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Part 2—Crop Conditions and Yields.
Part 3—Fertilizers, Feed Stuffs and Foods and Drugs.

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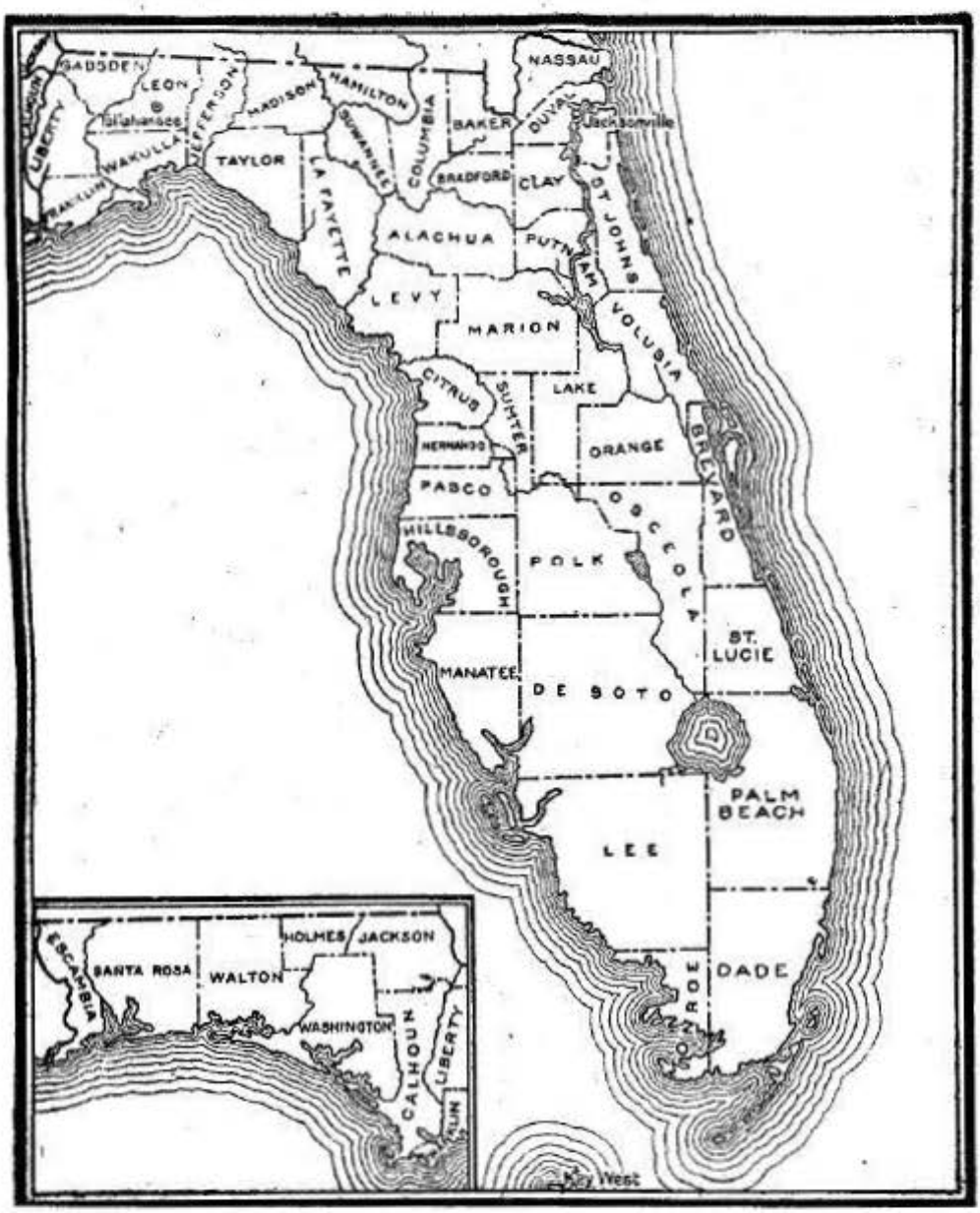
COUNTY MAP OF STATE OF FLORIDA.



PART I.

LIVE STOCK GROWING AND FEEDING IN FLORIDA.

LIVE STOCK GROWING AND FEEDING IN FLORIDA

By H. S. ELLIOT, Chief Clerk,

Department of Agriculture.

In discussing this subject we know that much has been said and written for and against the possibility of live stock production in Florida on a profitable basis. It is contended on the one hand that this State does not afford the native pasturage necessary to make the industry a success, and that the climate is not suited to the best development of animal life. Some show of reason is given for this contention because of the neglect on the part of the growers, of cattle in particular, in permitting their stock to take care of themselves from one year to another without attention, and to inbreed promiscuously for years without hindrance, and these statements comprise about the sum of objections raised against live stock production in Florida. They are simply claims based on past experiences of the range cattle growers, and not on consideration of true economic conditions, proven by facts as they exist and the experience of intelligent experiment by private individuals, live stock companies and the State Experiment Station.

Among the principal general reasons why Florida is adapted to successful live stock growing of all kinds, almost without limit, is its unlimited and unfailing water supply, which is absolutely essential to successful stock raising, as are its green pastures. Another equally important condition is the short period necessary for feeding and sheltering of stock as compared with other sections of the country. Another of equal, if not of greater importance is the adaptability and capacity of the soils

of this State to the production of nearly all kinds of grains and forage crops at as small, if not less cost than any other section of the country. In all of this, the equable climate of the State has much to do, of course, but it is because of these advantages and conditions that Florida should and can compete with any, and excel most of the States as a live stock producing country.

Of the entire area of Florida there are approximately three million acres in farms and under farm control. There are approximately thirty million acres that can be used to a greater or less extent for the production of grasses, forage and grazing purposes for live stock of all kinds in every portion of the State. There is no question but that Florida has within her borders the greatest grazing region east of the Mississippi river, and consequently an almost boundless capacity for the production of all the forage crops necessary to maintain all the live stock that can be grown upon it.

The number of live stock of all kinds in the State is, in round numbers, 2,000,000, having a value of about $25,000,000. Instead of this small number, there should be not less than 20,000,000 head, and 10,000,000 head of them should be cattle; the State can easily maintain such a number.

If the vast area of idle lands in Florida and the South as well were put to this purpose with intelligent direction, there would be no necessity for the big packers of the West to go to Argentina for their meat to supply American consumers. There is land enough idle in the South, including Florida, to produce all the beef cattle, hogs and sheep necessary to supply the demands of the people of the United States and also about all of the export trade that this country can control. In all of this Florida should and can bear a very large and important part.

FLORIDA SOILS ADAPTED TO FORAGE PLANTS.

The soils of Florida embrace practically all of those best adapted to the various agricultural purposes. In the several sections of the State soils varying from stiff red clay with all of its gradations of the loam soils, is found in immense areas, and all of these with possibly one or two exceptions are productive soils, some of them to a high degree naturally, and all can be made so at reasonable cost by proper methods of control or management. On these soils are produced nearly all of the crops suited to the temperate zone and of the semi-tropics, for be it remembered Florida includes in a large degree the climate of both. In the soils above referred to, the reclaimable swamp and other overflowed and wet lands are included.

FORAGE PRODUCTS.

On the soils just discussed can be produced practically all of the forage crops necessary for pasture or for the making of hay or silage. Included in this are all of the sorghums, both saccharine and non-saccharine, all of the legumes, except possibly a small number of clovers, which can probably also be grown with aid of inoculation with bacteria. To give an idea of the number of these plants used for grazing, forage and hay-making that are adapted to Florida soils, we append the following list, viz.:

SORGHUMS.

NAME OF VARIETY.	Yield per acre of green forage in tons.	Yield per acre of grain in head, in pounds.
Red Kaffir Corn.....	3.968	1,187.50
Sirak	10.225	1,050.00
Honey	6.281	562.50
Sapling	5.900	550.00
Brown Durra	5.350	450.00

Minnesota Amber	8.612	975.00
Planter's Friend, No. 36	13.068	787.00
Orange	13.813	1,366.50
Gooseneck, Erect	16.907	793.00
Planter's Friend, No. 37.	16.318	887.50
Amber	10.461	1,033.50
Sumac	12.449	429.50
Shallu	11.556	2,112.50
White Kaffir	8.153	727.00
Gooseneck, Pendant	19,036	856.25
Collier	13.896	742.50
Red Amber	12.283	1,500.00
Cigne	12.450	900.00
Jerusalem Corn	8.204	458.00
Yellow Milo	9.487	900.00

CLOVERS, GRASSES AND VETCHES.

		Yield per acre in tons of Dry Hay per Season.
1	Hairy Vetch	2 to 3
1	Alfalfa	5 " 6
	Lespedeza	1 " 2
1	Burr Clover	2 " 4
	Crimson Clover	2 " 4
	Rhodes Grass	4 " 6
	Natal "	1 " 2
	Orchard "	1 " 2
	Bermuda "	1 " 2
	Crab "	1 " 2
	Tall Meadow Oat Grass.....	1 " 2
	Para Grass	2 " 4
	Herds or Red Top Grass.....	1 " 2
	Crow-foot Grass	1 " 2
	Millet	3 " 5
	Johnson Grass	3 " 6
	Rape, (never cut)	———

1 Should be inoculated.

LEGUMINOUS CROPS OTHER THAN CLOVERS.

All Cow or Field Peas.
Velvet Beans.
Soy Beans.
Beggar Weed.
Kudzu.
Peanuts.

The following table gives the average composition of a few of the best hays and will serve to further impress those interested with not only the capacity of the soils of this State to produce the most valuable forage and hay plants, but with their high quality and value, as feeding products.

The following tables gives the average composition of some of the best hays:

Dry Hay—	Water—	Ash—	Protein—	Carbohydrates— (Nitrogen-free extract)	Crude Fibre—	Fat— (Ether extract)
Cowpea	11.9	8.4	14.4	41.2	21.5	2.5
Alfalfa	8.4	7.4	14.3	42.7	25.0	2.2
Soy Bean	11.3	7.2	15.4	38.6	22.3	5.2
Clover (Red) ..	15.3	6.2	12.3	38.1	24.8	3.3
Peanut Vine ..	7.6	0.8	10.7	42.7	23.6	4.6
Lespedeza	11.5	4.1	9.6	40.1	31.4	3.3
Timothy	13.2	4.4	5.9	45.0	29.5	2.5
Johnson Grass	10.2	6.1	7.2	45.9	28.5	2.1

Per Cent of Digestible Matter.—Continued.

Cowpea	9.3	29.1	2.1	1.9
Alfalfa	10.6	28.2	10.7	0.9
Soy Beans	10.9	26.6	13.6	1.5
Red Clover	7.6	26.3	12.1	2.0
Peanut Vine ...	6.7	29.9	12.3	—
Lespedeza	7.6	31.0	——	1.8
Timothy	2.8	28.3	15.1	1.4
Johnson Grass.	3.2	24.8	16.5	0.8

Food Elements in Other Hays.

	Protein	Carbohydrates.
Beggarweed	16 per cent.	69 per cent.
Cowpeas	16 per cent.	67 per cent.
Velvet Bean	14 per cent.	72 per cent.
Peanut	13 per cent.	73 per cent.
Crowfoot Grass	8 per cent.	75 per cent.
Crab Grass	7 per cent.	79 per cent.
Timothy	6 per cent.	82 per cent.
Millet	6 per cent.	76 per cent.
Mexican Clover	5 per cent.	79 per cent.

Showing Value of Some Hays.

Timothy	$20.00 per ton.
Velvet Bean	20.05 per ton.
Peanut	20.00 per ton.
Beggarweed	19.95 per ton.
Crab Grass	19.60 per ton.
Cowpea	19.50 per ton.
Mexican Clover	19.05 per ton.
Crowfoot Grass	19.00 per ton.
Millet	18.65 per ton.

PASSING OF THE RANGES.

The time has about passed when the growing of cattle on the ranges can be done profitably, because, mainly, of the cutting up of the vast tracts of prairie and wood lands and turning them into orchards or small farms; consequently it becomes necessary to change the method of live stock raising. Undoubtedly the change will be beneficial to the industry and be productive of greater profits, through the building up in both size and quality of the animal, for with the change will come about the substitution of better breeds of stock and a general grading up

and improvement in the native stock. This applies to sheep and hogs as well as cattle.

BREEDS FOR UPGRADING.

We suggest that from a large number of improved breeds of cattle, that there are a number which have proven themselves well adapted to Florida conditions. These are the Short Horn or Durham, Hereford, Aberdeen, Angus, Red Polled and Devon. There are others also of great merit, but these are well known to be adapted to the conditions and climate in Florida, and besides they represent the very best beef producing animals in America.

By grading up with the best of native cows and thoroughbred bulls of the above mentioned breeds, it will require but a short time comparatively to bring about a complete change.

We have shown that our Florida soils are capable of and do produce all of the grasses, forage and hay plants necessary to support all of the live stock and more than we can raise. The next most important question is to determine the best method of feeding this forage to the stock. We, of course, can arrange to have the grazing always with us. Scientific experiment and experience have abundantly demonstrated in the past few years, that the best as well as the most economical method of feeding live stock, especially cattle, is in the form of silage, as well as roughage.

SUGGESTIONS AS TO MANAGEMENT OF LIVE STOCK.

Before giving consideration to the subject of silage and its feeding, we offer a few suggestions as to necessary points to be considered in stock raising; these are, that good pastures are essential to successful and profitable live stock production, especially where beef is the object.

Use pure-bred bulls for grading up the native stock, and be sure to select the best heifers for breeding purposes. Eradicate the ticks on the farm; the cost is not great. Use all coarse forage, such as straws and stalks in the fields to assist in carrying the herd of breeding cattle through the winter. When pastures get short wean the calves, and put them in the corn and pea fields while weaning and teach them to eat corn and cotton seed meal. After raising your cattle, finish them on the farm if possible. A mixture of cotton seed meal, hulls and pea vine hay is a good ration for fattening calves. Silage is the best kind of roughage for fattening any class of cattle. Give more care to the feeding of calves than of grown cattle. Corn silage is a cheaper and better feed for fattening cattle than cotton seed hulls.

Summer feeding on pasture is usually more profitable than feeding in winter. The use of corn in small amounts in addition to cotton seed meal has proven profitable while feeding steers on grass. In feeding your grain or other products in the form of silage to live stock, thus converting it into meat, you get a higher price for both and in addition add fertility to the soil through the manure. It converts the farm into a factory, so to speak, and it becomes the creator of a finished or more nearly finished product, instead of being the producer of mere raw material.

LIVE STOCK RAISING AS AN UPBUILDER OF RUN DOWN FARMS.

There are in some portions of the State large areas which have for many years been devoted to short cotton planting that through lack of proper farming systems and worse methods of crop cultivation, have been robbed of their fertility to the extent of practical ruin, that can be, through the aid of live stock growing, rehabilitated and restored to their original fertile condition. To these sections, live stock growing and feeding should prove a manifold blessing.

SOME ADVANTAGES OF THE SILO.

All or nearly all of the forage crops previously mentioned herein can be made into silage either separately or in combination. The conversion of a crop into silage enables the maximum amount to be saved and fed and produces a greater per cent of feed than by any other method known. The silage assures a succulent feed for all the months of the year, regardless of favorable or unfavorable climatic conditions. When turned into hay green crops necessarily lose some of the available food material contained in them, but with the silo and the process of fermentation to which the silage is subjected, the food value is increased and much of the tough or woody parts are made available for the stock.

Corn is the best and principal silage crop, and with our practices offers the comparison most advantageous to the silo. If only the ears are gathered from an acre that produces say, thirty bushels, we save but little more than a ton, or about twenty-one hundred pounds. If this acre of corn is cut at the proper time and made into silage, it will easily furnish ten tons of excellent feed, and will often exceed these figures by several tons. The stalks and fodder usually left in the field to rot or blow away, will, with the aid of the silo, be made into splendid feed and eaten with relish by the animals. It will be readily seen that under the conditions described herein, relative to modern stock raising, that the use of the silo in the making and feeding of silage becomes a necessity from an economic standpoint and is a vast improvement over old and wasteful methods.

If a system somewhat on the lines herein suggested is put in practice by the live stock growers of Florida, the necessity to import beef from the West for Florida markets will cease.

To continue past (ancient) methods is the height of folly and wasteful in the extreme. Florida should export the best quality of beef; she can do so if she will.

MAKING AND FEEDING OF SILAGE.

In considering this subject we cannot do better than give place to the following article taken from Farmers' Bulletin No. 556, of the U. S. Department of Agriculture:

MAKING AND FEEDING OF SILAGE.

By T. E. WOODWARD, *of the Dairy Division.*

SOME POINTS IN FAVOR OF SILAGE.

Within the last 30 years silage has come into general use throughout the United States, especially in those regions where the dairy industry has reached its greatest development. Silage is universally recognized as a good and cheap feed for farm stock, and particularly so for cattle and sheep. There are several reasons for the popularity of silage.

1. More feed can be stored in a given space in the form of silage than in the form of fodder or hay.
2. There is a smaller loss of food material when a crop is made into silage than when cured as fodder or hay.
3. Corn silage is a more efficient feed than corn fodder.
4. An acre of corn can be placed in the silo at less cost than the same area can be husked and shredded.
5. Crops can be put in the silo during weather that could not be utilized in making hay or curing fodder.
6. More stock can be kept on a given area of land when silage is the basis of the ration.
7. There is less waste in feeding silage than in feeding fodder. Good silage properly fed is all consumed.
8. Silage is very palatable.
9. Silage, like other succulent feeds, has a beneficial effect upon the digestive organs.

10. Silage is the cheapest and best form in which a succulent feed can be provided for winter use.

11. Silage can be used for supplementing pastures more economically than can soiling crops, because it requires less labor, and silage is more palatable.

12. Converting the corn crop into silage clears the land and leaves it ready for another crop.

SILAGE CROPS.

Almost any green crop can be successfully made into silage if sufficient care is taken to force out the air from the material. On account of the difficulty, however, of expelling air from plants with a hollow stem, such as timothy, oats, and barley, these crops are rarely put in the silo

CORN.

In all parts of the United States where the silo has come into general use the principal silage crop is corn. One reason for this is that ordinarily corn will produce more food material to the acre than any other crop which can be grown. It is more easily harvested and put in the silo than any of the hay crops, such as clover, cowpeas, or alfalfa. These crops are much more difficult to handle after being cut. Furthermore, corn makes an excellent quality of silage. Sorghum makes a sour silage, and the legumes, such as clover and alfalfa, are liable to rot unless special care is taken to thoroughly pack the silage and force out the air. The fermentations which take place in leguminous silage are more extensive and in soncequence the loss of food materials is greater than with corn.

The only objection which has been raised concerning corn silage is the fact that it contains insufficient protein to fully meet the requirements of animals to which it may be fed. Some persons have advised mixing clover, cowpeas, or alfalfa with the corn when it is being put into

the silo in order to correct this deficiency of protein. Such a procedure is not to be advised, however, if it is at all possible to cure the clover or other crop into hay, and it usually is possible if hay caps are used. Since some dry forage should always be fed along with the silage, the leguminous hay would better be used in this way rather than by converting the crop into silage.

VARIETY TO PLANT.

The best variety of corn to plant is that which will mature and yield the largest amount of grain to the acre. since the grain is the most valuable part of the corn plant. The variety commonly grown in any particular locality for grain will also be the most satisfactory to grow for silage. As will be seen from the table below, taken from the First Annual Report of the Pennsylvania State College, 63 per cent of the digestible food materials present in the corn plant are found in the ears and 37 per cent in the stover.

Yield of Digestible Matter in Corn.

Constituent.	Yield per acre.		
	Ears.	Stover.	Total crop
	Pounds.	*Pounds.*	*Pounds.*
Protein	244	83	327
Carbohydrates	2,301	1,473	3,774
Fat	125	22	147
Total	2,670	1,578	4,248

CULTIVATION AND YIELD.

Corn for silage may be planted and cultivated in the same manner as when grown for grain. Weeds should be kept out, else they will be cut with the corn and may impair the quality of the silage. The yield of corn silage

per acre will vary from 4 or 5 to 20 tons or more. A 50-bushel per acre crop of corn will yield about 8 to 12 tons of silage per acre, depending upon the amount of foliage and stalk that accompanies the ear. Southern varieties of corn as a rule carry a larger proportion of the plant in the form of stalk and leaves than do the northern-grown varieties.

TIME TO HARVEST.

Corn should be harvested for the silo at about the same time that it is harvested for fodder—that is, when the grain has become glazed and the lower leaves of the stalk have turned brown. The following table taken from the Eighth Annual Report of the New York Experiment Station will furnish valuable information as to the proper time to cut corn for the silo:

Chemical Changes During Growth of Corn Plant.

Yield per acre	Stage of growth				
	Tasseled July 30	Silked Aug 9.	Milk Aug. 21.	Glazed Sept. 7.	Ripe Sept. 23.
	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
Total yield.	18,045	25,745	32,600	32,295	28,460
Water	16,426	22,666	27,957	25,093	20,542
Dry matter...	1,619	3,078	4,643	7,202	7,918
Ash	138.91	201.30	232.15	302.48	364.23
Albuminoids .	239.77	436.76	478.69	643.86	677.78
Crude fiber...	514.19	872.93	1,261.97	1,755.85	1,734.04
Nitrogen-free extract	653.91	1,399.26	2,441.29	4,239.82	4,827.60
Fat	72.20	167.75	228.90	259.99	314.34

The table shows that there is a steady increase in the amount of dry matter and food ingredients in the corn plant up to the time it is ripe. Immature corn is a poor feed, whether fed fresh or as silage. The protein and carbohydrates especially undergo changes from the imma-

ture to the mature stage which increase their food value. Silage made from immature corn is not only less nutritious but also more acid than that made from more mature corn. The corn should not be allowed to become thoroughly ripe and dry, however, because the stalk and foliage are rendered more difficult to digest, and, besides, the corn can not be packed into the silo tightly enough to prevent "fire-fanging" without using excessive amounts of water. In case the corn is frozen before it is properly matured for cutting, it should be harvested at once, before it has had time to dry out to any great extent. Enough water should be added to replace that lost by evaporation through standing in the field after frosting.

