it makes the crop too uncertain; therefore they should not be planted.

PLUMS.—Of the Japan group I found the following varieties in excellent condition and all that could be desired: Red June, Abundance, Shire, Burbank, Chabot, and Wickson.

Of the Green Gague (Wild Goose) or Chicasa types, the varieties were so numerous, and the wild and cultivated sorts so intimately and almost inseparably blended into each other, that I have not attempted to classify them. It is sufficient to say that all do well.

GRAPE.—The following varieties of grapes were noted: Concord, Delaware, Scuppernong, Roger Hybrids (Heavy Fruiter),
Moore’s Early (good but shy in bearing), Niagara (very fine but a little uncertain as to crop), Amber, Brighton, and Ives are essentially the same as Niagara in bearing.

FIGS.—This splendid fruit deserves more extensive planting. I found these varieties doing exceedingly well: Brown Turkey, Brunswick, Celestial, Madeline, Magnolia, Green Ischia, and Black Ischia.

STRAWBERRIES do well on these soils, but considerable care must be taken or they will die out during the summer from excessive heat and drouth. I found many varieties doing well, but the following seemed to be the cream of the lot: Heflin’s Early, Klondike, Brandywine, Warfield, Haverland, Hoffman, and improved Lady Thompson.

BLACKBERRIES.—I found no cultivated sorts growing within the county, but the wild vines are luxuriant, heavy fruiters, and abound throughout the county; and I see no reason why the standard sorts should not thrive.

MULBERRIES.—Hicks, Downing; and White and Black English make splendid trees, heavily laden with fruit.

POMEGRANATES.—The Spanish Ruby, Subacid, and Sweet seem especially adapted to these soils.

NUTS.—Pecans, black walnuts, English walnuts, hickorynuts, and chestnuts seem to do exceptionally well. The chestnuts, however, seem a little shy in bearing.

ORANGEBURG CLAY

The largest area of this clay lies between Calabee and Cubahatchie Creeks, extending from La Place to Cotton Valley.

This same type of soil extends along Big Swamp Creek, directly east and north, running westward to Little Calabee Creek.

There are a number of smaller areas scattered over the southern half of the county. Some of these soils are underlaid with a sort of limestone, inclined to be marly in some places. Very often this soil is termed “hog-wallow,” but it is not the hog-wallow proper. Seventeen and five-tenths per cent of the total area, or 69,504 acres, are of the above type.

PREPARATION

This soil requires the greatest care in its preparation if the best results are to be obtained. It is especially important that the plowing be done deep and thorough. The portion designated as “hog-wallow” and “sandy clay” washes and gullies badly during heavy rains. In fact, the soil is quicky, and melts down almost like a sugar-loaf when wet.

When handled properly this soil yields remarkably well, but must not be plowed or cultivated when it is too wet. It also must be caught when the moisture conditions are just right, or neither breaking nor
tilling can be satisfactorily done. This is why so much of the land of this character has been abandoned.

It is especially important that plenty of vegetable matter be worked into this soil.

During long periods of dry weather the crop should be cultivated at least once every nine days, and just as soon after a shower of rain as you can get into it. Do not cultivate deeper than two inches. Fertilize exactly the same as for the preceding soil.

CROP ADAPTATIONS

All the crops mentioned for Orangeburg Sandy Loam will thrive in this; and it seems especially adapted to the growing of corn, cotton, sweet potato, cow peas, and peanuts.

I found very promising patches of alfalfa in the lime sections. Sorghum cane and broom corn do well where properly fertilized and cultivated.

NORFOLK COARSE SAND

constitutes 10.8 per cent of the total area, or 42,752 acres. The type of soil may be found from about a mile east of Tuskegee to five miles west of Society Hill, and in irregular bands along the upland to the south of Uphapee Creek. Its next occurrence is in a large body between Chowoca and Chewockeleehatchee creeks, extending to Pleasant Hill, Alliance, and Little Texas. This soil is very treacherous for crops. The season must be unusually favorable or the crops are more or less of a failure. This is due largely to the fact that the soil is very porous, which causes it to give up its water readily, and therefore is nearly always in a drouth-stricken condition.

CROP ADAPTATIONS

At present practically no crop is much of a success, sweet potatoes being the best. Even fruit trees, such as peaches, cherries, etc., give fair yields, but are short-lived.

