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Part 1—Celery, Lettuce, Tomato, Irish Potato, Pecan and Sugar Cane Growing.
Part 2—Crop Acreages and Conditions.
Part 3—Fertilizers, Feed Stuffs and Foods and Drugs.

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COUNTY MAP OF STATE OF FLORIDA.

PART I.

CELERY, LETTUCE, TOMATO, IRISH POTATO, PECAN AND SUGAR CANE GROWING.

IRISH POTATO GROWING IN FLORIDA.

The potato (Solanum Tuberosum) belongs to the family Solocanacea the same as the tomato, eggplant, belladonna, etc. Solanin, the active principle, is found in small proportions and is poison to a small extent. This poison is developed when the surface turns green from exposure to the direct rays of the sunlight and is therefore unwholesome as well as unpalatable when in that condition. For this reason sprouted or greenish colored potatoes are less valuable for food even though in the process of cooking a change is effected in the composition of the tuber.

The chief organic ingredient of the potato is starch, which forms about one-tenth of its weight. According to history it was first introduced into Europe by the Spaniards from South America. It still grows wild in the mountain regions of Chili. It also has been found indigenous to Arizona and Mexico. It was introduced into England from Virginia by Sir Walter Raleigh. It is said that "The potato is one of the greatest blessings bestowed upon mankind, for next to rice, it affords sustenance to more human beings than any other gift of God." It is one of the few food products that can be consumed exclusively as a food without limit as to time with no injury to the system; it is a ration in itself that will sustain life and strength for a great while. It is a wonderful provision of nature, that the family which embraces the deadly night shade, and other very poisonous plants, should also have among its members this most useful vegetable. Of all the crops of the truck farmer, the potato is the one which is always saleable at more or less remunerative prices, its general use among all classes and nativities of population, makes it perhaps the most universally planted vegetable

known. The potato tuber is not a root, as it has neither root hairs itself, nor has the stem which connects it with the stock either fiibrous roots or hairs and, therefore, does not provide the plant with nourishment; neither is it a seed any more than a stalk of sugarcane is a seed, both having eyes. The potato is simply an enlarged underground stem, the eyes of which are also the buds. As is well known the larger number of the eyes are on the end of the tuber opposite from where the stem connects with the plant. When the potato has dried out to a considerable extent and the atmospheric conditions are favorable, the eyes or buds will swell and begin to grow or sprout out. Until roots put forth these shoots are dependent on the moisture and starch in the tuber for their support, the same as seeds; these eyes, however, are indedependent of each other, which enables the cutting of the tuber into numerous parts for planting. If the tuber and eyes are sound, the shoots will grow and make healthy plants, provided conditions are favorable, whether they be planted whole or in pieces with single eyes.

In cutting potatoes to single eyes, the cutter should commence at the stem end, where the eyes are fewer in number, and slice the pieces to single eyes each, in such a way as to distribute the greatest amount of the tuber-substance possible with each piece. A good rule is, cut all medium to large potaoes to single eyes whether sprouted or not. Small potatoes may not all mature enough to grow strong sprouts, but if a small potato is matured enough to put forth strong sprouts, cut it also to single eyes for very little substance will supply their support, but if the potato has not sprouted it may be planted without much danger of its putting forth more than one stalk.

A potato delights in a comparatively cool atmosphere and moist soil and therefore thrives best in cool months of the early spring and fall. Mulching with leaves to retain moisture often produces a good crop even if the season is very dry as the vegetable matter serves to

conserve the moisture in the soil. The soil best adapted to this crop is a rich sandy loam or a moderately light clay loam underlaid by a sub-soil of a character to retain moisture. It should be plowed deeply and thoroughly pulverized. Plow and harrow until it is put in a thoroughly good condition and well rotted stable manure may be applied broad-cast, should there be a lack of humus in the soil, but in the event the stable manure is applied, it should be done for spring crops early in the season or very late in the fall months. If too much green manure is applied it is apt to produce scab. The land should be broken a month or six weeks before time for planting. It should be broken with a two-horse turn plow and subsoiled if possible. Into these furrows put a complete commercial fertilizer at the rate of 800 to 2,000 pounds per acre depending on the character of the soil. Mix this with the soil and the subsoil by running two furrows with a long narrow bull tongue plow so as to thoroughly mix the fertilizer with the soil then let stand for ten or twelve days before planting. Cut the tubers as previously stated and plant when ready, covering about four inches deep.

VARIETIES.

The best varieties for plainting in the South and especially in Florida, are the early and extra early varieties, such as the Bliss' Red Triumph, Bliss' White Triumph, Irish Cobbler, Improved Rose Number 4, Dixie and Extra Early Sun Light. These are the extra early and the best for growing in Florida for the first crop. Second earlies an in some sections be grown with profit, but not generally throughout the State for commercial purposes. Beauty of Hebron, Early Rose and Carmen No. 3 are favorite second early varieties. Burbank and Peerless are late standard varieties for little later growing.

The time of planting potatoes in Florida depends upon the sections of the State. In the far southern portions

they can be planted as early as December growing later up to March as we go further north, indicating the change necessary to conform to the seasons and location, the difference being about ten to twelve days for each 100 miles.

The cultivation of potatoes is very similar to that of corn. Plow deep at first and shallower with each working until ready to lay by. In this way the roots that feed the plants will not be troubled and the process of making the tuber will not be interfered with. When the vines turn yellow the tubers are ready to dig which can best be done with an ordinary pronged potato hoe and the man. In some of the light sandy soils potato diggers are successfully used and can be successfully used in most Florida soils. The digger should not be permitted to pile them roughly into piles or throw them roughly into the baskets. The more carefully a vegetable is handled the better it will strike the public eye and consequently the more money it will bring the grower. Whatever may be its size, no cut or bruised potatoes should be put in the first quality, but may be in the culls. The barrels or baskets should be well shaken down and so full that the heads have to be pressed down. It is better that they should be double headed and well coopered. The potatoes should be classed as first and second quality and the culls, the small tubers, should be kept for feed purposes or seed as suggested elsewhere. Cloudy weather is best for digging the crop, as potatoes should not be exposed to the hot sun and if packed while warmed by the sun they are apt to rot before reaching the market. If dug during the sun shine, they should be gathered as they are dug and carefully emptied into baskets or barrels and promptly hauled from the field or shaded from the rays of the sun. The potato is subject to various insects and diseases, but in this country a Florida potato grower has a great deal less to combat in this respect than those further north and west, but it is unsafe to place full

reliance in this fact because there is no certainty as to when a disease or insects may attack the plant unsuspected. The potato scab is the greatest trouble to the potato grower in Florida. This is a fungus disease and can be prevented in a large measure by treating the pieces of potato before planting with solution of corrosive sublimate or formalin and a good plan to prevent this disease is to burn the vines wherever there is any appearance of the disease about them. The solution for treating this disease is corrosive sublimate, 4 ounces to 30 gallons of water. Soak the seed, after being cut, for one hour to one hour and a half; then drain. The formalin solution is one pint to 30 gallons of water. The potatoes are immersed in this latter solution for about two hours. A good plan to use in immersing potatoes in these solutions is to put them one-half bushel or so at a time in a gunny sack; then lift them out and let the water drain back into the vessel. Any other clean sack will answer the purpose if desired. As soon as this is done spread them out and let them dry so that they will dry quickly and thoroughly. Be sure that the solutions are not too strong or the buds or eyes will be damaged.

There is also a disease known as the late blight which comes about the time the potatoes are beginning to mature. This disease can be controlled by spraying with Bordeaux mixture. In a former Bulletin, the July number, 1911, the formulas for all sorts of sprays, the Bordeaux included, will be found.

FERTILIZERS.

The following formulas are adapted practically to all soils and sections in the State. The planter can choose which ever seems to suit his soil best.

No. 1.

	Per Cent.
1,000 lbs. of Blood and Bone (6-8)	4 Ammonia
100 lbs. of Nitrate of Soda (17 per cent)	8 Available
5000 lbs. of Acid Phosphatte (16 per cent.)	10 Potash
400 lbs. of Muriate of Potash (50 per cent.)	
2,000	

State value mixed and bagged.....$34.50
Plant Food per ton.....440 pounds

No. 2.

		Per Cent.
500 lbs of Castor Pomace (6-2 per cent)..		
200 lbs of Sulp. of Am. (25 per cent.).....		4.00 Ammonia
900 lbs. of Acid Phosphate (16 per cent.)..		7.70 Available
400 lbs. of Sulp. of Potash (48 per cent.)..		9.60 Potash
2,000		

State value mixed and bagged.....$33.76
Plant Food per ton.....426 pounds

TOMATO GROWING IN FLORIDA.

The Tomato (Lycopersicum esculentum) belongs to the order Solanaceae or night shade family, which contains something over twelve hundred species, among which are three of our most valuable and important vegetables—the Irish potato, the tomato and the egg-plant. It also includes the red pepper, and the narcotics, such as bittersweet, belladonna, Jamestown or "Jimson weed," the tobacco and others.

The Tomato was first introduced into Europe from South America in 1596, but for many years it was planted only as an ornament to the flower garden. It came into use very gradually in the preparation of sauces and soups, and has only attained its popularity as a table vegetable in comparatively recent years. Its importance as an article of commerce really dates back little more than twenty years, and as compared with the present it was then indeed of small proportions, though at that time the increasing annual crop was watched in fear and much suspicion as to the probable effect on the markets. At present in Florida it exceeds in volume and value nearly four times that of the next most important vegetable crop (Irish potatoes). In 1910 the crates marketed were 2,336,948, the net value of which was $2,528,620. The Tomato, therefore, is Florida's greatest vegetable crop, standing next in importance and value to the Orange.

SELECTION OF SOIL.

That the Tomato will resist drought better than it will too much rain, in fact it stands drought better than most vegetables; the soil therefore best adapted to this crop is a good well-drained sandy loam. The Tomato is not a gross

feeder; it seems to prefer a light soil to one that is too fertile, or that has been made rich with heavy animal manures; cow manure in moderate quantities is good, but chemical manures in proper quantities are best in most cases.

SEED BEDS.

We do not believe in the extreme views of some growers, who plant the seeds directly in the field, where the crop is to be produced. A seed bed is really indispensable; it makes success more certain and it shou'd be well equipped to afford speedy and ample protection against cold, and of ample dimensions to furnish a relay of plants, if the first setting is destroyed by cold, and even a second relay is often necessary, for some times even these reserve forces have to be brought into action.

It is best to have three or even four good, large plants provided in the seed bed for every one the planter expects to raise to maturity. This is the true wisdom of the foresighted and provident grower, who, by his strong management will force success against obstacles before which weaker men will go down in defeat. The tomato is a feeb'e plant in its infancy and an easy prey to frost and mysterious fungus enemies—yet, if we faithfully defend and feed it, it will yield the dollars at last more generously than anything else except the prodigal orange.

The seed-beds may be of light, rich, sandy loam, raised a few inches above the level of the ground. It is considered best to have them six feet wide, and as long as desired, running east and west. Have on the north side a tight board wall, three feet high, on the south side half as high, with tightly boarded gables. This will give a shed-roof with light rafters nailed across, on which to roll down the roof of cloth, tacked to rollers anywhere from thirty to fifty feet long.

Let the rafters have no projection, so that the cloth may drop down snugly against the south wall. Such a

covering of cloth alone will protect the plants against a white frost; a sheet iron coke burner, such as the pine-apple men and orange growers use, placed every fifty or seventy-five feet, will protect them against a black frost.

Make drills crossways of the beds, three to four inches apart, sow the seed in thinly, say about two or three to the inch. Cover three-fourths of an inch. *Firm the soil* with a board or light roller, and water with a light spray, as may be needed to keep the soil moist, but be sure not to overdo it as too much moisture will cause the plants to damp off, and to grow small and slender, especially near the front and back walls of the frame. It is therefore advisable to sow the seed more thinly near the front and back than in the middle of the bed. Roll down the cover on chilly nights.

When the plants begin to have four leaves, cultivate lightly at least once a week. Pull out clumps of spindling plants where the seed chanced to fall in a bunch. Thin to three inches by cutting across the drills with a narrow hoe.

Where the plantation does not exceed a half-dozen acres, it pays to take up and reset the plants once or twice to render them more hardy and stocky. To toughen them against this removal it is recommended to render them some what dormant. This is to be continued up to the hour of removal. This may be done without fear as the tomato is very tolerant of a transfer.

TRANSPLANTING TO THE FIELD.

First, make ready the field two weeks beforehand. Supposing it to have been plowed in November and thoroughly cross-plowed in January, then with a two-horse plow run out furrows four feet apart and strew in the fertilizer at the rate of 600 pounds per acre. Work in a little of the furrow slice and mix it with the fertilizer with a bull-tongue. Strew in as much more and mix again,

thus giving 1,200 pounds per acre and leaving the surface level. Set the plants two to three feet apart, according to the strength of the land. Some growers prefer to manure the plants in the hill, which probably saves in the amount of fertilizer required per acre, but either plan is good, one about as good as another, and is largely a matter of choice only.

Reject rigorously all weakling plants. Leave them in the seed-bed to grow; when relieved of the crowding, they may come on and furnish a relay, if needed. Wet the ground soft and pull the plants up carefully, running the forefinger under, if necessary. Wet the rows down again to restore the level after the upheaval.

We have very little confidence in plantsetting machines with tomatoes. They are fine, and great time and labor savers in the planting of some crops, but not for tomatoes, they are too tender and easily bruised. The way is to set by hand with the best paid class of men and not with children at all. Children are only fit to pick cut worms. Take hold of a plant and pull; if the leaf comes off, the plant was properly set; if the plant comes up, the setting was poorly done. Caution the setters constantly against leaving airholes at the bottom; make them fill in at the bottom first, then at the top. *Firm the earth;* have an experienced man follow along; place one foot on each side of the plant; rock a little forward and throw his whole weight on his toes, opposite the plant.

Keep the plants screened from the sun, in a vessel with water enough to cover their roots. Let each setter have his own vessel of plants; take one out at a time and immediately place it in a hole punched in the ground, not exposing the roots to the air two seconds.

CULTIVATION.

This is as simple as with corn. It may be deep and close for a few weeks, but keeping further away and more

shallow as the plant advances, ceasing when the bloom buds come.

There is little doubt that staking the plant and nipping out the terminal bud above the first cluster of bloom hastens the maturity and improves the size of the tomatoes; but it is questionable if it will pay with the present prices of labor. In a small field tended by the grower's family, it would probably be profitable. Do not prune the plants if you expect to ship your fruit to market; you will get fewer but larger fruit, but it will not pay you.

When picking the earliest fruits it should be remembered that the cold weather in the North will permit them to ripen very little on the road; hence they should not be gathered until they have begun to redden slightly. A greener one would remain hard and uneatable and rot before it would ripen. Later on, as the weather in the North grows warmer, they may be picked when they have fairly turned white, preparatory to reddening. An immature tomato removed from the plants always remains more or less tough. This objection may be remedied to a considerable extent by proper fertilizing. A tomato grown on a well-proportioned strongly mineral fertilizer will be comparatively crisp and melting in the mouth, while one produced on nitrogenous manures will be tough and wilted.

The tomato, though it is so great a crop, is well worth being treated as a fancy product, in fact, all the early produce of Florida is deserving of this distinction. Coarse, brown wrapping paper cheapens the fruit. The buyer is only too ready to take it at the grower's own estimate. Valuable packages are not wrapped in hardware paper. The best printed tissue wraps should be used, and—let the fruit also be worthy of the wrappings.

VARIETIES.

There are such a large number of equally good varieties to choose from that one can hardly go amiss, and while at

one time it was thought that only one or two kinds would bear shipment, continued improvements with new varieties have so changed these conditions that it is largely a matter of choice or personal preference as to which is best in the grower's opinion.

BLIGHT AND INSECT.

With the tomato, as with all other vegetables in this State, no precaution against insects should be neglected; prevention is much easier than medication. The one pre-eminent precaution is to use strong tobacco dust sprinkled around the plants as soon as they are set out. Blight is also far easier to overcome in advance. Burn all the old vines as soon as the harvest is over, thus destroying the germs of blight or other diseases. It is best to plant tomatoes in rotation with crops that are affected with diseases different from the tomato, such as corn, cabbages, peppers, etc.

FERTILIZER.

A good fertilizer for rather light soil would be composed of say—

No.1.

	Per Cent.
1,000 lbs of Blood and Bone (6½-8)	4 Ammonia
100 lbs. of Nitrate of Soda (17 per cent.)	8 Available
500 lbs of Acid Phosphate (16 per cent.)	10 Potash
400 lbs. of Muriate of Potash (50 per cent.)	
2,000	

State value mixed and bagged.....$34.50
Plant Food per ton..... 440 pounds

For heavier soils, as the best class of sandy or clay loams:

No. 2.

	Per Cent.
500 lbs. of Castor Pomace (6-2 per cent.)	4.00 Ammonia
200 lbs. of Sulp. of Am. (25 per cent.)	7.70 Available
900 lbs. of Acid Phosphate (16 per cent.)	9.60 Potash
400 lbs. of Sulp. of Potash (48 per cent.)	
2,000	

State value mixed and bagged.....$33.76
Plant Food per ton.....426 pounds

COMMERCIAL LETTUCE GROWING IN FLORIDA.

This plant has been cultivated for more than twenty centuries, and apparently continues to increase in popularity every year with all classes of people. Few plants are more easily grown, and yet with the enormous demand for it it is still a luxury on most tables, merely because so comparatively few gardeners take the trouble to grow it at the season of the year when it is appreciated. The best varieties are to a great degree intolerant of hot sunshine, but thrive well with very little protection from either hot sun or cold snaps, from October to the first of June.

The quality of the lettuce crop is more or less influenced by the kind of soil upon which it is grown, and while some soils are inferior for the work, their character may be changed to such a degree, by careful management, as to give satisfactory results.

The soils may be divided into three classes—light soils, heavy soils (those containing a good deal of clay), and medium soils, as the various grades of loamy soils—clay loam, fine sandy loam and sandy loam. All things considered, the ideal soils for the development of this crop are those of the best sandy loam, resting on a clay subsoil twelve to fifteen inches below the surface and well-drained. A soil retentative of moisture and plant-food must have a more or less impervious clay subsoil, for, no matter how suitable the surface soil may be, unless there is clay beneath it the plant food on becoming soluble will quickly leach out and be lost if it is not taken up by the crop. Deep, sandy soils, though quicker in their action than heavier soils, if constantly irrigated and fed, are

nevertheless expensive in both fertilizer and irrigation. In selecting a soil for lettuce growing, in fact, for any truck crop, it is best to look carefully into the character and position of the subsoil.

Lettuce thrive best on a very rich, loamy, moist soil, well drained so there will be no water sogging after rains, and in common with all quick-growing crops, requires a large amount of humus in the soil. Barnyard manure is one of the best and surest means of adding humus to the soil, but because of its scarcity it is not always available, so the next best and cheapest source of organic matter is by the use of cover crops of the legume order. Lettuce growers should see to it that whenever their lettuce soils are not under crop they should be storing humus and nitrogen from a crop of some legume; cowpeas or velvet beans are best. To make lettuce growing a success, humus must be supplied, and it may as well be set down as an incontrovertible fact, that where there is no humus in the soil there will be no lettuce. A rich soil is absolutely necessary. If you haven't got it, and are not willing to bear the expense of making it, don't plant lettuce.

Prepare the land by plowing deeply; scatter broadcast stable manure or well-rotted compost, and harrow in well till the soil is in finest tilth and the manure thoroughly incorporated with the soil seven days, or even two weeks, before the time for setting out the plants; it is also a good plan to apply before harrowing from one thousand to one thouand five hundred pounds per acre of a high-grade commercial fertilizer, as an adjunct to the stable manure, etc., and that it may be well assimilated by the soil before time for setting.

Plants are ready for setting at from four to six weeks after sowing the seed, at which time they should be from three to five inches high. Set only vigorous plants, or they will likely be stunted and run to seed instead of heading. The varieties most preferred and apparently

most in demand by consumers are the Big Boston and the California Cream Butter.

Preparation of the seed bed does not materially differ from that of the celery, and the same methods are applicable to a great degree.

Select for this purpose a piece of new, rich land, preferably hammock, for new land is not subject to the root knot plague which sometimes troubles roots. Clear the soil of all trash, plow or spade it deep and rake very fine and mellow, scattering on hardwood ashes or air-slaked lime two weeks beforehand to neutralize the sourness. Sow in drills, as you would turnip seed, very shallow, and rake in. *Firm the soil.* Beat down the earth with the back of the hoe or lay down boards and walk along them. If planted before October, it is well to shade the beds lightly for seven or eight hours during the middle of the day. Sprinkle night and morning with a fine spray, so as not to pack the land.

Watch sharply for ants; they may carry off every seed in forty-eight hours. Apply tobacco dust liberally; if they still persist, give them a tobacco solution, strong; also as a further preventative, sow grits over the bed. The ants will take this in preference to the seeds, and while they are carrying it away the lettuce will have sprouted and be out of danger.

When the plants are to be transplanted, weed out rigidly and throw away the diseased and feeble plants. A small strawberry plant, by diligent care, can be fed up to be nearly as good as a large one; but not so with a lettuce plant. With a lettuce, it is a head or it is nothing; unless it heads it is valueless.

We repeat, it is not worth while to attempt to grow lettuce commercially for profit unless you have made up your mind to fertilize liberally, unstintedly. Lettuce is largely a luxury of the rich, used for garnishing meats in splendid dinner services, and small leaves, though they may be just as crisp and high-flavored, are not wanted,

because they lack in spectacular qualities. A single large, rich, creamy-white leaf or head is worth a dozen smaller ones.

Fully four-fifths of the failures in lettuce culture in Florida are chargable to the stinting habit in the application of fertilizer. In some localities hundreds of dollars worth of fertilizer per acre is applied, with larger profits as a result.. One to two ton of ashes per acre, especially on medium to heavy soils, while preparing the land will be worth many times their cost. It will make the soil loose, friable and sweet.

The truckers of Central Florida begin to plant seed the latter part of August and continue to plant until the first of January. Those who plant prior to the middle of September seldom succeed in securing a satisfactory stand of plants. Lettuce is a cool weather plant; it germinates poorly in hot weather. The few, however, who do succeed by shading and watering in securing a good stand of these extra early plants, and who bring them on to a handsome and solid maturity, generally reap a rich reward, as this early lettuce commands a fine price. It is a good plan to make repeated sowings, from August 25th to January 1st.

It is an advantage to select a field on the south side of a forest, as a screen against wind. A covering of cotton cloth often pays heavy dividends on the investment. Lettuce, when in heading, is greatly injured by a temperature of 25 degrees; but when not heading it will often withstand 20 degrees without serious injury. The cloth is carried on short stakes, care being exercised to bring the edges well down to prevent the wind from getting under. If the field is not protected by a cloth cover, cut all the heads that will do to ship, when you see that there will be a killing frost; and ship them to market next day.

Following are two good formulas for fertilizing lettuce. Use the one which seems to suit your soil and general

conditions best; or if preferred, use some other approximating them:

1. Ammonia, 5 to 6 per cent.
   Available phospheric acid, 7 to 9 per cent
   Potash, 8 to 10 per cent.

2. Ammonia, 6 to 7 per cent.
   Available phosphoric acid, 6 to 7 per cent.
   Potash, 6 to 7 per cent.

Apply from 1,500 to 2,000 pounds per acre, and while the crop is growing top-dress with about 150 to 200 pounds of nitrate of soda per acre. It requires about three pounds of seed to sow an acre, or one ounce to every 250 feet of drill.

Baskets for shipping can be obtained from the vegetable crate manufacturers in any section of the State.

CELERY GROWING IN FLORIDA.

Celery has for many years been recognized as one of the greatest luxuries of the garden, and while there are no special difficulties in the way of cultivation, it is grown by comparatively very few. The plant is a native of England, where it grows in a wild state in favorable localities. It is also a native of and occurs in several localities in Florida in its wild state, though in this condition it is not fit to eat except by wild water fowl, as it contains a poisonous principle making it dangerous as human food.

Although it has been grown for market in various sections of the country in a comparatively small way for many years, it is really little more than ten years since it became one of the most important commercial vegetable crops. The first experiments in its cultivation were not without failures by any means, for they were many, but gradually success was generally the rule, and with well defined methods, the growing of celery became a commercial success.

Celery requires in both its early and late stages of growth a cool, moist atmosphere, and consequently does not do well under extremes of heat or drought. In Florida the seeds are sown in the open generally, protection being rarely necessary. The soil must be a rich loam, or other soil and means added to obtain the same character as nearly as possible, but it should be loose and rich, soil that has been previously cultivated and manured heavily being considered the very best. The seed bed may be any length desired, but from three to five feet is the best width, most growers use three feet widths.

Such beds are prepared generally in August and Sep-

tember. The most successful celery growers in Florida prepare their seed beds some two to three weeks *before* time for planting the seed, the bed having prviously been well manured, thus time enough is allowed to elapse for the manure to become thoroughly assimilated. The seed being very small must not be too deeply covered. Germination of the seed may be hastened by packing the soil over the seed immediately after sowing by means of a smooth board six or eight inches wide and three or more feet long, as may be necessary. Mark off the rows for planting the seed across the beds in the following manner: "Take a five-inch plank, three feet long; nail a lath on each edge, projecting one-fourth of an inch on one side. With this make marks across the beds by pressing it down on the beds. Scatter or sprinkle in the seeds thinly and cover by sprinkling or sifting light soil or sand over the rows. A good idea is to cover the beds with old gunny sacks, Spanish moss or by laying a corn stalk along each side of the drill, but not directly over it and keep fairly wet till the seeds sprout, which, under favorable conditions, will be in from eight to twelve days. As soon as the seed are well sprouted and show that they are coming up it is best to cover them as a protection against both hot sun and heavy rains, removing the cover in the evening till next morning. Each day as the plants grow stronger, a little more sunlight can be given them till in a few days they will, under ordinary circumstances, be able to remain uncovered all day. Keep the beds moist, not letting them become dry at any time. When the plants are well above ground, say about an inch high, it is a good plan to put a little fertilizer between the rows and either stir into the surface gently or let it be distributed by a gentle sprinkling of water, either or both is good. Good working of the surface to keep down the weeds should be given once every few days. When plants are two or three inches high they are about ready to transplant to other beds, though some growers prefer to

wait till the plants are larger, and some do not transplant but once and that direct from the original beds to the fields. None but the best stocky plants should be used, as spindling plants rarely develop into profitable growth. Celery has been and can be grown on almost all of the soils of Florida, the best soils, however, being the low hammock lands when well drained, but any soil loose in texture and containing a good upply of humus will, under proper management produce fine crops. As before stated, a soil of a cool nature should be selected if obtainable, as the plant develops better, and is less liable to attacks of injurious diseases. Following in concise form are the methods used in South Florida in connection with the system of irrigation practiced in Orange County:

"The plot to be planted should be well supplied with water either from artesian wells, steam pumps or natural sources. Many of the most successful growers are tile-draining their land, the tiles being placed from a foot and a half to two feet under ground. The joints are covered with cinders, sawdust or even moss, to keep the sand out and let the water pass in or out as necessary. These drains are placed about twenty-five feet apart, and are so arranged, that they can be used to drain the land during heavy rains or to irrigate it when it is dry. After the draining and irrigating system is completed, no pains should be spared ,or labor omitted to reduce the soil to perfect tilth so that the innumerable fine feeding roots of the plant can penetrate the soil in every direction."