SORGHUM.

Sorghum is readily made into silage. The only advantages which sorghum has over corn are that it will sometimes yield heavier on poor ground and that the operation of harvesting may extend over a greater period—that is, it stays in the right stage for harvesting longer than corn. Sorghum, however, makes a poorer quality of silage, being more acid, not so palatable, and less nutritious. Where corn yields well there is no advantage in growing sorghum.

CLOVER.

Clover is a successful silage crop yielding a palatable product high in protein. It does not pack so well as corn, so great care should be exercised in the tramping of the silage at the time of filling, and the depth of the silo should also receive particular attention. A shallow silo will not prove satisfactory. Clover should be chopped before siloing as a matter of convenience in feeding and also to secure more thorough packing, although it can be placed in the silo without chopping. Clover should be harvested at the same time as for making into hay—that

is, when in full bloom and some of the first heads are dead. As stated elsewhere, it is usually inadvisable to make clover into silage if it can be made into hay, as is the case under most conditions. It is better practice to grow corn for silage and use the clover in the form of hay as a supplement to the silage.

COWPEAS, ALFALFA, AND SOY BEANS.

These crops can all be successfully made into silage by exercising the same precautions as with clover. They should be cut at the same time as for haymaking. However, it is ordinarily preferable, as with clover, to make them into hay rather than silage.

Other good silage materials are kafir corn, milo maize, teosinte, and beet pulp.

HARVESTING THE CROP AND FILLING THE SILO.

Harvesting the Corn.

The corn is cut for the silo either by hand or by machine. Hand cutting is practiced on farms where the amount of corn to be harvested is so small as to make the expense of purchasing a corn harvester too great to justify its use. Hand cutting is also resorted to through necessity when the corn is down or lodged in such a manner as to prevent the use of the machine. This method of cutting, however, is slow and laborious and there are probably few localities now where the purchase of a harvester would not be a profitable investment. In case the expense is considered too great to be borne by a single individual two or more neighbors might well arrange to purchase a partnership machine.

In using the harvester it will be found a great advantage to make the bundles rather small. This will take more time, but the extra expense will be more than offset

by the ease of handling the bundles and in feeding them into the silage cutter. Two or three horses, the latter preferable, and one man will be required to run the harvester, and they should be able to cut about 6 acres a day. The harvester should not get so far ahead of the haulers that the corn will dry out to any considerable extent.

Hauling to the Cutter.

This is ordinarily done with the common flat hay frames. An objection to their use is that it is necessary to lift the green corn fodder to a considerable height in loading, which is hard work. A low-wheeled wagon is preferable to a high-wheeled one. A low-down rack quite commonly used in some ports of the United States can be easily made. The following are the directions for making this rack, taken from Farmers' Bulletin 292:

The rack * * * consists of two 4 by 6 inch bed pieces, 18 or 20 feet in length, bolted together at one end to form a V. On top of these timbers is built a rack 6 feet in width. The bottom of this rack is about 8 feet long. The end boards are 4 feet high, built flaring so they do not quite touch the wheels. The apex of the V is suspended below the front axle of an ordinary farm wagon by means of a long kingbolt. The other ends are attached below the hind axle by U-shaped clevises. The materials needed in its construction are 80 board feet of 4 by 6 inch plank, 96 feet of boards 1 by 12 inches, 22 feet of lumber 2 by 4 inches, 1 long kingbolt, 2 stirrup rods, and bolts and nails.

The load should be as large as possible, especially when the haul is for some distance. This is a matter which is rarely given sufficient attention by persons filling silos, and in consequence the expense of filling becomes unnecessarily high.

CUTTING THE SILAGE.

The Cutter.

There are several different makes of silage cutters on the market that will give satisfaction. The capacity of the machine to be purchased is an important consideration which should not be overlooked. Many persons make the mistake of getting a cutter which is too small, thus making the operation of filling the silo very slow and interfering with the continuous employment of the entire force of men. It is better to get a machine large enough so that every one will be able to keep busy all the time. Another matter to be considered is the fact that the larger cutters are equipped with a self-feeding device while the smaller sizes are not. Such a device saves a great deal of labor. Other factors to be taken into account in purchasing a cutter are the amount of work to be done and the power available. Of course, for the filling of a very small silo it would not be wise to buy a large machine. Neither would it be advisable to overload the engine or motor by using a cutter which is too large for the power available.

The Elevator.

Two types of elevators are in use—the old-style chain carrier and the blower. The chain carrier requires less power, but is harder to set up and there is more litter around when it is used, especially in windy weather. For these reasons the blower is now fast displacing the carrier.

The blower should be placed as nearly perpendicular as possible so as to reduce to the minimum the friction of the cut corn upon the inside of the pipe and reduce the danger of clogging.

Power Required.

The power necessary to operate the cutter will depend upon its size and whether the elevator is a chain carrier or a blower and upon the rate of feeding. It is possible to feed slowly and to get along with less power than would be required with full feeding. As a rule, however, a person should have power sufficient to run the cutter at full capacity, and even, a little surplus is advisable. The power required for a cutter and blower, if a gasoline engine is used, is about 1 horsepower for each 1-inch length in the cutting cylinder; that is, a 15-inch cutter will take a 15-horsepower engine, an 18 inch cutter will require an 18-horsepower engine, and so on. If a steam engine is employed, the power should be at least two-thirds of that indicated for the gasoline engine.

Length to Cut.

The usual length of cutting varies from one-half to 1 inch. The latter is considered a little too long, since pieces of this length will neither pack so closely in the silo nor be so completely consumed when fed as will the shorter lengths. On the other hand, the longer the pieces the more rapidly can the corn be run through the cutter.

Packing the Silage.

Ordinarily the blower or carrier empties the cut corn into the top of the silo and there are one or more men in the silo to distribute and tramp the material. Unless there is some one to do this the cut material will be thrown too much in one place and the leaves, stalks, and grain will not be uniformly distributed throughout the silo. The sides should be kept higher than the center and much of the tramping done close to the wall.

Various contrivances have been used for distributing

the silage. The one most to be recommended for this purpose, however, is a metal pipe similar to the one in which the cut corn is elevated, but put together loosely in sections. The corn from the blower passes down this pipe into the silo, and being loosely put together it can be swung so that the material can be placed anywhere in the silo. With this contrivance no work with a fork is necessary and one man can do the work of two or three and do it easier. There is very little loose material flying about in the silo and the work is much cleaner. Another advantage is a lessening of the danger of being struck by some foreign object which has passed up the blower pipe. Heavy knives of the cutter have been known to pass through the blower and into the silo. As has been mentioned, this pipe is put together in sections, so that as the silage rises in the silo the sections can be readily detached as required.

Adding Water.

In case the material has become too dry before it is put into the silo water should be added to supply the deficiency of moisture and so make the silage pack better. Unless it is well packed the silage will "fire-fang" or deteriorate through the growth of mold. Enough water should be added to restore the moisture content of the corn to what it would be if cut at the proper stage. The water may be added by running directly into the silo by means of a hose or by running through the blower. It is claimed that by running it into the blower the water is more thoroughly mixed with the cut corn.

It seems to be good practice, no matter what the condition of the corn, to thoroughly wet down the material at the top of the silo when through filling. This will help to pack the top layer and lessen the amount of spoiled silage on top.

Covering the Silage.

Several years ago it was a common practice to cover the silage with some material, such as dirt or cut straw, in order to prevent the top layer from spoiling. At present when any provision at all is made for this purpose it consists usually in merely running in on top cornstalks from which the ears have been removed. By this method some of the corn grain is saved. The heavy green cornstalks pack much better than straw does and so exclude the air more effectually. The top is thoroughly tramped and then wet down. Sometimes oats are sown on the top before wetting. The heat generated by the fermenting mass will cause the oats to sprout quickly and form a dense sod which serves to shut off the air from the silage beneath, and in consequence only a very shallow layer spoils.

Labor and Teams Required.

The labor and teams to be used will of course depend upon the help available, the length of haul, and the efficiency of the machinery. With plenty of help, a short haul, and good machinery the following distribution of labor might well be used:

1 man and 3 horses to bind the corn.
2 men to load the corn.
3 men and 6 horses to haul.
1 man to help unload.
1 man to feed the cutter.
1 or 2 men to work in the silo.
1 man to tend the engine, if steam is used.
Total, 10 or 11 men, 9 horses, and 3 wagons.

The least amount of help which it would be possible to work to advantage might be arranged as follows:

1 man and 3 horses to bind the corn.
1 man to help teamsters load.
3 men and 6 horses to haul and unload.
1 man to feed.
1 man in the silo.
Total, 7 men, 9 horses, and 3 wagons.

A good manager is required to so arrange the help that each man and team can do the most efficient work. Without careful attention to this matter the operation of filling the silo becomes needlessly expensive.

Cost of Harvesting and Filling.

It is not possible to set any definite figure as the cost of filling the silo because of the great variation in conditions in different parts of the country. But just in order to give some idea of the probable cost a few figures are taken from Farmers' Bulletin 292. The investigation reported in this bulletin included the work done upon 31 farms in Wisconsin and Michigan. The labor of each man was rated at 15 cents per hour and the same value placed upon each team of two horses. Engine hire was estimated at $4.50 per day, including the engineer. Twine was rated at 11½ cents a pound, coal at $5 a ton, and gasoline at 13 cents a gallon. The farmers owned their own cutters. In this investigation the cost per ton varied from 46 to 86 cents.

Investigations conducted by the Dairy Division during the past few years with 87 silos in various parts of the United States indicate the cost of filling to be an average of 87 cents per ton.

Cooperation in Silo Filling.

The high cost of silo-filling machinery makes it oftentimes advisable for several farmers to cooperate in the

purchase of a cutter and engine, or at least a cutter, since an engine is easier rented than a cutter. By varying the time of planting in the spring each man can get his silo filled when the corn is at the proper stage of maturity. Besides this the farmers can help one another in filling, so that there need be a very small cash outlay.

TOTAL COST OF SILAGE.

As with the cost of filling the silo, no definite figure can be set as to the cost of silage. This will depend upon the yield per acre, the cost of growing an acre, and the cost of filling. Several years ago the cost was variously estimated at from $1 to $1.50 per ton. At present this is much too low. The before-mentioned data collected by the Dairy Division on the filling of 87 silos in various parts of the country show the cost of growing the silage crop to average $1.58 per ton. This added to the 87 cents, which represents the cost of filling, makes the total cost of the silage $2.45 per ton. The cost of the silage for the individual farms varied from $1.10 to $5.42 per ton. In general, it may be stated that $1.50 to $3.50 per ton represents the limits between which most of the silage is produced.

LOSSES OF FOOD MATERIAL IN THE SILO.

When any crop is made into silage certain fermentation takes place, which results in the production of a considerable amount of heat and the consequent loss of food material. The extent of this fermentation is dependent upon the amount of air in the silo. The more air there is present the higher will be the temperature of fermentation and the greater the loss of food ingredients. Fermentation will continue until all the oxygen of the air has been used up or has been displaced by carbon dioxid. In the deep silos of the present time the pressure is so

great that very little air is left in the silo, consequently the losses of food ingredients are reduced to a minimum. As before mentioned, on account of the difficulty of pressing out this air in crops with hollow stems they are seldom put in the silo.

There have been some experiments conducted at the Wisconsin station which show that the losses in the siloing of corn are not nearly so great as in the field curing of corn fodder. According to Prof. Woll, in modern, well-built, deep silos the loss should not exceed 10 per cent. More food material can be saved by putting the corn crop in the silo than by harvesting and storing it in any other way.

FEEDING VALUE OF SILAGE.

Composition.

The composition of silage will, of course, vary according to the crop from which it is made, the degree of maturity of the crop, and other factors. The following figures, taken from Henry's Feeds and Feeding, represent the digestible nutrients in 100 pounds of average silage:

Crop.	Total dry matter.	Digestible.		
		Protein.	Carbohydrates.	Fat.
	Pounds.	Pounds	Pounds.	Pounds.
Corn	26.4	1.4	14.2	0.7
Sorghum	23.9	.1	13.5	.2
Red Clover ..	28.0	1.5	9.2	.5
Soy Bean	25.8	2.7	9.6	1.3
Cowpeas	20.7	1.5	8.6	.9

It will be observed that about three-fourths of the total weight of silage consists of water. It will also be noticed that both corn and sorghum contain a large amount of

carbohydrates in proportion to the protein. Silage is a bulky, succulent feed with a wide nutritive ratio, and for these reasons it will give the best results when fed along with some other feed richer in dry matter and in protein.

Succulence.

It is quite important in the feeding of cattle that the ration include some succulent material such as fresh grass, root crops, or silage. A feed containing a large amount of natural water is not only more easily digested but is also more palatable and, besides, serves the useful purpose of keeping the whole system of the animal in a state of healthy activity. A silage-fed animal is rarely troubled with constipation or other digestive disturbances, the coat is noticeably sleek and soft, and the skin is soft and pliable. It is a well-known fact that a cow usually reaches her maximum production when she has access to a good pasture. The cheapest and best substitute for fresh pasture grass during the fall and winter is silage.

Palatability.

No rough feed is more palatable than good corn silage Sometimes, however, a cow will not eat silage readily until she has acquired a taste for it, which may require several days. But silage is not peculiar in this respect, for it has been observed that range horses or cattle shipped into the corn belt will refuse corn the first time it is offered to them. This quality of being palatable is a decided advantage for silage in that it induces a large consumption and promotes the secretion of digestive juices.

Relative Feeding Value.

The value of silage as a food may be best shown by

comparing it with other feeds. The most accurate comparison which is available is found in Farmers' Bulletin 346. The figures given below are taken from this bulletin.

Energy Value of Various Feeds in Therms Per 100 *Pounds of the Feed.*

Corn Silage	16.56	Oats	66.27
Red Clover Hay	34.74	Linseed Meal	78.92
Timothy Hay	33.56	Cottonseed Meal	84.20
Mangel-wurzels	4.62	Wheat Bran	48.23
Corn	88.84		

These figures were obtained through experimentation with beef animals and are not claimed to be other than tentative and subject to correction later on. While they have not been prepared as a result of work with any kind of animals other than those for beef, it is thought that they are approximately correct when applied to sheep, horses, and dairy cows. At any rate they are the most reliable figures which we have at present.

From the table given it will be observed that clover hay is a little more than twice as valuable, pound for pound, as silage, that bran is three times as valuable, and that corn is more than five times as valuable. In other words, the feeding values of silage, clover hay, bran, and corn are in the approximate ratio of silage 1, clover hay 2, bran 3, and corn 5.

SILAGE FOR DAIRY CATTLE.

Silage has been found to be particularly well adapted to the dairy cow and as a consequence silos are more numerous upon farms devoted to dairying than upon any other kind of farms. In many sections silage has come to be the dairy farmer's main reliance for cow feed.

Supplementary Feeds.

While silage is an excellent feed it is not a complete one for dairy stock. It is too bulky and watery and contains insufficient protein and mineral matter to fully meet the requirements of the dairy cow. It should be combined with some leguminous hay such as clover, cowpeas, or alfalfa. These will tend to correct the deficiencies of the silage in dry matter, protein, and mineral constituents. A ration of silage and, say, alfalfa hay alone is satisfactory, however, only for cows which are dry or giving only a small amount of milk and for heifers and bulls. Cows in full milk require some more concentrated feed than hay or silage, else they can not consume enough feed to meet the demands of the body. The result will be that the cows lose in flesh and in milk flow.

Amount to Feed.

The amount of silage to feed a cow will depend upon the capacity of the animal to take feed. She should be fed as much as she will clean up without waste when consumed along with her hay and grain. Raise or lower the amount until the proper quantity is ascertained. Generally speaking, a good cow should be fed just short of the limit of her appetite. If she refuses any of her feed it should be reduced at once. The small breeds will take 25 or 30 pounds per day; the large breeds about 40; and the medium-sized ones amounts varying between.

Rations.

Ironclad directions for feeding cows can not be given In general, however, they should be supplied with all the roughage they will clean up with grain in proportion to butterfat produced. The hay will ordinarily range between 5 and 12 pounds per cow per day when fed in con-

nection with silage. For Holsteins 1 pound of concentrates for each 4 pounds of milk produced will prove about right. For Jerseys 1 pound for each 3 pounds of milk or less will come nearer meeting the requirements The grain for other breeds will vary between these two according to the quality of milk produced. A good rule is to feed seven times as much grain as there is butterfat produced.

The following rations will be found good:

For a 1,300-pound cow yielding 40 pounds of milk testing 3.5 per cent:

	Pounds.
Silage	40
Clover, Cowpea, or Alfalfa Hay	10
Grain mixture	10

For the same cow yielding 20 pounds of 3.5 per cent milk:

Silage	40
Clover, Cowpea, or Alfalfa Hay	5
Grain mixture	5

For a 900-pound cow yielding 30 pounds of 5 per cent milk:

Silage	30
Clover, Cowpea, or Alfalfa Hay	10
Grain mixture	11

For the same cow yielding 15 pounds of 5 per cent milk:

Silage	30
Clover, Cowpea, or Alfalfa Hay	8
Grain mixture	5

A good grain mixture to be used in a ration which includes silage and some sort of leguminous hay is composed of

	Parts.
Corn Chop	4
Wheat Bran	2
Linseed-oil Meal or Cottonseed Meal	1

In case the hay used is not of this kind some of the corn chop may be replaced by linseed or cottonseed meal. In many instances dried brewers' grains or crushed oats may be profitably substituted for the bran.

Time to Feed.

The time to feed silage is directly after milking or at least several hours before milking. If fed immediately before milking the silage odors may pass through the cow's body into the milk. Besides, the milk may receive some taints directly from the stable air. On the other hand, if feeding is done subsequent to milking the volatile silage odors will have been thrown off before the next milking hour. Silage is usually fed twice a day.

Many objections have been made to the feeding of silage; some condenseries even refusing to let their patrons use it. These objections are becoming less common, since milk from cows fed silage in a proper manner is in no way impaired; besides which there is nothing about silage that will injure in any way the health of the animals.

Feeding Frozen Silage.

Frozen silage must first be thawed before feeding. If it is then given immediately to the cows before decomposition sets in no harm will result from feeding this kind of silage; neither is the nutritive value known to be changed in any way.

Silage for Calves, Bulls, and Dry Cows.

Calves may be fed silage with safety when they are about 3 or 4 months old. It is perhaps of greater importance that the silage be free from mold or decay when given to calves than when given to mature stock. After the calves are weaned they may be given all the silage

they will eat up clean. Yearling calves will consume about one-half as much as mature stock, that is, from 15 to 20 pounds a day. When supplemented with some good leguminous hay little, if any, grain will be required to keep the calves in a thrifty, growing condition.

There is a decided opinion among some breeders of dairy stock that a large allowance of silage is detrimental to the breeding qualities of the bull. Whether there is any scientific foundation for this opinion remains to be determined. Pending further investigations, however, it is advisable to limit the allowance to about 15 pounds of silage a day for each 1,000 pounds of live weight. When fed in this amount silage is thought to be a good, cheap, and safe feed for bulls. It should of course be supplemented with hay, and with a small allowance of grain also in the case of bulls doing active service or growing rapidly.

Cows when dry will consume almost as much roughage as when milking. Silage may well form the principal ingredient of the ration, in fact, with 25 to 40 pounds of silage and a small supplementary feed of clover, cowpea, or alfalfa hay, say 5 or 6 pounds a day, the cows will keep in good flesh and even make some gain. Cows in thin flesh should receive in addition a small amount of grain. Silage will tend to keep the whole system in a state of healthy activity and in this way lessen the troubles incident to parturition.

Silage for Summer Feeding.

One of the most trying seasons of the year for the dairy cow is the latter part of the summer and early fall. At this season the pastures are often short or dried up, and in such cases it is a common mistake of dairymen to let their cows drop off in flow of milk through lack of feed. Later they find it impossible to restore the milk flow no matter how the cows are fed. Good dairy practice de-

mands that the milk flow be maintained at a high point all the time from parturition to drying off. It becomes necessary, therefore, to supply some feed to take the place of the grass. The easiest way to do this is by means of silage. Silage is cheaper and decidedly more convenient to use than soiling crops.

The amounts to feed will depend upon the condition of the pastures, varying all the way from 10 pounds to a full winter feed of 40 pounds. It should be remembered in this connection that silage contains a low percentage of protein, so that the greater the amount of silage fed the greater must be the amount of protein in the supplementary feeds to properly balance the ration.

SILAGE FOR HORSES.

By GEORGE M. ROMMEL, *Chief of the Animal Husbandry Division.*

Silage has not been generally fed to horses, partly on account of a certain amount of danger which attends its use for this purpose, but still more, perhaps, on account of prejudice. In many cases horses have been killed by eating moldy silage, and the careless person who fed it at once blamed the silage itself, rather than his own carelessness and the mold which really was the cause of the trouble. Horses are peculiarly susceptible to the effects of molds, and under certain conditions certain molds grow on silage which are deadly poisons to both horses and mules. Molds must have air to grow and therefore silage which is packed air-tight and fed out rapidly will not become moldy. If the feeder watches the silage carefully as the weather warms up he can soon detect the presence of mold. When mold appears, feeding to horses or mules should stop immediately.