NEEDS

The first thing this soil needs is plenty of vegetable matter, such as muck, leaves, straw, barnyard manure, green crops, etc., worked into it year after year until the whole sandy condition is changed to an alluvial soil. Then any of the crops designated for Orangeburg Sandy loam will not only thrive, but many will give superior yields in both quality and quantity. Peaches, pears, grapes, Chinese quinces, etc., will do exceptionally well. This is readily brought out by the farmer who has had foresight enough to take the above precautions. It is easy to see that his soil is becoming less droughty and hence more productive every year.
ADDITIONAL FERTILIZATION

In addition to the prime essential vegetatable matter, aim at the following:

1.9 per cent nitrogen,
2.3 per cent ammonia,
8.0 per cent available phosphoric acid, and
2.3 per cent potash,

which approximately can be had from the following mixture:

From 80 to 120 lbs. cotton seed meal per acre,
From 40 to 60 lbs. Kainit per acre,
From 160 to 240 lbs. acid phosphate per acre.

The feeding method should be practiced on these soils, or much of the fertilizer will be lost.

It is well to remember that, on this soil, large amounts of commercial fertilizers are more detrimental to the crop than beneficial, as it causes it to fire more readily, owing to a lack of vegetable matter in the soil and sufficient moisture.

NORFOLK GRAVELLY LOAM

This type of soil constitutes quite 14.3 per cent of the total area, or 56,900 acres. Its location approximately begins west and north, and including some of the Tuskegee Institute possessions, east beyond the Upahpee Creek to the county line beyond Notasulga, and within four miles east of Milstead. It blends almost inseparably into the Orangeburg Sandy Loam and Norfolk Coarse Sand, and on account of its being more open in texture, it is consequently more droughty and therefore less productive.

TREATMENT

Treat exactly the same as for Norfolk Coarse Sand, taking special care to work into the soil plenty of vegetable matter, with a view to overcoming its doughy and scalding propensities.

I think I have never seen soil respond more readily and more satisfactorily to such treatment than this. It produces a superior quality of sweet potatoes, as well as a satisfactory quantity (400 bushels have been produced on an acre). The sugar cane makes a very bright, pretty syrup; the best peaches are raised on these soils; pears and Chinese quinces (Quinceadonia) do well and yield abundantly up about Notasulga. I also found some very fine apples growing in this section. This soil, when built up, responds admirably to all kinds of truck crops.

LUFKIN CLAY

makes up 8.1 per cent of the total area, or 32,000 acres. This area constitutes the heavy red or yellowish red clay loam, which becomes so extremely sticky and gummy when wet.
The largest areas lie about 11-2 mile east of Chesson, and two miles east of Hardaway. This soil is naturally very productive, but unfortunately but few farmers know how to handle it. To the majority it is too wet or too dry, too hard or too soft to work; hence, it lies idle as a rule. Underdraining is the ideal thing needed, but some farmers are making excellent crops by working vegetable matter into it in the shape of leaves, straw, sawdust, muck, barnyard manure, etc.

I have in mind now a farmer who had about an acre of such soil on his farm. It had been originally used as a brickyard—it was even then full of brick-bats. Nothing grew upon it—not even weeds or grass, but after heavy rains water stood there for days upon it.

TREATMENT

He proceeded as follows, taking the land when it was comparatively dry:
1. Just as much leaves and tops from stripping the sugar-cane for planting as could be turned under with a good plow and two heavy mules, was put under to a depth of 8 or 9 inches.
2. It was disked well—crosswise, lengthwise, etc.
3. A heavy layer (from 5 to 6 inches) of leaves, muck, etc., from the swamp was spread over it and plowed in with a one-horse plow just deep enough so that it did not pull up the first layer.
4. It was disked again.
5. A layer of barnyard manure was applied now, the same as the leaves, muck, etc., and plowed in lightly so as not to interfere with the leaves, etc.
6. Disked again.
7. It was laid off, the commercial fertilizer put in, planted in cotton, and cultivated the same as the other part of the field. This area was noticeably better than any other part of the field in growth and yield of cotton.

The next year it changed hands and went back into those belonging to the old land-robber school, that of taking everything out and returning nothing. He has had it four years, and now this spot is the most productive of any in the field.

I can further testify to its value as portions of the Experiment Station have been built up in exactly the same way.