In sections where overhead or sprinkling and surface systems of irrigation are practiced the same principles will apply, and can be adapted to suit conditions, but one thing must be remembered, the plants whether in bed or field must not be permitted to suffer from lack of water any more than they must be over-watered. All manures applied to the soil should be in the most perfect condition—soluble and available—whether it be in the form of commercial or barnyard manure; the latter should be

thoroughly decomposed, evenly distributed broadcast and harrowed in well. At this stage, the general custom is to also apply about a ton of first-class commercial fertilizer to the land and harrow till thoroughly incorporated into the soil.

A well-known authority on this subject says: "When plants are ready for transplanting take great care to have those in each row of uniform size. To accomplish this, put the large and small plants in alternate rows, as the larger ones will often be ready for market from *ten* days to two weeks prior to the smaller ones. There is no use setting celery plants in dry soil. If there has been lack of rain as is often the case in October and November in Florida, then turn on the irrigating plant till the land is thoroughly moist and then water the plants freely. In setting the plants remember the rows must be absolutely straight. Use a line as a guide and run a cleated roller over the ground to mark the place for each plant. Setting in double rows is seldom practiced, and the rule now is to set plants four inches apart in single rows twenty-eight to thirty inches in width, giving about 60,000 plants to the acre. Droppers immediately preceding the plant setter, place the plants at the marks along the line. The plants are quickly placed in the holes made by a round dibble or garden trowel the depth of the center or heart leaf and the soil placed firmly alongside of the plant over the roots by pushing the dibble to the depth of the root and bearing towards the plant, afterwards closing up the depression made by the dibble to prevent drying out of the soil near the roots; thus *firm the soil.* When the soil is wet, celery plants will usually live even though carelessly set."

Either of the following formulas for commercial fertilizer are good for celery, and the one which seems best adapted to the soil and conditions can be used, or any other approximately similar:

1 300 lbs Nitrate of Soda..	yields	6.9% Ammonia	
800 lbs Fish Scrap.....		5.5% Avail. Phos. Acid	
600 lbs Acid Phos., 13 %.		7.2% Potash	
300 lbs Muriate Potash..			
2000 lbs			

2 250 lbs Nitrate of Soda..	yields	7.2% Ammonia	
600 lbs Dried Blood.....		5.5% Avail. Phos. Acid	
850 lbs Acid Phos., 13%.		7.8% Potash	
300 lbs Muriate Potash..			
2000 lbs			

During the growth of the crop from one to two tons per acre of the above may be applied between the rows, and from two to four hundred pounds of nitrate of soda per acre as a top-dressing in four equal applications at about four different times.

To make the cultivation of celery a success it must be worked often; in fact, it is not too much to say that the oftener it is worked the better, just so it is not disturbed or handled while the plant is wet with dew or rain, or while the soil is wet, or it will cause rust to the plant and pack the soil. The best implements for use near the plants when small are the hand cultivators with wheel hoes and small blades, while the middles can be worked out well with horse hoes on similar, or larger implements.

When the weather is cool during the winter month, be very careful not to apply too much water, as it may make your soil soggy and check the growth of the plants.

Blanching is done almost entirely with twelve-inch boards placed close alongside the rows of plants. It is found to be much better, takes much less time to blanche, and avoids the danger of the loose soil falling into the crown of the plants, as was the case when blanching was done by drawing the earth up against the plant. It requires only from twelve to fifteen days to blanche the plants to the creamy yellow color so desired in celery where boards are used. The above suggestions are appli-

cable to celery growing in all sections of the State by simply observing and adapting them to the prevailing climatic conditions and seasons.

Four ounces of seed is sufficient to plant an acre.

Crates of standard size can readily be obtained from any one of the numerous crate manufacturers throughout the State.

PECAN CULTURE IN FLORIDA.

BOTANY OF THE PECAN.

The pecan tree is indigenous in the United States in the rich, alluvial bottoms of the Mississippi, and also thought to be in some of the rich bottom lands of northeast Texas. Its northern limit is supposed to be about Davenport, Iowa. In the Mississippi Valley proper it extends within a few miles of the Gulf Coast, further west it extends into Mexico.

The area in which it may be grown is said to embrace within its four extremities the cities of Davenport, Iowa, Chattanooga, Tenn.; Laredo, Tex.; the region of the headwaters of the Colorado River in Texas, and even at the present day as far west as Arizona. It extends furthest from the center of the area along the streams and rivers. It is at present grown in all of the Southern States in greater or less degree. From the foregoing it will be seen that the pecan tree is a native in parts of the following States, viz: Illinois, Indiana, Iowa, Missouri, Tennessee, Kentucky, Alabama, Louisiana, Arkansas, New Mexico, and Oklahoma. Outside of this area it has been planted in a large number of States. Its cultivated area corresponds rather closely with that of the cotton plant, though its extension beyond this area is constantly increasing.

The pecan belongs to the family *Juglandaceae* (Walnut family), its near relatives being the other species of hickory, the walnut and butternut. For many years the scientific name commonly applied to it was *Cara Olivae formis Nutt,* but in deference to the rules of priority this name has largely given place to the name Hicoria pecan

(Marsh) Britton. This name *Hicoria pecan* is peculiarly significant, since it is truly American ,being derived from *powcohicora* and *pecan,* two words used by the Indians for hickory nuts.

It is a large, stately tree, 75 to 170 feet in height, with wide-spreading branches and symmetrical top. The bark is rough, broken and grayish-black in color. The bark of the young twigs is quite smooth, liberally dotted with lenticles, and during their early life, together with the leaves and flowers of the tree, they are covered with a liberal coating of rather rust-colored hair. The leaves are oval, compound, composed of from seven to fifteen falcate, oblong-lanceolate, sharp-pointed serrated leaflets, green and quite bright above, lighter colored below, and when mature, nearly or quite smooth. The flowers are of two kinds—pistillate and staminate. The former are produced upon the young shoots, while the latter come from buds upon twigs one year old. The staminate catkins are usually produced in two groups of three each, from a single bud, and have very short stalks. The stamens are three to five in number in each flower, and borne beneath a three-parted bract. The pistallate flowers have a four-valved involucre (known in the mature form as the husk) and a two-parted stamina. The nuts are quite variable in size, shape, color and quality. Some are long and pointed, others are nearly spherical. In Texas the spherical, or nearly spherical, nuts appear to be more common than elsewhere. Selected nuts of some varieties will weigh an ounce or more each, while of many other kinds it takes a hundred, more or less, to make a pound.

As a general rule the husks of most varieties open at maturity. In some, however, they remain closed, or nearly so. These latter varieties are objectionable on account of the increased difficulty of gathering the crop.

Pollenation.—The pecan is well-pollenated. In consequence, there is a great waste of pollen, to compensate

for which it is produced in large quantities. Wet, windy weather, at the time the trees are in bloom, frequently interferes with pollenation to such an extent that the crop is reduced very considerably.

With some species of hickory, notably *H. minima* and *H. Glabra,* cross-polleneation and consequent cross-fertilization with the pecan have resulted in several well-marked hybrids. None of these found thus far, with perhaps one or two exceptions, have been found worthy of propagation.

Range of Culture in Florida.

The pecan may be, and practically is, grown in all sections of the State wherever the soil conditions are found to be satisfactory. Its culture, however, should not be attempted in the southern portion of the State much, if any, below 28 degrees latitude; success would, at best, be questionable; it might succeed in the elevated portions of Polk and Hillsborough Counties, but it is uncertain.

The statement is frequently made, and quite generally believed, that the pecan will succeed wherever the larger species of hickory are found in the State. This is largely true, as the pecan belongs to the same family and genus of trees, but it should not be relied on implicitly. In no case must soil conditions be overlooked or disregarded.

Pecan Propagation.

The pecan may be propagated from seed or by budding and grafting.

Formerly they were grown almost entirely from seed and seedling trees were planted. But now seedlings have given place to budded and grafted trees. Why so? It was announced as a fact, not so many years ago, and there are some who may still maintain it, that 50 per cent., or some other per cent., of pecans would come true to seed. But it must be stated as a fact that neither 50,

nor any other percent., will come true to seed. We have yet to find a single instance where the nut of a seedling tree was identical with that borne by its parent plant. Occasionally they are better, but the rule is that they generally are vastly inferior to the fruit produced by the parent plant. Hence, if an orchard of trees of the same habit of growth, prolificness, regularity in bearing, uniform throughout, trees which will produce a crop of nuts uniform in size, shape, color and quality, is desired, do not plant seedling trees. Scores of these seedling trees produce nuts but little larger than chinquepins, and it is a fact which cannot be gainsaid that the seedling pecan, up to the time of fruiting, is an unknown quantity, after which it is too frequently a disappointment.

But seeds have their place. From them are grown the stocks upon which to work desirable varieties. From seeds may be originated new and desirable varieties, for it sometimes happens that the seedling is better than the parent. Seedling trees may be grown and set out in orchard form, to be top-worked afterward. This plan has something to recommend it. It is less expensive, provided time is not an object, for it takes a longer time to get bearing trees by this plan, and it is open to the further objection that it is more difficult to secure uniformity in size and shape of the trees than it is by setting out budded or grafted trees at first. The objection in the way of expense, if that be an objection, is best overcome by planting nuts in nursery rows, grafting the trees there, and then setting them in the field. By no means should the nuts be planted where the trees are to remain. It is too difficult to give them the necessary care. Besides, they are likely to be destroyed by squirrels or other animals, or the seedlings injured through carelessness in cultivation.

Selecting and Planting Nuts.—Nuts to be used in growing stocks should be fully matured before gathering. Some care should be taken in their selection. They should

be of good size for the variety, and should be gathered only from healthy, vigorous trees. Frequently the only object held in view is to get as many nuts as possible in a pound, without regard to the tree on which they grew. We believe that this is in a large degree responsible for the unsatisfactory growth made by many grafted trees. Those nuts which mature first are best for planting.

The nuts may be planted in Florida as soon as they are taken from the trees, placing them in drills three and a half feet apart and covering them two and a half or three inches deep. In many cases it may be necessary and more convenient to stratify the nuts in damp sand in boxes, first an inch-layer of sand, then a layer of nuts, until the boxes are filled. These boxes should be placed in a cool, shady place, under a building, in a cellar, or buried in the earth. It is a good plan to cover them with wire net to prevent mice, rats or squirrels from attacking them. In early spring the boxes should be emptied out and the nuts planted as directed above.

The seed-bed should be thoroughly prepared, plowed deeply or subsoiled, well supplied with organic matter either from stable manure or from beggarweed, velvet beans, cowpeas, or some other leguminous crop on the soil, and turned under.

During the growing season the seed-bed should be kept well cultivated and free from weeds and grass. A fertilizer rich in nitrogen should be used. Its composition will have to be governed very largely by the character of the soil and the care and cultivation given it previously; but for good nursery soils a fertilizer analyzing three per cent. nitrogen will give good results. In a favorable season the tops of the young trees will be a foot or somewhat more in height, with a tap-root two feet and a half or so in length. The following spring and summer many of the young trees can be worked by grafting or budding.

Propagating Tools.—The tools necessary for propagating pecans—nursery work and top-working—are a com-

mon budding knife, a budding tool, a grafting iron, a grafting mallet and a fine-toothed saw.

The budding knife should have a thin blade of good steel, capable of retaining a keen, sharp edge. The whetstone must be used frequently to keep the blade sharp to insure the making of smooth, clean cuts.

At least three budding tools have been invented. These are known as White's, Galbreath's and Nelson's budding tools, respectively. The principle in each one is that two sharp cutting blades are fixed parallel to each other to insure uniformity in cutting annular and veneer-shield or patch buds. White's budding implement is especially recommended for use in top-working. The holes along the sides are used as a gauge for measuring the stock and bud stick. In the writer's opinion, the one best adapted for veneer-shield budding, but the blades are just a little too close together. A very satisfactory knife for this work may be made from two ordinary budding knives and a piece of wood three-quarters of an inch square and four inches long. To opposite sides of this the blades can be firmly attached with rivets and by binding with fine wire and twine.

The grafting iron is indispensable in cleft-grafting. These can be purchased at small cost, or a blacksmith can make an excellent one from an old flat file. Three or four inches of the file should be flattened and sharpened for a blade. In the remainder drill two holes and attach two pieces of wood to form a handle.

A small-sized carpenter's mallet answers nicely for a grafting mallet, or a very good one can be made from a piece of tough wood or a piece of an old wagon spoke. A leather thong should be attached to the handle, through which the wrist can be slipped to carry it when top-working.

The best saw for use in top-working is a carpenter's back-saw. This has a stiff blade, fine teeth,and leaves a smooth, clean cut.

Waxes, Cloth and Twine.—Good grafting-wax may be made according to either of the following formulas:

1. Resin 6 pounds, beeswax 2 pounds, linseed oil 1 pint.
2. Resin 4 pounds, beeswax 2 pounds, tallow 1 pound.

Melt the ingredients in an iron kettle over a slow fire, stirring slowly to insure thorough mixing. When melted, pour out into a bucket of cold water. Grease the hands, remove the wax from the water as soon as it can be handled and pull until it is light-yellow in color. Wax not needed for immediate use may be rolled up in balls, wrapped in oiled, stiff brown paper, and put away for further use.

Waxed cloth can be prepared by melting the wax in a kettle and dropping into it sheets or wide strips of old calico or cotton cloth. As soon as saturated with the wax, remove them from the kettle and stretch on a board. For use tear into strips, one-quarter or one-half of an inch wide.

Waxed twine is prepared by dropping balls of No. 18 knitting cotton into the melted wax and stirring them about for four or five minutes, or until the wax has penetrated them.

Selecting Cions and Buds.—Cions and bud sticks should be taken from healthy, vigorous trees. Select the cions from well-matured wood of one year's growth, though a piece of two-year-old wood at the base will not matter. The wood is angular, small and the internodes long, and the pith large in proportion to the diameter. Either terminal portions of twigs may be used or portions back of the tip, but the buds should always be well developed, full and plump. For this reason grafts should not be cut from wood far back from the tip of the branch. As stated already, twigs of the previous season's growth are generally used, provided the growth is not too large. Grafts are generally cut about five or six inches long and should be from one-quarter to three-eighths of an inch in thickness.

It is best that the grafts be cut while still in a dormant state, and inserted in the stock just before growth starts. The cions may be kept for a considerable length of time by placing them loosely packed, in damp moss or sawdust, in a box. The box should be covered over with earth and the cions kept sufficiently moist to prevent drying out. The difference in the condition of the stock and cion, it should be understood, is not absolutely necessary, as good results are frequently obtained without these precautions, but in grafting the pecan a difference in dormancy is extremely desirable, and it is an important factor in securing good results.

For bud-sticks, well-developed one-year-old branches, one-half to seven-eighths of an inch in diameter, and on which the buds are well formed, or older wood, with plump, full buds, are selected. Such sticks frequently show three buds at a node, and if some misfortune should overtake one or two of these, there is still a chance of success, though the upper one, being the strongest, is generally the one which starts, provided it is uninjured and the bud takes. The degree of maturity of the bud is important, and care should be exercised that only those which are plump, full and well-developed, are used. It is easy to distinguish between desirable and undesirable buds.

Grafting and Grafting Methods.

Top-working by grafting, or the grafting of nursery stock above ground, should be done in spring just before growth starts. The preference is for the latter part of the season, provided there is not too much work to be done, as the cions have less time to dry out before the process of uniting with the stock begins. The work of whip-grafting nursery stock under ground just at the crown roots of the seedlings can be started in the latter part of December and continued until February. For this work the earth is thrown back from the seedlings, leaving

them standing in a narrow trench. After the cions are inserted, the ground is placed back about them, covering them up, leaving only the top bud exposed. The seedling trees cannot be dug up and bench-grafted satisfactorily in winter, as is the practice with apples, pears and other fruits. It can be done, but the percentage of unions secured is too small to make it an economical method to follow. The only satisfactory plan is to graft the seedlings in the nursery row, as described above.

Two methods of grafting are used, cleft-grafting for top-working and whip-grafting for working both nursery seedlings and old trees.

Cleft-Grafting.—Having selected the place on the branch or trunk at which the cion or cions are to be inserted, the part should be sawed off with a smooth, clean cut. The end of the stub can then be cut squarely off at the point desired.

The trunk or branch is then split with the grafting iron. The cleft should be carefully made, and should be about one and a half inches in length. In preparing the cion, a sloping cut is made at the lower end about one and a half inches long, cutting into the pith from a point one-half way up the cut, down to the lower end. On the opposite side, the second cut should not touch the pith, but should be made through the wood throughout. The cion should be left wider on the outer side than on the inner to make a tight fit when inserted. Start the cuts on each side of and just at a bud.

Having made the cleft, open it with the wedge end of the grafting iron and place the cion in position in the cleft-stock. *The cambium layers should be in contact* and the cion should be shoved well down until the whole of the wedge is within the stock. In large stocks two cions may be inserted, the weaker of which should be removed if both live. Large stocks will exert sufficient pressure against the cions to render tieing unnecessary, but if the stocks are small the union should be firmly tied with

waxed twine or cloth, and in any case the ends of the cut stock and the union should be covered smoothly with grafting-wax. Should there be danger of the stock exerting too much pressure (as in the case of large stocks), the cleft should be made well out to one side of the center.

Whip-Grafting.—Stocks, whether seedling trees or branches in the tops of old trees, should be less than an inch in diameter, one-half or five-eighths inch being a nice size.

A sloping cut, an inch or an inch and a half long, is made at the end of the cion, a corresponding cut is made on the stock, a small tongue of wood is raised on each by making a cut with a knife-blade parallel to the grain of the wood. The tongue is raised a little on both stock and cion and the two are then shoved together, with the cambium layers on one or both sides in contact. They must then be firmly bound together with twine or cloth, the whole of the cut surfaces being covered over to the exclusion of water, air and the germs of decay.

The cion and stock are preferably chosen of nearly the same size, but a cion somewhat smaller than the stock may be used, in which case the cambium layers along one side of the surfaces in contact must be placed opposite, as already indicated. In working nursery seedlings by whip-grafting, the cions should be inserted so that the point of union will be under the surface of the ground. The earth should be placed back around the union as soon as the work is completed. This plan of propagation will not give satisfactory results except on well-drained lands.

Budding and Methods.

Budding is preferred to grafting by some propagators, as they are able to secure a larger percentage of unions than by grafting. Much, however, depends upon the locality, soil and drainage. By either method from fifty to seventy-five per cent, of successful unions must be con-

sidered satisfactory. The amateur may well be satisfied with 10 per cent.

The season for budding is when the bark will slip well during the months of July and August. The season is, however, often extended into September. Many of the buds inserted late in the season remain dormant until the following spring.

During the season, from the first of July until September, the atmosphere is moist, the buds are in good condition, the sap flows freely, and better results are secured than at any other time. The buds commonly used are those which have been formed just previously. They should be carefully selected and only those fully matured should be used. Oliver (Bulletin 30, Bureau of Plant Industry, U. S. D. A.) recommends the use of dormant buds of last season, but the method has not met with favor because of the large amount of wood which must be sacrificed to secure a few buds.

Annular Budding.—By this method branches or seedling trees three-quarters of an inch or less in diameter may be worked. It is preferable that the stock and bud stick be of the same size, though the stock may be somewhat smaller. From the stock remove a ring of bark an inch or so in length. On the bud-stick select a good bud and remove it by taking out a ring of bark the same in size as the one removed from the stock. Place this ring in the place on the stock prepared for it and bandage securely in place, using a piece of waxed cloth. The wrapper should be brought around the stock, so as to cover the cut ends. The bud may be covered over or left exposed.

In ten days or two weeks remove the bandage, and examine the bud. A plump, full bud at this time is an indication that the union has taken place.

Veneer-Shield or Patch-Budding.—If this method is used, it is not essential that the stock and cion be of the same size, and so far as size alone goes almost any stock

may be used. A rectangular or triangular piece of bark is removed from the side of the stock. From the bud stick cut a similar piece of bark with a bud in its center. Place the bud in place on the stock and wrap as in annular budding. If the stock is considerably larger than the budstick, the piece of bark with bud attached will have to be flattened out somewhat before inserting.

Lopping.—Frequently buds, particularly those inserted late in the season, act as dormant buds and do not begin growth until the following spring. The top of stocks budded during June, July and August should be lopped up to September first. It is always well to start the buds out before growth ceases for the season, but stocks budded after the first of September should not be lopped until the following spring, just before growth begins.

One method of lopping is to cut the stock back to within five or six inches of the buds, at first. Later, after the bud has grown to some size, it should be cut right back to the bud and painted over to prevent rotting. Lopping may also be performed by cutting the stock half off two or three inches above the bud and bending it over. After growth starts in the bud, it should be removed entirely, thus throwing the full flow of sap into the bud.

The Nursery.

The best soil for the pecan industry is a well-drained, loamy soil, with a clay or sandy-clay sub-soil. The land should be put in good condition before the trees or nuts are planted in it. Crops of beggarweed, velvet beans plowed under, or a good dressing of well-rotted stable manure will go a long way toward putting the ground in good shape. The ground should be plowed deeply and put in the very best tilth.

Throughout the growing season the ground should be cultivated frequently. Shallow cultivation to conserve moisture and destroy weeds is all that is necessary. It

is not possible to grow good trees without thorough, frequent cultivation.

Fertilizers containing considerable nitrogen should be used at the rate of about 300 pounds per acre. One analyzing 3 per cent. phosphoric acid, 3 per cent. potash and 6 per cent. nitrogen is about right for nurseries on most Florida soils.

As soon as a block of trees is removed, it is an excellent plan to sow the ground in one of the leguminous crops mentioned above, to help it to recuperate. The frequent cultivations, so necessary for the growth of the trees, wear out the humus in the soil. The legumes will replace this if grown, and plowed back into the soil, after they are dead and dry.

Top-Working Pecan Trees.

By far the greater number of seedling trees in the State have not fulfilled the expectations of their planters. The trees are not prolific, or the fruit which they bear is small and inferior. Such trees, if in good health and vigor, may be top-worked to advantage. Seedlings may be planted with the expectation of top-working them, but this is not recommended.

If the trunks are small, an inch or an inch and a half in diameter, the whole top may be removed at once. If the trees are medium size the main branches may be worked close to the trunk; and if large, grafts may be inserted farther up from the trunk. Buds may be inserted in vigorous branches. The growth of such branches may be induced by cutting back the original branch of the tree in late winter. Lateral buds will then be forced into growth and by midsummer the branches formed from them will be large enough to bud. *The attempt should not be made to bud or graft over the whole top of a large tree in one season.* Only a few branches should be worked each year, and in the course of two, three or four years, depending

upon the size of the trees, the old tap can be entirely removed and replaced by a new one of a good variety.

Both cleft and whip-graft may be used, but the latter can, of course, only be used on small stocks. The objection to working very large branches is that they do not heal readily; two and a half inches is about the maximum in size. Large wounds should be painted over with white lead paint to prevent decay.

For several months after the new top has commenced to grow the cions or buds have but a slight hold upon the stock, and as the growth is usually very vigorous and the leaf surface great, considerable damage is frequently done by strong winds, or by wind and rain together. To prevent this, the young shoots may be tied together or fastened to other portions of the stock. If this be done, care should be taken that the twine used does not do injury by cutting into the wood. To obviate this, a piece of burlap should be placed around the branch beneath the twine, and the twine should be removed as soon as it has served its purpose. In some cases the top may be supported by lashing a pole against the side of the trunk and fastening the grafts to the upper part of this, or a pole may be driven into the ground at some distance from the trunk, fastened against a branch or stub of a branch above and used in the same way. After the top has grown sufficiently to take care of itself, these posts can, of course, be removed. Sometimes, after the top has made considerable growth, and particularly if large branches are allowed to develop opposite each other, they are split apart and the whole top ruined. If this undesirable conformation exists it is best to take steps to prevent splitting. A bolt having a stout washer against the head should be placed through two branches, a second washer placed on and the nut screwed up. The bolt will, in the course of a few years, be entirely covered. By this means the tree trunks are held firmly together. This same plan may be used to save branches which have partially split apart. Sometimes a

branch may be inarched from one large branch to another to serve as a living brace.

Necessarily, a considerable number of wounds are made in top-working. Branches are removed entirely, others are cut back to within a foot or so of the trunk and grafted. Often these fail to unite. Such stubs should not be left. If branches are formed on them they should be cut back to the point where these buds start; if no branches come out from them they should be cut back to the trunk or large branch on which they are borne. If left, they prevent the healing of the wound, rot back, and the rot is carried into and down the trunk of the tree, resulting in a hollow and weakening the trunk. *Smooth cuts should be made, and these should be covered with white lead paint to prevent decay.* A little lamp black may be added, if desired, to make the paint nearly the color of pecan bark.

Soils and Their Preparation.