It is also unsafe to feed horses frozen silage on account of the danger of colic. This is practically impossible to

avoid in very cold weather, especially in solid-wall silos. By taking the day's feed from the unfrozen center of the silo and chopping away the frozen silage from the edges and piling the frozen pieces in the center the mass will usually thaw out in time for the next feed.

Corn to be made into silage for horses should not be cut too green, as sour silage will result and may cause colic when fed. The corn should be well matured and cut when the grain is beginning to glaze. The silo should be filled rapidly and the corn should be vigorously tramped and packed while filling. At least three men should be inside the silo, moving constantly, two around the edges and the third across and around the center. This is by far the most important point in connection with feeding silage to horses, and the lives of the horses fed on silage may depend on the thoroughness with which the tramping is done. If properly done no danger is likely to result; if not properly done air pockets may form and cause the accumulation of a small mass of mold which the feeder may overlook but which might be sufficient to kill one or more horses.

The value of silage for horses is greatest as a means to carry them through the winter season cheaply or to supplement pasture during drought. As the danger of mold is greater in summer than in winter, silage should not be fed to horses in that season unless a large number of animals are getting it and the daily consumption is so large as to preclude the formation of mold on the surface.

To cheapen the ration of brood mares in winter no feed has more value than good corn silage. If the grain goes into the silo with the stover no additional grain is needed for brood mares, hay being the only supplementary feed necessary. If there is little grain on the corn the silage should be supplemented with 1 pound of old-process linseed-oil meal or cottonseed meal daily per 1,000 pounds live weight, sprinkled over the silage.

Horses to be wintered on a silage and hay ration should be started on about 5 pounds of silage daily per 1,000 pounds live weight, the grain and hay ration being gradually decreased as the silage is increased until the ration is 20 pounds silage and 10 pounds of hay daily per 1,000 pounds live weight. It will require about a month to reach the full feed of silage, but the period may be decreased somewhat, depending on the judgment and skill of the feeder.

Mares fed in this manner will be in splendid condition for foaling, and, so far as the writer's experience goes, the foals will be fully as vigorous, with just as much size and bone, as if the mares were fed the conventional grain and hay ration.

Work horses when idle can be wintered satisfactorily in this manner, but much silage is not recommended for horses at heavy work for the same reason that a driving horse can not do his best while on watery grass pasture.

The writer knows of cases where stallions receive a ration of silage, but has had no experience in feeding them in this manner. There seems no reason why silage should not be a valuable feed for stallions during the idle season.

Silage should also be useful for young horses, especially drafters, but here again the writer can not quote his own experience and experimental data are meager.

To summarize, silage is safe to feed to horses and mules only when it is made from fairly mature corn, properly stored in the silo. When it is properly stored and is not allowed to mold, no feed exceeds it as a cheap winter ration. It is most valuable for horses and mules which are not at heavy work, such as brood mares and work horses during the slack season. With plenty of grain on the cornstalks, horses will keep in good condition on a ration of 20 pounds of silage and 10 pounds of hay for each 1,000 pounds of live weight.

SILAGE FOR BEEF CATTLE.

By W. F. WARD, *Animal Husbandman in Beef Cattle Investigations.*

There is no roughage which is of more importance to the producer of beef cattle than silage. The value of silage to the beef producer varies considerably and is dependent upon a large number of other factors. If rough fodders are scarce or are high priced, if the grain is high priced, or if the grain is so near a good market that much of it can be readily sold, silage will have a greater value than if the opposite conditions exist. It is a great saver of grain regardless of whether it is to be fed to stock cattle or fattening cattle. It will lessen the grain feeding by practically the same amount as is contained in the silage. The value will also depend somewhat upon the kind of cattle to which it is to be fed. If there is an abundance of rough fodders which can not be marketed, silage will not be so valuable. But in a case of this kind the silage would prove more valuable if used for the calves and pregnant cows and the coarse fodders used for the other stock.

SILAGE FOR THE BREEDING HERD.

For wintering the entire breeding herd there is no roughage better than silage. All of the animals will relish a ration containing it and it will create a good appetite for all other feeds. Cows that are fed all of the silage they will consume along with clover hay will go through the winter in fine shape and make small gains. If the amount of silage is limited, a more economical method of wintering them will be to reduce the silage to a half ration, letting them have the run of a straw stack and feeding about 2 pounds of cottonseed meal or oil meal per day. Some dry coarse fodder or straw should

always be kept before animals getting silage, as it reduces the amount of silage consumed and prevents the bowels from becoming too loose. The succulent feed will cause the breeding cows to give a good flow of milk even though the calf be born in midwinter, and a thrifty calf will result. If the silage is free from mold or rotten spots there will be no danger in feeding it to breeding cows.

Silage is especially beneficial for calves which have just been weaned. They take to this ration quicker than to dry feed and there is usually little loss in weight from the weaning. The silage should be supplemented with some good leguminous hay, as alfalfa, cowpea, or clover, and the calves should be given a small amount of grain A mixture of one-half corn chop and one-half cottonseed meal is excellent.

SILAGE FOR STOCK CATTLE.

Each farmer will have to plan the rations for his cattle according to the amount of the various feeds he has on hand. Stockers can be wintered on silage and some good hay, fodder, or straw, but this may not always be the most profitable. When hay is high priced and grain is reasonably cheap or plenty of silage is available, it may be more economical to omit the hay altogether. A ration of corn silage alone has often been profitable for thin cattle. Stockers which have been fed liberally all winter and made to put on good gains usually do not make as large daily gains when put on grass as do steers which have not been quite so well fed.. The time the cattle are to be finished for market and the degree of fatness to be attained should govern to a large extent the method to be followed during the winter. When beeves are expected to sell high in the early summer and the steers are to be finished for market at that time, a heavy roughage ration

with a small amount of grain should be fed during the winter months.

SILAGE FOR FATTENING ANIMALS.

Silage stands first in rank of all the roughage for finishing cattle. Formerly, during the era of cheap corn and other concentrates little attention was given to the roughage, as it was usually considered merely a "filler" and of very little economic value in feeding. No especial care was taken in selecting any particular kind, nor was the quality of it seriously considered. As the prices of the concentrated feedstuffs advanced, the feeder looked about for methods of cheapening the cost of producing beef and soon found this could be accomplished by using judgment in selecting his roughage with respect to the grain fed. This has continued until at the present time the roughage receives as much attention as the concentrated feed, and has been made to take the place of a large amount of the latter. The feeding of silage came into general use with the advent of expensive grain and is becoming more popular each year. With the present prices of feedstuffs there is hardly a ration used for feeding cattle which can not be cheapened by the use of this succulent feed. By combining it with other feeds the efficiency of the ration is increased to such an extent that the amount of the daily gains is invariably greater and the cost of producing a pound of gain is lessened The heaviest daily gains are usually made during the first stage of the feeding period, and silage can then be used to advantage in large quantities with a small amount of grain, but as the feeding progresses the amount of silage should be lessened and the grain increased. In some places the price of hay and stover is so high that the greater the proportion of silage used in the ration the more profitable is the feeding.

Conditions in general are such that any given ration

will not suit a large number of farmers, nor will it be so profitable for some as it will for others, so each farmer must determine for himself just what combination of feeds will be most profitable for his use.

Rations Suitable for Florida Where Cottonseed Meal is of Moderate Price and Cowpea and Other Hays Are Raised on the Farm.

		Pounds.
(1)	Corn silage	35
	Cowpea hay	8
	Cottonseed meal or oil meal	7
(2)	Corn Silage	30
	Cottonseed hulls	12
	Cottonseed meal	7

BALANCED RATIONS FOR DAIRY COWS.

By JOHN M. SCOTT.

In the lists of rations given below, home-grown feeds are separate from purchased feeds. The amount given in each ration is sufficient for one day's feed for a cow weighing 1000 pounds and giving about three gallons of milk per day. (Dairy cows in Florida usually weigh from 600 to 800 pounds.) For cows giving a heavier flow of milk, it will be necessary to increase the amounts of feed accordingly. No attempt has been made to estimate the cost of these rations, or to say which will be the cheapest, as the prices of feeds vary in different places. The amounts of each feed being given, it will be an easy matter for the dairyman to calculate the local cost of the different rations and in this way find out which will be the cheapest for him to use.

RATIONS OF HOME GROWN FEEDS.

(1)	Velvet beans in the pod	10 pounds
	Japanese cane, cured in shock	10 pounds
	Cowpea hay	8 pounds

(2)	Velvet beans in the pod	10 pounds
	Cottonseed meal	2 pounds
	Japanese cane	12 pounds
(3)	Velvet beans in the pod	8 pounds
	Cowpea hay	10 pounds
	Japanese cane	10 pounds
(4)	Corn	3 pounds
	Velvet beans in the pod	7 pounds
	Cowpea hay	9 pounds
	Japanese cane silage	20 pounds
(5)	Velvet beans in the pod	8 pounds
	Cowpea hay	10 pounds
	Sorghum, green	20 pounds
(6)	Velvet beans in the pod	8 pounds
	Cowpea hay	8 pounds
	Crabgrass hay	8 pounds
	Sweet potatoes (or cassava)	25 pounds

The above are well-known home-grown feeds, or feeds that can be grown at home. Feeds can be grown more cheaply than they can be bought on the market. In these rations, cowpea hay can be replaced by an equal weight of beggarweed hay, velvet bean hay, or any other good legume hay. Which of these hays should be used will depend largely on the cost of the hay on the market, or rather on what it will cost to produce it. One may be so situated as to be able to grow beggarweed hay, or velvet bean hay, to better advantage than cowpea hay. All of the hays in these rations are considered to be of good quality, cut at the proper stage of maturity, and properly cured.

RATIONS OF PURCHASED FEEDS.

(1)	Alfalfa hay	10 pounds
	Wheat bran	4½ pounds
	Shorts	4½ pounds
(2)	Alfalfa hay	10 pounds
	Wheat bran	9 pounds
	Crabgrass hay	13 pounds

(3)	Alfalfa hay	10	pounds
	Shorts	9	pounds
	Crabgrass hay	13	pounds
(4)	Alfalfa hay	10	pounds
	Wheat bran	6	pounds
	Beet pulp	10	pounds
(5)	Wheat bran	9	pounds
	Cottonseed meal	3	pounds
	Cottonseed hulls	20	pounds
(6)	Shorts	8	pounds
	Cottonseed meal	2½	pounds
	Hay (any non-legume)	15	pounds
(7)	Wheat bran	6	pounds
	Cottonseed meal	2½	pounds
	Beet pulp	10	pounds
	Timothy hay	7	pounds
(8)	Wheat bran	9	pounds
	Cottonseed meal	3	pounds
	Japanese cane	15	pounds
(9)	Corn	5	pounds
	Cottonseed meal	2½	pounds
	Cowpea hay	12	pounds
	Silage	30	pounds

It should be understood that the above rations are not necessarily to be fed in the exact quantities given above, but should be modified to suit local conditions or the actual conditions on each farm. They are given to show approximately the average amounts and character of feed that would be consumed daily by a 1,000-pound steer during the feeding period.

It is well to feed as near a balanced ration as possible without materially increasing its cost. Sometimes the prices of available feeds are such that a farmer is justified in deviating from the standard. Such conditions are illustrated by the use of some of the rations given above. The second ration shown for the South is an example, as that ration is very narrow, but in certain localities it is more profitable than one which is balanced by the use of high-priced carbohydrate feeds.

Two rations are shown for the West where kafir-corn silage is used. With some farmers it would undoubtedly be more profitable to use alfalfa hay as a substitute for cottonseed meal, while with others the purchase of the cottonseed meal would be more economical.

MISCELLANEOUS CONSIDERATIONS.

Silage is a quick finishing roughage in that it produces large daily gains and produces a glossy coat and a soft, pliable skin. Moreover, it can be used to advantage at times for carrying cattle for a longer time so as to pass over a period of depression in the market, or to carry the cattle along in thrifty condition so they can be finished at a later period.

For many years the belief was general that cattle which received silage as a major portion of the roughage would have to be kept in warm barns and not be exposed to the cold. While they do need protection from the cold winds and rains and need a dry place to lie down, it has been clearly demonstrated that warm barns are not only unnecessary but that fattened cattle make both larger and cheaper gains when fed in the open sheds than when confined in barns. Stocker or thin cattle receiving silage will of course need more protection than animals which are being fattened.

Silage can be profitably used to supplement the pastures for steers during a time of drought, when they are being finished for market, but it is still an open question whether it can always be used profitably for feeding to breeding cattle during such times.

The theory that silage-fed cattle shrink very heavily in shipping to market is erroneous. While the actual shrinkage during transit is sometimes greater, the fill taken at market is usually good, and if good judgment is used in preparing them for shipping the net shrinkage is no greater than for cattle which have been fed on dry

feeds. For 36 hours previous to shipping nice bright hay and stover should be substituted for the silage in the ration.

The general impression that choice or prime carcasses can not be made by the use of succulent feed is equally untrue, as the silage-fed cattle usually make more desirable carcasses than cattle fed a similar ration, except that silage was replaced by one of the coarse fodders. There is no appreciable difference in the percentage of marketable meat that steers will dress out which have been finished on a silage ration and a dry ration. The meat seems equally bright and the fat as well intermixed with the lean.

If silage makes up the bulk of the roughage it will be necessary to haul large amounts of bedding into the sheds to keep the animals dry, as there is no waste in silage, or else make a cement floor and cover with bedding to absorb the urine and prevent the animals from slipping and to give them a warm place to lie down. When the enormous saving in the quality and amount of the feed is considered, this disadvantage does not seem so hard to overcome by the stockman who has the capital to put up the silo and pave his feed sheds or feed lots.

SILAGE FOR SHEEP.

By E. L. Shaw, *Animal Husbandman in Sheep and Goat Investigations.*

The use of this succulent feed for sheep has attracted the attention of most farmers only during the past few years. Although a few sheepmen fed silage many years ago with good results, most flock-masters have been slow in giving it a trial. Owing to the wonderful increase in the use of silos on farms, and owing to the cheapness of silage as compared with other succulent feeds, such as roots, farmers are constantly raising the question regarding the feeding of silage to sheep. A great deal has been

said of its bad effects upon sheep, but these have arisen either because an inferior quality of silage was fed or on account of carelessness on the part of the feeder in not feeding it properly.

A good quality of silage is extremely palatable and can be fed to all classes of sheep with good results. It must be borne in mind, however, that silage which is either very sour, moldy, or frozen should not be fed.

The amount of silage reported in feeding trials varies from 1 to 5 pounds per head per day. The amount to feed depends upon the class of sheep and the character of the other feeds comprising the ration. As a general rule from 2 to 4 pounds per head per day is considered as much as should be fed.

Lamb feeders have found silage a very satisfactory feed, and the amount fed ranges from 1 to 3 pounds per day. Where lambs are on full feed of grain, such as corn, and are receiving a fair allowance of hay, they will, as a rule, only consume from 1 to 2 pounds per head per day

In feeding breeding ewes before lambing a daily allowance of from 2 to 3 pounds should be considered a maximum quantity. After lambing the amount can be slightly increased.

In feeding silage or any other succulent feeds it must be borne in mind that the value of such feeds to a large extent is to act as an appetizer and to keep the digestive system in good condition. Under ordinary conditions where silage is fed it should not constitute more than one half of the entire ration, and it should be fed with other feeds that will properly balance the ration for the purpose intended.

SILOS.

THE KIND OF SILO TO BUILD.

There are silos and silos. Nearly all of them will keep silage. Some of them cost more money than others

Some are, on account of material and construction, only temporary. Others are permanent. A man must decide for himself whether he will invest a smaller amount of money in a temporary silo that will last from ten to twenty years, or invest a larger amount of money in a permanent silo that will last his lifetime, and that of his children perhaps. However, before building a silo we should make some investigation of the various silos on the market, learning their relative costs and efficiency. A silo is not a piece of furniture, neither is it a piece of machinery. But a silo must have attention, just the same as if it were a piece of machinery. The very best silo may prove a failure if neglected. Hence, the things to determine upon are these: Build a silo. Build a good one. Take care of it.

THE STAVE SILO.

By far the greater number of silos in the State are of the wooden stave type. This is a good silo. It will keep silage with as little loss from spoiling as any silo on the market, but not better than some other silos. There are many different wooden stave silos put out by many different companies. Each company has a strong talking point for its particular silo. However, it should be remembered that the best are none too good. That is, the best silo that any company puts out is none too good. If a man has not money enough to buy the best grade of silo offered, he can be excused for taking an inferior one. But it is never economy to buy a cheap silo of an inferior quality. If possible, buy only the best grade of lumber, the one piece stave.

The wooden stave silo demands more attention in the summer time while it is empty than at any other time. Since the silo is usually empty in the summer time it is apt to be neglected. But during the summer when the weather is hot and dry the staves will shrink and the

hoops get loose. If the nuts are not kept on tight the hoops may get so loose that the silo will fall down or "fall to staves." When the hoops and staves of a silo become loose; it sometimes does not take a very strong wind to blow it down, even if it is anchored.

A stave silo should be built or put up right. It should not lean. It should be perpendicular. If the silo leans, the silage will settle to one side, leaving a space between the silage and the opposite wall. Where there is not something else there will be air. The air getting into this space will spoil a lot of silage.

Again, if the summer is hot and dry and the hoops of the silo have been tightened several times, it will be necessary to loosen them when the silo is filled in the fall. If this is not done the moisture from the silage swelling the staves will cause them to "buck" in places, sometimes letting in the air, or break the hoops. In either case serious results will follow. When buying a stave silo, remember the instructions given by the company from whom it is bought. Even though some of us, it seems, do like to be "hum-bugged," we are not living in the age of gold bricks and fakes and fakers. Each company is trying to put out a good silo. They are all trying to "deliver the goods." Buy a good silo if you buy any, and follow instructions. For best results a thin coating of creosote should be applied to the inner wall of the silo once in two years. Never paint the inner wall of a wooden stave silo. If this is done, wood mold will likely form in the wood and rot the stave. Paint the outside wall. It will protect the wood from the weather and add to the appearance of the silo.

The stave silo as it comes from the company is ready to be put together. However, the purchaser must have prepared a foundation on which to set the silo. This foundation can be made of stone, brick or concrete. The latter is preferable. The wall of the foundation should be from eight inches to a foot in thickness, extending,

from two to three feet into the ground, and from 1 to 1½ feet above the ground. A 32-foot continuous stave with a foundation of four feet makes a good combination for a silo 36 feet in height. It is a good practice to make the foundation wall a foot thick at the bottom, tapering to eight inches at the top, the slope being on the outside In this way the inner wall is kept perpendicular. After the wall is complete a floor of concrete should be laid. The floor should be concave, several inches lower in the center than around the wall. The cost of a stave silo varies according to the size and quality of lumber, etc. A stave silo of good quality, 16x32 feet, together with the foundation, will cost about $375.00.

THE SOLID CONCRETE SILO. (MONOLITHIC.)

This is one of the permanent silos. When built properly it will last longer than a lifetime. It will not blow over. No guy wires are necessary. It will not dry out and fall down. It will not burn down. If proper care is taken in the construction, this type of silo will keep silage perfectly. The question, "Will the solid concrete silo keep silage?" is growing obselete. Time was when the stave silo men objected to the solid concrete silo on the ground that it would crack and it would not keep the silage, that too great a per cent of silage would spoil in it. However, since we have learned how to build concrete silos there is less objection of this nature. Much that has been said against the concrete silo is not warranted. It is true that some concrete silos have cracked, and silage has spoiled in some. But if the solid concrete silo is reinforced in the right way it will not crack. If the proper proportion of cement, sand, and gravel or chats is used in the wall with enough water to make the mixture impervious to air this type of silo will preserve silage perfectly. One difficulty has been in not using enough cement. Another has been that of not getting

the right amount of water in the mixture. If the mixture is too dry, there will be porous places that will admit the air. Again, if too much water is used the cement and sand will "run" leaving the gravel or chats, whichever is used, without enough cement to prevent cracking and to exclude the air. Some skill is required in building a concrete silo. However, any man who has had experience in making concrete walks, concrete watering troughs, etc., on the farm can build a concrete silo. If a man has had no experience in making things of concrete, he had better secure the services of some one who has had experience to build his concrete silo for him. He can employ men who know how to do concrete work and let them carry out his plans, or he can have the silo built by contract by a man who makes the building of concrete silos his business.

Regardless of who builds the silo, the farmer or a contractor, these two things must be remembered: First, use enough cement. Second, use enough reinforcing material. The mixture of cement, sand and gravel (instead of gravel, crushed rock or chats may be used) generally used is one of cement, two of sand and four of gravel. This proportion is generally designated thus: 1:2:4.

For reinforcing, woven wire has proven very success ful. A woven wire fencing, 38 inch, No. 9 wire, with a 5 or 6-inch mesh, answers the purpose very well.

The following estimate of cement, sand, gravel and woven wire for a solid concrete silo, six-inch wall, 16x32 feet, may be of assistance in building such a silo:

Portland cement (mixture, 1:2:4)	220 sacks.
Sand	15 cu. yds.
Gravel	30 cu. yds.
Woven wire (38-inch fencing, 40 rods)	2,090 sq. ft.

The table given below, taken from bulletin 103, Missouri Experiment Station, gives the amounts of cement, sand and gravel for silos of different sizes:

Material for Silos of Varying Sizes.