NORFOLK SAND

This area constitutes 5.5 per cent of the total, or 22,016 acres. It is found one-half mile west of Warrior Stand, and two miles north of Calabee Creek. This type of soil is poor, washes badly, and should be handled exactly the same as recommended for Orangeburg Sandy Loam.

NORFOLK FINE SANDY LOAM

constitutes about 5.5 per cent of the total area, or 21,952 acres. It is found six miles south of Tuskegee, and three miles south of La
Place—the principal areas lie along the upper courses of Calabee, Gubahatchee, Line, and Old Town creeks. The soil is rich and productive, but subject to overflow, which is its worst drawback.

Prepare, fertilize, and cultivate the same as for Orangeburg Sandy Loam—the yield, however, will be much better. Sugar-cane, broom corn, sorghum cane, pears, apples, and oats seem to do exceptionally well.

**NORFOLK SANDY LOAM**

occupies 2.4 per cent of the total area, or 9,408 acres. It is found near Tuskegee, and extends three miles east of Chehaw. In crop adaptation, fertilization, preparation, yield, etc., it is essentially the same as Orangeburg Sandy Loam.

**HOUSTON BLACK CLAY**

constitutes 2.2 per cent of the total area, or 8,576 acres. This small area is found one-half mile south of Edwards, and is known as “black prairie land.” It is very level and is inclined to be wet. Naturally the soil is very fertile, and the staple crops do well except in times of excessive rainfall.

Native grasses do well, especially Johnson grass, and, with proper draining, I am sure alfalfa would thrive. This section is especially adapted to stock-raising.

Deep plowing, proper draining, and moderate fertilization is all that is needed for the production of excellent crops.

**OCKLOCKNEE CLAY**

constitutes 1.2 per cent of the total area, or 4,800 acres. It occupies a small area 2 1-2 mile west of Milstead. This is probably the richest soil of the county, and in favorable seasons produces a bale of cotton and 40 bushels of corn (with the small application of 200 lbs. of mixed commercial fertilizer) per acre. It brings excellent truck, squash, cushaws, pumpkins, etc., in abundance. It is fine for sugar-cane, sorghum, and hay crops.

**MEADOW**

constitutes 4.9 per cent of the total area, or 19,328 acres. The so-called “meadow-lands” consist of nearly flat areas along streams, and is typical overflow land; so much so that rarely any attempt is made to cultivate it. Nearly all supports a dense growth of water-loving trees. It yields excellent crops when cleared, drained, and properly tilled, which, in essentials, does not differ from the Ocklocknee Clay.
HOW THE FARMER CAN SAVE HIS SWEET POTATOES

a very difficult thing to do. For this a well drained piece of land is selected which is slightly hollowed out—the size of the base of the desired bank. This is covered with leaves, pire-tag or straw.

BANKING POTATOES

The potatoes are piled up into a conical shaped mound around a piece of bark curled up, a board flue, or anything that will serve as a ventilator.

The depth to which the straw and earth should be put for this locality, and the cover should vary according to the severity of the climate. When large quantities are kept, potato houses seem preferable, and they can at all times be examined and the defective ones removed.

HOW TO CURE AND STORE THE SWEET POTATO

During the war this station along with many others, set out to find, if possible how to reduce the enormous storage losses which rendered the growing of sweet potatoes hardly thought of as a money crop.

There seemed to be no method which had an element of certainty about it as far as the farmer was concerned, and for this reason the Tuskegee Station has directed its efforts almost wholly along this line, with the following encouraging results:

(a) We found that there was little more excuse for the farmers to allow their potatoes to rot than their corn.

(b) That the fundamental thing in the saving of sweet potatoes is to cure it first.

WHAT IS CURING

By curing we mean to dry the moisture out of the potatoes to the point where they will give a little when pressed hard between the ball of the thumb and fingers.

HOW DONE

I always manage to dig my potatoes in a very dry time. Spread out very thinly in the shade where the air will blow over them freely. They may also be dried out by artificial heat, my method is as follows:

I took an ordinary wire screen door, took off the fine wire and covered it with large coarse wire, I put from two to two and one-
AND WAYS OF PREPARING IT FOR TABLE

half bushels of potatoes on this door which was placed in a window of an ordinary living room. The window was raised so there was a brisk breeze blowing directly over and through the potatoes. If dug in a dry time and the air is dry, three or four days are all that is necessary for medium sized potatoes. I then lay them very carefully in barrels without breaking or bruising any, spread a bit of coarse bagging over the top of the barrel. I have paid no attention to temperature, except to keep them always above the freezing point.