The peculiar conditions of soil and moisture surrounding the pecan in its native home might be regarded as an indication that it cannot be grown except on deep, rich soil in proximity to rivers, ponds or streams. Such, however, would be a wrong inference, for it succeeds admirably and bears good crops on a wide range of soils. Hence we find it today in localities far removed from the regions to which it is indigenous and thriving under conditions differing greatly from those obtaining in its native home. In Florida, trees may be found growing on soils ranging from the black hammock to the less fertile high pine lands. On hammock soils, however, the trees are often inclined to develop wood at the expense of fruit, while on less fertile soils the trees make less wood and bear more fruit proportionately. Pecans thrive well on flat woods; the grove of Dr. J. B. Curtis, Orange Heights, Fla., is planted on this type of land. Moisture in sufficient quantity must

be present, but it will not do to plant the pecan on land that is continually wet and boggy. The presence of a hard, impenetrable sub-soil doubtless has a great influence upon the welfare of the tree, and it would be better to select other ground, or when this is impossible, to blast out the hardpan. A quick-sand sub-soil is equally objectionable. If close to the surface, it should not be used. The roots cannot penetrate it. All things considered, the best soil is probably one which has previously supported a growth of holly, willow-leaved oak, dog-wood, hickory and those other trees usually found associated with them. A sandy loam, with a clay or sandy-clay sub-soil, is difficult to surpass.

A land intended for young trees should be well prepared. This preparation will depend largely upon the care and treatment which the soil has received previously. Land on which the forest still stands should preferably be thoroughly cleared and put in cultivation for a year or two before planting. Leguminous crops are excellent to precede the setting of the trees. Plow the ground thoroughly, break deeply, harrow it level, and it is ready for the trees.

Pecan Planting.

Buying Trees.—Florida has suffered as much from fraudulent pecan tree agents as any other State. Seedling trees have been "doctored" and sold to planters, and varieties have been sold which were untrue to name. Unfortunately, too few people are acquainted with the characteristics of a budded or grafted tree.

Those who are thoroughly acquainted with the wood, twigs and branches of pecan trees are able to tell the different varieties at a glance. The color of the bark, the shape, size and arrangement of the lenticles, the size and shape of the buds are always characteristic, and by these marks varieties can be distinguished. Every planter

should acquaint himself with the wood characteristics of the varieties. But, after all, the safest, by far the safest, plan is to deal directly with honest nurseryman, men of unquestionable integrity, men who give their business careful thought and attention.

The best trees for general planting are well-grown one-year-old trees, from three to five feet high.

Too often but slight attention is given to the planting of the trees. There is too frequently a disposition on the part of the person setting trees of any kind to do the work as rapidly as possible, without consideration for the future welfare of the plants. Few realize that time spent in careful, intelligent preparation of the soil and in setting the trees is time well spent and well paid for in the after-development of trunk and branch. Better a month spent in preparing the future home of the young tree than years of its life spent in an unequal struggle for existence. More than that, the tree may die outright and a year must elapse before it can be replaced. It is generally stated that the pecan is a slow grower, and yet trees from twelve to fourteen years old will sometimes measure from thirty-five to fifty-seven inches in circumference at the base, while under less favorable circumstances others will stand still for a period of six or seven years, or until they have accumulated sufficient energy to overcome the untoward conditions of their environment.

Distance.—The distance apart at which the tree should be set will depend in a measure upon the character of the soil. If rich and moist, the trees should be set farther apart than on higher, dried soils. Forty feet is generally believed to be about right for most Florida lands. Two methods of setting may be followed, rectangular and hexagonal. The number of trees which may be set per acre by the rectangular system are as follows:

40x40	27 trees
40x45	24 trees
40x50	21 trees

40x60	18 trees
45x45	21 trees
50x50	17 trees
50x60	14 trees
50x75	11 trees
60x60	12 trees
60x75	9 trees
70x70	8 trees
70x75	8 trees
75x75	7 trees

To find the number of trees for any distance not given in the above table, multiply the distances together and divide 43,560, the number of square feet in an acre, by the product. The result will give the number of trees.

By the hexagonal system, about fifteen per cent. more trees may be set per acre than by the rectangular system. If a double planting is contemplated, as pecans and peaches, the rectangular system should be used, and one or more peaches set out in each rectaugular formed by the pecans.

Staking the Ground.—If a good plowman can be secured, the rows can be run off with a plow, running both lengthwise and crosswise of the field. Ordinarily, however, a true corner may be established with a carpenter's square, the field staked out around the outside. For the rectangular system, the stakes can then be set up in the center of the field by measuring or by sighting, or by both. Ordinary building laths make good stakes.

To stake off the ground by the hexagonal method, commence on one side of the field and plant stakes at the desired distance apart where the trees are to stand. Using two chains or two pieces of wire with rings at the ends (their length being the same as the tree distance), the position for the second row of trees may be easily ascertained. Drop the rings over two adjoining stakes and stretch them out until they form an equilateral triangle with the base line. Plant a stake at the apex to indicate

where the tree is to stand. Set up all the stakes for this second row in the same manner, then use it as a base line and so on across the field.

Planting.—Having set a stake where each tree is to stand, the planting board should then be brought into use. This is simply a light board, five or six inches wide and six feet long, with a notch cut in the center of one side and an inch hole bored in each end. In digging the holes for the trees this board is laid down on the ground with the notch against the tree stake. Two small wooden stakes are then shoved into the ground through the holes in the ends and the board and tree stake both taken away.

In preparing the tree for planting, all broken or bruised roots should be cut off immediately behind the injuries. This is usually done before packing for shipment if trees are purchased from a nurseryman, but possibly may be neglected or the ends of roots become rubbed or lagged in transit. The cuts should be made with a sharp knife from the underside of the roots and outward, leaving a smooth, sloping cut. To trim the roots to the best advantage, they should be held upside down while trimming.

In setting out a pecan tree, a hole 24 inches in diameter and 30 inches deep is usually large enough, although wider holes may be dug with advantage, thereby enabling more pulverized and richer soil to be put around the roots, which is beneficial to the new feeding roots as they form. When setting out the trees, carefully fill in among the roots with pulverized top soil or woods earth. Well-rotted manure or not exceeding one and one-half pounds of commercial fertilizer may be put in the outer sides of hole, as far as practicable beyond outer ends of lateral roots, while hole is being filled, but by no means to come in contact with the roots or trunk of tree. No fertilizer should be put at bottom of hole. Work and firmly press the dirt among the roots, laying each root in a natural position. No holes or cavities in the soil should be left,

and soil must be in close contact with all roots, especially the tap-root. The bottom of the hole should be firm, to avoid further settling of the tree. The tree should be set at such a depth that after a copious watering and the permanent settling of the earth it will be, perhaps, a little deeper than it stood in the nursery row. It is very important that no part of the crown or root be left uncovered when planted or afterward, and if at any time it is found that the earth has settled and left any brownish-red part of the crown or root exposed, it must again be covered with soil.

The point where the root and crown leave off and the trunk begins is a very vital portion of the newly-set tree and must always be underground. Trees should be carefully examined after the first heavy rain after planting, and earth thrown to tree if soil has settled. It is better to plant them an inch or two deeper than they stood in the nursery row than to run the risk of having the crown of root exposed. If tap-roots are inconveniently long, say over thirty inches, they must be cut off by a sloping cut with a sharp knife. In the larger size trees it is better to sink a hole deep enough to receive the root without cutting shorter than is done before packing. The foolish theory about a pecan tree not bearing if its tap-root has been cut has been so thoroughly disproved that it is not worth discussion. If the tap-root is cut when the tree is dug, as is often necessary, the cut quickly heals and a new tap-root (sometimes several) will form. After planting is completed, loose soil should be lightly thrown around the tree to loosen evaporation, or it may be mulched with leaves, straw, etc., in lawns and other places where no crops are to be planted. The mulching of newly-set trees is highly recommended. The ground is thereby kept moist, a slow decaying supply of natural plant food is provided, and grass and weeds are not so troublesome, thus avoiding the necessity of so frequently stirring the soil immediately around the trees. The

ground around fruit or nut trees should never be allowed to bake or crust, and it is the more important with newly set trees, particularly the first season.

Never allow the roots of a pecan tree to become dried out. It is best that the necessary root pruning be done in the shed and the trees carried to the field wrapped in a damp blanket, from which they are removed one by one as required for planting. The tops should be pruned back slightly to restore the balance between the roots and the tops, which has been disturbed in the process of transplanting.

The best time to plant pecan trees is somewhere between the first of December or the latter part of November and the first of February. Preference must be given to the earlier part of this period, as the ground will have a chance to become firmly packed and the root wounds will have partially calloused over before the growing season begins. Besides, the early spring season in Florida is usually dry and recently planted trees do not stand nearly so good a show as those planted in December and January.

Cultivation.

Because the pecan grows as a forest tree in some parts of the country many people suppose that it can be left without care and cultivation, left as any other tree in the fields and woods is left to shift for itself. But if fruit is required from the tree, no matter whether planted in the garden or the orchard, it should be given good care. Too many of our practices are based upon ideas taken from the native trees of the woods and fields. But all these trees do from year to year is bear a few fruits, many of which are imperfect, in the attempt to reproduce themselves. If that is all that is desired of the pecan tree well and good; a system of neglect will secure the result and the insects and fungi will be the chief beneficiaries of the practice.

One lesson can be learned from the woods. The ideal soil conditions for the pecan grove is that found in the forest. The soil there is filled with vegetable matter and humus; it holds water and plant food. The aim in the cultivation of the trees should be to provide and maintain a soil as nearly ideal as that.

Whether anyone would have the temerity to advocate the cultivation of a pecan orchard along the lines applied to peach orchards and citrus groves is seriously doubted. A pecan plantation will begin to bear in from six to eight years after planting and should produce a very fair crop at ten years, after which it rapidly increases in productivity. But during the period when the trees are growing and no fruit is being produced, cultivation must be given. This is best done by planting the land between the tree rows in cotton, peanuts or other field crops, in vegetables, cowpeas, beggarweed or velvet beans. The last mentioned crops may be used in making hay. These are the ideal crops for the pecan orchard. It would be best to follow a systematic rotation of these crops. As, for instance, first year peanuts, second year cotton, or first year crabgrass and beggarweed, second year cotton, and third year velvet beans or cowpeas.

The area grown in these crops should by no means equal the total area of the field. The tree rows for a width of four or five feet on each side should not be planted in crops during the first year. This strip should, however, be cultivated during the first part of the season and about the beginning of the rainy season sowed to beggarweed. The cultivated area will necessarily become more restricted each year, and eventually the ground will have to be given up to the trees.

Then the plan frequently advised is to put the land in grass and use it for a pasture. But grass is generally an important item in the cultivation of neglected pecan orchards. *It is synonymous with neglect and bad treatment.* It interferes with the growth, development and

fruiting of the trees, and this plan is no longer advised by growers.

Instead, it is preferable to cultivate the trees in spring, continuing the cultivation well up to the rainy season. Later, in August, a crop of crabgrass and beggarweed may be removed for hay. By autumn a considerable additional growth will be formed to cover the ground in winter and turn back into the soil to restore and maintain the necessary humus content of the soil.

Fertilizers.

On nearly all Florida soils pecan trees are benefited by the application of fertilizers in some other form or other. Large quantities of food materials are taken from the soil in the growth of the trees and the development of the crop.

The greatest demand made on the soil by the tree is for nitrogen, and this can be met by applying stable manure, or by growing leguminous crops and turning them under, as already directed. In the fertilizing of the pecan this is by all means the best policy. The potash in the form of sulphate or muriate of potash and the phosphoric acid in the form of acid phosphate can be supplied separately.

Formulas.—The requirements of the trees will differ at different stages of their growth. The needs of the young trees differ from those of fruiting ones. For young trees, nitrogen in considerable amounts is required, while for bearing trees more potash and phosphoric acid and less nitrogen, relatively, are required. If complete fertilizers are used, those given the young trees should analyze about five per cent. phosphoric acid, six per cent. potash and four per cent. nitrogen; while one containing six per cent. phosphoric acid, eight per cent. potash and four per cent. nitrogen is about right for bearing trees.

If we assume that acid phosphate analyses 14 per cent.

phosphoric acid, high-grade sulphate of potash 50 per cent. potash, cotton seed meal 6.5 per cent. nitrogen, and dried blood 14 per cent. nitrogen, the following amounts of these materials, which may be mixed at home, will give approximately the above analysis:

For Young Trees—

Acid Phosphate (14 per cent. goods)	700 pounds
H. G. Sulphate Potash	225 pounds
Cotton Seed Meal	1,150 pounds

If dried blood is used in place of cotton seed meal, one-half of the amount, or 575 pounds, will give as much, or slightly more nitrogen, than the 1,150 pounds of cotton seed meal.

For Old Trees—

Acid Phosphate (14 per cent.)	850 pounds
H. G. Sulphate Potash	300 pounds
Dried Blood	250 pounds
Cotton Seed Meal	600 pounds
	2,000 pounds

Applying the Fertilizer.—The whole of the fertilizer may be applied in spring, just before the growth starts. On the whole, this is one of the best times to apply it. In some cases it may be advisable to apply only half the material at that time, leaving the other half for application about the first of June. So far as the nitrogen part of the fertilizer is concerned, this would be good practice, but the potash and phosphoric acid may well be applied at the beginning of the season's growth.

In applying the fertilizer to young trees, it should be put on in a circular band about the tree (closer or farther away, depending on the size of the tree), and spreading it around on a strip four or five feet wide. As the trees

increase in size, the fertilizer should be applied over a larger area until, in the case of old trees, the whole surface should receive an application.

Pruning.

For such pruning as is necessary for pecan trees, a few tools should be provided. These will consist of a pair of good pruning shears, German solid steel pruning shears being the best, a pair of Walter's tree prunes for cutting back long branches, and a good pruning saw. One of the best pruning saws is what is known as a Climax pruning saw, or a Pacific Coast saw is equally as good.

It is not advisable to prune the trees during the time when growth has just started in spring, and the sap is in active motion. At this time it will be well-nigh impossible to properly protect the wounds. The necessary coat of paint will not stick to the wound when wet with sap from the tree.

While pruning may be done during the summer months, when the tree is in full leaf, all things considered, the best time to prune is in early spring before growth starts. There is usually less to be done on the farm at this season and more time is available for the work. Wounds made at this time usually heal quite rapidly.

In cutting all branches the saw should be held parallel to the part which is to remain, and the branch should be cut off smoothly close up to the trunk.

As soon as the branch is removed the wound should be painted to protect it from decay. For a protective covering, nothing is better than white lead paint. A small amount of coloring matter may be added to it, if desired.

As a general rule, the pecan requires comparatively little pruning. At the time of planting, the young trees should be cut back some distance, particularly if they are very tall. It is well to have the main branches from within four or five feet of the ground. After this about

all the pruning necessary is to remove dead or injured branches and cut back those which have a tendency to run up beyond their neighbors. For this work, as well as in procuring grafts or bud-wood from the top of the tree, the tree-pruner comes into good service.

Top-worked trees frequently require considerable pruning to get them started so that they will develop into symmetrical trees.

Harvesting and Marketing.

The pecan crop is not so difficult to harvest and prepare for marketing as a crop of oranges or peaches, for instance, and yet some care must be taken to put the nuts on the market in inviting shape.

Field Equipment.—The equipment necessary for harvesting consists of an extension ladder, a step-ladder, a number of bamboo fishing-poles and picking sacks. The best kind of step-ladder is one having three legs instead of four. Picking sacks should be made from ordinary hemp or jute sacks. The sack should be spread open with a piece of stick, sharp-pointed at both ends, placed in one side of the mouth, thus making the opening triangular. Place a pecan nut in the lower corner of the sack, tie one end of a piece of stout twine about it as it lies in the corner and then tie the other end of the twine to the center of the mount of the stick opposite the stick. The twine should be short enough to draw the bottom and top of the sack close together, leaving an opening through which the arm may be thrust and the sack slung over the shoulder.

Picking.—As soon as the greater percentage of the burrs have opened, the crop should be gathered. It will not do to wait until all have opened, neither is it advisable to pick the trees over a number of times. Pick them clean at one picking. The burrs of those nuts which are fully matured will open, the burrs of immature ones may not. The latter should be discarded.

The men should climb the trees and pick the nuts by hand, using the bamboo poles only for those entirely out of reach. Even this should be done carefully, so as not to injure the bearing wood of the trees. Care in picking good nuts by hand will amply pay the grower, because the beating and shaking of the trees will cause a considerable quantity of fruit to be lost, and a few pounds saved will repay all the time and trouble. Of course, in very high trees there is frequently nothing to do but shake and thrash the crop off the trees. The plan of covering the ground beneath the trees with a large sheet would work well and assist in reducing losses. As soon as taken from the trees the nuts should be spread out under a shed or in a building to dry. A very convenient plan, and one which will save space, is to provide a sufficient number of trays, three feet by four feet, and three inches deep, with half-inch mesh wire bottoms, and place the nuts in these, two or two and a half inches deep. Racks can be provided around the room in which to place these. In from ten days to two weeks from the time of picking the nuts should be cured.

Grading.—The variety should be made the basis of the grade; that is, each variety should be picked, packed and marketed by itself. This, besides, gives an excellent opportunity to compare the commercial value of different kinds. When a grower has a large number of different kinds of seedling nuts, and a small quantity of each, they may be graded by passing them through screens.

Polishing.—At the present time practically all of the common market nuts are both polished and colored. Coloring should not be resorted to, and in the case of good varieties of nuts polishing should not be done. In the case of small or mixed lots, however, polishing is useful in making the nuts more uniform. It can be accomplished by putting the nuts, with a little dry sand, in a barrel fixed so that it can be rotated like a revolving churn and turning over until the nuts receive the desired polish. The

better nuts, however, should be put on the market just as they come from the trees. The marketings, dots and streaks on the outside are their trademark and should not be interfered with.

Packages.—For shipping small quantities of pecans by express, nothing is better than a box. Barrels are best for larger shipments. For mail shipments stout pasteboard, wooden or tin boxes or tin cans make good packages. Frequently shipments are made in sacks, but the sack does not afford sufficient protection to the contents and should not be used. As a rule, the box should be made so that a given weight will fill it, but this difficulty may be overcome, to a certain extent, by putting in a pad of paper or excelsior—paper being preferable. Fill the packages on a solid floor, shaking them down well and putting in all they will hold, placing the pad, if one box has to be used, in the bottom.

On the outside of the packages, before shipping, should be placed the name of the grower, the variety, the number of pounds, and the shipping directions. Small boxes to be shipped by express for the holiday trade should be wrapped in good quality wrapping paper before shipping.

Marketing.—The best plan for marketing good pecan nuts is to build up a private trade. As a matter of fact, at the present time but very few of the large, full-meated pecans find their way into the general market. They are either taken by seedsmen or consumed by private customers. In building up a private trade, advertising has its place, of course. Advertisements inserted in a magazine or papers, particularly in those which are published in the tourists towns of the State, may be found helpful.

The object and aim should be to give each private customer a package, bright, neat, attractive and containing the best quality of nuts. If a certain price per pound is fixed for a given quantity, then this should not be varied under any circumstances. Each year the same quality of nuts should be given to each customer. It will not do to

give large ones one year and smaller ones the next; this tends to create dissatisfaction. In some of the larger cities there are high-class fruit dealers who handle nothing but fruits, nuts, etc., of the very highest quality. Under some circumstances it might be well to enter into negotiations with such firms.

Varieties.

Although the pecan industry is not old, yet a very considerable number of varieties has been brought forward. Not all of these are or have been meritorious, and in fact many varieties are now represented by name only. Other varieties are comparatively new, and no one can speak authoritatively of what they will do over a wide range of territory. Still other varieties have been propagated by buds or grafts for a number of years, with the result that they have been tested fairly well over the country. Some of the varieties so tried have proved satisfactory, others have not. Of the older varieties, Stuart, Van Deman and Frotscher have been found satisfactory in nearly all cases, while Centennial and Rome have proved so unsatisfactory that they have been cut out of the lists of many propagators. It is doubtful whether a more worthless nut has even been propagated and sold than that much-named variety, Rome, Columbian, Pride of the Coast, Century, Twentieth Century, etc. For the Florida planters, the best advice that can be given is to plant neither Centennial nor Rome. They either do not bear enough fruit or that which they do produce is inferior or poorly filled out. Van Deman, Stuart and Frotscher, on the other hand, have generally borne full crops of nuts of good quality.

A satisfactory commercial pecan nut must be prolific, of good size, good quality, must not be spasmodic in its bearing, plump, with a bright, presentable exterior and preferably a light-colored kernel. The nuts should, be-

sides, yield sixty per cent. or upward of kernels. All these things in one variety make a difficult combination to secure. Undue weight must not, however, be given to size, for size and quality are usually antagonistic to each other. In fact, in pecans, as in other fruits, we must go to the small or medium-sized ones for the best quality. No variety of pecan is superior to Santa Saba in quality, yet it is a small nut. Other varieties which may be regarded as standards of quality are Schley and Curtis. The former is a medium to a large nut and medium prolific variety, while Curtis is of medium size, precocious and prolific.

Moneymaker is reported as doing well in Louisiana, and, being a medium-sized nut, it is likely to succeed in Florida; but the shell is rather thick. Georgia has proved to be a prolific and precocious bearer. Nearly all of the varieties given in the following list have been reported upon favorably by different growers.

In planting pecans, no greater mistake than that of planting a large number of varieties can be made. At most, the plantings should be confined to four or five varieties. If the grower desires to experiment, and it is a good thing to do, then a tree or two of a number of other varieties should be included in order to test their merits.

Varieties Recommended.—The following list contains the varieties which are worthy the attention of Florida planters. Not all of them have been thoroughly tested as yet, and the reason for inserting them here is to urge that this be done—not in large numbers, not in ten-acre blocks, but in lots of two or three trees. In the mean-time, until our knowledge of the varieties and their adaptation is increased, the safest advice that can be given the Florida planter by the writer is to confine himself to such well-known varieties as Curtis, Frotscher, Schley, Stuart, Van Deman, and Delmas. This list for planting in the western part of the State may be supplemented by Bolton, Sweet-

meat, and Georgia. Pabst and Russell are also much in favor with a good many growers. Continued improvements in those we have and equally as valuable additions are, of course, to be expected and are being added from time to time.

Remarks.

While we believe pecan growing to be a fine investment, we advise conservatism; do not plant more than can be properly cared for; the industry has come to stay, and with time it will grow to vast proportions. We do not believe that any person living today will ever see the demand wholly supplied, let alone a glutted market. The best grade of pecans are bringing about 50 cents per pound, but if this price is reduced in time as low as ten cents per pound there is more money in growing them than there is in most of the standard crops under good management. So we say to the young or the middle-aged man or woman engaged in, or about to engage in, either general or special farming, to plant pecans in proportion to their ability to care for them properly—it will pay them.

SUGAR-CANE AND SYRUP MAKING.

By A. P. Spencer.

SOME IMPORTANT FACTS.

(1) Sugar-cane is successfully grown throughout Florida, though it only matures perfectly in Southern Florida.
(2) Any good agricultural soil in Florida that has sufficient drainage is capable of producing profitable crops of sugar-cane.
(3) Sufficient moisture is the controlling element in the production of sugar-cane, from its earliest growth.
(4) Ammonia and potash are especially needed in any fertilizer applied, while phosphoric acid is needed in lesser quantities.
(5) Cultivation should be frequent until the crop is well grown, but always with shallow-working implements.
(6) The longer the cane can stand without danger of frost, the higher will be the sucrose content, and the better the quality of syrup.
(7) Sugar-cane will give a better yield if the seed-cane has been selected for healthiness and maturity.

Sugar-cane is among the most certain of Florida crops. Crop failure for the State has never been reported. Sugar-cane has been grown more or less in almost every county in Florida, and with a degree of success on almost every grade of agricultural soil in the State. It must not be inferred that sugar-cane has no preference as to soil fertility, moisture, or physical condition of the soil. Success in growing this crop is governed by the methods adopted in each stage of its growth.

Sugar-cane is a tropical plant. The different varieties require more or less than twelve months without frost to reach full maturity. Certain varieties are propagated successfully and profitably as far as 100 miles north of the Gulf of Mexico. Below the twenty-seventh parallel, or the region around Manatee and Lake Okeechobee in Southern Florida, sugar-cane matures, forming long sprays of bloom called "arrows." In seasons with little or no frost, the cane may mature even north of this line. In all sections of the State it reaches a stage of maturity sufficient for making syrup or sugar.

Up to the sixties, large plantations of sugar-cane existed on the low hammock lands of Manatee, Volusia, and Citrus Counties. At this time the industry was perhaps the most important one in Florida. At the close of the war, these plantations were nearly abandoned. Some of this land was planted in orange groves. Since this period, little attention has been given to growing sugar-cane on a large scale, although nearly every county of the State produces more or less of it. At the present time the largest acreage is on the rolling high pinelands of West Florida.

Soil.

The greatest tonnage of canes per acre is usually produced on low rich hammocks where the drainage is good. However, it is still an open question what class of soil in Florida is best for producing syrup. The better grades of high pine land in West Florida are producing from fifteen to twenty-five tons of sugar-cane per acre, and a superior grade of syrup. We may conclude that any good agricultural soil in Florida that has sufficient drainage is capable of producing profitable crops of sugar-cane, if the crop is grown by methods suitable to the soil. The rolling pine lands are well adapted without further drainage. Flat-woods soils frequently require drainage to carry off

the surplus water that is usually present during the rainy season. The flat hammock lands and reclaimed marsh lands, for the most part, have usually artificial drainage to control the surplus water during the wet season. While sugar-cane is a heavy consumer of moisture, it must have an open soil with the water table below the feeding area of the roots. It is a vigorous plant, and succeeds well on any soil suitable for corn or other farm crops.

Soil-Preparation.

Soil intended for sugar-cane should be prepared as long in advance of the planting time as the previous crop will permit; before November 1 for fall planting, and not later than January 1 for winter planting. After the vegetable matter has been plowed under, the surface should be harrowed and pulverized two or three times before the land is laid off for planting. Soils that have not been plowed deeply and worked back into condition cannot conserve the moisture already in the soil, or absorb and store up the rainfall that occurs during the winter months. Sufficient moisture is the controlling element in the production of sugar-cane from its earliest growth. The conservation is one of the main things to look to in the prepara tion of the soil for growing sugar-cane.

The deeper the land can be plowed, the better for sugar-cane, because of the extensive root system and the long season the cane remains in the growing stage. Fields that have been in cultivation for a number of years will be benefited by subsoiling until a depth of sixteen or twenty inches is secured. This may be done with an ordinary subsoil plow, or by a scooter following in the furrow behind a turning plow in breaking. This gives additional depth to the seed-bed, and proves advantageous to the crop, in that it gives a large storage area for the moisture supply needed.

Rotation.