	Silo 12 x 28 ft.	Silo 14 x 30 ft.	Silo 16 x 32 ft.
Cement, barrels	37	45	55
Sand, cubic yards	11	13	15
Gravel or stone, cu. yds..	21	26	30

The forms for building concrete silos can be homemade or bought. If the forms are made at home they will cost about $50. If they are bought, the price will vary. The steel forms on the market are serviceable, easily handled, and can be rented out for enough to pay for the first cost. However, in either case, whether homemade or bought, it is advisable sometimes for several men in a community to share equally in making or buying the forms. All can use them and the expense when shared in this way is not very great. The cost of a solid concrete silo, 16x32, six inch wall, will vary from $350 to $450, depending upon the price of labor and cement and the distance that material must be hauled.

The expense of maintaining the solid concrete silo is practically nothing. During the summer when the silo is empty the walls become very dry. For this reason the walls should be wet thoroughly before new silage is put in. This precaution should be taken with all concrete silos, and with stave silos as well. It will prevent the walls from absorbing moisture from the silage, causing it to mold. Just as the stave silo should have a treatment of creosote on the inside once in two years, so should the concrete silo have a thin coat of cement and water every two years. This should be of the consistency of white wash. It will serve to stop up all pores and to keep the wall smooth.

THE CONCRETE BLOCK SILO.

It is not claimed that the concrete block silo will keep

silage any better than will the solid wall type. However, the concrete block silo has one advantage over the monolithic type—i. e., the blocks can be made at times when other work on the farm is not pressing. Anybody can make the blocks for a concrete silo. Since the blocks can be made at leisure times and by cheap labor, and further, since the blocks are more easily handled than concrete, some men prefer this type rather than the solid wall type. The blocks are hollow (of dimensions to suit the builder) and are made with a groove in one side through which passes an iron rod for reinforcing. This type of silo must be well reinforced to prevent cracking. Strong iron rods are used for this purpose. There are a great many silos of this type in use in the States. The concrete block silo of a given size costs, on an average, about the same as the monolithic type, or a good stave silo.

THE GURLER SILO (PLASTERED).

This type of silo is in common use in Missouri and other States. It gets its name from Mr. H. B. Gurler, of Illinois. He was the first man to try it and advocate its use. The claim of this silo for recognition is on account of its low cost as compared to that of other temporary silos, and because native lumber can be used in its construction. It is a homemade silo.

The foundation is made of concrete extending from 1½ to 2 feet into the ground and the same distance above the ground. Before the foundations hardens a sill is laid in the top of the concrete. To this sill two by four scantlings or studdings are nailed. These studdings are set on the sill 18 inches apart. To the inside of the studding, running round and round, is nailed half-inch sheeting of native lumber. Either elm, sycamore, cottonwood, pine, cypress or oak will do. Inside of this laths are nailed. The laths can be homemade. But if they must be bought the steel laths are better. The laths should run with the

sheeting. To the laths a half-inch layer of cement plaster is applied. When this is done the silo, though not complete, can be used. There should be a cement floor, concave, lower in the center than around the wall. In order to protect the inner wall, boxing should be put on the studding outside, and the boxing painted. Vents or holes should be made in the boxing below and in the inner wall above to allow a free passage of air between the walls. This will prevent wood mold from forming and destroying the sheeting. A roof should be put on to keep the rain or snow out in the winter time. Snow will not injure the silage. It is disagreeable to handle. A roof is necessary to keep out water in Florida, though not enough water to injure the silage is likely to fall into the silo in winter, but all silos should be covered in Florida.

This type of silo, when properly built, will keep silage perfectly. However, it is as stated obove, only a temporary silo. It will last from ten to fifteen years, according to the material used and the attention it receives It will last as long as the average stave silo. It will not dry out and collapse. There are no hoops to keep tighten ed. Where all the material for the Gurler silo must be bought, a silo 16x32 feet can be built for about $225. If native lumber sawed from timber on the farm can be used, the expense will be less. Many silos of this type and the size mentioned have been built for an expenditure ranging from $125 to $150.

Another type of silo very similar to the Gurler is in common use. Instead of putting on the laths and cement plaster, a layer of tar paper is used. Inside of this is put another thickness of half-inch sheeting. A silo *of* this kind is even cheaper than the Gurler. It will keep silage well and last from 10 to 12 years, maybe longer, depending, of course, on the material used.

THE SIZE OF SILO TO BUILD.

The diameter of the silo should be determined by the

number of head of stock that must be fed, and the height should be determined by the number of days desired in the feeding period. It is necessary to feed from an inch and a half to two inches a day off of the top in order to keep the silage fresh and sweet. It will readily be seen that if the diameter is very great and the number of head of stock to feed is small there is a chance of having to take out of the silo each day more silage than the stock can eat. This, of course, would result in a great waste of feed. It is much better to have two small silos than one very large one, especially when the number of stock is small and the feeding period desired is long. Again, if two small silos are built in preference to one large one, one silo can be left undisturbed until needed, or perhaps can be had for summer use when pastures are short or feed scarce. In general, the following rule is a good one. "The height of a silo should never be less than twice the diameter." The taller the silo of a given diameter the greater the weight on a given area of surface and the greater the amount of silage it will hold. Not only will a tall silo hold proportionately more silage, but it will keep silage better. The greater weight serves to pack the silage more tightly and to exclude the air, one of the two agencies that cause silage to spoil.

Since a mature beef animal will eat about the same amount of silage in a day as a dairy cow of the same size, the following tables taken from Bulletin 103 of the Missouri Experiment Station are offered here. Table No. 1 will serve to give a better idea of the relation existing between the size of the silo to the length of the feeding period and the number of head of stock to feed. Table No. 2 will serve to show the capacity of silos of varying sizes:

Table No. 1.

Relation of Size of Silo to Length of Feeding Period and Size of Herd.

No. Cows in herd.	Feed for 180 days.			Feed for 240 days.		
	Estimated tonnage of silage consumed, tons.	Size of Silo.		Estimated tonnage of silage consumed, tons.	Size of Silo.	
		Diam. feet.	Height, feet.		Diam. feet.	Height, feet.
10	36	10	25	48	10	31
12	43	10	28	57	10	35
15	54	11	29	72	11	36
20	72	12	32	96	12	39
25	90	13	33	120	13	40
30	108	14	34	144	15	37
35	126	15	34	168	16	38
40	144	16	35	192	17	39
45	162	16	37	216	18	39
50	180	17	37	240	19	39

The following table gives further figures regarding the capacity of silos of different sizes:

Table No. 2.

Capacity of Silos of Varying Sizes.

Depth of silage, ft.	Inside diameter of silo in feet.				
	10	12	14	16	18
	Tons.	Tons.	Tons.	Tons.	Tons.
25	36	52	68	96	122
28	40	61	81	108	137
30	44	68	90	115	150
32	50	72	95	126	162
34	53	77	108	142	171
36	57	82	114	158	194

After ascertaining the capacity of silos of various sizes and learning the length of time the silage in each will last with a given number of animals to feed, our next question will probably be, "How many acres of corn are required to fill a silo of given dimensions?" The answer to this question can be found in the data given below. This data is taken from Bulletin 103, Missouri Experiment Station:

Average Yield of Silage Per Acre.

Yield of corn, bushels.	Yield of silage, tons.
30	6
40	8
50	10
60	12
80	16
100	20

It will be seen from the figures just given that corn yielding 50 bushels to the acre will make ten tons of silage to the acre. Quoting Professor C. H. Eckles, in the bulletin just mentioned, he states:

"Upon the basis of total food value 2½ tons of silage are equal to one ton of timothy hay. This means that a yield of 10 tons of silage per acre is equivalent in feeding value to 4 tons of timothy hay per acre. On the same basis, when corn is worth 50 cents per bushel a ton of silage is worth $3.35. Calculated in this way, an acre of corn yielding 50 bushels per acre when put into the silo is worth $33.50, while at 50 cents per bushel the grain is worth $25.00."

HOW TO DETERMINE THE WEIGHT OF SILAGE IN THE SILO.

Sometimes we would like to know just how many pounds or tons of silage remain in a silo after we have begun feeding. Feeders have been heard to say: "If I had known that my silage would run out before grass was good enough for pasture, I should have fed a little lighter." If the silage is partly used out of a silo and we wish

to sell the remainder, we would like some method of computing the number of tons that we may have for sale.

The table given below shows the computed weight of well-matured corn silage at different distances below the surface, and the total weight to those distances, two days after filling. The table was compiled from Wisconsin Bulletin No. 59:

Depth of silage, feet.	Weight per Cubic foot of silage at different depths, lbs.	Total weight one square foot area to depth given. lbs.
1	18.7	18.7
2	20.4	39.1
3	22.1	61.2
4	23.7	84.9
5	25.4	110.3
6	27.0	137.3
7	28.5	165.8
8	30.1	195.9
9	31.6	227.5
10	33.1	260.6
11	34.5	295.1
12	35.9	331.0
13	37.3	368.3
14	38.7	407.0
15	40.0	447.0
16	41.3	488.3
17	42.6	530.9
18	43.8	574.3
19	45.0	619.7
20	46.2	665.9
21	47.4	713.3
22	48.5	761.8
23	49.6	811.4
24	50.6	862.0
25	51.7	913.7
26	52.7	966.4
27	53.6	1020.0
28	54.6	1074.6
29	55.5	1130.1
30	56.4	1186.5
31	57.2	1243.7
32	58.0	1301.7
33	58.8	1360.5
34	59.6	1420.1
35	60.3	1480.4
36	61.0	1541.4

ADDITIONAL INFORMATION ON THE METHODS OF CALCULATING SIZE AND COST OF SOME HOME MADE SILOS, AND OTHER VALUABLE AND NECESSARY DATA ON SILOS, FEEDS, ETC.

The concrete silo has the advantage over all others in permanency and stability. A well constructed concrete silo will last indefinitely; there is no danger of its blowing or burning down, rotting out, or being attacked by vermin. Little attention is required to keep it in good condition. The chief objection to it is, its cost. In the end it is cheapest.

COST OF SILOS.

Recent data on the cost of home-made silos collected from all parts of the country show the following relative cost of the three types:

Type of silo.	Number of silos	Average capacity, tons.	Average cost.	Average cost per ton capacity.
Concrete:				
100 tons or less.....	71	71	$220.47	$ 3.10
101 to 200 tons.....	50	135	348.68	2.59
More than 200 tons...	23	219	446.42	2.04
Total concrete....	144	117	301.08	2.58
Modified Wisconsin	8	116	185.52	1.61
Stave:				
100 tons or less.....	25	63	118.40	1.87
Over 100 tons.....	16	129	187.46	1.45
Total stave.....	41	89	145.35	1.63

The following table will show the proper diameter of the silo for herds of different sizes to be fed different amounts for winter feeding, when 2 inches of silage are removed daily:

Relation of size of herd to diameter of silo for winter feeding (on basis of 40 pounds of Silage per cubic foot.)

Inside Diameter of silo.	Quantity of silage in depth of 2 inches.	Number of animals that may be fed, allowing—			
		40 pounds per head.	30 pounds per head.	20 pounds per head.	15 pounds per head.
Feet.	*Pounds.*				
10	524	13	17	26	35
11	634	16	21	31	42
12	754	19	25	37	50
13	885	22	29	44	59
14	1,026	25	34	51	68
15	1,178	29	39	59	78
16	1,340	33	44	67	89
17	1,513	38	50	75	101
18	1,696	42	56	85	113
20	2,094	52	70	104	139

A 900-pound cow will ordinarly consume 30 pounds of silage a day; a 1,200-pound cow about 40 pounds. Yearlings will eat about one-half as much as mature animals; fattening cattle, 25 to 35 pounds for each 1,000 pounds live weight. A sheep will take about one-eighth as much as a cow. Horses should be limited to 15 to 20 pounds daily.

In general, the depth of the silo should not be less than twice nor more than three times the diameter. The greater the depth the better the silage, on account of the pressure from above. If less than 24 feet in height the quality of silage will not be the best. A very great height, however, is to be avoided on account of the excessive amount of power required to elevate the cut corn into the silo.

CAPACITY OF ROUND SILOS.

Approximate Capacity of Cylindrical Silos, for Well-Matured Corn Silage, in Tons.

(From Modern Silage Methods.)

Height of Silo Inside, Feet.	Inside Diameter of Silo, Feet.											
	8	10	11	12	13	14	15	16	17	18	19	20
20	18	30	36	45	51	60	66	—	—	—	—	—
21	19	31	39	48	54	63	71	—	—	—	—	—
22	20	33	41	50	57	66	76	87	—	—	—	—
23	22	34	43	52	60	70	80	91	—	—	—	—
24	23	36	45	55	64	73	85	95	104	120	122	—
25	24	38	48	57	68	77	90	99	110	125	129	145
26	25	40	50	60	71	80	94	103	116	130	137	155
27	27	42	52	63	75	85	98	107	121	136	145	161
28	28	44	54	66	79	90	102	111	126	140	152	170
29	30	46	56	70	83	95	106	116	132	145	160	177
30	31	48	58	75	86	100	110	120	136	150	168	185
31	33	50	62	79	90	105	114	125	141	156	176	193
32	35	53	66	84	94	110	118	131	148	162	184	200
33	36	55	69	89	98	115	123	137	155	169	192	208
34	37	58	73	94	102	120	131	143	162	175	200	217
35	39	61	77	100	106	125	136	149	169	183	209	226
36	40	64	82	105	110	130	139	155	176	190	218	235
37	41	67	86	109	115	135	144	161	183	200	227	245
38	43	70	89	114	119	140	151	167	190	212	236	256
39	45	73	95	118	124	145	157	173	197	220	245	267
40	47	75	98	121	129	150	165	180	204	228	255	279
41	—	77	101	125	134	155	170	187	211	236	262	290
42	—	80	104	128	139	160	176	193	218	244	270	300
43	—	—	—	132	144	166	181	201	225	252	280	310
44	—	—	—	135	150	171	188	207	233	261	289	320
45	—	—	—	—	—	176	195	215	240	269	298	330
46	—	—	—	—	—	182	200	222	247	277	307	340
47	—	—	—	—	—	—	—	229	254	285	316	350
48	—	—	—	—	—	—	—	236	261	293	325	361
49	—	—	—	—	—	—	—	—	—	301	334	371
50	—	—	—	—	—	—	—	—	—	310	344	382

Table Showing Required Acreage and Stock Feeding capacity for Silos of Various Sizes.

(From Modern Silage Methods).

Dimensions.	Capacity in Tons.	Acres to Fill. 15 Tons to Acre	Cows it will keep 6 mos., 40 lbs. Feed per day.
10 x 20	30	3.	8
10 x 24	36	3.	10
10 x 28	44	3.	11
10 x 32	53	3.4	14
10 x 40	75	4.6	19
12 x 20	45	3.	11
12 x 24	55	3.2	13
12 x 28	66	4.1	15
12 x 32	84	5.	20
12 x 40	121	7.3	27
14 x 20	60	4.2	15
14 x 22	66	4.5	17
14 x 24	73	4.7	19
14 x 28	90	5.6	22
14 x 32	110	6.7	27
14 x 40	150	9.2	37
16 x 24	95	6.2	24
16 x 28	111	7.2	29
16 x 32	130	8.7	35
16 x 40	180	12.	49
18 x 30	150	10.2	41
18 x 36	190	13.	50
18 x 40	229	15.3	62
18 x 36	277	18.8	77
20 x 30	185	12.5	50
20 x 40	279	18.8	77
20 x 50	382	25.5	104
20 x 60	500	32.	136

APPROXIMATE COST OF DIFFERENT KINDS OF SILOS.

The cost of a silo will depend on local conditions as to price of labor and materials; how much labor has to be paid for; the size of the silo, etc. The comparative data for the cost of two round silos, 13 and 25 feet in diameter, and 30 feet deep, is given by Prof. King, as shown in the following table:

(From Modern Silage Methods).

Kinds of Silo.	13 Feet Inside Diameter.		25 Feet Inside Diameter.	
	Without Roof.	With Roof.	Without Roof	With Roof.
Stone Silo.....	$ 151	$ 175	$ 264	$ 328
Brick Silo.....	243	273	437	494
Brick-lined Silo, 4 inches thick	142	230	310	442
Brick-lined, 2 in. thick..	131	190	239	369
Lathed and plastered Silo	133	185	344	363
Wood Silo with Galvanized Iron	168	185	308	432
Wood Silo with Paper..	128	222	235	358
Stave Silo.....	127	183	136	289
Cheapest Wood Silo....	101	144	195	240

The following rule for feeding good dairy cows is a safe one to be guided by: Feed as much roughage (Succulent feeds like silage or roots, and hay) as the cows will eat up clean, and in addition, 1 pound of grain feed (concentrates) a day per head for every pound of butter fat they produce in a week (or one-third to one-fourth as many pounds as they give milk daily.

The farmer should aim to grow protein foods like clover, alfalfa, peas, etc., to as large extent as practicable, and thus reduce his feed bill.

The following table gives actual chemical analysis of the products mentioned and includes the entire contents of the various feeds. The next table shows the average amount of digestible nutrients in the more common American fodders, grains and by-products, and is the table that should be used in formulating rations. The table gives the number of pounds of digestible nutrients contained in 100 lbs. of the feeds and these figures can, therefore, be used in figuring out the amount of digestible nutrients in any given amount of a food material.

Average Composition of Silage Crops of Different Kinds, in Per Cent.

(From Modern Silage Methods).

	Water	Ash.	Crude Protein	Fiber.	Nitrogen free Extract.	Ether Extr'ct.
Corn Silage, Mature Corn	73.7	1.6	2.2	6.5	14.1	.9
Immature Corn .	79.1	1.4	1.7	6.0	11.0	.8
Ears removed...	80.7	1.8	1.8	5.6	9.5	.6
Clover Silage ...	72.0	2.6	4.2	8.4	11.6	1.2
Soja Bean Silage	74.2	2.8	4.1	9.7	6.9	2.2
Cow-pea Vine Silage	79.3	2.9	2.7	6.0	7.6	1.5
Field-pea Vine Silage	50.0	3.6	5.9	13.0	26.0	1.6
Corn cannery refuse Husks ...	83.8	.6	1.4	5.2	7.9	1.1
Corn cannery refuse Cubs	74.1	.5	1.5	7.9	14.3	1.7
Pea can'y Refuse	76.8	1.3	2.8	6.5	11.3	1.3
Sorghum Silage.	76.1	1.1	.8	6.4	15.3	.3
Corn-soja Bean Silage	76.0	2.4	2.5	7.2	11.1	.8
Millet-soja Bean Silage	79.0	2.8	2.8	7.2	7.2	1.0
Rye Silage.....	80.8	1.6	2.4	5.8	9.2	.3
Apple Pomace Silage	85.0	.6	1.2	3.3	8.8	1.1
Cow-pea and Soja Bean mixed	69.8	4.5	3.8	9.5	11.1	1.3
Corn kernels ...	41.3	1.0	6.0	1.5	46.6	3.6
Mixed grasses (Rowen)	18.4	7.1	10.1	22.8	36.0	5.7
Brewers' Grain Silage	69.8	1.2	6.6	4.7	15.6	2.1

Analysis of Feeding Stuffs, of the More Common American Fodders, Grains and By-Products.

(From Hoard's Dairyman).

Name of Feed.	Dry Matter in 100 Lbs.	Digestible Nutrients in 100 Pounds.		
		Protein. Lbs.	Carbohydrates. Lbs.	Ether Extract (Crude Fat) Lbs.
Green Fodders.				
Pasture Grasses, mixed.	20.0	2.5	10.2	0.5
Fodder Corn	20.7	1.0	11.6	0.4
Sorghum	20.6	0.6	12.2	0.4
Red Clover	29.2	2.9	14.8	0.7
Alfalfa	28.2	3.9	12.7	0.5
Cow Pea	16.4	1.8	8.7	0.2
Soja Bean	24.9	3.2	11.0	0.5
Oat Fodder	37.8	2.6	18.9	1.0
Rye Fodder	23.4	2.1	14.1	0.4
Rape	14.0	1.5	8.1	0.2
Peas and Oats	16.0	1.8	7.1	0.2
Beet Pulps	10.2	0.6	7.3	——
Silage				
Corn	20.9	0.9	11.3	0.7
Corn Wisconsin Analyses	26.4	1.3	14.0	0.7
Sorghum	23.9	0.6	14.9	0.2
Red Clover	28.0	2.0	13.5	1.0
Alfalfa	27.5	3.0	8.5	1.9
Cow Pea	20.7	1.5	8.6	0.9
Soja Bean	25.8	2.7	8.7	1.3
Dry Fodder and Hay.				
Corn Fodder	57.8	2.5	34.6	1.2
Corn Fodder, Wis. Anal.	71.0	3.7	40.4	1.2
Corn Stover	59.5	1.7	32.4	0.7
Sorghum Fodder	59.7	1.5	37.3	0.4
Red Clover	84.7	6.8	35.8	1.7
Alfalfa	91.6	11.0	39.6	1.2
Barley	85.2	6.2	46.6	1.5
Blue Grass	78.8	4.8	37.3	2.0
Cow Pea	80.3	10.8	38.6	1.1
Crab Grass	82.4	5.7	39.7	1.4
Johnson Grass	87.7	2.4	47.8	0.7
Marsh Grass	88.4	2.4	29.9	0.9
Millet	92.3	4.5	51.7	1.3

Oat Hay	91.1	4.3	46.4	1.5
Oat and Pea Hay	85.4	9.2	36.8	1.2
Orchard Grass	90.1	4.9	42.3	1.4
Prairie Grass	87.5	3.5	41.8	1.4
Red Top	91.1	4.8	46.9	1.0
Timothy	86.8	2.8	43.4	1.4
Timothy and Clover	85.3	4.8	39.6	1.6
Vetch	88.7	12.9	47.5	1.4
White Daisy	85.0	3.8	40.7	1.2
Grain and By-Products.				
Barley	89.1	8.7	65.6	1.6
Brewers' Grains, dry	91.8	15.7	36.3	1.6
Brewers' Grains, wet	24.3	3.9	9.3	1.4
Malt Sprouts	89.8	18.6	37.1	1.7
Buckwheat	87.4	7.7	49.2	1.8
Buckwheat Bran	89.5	7.4	30.4	1.9
Buckwheat Middlings	87.3	22.0	33.4	5.4
Corn	89.1	7.9	66.7	4.3
Corn and Cob Meal	89.0	6.4	63.0	3.5
Corn Cob	89.3	0.4	52.5	0.3
Corn Bran	90.9	7.4	59.8	4.6
Atlas Gluten Meal	92.0	24.6	38.8	11.5
Gluten Meal	88.0	32.1	41.2	2.5
Germ Oil Meal	90.0	20.2	44.5	8.8
Gluten Feed	90.0	23.3	50.7	2.7
Hominy Chop	88.9	7.5	55.2	6.8
Starch Feed, wet	34.6	5.5	21.7	2.3
Cotton Seed	89.7	12.5	30.0	17.3
Cotton Seed Meal	91.8	37.2	16.9	8.4
Cotton Seed Hulls	88.9	0.3	33.1	1.7
Cocoanut Meal	89.7	15.6	38.3	10.5
Cow Peas	85.2	18.3	54.2	1.1
Flax Seed	90.8	20.6	17.1	29.0
Oil Meal, old process	90.8	29.3	32.7	7.0
Oil Meal, new process	89.9	28.2	40.1	2.8
Cleveland Oil Meal	89.6	32.1	25.1	2.6
Kaffir Corn	84.8	7.8	57.1	2.7
Millet	86.0	8.9	45.0	3.2
Oats	89.0	9.2	47.3	4.2
Oat Feed or Shorts	92.3	12.5	46.9	2.8
Oat Dust	93.5	8.9	38.4	5.1
Peas	89.5	16.8	51.8	0.7
Quaker Dairy Feed	92.5	9.4	50.1	3.0
Rye	88.4	9.9	67.6	1.1
Rye Bran	88.4	11.5	50.3	2.0
Wheat	89.5	10.2	69.2	1.7
Wheat Bran	88.1	12.6	38.6	3.0
Wheat Middlings	87.9	12.8	53.0	3.4
Wheat Shorts	88.2	12.2	50.0	3.8

OTHER REASONS FOR RAISING LIVE STOCK.