I put up four barrels every year and lost less than three potatoes to the barrel. Last year I lost four potatoes. I have some of the potatoes now, October 14th, 1920, just as sound as those I am putting away now.

Note what the Chamber of Commerce, Montgomery, Alabama, says about them:

October 1, 1920.

"I received the cured sweet potatoes you sent me, and appreciate very much thought. I have cooked and compared one with one of this year's crop, and readily noted the difference. I am convinced now of their superiority.

"I exhibited to our Board of Directors at their last meeting, and they were very much interested. Each cut a slice and ate it raw. They could hardly believe that the flavor and interior freshness could have been retained.

"On October 4th, I had dug nine bushels of Porto Rican potatoes, they were badly cut and bruised as I had them dug by outside labor in the same way the average farmer digs his potatoes, they were removed and placed on a screen in a window, rotting ceased and those slightly affected cured up nicely when the spoiled portion was cut off and the sound part placed in a good draft where the excess of moisture was carried away quickly."

NOTE:—Care must be taken not to cover the barrels or boxes up tightly or the potatoes will sweat and spoil.

AS FOOD FOR MAN

As a food for human consumption, the sweet potato has been, and always will be, held in very high esteem, and its popularity will increase as we learn more about its many possibilities.

There is an idea prevalent that anybody can cook sweet potatoes. This is a very great mistake, and the many, many dishes of illy cooked potatoes that are placed before me as I travel over the South, prompt me to believe that these recipes will be of value
HOW THE FARMER CAN SAVE HIS SWEET POTATOES

(many of which I have copied verbatim from Bulletin No. 129 U. S. Department of Agriculture). The above bulletin so aptly adds the following:

"The delicate flavor of a sweet potato is lost if it is not cooked properly. Steaming develops and preserves the flavor better than boiling, and baking better than steaming. A sweet potato cooked quickly is not well cooked. Time is an essential element. Twenty minutes may serve to bake a sweet potato so that a hungry man can eat it, but if the flavor is an object, it should be kept in the oven an hour."

No. 1, BOILED OR STEAMED

Boil or steam like white potatoes and without breaking the skin. If boiled, pour off the water as soon as done, cover the pot with a cloth and let stand on the back part of the range a few minutes before serving.

No. 2, BAKED

Scrub with a brush and rinse with water until thoroughly clean. Bake like white potatoes, without breaking the skin. When done break the skin in one place in the form of a cross, forcing the meat partly out, cap with butter and serve.

Potatoes from 1 to 1 1-2 inches in diameter, and from 5 to 6 inches long, are the most desirable for baking—the flavor seems to be far superior to the larger kinds, or the round or irregular sort.

No. 3, BAKED IN ASHES

In this method the sweetness and piquancy of the potato is brought out in a manner hardly obtainable in any other way. Select the same kind of potatoes as described above for baking; cover them with warm ashes to a depth of 4 inches, upon this place live coals and hot cinders; let bake slowly for at least two hours. Remove the ashes with a soft brush, and serve while hot with butter.

No. 4, FRIED

Cut in slices lengthwise and fry in deep grease, same as white potatoes. Care must be taken to not allow them to become hard and dry.

No. 5, CHIPS

Cut in thin slices, steam until nearly-done, allow the surplus water to drain off or dry between napkins, fry in deep fat to a light brown. This makes a fine breakfast dish. A little salt adds to its flavor.
AND WAYS OF PREPARING IT FOR TABLE

No. 6, PIE (EXTRA FINE)

Boil in skins. When tender, remove skins; mash and beat until light. To each pint of potato, add 1-2 pint of milk, 1-2 pint of cream and four well beaten eggs; add 1 1-2 tea-cups of sugar (less if the potatoes are very sweet). Add spice, cinnamon and ginger to taste; one ground clove will improve it. Bake with bottom crust only. The above is enough for five or six pies.

No. 7, SLICED POTATO PIE

Line a deep baking dish with a rich sheet of pastry. Parboil the number of potatoes desired. When two-thirds done remove the skins, slice lengthwise, very thin, cover the dish to a depth of 2 inches; sprinkle with ground allspice and a dash of ginger, cloves and nutmeg. To a pie sufficient for six people, scatter around the top in small pieces a lump of butter the size of a hen egg; add one teacupful of sugar and 1-2 teacupful of molasses. Add 1-2 pint of cream, dust a little flour over the top sparingly; cover with hot water, put on upper crust, crimp edges, and bake in a moderate oven until done. Serve hot, with or without sauce.