In rotation, sugar-cane may follow almost any of the ordinary farm crops, but preferably sweet potatoes, velvet beans, or other leguminous crops; the latter being especially desirable because of the liberal amounts of humus they add to the soil.

Because of its gross feeding tendencies and the large amounts of fertilizing elements it consumes in the making of a twenty-ton crop, it is not advisable that sugar-cane shall follow itself on the same land, unless where it is desirable to grow it from the "stubble" or "ratoons," and then not for more than three years in succession.

Fertilizers.

With the exception of the rich hammock lands, sugar-cane will require liberal applications of fertilizer. Ammonia and potash are especially needed in any fertilizer applied, while phosphoric acid is needed in lesser quantities. The richer the soil in humus and decaying organic matter, the less will be the need of heavy applications of ammonia. This is evidenced by the very heavy crops grown in the hammock lands of Southern Florida before the war, when commercial fertilizers were nearly unknown here. On high pine land a fertilizer analyzing 5 per cent. of ammonia, 4 per cent. of phosphoric acid, and 8 per cent. of potash, should be applied at the rate of 600 to 1,000 pounds per acre, ten days before planting. The ammonia should come from an organic source, because of the long season required by the crop for growing. If the crop appears uneven and yellow, and shows an unthrifty appearance, it will be advisable to give a second application of ammonia not later than August 1. This ammonia should be applied in the form of nitrate of soda at the rate of 200 pounds per acre, and broad-casted. It matters little in what form the potash or phosphoric acid

is applied, because of the gross feeding tendencies of the sugar-cane plant. It is, however, conceded by some growers that a better grade of syrup will be produced by using sulphate of potash, instead of muriate of potash or kainit. This, however, it still an open question.

Planting.

When ready to plant the crop, lay off the furrows six inches deep and six feet apart. In these furrows plant the canes, after cutting them in lengths of three or four joints each, lapping them in the furrow a few inches. Cover the canes with about three inches of soil. If they are covered too deeply in mid-winter the eyes will be slow in sprouting, and likely to make a less vigorous growth than if they sprouted readily. After the cane is well up, the furrow may be filled in to the level. This places the roots well below the surface, giving a better root system, and helps to prevent the canes from blowing over when the crop is about mature and top-heavy. Canes that are planted very shallow will often blow over and tangle during the heavy winds storms of October. A tangled cane patch requires more labor for cutting and harvesting than one which stands erect.

Cultivation.

The cultivation of sugar-cane is similar to that of corn. This cultivation should begin soon after the canes are planted, mainly to prevent the loss from evaporation that will occur during the spring months unless the surface soil is kept stirred. The first two or three cultivations may be done with the weeder or harrow, which may be run in any direction over the rows. After the canes are too high for the weeder to pass over, the one or two-horse cultivator, running shallow, is a good implement to use. Cultivation should be frequent until the crop is well

grown, but always with shallow-working implements. If the ground is allowed to become dry from lack of cultivation at any stage in the growth, the cane suffers. A maximum crop cannot be made unless the plants have an abundant supply of moisture. In all probability the rainfall will be sufficient between June 1 and September 1, but during this period the weeds and grass will get a good start and fill the land unless the cultivation is frequent. The most likely period for the cane to be injured from lack of moisture is between planting time and June 15. It is advisable to keep the cultivation up just as long as it is possible to go through the cane patch.

Harvesting.

The first operation in harvesting is stripping the canes. This should be done about the last week in October in West Florida, and two weeks later in Central Florida. By removing the dead leaves the sunlight is admitted to the ground, which is thought to hasten the ripening of the canes. As there is a large amount of work involved in handling one acre of sugar-cane, it is further advisable to have this stripping done early, so that there will be no delay when the grinding season begins. The longer the cane can stand without danger of frost, the higher will be the sucrose content, and the better the quality of syrup, as immature cane makes inferior syrup. Cutting should commence about November 15 in West Florida, and in Central Florida about ten days later. The tops are removed before the cane is cut. It is recommended to leave about one immature joint to every eight mature joints, because of the glucose contained in the immature stalk, which helps to prevent crystallization in the evaporation of the juice. After the cane is topped, it should then be cut as low as possible and put into rows, or on the wagon for hauling to the cane mill. In the event of approaching freezing weather it is well to cut all the

canes and cover them up with the tops to prevent them from freezing. A white frost does not injure sugar-cane, but checks its growth and hastens maturity. A freeze is apt to kill the buds or eyes, and so injure them for seed; but it does not injure the canes for syrup or sugar, unless they ferment in the meantime.

Seed-Cane.

Sugar-cane will give a better yield if the seed-cane has been selected for healthiness and maturity. While this is one of the most general crops in the State and has been grown for many years, yet comparatively little attention has been given to careful selection of seed-cane. The loss from inferior seed-cane comes in several ways. If immature and poorly developed canes are planted, the stand of canes is almost sure to be uneven. The poorer canes will have many immature eyes that will not germinate at all, and many more that will germinate slowly, so that in the next year's crop there will be several blank spaces and many short-jointed small canes. There is the possibility of putting diseased seed-canes in the bed; perhaps causing the entire bed to rot, or at least injuring the growing powers of even the best canes. The selection of proper seed-cane is of the greatest importance in the growing of sugar-cane. Seed-canes should have well-matured buds, and joints of medium length. If the joints are short, the cane is apt to be less vigorous in growth.

It will require upward of 1,800 whole canes to plant an acre. In filling the beds it would be a wise precaution to allow at least 2,500 canes for each acre to be planted, so that in case of a loss there will be a sufficient number left for planting. No canes should be bedded from any field where red rot is suspected or known to be present. This disease is described on a later page.

Time to Save Seed Cane.

It has been already stated that cane buds are injured

by a freeze. It is important that the seed-canes should be cut and bedded before a freeze is likely. This date would be in west Florida about November 20, and in middle Florida about ten days later. It is to be remembered, however, that the seed-cane is more likely to grow well if it is well matured and if the buds are large and well developed. So that it is advisable to allow the canes to stand as long as they are safe from frost.

Laying Down the Beds.

The bottom of the bed for the seed-cane should be about eight inches below the surface of the ground. The bed should be six feet wide. The seed-canes should be placed in this bed in even layers about four canes deep on the sides and a little deeper in the center, so as to give a rounded top to shed the water. Seed-canes should not be topped. Each layer in the beds should be about ten inches forward of the previous one, so that the tops will cover the joints of the lower layers. The beds should be made as uniform and even as possible, so that no canes will be left uncovered and no depressions occur in the bed to collect water during rains. It is well in all cases that the butts of the canes should touch the ground and the canes be moist when laid down. This will help to prevent the buds from drying out, and also prevent dry rot. "Immediately after a heavy rain is a good time to bed seed-cane." When the bed is filled, it should be covered with about two inches of soil as a protection against frost. A strip about two inches wide may be left open along the ridge the entire length of the bed to give ventilation, and one or two furrows thrown up with a plow on each side to drain the water away. Should water stand in the bed during the winter, even for a short time, the canes would probably ferment and the buds be destroyed. If the bed is located on a slope, there is little danger of water standing in it. It might be again emphasized that a lack of

moisture in the seed-bed will probably produce dry rot or drying out of the buds, causing them to germinate slowly if at all; while standing water in the seed-bed will destroy the buds and possibly destroy the cane entirely. If the stubble is to be bedded for seed, it is best to dig it up by the roots, and bed it with the root attached. It would not be wise, however, to bed stubble cane in this way in the same bed with seed-canes; although about the same protection against freezing, and the same precautions as to excess or lack of moisture are recommended.

Stubble or Ratoon Cane.

While it is generally considered that a better yield of cane will be secured if the canes are planted annually, it is nevertheless a common practice to use stubble or ratoons for seed-cane. Unless these ratoons have more care than is frequently given them, an uneven stand will result in the following year. This is due to many causes, most of which can be avoided. In the first place, ratoons should be cut very low. If they are cut high there will be fermentation and decay, which injures the buds. A practice that is adopted by the best cane growers is to run a light furrow along one side of the cane, and then turn the ratoons up-side-down in this furrow, throwing a light furrow on them. This gives a covering for protection during the winter and prevents decay of the stumps of the canes.

It is not considered a good practice to use ratoons for more than two years in succession. Those who do this seldom get as good yield in the third year as in the second year.

Varieties.

Little attention has been given to the varieties of sugar cane in Florida. Nevertheless the best growers usually

select the light-colored canes because these produce a lighter colored syrup. It is fortunate that the light-colored canes usually produce as well as the red or purple canes.

In Louisiana the best results have been obtained from D. 74, which is a light-colored cane. It produces a larger tonnage of cane than other varieties in Louisiana. It is said to resist heavy winds, and to be altogether desirable. It is recommended by the Louisiana Experiment Station in preference to the purple or ribbon cane. A few farmers in Florida have, also, reported D. 74 to be one of the best canes for Florida. In Bulletin 129 of the Louisiana Experiment Station, the author speaks of it as follows "In nearly all sections of Louisiana it has given heavier yields than the purple or ribbon canes. It is reported to be in tonnage 20 per cent. superior to either green or ribbon canes. In addition it is reported to contain a larger percentage of sugar in its juice." The richer in sugar a cane, the larger the amount of syrup that can be made from it. With the ordinary process of manufacture, this high percentage of sugar will cause crystallization in the syrup, but with the better methods, crystallization can be avoided in other ways.

Japanese Cane.

Japanese cane was introduced into Florida about 1889 from Louisiana. It makes an excellent grade of syrup, but is it not generally recommended for syrup-making. It is much harder to grind than other canes, and the juice is more difficult to extract. It usually has a lower yield of syrup. There are, however, exceptional cases when Japaneses cane has yielded as high as five hundred gallons of syrup per acre. The average yield of all canes in the State is less than three hundred gallons an acre. Where this exceptionally high yield was obtained, it was under very favorable conditions, and in these cases other canes

would probably have given still greater yields. Japanese cane will withstand ten degrees of frost, and is therefore a perennial, and can be grown several years in succession without replanting. Some growers claim it will not require replanting for an almost indefinite number of years, but experiments do not altogether bear this out. The test plots on the Experiment Station farm show a much greater yield on the newly planted plots than on stubble originally planted about six years ago. Japanese cane is not generally recommended for syrup-making, but has proved an excellent winter forage crop for live stock. Because of the extra labor involved in stripping the leaves, and because the hardness of the cane requires heavier mills to get as high a percentage of the juice, this cane is less desirable than the other sugar-canes for syrup-making.

Cane Grinding.

Most of the cane mills in Florida are of the small type, and are operated by horse power. They will not give a high extraction, and are not to be recommended, except where only a small amount of syrup is made. It must be remembered that the greater the extraction, that is, the larger amount of juice that is pressed out per ton of cane, the greater will be the amount of syrup per acre. Very few of the small mills extract more than fifty per cent. of the weight of the cane in juice, leaving 35 per cent. still in the cane. (Cane is composed on the average of 85 per cent. juice and 15 per cent. dry material.) To secure the full extraction, it is necessary to set the rolls so close that the pulp or bagasse when passed through the mill will be broken into short pieces apparently free from juice and so dry that they will burn readily. A well designed steam power mill, when properly set, will extract 75 per cent. of the weight of the cane in juice, leaving only 10 per cent. in the bagasse. The most powerful steam mills extract an amount of juice equal to about 80 per cent. of the

weight of the cane, or nearly all the sucrose in the cane. A large percentage of the sucrose is wasted on farms where light mills are employed.

When sugar-cane has been properly grown on a good quality of soil, a yield of twenty tons per acre may be expected. As high as thirty or thirty-five tons have been produced under exceptionally good conditions. The average yield for the State is perhaps fifteen tons. One ton of well matured sugar-cane will produce about twenty gallons of syrup at a density of 33 degrees Baume. The exact figures cannot be given, since analyses of Florida canes vary from 9 to 18 in percentage of cane-sugar in the juice.

Several firms manufacture cane mills of standard designs, and it would be well for those who contemplate buying new syrup-making equipment to investigate the tonnage capacity per day and horse-power required to operate the machinery, bearing in mind that the chief value of a mill lies in its power to extract the highest percentage of juice from the canes.

Evaporation of Juice.

As the juice comes from the mill, it contains large quantities of coarse materials that should be removed before it goes into the evaporating pans. Thorough straining at this particular stage is necessary in the manufacture of high-grade syrup. As the juice leaves the mill, it should pass through a close wire screen to remove the coarse particles and leaves. Below this would be a coarse cloth strainer to catch finer pieces, and then the juice should pass through coarse muslin. Just before going into the receiving tank it passes through a wooden blanket which catches most of the finest sediment. These filters should be stretched on hoops, and a number of them kept on hand so they can be frequently changed and cleaned, otherwise they will become clogged and prevent the juice

from passing through. Thorough straining before the juices enters the evaporating pans will not only reduce the amount of skimming, but also improve the quality of the syrup. The receiving tank for the strained juice should be large enough for a full run in the evaporating pans, so there may be no delay when evaporation begins. This receiving tank also acts as a settling tank between the process of straining and that of evaporation. For plants suited to handle from five to forty acres of cane, the evaporating pan with steam coils is recommended. The better pan evaporators are equipped with steam coils for evaporation, while the smaller outfits are of the furnace type with the pans immediately over the firebox. The steam coils are to be preferred because of the control in boiling the juice. These pans are manufactured for their special purpose and can be purchased complete from the manufacturer.

When the juice enters the first evaporating pan, it should boil up quickly. This throws up a large amount of sediment and scum, which must be removed with a skimmer. If this boiling is slow, a large amount of the sediment will rise to the surface and cannot be skimmed off; but will pass over into the second pan, from which it is more difficult to remove it because of the greater density of the juice in the second pan. In the first pan the juice is evaporated to a density of about 25 degrees Baume. In the second pan the evaporation continues until the density of the syrup is 33 or 34 degrees Baume. With larger plants the juice remains in the receiving tank for six hours or more, so that the sediment goes to the bottom. Then the juice is drawn from the top, over into the first evaporating pan. Most of the clarification takes place in the first evaporating pan. As the juice becomes of a greater density it will hold a large amount of the sediment in suspension. If not thoroughly clarified before leaving the first pan, it will be almost impossible to remove the finer particles when the juice has become more

concentrated in the second evaporating pan. A cloudy syrup results.

When the juice has been boiled to the required density, it should be run into the containers, and immediately sealed up. The secret in making syrup of a uniform grade and high quality is in the care exercised in securing proper straining and the proper density in each stage of evaporation. It is nearly impossible for anyone to determine the exact density without the use of a Baume spindle. This Baume spindle is a glass float with a graduated scale. The point to which it sinks into the liquid will indicate the density. A small quantity of syrup may be removed from the boiling mass and placed in a glass or tin, and the Baume spindle inserted. The heated syrup in which the instrument sinks to 33 or 34 degrees has been sufficiently boiled. This on cooling, will give a density of 37 or 38 Baume, which is the proper density for marketable syrup.

Fermentation in Syrup.

Fermentation in syrup is caused by molds, yeasts, or bacteria. The preservation of syrup consists in sterilizing it, which can be done by continuous boiling until all the mold spores or microbes which cause fermentation have been destroyed. This sterilization may be accomplished by heating it to 180 degrees Fahrenheit. Fermentation, however, will take place even though the syrup has been heated much above 180 degrees, unless the containers into which the syrup is placed have also been completely sterilized. It is practically impossible to thoroughly sterilize a barrel under the ordinary conditions around a small syrup plant. In most cases the fermentation that syrup undergoes after it has been standing three or four months in barrels is due to the condition of the barrel when the syrup is placed in it. For this reason, syrup placed in cans or bottles will usually

keep a longer period if the containers have been properly sterilized by thorough boiling before the syrup is placed in them. Under this condition, syrup will keep for an almost indefinite period if the cans are filled while the syrup is still hot, and are immediately sealed, to prevent further contamination from outside sources. Sterilization of both syrup and container is therefore the only means of preventing fermentation in cane-syrup. Furthermore, it should be borne in mind that cleanliness in manufacture, from the time the cane enters the mill until the syrup is placed in the container, is the main thing in keeping syrup sweet. The rollers of the mill should be washed with lime water when stopped for any length of time. The juice gutters and all surfaces over which the juice passes must also be thoroughly cleaned. The walls of the building and the surroundings should be kept clean. Where it is practicable, cold storage will facilitate the keeping of the syrup. Fermentation of syrup does not take place at low temperatures, so that if the syrup can be put in cold storage it should keep almost indefinitely. It is a mistaken idea that syrup is a readily perishable product. There should be no more difficulty in preserving it than there is with canned sweet potatoes, if it has been handled properly during the process of manufacture.

DISEASES OF SUGAR-CANE.

RED ROT OF SUGAR-CANE.

(*H. S. Fawcett.*)

The disease has characteristic marks inside the canes by which it may be recognized, but is difficult to recognize externally. It is therefore apt to be overlooked until it becomes so serious as to attract attention. When the diseased canes are still lengthwise the soft tissue of the internodes shows a reddish discoloration. In these red discolored areas are found white spots which shade off

into the red. These white spots are especially characteristic of Red Rot. As the disease advances the central portion of the stem gives way, forming a long straight cavity, in which is a whitish mold made up of fungus threads. The nodes and buds become first brown, and finally black. The hard outside of the stalk remains apparently unchanged. When the disease has not progressed so far as this, the canes may appear at first glance to be healthy; but when they are split length-wise the soft tissue in the internodes will show the beginnings of the disease as small reddish patches. Because it is so easily overlooked, the grower should keep a watch for it. There are other diseases that may cause reddening of the soft tissue, but if there are also white patches within the red areas, the disease may be pronounced Red Rot.

Although Red Rot is usually not noticed until the cane is cut for planting, it may be present during the summer. In some cases the fungus causing Red Rot may seriously check the growth of the plant during the summer, and redden the leaves and the soft tissue inside the canes, The fungus attacks the plant most easily through wounds or holes made by borers. It appears to get to the growing plant, however, mostly by means of the planted cuttings, and does not spread much through the air. Usually the injury is only slight during the growing season. At the bedding season, however, the fungus is present ready to cause serious damage to the dormant canes. It is at this time that the fungus grows, advances into the interior of the canes, and kills the buds. In the beds decay appears to start mostly at the ends of the canes, although it may also start at other places along the canes.

MEANS OF CONTROL.—1. Plant only healthy canes. In Hawaii and other places, it has been found that this disease may be easily and successfully controlled by planting only healthy canes that show no sign of discoloration. Any canes showing even the slightest discoloration of the interior should be discarded. It will be necessary, in

sections where the disease has become prevalent, to grind all the cane, and get seed-cane for planting from some other locality.

2. As an extra preventive the selected canes may be dipped in Bordeaux mixture just before they are planted. This will kill any fungus that may have gotten onto the cut ends or surfaces. A large wooden trough is convenient for holding the Bordeaux mixture while dipping. The formula, 5 pounds of copper sulphate, 5 pounds of lime, and 50 gallons of water, may be used. The cost is but slight.

3. Whenever possible plant the canes in the fall instead of bedding them. Planting the cane in the fall will give one an opportunity to discover the disease, if present, and will do away with danger from contamination in the bed.

4. Burn all the trash in the old bed, and all diseased cane.

INSECT ENEMIES OF SUGAR-CANE.

J. R. Watson.

THE CANE BORER.

The most serious enemy of cane is the borer (*Diatraea saccharalis*). In some parts of the State this is a serious pest. Luckily it is not generally distributed, and many localities are entirely free from it. It is very important for growers in such places to keep it out.

The borer is the caterpillar of a moth. The female moth lays her eggs on the foliage. The young caterpillars, hatching out, feed on the tender leaves for a few days, but soon enter the cane through a bud or "eye," thereby reducing the stand of cane. They spend their entire larval life in the cane, tunnelling up and down, stunting its growth, weakening it so that the wind may blow it over, reducing the sugar content, and making easy the

entrance of fungus diseases. Here they go into the pupa stage, to hatch out as small moths in a week or so, unless delayed by cold weather, in which event the pupae spend the winter in the cane.

Control is difficult once the borer becomes established in a field, hence we urge Florida growers to be very careful about introducing this pest into a community now free from it, as such a community has a great advantage over the infested one in the matter of cane-growing. A little carelessness in this respect now may cause, in a community, a loss of thousands of dollars in a few years. Dissemination is almost entirely through infested seed-cane, as the female flies only a few score feet. Planters should carefully inspect all seed-cane, and any canes exhibiting holes should be promptly burned.

Remedy.—Once introduced the best the grower can do is to reduce the numbers of hybernating larvae by burning the tops and rubbish as soon as sufficiently dried, cutting the canes low, and destroying shoots that start from the roots where cane is cut early. Plant in the fall from sound canes only. Rotation of crops must be practiced in infested fields.

THE ARMY WORM.

Sugar-cane is one of the favorite food plants of this caterpillar (also known as the Southern grass worm), which in some years occurs in destructive numbers. On cane it can readily be controlled by the arsenic compounds. Use a spray of three pounds of lead arsenate paste or one pound of zinc arsenite powder to fifty gallons of water, or dust the plants with the latter, using air-slaked lime as a filler.

DANGER IN IMPORTED CANE.

There are, in the West Indies, many serious enemies of

cane that have not yet been introduced into the United States, or which are rare here. Among them are the larger cane-borer, the weevil borer, frog-hoppers, root-borers, pink mealy bugs, and mites. For this reason introduction of West Indian cane for seed should be done, if at all, with the greatest care possible and the most rigid inspection. The Bureau of Entomology of the United States Department of Agriculture, recommends that such introduced canes be grown during the first year, at least, under the constant supervision of an entomologist.

PART II.

CROP AND LIVE STOCK CONDITIONS

DIVISION OF THE STATE BY COUNTIES.

Following are the divisions of the State, and the counties contained in each:

Northern Division.

Franklin,
Gadsden,
Hamilton,
Jefferson,
Lafayette,
Leon,
Liberty,
Madison,
Suwannee,
Taylor,
Wakulla—11.

Western Division.

Bay,
Calhoun,
Escambia,
Holmes,
Jackson,
Santa Rosa,
Walton,
Washington—8.

Northeastern Division.

Alachua,
Baker,
Bradford,
Clay,
Columbia,
Duval,
Nassau,
Putnam,
St. Johns—9.

Central Division.

Citrus,
Hernando,
Lake,
Levy,
Marion,
Orange,
Pasco,
Seminole,
Sumter,
Volusia—10.

Southern Division.

Brevard,
Dade,
DeSoto,
Hillsborough,
Lee,
Manatee,
Monroe,
Osceola,
Palm Beach,
Pinellas,
Polk,
St. Lucie—12.

DEPARTMENT OF AGRICULTURE

W. A. McRAE, Commissioner. H. S. ELLIOT, Chief Clerk.

CONDENSED NOTES OF CORRESPONDENTS.

By Divisions.

Northern Division.—The reports from our correspondents throughout this division show a condition as regards cotton and corn, especially, to be very discouraging. The stands of cotton have been poor and a great deal of it has had to be replanted several times. A great deal of harm also was done to the cotton during the several periods when the temperature was low and the season was wet, which also had a very disastrous effect on young plants, such cold spring weather being almost unprecedented in this country. In fact, such climatic conditions have seldom been known at this season of the year. The same conditions affected the growing of other crops unfavorably, but not to the same extent, and, consequently, the corn crop of this section is in poor condition and cannot yield other than a very small crop. Although the acreage intended to be planted was about the same as usual, it was cut down by the unfavorable weather that prevented breaking of the land. Live stock has been doing very well in this district, perhaps better than last year and, taking it all together it is in good condition, except that some complaints of hog cholera have been made from two or three localities in this district.

Western Division.—Conditions in this division are about the same as in the previous one, as the same climatic conditions prevailed over this territory as over the first. The crops affected in the first case were similarly affected in this case and about to a similar extent. Such crops as

field peas, peanuts, velvet beans, etc., are in only a fair condition, and a general shortage is at present apparent. Live stock is in fair condition by reason of good pastures which were not affected so much by the climatic changes in the first of the season. There has been little cholera among the hogs so far reported. Warm weather following the cold of the first portion of the season has perhaps had a good effect generally, but its effect will not be noticeable generally unless favorable conditions continue. This especially refers to the condition of cotton and corn. but a number of other crops in this and other districts are very short, in fact, some of them are, practically, failures.

Northeastern Division.—The counties of this district being further east did not suffer quite as much from climatic conditions as the two previously mentioned ones, therefore, the crops seem to be in somewhat better condition, except as to cotton and corn. These crops are in general poor condition in all of the cotton and corn growing counties. There are few localities where corn and cotton are either in a normal condition or a normal stand and, judging from the reports as shown from our correspondents, the corn and cotton crops will be the shortest made in this State for a number of years. Cotton is better than corn. Corn in this district is not in as good condition as in the previous districts, but the area planted in proportion is greater and it is probable that what is lost in yield will be, to some extent, made up by the additional acreage. Cane and other crops, such as potatoes, field peas, peanuts, and velvet beans, show tolerably well and at this season of the year it is possible that nothing further will happen to prevent a fair yield of most of them. The condition of the pastures is good, and our correspondents report live stock generally throughout the country as being in good condition. It is also notable, in this connection, that few of our correspondents in this district make any reference to the presence of

cholera among the hogs as compared with last year, as only two or three localities have made any serious complaints. It is fair, under these conditions to assume that the disease is under better control through the agencies in charge of such matters.

CENTRAL DIVISION.—The conditions in this district show a slight change, if any, for the better, as this section was not influenced by the unfavorable climatic conditions to quite the same extent existing in the more northern and western sections of the State. True, mention is made through some of our correspondents of drought in many instances, but it does not seem to have been of so wide and disastrous affect. Apparently it was more local than otherwise though very serious in some localities. This being one of the principal fruit and vegetable growing sections of the State, the unfavorable weather conditions were disastrous to a number of growers. In this district it is notable that there is apparently a slight falling off in the prospective yield of citrus fruits, more particularly the oranges, but we do not believe that the loss will be of any extent. To what extent the loss will reach, we are unable to say at present, but it seems that the orange crop will probably be about eight to ten per cent. less than last year, while the grape fruit crop may be a little more or at least the equal of last year, however, it is too early to be certain of conditions as to these products. In fact it is possible that new bearing young trees may more than affect any loss by old bearing groves. Live stock in this district is also reported to be in good condition.