From earliest times man has owned flocks and herds of live stock. It has been from time immemorial one of the most universal and profitable industries. In fact it was in ancient times, as it is now, the great necessity for many's comfort and support; it was his greatest source of livelihood, as well as of wealth, being his chief occupation. At present live stock is growing scarcer all the time; already this year the number of hogs has decreased over ten per cent and cattle over twelve per cent as compared with last year. The short supply has increased the demand and, consequently, the value also.

Another point not usually considered is, that our lands are as yet, cheap by comparison, and therefore an additional reason why live stock production in Florida must be profitable. And another is that the condition of the wreck and ruin that is blighting humanity across the seas, is destroying millions of live stock that must be replaced either for man's active physical use, or food. The devastation that follows in the wake of war always increases the demand for the necessities of life. It will be doubly true in this instance because of the magnitude of the occasion. Therefore, grow cattle, hogs, sheep, horses and mules. All that can be grown, will be in demand in the near future, and grow them by modern methods, herein suggested. The present opportunity for this industry is without example in recent times.

CONCLUSION.

In the foregoing pages we have endeavored to convince those interested in this subject, of the ability of this State to produce live stock successfully and profitably, and to show how this industry can be maintained. There can be no reasonable doubt of its practicability. We have the soils to produce the grasses, forage crops and grain crops; a climate favorable throughout the year, a

blessing which we have not yet even begun to appreciate at its full value, yet it is one of the most marked and singular advantages of the State when it is realized that, in more northerly States, live stock must be housed and fed six to eight months of the year. In any part of Florida three months is ample time. In the not distant past, Florida shipped a large number of cattle to Cuba and other nearby countries. These were generally range stock, but in recent years these countries have to a great extent supplied their own market. The stock ranges of those times are practically passed, for good, and it is well that it is so. In the past it may have been good business policy to adopt the methods then pursued, but that which may have been sound policy in one condition of affairs may be just the reverse in another. We have never availed ourselves of the full natural resources with which our State is blessed. On the contrary we have either overlooked or wasted them. It behooves us to turn our errors to good account, and when we have availed ourselves of these natural resources, have grasped the real meaning of new ideas and adopted modern methods of agricultural and industrial science, we will quickly attain a degree of prosperity which will make our State a marvel of even this progressive age.

PART II.

REPORT OF CONDITION AND PROSPECTIVE YIELD OF CROPS.

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.—From careful reports by our correspondents throughout this district, the conclusion is readily arrived at that the crops generally, with one exception, are from 10 to 20 per cent. poorer than last year at this time. Cotton is the exception and undoubtedly cotton shows the best condition and the best indicated yield that it has shown for several years. We, therefore, cannot help but conclude that the cotton crop in this section will be as large, if not larger, than yet produced. The other crops, as before stated, are considerably decreased. Corn averages from 20 to 25 per cent. less than last year in both condition and indicated yield. The season so far with the exception of a short time in the beginning of the year, has been an especially favorable one for the growing of cotton and it has had its effect in a large crop. This has also been a favorable season for pastures and for live stock. Although at times the season has been a dry one, yet very little inconvenience has been felt because of it. Stock generally is in good condition and less complaint of the effects of fatal diseases than there was last year. The best crops that we will have this year are the hay and forage crops which, if properly used to advantage, are among the most valuable of farm products when it comes to the support and maintenance of the farm.

Western Division.—In this division conditions are practically the same as in the foregoing division. Crops

of all kinds indicate about the same condition and yield. The best crops noted in this section are cotton, peanuts and velvet beans. Cowpeas are good, but the rest of the crops, including corn, will be short about the same percentage as in the foregoing section. Live stock is reported in good condition and doing well. The season has been favorable for the production of pastures and forage plants. No fatal diseases are reported.

NORTHEASTERN DIVISION.—In this division there is practically no difference in the condition and prospective yield of the crops, especially the important ones. Cotton is slightly shorter in this division than in the previous ones, but in this division sea island cotton predominates. Both varieties of cotton, however, are shorter than in the divisions first above mentioned. Corn is about the same. Sugar cane slightly better, and the forage crops average just about the same as in the former two. In these conditions of cotton we have the proof of the character of the season, especially when we compare it with the condition of the indicated yield of the corn crop. One requires a uniformly warm and dry temperature, the other uniformly moist and moderate temperature. The first condition has prevailed throughout all the foregoing districts. The fruit in this district indicates a slightly better crop than last year, and the condition of live stock is also good as in the former. No reports of diseases have been made.

CENTRAL DIVISION.—There is no appreciable difference in the condition of crops in this division and those just above considered. In this section of the tSate the citrus fruit crops begin to show up in preponderance of the others, but the usual farm crops adapted to that section show about the same condition and indicated yield as the former sections. It shows that there has been a remarkable uniformity in climatic conditions throughout the State for this to occur. There is little cotton grown in this section, but what is grown is in good condition and

indicates a good yield. The condition of live stock in this section is also good.

SOUTHERN DIVISION.—In this division the climatic conditions that prevailed were about the same as throughout other sections of the State. There has been little rain in some sections and much less than was necessary for the regular crops, but they have done tolerably well considering the slight precipitation that has fallen throughout the district, and it is quite possible that with the improvement of the last few weeks that the grape fruit and orange crop will be somewhat superior to that of last year. The principal increase, in the opinio of the correspondents, will be on the part of grape fruit, which they expect to see far exceed any former crop. It is, therefore, possible that the citrus fruit crop of this season will exceed that of last year by 10 to 12 per cent.

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

COUNTY.	*Upland Cotton.*		*Sea Island Cotton.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	.....	.....	.....	.....
Gadsden	120	125	100	100
Hamilton	90	100	70	80
Jefferson	65	80	.....	.....
Lafayette	.....	.....	100	80
Leon	100	110	.....	.....
Madison	90	90	110	110
Suwannee	80	80	99	99
Taylor	.....	.....	90	90
Wakulla	80	80	75	80
Div. Av. per cent.	89	96	92	91
Western Division.				
Calhoun	125	125	100	100
Escambia	50	50	.....	.....
Holmes	.....	.....	100	105
Jackson	100	110	.....	.....
Santa Rosa	65	65	.....	.....
Walton	75	75	.....	.....
Washington	90	90	.....	.....
Div. Av. per cent.	84	86	100	102
Northeastern Division.				
Alachua	90	80	75	80
Baker	75	75	80	80
Bradford	70	85	70	85
Clay	.....	.....	100	100
Nassau	100	100	100	100
Putnam	.....	.....	.....	.....
St. Johns	.....	.....	.....	.....
Div. Av. per cent.	84	85	86	85
Central Division.				
Citrus	.....	.....	.....	.....
Hernando	.....	.....	.....	.....
Levy	85	75	80	75
Marion	100	100	100	100
Orange	.....	.....	.....	.....
Pasco	.....	.....	.....	.....
Seminole	.....	.....	.....	.....
Sumter	.....	.....	.....	.....
Volusia	.....	.....	.....	.....
Div. Av. per cent.	92	87	90	87
Southern Division.				
Brevard	.....	.....	.....	.....
Dade	.....	.....	.....	.....
DeSoto	.....	.....	.....	.....
Hillsboro	.....	.....	.....	.....
Lee	.....	.....	.....	.....
Osceola	.....	.....	.....	.....
Palm Beach	.....	.....	.....	.....
Pinellas	.....	.....	.....	.....
Polk	.....	.....	.....	.....
St. Lucie	.....	.....	.....	.....
Div. Av. per cent.	.....	.....	.....	.....
State Av. per cent.	87	88	92	91

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Corn.		Sugar Cane.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	75	80	100	100
Gadsden	90	90	60	65
Hamilton	75	75	95	90
Jefferson	50	65	50	65
Lafayette	70	70	80	80
Leon	100	100	90	100
Madison	85	85	100	100
Suwannee	85	85	80	80
Taylor	50	50	90	90
Wakulla	95	100	90	100
Div. Av. per cent.	78	80	83	87
Western Division.				
Calhoun	50	50	75	80
Escambia	60	60	75	75
Holmes	60	60	80	85
Jackson	80	85	85	90
Santa Rosa	75	75	90	90
Walton	75	75	80	80
Washington	60	60	80	85
Div. Av. per cent.	66	66	81	84
Northeastern Division.				
Alachua	50	50	80	80
Baker	85	85	100	100
Bradford	65	75	110	115
Clay	80	80	100	90
Duval	90	90	70	70
Nassau	80	75	75	80
Putnam	75	75	100	100
St. Johns	90	90	85	90
Div. Av. per cent.	77	78	90	91
Central Division.				
Citrus	75	50	100	100
Hernando	75	60	90	95
Levy	65	60	90	90
Marion	80	80	100	100
Orange	.....	.....	.....	.....
Pasco	40	40	75	75
Seminole	100	100	.....	.....
Sumter	60	60	60	60
Volusia	70	70	100	90
Div. Av. per cent.	71	65	88	87
Southern Division.				
Brevard	.....	.....	60	60
Dade	100	100	.....	.....
DeSoto	90	100	100	100
Hillsboro	90	90	85	90
Lee	.....	.....	90	100
Osceola	.....	.....	90	95
Palm Beach	.....	.....	100	150
Pinellas	90	90	90	100
Polk	50	50	60	60
St. Lucie	.....	.....	95	95
Div. Av. per cent.	84	86	85	94
State Av. per cent.	75	75	85	89

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Field Peas.		Rice.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	100	100	.....	.....
Gadsden	100	100	.....	.....
Hamilton	85	85	.....	.....
Jefferson	100	100	.....	.....
Lafayette	80	85	.....	.....
Leon	100	100	.....	.....
Madison	75	75	.....	.....
Suwannee	100	100	60	60
Taylor	75	80	.....	.....
Wakulla	100	100	.....	.....
Div. Av. per cent.	92	92	60	60
Western Division.				
Calhoun	70	70	65	60
Escambia	100	100	75	75
Holmes	90	95	80	80
Jackson	95	100	.....	.....
Santa Rosa	100	100	90	90
Walton	100	100	100	100
Washington	100	100	.....	.....
Div. Av. per cent.	94	95	82	83
Northeastern Division.				
Alachua	100	100	.....	.....
Baker	80	80	60	60
Bradford	100	100	80	90
Clay	100	100	.....	.....
Duval	100	100	.....	.....
Nassau	80	80	100	100
Putnam	50	50	70	75
St. Johns	90	90	90	90
Div. Av. per cent.	87	87	80	83
Central Division.				
Citrus	100	100	.....	.....
Hernando	90	100	.....	.....
Levy	90	95	.....	.....
Marion	100	100	98	98
Orange	90	85	.....	.....
Pasco	90	90	.....	.....
Seminole	100	90	.....	.....
Sumter	40	40	.....	.....
Volusia	90	90	.....	.....
Div. Av. per cent.	88	88	98	98
Southern Division.				
Brevard	80	80	.....	.....
Dade	100	100	.....	.....
DeSoto	100	100	.....	.....
Hillsboro	90	95	80	80
Lee	100	100	.....	.....
Osceola	100	100	.....	.....
Palm Beach	100	100	.....	.....
Pinellas	100	100	.....	.....
Polk	50	50	50	50
St. Lucie	.....	.....	.....	.....
Div. Av. per cent.	91	92	65	65
State Av. per cent.	90	91	77	78

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Sweet Potatoes.		Cassava.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	100	100	.....	.....
Gadsden	60	50	.....	.....
Hamilton	100	85	.....	.....
Jefferson	50	75	.....	.....
Lafayette	100	100	.....	.....
Leon	100	100	.....	.....
Madison	100	100	.....	.....
Suwannee	100	100	.....	.....
Taylor	65	65	.....	.....
Wakulla	90	100	.....	.....
Div. Av. per cent.	86	89	.....	.....
Western Division.				
Calhoun	80	85	.....	.....
Escambia	80	80	75	75
Holmes	85	90	.....	.....
Jackson	85	90	.....	.....
Santa Rosa	85	90	.....	.....
Walton	100	100	.....	.....
Washington	100	100	.....	.....
Div. Av. per cent.	88	91	75	75
Northeastern Division.				
Alachua	100	100	.....	.....
Baker	100	100	.....	.....
Bradford	90	95	.....	.....
Clay	100	100	.....	.....
Duval	75	75	.....	.....
Nassau	80	60	.....	.....
Putnam	75	75	.....	.....
St. Johns	100	100	100	100
Div. Av. per cent.	90	88	100	100
Central Division.				
Citrus	100	100	.....	.....
Hernando	95	100	.....	.....
Levy	90	85	.....	.....
Marion	100	100	.....	.....
Orange	90	100	.....	.....
Pasco	60	60	.....	.....
Seminole	100	110	.....	.....
Sumter	75	75	.....	.....
Volusia	100	80	.....	.....
Div. Av. per cent.	80	90	.....	.....
Southern Division.				
Brevard	70	70	.....	.....
Dade	100	100	100	100
DeSoto	100	100	.....	.....
Hillsboro	95	100	95	95
Lee	100	100	.....	.....
Osceola	100	100	.....	.....
Palm Beach	100	125	.....	.....
Pinellas	100	100	.....	.....
Polk	100	150	100	120
St. Lucie	105	100	.....	.....
Div. Av. per cent.	97	104	98	157
State Av. per cent.	88	72	91	111

REPORT OF CONDITION AND PROSPECTIVE YIELD—Continued.

COUNTY.	Peanuts.		Broom Corn.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	.....	.....	.....	.....
Gadsden	100	100	.....	.....
Hamilton	85	85	.....	.....
Jefferson	75	85	.....	.....
Lafayette	80	85	.....	.....
Leon	90	100	.....	.....
Suwannee	100	100	.....	.....
Taylor	100	100	.....	.....
Wakulla	90	100	.....	.....
Div. Av. per cent.	87	93	.....	.....
Western Division.				
Calhoun	90	90	.....	.....
Escambia	80	80	75	75
Holmes	90	95	.....	.....
Jackson	90	100	.....	.....
Santa Rosa	100	100	.....	.....
Walton	90	100	.....	.....
Washington	100	105	.....	.....
Div. Av. per cent.	91	96	75	75
Northeastern Division.				
Alachua	80	80	.....	.....
Baker	100	100	.....	.....
Bradford	125	125	.....	.....
Clay	100	100	.....	.....
Duval	85	85	.....	.....
Nassau	90	100	100	100
Putnam	90	90	.....	.....
St. Johns	100	100	.....	.....
Div. Av. per cent.	96	97	100	100
Central Division.				
Citrus	100	100	.....	.....
Hernando	.....	.....	.....	.....
Levy	90	85	.....	.....
Marion	105	105	.....	.....
Orange	.....	.....	.....	.....
Pasco	90	90	.....	.....
Seminole	.....	.....	.....	.....
Sumter	100	100	.....	.....
Volusia	100	100	.....	.....
Div. Av. per cent.	97	97	.....	.....
Southern Division.				
Brevard	.....	.....	.....	.....
Dade	100	100	.....	.....
DeSoto	.....	.....	.....	.....
Hillsboro	.....	.....	.....	.....
Lee	.....	.....	.....	.....
Osceola	.....	.....	.....	.....
Palm Beach	.....	.....	.....	.....
Pinellas	.....	.....	.....	.....
Polk	100	120	.....	.....
St. Lucie	.....	.....	.....	.....
Div. Av. per cent.	100	110	.....	.....
State Av. per cent.	94	98	87	87

REPORT OF CONDITION AND PROSPECTIVE YIELD—Continued.

COUNTY.	*Hay—Native Grasses.*		*Alfalfa.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	100	100	.....	.....
Gadsden	110	110	125	125
Hamilton	100	100	.....	.....
Jefferson	.....	.....	.....	.....
Lafayette	75	75	.....	.....
Leon	100	100	.....	.....
Madison	100	100	.....	.....
Suwannee	100	100	60	60
Taylor	75	75	.....	.....
Wakulla	100	100	.....	.....
Div. Av. per cent.	95	95	92	92
Western Division.				
Calhoun	80	80	.....	.....
Escambia	100	110	.....	.....
Holmes	85	85	.....	.....
Jackson	90	95	.....	.....
Santa Rosa	100	100	.....	.....
Walton	90	95	.....	.....
Washington	100	110	.....	.....
Div. Av. per cent.	92	96	.....	.....
Northeastern Division.				
Alachua	80	80	.....	.....
Baker	100	100	.....	.....
Bradford	70	75	.....	.....
Clay	100	100	.....	.....
Duval	90	90	.....	.....
Nassau	90	100	.....	.....
Putnam	100	100	.....	.....
St. Johns	100	100	.....	.....
Div. Av. per cent.	91	93	.....	.....
Central Division.				
Citrus	110	115	.....	.....
Hernando	100	100	.....	.....
Levy	90	90	.....	.....
Marion	110	110	.....	.....
Orange	.....	.....	.....	.....
Pasco	80	80	.....	.....
Seminole	100	100	.....	.....
Sumter	.....	.....	.....	.....
Volusia	100	100	.....	.....
Div. Av. per cent.	99	99	.....	.....
Southern Division.				
Brevard	75	75	.....	.....
Dade	105	110	100	100
DeSoto	100	100	.....	.....
Hillsboro	90	90	.....	.....
Lee	100	100	.....	.....
Osceola	100	100	.....	.....
Palm Beach	100	115	.....	.....
Pinellas	90	100	.....	.....
Polk	100	115	.....	.....
St. Lucie	100	100	.....	.....
Div. Av. per cent.	96	100	100	100
State Av. per cent.	96	97	96	96

REPORT OF CONDITION AND PROSPECTIVE YIELD—Continued.