No. 8, GLACE No. 1

Boil and cut in halves medium-sized sweet potatoes, lay evenly in braising pan, baste with syrup and butter warmed together, sprinkle lightly with brown sugar, put in hot oven till brown, and serve in the syrup.

No. 9, GLACE No. 2

Cut in slices 1-2 inch thick, wash and place in deep saucepan; spread with butter; season with a little grated nutmeg and salt; moisten with broth or water, cover and let simmer over a slow fire for three-fourths of an hour, turning the slices so that they will glace on both sides. Serve with drawn butter or other sauce.

No. 10, SWEET POTATO COBBLER

Prepare the potatoes same as for No. 6. Proceed to fill the dish the same as for layer cake, rolling out the layer of dough quite thin and spreading the mixture on in layers about 1-4 of an inch thick. Proceed until the dish is full; add to each layer just enough water to cook the layer of crust. Bake until thoroughly done, and serve hot with drawn butter or hard sauce.
HOW THE FARMER CAN SAVE HIS SWEET POTATOES

No. 11, WITH ROAST BEEF No. 1

Roast the beef and make a brown gravy. Take sweet potatoes of medium size, previously baked; remove the skin, and garnish the dish with the potatoes. Serve the potatoes with the beef.

No. 13, WITH ROAST PORK

Parboil the desired number of potatoes with the peelings on until nearly done; remove and peel; lay in the baking dish with the nearly done roast; cook until done, and serve with the pork.

No. 14, WITH ROAST PORK

Select a desirable piece of fresh pork; bake until nearly done; dip or pour off as much of the grease as possible; prepare the potatoes the same as for No. 12. Lay them in the gravy; and slightly brown, with the meat, until done.

No. 15, BROILED

Steam, pare and cut in slices 3-8 of an inch thick; lay the slices in a double boiler; salt; cover with melted butter, and broil over a slow fire; serve in folded napkins.

No. 16, STUFFED No. 1

Bake, then cut off one end and scoop out the inside; season with butter, pepper and salt; beat until light; replace in the skin; close with the piece cut off and put into the oven to heat through. Serve in napkins. Suitable for luncheon.

No. 17, STUFFED No. 2

Prepare the same as for No. 15, to which add to every pint of potato 1-4 pint of minced ham; mix thoroughly, fill the hulls, heat and serve.

No. 18, A SOUTHERN DISH

Cut cold baked sweet potatoes into slices and put into an earthen dish; add sugar and butter to each layer and bake until slightly brown.

No. 19, CROQUETTES

Take two cupfuls of mashed, boiled, steamed or baked sweet potatoes; add the beaten yolks of two eggs and season to taste; stir over the fire until the mass parts from the sides of the pan. When cold, form into small croquettes, roll in egg and bread crumbs, and fry in hot lard to amber color. Serve on napkins.
AND WAYS OF PREPARING IT FOR TABLE

No. 20, SWEET POTATO BALLS

Prepare the sauce for croquettes, make into balls and enclose within the center of minced meat.

No. 21, PUREE

Take mashed, boiled, steamed or baked sweet potatoes; season and add enough hot milk to moisten; serve like mashed white potatoes, or put in pudding dish; dress the top with egg and brown in oven; serve with sauce.

No. 22, BROWNED

Cut cold, boiled or stewed sweet potatoes into slices 1-4 of an inch thick; add butter, sugar, pepper and salt and put into hot oven to brown.

No. 23, SCALLOPED POTATOES

Wash and peel the potatoes; slice very thin; put in baking dish in layers; season each layer with salt, butter, 1-2 teacup of sugar, a dash of spice, nutmeg and ginger; cover with milk that has been made 1-2 cream; bake in moderate oven until tender; serve hot.

No. 24, DELICIOUS POTATOES

Wash and pare rather small sized potatoes; steam or boil until they can be readily pierced with a fork; dry the surplus water off; have a little butter melted in a dish, roll the potatoes in this; place in a quick oven and brown slightly; serve hot.

No. 25, HASHED POTATOES

Take cold sweet potatoes, either steamed or boiled, roasted or baked; cut into small pieces, place in a well buttered pan, mince scraps of meat of any kind and stir into it; let brown and serve hot. Chicken makes a most excellent meat to put into it.