SOUTHERN DIVISION.—In this section of the State conditions are about the same as in the previous one, especially with regard to the condition of the citrus fruit crops, and also others. It is, however, stated that the citrus fruit crop, and especially grape fruit in this district will, in some localities, be greater in quantity and superior in quality to the crop of last year. There is, apparently, also a large increase in guavas, avocado pears,

mangoes and some other fruits, and as the demand in the market for these crops is so much greater than the supply, it is not likely that prices will be reduced. The demand for these fruits increases much more rapidly than the supply. Conditions of other crops in this section have been good and also the yield. Live stock also is in a flourishing condition. Outside of a few localities, climatic conditions have been favorable to most kinds of crop production. One notable fact appears throughout nearly all of the reports of our correspondents in regard to conditions and yield, and that is the unusual occurrence of what might be termed, spotted climatic conditions, that is to say that the rain or the drought as the case may be has been continuously confined to certain limited areas, and this condition has extended from one end of the State to the other without regard to latitude.

REPORT OF CONDITION AND PROSPECTIVE YIELD OF CROPS, FRUIT AND FRUIT TREES, AND CONDITION OF LIVE STOCK, FOR QUARTER ENDING JUNE 30, 1914, AS COMPARED WITH SAME PERIOD LAST YEAR.

COUNTY.	*Upland Cotton.*	*Sea Island Cotton.*	*Corn.*	*Sugar Cane.*
Northern Division.	*Condition.*	*Condition.*	*Condition.*	*Condition.*
Franklin	...	...	90	100
Gadsden	100	60	100	50
Hamilton	...	60	50	70
Jefferson	75	...	60	60
Lafayette	...	100	50	75
Leon	80	...	60	75
Madison	95	90	100	95
Taylor	...	90	75	75
Wakulla	75	...	75	80
Div. Av. per cent.	85	80	73	76
Western Division.				
Calhoun	90	85	50	75
Escambia	75	...	70	65
Holmes	90	...	60	85
Santa Rosa	85	...	70	50
Walton	90	...	75	75
Washington	85	...	75	80
Div. Av. per cent.	86	85	67	72
Northeastern Division.				
Alachua	75	100	40	45
Baker	100	100	65	90
Bradford	75	75	60	75
Clay	...	80	60	90
Duval	...	...	75	90
Nassau	80	80	60	70
Putnam	...	...	20	20
St. Johns	...	...	85	65
Div. Av. per cent.	82	87	58	68
Central Division.				
Hernando	...	...	100	100
Levy	70	75	55	70
Marion	...	90	60	90
Orange	...	...	80	...
Pasco	...	...	60	80
Seminole	...	...	100	...
Sumter	...	...	40	75
Volusia	...	...	60	70
Div. Av. per cent.	70	82	69	81
Southern Division.				
Brevard	...	...	60	75
Dade	...	...	125	100
DeSoto	...	...	90	100
Hillsboro	...	...	85	100
Lee	...	...	150	120
Osceola	...	...	100	100
Palm Beach	...	...	...	100
Pinellas	...	...	...	90
Polk	...	...	60	75
St. Lucie	...	...	...	75
Div. Av. per cent.	...	...	97	93
State Av. per cent.	81	83	73	78

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Rice.*	*Sweet Potatoes.*	*Field Peas.*	*Eggplant.*
Northern Division.	*Condition.*	*Condition.*	*Condition.*	*Condition.*
Franklin	...	80	80	50
Gadsden	100	40	100	...
Hamilton	...	20	50	...
Jefferson	...	40	60	...
Lafayette	...	80	80	...
Leon	...	60	75	...
Madison	...	100	100	...
Taylor	25	25	...	...
Wakulla	...	50	60	...
Div. Av. per cent.	64	55	76	50
Western Division.				
Calhoun	100	65	50	...
Escambia	...	70	60	...
Holmes	...	80	95	...
Santa Rosa	...	50	50	...
Walton	...	50	50	...
Washington	...	80	90	...
Div. Av. per cent.	100	66	66	...
Northeastern Division.				
Alachua	...	50	75	...
Baker	...	70	100	...
Bradford	...	60	90	...
Clay	...	90	100	...
Duval	...	90	100	85
Nassau	60	60	75	75
Putnam	...	20	...	...
St. Johns	65	85	90	90
Div. Av. per cent.	62	65	90	83
Central Division.				
Hernando	...	75	100	...
Levy	...	82	85	65
Marion	95	75	95	85
Orange	...	100	100	...
Pasco	...	80	90	...
Seminole	...	100	...	60
Sumter	...	75	60	75
Volusia	...	50	70	70
Div. Av. per cent.	95	80	86	71
Southern Division.				
Brevard	...	...	80	...
Dade	...	95	100	...
DeSoto	75	100	100	100
Hillsboro	90	90	85	90
Lee	100	100	95	100
Osceola	80	80	100	100
Palm Beach	...	100	...	60
Pinellas	...	75	75	...
Polk	...	95	65	80
St. Lucie	...	80	...	...
Div. Av. per cent.	86	91	88	88
State Av. per cent.	81	71	81	73

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Cassava.*	*Tobacco.*	*Peanuts.*	*Pasture.*
Northern Division.	*Condition.*	*Condition.*	*Condition.*	*Condition.*
Franklin	...	...	40	60
Gadsden	...	105	100	100
Hamilton	...	...	80	40
Jefferson	...	...	50	70
Lafayette	...	...	100	...
Leon	...	90	85	85
Madison	...	...	80	65
Taylor	...	...	90	...
Wakulla	...	...	90	80
Div. Av. per cent.	...	97	79	71
Western Division.				
Calhoun	...	...	75	75
Escambia	...	...	70	70
Holmes	...	...	95	70
Santa Rosa	...	...	75	70
Walton	...	...	75	75
Washington	50	...	85	50
Div. Av. per cent.	50	...	79	68
Northeastern Division.				
Alachua	...	...	65	65
Baker	...	...	100	...
Bradford	...	...	100	40
Clay	...	...	100	...
Duval	...	...	90	65
Nassau	...	...	60	75
Putnam	...	...	...	...
St. Johns	90	...	80	75
Div. Av. per cent.	90	...	85	64
Central Division.				
Hernando	...	...	90	90
Levy	...	...	80	55
Marion	...	...	90	90
Orange	...	...	...	100
Pasco	...	90	80	90
Seminole	...	...	...	100
Sumter	75	...	75	75
Volusia	60	...	60	40
Div. Av. per cent.	67	90	79	80
Southern Division.				
Brevard	...	...	...	50
Dade	...	...	95	100
DeSoto	...	...	85	100
Hillsboro	95	...	...	95
Lee	100	...	110	110
Osceola	100	...	...	100
Palm Beach	...	...	...	...
Pinellas	...	...	...	...
Polk	...	...	80	100
St. Lucie	...	...	...	90
Div. Av. per cent.	98	...	92	93
State Av. per cent.	76	93	83	75

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Velvet Beans.*	*Alfalfa.*
Northern Division.	*Condition.*	*Condition.*
Franklin	60	...
Gadsden	100	...
Hamilton	85	...
Jefferson	90	...
Lafayette	100	...
Leon	85	...
Madison	75	...
Taylor	...	...
Wakulla	90	...
Div. Av. per cent.	86	...
Western Division.		
Calhoun	85	...
Escambia	75	...
Holmes	75	...
Santa Rosa	80	...
Walton	85	...
Alachua	85	...
Washington	90	...
Div. Av. per cent.	82	...
Northeastern Division.		
Alachua	85	...
Baker	100	...
Bradford	65	...
Clay	90	...
Duval	80	80
Nassau	75	60
Putnam	25	...
St. Johns	75	...
Div. Av. per cent.	74	70
Central Division.		
Hernando	90	...
Levy	73	...
Marion	85	...
Orange	...	...
Pasco	90	...
Seminole	...	...
Sumter	60	...
Volusia	50	...
Div. Av. per cent.	75	...
Southern Division.		
Brevard	...	...
Dade	100	...
DeSoto	115	...
Hillsboro	90	...
Lee	120	...
Osceola	120	...
Palm Beach	...	...
Pinellas	90	...
Polk	115	...
St. Lucie	85	...
Div. Av. per cent.	104	...
State Av. per cent.	84	70

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Guavas.		Avocado Pears.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	...	...	...	...
Gadsden	...	...	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	...	...	...	...
Leon	...	...	...	...
Madison	...	...	...	...
Madison	...	...	...	...
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	...	...	...	...
Western Division.				
Calhoun	...	...	...	...
Escambia	...	...	...	...
Holmes	...	...	...	...
Santa Rosa	...	...	...	...
Walton	...	...	...	...
Washington	...	...	...	...
Div. Av. per cent.	...	...	...	...
Northeastern Division.				
Alachua	...	...	...	...
Baker	...	...	...	...
Bradford	...	...	...	...
Clay	...	...	...	...
Duval	...	...	...	...
Nassau	...	...	...	...
Putnam	...	...	...	...
St. Johns	100	90	...	...
Div. Av. per cent.	100	90	...	...
Central Division.				
Hernando	...	100	...	...
Levy	...	...	...	...
Marion	90	90	...	...
Orange	...	...	...	...
Pasco	80	90	...	...
Seminole	100	100	...	...
Sumter	...	...	...	...
Volusia	50	50	...	...
Div. Av. per cent.	84	86	...	...
Southern Division.				
Brevard	85	100	...	...
Dade	100	100	100	100
DeSoto	100	100	...	...
Hillsboro	100	95	90	85
Lee	100	100	100	110
Osceola	150	200	...	...
Palm Beach	100	90	95	80
Pinellas	100	100	...	...
Polk	100	100	...	...
St. Lucie	75	70	75	50
Div. Av. per cent.	101	105	92	85
State Av. per cent.	95	94	92	85

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Bananas.		Mangoes.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	50	50	...	...
Gadsden	...	...	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	...	...	...	...
Leon	...	...	...	...
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	50	50	...	...
Western Division.				
Calhoun	...	...	...	...
Escambia	...	...	...	...
Holmes	...	...	...	...
Santa Rosa	...	...	...	...
Walton	...	...	...	...
Washington	...	...	...	...
Div. Av. per cent.	...	...	...	...
Northeastern Division.				
Alachua	...	...	...	...
Baker	...	...	...	...
Bradford	...	...	...	...
Clay	...	...	...	...
Duval	...	...	...	...
Nassau	90	50	...	...
Putnam	...	...	...	...
Levy	...	...	...	...
St. Johns	90	50	...	...
Div. Av. per cent.	90	50	...	...
Central Division.				
Hernando	...	...	...	...
Levy	...	...	...	...
Marion	100	100	...	...
Orange	...	...	...	...
Pasco	...	...	...	...
Seminole	100	100	...	...
Sumter	40	40	...	...
Volusia	...	...	...	...
Div. Av. per cent.	80	80	...	...
Southern Division.				
Brevard	90	90	85	90
Dade	100	100	100	100
DeSoto	70	60	...	...
Hillsboro	90	90	90	85
Lee	100	100	120	150
Osceola	150	200	100	200
Palm Beach	100	95	90	70
Pinellas	...	...	75	80
Polk	100	85	...	...
St. Lucie	60	50	75	60
Div. Av. per cent.	96	97	92	104
State Av. per cent.	79	69	92	104

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Orange Trees.*		*Lemon Trees.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	90	80	80	70
Gadsden	...	...	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	90	75	...	...
Leon	90	75	...	...
Madison	50	50	...	...
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	80	70	80	70
Western Division.				
Calhoun	100	50	100	50
Escambia	...	...	...	...
Holmes	...	...	...	...
Santa Rosa	...	...	...	...
Walton	...	...	...	...
Washington	...	...	...	...
Div. Av. per cent.	100	50	100	50
Northeastern Division.				
Alachua	90	75	...	...
Baker	100	90	...	...
Bradford	100	90	...	...
Clay	80	50	...	...
Duval	80	75	80	70
Nassau	100	75	100	75
Putnam	75	50	75	50
St. Johns	75	75	...	...
Div. Av. per cent.	88	73	85	65
Central Division.				
Hernando	85	100	...	...
Levy	75	85	...	...
Marion	90	90	90	90
Orange	100	50	...	...
Pasco	80	90	...	...
Seminole	100	100	...	...
Sumter	80	75	...	...
Volusia	70	50	...	...
Div. Av per cent.	85	80	90	90
Southern Division.				
Brevard	75	90	85	90
Dade	95	100	80	95
DeSoto	100	80	100	80
Hillsboro	90	95	90	95
Lee	100	120	100	100
Osceola	100	80	100	80
Palm Beach	95	90	...	...
Pinellas	85	90	80	90
Polk	90	110	...	...
St. Lucie	100	90	80	75
Div. Av. per cent.	93	94	89	88
State Av. per cent.	89	73	89	72

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Lime Trees.*		*Grapefruit Trees.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	...	...	80	75
Gadsden	...	...	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	...	...	...	...
Leon	...	...	90	75
Madison	...	...	...	...
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	...	...	85	75
Western Division.				
Calhoun	...	...	100	50
Escambia	...	...	...	...
Holmes	...	...	...	...
Santa Rosa	...	...	...	...
Walton	...	...	...	...
Washington	...	...	...	...
Div Av. per cent.	...	...	100	50
Northeastern Division.				
Alachua	...	...	90	75
Baker	...	...	90	75
Bradford	...	...	100	90
Clay	...	...	...	...
Duval	80	60	80	75
Nassau	...	...	100	80
Putnam	...	...	75	50
St. Johns	...	...	75	75
Div. Av. per cent.	80	60	89	76
Central Division.				
Hernando	...	...	85	90
Levy	...	...	80	85
Marion	...	...	90	90
Orange	...	...	100	75
Pasco	...	...	80	90
Seminole	...	...	100	100
Sumter	...	...	90	75
Volusia	...	...	70	50
Div. Av. per cent.	...	...	87	80
Southern Division.				
Brevard	80	90	85	90
Dade	95	95	110	100
DeSoto	100	80	100	70
Hillsboro	94	95	95	100
Lee	100	110	100	120
Osceola	100	90	100	90
Palm Beach	90	90	100	95
Pinellas	85	85	85	90
Polk	...	...	95	110
St. Lucie	80	75	90	85
Div. Av. per cent.	92	90	96	95
State Av. per cent.	86	75	91	75

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Plums.		Pears.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	90	90	90	40
Gadsden	...	...	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	100	90	...	...
Leon	100	100	75	35
Madison	100	100	50	25
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	97	95	72	33
Northeastern Division.				
Calhoun	100	75	...	...
Escambia	90	75	...	...
Holmes	90	75	...	...
Santa Rosa	60	65	80	70
Walton	50	65	75	75
Washington	75	75	50	50
Div. Av. per cent.	77	72	68	65
Northeastern Division.				
Alachua	...	...	100	100
Baker	100	100	100	100
Bradford	100	100	100	100
Clay	...	...	...	...
Duval	95	90	45	50
Nassau	100	90	100	90
Putnam	...	...	...	...
St. Johns	100	80	75	60
Div. Av. per cent.	99	92	87	83
Central Division.				
Hernando	...	...	...	...
Levy	80	90	80	100
Marion	100	100	100	100
Orange	...	...	...	...
Pasco	60	60	...	...
Seminole	...	...	...	...
Sumter	...	...	90	80
Volusia	...	...	70	50
Div. Av. per cent.	80	83	85	82
Southern Division.				
Brevard	...	...	...	...
Dade	...	...	...	...
Hillsboro	90	70	95	80
Lee	...	...	...	...
Osceola	100	100	100	120
Palm Beach	...	...	...	...
Pinellas	...	...	...	...
Polk	100	100	...	...
St. Lucie	...	...	...	...
Div. Av. per cent.	97	90	97	100
State Av. per cent.	90	86	82	73

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Peaches.		Watermelons.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	96	60	90	90
Gadsden	...	...	90	90
Gadsden	...	...	90	90
Hamilton	...	...	85	75
Jefferson	...	...	90	90
Lafayette	...	...	80	80
Leon	75	35	90	90
Madison	...	...	75	80
Taylor	...	...	75	75
Wakulla	100	90	80	85
Div. Av. per cent.	90	62	84	84
Western Division.				
Calhoun	100	50	65	40
Escambia	90	65	75	65
Holmes	...	...	90	75
Santa Rosa	75	80	65	65
Walton	100	100	50	60
Washington	55	50	70	75
Div. Av. per cent.	84	69	69	63
Northeastern Division.				
Alachua	80	75	50	50
Baker	90	95	100	100
Bradford	100	100	75	65
Clay	75	50	80	80
Duval	50	50	70	75
Nassau	100	90	90	90
Putnam	75	50	50	30
St. Johns	75	65	80	70
Div. Av. per cent.	81	72	74	70
Central Division.				
Hernando	100	100	75	80
Levy	90	95	55	80
Marion	100	100	85	85
Orange	...	...	...	...
Pasco	40	40	50	50
Seminole	...	...	75	75
Sumter	50	60	75	75
Volusia	70	40	90	90
Div. Av. per cent.	75	74	72	76
Southern Division.				
Brevard	75	75	60	60
Dade	...	...	...	...
DeSoto	...	...	100	100
Hillsboro	100	50	80	85
Lee	100	100	110	110
Osceola	80	75	100	150
Palm Beach	...	...	90	80
Pinellas	85	90	85	90
Polk	85	75	95	90
St. Lucie	...	...	85	80
Div. Av. per cent.	88	77	87	94
State Av. per cent.	84	71	77	77

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Cantaloupes.*		*Pineapples.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	80	75	...	...
Gadsden	75	80	...	...
Hamilton	...	...	...	...
Jefferson	...	...	...	...
Lafayette	...	...	...	...
Leon	85	80	...	...
Madison	50	50	...	...
Taylor	...	...	...	...
Wakulla	...	...	...	...
Div. Av. per cent.	73	71	...	...
Western Division.				
Calhoun	65	40	...	...
Escambia	65	50	...	...
Holmes	...	...	...	...
Walton	50	60	...	...
Washington	50	50	...	...
Div. Av. per cent.	57	50	...	...
Northeastern Division.				
Alachua	25	20	...	...
Baker	100	100	...	...
Bradford	50	50	...	...
Clay	...	...	...	...
Duval	70	70	...	...
Nassau	90	90	...	...
Putnam	50	40	...	...
St. Johns	80	70	...	...
Div. Av. per cent.	66	63	...	...
Central Division.				
Hernando	...	...	...	...
Levy	70	70	...	...
Marion	85	80	...	...
Orange	...	...	...	...
Pasco	40	40	...	...
Seminole	70	75	...	...
Sumter	60	60	...	...
Volusia	80	50	...	...
Div. Av. per cent.	68	63	...	...
Southern Division.				
Brevard	...	...	80	75
Dade	...	...	...	...
DeSoto	...	...	100	100
Hillsboro	70	75	85	85
Lee	100	100	100	100
Osceola	100	100	125	175
Palm Beach	...	...	80	70
Pinellas	85	90	...	...
Polk	100	100	...	...
St. Lucie	...	...	50	40
Div. Av. per cent.	91	93	89	92
State Av. per cent.	71	68	89	92

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Grapes.	
Northern Division.	*Condition.*	*Prospective Yield.*
Franklin	80	80
Gadsden	...	...
Hamilton	...	...
Jefferson	...	...
Lafayette	...	...
Leon	100	90
Madison	...	...
Taylor	...	...
Wakulla	...	...
Div. Av. per cent.	90	85
Western Division.		
Calhoun	75	60
Escambia	...	...
Holmes	...	...
Santa Rosa	...	...
Walton	...	...
Washington	100	100
Div. Av. per cent.	87	80
Northeastern Division.		
Alachua	...	...
Baker	90	90
Bradford	80	75
Clay	100	100
Duval	85	100
Nassau	100	100
Putnam	...	...
St. Johns	80	75
Div. Av. per cent.	89	88
Central Division.		
Hernando	...	...
Levy	90	60
Marion	100	100
Orange	...	...
Pasco	40	40
Seminole	...	...
Sumter	40	40
Volusia	100	100
Div. Av. per cent.	74	68
Southern Division.		
Brevard	...	...
Dade	...	...
DeSoto	90	100
Hillsboro	90	100
Lee	100	100
Osceola	100	100
Palm Beach	...	...
Pinellas	90	90
Polk	...	...
St. Lucie	90	75
Div. Av. per cent.	94	93
State Av. per cent.	87	83

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Horses and Mules.*	*Cattle.*	*Hogs.*	*Sheep.*
Northern Division.	*Condition.*	*Condition.*	*Condition.*	*Condition.*
Franklin	90	75	75	80
Gadsden	110	110	100	100
Hamilton	90	95	70	...
Jefferson	90	90	75	90
Lafayette	90	100	100	...
Leon	90	90	85	90
Madison	80	100	90	75
Taylor	80	75	60	70
Wakulla	85	85	75	...
Div. Av. per cent.	89	90	81	56
Western Division.				
Calhoun	90	75	50	65
Escambia	90	80	65	90
Holmes	100	100	90	85
Santa Rosa	90	90	95	90
Walton	100	100	100	100
Washington	95	90	95	90
Div. Av. per cent.	94	89	83	87
Northeastern Division.				
Alachua	75	75	85	75
Baker	95	95	90	100
Bradford	100	125	125	...
Clay	100	90	90	100
Duval	90	80	85	80
Nassau	100	100	100	100
Putnam	100	100	100	...
St. Johns	90	100	100	100
Div. Av. per cent.	94	96	97	93
Central Division.				
Hernando	100	100	100	100
Levy	90	80	80	80
Marion	100	100	100	100
Orange	100	100	...	...
Pasco	100	90	...	...
Seminole	100	100	90	100
Sumter	75	75	50	40
Volusia	...	80	70	80
Div. Av. per cent.	95	91	82	83
Southern Division.				
Brevard	100	80	85	...
Dade	100	125	100	...
DeSoto	95	100	100	...
Hillsboro	95	90	90	...
Lee	100	110	100	100
Osceola	100	100	100	100
Palm Beach	100	100	100	...
Pinellas	95	95	90	...
Polk	90	90	85	...
St. Lucie	100	90	90	...
Div. Av. per cent.	98	98	94	100
State Av. per cent.	94	93	87	86

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Tobacco.*	*Honey.*	*Wool.*
Northern Division.	*Pounds.*	*Pounds.*	*Pounds.*
Franklin	.....	180,000	.....
Gadsden	2,650,000	.....	.....
Hamilton	.....	.....	.....
Jefferson	.....	.....	.....
Lafayette	.....	.....	.....
Leon	75,000	10,000	10,000
Madison	70,000	.....	.....
Taylor	.....	500	1,000
Wakulla	.....	5,000	.....
Div. Average per cent.	2,795,000	195,500	11,000
Western Division.			
Calhoun	.....	.....	8,000
Escambia	.....	.....	16,000
Holmes	.....	18,000	21,000
Santa Rosa	.....	.....	15,000
Walton	.....	10,000	75,000
Washington	.....	5,000	52,000
Div. Average per cent.	.....	33,000	187,000
Northeastern Division.			
Alachua	.....	.....	.....
Baker	.....	2,000	12,000
Bradford	.....	500	.....
Clay	.....	.....	.....
Duval	.....	1,500	1,000
Nassau	.....	.....	.....
Putnam	.....	.....	.....
St. Johns	.....	90,000	3,000
Div. Average per cent.	.....	94,000	16,000
Central Division.			
Hernando	.....	.....	.....
Levy	.....	4,000	3,500
Marion	.....	.....	38,000
Orange	.....	.....	.....
Pasco	20,000	.....	.....
Seminole	.....	500	500
Sumter	.....	600	900
Volusia	.....	150,000	25,000
Div. Average per cent.	20,000	155,100	67,900
Southern Division.			
Brevard	.....	20,000	.....
Dade	.....	.....	.....
DeSoto	.....	.....	.....
Hillsboro	.....	.....	.....
Lee	.....	.....	.....
Osceola	.....	2,000	.....
Palm Beach	.....	15,000	.....
Pinellas	.....	.....	.....
Polk	.....	.....	.....
St. Lucie	.....	.....	.....
Div. Average per cent.	.....	39,000	12,000
State Average per cent.	2,815,000	516,600	293,900

PART III.

Fertilizers,
Feed Stuffs, and
Foods and Drugs.

REGULATIONS GOVERNING THE TAKING AND FORWARDING OF FERTILIZER OR COMMERCIAL FEEDING STUFF SAMPLES TO THE COMMISSIONER OF AGRICULTURE.

SECTION 15 OF THE LAWS.

Special samples of Fertilizers or Commercial Feeding Stuffs sent in by purchasers, under Section 9 of the laws, shall be drawn in the presence of two disinterested witnesses, from one or more packages, thoroughly mixed, and A FAIR SAMPLE OF THE SAME OF NOT LESS THAN EIGHT OUNCES (ONE-HALF POUND) SHALL BE PLACED IN A TIN CAN OR BOTTLE, SEALED AND SENT BY A DISINTERESTED PARTY TO THE COMMISSIONER OF AGRICULTURE AT TALLAHASSEE. NOT LESS THAN EIGHT OUNCES, IN A TIN CAN OR BOTTLE, WILL BE ACCEPTED FOR ANALYSIS. This rule is adopted to secure fair samples of sufficient size to make the necessary determinations, and to allow the preservation of a duplicate sample in case of protest or appeal. This duplicate sample will be preserved for two months from the date of certificate of analysis.

The State Chemist is not the proper officer to receive special samples from the purchaser. The propriety of the method of drawing and sending the samples as fixed by law is obvious.

The drawing and sending of special samples in rare cases is in compliance with law. Samples are frequently sent in paper packages or paper boxes, badly packed, and frequently in very small quantity (less than ounce); frequently there are no marks, numbers or other means of identification; the postmark in some instances being absent.

I would call the attention of those who desire to avail themselves of this privilege to Sections 9 and 10 of the laws, which are clear and explicit.

Hereafter strict compliance with above regulations will

be required. *The sample must not be less than one-half pound, in a tin can or bottle, sealed and addressed to the Commissioner of Agriculture. .The sender's name and address must also be on the package, this rule applying to special samples of fertilizers or commercial feeding stuff.*

A one-pound baking powder tin can, properly cleaned, filled with a fairly drawn, well mixed sample taken from several sacks, is a proper sample. *It should be sealed and addressed to the Commissioner of Agriculture at Tallahassee. The sender's name and address should also be placed on the package. If more than one sample is sent, the samples should be numbered so as to identify them. All this should be done in the presence of the witnesses and the package mailed or expressed by one of the witnesses.*

The tags off the sacks should be retained by the sender to compare with the certificate of analysis when received, and not sent to *this office. The date of the drawing and sending of the sample, and names of the witnesses, should also be retained by the sender; not sent to this office.*

WATER ANALYSIS.