COUNTY.	*Velvet Beans*		*Pastures.*
	Condition.	*Prospective Yield.*	*Condition.*
Franklin	60	70	100
Gadsden	75	75	100
Hamilton	95	90	100
Jefferson	75	85	75
Lafayette	75	75	75
Leon	100	100	100
Madison	90	90	100
Suwannee	100	100	100
Taylor	.....	.....	.....
Wakulla	100	100	100
Div. Av. per cent.	79	87	95
Western Division.			
Calhoun	90	90	80
Escambia	75	75	100
Holmes	95	95	90
Jackson	90	95	90
Santa Rosa	100	100	100
Walton	100	100	100
Washington	90	85	100
Div. Av. per cent.	91	91	91
Northeastern Division.			
Alachua	80	80	100
Baker	100	100	100
Bradford	65	75	75
Clay	100	100	100
Duval	.....	.....	90
Nassau	100	100	100
Putnam	75	75	.....
St. Johns	100	100	100
Div. Av. per cent.	87	90	95
Central Division.			
Citrus	100	90	100
Hernando	90	90	100
Levy	90	95	95
Marion	97	100	110
Orange	100	100	100
Pasco	90	90	90
Seminole	100	90	100
Sumter	60	60	100
Volusia	100	100	100
Div. Av. per cent.	92	91	99
Southern Division.			
Brevard	.....	.....	.....
Dade	100	100	100
DeSoto	100	100	100
Hillsboro	80	80	90
Lee	90	100	100
Osceola	100	100	100
Palm Beach	.....	.....	.....
Pinellas	100	100	100
Polk	100	100	70
St. Lucie	95	100	100
Div. Av. per cent.	96	97	83
State Av. per cent.	89	91	95

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Bananas.*		*Mangoes.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	50	75	.....	.....
Gadsden	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....
Jefferson	.....	.....	.....	.....
Lafayette	.....	.....	.....	.....
Leon	.....	.....	.....	.....
Madison	.....	.....	.....	.....
Suwannee	.....	.....	.....	.....
Taylor	.....	.....	.....	.....
Wakulla	.....	.....	.....	.....
Div. Av. per cent.	50	75	.....	.....
Western Division.				
Calhoun	.....	.....	.....	.....
Escambia	.....	.....	.....	.....
Holmes	.....	.....	.....	.....
Jackson	.....	.....	.....	.....
Santa Rosa	.....	.....	.....	.....
Walton	.....	.....	.....	.....
Washington	.....	.....	.....	.....
Div. Av. per cent.	.....	.....	.....	.....
Northeastern Division.				
Alachua	.....	.....	.....	.....
Baker	.....	.....	.....	.....
Bradford	.....	.....	.....	.....
Clay	.....	.....	.....	.....
Duval	.....	.....	.....	.....
Nassau	90	75	.....	.....
Putnam	.....	.....	.....	.....
St. Johns	.....	.....	.....	.....
Div. Av. per cent.	90	75	.....	.....
Central Division.				
Citrus	.....	.....	.....	.....
Hernando	.....	.....	.....	.....
Levy	.....	.....	.....	.....
Marion	.....	.....	.....	.....
Orange	.....	.....	.....	.....
Pasco	.....	.....	.....	.....
Seminole	.....	.....	.....	.....
Sumter	.....	.....	.....	.....
Volusia	.....	.....	.....	.....
Div. Av. per cent.	.....	.....	.....	.....
Southern Division.				
Brevard	60	60	.....	.....
Dade	100	100	90	90
DeSoto	.....	.....	75	60
Hillsboro	100	100	.....	.....
Lee	100	100	.....	.....
Osceola	90	90	.....	.....
Palm Beach	100	125	85	75
Pinellas	100	100	.....	.....
Polk	100	100	.....	.....
St. Lucie	90	70	100	75
Div. Av. per cent.	93	94	87	75
State Av. per cent.	78	81	87	75

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	Avocado Pears.		Guavas.	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	.....	.....	50	60
Gadsden	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....
Jefferson	.....	.....	.....	.....
Lafayette	.....	.....	.....	.....
Leon	.....	.....	.....	.....
Madison	.....	.....	.....	.....
Suwannee	.....	.....	.....	.....
Taylor	.....	.....	.....	.....
Wakulla	.....	.....	.....	.....
Div. Av. per cent.	.....	.....	50	60
Western Division.				
Calhoun	.....	.....	.....	.....
Escambia	.....	.....	.....	.....
Holmes	.....	.....	.....	.....
Jackson	.....	.....	.....	.....
Santa Rosa	.....	.....	.....	.....
Walton	.....	.....	.....	.....
Washington	.....	.....	.....	.....
Div. Av. per cent.	.....	.....	.....	.....
Northeastern Division.				
Alachua	.....	.....	.....	.....
Baker	.....	.....	.....	.....
Bradford	.....	.....	.....	.....
Clay	.....	.....	.....	.....
Duval	.....	.....	.....	.....
Nassau	.....	.....	.....	.....
Putnam	.....	.....	.....	.....
St. Johns	.....	.....	100	100
Div. Av. per cent.	.....	.....	100	100
Central Division.				
Citrus	.....	.....	.....	.....
Hernando	.....	.....	.....	.....
Levy	.....	.....	.....	.....
Marion	.....	.....	100	100
Orange	.....	.....	100	150
Pasco	.....	.....	100	100
Seminole	.....	.....	100	110
Sumter	.....	.....	.....	.....
Volusia	.....	.....	100	110
Div. Av. per cent.	.....	.....	100	114
Southern Division.				
Brevard	.....	.....	90	100
Dade	100	100	100	100
DeSoto	.....	.....	100	125
Hillsboro	.....	.....	95	100
Lee	100	100	100	110
Osceola	.....	.....	100	100
Palm Beach	100	110	95	100
Pinellas	.....	.....	100	100
Polk	.....	.....	100	115
St. Lucie	100	65	90	65
Div. Av. per cent.	100	94	97	102
State Av. per cent.	100	94	86	94

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Orange Trees.*		*Lemon Trees.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	90	100	90	100
Gadsden	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....
Jefferson	.....	.....	.....	.....
Lafayette	.....	.....	.....	.....
Leon	100	75	.....	.....
Madison	.....	.....	.....	.....
Suwannee	50	50	40	40
Taylor	.....	.....	.....	.....
Wakulla	.....	.....	.....	.....
Div. Average per cent....	80	75	65	70
Western Division.				
Calhoun	100	90	100	90
Escambia	.....	.....	.....	.....
Holmes	.....	.....	.....	.....
Jackson	.....	.....	.....	.....
Santa Rosa	.....	.....	.....	.....
Walton	.....	.....	.....	.....
Washington	.....	.....	.....	.....
Div. Average per cent....	100	90	100	90
Northeastern Division.				
Alachua	100	100	.....	.....
Baker	100	100	100	100
Bradford	200	200	200	200
Clay	90	75	.....	.....
Duval	75	75	.....	.....
Nassau	100	100	100	100
Putnam	50	50	.....	.....
St. Johns	90	95	.....	.....
Div. Average per cent....	101	99	133	133
Central Division.				
Citrus	80	90	.....	.....
Hernando	90	95	.....	.....
Levy	95	95	.....	.....
Marion	100	100	100	100
Orange	100	125	.....	.....
Pasco	90	90	90	90
Seminole	110	125	.....	.....
Sumter	75	75	.....	.....
Volusia	90	70	.....	.....
Div. Average per cent....	92	96	95	95
Southern Division.				
Brevard	75	95	.....	.....
Dade	100	100	100	100
DeSoto	80	95	.....	.....
Hillsboro	100	105	90	90
Lee	100	100	.....	.....
Osceola	100	100	.....	.....
Palm Beach	95	105	.....	.....
Pinellas	100	100	.....	.....
Polk	100	110	100	90
St. Lucie	100	100	100	80
Div. Average per cent....	95	101	97	90
State Average per cent...	93	92	98	96

REPORT OF CONDITION AND PROSPECTIVE YIELD.—Continued.

COUNTY.	*Lime Trees.*		*Grapefruit Trees.*	
Northern Division.	*Condition.*	*Prospective Yield.*	*Condition.*	*Prospective Yield.*
Franklin	.....	.....	90	100
Gadsden	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....
Jefferson	.....	.....	.....	.....
Lafayette	.....	.....	.....	.....
Leon	.....	.....	100	75
Madison	.....	.....	.....	.....
Suwannee	.....	.....	40	40
Taylor	.....	.....	.....	.....
Wakulla	.....	.....	.....	.....
Div. Average per cent.	.....	.....	77	72
Western Division.				
Calhoun	.....	.....	100	90
Escambia	.....	.....	.....	.....
Holmes	.....	.....	.....	.....
Jackson	.....	.....	.....	.....
Santa Rosa	.....	.....	.....	.....
Walton	.....	.....	.....	.....
Washington	.....	.....	.....	.....
Div. Average per cent.	.....	.....	100	90
Northeastern Division.				
Alachua	.....	.....	100	100
Baker	.....	.....	100	100
Bradford	.....	.....	200	200
Clay	.....	.....	.....	.....
Duval	.....	.....	75	75
Nassau	.....	.....	100	100
Putnam	.....	.....	50	50
St. Johns	.....	.....	90	95
Div. Average per cent.	.....	.....	102	103
Central Division.				
Citrus	.....	.....	90	80
Hernando	.....	.....	95	95
Levy	.....	.....	90	95
Marion	100	100	100	100
Orange	.....	.....	100	125
Pasco	90	90	90	90
Seminole	.....	.....	110	125
Sumter	.....	.....	75	75
Volusia	.....	.....	90	110
Div. Average per cent.	95	95	93	99
Southern Division.				
Brevard	40	50	80	90
Dade	100	100	110	110
DeSoto	.....	.....	90	95
Hillsboro	90	90	110	120
Lee	.....	.....	100	115
Osceola	.....	.....	100	100
Palm Beach	95	100	95	110
Pinellas	90	90	100	110
Polk	100	90	100	110
St. Lucie	100	80	100	100
Div. Average per cent.	88	89	91	97
State Average per cent.	91	91	92	92

PART III.

Fertilizers,
Feed Stuffs, and
Foods and Drugs.

HOME-MIXING OF FERTILIZERS.

Some years ago there was much discussion in the agricultural Press on this subject, "The Economy of Home-mixing of Fertilizers." Many writers advocated the practice, though few practiced it themselves.

For several years the practice has not been generally recommended, and the advocates of "home-mixing" have become less in number. Numbers of growers who have a favorite formula, and who use large quantities of commercial fertilizers, find it more satisfactory and economical to send their formula to a reliable Florida factory, stipulating the quantities and particularly the grades, or percentages, of each material they desire in each ton, and the final analysis of the mixture to be guaranteed by the factory.

It has been but a few years, comparatively, that factories would accept such orders—they preferred to sell their own particular "brands" or mixtures. Frequently numerous "brands" of the same mixture, and of identical analysis, were sold by the same factory, some recommended for one crop, some for another, all being the same goods under different names. The multiplicity of brands was, and still is, confusing to the average farmer or grower.

A list of brands not to exceed ten or a dozen, would easily cover all the various necessary formulas, five or six made with organic materials as a base, and the same number using the so-called "High Grade Salts" as the principal ingredients of the mixture.

Of recent years, however, the factory has recognized the necessity of catering to the demands of their customers, and few of our Florida Factories now decline to make the "special mixtures" demanded by their customers, charging for the materials used at current prices f.o.b. factory, with an additional charge of $1.50 per ton for proper mixing and sacks.

I have discussed this matter with a number of our most successful truckers and orange growers, who, as a class, are probably the best informed users of commercial fertilizers in the world, generally trained men—often scientists—who know what their soil and their crops require from careful study of local conditions; who were but a few years since, advocates of home-mixing, finding it difficult, if not impossible, to have their particular formulas made by a factory, mixed their own raw materials, who, now that they can procure their materials at ton prices, and have them properly mixed and sacked under full guarantee, at an advance of but $1.50 per ton above the price of materials in ton lots, have informed me that they no longer advocate or practice home-mixing.

When small lots of five to twenty tons are used by the individual farmer, I do not advocate home-mixing, but rather to buy a standard brand of so-called high grade goods—say 4-6.8 (nominal value $30.10 at factory), which cannot be adulterated with a "filler"—and apply to his crops one-half the amount he would use of cotton goods (normal value $17.80 at factory), of low grade 8.2.2 goods, which cannot be made without a "filler"; obtaining in one ton of 4.6.8 360 pounds of High Grade Plant Food, the normal value of which would be $30.10 f.o.b. factory, while two tons of 2.2.8 would contain 240 pounds each, or 480 pounds of Low Grade Plant Food (principally acid phosphate) with from 125 to 500 pounds of filler in each ton (250 to 1,000 pounds), in the two tons.

One ton of 4.6.8 goods wold produce better results on a given area than two tons of the 2.2.8, and save the cost of freight, drayage and hauling of one ton of low grade goods.

However, a neighborhood, or Farmers' Union, may join together, ordering 100 to 500 tons of raw goods. They may establish a local factory, purchasing their raw goods at car lot prices (at large discount for cash) and, by employing a competent man to mix the goods—with proper

apparatus—can probably save a considerable sum. A number of co-operative farming communities are now purchasing in large quantities their supplies of mixed fertilizers of their own formulas, of materials of prescribed percentages of nitrogen, phosphate and potash, from organiic sources, or from salts, as experience dictates, and paying form.them at current market prices of materials in ton or carload lots, as the case may be, for cash at the factory, thus obtaining all the trade discounts for a cash transaction.

Few farmers in Georgia, Florida or Alabama in the cotton regions read their guarantee tags. They do not purchase their goods on account of their value in plant foods, but base their value on the cost per ton, irrespective of quality, selecting a "brand"—"Big Boll," "Champion," "Sure Crop," "Mortgage Lifter," "Alligator", "Boar's Head"—as the criterion of its value. Probably seventy-five per cent of the goods sold in the farming districts—where the advocates of "home-mixing" are most numerous—is the common 8.2.2 cotton goods which contains 160 pounds of available phosphate, 40 pounds of potash, and 40 pounds of ammonia, or 240 pounds of plant food in a ton, with 125 to 450 pounds of "filler." Such a formula cannot be made without a "filler"—some inert matter, slate, clinkers, cinders, etc., for a make-weight—it being impossible to make a mixture of complete goods of so low a percentage of plant food, of the lowest grade materials, without a "filler" or "make-weight."

For those who may desire to mix their own goods at home, the following formulas are given:

For 2.2.8 "Cotton Goods," No. 1.

540 lbs.	2.00%	cotton seed meal	= 40 lbs.	= 2.00%	ammonia
540 lbs.	2.00%	phosphoric acid	= 10 lbs.	= 0.50%	phosphate
540 lbs.	1.50%	potash	= 8 lbs.	= 0.40%	potash
950 lbs.	16.00%	acid phosphate	= 152 lbs.	= 7.60%	phosphate
250 lbs.	12.00%	kainit	= 30 lbs.	= 1.50%	potash
1,740 lbs.					
260 lbs.		"filler"			

2,000 lbs. or one ton=2% ammonia, 2% potash, and 8% phosphate

For 2.2.8 "Cotton Goods," No. 2.

540 lbs.	7.50%	cotton seed meal	=2.00% ammonia
540 lbs.	7.50%	cotton seed meal	=0.50% phosphate
540 lbs.	7.50%	cotton seed meal	=0.49% potash
950 lbs.	16.00%	acid phosphate	=7.60% phosphate
60 lbs.	50.00%	muriate of potash	=1.50% potash
1,550 lbs.			
450 lbs.		"filler."	

2,000 lbs. or one ton=2% ammonia, 2% potash, and 8% phosphate

Materials for either of these formulas could be purchased in ton lots for cash f.o.b. factory at normal prices (July 1, 1914), mixed and bagged under full guarantee as to analysis, for—

Ammonia	2% x $3.50	$ 7.00
Potash	2% x 1.10	2.20
Phosphate	8% x 1.00	8.00
Bags and mixing		1.50
For cash f.o.b. factory per ton		$18.70

These examples are given for low grade goods with 250 to 450 lbs. of necessary "filler" to make up the weight of the material to 2000 lbs. Such goods are not economical. Much better to select one of the formulas published in each bulletin. A good general formula would be one of those quoted in each bulletin costing, mixed and bagged, from $27.50 to $34.50 per ton, bearing in mind that the "unit value" or price per each 20 lbs. of plant food in the ton of fertilizer is:

Ammonia	3.50%
Potash	1.10%
Phosphoric Acid	1.00%

under normal conditions such as prevailed on July 1st, 1914.

Excepting when materials can be purchased in carload

lots, under full guarantee as to the grades or percentages, for cash f.o.b. seaports or factories, and mixed by proper machinery by skillful and competent men, my opinion is that home-making will not be as economical, or the result as satisfactory, as to have the required formula mixed and manufactured by a reliable Florida factory under full guarantee as to materials and percentages of plant foods.

A large number of Farmers' Co-Operative Associations are now following this plan with satisfactory results, agriculturally and financially. Purchasing for cash in car lots, they obtain all the trade concessions granted to dealers, save commissions to agents, and get the benefit of car lot freights.

Potash Salts.

Owing to the fact that German Potash Salts cannot be imported on account of the war in Europe, much discussion is had at present as to the potash supply. Much of this agitation is, in my opinion, inspired by speculators who have secured the control of the supply for the purpose of increasing the price. That more potash has been used than required in ordinary soils is generally conceded. No great falling off in crops may be anticipated for the coming season on account of the lack of potash. There is no necessity to fear a failure of crops on account of the scarcity of German potash.

The latest prices obtained were $100.00 per ton for 50% Potash, or 10 cents per lb. for actual potash (K_2O), ($2.00 per unit of 20 lbs.) actual Potash (K_2O). These prices have doubtless increased as the supply is limited, and mostly controlled by fertilizer companies and speculators.

Ashes.

We are having many inquiries as to the percentage of potash in ashes, and numerous samples have been sent.

in for analysis. The average potash content of unleached hardwood ashes is from 2% to 8%, with some 40% of lime. We seldom find more than 3%—more frequently from 0.50% to 2.00%. We therefore caution purchasers to purchase only under full guarantee of the minimum percentage, and of reliable Florida dealers, from whom collections can be made in case of failure to meet the guarantees. Understand that in a guarantee stating from 3% to 5%, or from 4% to 8%, of potash, the guarantee is the minimum figure only.

Ashes have been largely used in Florida. Their value has been derived more from the lime content than the potash content. Lime can be purchased for $1.75 per ton—ashes are quoted at $20.00. On the basis of 4% potash (which is seldom found) under normal conditions their value would be $4.40 per ton for the potash, the balance being paid for the 40%, or 800 lbs. of lime (Calcium Oxide).

GROUND LIMESTONE.

Many inquiries have been recently received as to the value of Limestone as a substitute for Potash.

A number of newspaper articles have recently advocated Lime as a substitute for Potash.

Lime cannot be substituted for Potash.

However, as Lime, by its chemical action decomposes soil, particularly soils rich in vegetable matter, it releases Potash and other plant foods in the soil. It will, to a large extent, improve most crops by making available the insoluble and unavailable plant food present in the soil, including Potash.

Probably 90% of our Florida soils would be materially benefited and made more productive by the application of from two to four tons of ground Limestone per acre.

Many growers have obtained good results from the use of Hardwaad Ashes, containing from two to four per cent of Potash (K_2O), twenty to forty pounds per ton. These

ashes also contain practically 55% Carbonate of Lime (1,100 lbs. Lime per ton). At normal prices (Ashes at $20.00 per ton) 3% Potash as worth $3.30, the Lime costing, therefore, $16.70 for 1,100 pounds with added freight.

First class ground Limestone, 95 to 98% aCrbonate of Lime, can be purchased f.o.b. Florida factories for $1.75 per ton in carload lots, 1,900 to 1,960 pounds of Carbonate of Lime for practically one-tenth the cost of 1,100 pounds of the same material in ashes.

Growers are advised to write to the "Southern Settlement and Development Organization, Jacksonville, Fla., for Dr. Cyrel C. Hopkins for pamphlet: "Ground Limestone for Southern Soils," also to the Director of the Florida Agricultural Experiment Station, Gainesville, Fla., for Press Bulletin No. 148: "Using Ground Limestone."

Lime has been used by farmers for centuries. The old proverb: "Lime makes rich farmers and poor sons," is as true today as when first spoken many years ago.

Lime without added manures (vegetable matter), Potash and Phosphoric Acid, will certainly deplete soils of their plant foods.

Lime, however, used intelligently together with manure, legumes, Potash and Phosphates, will produce larger crops and increase the fertility and productiveness of soils.

COMMERCIAL FERTILIZERS FROM THE MANUFACTURER'S VIEW POINT.

Read by Mrs. N. M. G. Prange Before the County Demonstration Agents, Gainesville, Florida, February 3, 1914.

MR. CHAIRMAN, GENTLEMEN:

I am asked to speak to you today of fertilizer from a manufacturer's viewpoint. The manufacturer has no particular viewpoint, since to achieve greatest success he must take truth for his standard and seek real knowledge. I will speak of fertilizer as I know it after twenty-one years on a Florida farm and six years' association with the largest fertilizer company of the South—years of actual and successful field work, and years of careful scientific study.

LEARN TO UNDERSTAND THE TAG.

The first thing a grower should learn about commercial fertilizer is to read and understand the tag. The tag is the surety given by the State that the contents of the sack are not misrepresented. It must show the number of pounds of fertilizer, the analysis, and the materials from which it is made.

The moisture content is to guarantee good physical condition—that it is dry and easily handled, instead of a wet, sticky mass,—while the percentage of chlorine is given to protect the grower of those crops upon which the use of chlorides is detrimental. The percentage of ammonia, available phosphoric acid, and potash, show the amount of commercial plant food present, and the list

of materials gives the grower a chance to know whether this plant food is in a form suited to his use.

Note, I say "gives the grower a chance to know," for, as a matter of fact, a large percentage of the growers seldom read their tags, and when they do read them, do not understand them.

The State stands back of the tag, but a manufacturer can suit himself as to advertising matter.

THREE DISTINCT VALUES.

Fertilizer has three values: The State value, which makes no distinction as to sources; the market value, which is governed by supply and demand; and the agricultural value, which is determined by the field results secured.

It is the agricultural value in which we are most interested today. We want to consider the factors of really good fertilizer.

Though there are ten different elements essential to plant growth, Nature provides all these in abundance to the Florida grower except ammonia, phosphoric acid and potash. I expect some of you are wondering why I do not include lime, since practically all our soils need lime; but this need is as a base, not as a plant food, hence does not come under our present discussion.

While these three essentials of fertilizer all work together, each is most active in certain ways: ammonia inducing growth; phosphoric acid, fruiting; and potash, hardening the tissues. Both phosphoric acid and potash are active in plant developments apart from those in which they enter through actual combination; phosphoric acid bringing other elements into availability, while potash is essential to the formation of starch and sugar, though not a constituent of these compounds.

AS TO DETERMINING PLANTS' NEEDS.