No. 26, BAKED WITH APPLES

Take four medium-sized potatoes and the same number of apples. Wash, peel and cut the potatoes in slices about ¼ of an inch thick; pare and slice the apples in the same way; put in baking dish in alternate layers; sprinkle 1 1-2 cups of sugar over the top, scatter 1-2 cup of butter also over the top; add 3-4 pint of hot water; bake slowly for one hour; serve steaming hot.

No. 27, SWEET POTATO MUFFINS

Boil until thoroughly done a sweet potato weighing about 3-4 of a pound; mash very fine; pass through colander to free it from
lumps; add to it a large tablespoonful of butter and a little salt; whip well; now add 1-2 cupfuls of cold mashed potatoes; one cup of flour into which one teaspoon of baking powder has been sifted. The potatoes and eggs should be worked together, then the flour and baking powder; roll lightly; cut quickly, and fry in deep fat like doughnuts.

Some think a little spice improves the flavor.

No. 29, SWEET POTATO SAVORIES

Boil and mash as many sweet potatoes as required; when cold stir in sufficient flour to form into a paste; roll out and cut into small squares; soak a few bread crumbs in water for 5 or 10 minutes; squeeze dry; add a little chopped parsley, mixed herbs, and a small onion previously soaked in hot water; season with salt and a dash of pepper. Mix all together thoroughly, put a little on each square of paste, and fold over as in sausage rolls; fry in boiling fat till brown; drain and serve.

No. 30, SWEET POTATO NUTS

Take one pint of boiled and mashed potatoes, one pint of toasted bread crumbs rolled fine, one pint mixed nut meats chopped fine (peanuts are excellent); season with salt, a little pepper, also sage and mace if desired; take the yolks of two eggs; stir in two teaspoons of baking powder; whip until light; pour it into the above mixture and stir well; form into small cakes; dip each into the whites of the eggs, then into shredded cocoanut, and brown in a frying pan containing a little pork fat (not deep fat); turn; brown on both sides.

No. 31, SWEET POTATO RICED

Pare and boil the potatoes in water slightly salted; when done drain off the water, and run through a ricer; serve hot with plain or drawn butter.

The dry, mealy varieties are especially pleasing when prepared in this way.

CANNING

The sweet potato is quite easy to can, and in several states the industry has assumed quite handsome proportions. They find a ready sale in localities where fresh ones cannot be had.
HOME CANNING OF SWEET POTATOES IN GLASS JARS

Peel and cut the potatoes in small cubes or thick slices; pack them just as closely and firmly as possible in the jars; fill with cold water; put the lid on loosely, and boil 60 minutes; tighten the lids at once. Potatoes prepared in this way are exceedingly fine.

COMMERCIAL CANNING

Mr. H. B. Benson, head of our Canning Division, and who successfully cans every year several thousand cans of potatoes, hands us the following as his method:

"The canning of sweet potatoes is not very difficult, but requires considerable attention and care, because if not handled properly an unsightly article will appear.

"There are two styles of packing, one being the whole potatoes, packed as dry as possible, the other being pie stock, in which the potatoes appear as a pulp. In packing the whole potatoes it is very necessary to keep them dry, because the nature of this vegetable is to absorb water, and they should not come from the cans in a water-soaked condition. To avoid this, steam them about three-fourths done; slip the skins off, and pack into the cans as tightly as possible without mashing; exhaust 15 or 20 minutes; seal, and cook 3-pound cans 45 minutes at 240 degrees Farenheit, or 90 minutes at 212 degrees Farenheit."

AS A FOOD FOR STOCK

The value of root crops for stock has so long been recognized that it is almost universally regarded as a necessity, not alone for the actual food nutrients they contain, but the peculiar diatetic effect so essential to the well-being of all animals.

A glance at the table below will convince the most skeptical of its superiority over many of the standard food-stuffs.