We frequently analyze water from publicly-owned water supplies, municipal plants, etc., owned and operated by the city or town, when accompanied by the certificate of the mayor, or other city officer, that the water is furnished the public by the city or town.

We do not analyze water for individuals or corporations selling water to the public, water companies, ice companies, mineral springs, health resorts, etc., maintained for profit. Such samples should be sent to a commercial laboratory.

The State Laboratory does not make bacteriological examinations for disease germs. Such examinations are made by the State Board of Health, at Jacksonville, Fla., which has entire charge of the public health.

We do not make a sanitary analysis. We determine the total dissolved solids in the sample quantitatively, and report them as parts per 1,000,000, naming the principal ingredients in the order of their predominance qualitatively. We find Calcium Carbonate (lime), Sodium chloride (salt), Magnesium Sulphate (epsom salts), Silica (sand), and Iron, is the general order of their predominance, though on the coast, where the total dissolved solids amounts to 5,000 or more parts per 1,000,000, Sodium Chloride (salt) is the predominant substance.

From a knowledge of the chemical analysis of a water, unaccompanied by any further information, no conclusion as to the potability and healthfulness of the water can be deduced.

Therefore, we require the following information to be given in regard to the source of the water:

(1). The source of the water: spring, lake, driven well, dug well, bored well, artesian well, or flowing well; and also the depth of the water surface below the top of the soil, and (in cased wells) the depth of the casing.

(2). The locality of the source of the water: town, city or village; or the section, township and range.

(3). The proposed use of the water; city supply, domestic use, laundry, boiler, irrigation or other industrial use.

(4). No sample of water will be analyzed unless the name and address of the sender is on the package for identification.

We require two gallons of each sample of water, in a new jug, stopped with a new cork, and sent by prepaid express. We will not accept any sample of water for analysis not in a new jug. Vessels previously used for other purposes are never properly cleaned for sending samples of water for analysis. Corks, once used for other substances (molasses, vinegar, whiskey, kerosene, etc.), are never properly cleaned.

NOTE.—We find the waters of the State—springs,

wells, driven well and artesian wells—generally very pure and wholesome, with but little mineral impurity, and that such as are not harmful. Except in cases of gross carelessness, in allowing surface water to contaminate the well or spring, the waters of the State are pure and wholesome. The deep wells of the State are noted for their purity and healthfulness.

ANALYSIS OF FOODS AND DRUGS.

Samples of Foods and Drugs are drawn under special regulations. Applications should be made to the Commissioner of Agriculture or State Chemist for the necessary blanks, instructions, etc., for drawing and transmitting samples of foods and drugs, including drinks of all kinds.

COPIES OF LAWS, RULES AND REGULATIONS, AND STANDARDS.

Citizens of the State interested in fertilizers, foods and drugs, and stock feed, can obtain, free of charge, the respective Laws, including Rules and Regulations and Standards, by applying to the Commissioner of Agriculture or State Chemist. Application for the Quarterly Bulletin of the State Department of Agriculture should also be made to the Commissioner of Agriculture or State Chemist. The Bulletins of the Florida Agricultural Experiment Station can be had by application to the Director at Gainesville.

ANALYSIS MADE BY STATE LABORATORY.

Only such materials as are of public interest are analyzed by the State Laboratory, such as are directed by the Pure Food, the Fertilizer, and Stock Feed Laws.

There are no fees or charges of any kind made by the State Laboratory.

The State Laboratory is not permitted to compete with commercial laboratories.

No commercial work of any kind is accepted.

The State Laboratory does not analyze samples for individual account wherein the public is not interested. Such samples should be sent to a commercial laboratory.

ANALYSES IN CRIMINAL CASES.

The State Laboratory does not make post mortem examinations, nor furnish evidence in criminal cases (except as provided by the Pure Food, Fertilizer, and Stock Feed Laws). Such analyses and examinations are made by specialists employed by the grand jury and prosecuting attorney, the cost being taxed as other criminal costs, by the court.

SOIL ANALYSIS.

We frequently have samples of soils sent in for analysis with a request to advise as to the best methods of fertilizing. There is but little information to be derived from a soil analysis that would be of benefit to farmers. So much depends on tilth, drainage, culture and other physical conditions, that an analysis made under laboratory conditions is of little value.

A chemical analysis of soil may indicate a very fertile soil, rich in plant food, while the facts are the soils are not productive. This is instanced by the rich Sawgrass muck lands and river bottoms of the State, that are fertile chemically, but not productive until properly drained; also, by the arid lands of the West, rich in the elements of plant food, but not productive until irrigated. Other soils, with less plant food, but on account of proper physical conditions, culture and tilth, are exceedingly productive.

The average of thousands of analyses of Florida soils

made by the Agricultural Experiment Station and the State Laboratory is as follows:

Nitrogen (per cent.)	0.0413
Potash (per cent.)	0.0091
Phosphoric Acid (per cent.)	0.1635

This is a fair average of all the Norfolk and Portsmouth soil series of the State, which comprise by far the greater portion of the State.

In this connection we quote from the report of the Indiana Agricultural Experiment Station, Purdue University, Lafayette, Ind., 1908, as follows:

"SOIL ANALYSES OF LITTLE VALUE IN SHOWING FERTILIZER REQUIREMENTS.—The Chemical Department is called upon to answer hundreds of letters of inquiry in relation to agricultural chemical problems from people all over the State. In this connection it might be well to say that there is a widespread idea that the chemist can analyze a sample of soil and, without further knowledge of the conditions, write out a prescription of a fertilizer which will fill the needs of that particular soil.

"The Experiment Station does not analyze samples of soil to determine the fertilizer requirements. There is no chemical method known that will show reliably the availability of the plant food elements present in the soil, as this is a variable factor, influenced by the kind of crop, the type of soil, the climate and biological conditions; hence, we do not recommend this method of testing soil.

"The method recommended by the Indiana Station is the field fertilizer test or plot system, in which long, narrow strips of the field to be tested are measured off side by side. The crop is planted uniformly over each. Different fertilizers are applied to the different plots, every third or fourth one being left unfertilized. The produce from these plots is harvested separately and weighed. In this manner the farmer can tell what fertilizer is best suited for his needs. As climatic conditions may influence the yield with different fertilizers, it is best to carry on

such tests for more than one year before drawing definite conclusions. There is positively no easier or shorter method of testing the soil that we feel safe in recommending.

"Soil can be greatly improved by an intelligent rotation of crops, the conservation of stable manure, and the use of some kind of commercial fertilizer. Farmers need have no fear that the proper application of commercial fertilizer will injure the land."

INSTRUCTIONS TO SHERIFFS.

The attention of Sheriffs of the various counties is called to Section 3 of both laws, defining their duties. This Department expects each Sheriff to assist in maintaining the law and protecting the citizens of the State from the imposition of fraudulent, inferior or deficient, Commercial Fertilizers or Commercial Feeding Stuffs.

SPECIAL SAMPLES.

Florida is the only State in the Union that provides for the "special sample," drawn by the consumer or purchaser, under proper rules and regulations fixed by law—to be sent to the State Laboratory for analysis free of cost. Any citizen in the State who has purchased fertilizers or feeds for his own use may draw a sample of the same, according to law, and have the same analysed by the State Chemist free of cost. And in case of adulteration or deficiency he can, on establishing the fact, receive double the cost of price demanded for the goods.

The law requires the "special samples" to be drawn in a manner to prevent the submission of spurious samples; rules and regulations are published in every Bulletin for drawing and transmitting "special samples."

This special sample has been a most potent factor in enforcing the law and discouraging the sale of adulterated or misbranded goods.

Special samples of foods and drugs may also be sent to the State Laboratory for analysis free of cost, when the sample is properly drawn according to law. The necessary instructions and blanks required to properly draw and transmit samples of "food and drugs" will be sent to any citizen requesting the same.

"THE SPECIAL SAMPLE FURNISHES THE CONSUMER WITH THE SAME PROTECTION DEMANDED BY THE MANUFACTURER, WHO BUYS HIS MATERIALS ONLY UPON GUARANTEE AND PAYS FOR THEM ACCORDING TO ANALYSIS, AND IS PAID FOR BY THE CONSUMER OUT OF THE FUNDS DERIVED FROM THE INSPECTION FEE OF TWENTY-FIVE CENTS PER TON PAID ON FERTILIZERS AND FEEDS SOLD IN THE STATE.

MARKET PRICES OF CHEMICALS AND FERTILIZING MATERIALS AT FLORIDA SEA PORTS, JULY 1, 1914.

AMMONIATES.

Nitrate of Soda, 17% Ammonia	$ 56.00
Sulphate of Ammonia, 25% Ammonia	76.00
Dried Blood, 16% Ammonia	65.00
Cynanamid, 18% Ammonia	60.00

POTASH.

High Grade Sulphate of Potash, 90% Sulphate, 48% K_2O	$ 50.00
Low Grade Sulphate of Potash, 48% Sulphate, 26% K_2O	30.00
Muriate of Potash, 80%; 48% K_2O	46.00
Nitrate of Potash, imported, 15% Ammonia, 44% Potash K_2O	107.00
Nitrate of Potash, American, 13% Ammonia, 42% Potash K_2O	100.00
Kainit, Potash, 12% K_2O	13.00
Canada Hardwood Ashes, in bags, 4% K_2O Potash	19.00

AMMONIA AND PHOSPHORIC ACID.

Water Soluble Tankage, 14% Ammonia	$ 60.00
High Grade Tankage, 10% Ammonia, 10% Phosphoric Acid	46.00
Tankage, 8% Ammonia, 18% Phosphoric Acid	40.00
Low Grade Tankage, 6½% Ammonia, 12% Phosphoric Acid	35.00
Hotel Tankage, 6% Ammonia, 7% Phosphoric Acid	28.00
Sheep Manure, ground, 5% Ammonia	24.00

Imported Fish Guano, 11% Ammonia, 5½% Phosphoric Acid	60.00
Pure Fine Steamed Ground Bone, 3% Ammonia, 22% Phosphoric Acid	31.00
Raw Bone, 4% Ammonia, 22% Phosphoric Acid.	37.00
Ground Castor Pomace, 5½% Ammonia, 2% Phosphoric Acid	26.00
Bright Cotton Seed Meal, 7½% Ammonia	30.00
Dark Cotton Seed Meal, 4½% Ammonia	26.00

PHOSPHORIC ACID.

High Grade Acid Phosphate, 16% Available Phosphoric Acid	$ 15.00
Acid Phosphate, 14% Available Phosphoric Acid	14.00
Bone Black, 17% Available Phosphoric Acid	25.00

MISCELLANEOUS.

High Grade Ground Tobacco Stems, 2% Ammonia, 7% Potash	$ 24.00
High Grade Ground Kentucky Tobacco Stems, 2½% Ammonia, 10% Potash	28.00
Tobacco Dust No. 1, 2% Ammonia, 2% Potash	24.00
Cut Tobacco Stems, in sacks, 2% Ammonia, 4% Potash	20.00
Dark Tobacco Stems, baled, 2% Ammonia, 4% Potash	22.00
Land Plaster, in sacks	12.00

The charges by reputable manufacturers for mixing and bagging any special or regular formula are $1.50 per ton in excess of above prices.

NEW YORK WHOLESALE PRICES, CURRENT JULY 1, 1914—FERTILIZER MATERIALS.

Ammoniates.

Ammonia, sulph., foreign, prompt	2.80	@	—
futures	2.80	@	—
Ammonia, sulph., domestic, spot	2.60	@	—
futures	2.60	@	—
Fish scrap, dried, 11 p. c. ammonia and 14 p. c. bone phosphate, f. o. b. fish works, per unit	—	@	—
wet, acidulated, 6 p. c. ammonia, 3 p. c. phosphoric acid, delivered	—	@	—
Ground fish guano, imported, 10 and 11 p. c. ammonia and 15-17 p. c. bone phosphate, c. i. f. N. Y., Balto. or Phila.	—	@	—
Tankage, 11 p. c. and 15 p. c. f. o. b. Chicago	2.75	&	10
Tankage, 10 and 20 p. c., f. o. b. Chicago, ground	3.00	&	10
Tankage, 9 and 20 p. c., f. o. b. Chicago, ground	3.00	&	10
Tankage, concentrated, 14 to 15 per cent., f. o. b. Chicago	3.10	&	10
Garbage, tankage, f. o. b. Chicago	9.00	@	—
Sheep manure, concentrated, f. o. b. Chicago, per ton	13.00	@	—
Hoofmeal, f. o. b. Chicago, per unit	2.60	@	2.70
Dried blood, 12-13 p. c. ammonia, f. o. b. New York	3.30	@	—
Chicago	3.15	@	—
Nitrate of soda, 95 p. c. spot, per 100 lbs.	2.22	@	—
futures, 95 p. c.	2.12½	@	—

Phosphates.

Acid phosphate, per unit	45	@	50
Bones, rough, hard, per ton	22.50	@	24.00

soft steamed unground .....21.50 @22.00
ground, steamed, 1¼ p. c. bone phosphate .....20.00 @21.00
ditto, 3 and 50 p. c. .....23.50 @24.00
raw, ground 4 p. c. ammonia and 50 p. c. bone phosphate .....28.50 @30.00
South Carolina phosphate rock, kiln dried, f. o. b. Ashley River ..... 3.50 @ 3.75
Florida land pebble phosphate rock, 68 per cent, f. o. b. Port Tampa, Fla. ..... 3.00 @ 3.25
Florida high grade phosphate hard rock 77 per cent., f. o. b. Florida ports ..... 5.75 @ 6.25
Tennessee phosphate rock, f. o. b. Mt. Pleasant, domestic, 78@80 p. c., per ton ..... 5.00 @ 5.50
75 p. c. guaranteed ..... 4.75 @ 5.00
68@72 p. c. ..... 4.25 @ 4.50

Potashes.

Muriate of potash, 80-85 per cent., basis 80 per cent., in bags .....39.07 @ —
Muriate of potash, min. 95 per cent., basis 80 per cent., in bags .....40.75 @ —
Muriate of potash, min. 98 per cent., basis 80 per cent., in bags .....41.65 @ —
Sulphate of potash, 90-95 per cent., basis 80 per cent., in bags .....47.57 @ —
Double manure salt, 48-53 per cent., basis 48 per cent., in bags .....25.04 @ —
Manure salts, min. 20 per cent., K_2O, in bulk .....13.58 @ —
Hartsalt, min. 16 per cent., K_2O, in bulk...10.87 @ —
Kainit, min. 12.4 per cent., K_2O, in bulk... 8.36 @ —

STATE VALUATIONS.

For Available and Insoluble Phosphoric Acid, Ammonia and Potash, for the Season of 1914.

Available phosphoric Acid	5c a pound
Insoluble Phosphoric Acid	1c a pound
Ammonia (or its equivalent in nitrogen	17½c a pound
Potash (as actual potash, K_2O)	5½c a pound

If calculated by units—

Available Phosphoric Acid	$1.00 per unit
Insoluble Phosphoric Acid	20c per unit
Ammonia (or its equivalent in nitrogen)	3.50 per unit
Potash	1.10 per unit

With a uniform allowance of $1.50 per ton for mixing and bagging.

A unit is twenty pounds, or 1 per cent., in a ton. We find this to be the easiest and quickest method for calculating the value of fertilizer. To illustrate this, take for example a fertilizer which analyzes as follows:

Available Phosphoric Acid	6.22 per cent.	x $1.00	—$ 6.22
Insoluble Phosphoric Acid	1.50 per cent.	x .20	— .30
Ammonia	3.42 per cent.	x 3.50	— 11.97
Potash	7.23 per cent.	x 1.10	— 7.95
Mixing and Bagging			— 1.50
Commercial value at sea ports			$27.94

Or a fertilizer analyzing as follows:

Available Phosphoric Acid	8 per cent.	x $1.00	—$ 8.00
Ammonia	2 per cent.	x 3.50	— 7.00
Potash	2 per cent.	x 1.10	— 2.20
Mixing and Bagging			— 1.50
Commercial value at sea ports			$18.70

The State valuations are for cash for materials delivered at Florida seaports, and they can be bought in one-ton lots at these prices at the date of issuing this Bulle-

tin. Where fertilizers are bought at interior points, the additional freight to that point must be added.

The valuations and market prices in preceding illustrations are based on market prices for one-ton lots.

STATE VALUES.

It is not intended by the "State valuations" to fix the price or commercial value of a given brand. The "State values" are the market prices for the various approved chemicals and materials used in mixing or manufacturing commercial fertilizers or commercial stock feed at the date of issuing a Bulletin, or the opening of the *"season."* They may, but seldom do, vary from the market prices, and are made liberal to meet any slight advance or decline.

They are compiled from price lists and commercial reports by reputable dealers and journals.

The question is frequently asked: "What is 'Smith's Fruit and Vine' worth per ton?" Such a question cannot be answered categorically. By analysis, the ammonia, available phosphoric acid and potash may be determined and the inquirer informed what the cost of the necessary material to compound to a ton of goods similar to "Smith's Fruit and Vine" would be, using none but accepted and well known materials of the best quality.

State values do not consider "trade secrets," loss on bad bills, cost of advertisements and expenses of collections. The "State value" is simply that price at which the various ingredients necessary to use in compounding a fertilizer, or feed, can be *purchased for cash in ton lots at Florida seaports.*.

These price lists are published in this report, with the "State values" for 1914 deducted therefrom.

COMPOSITION OF FERTILIZER MATERIALS.

NITROGENOUS MATERIALS.

	POUNDS PER HUNDRED		
	Ammonia	Phosphoric Acid	Potash
Nitrate of Soda	17 to 19	.....	.....
Sulphate of Ammonia	21 to 24	.....	.....
Dried Blood	12 to 17	.....	.....
Concentrated Tankage	12 to 15	1 to 2	.....
Bone Tankage	6 to 9	10 to 15	.....
Dried Fish Scrap	8 to 11	6 to 8	.....
Cotton Seed Meal	7 to 10	2 to 3	1½ to 2
Hoof Meal	13 to 17	1½ to 2	.....

PHOSPHATE MATERIALS.

	POUNDS PER HUNDRED		
	Ammonia	Available Phos. Acid	Insoluble Phos. Acid
Florida Pebble Phosphate	.....	.....	26 to 32
Florida Rock Phosphate	.....	.....	33 to 35
Florida Super Phosphate	.....	14 to 45	1 to 35
Ground Bone	3 to 6	5 to 8	15 to 17
Steamed Bone	3 to 4	6 to 9	10 to 20
Dissolved Bone	2 to 4	13 to 15	2 to 3

POTASH MATERIALS AND FARM MANURES.

	POUNDS PER HUNDRED			
	Actual Potash	Ammonia	Phos. Acid	Lime
Muriate of Potash	50	.....	.....	.....
Sulphate of Potash	48 to 52	.....	.....	.....
Carbonate of Potash	55 to 60	.....	.....	.....
Nitrate of Potash	40 to 44	12 to 16	.....	.....
Double Sul. of Pot. & Mag.	26 to 30	.....	.....	.....
Kainit	12 to 12½	.....	.....	.....
Sylvinit	16 to 20	.....	.....	.....
Cotton Seed Hull Ashes	15 to 30	.....	7 to 9	10
Wood Ashes, unleached	2 to 8	.....	1 to 2	.....
Wood Ashes, leached	1 to 2	.....	1 to 1½	35 to 40
Tobacco Stems	5 to 8	2 to 4	.....	3½
Cow Manure (fresh)	0.40	0 to 0.41	0.16	0.31
Horse Manure (fresh)	0.53	0 to 0.60	0.28	0.31
Sheep Manure (fresh)	0.67	1.00	0.19	0.33
Hog Manure (fresh)	0.60	0.55	0.19	0.08
Hen Dung (fresh)	0.85	2.07	1.54	0.24
Mixed Stable Manure	0.63	0.76	0.26	0.70

FACTORS FOR CONVERSION.

To convert—

Ammonia into nitrogen, multiply by	0.824
Ammonia into protein, multiply by	5.15
Nitrogen into ammonia, multiply by	1.214
Nitrate of soda into nitrogen, multiply by	0.1647
Nitrogen into protein, multiply by	6.25
Bone phosphate into phosphoric acid, multiply by	0.458
Phosphoric acid into bone phosphate, multiply by	2.184
Muriate of potash into actual potash, multiply by	0.632
Actual potash into muriate of potash, multiply by	1.583
Sulphate of potash into actual potash, multiply by	0.41
Actual potash into sulphate of potash, multiply by	1.85
Nitrate of potash into nitrogen, multiply by	0.139
Carbonate of potash into actual potash, multiply by	0.681
Actual potash into carbonate of potash, multiply by	1.466
Chlorine, in "kainit," multiply potash (K_2O) by	2.33

For instance, you buy 95 per cent. of nitrate of soda and want to know how much nitrogen is in it, multiply 95 per cent. by 0.1647, you will get 15.65 per cent. nitrogen; you want to know how much ammonia this nitrogen is equivalent to, then multiply 15.65 per cent. by 1.214 and you get 18.99 per cent., the equivalent in ammonia.

Or, to convert 90 per cent. carbonate of potash into actual potash (K_2O), multiply 90 by 0.681, equals 61.29 per cent. actual potash (K_2O).

FORMULAS.

There are frequent inquiries for formulas for various crops, and there are hundreds of such formulas published; and, while there are hundreds of "brands," the variations in these grades are surprisingly little. Dozens of "brands" put up by the same manufacturer are identical goods, the only difference being in the name printed on the tag or sack. A good general formula for field or garden might be called a "vegetable formula," and would have the fol-

lowing: Ammonia, 3½%; available phosphoric acid, 6½%; and potash, 7½%. The following formulas will furnish the necessary plant food in about the above proportion. I have purposely avoided the use of any fraction of 100 pounds in these formulas to simplify them. Values are taken from price lists furnished by the trade, January 1, 1912.

For cotton, corn, sweet potatoes and vegetables: Ammonia, 3½%; available phosphoric acid, 6½%; potash, 7½%.

(A) "VEGETABLE."

No. 1.

		Per Cent.
900	pounds of Cotton Seed Meal (7½-2½-1½)	3.25 Ammonia
800	pounds of Acid Phosphate (16 per cent)	6.46 Available
300	pounds of Muriate or (Sulphate) (50 per cent)	7.50 Potash
2,000	State value mixed and bagged	$27.52
	Plant Food per ton	343 pounds

No. 2.

		Per Cent.
1,000	lbs. of Blood and Bone (6½-8)	3.25 Ammonia
400	lbs. of Acid Phosphate (16 per cent)	7.00 Available
600	lbs. Low Grade Sulp. Pot. (26 per cent)	7.80 Potash
2,000		
	State value mixed and bagged	$28.45
	Plant Food per ton	360 pounds

No. 3.

		Per Cent.
300	lbs. of Dried Blood (16 per cent)	3.25 Ammonia
100	lbs of Nitrate of Soda (17 per cent)	8.00 Available
1,000	lbs of Acid Phosphate (16 per cent)	7.80 Potash
600	lbs of Low Grade Sulp. Pot. (26 per cent)	
2,000		
	State value mixed and bagged	$29.45
	Plant Food per ton	381 pounds

(B) "FRUIT AND VINE."

No. 1.

Fruits, Melons, Strawberries, Irish Potatoes: Ammonia, 4 per cent., Available Phoshporic Acid 7 per cent., Potash 10 per cent.

		Per Cent.
1,000 lbs.	of Blood and Bone (6½-8)	
400 lbs.	of Muriate of Potash (50 per cent)	4 Ammonia
500 lbs.	of Acid Phosphate (16 per cent)	8 Available
100 lbs.	of Nitrate of Soda (17 per cent)	10 Potash
2,000		

State value mixed and bagged.....$34.50
Plant Food per ton..... 440 pounds

No. 2.

		Per Cent.
500 lbs.	of Castor Pomace (6-2 per cent)	4.00 Ammonia
200 lbs.	of Sulp. of Am. (25 per cent)	7.70 Available
900 lbs.	of Acid Phosphate (16 per cent)	9.60 Potash
400 lbs.	of Sulp. of Pot. (48 per cent)	
2,000		

State value mixed and bagged.....$33.76
Plant Food per ton..... 426 pounds

No. 3.

		Per Cent.
500 lbs.	of Cotton Seed Meal (7½-2½-1½)	
100 lbs.	of Nitrate of Soda (17 per cent)	3.97 Ammonia
100 lbs.	of Sulp. of Am. (25 per cent)	8.30 Available
900 lbs.	of Acid Phosphate (16 per cent)	8.97 Potash
400 lbs.	of Sulp. of Potash (48 per cent)	
2,000		

State value mixed and bagged.....$33.56
Plant Food per ton ..... 425 pounds

AVERAGE COMPOSITION OF COMMERCIAL FEED STUFFS.