The functions of plant organs are very intricate; they are not thoroughly understood by anyone, but we will not attempt even to go into the details that are well known. It is sufficient to emphasize that plants use in their growth far different proportions of the various elements than is shown by chemical annlysis, that all authorities agree that a chemical analysis of the soil does not determine the amount of food available to the plant. This makes impossible the plan usually advocated by the novice to analyze the soil and take the result from the general analysis of the crop to be grown in order that the lacking elements be supplied. Nature allows us no such cut-and-dried method.

The needs of crops must be learned through actual field work. It takes years of experience to get this information, and the man who is depending on field results for his living cannot afford to test out the many combinations possible in fertilizer applications. One season is wet, another dry; one extra warm, another extra cold; while other seasons may combine extremes. With these variations and others not mentioned, how is a grower to know to just what extent his results were governed by the fertilizer applied? Very often he forms conclusions based on his field work that are entirely at variance with the findings of carefully trained scientific men working under controlled conditions. Why? Because, in the field, results may be controlled by factors unnoticed by him. There is much said about theory and practice in farming, but when dealing with basic principles, it is the grower and not the scientist who is theoretical.

It is not at all unusual to have such good condition of the soil and favorable climatic influences as to produce a fine crop with very poor fertilization; neither is it unusual, especially where people have been experimenting with all sorts of mixtures, to have such abnormal soil con-

ditions as to cause a most abnormal fertilizer to give excellent results; but these are only exceptional cases and form no standard for general work. A man may spend year after year trying to "exactly meet his special needs," and each year he will find these needs to be different from those of the year before.

Now, I suppose you are asking, "If he can't do it, how is the fertilizer man going to do any better?" I will tell you. The fertilizer man has a very much broader experience than any single grower. Instead of one farm, one town, or even one section, he has spread before him the entire State, and, with less intimacy, the whole world. He does not try to meet special conditions except in a very broad way. He furnishes fertilizer suited to the different crops on different types of soil, but of such well balanced proportions as to give good general results whichever way the weather may turn.

How can he do this? Just as the life insurance man can tell what percentage of his risks will die in the next five years, or the transportation companies foretell the number of their passengers, the hotel man his guests, the merchant his trade, or any business man who deals in the law of averages. As the history of other businesses lies before these people, so does the history of crop production lie before the fertilizer manufacturer. He must know what will be most likely to produce a good crop under any of the many conditions which may occur.

MUST PLEASE THE CROPS.

Now, going into the fertilizer business does not give this knowledge to a man any more than buying a farm makes a successful farmer, but it is necessary for him to gain it if his business is to grow year after year. He may be ever so honest or of pleasing personality, but his success is dependent upon actual field results. In other words, *he* may please the *people*, but his *fertilizers must*

please the crops. If the crops do well, his buyer wants more fertilizer, and the neighbors want some; if the crops do not flourish, trade languishes; so I repeat, there is no particular viewpoint of the quality of fertilizer for the manufacturer. His aim must be to supply the needs of the crop.

What are these needs? I am going to make a statement that may be unpopular at first, but if we take a little review of other phases of life we may become in a measure prepared for it.

Did you ever know a love affair that to its participants did not have a distinction from all others; a marriage that was not expected to be entirely different than other marriages; a baby that was not to its fond parents something most wonderful as a specimen of the human race; or a sickness or surgical operation that was not supposed to be attended by peculiar conditions or complications?

Yet, we who are not the interested parties, laugh at the lovers; sigh and hope the young people will eventually find true happiness on a sensible basis; fail to see how *that* baby can be looked at as compared with our Johnnies and Marys; and know if the supposed sufferers once lived through the sicknesses we have had, theirs would seem as nothing; while if the truth were only known, others look upon our experiences in the same light.

ALL COME UNDER THE LAW OF AVERAGES.

It is against human nature to be willing to be just ordinary, but if we are to profit the most from life, we must accept the fact that life is rather ordinary, and that while we differ more or less on minor points, human nature is much the same and none of us have a special corner of this world for our exclusive occupancy. We may have a different type of soil than Bill Jones, but there are numerous John Browns who have close duplicates to our sup-

posedly "special conditions," and Bill Jones also has plenty of company.

"Special needs" is a term that is vastly overworked, and especially when applied to the crops of Florida. Except in extremely limited areas, all three essentials of fertilizer are lacking, and, though in some of the heavier lands the ammonia is lacking to a less extent than in the light soils, generally speaking, the grower has to *feed the crops* with little regard for natural resources. Throughout Florida, practically speaking, each particular crop needs the same percentages of ammonia, phosphoric acid and potash. What these percentages are has been well established through long experiences on general averages.

SOIL BUILDING THE PRIME NEED.

I think you will acknowledge a crop needs the same amount of water and air and the same soil texture wherever it may be grown. This calls for different forms of cultivation on different types of land. We have the rather heavy, moist land, and the light, dry type. By cultivation we strive to bring them to equality, insuring good drainage and aeration on the one and conservation of moisture on the other. While the two types of land are handled differently, there are acres upon acres of each type and of each gradation of these types, and what will conserve moisture on your land will conserve it on mine.

If you have been more energetic than I in building up the humus content of your soil you can hold more moisture and you can use more fertilizer to good advantage because you will have so much better soil conditions than I, and you will get better crops. If you grow legumes, you will provide a certain amount of valuable plant food from the air, not as much practically as scientific figures show, for there is loss from all sources of ammonia, but sufficient to make the practice essential to good farm management. In fact, there is so much to be said on the sub-

ject of soil building, that is, the establishment of optimum aeration, moisture, and bacterial action, it is with difficulty I touch upon it so lightly, but my time is limited and my subject a large one.

PROPERLY BALANCED PLANT FOOD.

Just as the plant needs right soil conditions, so does it need rightly balanced plant food. Since the variance in the content of plant elements in our Florida soils is very slight indeed, the changes in the fertilizers for the same crop are far more to meet soil conditions than to supply more or less of any of the plant food elements, though in many instances the natural ammonia must be considered. Since soil conditions are so very important, let us review briefly the influence in this direction of some of our most common fertilizer materials.

TENDENCIES TOWARDS ACIDITY.

All natural fertility and a great part of the commercial sources of plant food tend to acidity. The materials that tend to alkalinity do so to such slight extent that with crushed limestone at $1.75 per ton f.o.f. works, it never pays to run chances on losses from leaching or otherwise for the sake of the very slight amount of base obtained. As an example, Nitrate of Soda tends to alkalinity; Sulphate of Ammonia to acidity, yet the money value of these tendencies is ten cents for each per cent of ammonia. That is, the sodium left from one per cent ammonia derived from Nitrate of Soda is equal as a base to lime that would cost ten cents laid down at your home station, and this same amount of lime will satisfy the acidity left from one per cent of ammonia derived from Sulphate of ammonia. Therefore, from the acid viewpoint, there is twenty cents difference in these two sources.

In a formula carrying three per cent ammonia, all

from Nitrate of Soda, it is conservative to say that two-thirds of it will leach away before the plant can use it, the exact amount being dependent upon texture of soil and amount and distribution of rainfall. Hence the grower runs a good chance of losing between six and seven dollars worth of plant food in the attempt to save forty cents. If he seeks to avoid this loss by frequent applications, I will leave it to you to work out how much he gets for his labor. To my mind, forty cents could be more easily earned in other ways.

OTHER EFFECTS FAR-REACHING.

The effects on the chemical condition of the soil other than acidity are far-reaching. Fertilizer materials may either bring more plant food into availability or combine with ready available plant food to form less available compounds. They can also, by these chemical reactions, have decided influence on the physical condition of the soil. This latter change is not so noticeable on the sandy loams of peninsular Florida as on the heavier soils in the northern part of the State.

On clay soils, excessive amounts of Nitrate of Soda cause a packing, so also does Kainit, but Muriate of Potash tends to make clay friable. Organic matter ever has good influence on soil texture, since it opens up clay soils and fills in sandy ones. However, even this must be used with discretion. For instance, cotton seed meal, so useful on heavy, damp soils, because of its heating qualities, often proves disastrous on light, dry soils because of the same characteristic.

EFFECTS ON INSECTS AND DISEASE GERMS.

Then, too, there are the insects and disease germs living in the soil. Cotton seed meal and fish scrap attract cutworms, while castor meal, sheep manure, Muriate of Pot-

ash and Kainit repel them. Stable manure induces a rapid multiplication of disease germs, but Kainit has a decided tendency toward checking same. Kainit has an unexplained influence for good in the control of rust on cotton and blight on eggplant.

Besides these insect and disease enemies, there are many soil organisms working for us. Different materials excite or retard their development, and it is quite possible that biological influence is as important as any phase of the fertilizer question. To be sure, it is little understood, but the day has gone by when soil experts value fertilizers only for their actual commercial plant food constituents.

The effect of different fertilizer materials upon the plant is very pronounced in some instance and not noticeale in others. The citrus tree endures organic fertilizer only to a certain extent and under certain conditions; field crops are practically indifferent as to sources, while vegetables in general care little for their sources in making the plant, but need a goodly proportion of chemicals if the fruit is to be of fine, firm texture. Cotton seed meal makes stringy sweet potatoes, quick to decay, and either cotton seed meal or stable manure will produce a fine, luscious strawberry that will hold together hardly long enough to reach the station. Theoretically speaking, Sulphate of Potash is particularly desirable for Irish potatoes, but because of the influence of Muriate of Potash on soil conditions, field results are far better when a portion of the potash is derived from Muriate.

INDIRECT INFLUENCES.

Were there only one direct action of each material, the problem of what to use would be far easier, but we are obliged to take into consideration not only the effect on the plant and the fruit directly, but the indirect influences through the effect on the physical, chemical and biological conditions of the soil. These are very complex; often we

must endure the lesser evil for the sake of the greater good, and more often, alas, the novice sees only a lesser good which is accompanied by a greater evil. The solving of these details is beyond the capacity of man to the present date. It is true no two soils are exactly alike; neither can there be found two plants, or even two leaves exactly alike, but would any of us dare say two similar leaves did not serve the same purpose and respond to the same treatment?

When going into soil intricacies, has it occurred to you that no soil is ever exactly alike at any two different times? That under changing climatic conditions the variances in soil from the same spot will be every bit as great as between soils from similar fields? No one, not even the best of chemists, can tell the exact resources available to the plant at any one time, and certainly would not presume to foretell to a nicety the result of uncertain weather conditions. In fact, with all due respect to the knowledge at our command, the careful student must concede that the differences which exist under similar conditions are far too fine for our understanding or adjustment, and it is because of the utter impossibility of getting the exact answer that the average of wide experiences is so valuable.

HOW FORMULAS ARE DEVELOPED.

I do not want to be understood as claiming that all commercial formulas represent this desired average, or that no special mixtures can represent it. I have already stated that buying a fertilizer plant did not give the knowledge to the manufacturer, and we must also grant that owning a farm does not give it to the grower. However, there are some growers who are really gifted in working out field problems. They do not look upon plant life as merely a means of making money, though often these same growers so thoroughly understand their crops as to attain the greatest of moneyed success.

Such a grower studies his field and the work of others; he uses only a comparatively small plot for experiments, making his main crop with regular commercial formulas known to be adapted to his needs, or possibly with a special mixture he has worked up through previous experiments. When such special mixture shows its superiority over the commercial brands on the market at that time, it immediately becomes a commercial brand, for it is for just such instances that the enterprising fertilizer manufacturer is looking. The really good commercial formulas are developed in this way—through actual field experiments which are often co-operative between the manufacturer and the grower. The capable fertilizer manufacturer offers to you in the commercial formulas the best he can find from whatever source, and he has a wide outlook.

AMATEUR WORK IS WASTEFUL.

We do not want to stop in our search for knowledge, but for the grower, who has not the time or the gift to solve these problems, and who has not learned a tenth part of the knowledge at the command of anyone who studies the subject, it is a waste of time and money to struggle along with crude combinations when there is at his command at reasonable price the very best of plant food mixtures as measured by the human knowledge of today.

We all cannot be specialists along the same line; none of us could make as good shoes as we are wearing, though it is likely that we are superior in general intellect to the person who did make them. No two feet are exactly alike, yet we buy satisfactory shoes—light weight or heavy, plain or fancy, high-cut or low, black, tan or white, as our fancy dictates—and get far better service than did we select the calf and try to follow the whole process through to make sure of getting something to "exactly fit our special needs."

FLORIDA MANUFACTURERS.

The fertilizer manufacturer should be classed with other manufacturers and merchants. He is no more a "Beast of Prey" than is any other man who supplies your needs. In this move for farm improvement there is no justice in the attitude taken by many that the only hope of the farmer is to down the fertilizer man, which, when attempt is made to put it into practice, means merely to down the fertilizer men of his own State, for he has to supply his needs from some fertilizer company. It is well to consider carefully whether a company with large Florida investment really has the interest o fthe Florida grower less at heart than people whose investments in Florida are represented by their hotel bills. Probably there is not one of the supplies sold to the Florida grower that is furnished to him with such a combiantion of high quality, low profit, co-operation for success in its use, and concessions in regard to payment as is the fertilizer sold by the Florida manufacturer. I am speaking of Florida conditions and Florida manufacturers.

ARGUMENTS FOR HOME MIXING CONSIDERED.

Here are some of the arguments for home mixing:

(1) "Pay no freight on filler." When we get right down to the truth of the matter, very little filler is used in making fertilizer. The exceptions are when a low analysis is demanded from materials of high aanlysis. Generally speaking, the fertilizer materials carry the filler with them. Remember, there is only seventeen pounds of plant food in a hundred pounds Nitrate of Soda, which is one of the best fertilizer chemicals, while cotton seed meal, the farmer's own product, carries but seven and a half pounds to each hundred. It would be interesting to any of the "filler" agitators to take an ordinary commercial formula and figure out the ingredients. He will find

more often than not, that at first attempt in proportioning he has over two thousand pounds in his supposed ton.

(2) "Buy your materials so as to know what you are getting." Can any of you tell each of the different fertilizer materials by sight, and can you tell if they are unadulterated? I am sure you cannot. As a matter of fact, no one can tell the quality of fertilizer materials without chemical analysis. Fertilizer materials are bought on the dealer's guarantee. If he can be trusted on materials, why not on mixtures? To be sure, in either case the State law protects both the grower and the honest manufacturer, but if you will notice the reports, the greater part of the inspection work is done on mixed goods, leaving a far greater opportunity to sell questionable materials than questionable mixtures.

(3) "Save money." Did you ever think, no one is going to handle your business without adequate profit? If you buy in quantities and for cash, either straight materials or regular brands, you get liberal concessions, but it certainly is not fair to get prices on that basis, as some do, and then cut down the quantity and instead of paying cash let the account run. Neither is it fair to compare prices made by firms granting concessions in payment, with prices from those attaching draft to bill of lading, nor to get bids and show the lowect bid to other parties and dicker back and forth.

Business principles demand that the conditions named when prices are obtained be rigorously fulfilled, and that when business is opened to bids the lowest bidder gets the order. Neither is it of any avail to name unreasonable prices—prices from forced sales, or that are unfounded. There are instances when a firm has to realize on its stock. Such instances are the grower's good luck if he can benefit by them, but are no more a criterion for the prices of solid firms than are forced sales of merchandise a guide for prices in general trade. Then there is always the man who would have sold you for less than you paid, or who

will talk very attractively until you get down to business, then you will find this, that, and the other stipulation.

HOW TO REALLY SAVE MONEY.

The only way to save money is to do business in such a way that it can be handled economically and to see that you get the saving thus made. Any firm prefers this class of trade, whether in straight materials or in regular brands. Find the people best equipped to give you economical service. As an example: One man may give you a contract price on stumping your land and charge only fair profit over the actual cost of hand labor, while another man can do the same work for much less because of an up-to-date stump puller and still make a good profit on the job. The volume of his business warrants such equipmetn, and you can get the benefit all in a good, straight, fair way.

People in business look to their own interests; the point is to find in your dealings someone whose interests depend upon yours. Who could be so thoroughly dependent upon your success as the Florida fertilizer manufacturer? Your success makes his business. He gives you better value in one of his brands than on straight materials, for when good results are obtained from the use of that brand he is the only one supplying it, so the extra trade is sure to come to him. I say better value, for you get the actual plant food at the same price and get it in right proportions and combinations.

Now, perhaps we come to the questions, "What does he give in that brand that others cannot supply, considering that the analysis and materials are plainly stated on the tag, and wherein is the commercially mixed formula better than the home mixed made along the same lines?"

A QUESTION OF ACCURACY.

If the formula is made from just three materials, one

supplying the ammonia, one the phosphoric acid, and one the potash, any manufacturer can copy it if he does the work accurately and well. The only variance in commercial formulas of this nature would be in the honesty and chemical skill of the manufacturer. The honesty of the Florida manufacturer is unquestioned, but a careful study of the analyses of different brands will show that some chemists do far less accurate work than others.

In the home mixed goods, if there be a goodly content of organic matter the greatest trouble will be uneven mixing. H. C. Moore of Atlanta, Ga., has done considerable work in studying the results of crude mixing facilities. From a long array of figures I select as representative four samples of a mixture that was intended to analyze 9-2-3. As a matter of fact, the phosphoric acid in these samples actually run from eight and a quarter to nearly fifteen and a half (8.18 to 15.35) per cent, the ammonia from slightly over one-half to nearly three (.56 to 2.89) per cent, and the potash from less than one-half to three and a quatrer (.43 to 3.27) per cent. What would you say to the manufacturer who gave you such variable results as this? I would suggest that you have a reputable chemist analyze some of your own home mixtures. The results might be of interest.

MANUFACTURER MUST BE LIBERAL.

Then, too, it must be remembered that in home mixing the materials are reckoned to give the exact analysis desired, while in commercial formulas there must be a slight overrun to insure meeting the State's requirements. For his own protection the manufacturer is bound to give liberal measure. In every instance this overrun of plant food above the guarantee upon which the fertilizer is sold will amount to around two dollars; therefore, reckoning upon the plant food content alone, a commercial formula is worth about two dollars per ton more than a home mixture of supposedly the same analysis.

But in the case of chemicals which set when first combined, what does the ordinary farmer know of "conditioners," (and why should he know, any more than to know how to temper the steel of his plow point, or the details of any other manufactured product), and what facilities has he for re-grinding and screening? He simply cannot handle such combinations, therefore would be deprived of some of the best formulas he could use; and in both the largely organic and purely chemical, there would occur the imperfect combinations from mere mixing in place of grinding.

Were it possible to combine fertilizer materials with a "nigger" and a shovel, the enormous fertilizer plants never would exist, as the fertilizer men, like other capable people, spend only as their needs require. The fertilizer manufacturer has studied fertilizer so that he *knows* the shovel mixing does not bring the best results, and results is what he must get to bring trade, hence the expensive but absolutely necessary machinery.

JUDGMENT AND KNOWLEDGE REQUIRED.

Then, too, the capable fertilizer man does not mix materials that make volatile or unavailable compounds. I know one good trucker in years gone by who always put ashes with his fertilizer because they "made it so strong." His reason for thinking it was strong was the smell of the escaping ammonia. By such mixing he undoubtedly reduced the value of his fertilizer about three dollars per ton, yet he thought he had a great idea. He used enough fertilizer to make good crops, therefore, never realized his loss. I wonder if he continues the practice? Most growers know better now than to mix lime and ammonia, but there are many similar things they do not know.

Then, there is the proportioning. Formulas of only three sources are the exception and are certainly not to be advised in field or gardens. One source each of phos-

phoric acid and potash is sufficient so far as economy is concerned, as neither of these essentials leach away to any extent, but when we consider that practically all available ammonia is subject to leaching, the proportioning of ammoniates to insure a steady supply of nitrate with a minimum amount of loss is a question of vast importance and the key to the difference in field work of commercial formulas of the same analysis and ingredients.

There should be enough nitrate to supply the needs of the plant until the Sulphate of Ammonia comes itno availability, and enough Sulphate of Ammonia to last until the Tankage or other organic matter has been reduced to nitrate form. The slower ammoniates do not become available all at once, so if the proportioning is right there is very little loss. If, however, there is too great a proportion of nitrate a large part is likely to leach away leaving an insufficient supply for the later growth, for remember, we have only a definite amount of ammonia in the formula as indicated by the analysis. On the other hand, if we ahve too little nitrate there is a stunting period at first and a period later, perhaps of waste or perhaps of over growth. The same unbalanced condition occurs by the use of too small or too great proportions of the slower ammoniates. The point is to have food for the plants when they need it and just as little as possible in a form subject to waste.

VARIOUS NEEDS OF PLANTS.

These proportions are different for different crops. For instance, if the tomato plant is stunted during its early period of growth, though it may become a most luxuriant plant later, it never will be prolific. On the other hand, if corn is pushed too much at first, it is not prolific. Later on, the tomato blooms may be thrown by an over-abundance of nitrate, while the corn needs an extra application of nitrate just at silking time if the greatest yield is to be

secured. Different crops have different needs; different soils need different management, and can use to best advantage different fertilizer materials, but these needs have been carefully considered as the great number of fertilizer formulas show.

PROOF OF VALUE.

The worth of these formulas is indicated by their field work, and the field work is indicated by the volume of trade and the class of people as customers. Measured by this, commercial fertilizers must be a success, for the greatest yields of fanciest products throughout the State are made by our regular brands. The volume of business goes upward by leaps and bounds, increasing sometimes in a single year over thirty-three per cent, and the most prosperous and best informed growers, generally use the regular brands of the market. The few exceptions are where special mixtures are made at the factory from the grower's own formula or more rarely where the grower applies different fertilizer materials separately; but there is not to my knowledge a single instance where a grower of State-wide prominence follows the practice of home mixing. They have tried home mixing and discarded it as expensive and ineffective. In fact, it is generally conceded that "He who knows enough to mix his own fertilizer knows enough not to."