AVERAGE COMPOSITION

<table>
<thead>
<tr>
<th>Food Material</th>
<th>Protein, or Muscle Builders</th>
<th>Carbohydrates, or Fat Formers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangel Beet</td>
<td>1.4 per cent</td>
<td>7.6 per cent</td>
</tr>
<tr>
<td>Turnip</td>
<td>1.1 per cent</td>
<td>7.6 per cent</td>
</tr>
<tr>
<td>Rutabaga</td>
<td>1.2 per cent</td>
<td>9.0 per cent</td>
</tr>
<tr>
<td>Carrot</td>
<td>1.1 per cent</td>
<td>9.3 per cent</td>
</tr>
<tr>
<td>Parsnip</td>
<td>1.6 per cent</td>
<td>11.4 per cent</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>1.5 per cent</td>
<td>26.4 per cent</td>
</tr>
</tbody>
</table>

We readily see that the potato contains practically as much muscle-building material as any, and more than double that of the fat formers.
HOW THE FARMER CAN SAVE HIS SWEET POTATOES

In view of the above table and most especially the fact that years of experience has taught us that the sweet potato crop is the one that can be depended upon in favorable years for an enormous yield, which can be greatly increased with a little intelligent direction in the preparation of the soil, fertilization, etc., we have been able to produce here on our Experiment Station 359 bushels to the acre, and I fully believe our soils can be made to yield 500 bushels of the coarser growing varieties.

A series of experiments have proven that the Dooley Yam, Southern Queen, Pumpkin Yam and the White and Red Nansemond may be left out in the field with but slight injury for feeding purposes, which would save the expense of housing or banking.

EXPERIMENT No. 1

Mr. M. V. Dartard, in charge of the horses and mules, who personally conducted the following experiments, is enthusiastic over the results. The experiment covered a period of 30 days:

Four mules were fed potatoes, two that were doing heavy work and two that were doing light work; corn was the grain ration. After the preliminary feeding, substitutions for grain were made at the rate of 2 3-4 to 2 1-2 pounds of potatoes to 1 1-2 pounds of corn plus the usual ration of hay.

These four mules kept in good condition, and were able to do good work. In fact, they looked as well and were able to do as much work as the four check mules.

The result of this experiment, was, that the sweet potato was made to replace 1-2 of the corn for the feeding of mules, which means a great saving in actual dollars and cents.

CAUTION

It is highly important that the potatoes be gradually fed in the beginning, increasing the quantity as the animal becomes accustomed to them. Frozen potatoes must also be fed with caution, or ascetic or alcoholic fermentation may set in and cause serious results. Do not feed the potatoes to horses, mules and cattle after they have become sour; hogs may eat them with safety.

EXPERIMENT No. 2

THE FEEDING OF SWEET POTATOES TO HOGS

This experiment was conducted by Mr. R. R. Robinson, in charge of the swine herd.

Six hogs were used; two were fed wholly on sweet potatoes, two were fed shorts, and two were fed corn. Eight pounds of potatoes were fed each day, with the following gain of flesh at the close of 28 days:
AND WAYS OF PREPARING IT FOR TABLE

Lot No. 1. Fed on potatoes; made a total gain of 24 1-2 pounds.  
Lot No. 2. Fed on shorts; made a total gain of 33 pounds.  
Lot No. 3. Fed on corn; made a total gain of 53 1-2 pounds.  

These figures are intensely interesting from the fact that such highly concentrated foodstuffs as shorts and corn only exceed the potatoes thus: In the matter of putting on fat—corn, 29 pounds; shorts, 8 1-2 pounds. It is also easy to see that these results are not inconsistent with good farm practice, and all farmers with experience know that all kinds of stock, such as hogs, cattle, horses, mules and poultry, are not only fond of them, but thrive upon them as well, when the potatoes are judiciously fed, with concentrates, such as corn, cotton-seed meal, bran, shorts, etc.

VINES

The vines make an excellent quality of hay, which chemists find to be in composition about the same as that of succulent cow-pea vines. The vines turn black when dried, but stock eat them greedily. The vines have been found to be of the following composition: muscle-builders, 12.48 per cent; fat formers, 78.79 per cent.

MISCELLANEOUS INFORMATION

When potatoes are frozen so that they become soft they must be fed as fast as possible, as they will not keep.  
Care must be taken not to give horses, mules and cattle too much of them, as they are very sweet after freezing and tempting to the appetite. Steaming, boiling and mixing with grains, shorts, meal, bran, corn, etc., make an excellent fattening food for hogs and one greatly relished. We feed them after being frozen the same as before without any apparent bad results.  
I have very briefly and imperfectly touched upon the many possibilities of the sweet potato. I trust that Macon County will take the lead in developing the almost limitless possibilities of this splendid crop and show its relation to the dairy industry, beef production, starch mills and that it is the most important and useful of all our root crops for the feeding of farm animals.