NAME OF FEED.	Crude Fiber.	Protein.	Starch and Sugar.	Fat.	Ash.
Bright Cot'n Seed Meal	9.35	39.70	28.60	7.80	5.80
Dark Cotton Seed Meal	20.00	22.90	37.10	5.50	5.00
Linseed Meal, old process	7.50	35.70	36.00	7.20	5.30
Linseed Meal, new process	8.40	36.10	36.70	3.60	5.20
Wheat Bran	9.00	15.40	53.90	4.00	5.80
Wheat Middlings	5.40	15.40	59.40	4.10	3.20
Mixed Feed (Wheat)	7.80	16.90	54.40	4.80	5.30
Ship Stuff (Wheat)	5.60	14.60	59.80	5.00	3.70
Corn (grain)	2.10	10.50	69.60	5.40	1.50
Corn Meal	1.90	9.70	68.70	3.80	1.40
Corn Cobs	30.10	2.40	54.90	0.50	1.40
Corn and Cob Meal	6.60	8.50	64.80	3.50	1.50
Hominy Feed	4.05	10.50	65.30	7.85	2.55
Corn and Oats, equal parts	5.80	11.15	64.65	5.20	2.25
Barley (grain)	2.70	12.40	69.80	1.80	2.40
Barley and Oats, equal parts	6.10	12.10	64.75	3.40	2.70

AVERAGE COMPOSITION OF COMMERCIAL FEED STUFFS—(*Continued.*)

NAME OF FEED.	Crude Fiber.	Protein.	Starch and Sugar.	Fat.	Ash.
Oats (grain)	9.50	11.80	59.70	5.00	3.00
Rice (grain)	0.20	7.40	79.20	0.40	0.40
Rice Bran	9.50	12.10	49.90	8.80	10.00
Rice Hulls	35.70	3.60	38.60	0.70	13.20
Wheat (grain)	1.80	11.90	71.90	2.10	1.80
Dry Jap Sugar Cane...	26.22	2.28	62.55	1.55	2.77
Cow Pea	4.10	20.80	55.70	1.40	3.20
Cow Pea Hay	20.10	16.60	42.20	2.20	7.50
Velvet Beans	6.70	23.08	51.28	5.57	3.90
Velvet Bean Hulls	27.02	7.46	44.56	1.57	4.32
Velvet Beans and Hulls	9.20	19.70	51.30	4.50	3.30
Velvet Bean Hay.....	29.70	14.70	41.00	1.70	5.70
Beggarweed Hay	24.70	21.70	30.20	2.30	10.90
Japanese Kudzu Hay..	32.14	17.43	30.20	1.67	6.87
Cotton Seed (whole)...	23.20	18.40	24.70	19.90	3.50
Cotton Seed Hulls.....	44.40	4.00	36.60	2.00	2.60
Gluten Feed	5.30	24.00	51.20	10.60	1.10

COMMERCIAL STATE VALUES OF FEED STUFF FOR 1914.

For the season of 1914 the following "State values" are fixed as a guide to purchasers, quotation January 1.

These values are based on the current prices of corn, which has been chosen as a standard in fixing the commercial values; the price of corn, to a large extent, governing the price of other feeds, pork, beef, etc.:

Commercial Values of Feed Stuffs for 1914.

Indian corn being the standard @$35.00 per ton.
($1.75 per sack of 100 lbs., 98c per bu. 56 lbs.)

To find the commercial State value, multiply the percentages by the price per unit.

A unit being 20 pounds (1%) of a ton.

Protein, 4.8c, per pound	96c. per unit
Starch and Sugar, 1.55c. per pound	31c. per unit
Fats, 3.5c. per pound	70c. per unit

Example No. 1.

CORN AND OATS, EQUAL PARTS—

Protein	11.15 x 96c,	$10.71
Starch and Sugar	64.65 x 31c,	20.04
Fat	5.20 x 70c,	3.64
State value per ton		$34.49

Example No. 2.

Protein	10.50 x 96c,	$10,08
Starch and Sugar	69.60 x 31c,	21.57
Fat	5.40 x 70c,	3.78
State value per ton		$35.43

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

SPECIAL FERTILIZER ANALYSES, 1914.

R. E. ROSE, State Chemist. FERTILIZER SECTION. FRANK T. WILSON, Asst. Chemist.

Samples Taken by State Chemist and State Inspector Under Sections 1, 2, and 13, Act Approved May 24, 1905.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O).	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer	3239	8.31	6.60	0.30	6.90	4.47	8.72	Geo. B. Price, Hastings.
Fertilizer	3240	6.84	6.88	1.07	7.95	4.77	6.31	F. H. Smith, Hastings.
Fertilizer	3241	6.51	6.00	2.00	8.00	5.75	7.53	J. L. Morrison, Hastings.
Fertilizer	3242	6.28	6.90	0.35	7.25	4.57	8.44	W. S. Stevens, Hastings.
Fertilizer	3243	4.48	7.27	0.83	8.10	4.65	7.21	R. T. Hewitt, Hastings.
Fertilizer	3244	10.50	6.75	1.85	8.60	4.30	7.30	N. J. Adams, Hastings.
Fertilizer	3245	6.75	6.52	0.28	6.80	4.50	9.22	S. I. Killingsworth, Hastings.
Fertilizer	3246	8.84	6.80	0.50	7.30	4.45	8.14	Grady Stevens, Hastings.

Fertilizer	3247	7.27	6.48	1.67	7.55	4.43	7.28	W. R. Sellers, Hastings.
Fertilizer	3248	6.42	7.75	1.06	8.80	4.23	8.02	J. W. L. Bessert, Hastings.
Fertilizer	3249	6.23	8.23	0.87	9.10	4.40	7.20	D. W. Knight, Hastings.
Fertilizer	3250	6.64	6.63	0.27	6.90	4.70	8.40	H. R. Brown, Hastings.
Fertilizer	3251	8.87	6.90	0.90	7.80	2.80	9.71	T. A. Minton, Hastings.
Fertilizer	3252	7.63	6.23	1.22	7.45	3.95	9.32	Mary Lenhy, Hastings.
Fertilizer	3253	13.45	6.43	1.30	7.80	4.30	7.38	M. Minton, Hastings.
Fertilizer	3254	4.89	9.07	0.48	9.55	4.77	8.68	E. D. Davis, Hastings.
Fertilizer	3255	6.94	6.70	1.00	7.70	5.05	5.62	A. M. Stevens, Hastings.
Fertilizer	3256	7.50	6.13	1.37	7.50	3.98	9.22	Gordon Stanton, Hastings.
Fertilizer	3257	8.06	7.08	0.77	7.85	4.25	7.67	R. K. Theris, Hastings.
Fertilizer No. 1	3258	9.09	11.18	1.37	12.55	1.86	2.05	P. B. Senterfitt, Laurel Hill.
Fertilizer No. 2	3259	10.24	9.12	1.70	10.82	.....	5.03	P. B. Senterfitt, Laurel Hill.
Fertilizer	3260	8.90	6.90	1.20	8.10	3.70	8.43	Joseph Crews, Wachula.
Fertilizer	3261	11.01	10.25	1.80	12.15	2.24	2.78	O. A. Gavin, Laurel Hill.
Fertilizer No. 1	3262	11.55	11.35	0.50	11.85	.....	4.08	Edward Wang, Sr., Laurel Hill.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O).	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer No. 2	3263	10.29	9.38	0.82	10.10	2.04	3.54	Edward Wang, Sr., Laurel Hill.
Potassium Muriate	3264	.....	.....	.....	.....	.....	48.04	Edward Wang, Sr., Laurel Hill.
Fertilizer	3265	7.79	6.84	0.96	7.80	1.86	1.70	J. A. McVicker, Baker.
Fertilizer No. 1	3266	9.52	7.07	0.42	7.50	3.89	6.71	R. E. Whittle, Milton.
Fertilizer No. 1	3267	.....	16.25	0.10	16.35	.....	.....	Culpepper Bros., Laurel Hill.
Fertilizer No. 2	3268	10.39	8.35	0.15	8.50	1.55	3.90	Culpepper Bros., Laurel Hill.
Fertilizer No. 3	3269	.....	9.10	0.15	9.25	1.89	2.49	Culpepper Bros., Laurel Hill.
Fertilizer No. 4	3270	11.68	8.95	0.15	9.10	3.37	4.23	Culpepper Bros., Laurel Hill.
J. E. W. Fertilizer No. 1	3271	.....	18.70	3.00	21.70	.....	27.25	J. E. Ward, Lake Jackson.
J. E. W. Fertilizer No. 2	3272	.....	17.30	2.80	20.10	.....	27.25	J. E. Ward, Lake Jackson.
A. F. W. Fertilizer No. 1	3273	.....	18.25	2.05	20.30	.....	29.60	Lake Jackson Mercantile Co., Lake Jackson.

A. F. W. Fertilizer No. 2	3274	.....	19.40	2.75	22.15	.....	28.25	Lake Jackson Mercantile Co., Lake Jackson.
Fertilizer No. 1	3275	11.24	11.05	0.35	11.40	0.47	2.20	M. M. Grimes, Laurel Hill.
Fertilizer No. 2	3276	9.56	10.25	0.60	10.85	2.30	3.92	M. M. Grimes, Laurel Hill.
Fertilizer No. 1	3277	8.07	9.07	0.58	9.65	2.28	3.18	Raymond Grey, Havana.
Fertilizer No. 2	3278	.....	.....	.....	.....	8.15	.....	Raymond Grey, Havana.
Fertilizer No. 16	3279	10.75	8.15	0.80	8.95	3.95	8.61	J. R. McDonald, Galloway.
Fertilizer No. 18	3280	12.92	6.85	1.85	8.70	4.67	5.64	J. R. McDonald, Galloway.
Fertilizer No. 1	3281	6.36	6.55	0.15	6.70	.....	10.47	M. F. Lee, Marianna.
Fertilizer No. 2	3282	8.66	11.23	0.47	11.70	1.56	3.19	M. F. Lee, Marianna.
Guano No. 1	3283	11.42	13.20	1.30	14.50	1.06	2.02	W. W. Gay, Round Lake.
Guano No. 2	3284	4.73	8.08	0.22	8.30	.....	4.97	W. W. Gay, Round Lake.
Guano No. 3	3285	9.74	8.53	0.77	9.30	.....	4.24	W. W. Gay, Round Lake.
Fertilizer	3286	8.89	14.83	1.27	16.10	.....	6.16	T. M. Tidwell, Bascom.
Kainit	3287	.....	.....	.....	.....	.....	12.54	O. L. Mizell, Dukes.
Guano	3288	9.62	10.00	0.15	10.15	1.50	4.02	L. Adams, Glendale.
Fertilizer No. 1	3289	9.58	10.10	0.10	10.20	1.30	2.13	A. W. Shurette, Laurel Hill.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O).	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer No. 2	3290	.....	17.00	0.15	17.15	.....	.....	A. W. Shurette, Laurel Hill.
Fertilizer No. 1	3291	9.97	10.05	0.15	10.20	3.75	2.86	E. J. Johnson, Laurel Hill.
Fertilizer No. 2	3292	.....	16.80	0.15	16.95	.....	.....	E. J. Johnson, Laurel Hill.
Fertilizer No. 1	3293	7.02	7.50	3.55	11.05	4.27	8.59	J. A. Stevens, DeLand.
Fertilizer No. 1	3294	11.76	2.10	4.30	6.40	0.39	8.68	L. R. Woods, Tampa.
Fertilizer No. 2	3295	6.34	2.60	2.40	5.00	0.29	9.24	L. R. Woods, Tampa.
Fertilizer No. 3	3296	4.19	1.65	2.65	4.30	0.31	9.92	L. R. Woods, Tampa.
Guano	3297	7.38	9.00	0.95	9.95	1.66	2.28	R. L. Williams, Clarksville.
Fertilizer No. 1	3298	7.43	6.38	6.67	12.05	4.52	5.60	H. S. Riggins, Winter Haven.
Fertilizer No. 2	3299	8.74	9.70	4.00	13.70	2.98	3.58	H. S. Riggins, Winter Haven.
Fertilizer No. 3	3300	6.94	6.75	4.60	11.35	5.19	6.84	H. S. Riggins, Winter Haven.

Fertilizer No. 4	3301	4.96	10.75	0.40	11.15	2.47	11.43	H. S. Riggins, Winter Haven.
Fertilizer No. 1	3302	.....	17.60	0.85	18.45	.....	.....	S. A. Stokes, Laurel Hill.
Fertilizer	3303	7.39	6.70	1.20	7.90	3.48	10.72	C. E. Van Landingham, Juniper.
Fertilizer	3304	9.45	8.35	0.35	8.70	2.49	3.97	T. M. Tidwell, Bascom.
Fertilizer No. 1	3305	8.14	7.03	1.52	8.55	4.70	5.96	W. E. Campbell, Seminole.
Fertilizer No. 2	3306	2.46	4.75	3.60	8.35	4.65	5.85	J. P. Cowburn, Crescent City.
Fertilizer No. 1	3307	6.48	6.60	0.90	7.50	4.81	8.09	W. A. Parrish, Dania.
Fertilizer No. 2	3308	8.51	6.53	0.53	7.05	4.66	7.84	W. A. Parrish, Dania.
Cotton Seed Meal	3309	.....	.....	.....	.....	7.35	.....	Frank T. Wilson, Tallahassee.
Cotton Seed Meal	3310	.....	.....	.....	.....	7.55	.....	A. L. Wilson, Quincy.
Fertilizer No. 1	3311	9.49	7.63	0.37	8.00	2.65	3.60	Lud Givens, Laurel Hill.
Fertilizer No. 2	3312	7.66	8.00	0.50	8.50	2.54	3.80	Lud Givens, Laurel Hill.
Fertilizer No. 3	3313	7.87	8.25	0.55	8.80	2.08	3.51	Lud Givens, Laurel Hill.
Fertilizer No. 1	3314	10.88	10.35	0.35	10.75	2.12	2.34	M. M. Grimes, Laurel Hill.
Fertilizer No. 2	3315	9.20	10.95	0.90	11.85	2.12	1.85	M. M. Grimes, Laurel Hill.
Fertilizer No. 1	3316	11.50	9.93	0.57	10.50	1.34	2.03	D. R. Moore, Laurel Hill.

SPECIAL FERTILIZER ANALYSES, 1914—Continued.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O.)	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer No. 2	3317	7.32	8.75	0.15	8.90	2.39	4.25	D. R. Moore, Laurel Hill.
Fertilizer No. 3	3318	8.09	7.55	0.85	8.40	2.13	2.17	D. R. Moore, Laurel Hill.
Fertilizer No. 4	3319	.....	10.15	2.05	12.20	2.30	2.23	D. R. Moore, Laurel Hill.
Fertilizer No. 5	3320	.....	4.98	0.17	5.15	2.12	1.80	D. R. Moore, Laurel Hill.
Guano No. 1	3321	8.38	8.95	0.75	9.70	2.04	3.77	J. C. Stewart, Bascom.
Guano No. 2	3322	8.87	7.85	0.80	8.65	1.41	4.07	J. C. Stewart, Bascom.
Fertilizer	3323	10.52	11.65	0.60	12.25	.....	3.83	J. D. Johnson, Holt.
Fertilizer No. 1	3324	8.20	5.10	1.20	6.30	4.28	6.91	J. E. Hancock, Oakland.
Fertilizer No. 2	3325	7.35	5.95	2.55	8.50	4.07	7.73	J. E. Hancock, Oakland.
Fertilizer No. 1	3326	6.54	8.90	0.30	9.20	2.80	7.55	W. H. Hertel, Gainesville.
Fertilizer No. 2	3327	9.10	11.70	0.25	11.95	0.41	3.80	W. H. Hertel, Gainesville.

Fertilizer No. 1	3328	.....	7.25	1.55	8.90	3.86	5.62	C. L. Eaddy, Linden.
S. F. Guano No. 1	3329	11.50	19.13	2.17	12.30	2.44	3.22	Chas. C. Haynes, Wallace.
A. T. Guano No. 2	3330	8.52	8.10	0.50	8.60	2.92	4.97	Chas. C. Haynes, Wallace.
Fertilizer No. 1	3331	7.37	7.70	2.10	9.80	2.05	1.85	J. O. Boyett, Otahite.
Fertilizer No. 2	3332	11.22	9.50	1.50	11.00	2.00	2.14	J. O. Boyett, Otahite.
Fertilizer No. 3	3333	.....	6.40	0.40	6.80	5.00	8.04	C. L. Eaddy, Linden.
Cotton Seed Meal	3334	.....	.....	.....	.....	7.05	.....	W. K. Hall, Panama City.
Fertilizer No. 1	3335	18.89	10.40	0.30	10.60	3.40	5.40	D. R. Moore, Laurel Hill.
Fertilizer No. 2	3336	16.73	11.40	0.10	11.50	1.63	1.80	D. R. Moore, Laurel Hill.
Fertilizer	3337	8.09	6.55	1.95	8.50	4.10	6.92	G. A. McCort, Hastings.
Fertilizer	3338	.....	.....	.....	.....	.....	48.55	E. S. Chase, Ft. Lauderdale.
Fertilizer No. 3	3339	4.00	4.40	2.70	7.10	4.23	13.62	J. P. Cowburn, Crescent City.
Fertilizer	3340	.....	6.70	1.30	8.00	4.70	11.30	A. E. Berry, Brandon.
Fertilizer No. 1	3341	11.28	7.90	0.90	8.80	2.10	2.62	Jas. A. Davis, Laurel Hill.
Guano No. 1	3342	6.86	7.43	0.82	8.25	3.45	6.40	Milton Foster, Munson.
Guano No. 2	3343	10.08	10.18	1.27	11.45	2.45	2.07	Milton Foster, Munson.

SPECIAL FERTILIZER ANALYSES, 1914—Continued.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O).	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer No. 1	3344	9.00	6.60	0.85	7.45	4.42	4.18	F. W. Lanfear, Citrus Center.
Fertilizer No. 2	3345	10.46	6.83	0.77	7.60	4.00	6.27	F. W. Lanfear, Citrus Center.
Fertilizer	3346	9.87	11.57	0.69	12.26	1.96	2.56	W. J. Wilkerson, Glendale.
Fertilizer No. 1	3347	11.08	7.97	1.70	9.67	1.94	6.62	D. R. Henderson, Indian Ford.
Fertilizer	3348	14.44	6.80	0.85	7.65	3.91	6.54	G. A. Lee, Parrish.
Fertilizer No. 36	3349	5.61	7.45	0.88	8.33	3.12	14.72	Jay Stubbs, Winter Haven.
Fertilizer No. 46	3350	6.60	8.02	0.31	8.33	4.15	11.02	Jay Stubbs, Winter Haven.
Muriate of Potash	3351	.....	.....	.....	.....	.....	52.56	J. O. Enzor, Baker.
German Kainit	3352	.....	.....	.....	.....	.....	13.28	J. O. Enzor, Baker.
Acid Phosphate	3353	.....	18.37	0.63	19.00	.....	.....	J. O. Enzor, Baker.
Acid Phosphate	3354	.....	19.42	0.38	19.80	.....	.....	J. O. Enzor, Baker.

Kainit	3355							12.54	J. O. Enzor, Baker.
Meal Mixture	3356	5.54	8.48	0.97	9.35	2.02	2.07		J. O. Enzor, Baker.
Fertilizer	3357	4.41	6.20	1.20	7.40	2.28	5.80		Armour Fertilizer Co., Jacksonville.
Fertilizer	3358	7.63	8.42	1.16	9.58	5.43	7.30		Armour Fertilizer Co., Jacksonville.
Fertilizer	3359	4.40	6.05	0.63	6.68	4.12	8.93		Armour Fertilizer Co., Jacksonville.
Fertilizer	3360	2.66	5.25	0.90	6.15	2.21	8.40		Armour Fertilizer Co., Jacksonville.
Fertilizer	3361	5.95	6.90	0.90	7.80	3.01	10.21		Armour Fertilizer Co., Jacksonville.
Fertilizer No. 1	3362	4.78	5.36	1.09	6.45	5.41	5.40		Armour Fertilizer Co., Jacksonville.
Fertilizer	3363	9.30	7.89	0.60	8.49	2.56	1.87		T. G. Maughon, Baker.
Fertilizer No. 1	3364	5.63	6.72	1.23	7.95	3.21	6.23		O. A. Gavin, Laurel Hill.
Fertilizer No. 2	3365	8.06	10.89	1.02	11.91	2.65	7.62		O. A. Gavin, Laurel Hill.
Fertilizer No. 1	3366		8.86	0.62	9.48	2.23	2.60		J. W. Kelley, Otahlte.
Fertilizer No. 1	3367	7.57	9.11	0.08	9.19	2.43	3.23		J. W. Kelley, Otahlte.
Fertilizer No. 2	3368	8.57	9.54	0.79	10.33	2.18	2.06		J. W. Kelley, Otahlte.

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

FERTILIZER SECTION.

R. E. ROSE, State Chemist. OFFICIAL FERTILIZER ANALYSES, 1914. FRANK T. WILSON, Asst. Chemist.

Samples Taken by State Chemist Under Sections 1 and 2, Act Approved May 22, 1905.

Deficiencies Greater than 0.20% are Distinguished by Black Face Type.

NAME, OR BRAND	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O.)	BY WHOM AND WHERE MANUAFACTURED
				Available.	Insoluble.	Total.			
Bean Special No. 3.....	1977	Guaranteed.....		5.00	.....	.....	5.00	6.00	Independent Fert. Co.,
		Found	6.40	5.02	1.10	6.12	4.27	7.06	Jacksonville, Fla.
Ideal Fruit & Vine Manure....	1978	Guaranteed	8.00	6.00	.....	.....	3.00	10.00	Wilson & Toomer Co.,
		Found	6.79	7.45	2.65	10.10	3.24	10.45	Jacksonville, Fla.
Palmetto Tomato Formula.....	1979	Guaranteed.....		.....	.....	4.75	4.50	9.50	E.O.Painter Fert. Co.,
		Found	6.25	6.10	0.25	6.35	4.50	11.20	Jacksonville, Fla.
Gaskin's DeSoto Orange Tree Grower	1980	Guaranteed	8.00	6.00	1.00	.....	5.00	6.50	Va.-Caro. Chem. Co.,
		Found	6.63	6.40	0.60	7.00	4.55	6.95	Jacksonville, Fla.
H. G. Sou. States Special Vegetable Grower	1981	Guaranteed	8.00	6.00	1.00	.....	4.00	5.00	Va.-Caro. Chem. Co.,
		Found	8.42	6.90	0.25	7.15	4.60	5.51	Jacksonville, Fla.

Early Bird Orange Tree Manure	1982	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fert. Co.,
		Found	7.35	7.08	0.72	7.80	3.74	5.07	Jacksonville, Fla.
Early Bird Young Pineapple Manure	1983	Guaranteed	10.00	2.00	3.00	.....	5.00	5.00	Osceola Fert. Co.,
		Found	5.57	2.65	2.65	5.30	5.25	5.08	Jacksonville, Fla.
Early Bird Orange Tree Manure	1984	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fert. Co.,
		Found	7.36	6.58	0.72	7.30	3.75	4.78	Jacksonville, Fla.
Early Bird Florida Vegetable Manure	1985	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fert. Co.,
		Found	7.12	6.40	0.80	7.20	3.60	5.44	Jacksonville, Fla.

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

FEEDING STUFF SECTION.

R. E. ROSE, State Chemist. SPECIAL FEEDING STUFF ANALYSES, 1914. E. PECK GREENE, Asst. Chemist.

Samples Taken by Purchaser Under Section 9, Act Approved May 24, 1905.

NAME, OR BRAND.	Laboratory Number.	Fibre.	Protein.	Starch and Sugars (Nitrogen Free Extract).	Fat.	Ash.	BY WHOM SENT.
Feed	283	8.07	11.45	51.62	4.19	11.45	H. S. Riggins, Winter Haven, Fla.
Argentine Middlings	284	8.70	18.34	51.19	4.67	8.55	C. H. Kentgen, Co., New York, N. Y.
Purina Scratch Feed	285	2.45	12.11	67.16	3.10	2.63	W. A. Merryday Co., Palatka, Fla.
Green Cross Feed	286	10.42	10.19	58.19	2.85	3.85	Consolidated Grocery Co., Tampa, Fla.
Velvet Beans	287	6.70	23.68	51.28	5.57	3.90	C. A. Williams, Alachua, Fla.
Beet Pulp	288	18.27	8.78	58.77	0.42	2.25	N. T. McCourtney, Miami, Fla.
Feed	289	3.55	12.29	66.84	3.27	3.60	W. A. Merryday Co., Palatka, Fla.

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

FEEDING STUFF SECTION.

R. E. ROSE, State Chemist. OFFICIAL FEEDING STUFF ANALYSES, 1914. E. PECK GREENE, Asst. Chemist.
Samples Taken by State Chemist and State Inspector Under Sections 1, 2, and 13, Act Approved May 24, 1905.
Deficiencies Greater than 0.20% are Distinguished by Black Face Type.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Fibre.	Protein.	Starch and Sugar. (Nitrogen Free Extrct.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
Boss Feed	1719	Guaranteed	12.00	8.00	62.00	3.00	.....	The Quaker Oats Co., Chicago, Ill.
		Found	9.65	10.35	63.00	2.27	5.75	
Georgia Prime Feed Meal	1720	Guaranteed	17.40	26.00	14.50	6.50	.....	Empire Cotton Oil Co., Quitman, Ga.
		Found	16.83	26.15	34.21	5.66	8.32	
Cotton Seed Meal	1721	Guaranteed	.....	38.62	.....	.....	.....	The Buckeye Cotton Oil Co., Macon, Ga.
		Found	9.00	40.02	23.03	7.30	12.75	
Creamo Brand Cotton Seed Meal	1722	Guaranteed	.....	20.00	30.00	5.00	.....	Tennessee Fiber Co., Memphis, Tenn.
		Found	19.40	24.22	38.01	4.92	5.68	
C. H. M. Hen Feed	1723	Guaranteed	4.00	10.00	60.00	3.50	.....	Chas. H. Morehouse, Tampa, Fla.
		Found	3.12	11.50	61.95	2.90	8.66	
Malzefalfa Feed	1724	Guaranteed	12.00	10.00	58.00	3.50	.....	The Quaker Oats Co., Chicago, Ill.
		Found	11.95	10.79	60.38	2.90	4.08	

NAME, OR BRAND	Laboratory Number.	Analyses, Guaranteed and Found.	Fibre.	Protein.	Starch and Sugar. (Nitrogen Free Extr't.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
Grainfalfa Feed	1725	Guaranteed	12.00	10.00	58.00	3.50	.....	The Quaker Oats Co., Chicago, Ill.
		Found	6.90	12.29	63.00	3.62	5.07	
Green Cross Horse Feed	1726	Guaranteed	10.50	10.00	62.00	3.00	.....	The Quaker Oats Co., Chicago, Ill.
		Found	8.84	9.38	59.62	2.35	5.23	
Lasskorn Stock Feed	1727	Guaranteed	12.00	10.00	50.00	2.50	.....	G. E. Patteson & Co., Memphis, Tenn.
		Found	10.05	10.02	51.47	1.96	9.23	
Cavalry Molasses Feed	1728	Guaranteed	12.00	10.00	55.00	3.50	.....	National Milling Co., Macon, Ga.
		Found	10.55	10.26	60.72	3.81	6.60	
Wildfire Horse Feed	1729	Guaranteed	12.00	11.00	50.00	2.50	.....	Permenter Co., Jacksonville, Fla.
		Found	13.90	11.04	55.04	2.52	5.11	
Butterfat Dairy Feed	1730	Guaranteed	15.00	15.00	50.00	3.00	.....	Allneeda Mills Co., East St. Louis, Ill.
		Found	16.16	15.24	42.79	3.69	5.15	
Crackajack Stock Feed	1731	Guaranteed	12.00	10.50	55.00	3.25	.....	The J. D. Frazier Co., Atlanta, Ga.
		Found	6.26	10.73	61.72	3.79	6.11	
Molasses Horse and Mule Feed	1732	Guaranteed	16.00	10.00	50.00	4.00	.....	American Milling Co., Peoria, Ill.
		Found	11.01	10.41	52.60	3.63	7.42	

Royal Horse and Mule Feed..	1733	Guaranteed	17.33	10.00	55.00	2.50	.....	Standard Feed Co., Memphis, Tenn.
		Found	9.31	10.64	60.99	2.30	5.11	
I. X. L. Sweet Stock Feed.....	1734	Guaranteed	12.00	9.00	60.00	2.75	.....	Webb & Maury, Memphis, Tenn.
		Found	8.10	10.89	55.45	4.50	7.96	
Alfo Molasses Feed.....	1735	Guaranteed	14.90	9.00	52.00	2.00	.....	John Wade & Sons, Memphis, Tenn.
		Found	9.81	8.80	56.39	2.43	6.34	
Sugaration Stock Feed.....	1736	Guaranteed	11.04	11.65	64.00	3.00	.....	G. h. Patteson & Co., Memphis, Tenn.
		Found	8.28	11.55	58.30	2.68	5.06	
Missouri Horse & Mule Feed..	1737	Guaranteed	17.00	10.00	47.00	2.40	.....	Commonwealth Feed Mills Co., St. Louis, Mo.
		Found	16.25	10.53	51.86	3.02	4.75	
Pure Wheat Middlings.....	1738	Guaranteed	6.50	16.00	56.00	5.00	.....	The Acme Mills, Hopkinsville, Ky.
		Found	6.32	16.32	52.61	4.20	5.30	
Peck's Mule Feed.....	1739	Guaranteed	11.90	10.00	55.00	3.30	.....	Illinois Feed Mills, St. Louis, Mo.
		Found	9.98	13.43	58.25	3.00	5.77	
Brown Mule Feed.....	1740	Guaranteed	12.00	10.00	50.00	3.00	.....	Ralston Purina Co., St. Louis, Mo.
		Found	10.30	12.99	57.56	2.93	5.01	
Choice Feed	1741	Guaranteed	9.00	11.00	58.00	2.50	.....	City Mills Co., Columbus, Ga.
		Found	7.78	13.16	63.82	3.10	4.62	
Pine Leaf Middlings.....	1742	Guaranteed	6.10	15.75	57.95	4.20	4.10	Cairo Milling Co., Cairo, Ill.
		Found	11.12	15.71	52.77	4.80	6.35	
Pure Wheat Shorts.....	1743	Guaranteed	6.00	16.00	48.00	4.00	.....	Southern Mills, Nashville, Tenn.
		Found	6.55	16.50	54.19	4.92	8.22	

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Fibre.	Protein.	Starch and Sugar (Nitrogen Free Extr't.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
Gano Feed	1744	Guaranteed	.....	7.50	59.00	2.50	.....	The Valley Milling Co., St. Louis, Mo.
		Found	12.42	11.41	56.65	4.05	6.20	
Rice Meal	1745	Guaranteed	11.00	11.00	50.00	8.00	.....	Louisiana State Rice Milling Co., New Orleans, La.
		Found	8.07	14.22	43.52	16.75	6.22	
Eagle 3 D Grains	1746	Guaranteed	13.00	30.00	30.00	10.00	.....	The Dewey Bros. Co., Blanchester, Ohio.
		Found	16.34	35.28	32.73	8.20	2.10	
Tampa Dairy Feed	1747	Guaranteed	13.15	17.12	49.06	4.10	.....	Barnard & Hester, Tampa, Fla.
		Found	9.50	17.50	54.26	4.65	5.27	
Puritan Brand Feed	1748	Guaranteed	12.00	9.00	55.00	1.50	.....	Golden Grain Milling Co., East St. Louis, Mo.
		Found	9.62	12.50	52.69	2.32	6.85	
Steer Head Molasses Feed	1749	Guaranteed	12.50	9.00	56.51	3.00	.....	Drago Grain Co., Mobile, Ala.
		Found	8.67	10.96	54.40	3.70	6.86	
Sugar Loaf Horse Feed	1750	Guaranteed	15.00	8.00	50.00	2.50	.....	Allneeds Mills Co., East St. Louis, Mo.
		Found	9.97	10.66	59.07	3.04	5.11	
Atlas Feed	1751	Guaranteed	.....	11.85	57.18	3.35	.....	Hester & Hughes, Tampa, Fla.
		Found	10.04	11.76	61.21	2.77	5.27	

Superior Stock Feed.....	1752	Guaranteed	12.00	11.00	50.00	2.50	.....	The Superior Feed Co., Memphis, Tenn.
		Found	13.46	11.03	53.46	2.78	6.10	
Gem Sweet Dairy Feed.....	1753	Guaranteed	10.00	16.00	45.00	2.00	.....	Edgar-Morgan Co., Memphis, Tenn.
		Found	13.30	16.84	47.78	2.03	6.83	
Winter Wheat Bran and Screenings	1754	Guaranteed	9.50	15.66	56.69	3.00	.....	Akin-Erskine Milling Co., Evansville, Ind.
		Found	11.02	16.67	52.42	3.44	6.90	
Pure Wheat Bran & Screenings	1755	Guaranteed	9.50	14.50	50.00	4.00	.....	Liberty Mills, Nashville, Tenn.
		Found	9.50	14.92	53.29	3.27	9.00	
XX Hen Feed	1756	Guaranteed	4.00	10.00	69.00	2.50	.....	Webb & Maury, Memphis, Tenn.
		Found	3.72	11.93	70.23	2.70	1.12	
Alfalfa Horse & Mule Feed....	1757	Guaranteed	10.50	10.00	56.00	3.75	.....	Just Milling and Feed Co., Nashville, Tenn.
		Found	10.62	10.09	59.10	2.65	3.97	
Danco Feed	1758	Guaranteed	4.00	9.00	65.00	8.50	.....	Danke-Walker Milling Co., Union City, Tenn.
		Found	8.25	11.41	58.27	5.85	5.02	
Just Corn Goods.....	1759	Guaranteed	1.75	8.75	72.00	2.75	.....	Just Mills, Nashville, Tenn.
		Found	1.62	8.60	70.62	3.62	1.37	
Molasses Horse and Mule Feed	1760	Guaranteed	16.00	10.00	50.00	4.00	.....	American Milling Co., Peoria, Ill.
		Found	9.56	9.71	55.41	2.34	6.03	
"Snowflake" Middlings	1761	Guaranteed	6.00	16.00	53.00	5.10	.....	Lawrenceburg Roller Mills Co., Lawrenceburg, Ind.
		Found	5.37	16.67	58.07	5.52	5.00	
M. Middlings	1762	Guaranteed	6.50	16.80	55.11	5.60	.....	Hecker - Jones - Jewell Co., New York, N. Y.
		Found	7.00	16.94	56.82	5.67	4.77	

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Fiber.	Protein.	Starch and Sugar. (Nitrogen Free Extract.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
Choice Wheat Middlings.....	1762	Guaranteed	8.00	15.00	50.00	5.00	.....	Kensch & Schwartz Co., New York, N. Y.
		Found	5.54	15.97	60.47	5.20	2.55	
Pure Wheat Shipstuff.....	1764	Guaranteed	6.26	15.69	55.80	4.42	.....	Sunny Side Flour Mills, Evansville, Ind.
		Found	4.82	16.06	60.18	4.21	3.56	
Just Dairy Feed.....	1765	Guaranteed	12.00	20.00	54.00	3.25	.....	Just Mills, Nashville, Tenn.
		Found	12.35	20.35	45.36	3.21	6.25	
Just Horse Feed.....	1766	Guaranteed	12.00	10.00	58.00	3.25	.....	Just Mills, Nashville, Tenn.
		Found	9.70	10.46	56.48	2.29	5.64	
Nutriline Stock Feed.....	1767	Guaranteed	12.00	10.00	50.00	3.50	.....	Nutriline Milling Co., Crowley, La.
		Found	9.17	10.50	55.14	3.89	7.50	
Molasco	1768	Guaranteed	12.00	10.00	55.00	3.25	.....	National Oats Co., St. Louis, Mo.
		Found	12.85	10.37	56.78	4.19	5.72	
Chieftain Horse Feed.....	1769	Guaranteed	12.00	9.00	59.00	2.00	.....	G. E. Patteson & Co., Memphis, Tenn.
		Found	10.95	10.92	55.65	2.32	6.17	

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

R. E. ROSE, STATE Chemist. FOOD AND DRUG SECTION. L. HEIMBURGER, Asst. Chemist.

Samples Taken by State Inspector Under Section 12, Act Approved June 5, 1911.

OFFICIAL FOOD ANALYSES, 1914.

CIDER VINEGARS.

Number.	LABEL.	Total Acid as Acetic (per cent).	Total Solids (grams in 100 cc).	Total Ash (grams in 100 cc).	Alkalinity of Ash (cc. n/10 Acid).	Lead Acetate (Precipitate).	Polarization (Degrees V in 200 m m).	Artificial Color (added caramel).	Net Measure.	REMARKS.
1517	*Elko Brand Pure Apple Cider Vinegar. Contents 1 quart. Wallace Vinegar Co., Paducah, Ky.	4.45	1.16	0.19	27	Heavy...	—2.9	None.	1 qt. 1, 3-8 ozs.	*Passed.
1707	*Elko Brand Pure Apple Cider Vinegar. Contents 1 quart. Wallace Vinegar Co., Paducah, Ky.	4.10	1.01	0.18	17	Heavy...	—1.4	None.	1 qt. 2 ozs.	*Passed.
1709	*Hirsch's Goodies. Pure Apple Cider Vinegar. 32 ozs. avd. Hirsch Bros. & Co., Louisville, Ky., and Pittsburg, Pa.....	4.33	1.90	0.30	29	Heavy...	—1.8	None.	1 qt. 1, 7-8 ozs.	*Passed.

CIDER VINEGARS—Continued.

Number.	LABEL.	Total Acid as Acetic (per cent).	Total Solids (grams in 100 cc).	Total Ash (grams in 100 cc).	Alkalinity of Ash (cc. n/10 Acid).	Lead Acetate (Precipitate).	Polarization (Degrees V in 200 m m).	Artificial Color (added caramel).	Net Measure.	REMARKS.
1710	*Georgia Belle Brand Pure Apple Cider Vinegar. 1 lb. 8 ozs. or over. Jones Bros. & Co., Atlanta, Ga.	4.60	1.82	0.16	9	Heavy...	—1.4	None.	1 qt. 2, 2-8 ozs.	*Passed.
1711	*Over Sea Brand Pure Apple Cider Vinegar. Contents not less than 23 ozs. Consolidated Grocery Co., Tampa, Jacksonville and Pensacola, Fla.	4.63	2.50	0.29	30	Heavy...	—2.0	None.	1 qt. 2, 5-8 ozs.	*Passed.
1713	*Crescent Brand Pure Cider Vinegar. Not less than 24 ozs. Chas. L. Hirsch & Co., New York.	4.70	1.72	0.17	16	Heavy...	—2.0	None.	1 pt. 9 ozs.	*Passed.

1716	*Lion Brand Pure Apple Cider Vinegar. 25 fl. ozs. Morgan-Abbott-Barker Co., Albion, N. Y. and Louisville, Ky.	4.35	2.00	0.35	26	Heavy...	—2.4	None.	1 pt. 10, 1-2 ozs.	*Passed.
1719	†Hyman's Old Kentucky Home Pure Apple Cider Vinegar. Hyman Pickle Co., Louisville, Ky. (On sticker: Net contents 16 ozs.)	4.15	2.30	0.36	31	Heavy...	—1.2	None.	1 pt. 1 oz.	†Illegal.
1721	†Red Cap Pure Apple Cider Vinegar. 25 ozs. United Grocery Co., Jacksonville, Fla.	3.25	2.10	0.46	32.5	Heavy...	—2.2	None.	1 pt. 12, 1-4 ozs.	†Illegal.
1726	*Robin Hood Brand Pure Apple Vinegar. 23 fl. ozs. R. C. Williams & Co., New York.	4.50	1.93	0.27	20	Heavy...	—0.8	None.	1 pt. 12 ozs.	*Passed.
1727	†Cupid Brand Vinegar, Choice High Grade Apple Juice Vinegar. Dodson-Brain Mfg. Co., St. Lois. (On sticker: 26 ozs. net).	4.60	1.55	0.25	18	Heavy...	—1.0	None.	1 pt. 12, 7-8 ozs.	†Illegal.
1728	*Warfield Brand Clarified Pure Cider Vinegar. Seeman Bros., New York. 23 fl. ozs.	4.70	2.69	0.27	28	Light....	—1.1	None.	1 pt. 10, 1-2 ozs.	*Passed.
1729	*Beech-nut Brand Cider Vinegar. Made from Apples only. 31 fl. ozs. Beech-nut Packing Co., Canajoharie, N. Y.	4.20	2.04	0.30	32	Heavy...	—1.5	None.	1 qt. 1 oz.	*Passed.

CIDER VINEGARS—Continued.

Number.	LABEL.	Total Acid as Acetic (per cent).	Total Solids (grams in 100 cc).	Total Ash (grams in 100 cc).	Alkalinity of Ash (cc. n/10 Acid).	Lead Acetate (Precipitate).	Polarization (Degrees V in 200 m m).	Artificial Color (added caramel).	Net Measure.	REMARKS.
1796	*Georgia Belle Brand Pure Apple Cider Vinegar. Average net weight 14 ozs. or over. Jones Bros. & Co., Atlanta, Ga.	4.96	2.17	0.31	43	Heavy...	—0.9	None.	1 pt. 1, 3-4 ozs.	*Passed.
1799	*Beech-nut Brand Cider Vinegar. Made from Apples only. 31 fl. oz. Beech-nut Packing Co., Canajoharie, N. Y.	4.15	1.15	0.16	31	Light....	—0.6	None.	.....	*Passed.
1801	*White Rose Cider Vinegar. Seeman Bros., New York.	3.50	0.91	0.11	32	Heavy...	—1.3	None.	Bulk.....	*Passed.
1803	*Elko Brand Pure Apple Cider Vinegar. 1 qt. Wallace Vinegar Co., Paducah, Ky.	4.25	1.02	0.19	29	Moderate	—0.9	None.	.....	*Passed.

1804	*Heinz Pure Cider Vinegar. 25 fl. oz. H. J. Heinz Co., Pittsburg, Pa.	5.70	1.65	0.21	39	Heavy...	—1.5	None.	1 pt. 12, 1-4 ozs.	*Passed.
1808	‡Apple Cider Vinegar. R. M. Hughes & Co., Middleport, N.Y.	4.25	2.10	0.18	44	Heavy...	—1.3	None.	Bulk.....	‡Legal.
1811	*Robin Hood Brand Pure Apple Vinegar. 22 fl. ozs. R. C. Williams & Co., New York.	4.65	1.70	0.15	20	Heavy...	—1.1	None.	1 pt. 10, 5-8 ozs.	*Passed.
1813	*Warfield Brand Clarified Pure Cider Vinegar. Made from Apples. About 23 fl. ozs. Seeman Bros., New York.	4.70	1.46	0.13	25	Moderate	—3.5	None.	1 pt. 10, 1-8 ozs.	*Passed.
1816	*Eddy's High Grade Apple Cider Vinegar. Eddy & Eddy Mfg. Co., St. Louis. (On sticker: 24 fl. ozs.).	3.90	1.85	0.32	24	Heavy...	—1.1	None.	1 pt. 9, 1-2 ozs.	*Passed.
1817	*Williams Sunset Brand Cider Vinegar. Williams Bros. Co., Detroit. (On sticker: 25 oz. av. net wt.).	4.65	1.87	0.24	30	Moderate	—1.5	None.	1 pt. 10, 1-4 ozs.	*Passed.
1818	*Lion Brand Pure Apple Cider Vinegar. Morgan-Abbott-Barker Co., Inc., Louisville, Ky.	4.30	1.90	0.26	33	Heavy...	—0.6	None.	Bulk.....	*Passed.

Number.	LABEL.	Total Acid as Acetic (per cent.)	Mineral Acids.	Artificial Color (added Caramel).	Net Measure.	REMARKS.
1516	*Red Star Brand Compound Distilled and Sugar Vinegar. At least 30 ozs. Wallace Vinegar Co., Paducah, Ky., and Savannah, Ga.	4.45	None.	None....	1 qt. 1, 7-8 ozs.	*Passed.
1600	*Circle Brand Pure Fermented Cane, Sugar Vinegar. This package contains 1 lb. 10 ozs. Dawson Bros. Mfg. Co., Memphis, Tenn.	4.60	None.	Present.	1 pt. 11, 1-8 ozs.	*Passed.
1601	*Squire Brand Colored Distilled Vinegar. Squire Dingee Co. Chicago, Ill.	4.50	None.	Present.	1 pt. 11, 1-4 ozs.	*Passed.
1602	*Squire Brand Colored Distilled Vinegar. 24 fl. ozs. net. Squire Dingee Co., Chicago, Ill.	4.35	None.	Present.	1 pt. 10, 1-2 ozs.	*Passed.

1708	†Red X Brand Blend Cane Syrup and Distilled Vinegar. Colored. Contents 32 ozs. Franklin Remedy Co., Jacksonville, Fla.	2.90	None.	Present.	1 qt. 2, 1-8 ozs.	†Illegal.
1712	*Distilled Vinegar. Colored. 27 ozs. W. B. Johnson Co., Jacksonville, Fla.	4.33	None.	Present.	1 pt. 10, 3-4 ozs.	*Passed.
1715	†Distilled Vinegar. Colored. This package contains 28 ozs. net. Jacksonville Chemical Co., Jacksonville, Fla.	3.45	None.	Present.	1 qt. 7-8 ozs.	†Illegal.
1718	†Dixie Brand Vinegar. Colored. Made from pure acetic acid. Jacksonville Specialty Co., Jacksonville, Fla. Contains 28 ozs.	3.85	None.	Present.	1 qt. 2, 1-8 ozs.	†Illegal.
1720	‡Walters' Special Distilled Vinegar, 4%, colored, 13 ozs. Garnby-Walters Co., Manufacturing Chemists, Jacksonville, Fla.	4.90	None.	Present.	12, 3-4 ozs.	‡Legal.
1722	†Eagle Brand Distilled Vinegar. Colored. Simmons Bottling Co., Jacksonville, Fla. This package contains 28(in pencil mark 13) ozs. net.	3.60	None.	Present.	14, 1-2 ozs.	†Illegal.
1723	*Madison Brand Imitation Vinegar. Added caramel. Net wt. not less than 1 lb. 11 ozs. Alart & McGuire Co., New York.	4.68	None.	Present.	1 pt. 11 ozs.	*Passed.

Number.	LABEL.	Total Acid as Acetic (per cent.)	Mineral Acids.	Artificial Color (added Caramel).	Net Measure.	REMARKS.
1724	*Heinz Rex Amber (sugar) Vinegar. Fermented from cane sugar, 4½% acetic strength. H. J. Heinz Co., Pittsburg, Pa.	4.50	None.	None....	1 pt. 10, 1-8 ozs.	*Passed.
1725	†Hardin County Brand Pure Distilled Vinegar. Colored with carsmel. The Castleman-Blakemore Co., Louisville, Ky. (On sticker: Average Contents 25 fl. ozs.)	4.15	None.	Present.	1 pt. 8, 3-8 ozs.	†Illegal.
1802	*Red Star Brand Compound Distilled and Sugar Vinegar. At least 30 ozs. Bottled by Wallace Vinegar Co., Paducah, Ky., and Savannah, Ga.	4.30	None.	Present.	.....	*Passed.

1805	*Distilled Colored Imitation Vinegar, Colored with burnt sugar. Net weight not less than 1 lb. 7½ ozs. Alart & McGuire Co., New York.	4.30	None.	Present.	.....	*Passed.
1806	‡Royal Crown Brand, caramel-colored, Distilled Vinegar. Dawson Bros. Mfg. Co., Memphis, Tenn.	4.24	None.	Present.	Bulk	‡Legal.
1809	*Distilled Vinegar. Colored. Creikshank Bros. Co., Pittsburg, Pa.	5.10	None.	Present.	Bulk	*Passed.
1810	*Walters' Special Distilled Vinegar. Colored. Garnby-Walters & Co., Mfg. Chemists, Jacksonville, Fla.	3.90	None.	Present.	Bulk	*Passed.
1814	†Dixie Brand Vinegar. Colored. Made from Pure Acetic Acid. This package contains 13 ozs. net. Standard Specialty Co., Jacksonville, Fla.	4.40	None.	Present.	14 ozs.	†Illegal.
1815	‡Family Colored Distilled Vinegar. Louisville Cider & Vinegar Works, Louisville, Ky.	4.15	None.	Present.	Bulk	‡Legal.

SUGAR, COMPOUND, DISTILLED, AND IMITATION VINEGARS—Continued.

Number.	LABEL.	Total Acid as (per cent.)	Mineral Acids.	Artificial Color (Added Caramel.)	Net Measure.	REMARKS.
1820	*Uncle Josh Brand. Distilled. Caramel colored, 1 lb. 10 ozs. or more. Consolidated Cider and Vinegar Co., Memphis, Tenn.	4.30	None.	Present.	1 pt. 10, 1-2 ozs.	*Passed.

MALT VINEGARS.

Number.	LABEL.	Total Acid as Acetic (per cent.)	Total Solids (Grams in 100 cc.)	Total Ash (Grams in 100 cc.)	Alkalinity of Ash (cc. $\frac{n}{10}$ Acid.)	Lead Acetate (Precipitate.)	Polarization (Degrees V in 200 m. m.)	Artificial Color (Added Caramel.)	Net Measure.	REMARKS.
1800	*Crosse & Blackwell's Pure Malt Vinegars, 26 ozs. net. Soho Sq., London, England.	4.75	2.99	0.41	26	Heavy...	+2.2	None.	1 pt. 10, 5-8 ozs.	*Passed.
1807	*White Rose Imported Malt Vinegar. Liquid contents at least 23 ozs. Seeman Bros., New York.	4.60	1.78	0.25	23	Heavy...	+2.64	None.	.....	*Passed.
1812	*Royal Scarlet Brand English Malt Vinegar. Average contents 23 ozs. R. C. Williams & Co., New York.	3.95	2.79	0.32	25	Moderate	+3.8	None.	1 pt. 11, 1-4 ozs.	*Passed.

GRAPE VINEGARS.

Number.	LABEL.	Total Acid as Acetic (per cent.)	Total Solids (Grams in 100 cc.)	Total Ash (Grams in 100 cc.)	Tartaric Acid and Tartrates.	Lead Acetate (Precipitate.)	Artificial Color (Added Caramel.)	Net Measure.	REMARKS.
1714	†Grapeland Brand Pure Grape Vinegar. Bottled by Wallace Vinegar Co., Paducah, Ky., and Savannah, Ga.	5.80	3.10	0.35	Present.	Heavy.	None.	1 qt. 1, 3-4 ozs.	†Illegal.

FOOT NOTES TO VINEGARS.

‡Legal—Complies with the law in every respect.

*Passed—Though not strictly legal, complies sufficient with the law to be passed. Net measure should be stated in qts., pts. and ozs., or in some instances, the sample was slightly below standard.

†Illegal—Samples were illegal for the following reasons:

No. 1708—Below standard in acetic acid. Statement of net measure should be in qts. and ozs.

No. 1714—No statement of net measure on label.

No. 1715—Below standard in acetic acid. Statement of net measure should be given in qts. and ozs.

No. 1718—Misbranded. Adulterated. Not a Vinegar. A dilute solution of acetic acid. Statement of net measure should be in qts. and ozs.

No. 1814—Same as No. 1718.

FOOT NOTES TO VINEGARS—Continued.

No. 1719—Net contents not printed on label. No stickers allowed. Statement of net measure should be in pts. and ozs.

No. 1722—Misbranded. Adulterated. Below standard in acetic acid. Printed label states 28 ozs., but illegally pencil marked 13 ozs. over it. Net weight *or* measure should be conspicuously, legally and correctly stated on the outside of the package.

No. 1725—Net contents not printed on label. No stickets allowed. Statement of net measure should be in pts. and ozs.

No. 1727—Net contents not printed on label. No stickets allowed. Statement of net measure should be in pts. and ozs.

ALCOHOLIC DRINKS.

Number.	LABEL.	Alcohol (per cent by Volume.)	Net Measure as Stated.	Net Measure as Found.	REMARKS.
1518	No label, but sold as "Glory Tonic" by Joe Dethier, Mulberry, Fla.	0.40	.....	13 ozs.	Illegal. Misbranded. No label. A home-brewed corn beer.
1731	Tourist Whiskey. Fine Mellow Blend. Thos. F. McNulty & Co., Baltimore, Md. (In indistinct rubber stamp: Guaranteed to conform to Florida Pure Food Law. Alcohol 42%.)	40.74	.....	7, 7-8 ozs.	Illegal. Misbranded. No statement of net measure on label. The use of indistinct rubber stamp not permissible. Alcohol per cent. overstated on label.
1732	Extra Fine Gin. A compound. Alcoholic strength 40%. Guaranteed to comply with the national and Florida Pure Food Laws.	42.06	.....	7, 3-8 ozs.	Illegal. Misbranded. No statement of net measure on label. Percentage of alcohol greater than stated on label.

ALCOHOLIC DRINKS.

Number.	LABEL.	Alcohol (per cent by Volume.)	Net Measure as Stated.	Net Measure as Found.	REMARKS.
1733	Dixie Gin. A compound, 60 proof. Alcoholic strength 30%. Solomon Shad, Jacksonville, Fla.	29.86	.....	13, 5-8 ozs.	Illegal. Misbranded. No statement of net measure on label.
1734	Dixie Whiskey, 60 proof. Alcoholic strength 30%. Solomon Shad, Jacksonville, Fla.	31.24	.....	13, 7-8 ozs.	Illegal. Misbranded. No statement of net measure on label.
1735	Dixie Corn, 60 proof. Alcoholic strength 30%. Solomon Shad, Jacksonville, Fla.	30.80	.....	13, 7-8 ozs.	Illegal. No statement of net measure on label.