MRS. N. M. G. PRANGE.

THE STATE OF FLORIDA,

Department of Agriculture.

REGULATIONS GOVERNING THE TAKING AND FORWARDING OF SAMPLES OF COMMERCIAL FEEDING STUFF TO THE COMMISSIONER OF AGRICULTURE FOR ANALYSIS BY THE STATE CHEMIST.

The following regulations for drawing, preparing and sending samples of Commercial Fertilizer and Commercial Stock Feed, under the authority given in Section 15 of Chapter 4150, Acts of 1901 (Sec. 1277 General Statutes), and Sec. 15, Chapter 5452, Acts of 1907, are this day adopted.

OFFICIAL SAMPLES, drawn by State Chemist, Assist State Chemist or Inspectors.

An approximately equal quantity (a pint or a pound, approximately) shall be taken from each of ten original packages of the same brand in the possession of any manufacturer, dealer, or person, when the lot being sampled contains ten or more packages of the same brand.

In case the lot contains less than ten packages of the same brand, each package shall be sampled as directed.

PREPARATION OF SAMPLE.—The several samples, drawn as above from each package, shall be carefully and thoroughly mixed. From this well-mixed lot from each package drawn as above, a fair sample of not less than one pound each, in the case of fertilizers, and of not less than one-half pound in the case of stock feed, shall be placed in a bottle or tin can—approximately a quart can or bottle.

The sample shall be delivered to the State Chemist who shall prepare the sample for analysis (by properly grinding, mixing and sifting the same.) The State Chemist

shall retain one-half of this prepared sample for analysis; the remainder shall be placed in a glass bottle, sealed, and identified by the Laboratory number, and date, and placed in the custody of the Commissioner of Agriculture. These duplicate samples shall be retained for a period of three months from the date of the certificate of analysis. In case of appeal from analysis of the State Chemist (within three months from the date of the certificate) the sample shall be retained indefinitely, until the final disposition of the case.

SPECIAL SAMPLES.—Samples drawn and transmitted by the purchaser under Sections 9 of both the Commercial Fertilizer and the Commercial Stock Feed Laws.

The purchaser or owner of the material to be sampled, when the lot or shipment contains ten or more original packages of the same brand, shall take in the presence of two witnesses, an approximately equal quantity from each of ten packages of the same brand (approximately a pint or a pound), after carefully and thoroughly mixing these samples, a fair sample of the mixture, not less than a pound in the case of commercial fertilizer, and not less than one-half pound in the case of commercial stock feed, shall be placed in a bottle or tin can, and sealed in the presence of the witnesses.

On the sample thus drawn shall be written the name and address of the purchaser, and the name of a disinterested party, who shall transmit the package to the Commissioner of Agriculture by mail or express, properly packed to prevent damage in transportation.

In case the lot or shipment contains less than ten original packages of the same brand, each package shall be sampled as provided in the foregoing paragraph, the samples mixed, and a fair sample of the lot, "one or more packages", shall be drawn and transmitted as provided in the foregoing paragraphs.

The purchaser, or sender of the sample, shall also address a letter to the Commissioner of Agriculture, ad-

vising him of the sending of the sample. This letter must not be enclosed in the package.

The object of the sealed bottle or tin can is to prevent the evaporation of the moisture from the sample—an important determination.

SAMPLES IN PAPER OR WOODEN PACKAGES WILL NOT BE ACCEPTED.

These regulations are adopted to secure fair samples of sufficient size to allow the preservation of a duplicate sample in case of protest or appeal. This duplicate sample will be preserved for three 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 samples as fixed by law is obvious.

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

The attention of those who desire to avail themselves of this privilege is called to Sections 9 and 10 of the laws, which are clear and explicit.

NOTE.—HEREAFTER STRICT COMPLIANCE WITH ABOVE REGULATIONS WILL BE REQUIRED. THE SAMPLE MUST NOT BE LESS THAN ONE POUND OF FERTILIZER OR ONE-HAIF POUND OF STOCK FEED, IN A TIN CAN OR BOTTLE, SEALED AND ADDRESSED TO THE COMMISSIONER OF AGRICULTURE. THE PURCHASER'S NAME AND ADDRESS, AND THE NAME OF THE SENDER, MUST ALSO BE ON THIS PACKAGE, THIS RULE APPLYING TO SPECIAL SAMPLES OF FERTILIZERS OR COMMERCIAL FEEDING STUFF.

NOTE.—A one-pound baking powder tin can, properly cleaned, filled with a fairly drawn, well mixed sample drawn as directed, is a proper sample. IT MUST BE SEALED

AND ADDRESSED TO THE COMMISSIONER OF AGRICULTURE, AT TALLAHASSEE. THE PURCHASER'S NAME AND ADDRESS, AND THE NAME OF THE SENDER, MUST ALSO BE PLACED ON THE PACKAGE.

IF MORE THAN ONE SAMPLE IS SENT REPRESENTING DIFFERENT BRANDS, THE SAMPLES MUST 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 A DISINTERESTED PERSON.

NOTE.—The tags off the sacks with analyses, and names of manufacturers should be retained by the purchaser, 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 WITNESSEE, SHOULD ALSO BE RETAINED BY THE PURCHASER; NOT SENT TO THIS OFFICE.

This regulation supersedes and revokes all previous regulations governing the drawing and transmitting of samples of Commercial Fertilizer and Commercial Stock Feed.

W. A. MCRAE,
Commissioner of Agriculture.
R. E. ROSE,
State Chemist.

Tallahassee, Florida, September 5, 1914.

THE STATE OF FLORIDA,

Department of Agriculture.

RULES AND REGULATIONS GOVERNING THE ANALYSIS OF WATER, SOILS, COMMERCIAL SAMPLES, AND SAMPLES INVOLVING CRIMINAL CASES.

WATER ANALYSIS.

The State Laboratory will analyze samples of 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.

It will 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, river, 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.

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 wells 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.

SOIL ANALYSIS.

Frequently samples of soil are 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 Florida 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 of 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, Indiana, 1908, as follows:

"Soil Analysis 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."

ANALYSIS OF FOODS AND DRUGS.

Samples of Foods and Drugs are drawn under special regulations as provided by law.

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.

FOOD AND DRUG SAMPLES NOT DRAWN AND TRANSMITTED ACCORDING TO LAW WILL NOT BE ACCEPTED FOR ANALYSIS.

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 Law.

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.

W. A. McRae,
Commissioner of Agriculture.
R. E. Rose,
State Chemist.

Tallahassee, Florida, September 5, 1914.

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.

NEW YORK WHOLESALE PRICES, CURRENT

OCT. 1, 1914—FERTILIZER MATERIALS.

"Under unsettled conditions, quotations are

WHOLLY NOMINAL.

AMMONIATES.

Ammonia, Sulph., foreign, prompt.....	2.55	@	2.70
futures	2.55	@	—
Ammonia, Sulph., domestic, spot.....	2.55	@	2.80
futures	—	@	—
Fish Scrap, drier 11 p.c. Ammonia and 14 p.c. Bone Phosphate, f.o.b. fish works.....per unit	3.35	@	10
wet, aciduated, 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., Baltimore, or Philadelphia	—	@	—
Tankage, 11 p.c. and 15 p.c. f.o.b. Chicago	2.95	@	10
Tankage, 10 and 20 p.c., f.o.b. Chicago, ground	3.05	@	10
Tankage, 9 and 20 p.c., f.o.b. Chicago, ground	3.05	@	10
Tankage, concentrated, f.o.b. Chicago, 14 to 15 p.c., f.o.b. Chicago.....	2.95	@	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	3.15	@	—
Chicago	3.00	@	—
Nitrate of Soda, 95 p.c. spot, per 100 lbs	1.90	@	—
futures, 95 p.c.....	1.80	@	1.90

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, 1¼p. c. ammonia and 60 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 Pvhosphate 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.....	Nominal
Muriate of Potash, min. 95 per cent., basis 80 per cent., in bags.....	"
Muriate of Potash, min. 98 per cent., basis 80 per cent., in bags.....	"
Sulphate of Potash, 90-95 per cent., basis 80 per cent., in bags.....	"
Double Manure Sale, 48-53 per cent., basis 48 per cent., in bags.....	"
Manure Salt, min. 20 per cent., K_2O, in bulk.....	"
Kainit, min. 12.4 per cent., K_2O, in bulk	"

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

"Under unsettled conditions, quotations are wholly nominal."

Ammoniates.

Nitrate of Soda, 17% Ammonia	$ 56.00
Sulphate of Ammonia, 25% Ammonia	74.00
Dried Blood, 16% Ammonia	70.00
Cynanamid, 18% Ammonia	60.00

Potash.

High Grade Sulphate of Potash, 90% Sulphate, 48% K_2O	Nominal
Low Grade Sulphate of Potash, 48% Sulphate, 26% K_2O	"
Muriate of Potash, 80%; 48% K_2O	"
Nitrate of Potash, imported, 15% Ammonia, 44% Potash K_2O	"
Nitrate of Potash, American, 13% Ammonia, 42% Potash K_2O	"
Kainit, Potash, 12% K_2O	18.00
Canada Hardwood Ashes, in bags, 4% K_2O Potash	20.00

Ammonia and Phosphoric Acid.

Water Soluble Tankage, 14% Ammonia	$ 65.00
High Grade Tankage, 10% Ammonia, 10% Phosphoric Acid	49.00
Tankage, 8% Ammonia, 18% Phosphoric Acid	43.00
Low Grade Tankage, 6½% Ammonia, 12% Phosphoric Acid	39.00

Hotel Tankage, 6% Ammonia, 7% Phosphoric Acid	35.00
Sheep Manure, ground, 5% Ammonia	27.00
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	38.00
Ground Castor Pomace, 5½% Ammonia, 2% Phosphoric Acid	26.00
Bright Cotton Seed Meal, 7½% Ammonia	25.00
Dark Cotton Seed Meal, 4½% Ammonia	22.00

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.

STATE VALUATIONS.

(Based on commercial values, July 1st, 1914)

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 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 published in this report, with the "State values" Sept 1, 1914, are nominal.

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."

Based on Commercial Values July 1, 1914.

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 12, Act Approved May 24, 1905.

NAME, OR BRAND.	Laboratory Number.	Moisture.	Phosphoric Acid			Ammonia.	Potash (K_2O).	BY WHOM SENT.
			Available.	Insoluble.	Total.			
Fertilizer	3369	7.08	7.60	0.70	8.30	4.12	7.12	Geo. F. Nelson, Floral City.
Cotton Seed Meal	3370	.....	.....	.....	.....	8.05	.....	H. I. Enzor, Baker.
Fertilizer	3371	12.81	11.45	0.05	11.50	2.00	1.95	H. I. Enzor, Baker.
Fertilizer No. 4	3372	1.83	5.53	4.52	10.05	2.99	13.14	J. P. Cowburn, Crescent City.
Fertilizer	3373	14.18	4.65	0.15	4.80	4.67	6.32	W. H. Crawford, Zolfo.
Fertilizer	3374	.....	9.65	0.80	10.45	2.70	2.27	J. A. McVicker, Gulliver.
Fertilizer No. 5	3375	6.65	10.05	0.45	10.50	2.39	11.96	H. S. Riggins, Winter Haven.
Kelp Ashes	3376	.....	.....	.....	.....	.....	11.05	Chas. Carroll, Yamato.

Fertilizer No. 1	3377	12.46	7.28	0.82	8.10	3.65	5.62	P. W. Lanfear, Citrus Center.
Fertilizer No. 1	3378	7.01	7.48	0.77	8.25	4.10	7.49	C. S. Keating, Citrus Center.
Fertilizer No. 2	3379	8.90	7.85	0.85	8.70	4.15	5.76	C. S. Keating, Citrus Center.
Fertilizer No. 3	3380	9.47	7.00	0.75	7.75	6.00	2.58	C. S. Keating, Citrus Center.
Fertilizer No. 4	3381	10.32	7.50	1.10	8.60	4.50	4.50	C. S. Keating, Citrus Center.
Fertilizer No. 5	3382	10.47	6.15	0.85	7.00	3.95	6.51	C. S. Keating, Citrus Center.
Fertilizer No. 6	3383	11.41	5.08	0.92	6.00	4.30	5.54	C. S. Keating, Citrus Center.
Fertilizer	3384	9.05	9.38	0.72	10.10	3.13	4.80	M. P. Rushing, Ponce de Leon.
Fertilizer	3385	8.98	11.55	0.85	12.40	2.69	4.25	M. R. Senterfitt, Holt.
Fertilizer	3386	6.84	4.80	1.90	6.70	4.15	12.71	Walter Cliff, Crescent City.
Fertilizer	3387	7.25	7.08	0.50	7.58	3.93	11.15	C. E. Taylor, DeLand.
Fertilizer No. 1	3388	8.29	6.65	1.22	7.87	3.60	12.14	W. N. Swain, Millville.
Corn Special	3389	6.80	4.74	0.76	5.50	2.10	6.66	C. W. Prates, DeFuniak Springs.
Fertilizer No. 2	3390	14.20	9.85	1.95	11.80	2.33	3.24	W. N. Swain, Millville.
Special Mixture	3391	.....	9.65	0.35	10.00	2.95	7.39	John Haughton, Branford.
Fertilizer	3392	11.44	8.70	0.20	8.90	3.90	9.36	H. A. Perry, Pomona.

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	3392	8.25	7.13	0.67	7.80	4.23	11.76	C. E. Taylor, DeLand.
Tankage	3394	.....	3.08	2.32	5.40	1.84	.....	J. Helseth, Viking.
Cotton Seed Meal	3395	.....	.....	.....	.....	7.40	.....	E. O. Painter Fertz. Co., Jacksonville.
Fertilizer No. 1	3396	5.71	9.63	1.12	10.75	2.70	7.10	J. C. Smith, Glendale.
Fertilizer No. 2	3397	7.91	9.70	1.15	10.85	2.25	2.57	J. C. Smith, Glendale.
Fertilizer No. 3	3398	10.13	10.98	0.70	11.68	.....	4.11	J. C. Smith, Glendale.
Fertilizer	3399	7.20	6.58	1.02	7.60	4.55	7.86	Z. G. Holland, St. Johns Park.
Fertilizer	3400	8.41	7.55	1.10	8.65	4.07	7.80	Geo. Salyereds, St. Johns Park.
Fertilizer	3401	7.11	7.25	0.80	8.05	4.00	7.75	P. T. Pellicer, St. Johns Park.
Fertilizer	3402	11.85	10.15	0.65	10.80	2.40	4.49	R. S. Renfroe, Gonzalez.
Nitrate of Soda	3403	.....	.....	.....	.....	17.20	.....	A. D. Dutton, Ancilla.

Fertilizer No. 1	3404	9.58	8.33	1.27	9.60	2.23	5.96	J. M. Miller, Dorcas.
Fertilizer No. 2	3505	10.33	10.77	0.63	11.40	2.50	2.02	J. M. Miller, Dorcas.
Fertilizer	3406	.....	5.63	1.07	6.70	4.85	4.68	J. P. Buchan, Tiger Bay.
Fertilizer	3407	10.91	5.50	1.75	7.25	5.08	7.53	D. G. Calkins, E. Palatka.
Fertilizer	3408	6.36	7.30	1.30	8.60	4.62	9.49	J. W. Case, Hastings.
Fertilizer No. 2	3409	5.66	7.80	1.50	9.30	5.00	0.95	J. W. Case, Hastings.
Hardwood Ashes	3410	.....	.....	.....	.....	.....	3.61	B. F. Blackburn, Osprey.
Cotton Seed Meal	3411	.....	.....	.....	.....	7.35	.....	Phoenix Fruit Co., Stuart.
Fertilizer	3412	5.83	4.11	5.29	9.40	5.42	5.32	A. W. Warner, Jensen.
Cotton Seed Meal	3413	.....	.....	.....	.....	8.10	.....	J. O. Holman, Quincy.
Tankage	3414	.....	.....	.....	.....	9.85	.....	Fred W. Lease, Ft. Meade.
Fertilizer	3415	8.98	1.23	0.57	1.80	6.03	3.45	Seminole Fruit Co., Ft. Pierce.
Fertilizer	3416	.....	6.00	0.85	6.85	3.02	2.77	Z. T. Bagwell, Zolfo.
Fertilizer No. 1	3417	12.51	6.18	1.12	7.30	3.98	5.61	Bert L. Woolf, Citrus Center.
Fertilizer No. 2	3418	13.94	6.00	1.10	7.10	3.75	6.58	Bert L. Woolf, Citrus Center.
Fertilizer No. 3	3419	12.23	6.00	1.32	7.32	4.08	5.65	Bert L. Woolf, Citrus Center.

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. 4	3420	13.23	4.73	1.02	5.75	4.42	5.55	Bert L. Woolf, Citrus Center.
Fertilizer No. 5	3421	14.96	5.60	1.30	6.90	3.85	5.01	Bert L. Woolf, Citrus Center.
Fertilizer No. 6	3422	10.65	6.95	0.95	7.90	4.14	5.15	Bert L. Woolf, Citrus Center.
Fertilizer	3423	16.37	5.16	1.49	6.65	3.35	4.11	J. A. Nagel, Citrus Center.
Fertilizer	3424	.....	6.10	1.10	7.20	2.58	9.94	R. A. Baskin, Anthony.
Sea Weed Ash	3425	.....	.....	.....	0.20	.....	0.90	DuVal & Franklin, Miami.

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

FERTILIZER SECTION.

R. E. ROSE, State Chemist. OFFICIAL FERTILIZER ANALYSES, 1914. L. HEIMBURGER, 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 MANUFACTURED
				Available.	Insoluble.	Total.			
Standard Grade Cotton Seed Meal	1986	Guaranteed	.....	.....	.....	.....	7.50	.....	Richland Cotton Oil Co., Richland, Ga.
		Found	.....	.....	.....	.....	7.56	.....	
Cotton Seed Meal	1987	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Cuthbert Oil Co., Cuthbert, Ga.
		Found	.....	.....	.....	.....	7.83	.....	
Better Grade	1988	Guaranteed	.....	10.00	.....	.....	1.00	3.00	A. D. Campbell, Chipley, Fla.
		Found	7.30	11.97	0.64	12.61	1.20	2.91	
Myers' Choice	1989	Guaranteed	.....	5.00	.....	.....	2.00	6.00	A. D. Campbell, Chipley, Fla.
		Found	5.87	9.29	0.40	9.69	1.99	6.86	
Bigbee Meal Compound	1990	Guaranteed	16.00	8.00	0.50	.....	1.00	3.00	Bigbee Fertz. Works, Pensacola, Fla.
		Found	7.11	11.32	0.57	11.89	0.97	2.48	

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
New Life	1991	Guaranteed	.....	10.00	.....	.....	2.00	2.00	A. D. Campbell, Chipley, Fla.
		Found	8.32	9.05	1.56	10.61	1.90	2.37	
Bigbee Fish Guano	1992	Guaranteed	16.00	10.00	0.50	.....	2.00	2.00	Bigbee Fertz. Works, Pensacola, Fla.
		Found	11.43	11.65	1.33	12.98	1.82	2.23	
Favorite Early Trucker	1993	Guaranteed	10.00	6.00	2.00	.....	3.00	10.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	7.79	6.02	0.39	6.41	3.25	10.60	
Favorite Bean Special No. 2	1994	Guaranteed	10.00	5.00	1.00	.....	5.00	6.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	6.11	5.07	0.57	5.64	4.79	6.40	
Favorite Bone-Black and Potash Compound	1995	Guaranteed	10.00	8.00	0.50	.....	.....	12.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	6.00	7.85	0.74	8.59	.....	10.74	
Price's Lettuce Special	1996	Guaranteed	10.00	5.00	.....	.....	5.00	5.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	6.38	5.81	0.58	6.39	5.16	5.00	
Favorite Non-Ammoniated Special	1997	Guaranteed	10.00	10.00	1.00	.....	.....	11.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	9.59	11.01	0.28	11.29	.....	9.33	

Hastings' Meal Mixture.....	1998	Guaranteed	10.00	7.00	.....	.....	4.00	7.50	Independ't Fertz. Co.,
		Found	5.92	7.07	0.89	7.96	3.95	10.12	Jacksonville, Fla.
Favorite Fruiter Manure.....	1999	Guaranteed	10.00	8.00	0.05	.....	4.00	12.00	Independ't Fertz. Co.,
		Found	3.19	9.37	0.24	9.69	5.15	9.71	Jacksonville, Fla.
Potato Producer	2000	Guaranteed	10.00	5.00	.....	.....	5.00	7.50	Independ't Fertz. Co.,
		Found	13.75	5.73	1.22	6.95	4.39	8.32	Jacksonville, Fla.
Favorite Orange Formula.....	2001	Guaranteed	10.00	6.00	1.00	.....	3.00	14.00	Independ't Fertz. Co.,
		Found	5.60	8.13	0.11	8.24	2.87	13.63	Jacksonville, Fla.
Favorite Vegetable	2002	Guaranteed	10.00	7.00	2.00	.....	4.00	6.00	Independ't Fertz. Co.,
		Found	6.26	7.77	0.83	8.60	3.81	5.66	Jacksonville, Fla.
Cotton Seed Meal.....	2003	Guaranteed	.....	.....	.....	2.00	7.50	1.50	McCaw Mfg. Co., Ma-
		Found	.....	.....	.....	.....	7.35	.....	con, Ga.
Va.-Car. High Grade Fish Guano	2004	Guaranteed	10.00	10.00	2.00	.....	2.00	2.00	Va.-Car. Chem. Co.,
		Found	7.65	8.95	5.42	14.37	2.18	1 26	Montgomery, Ala.
Standard Tomato Special.....	2005	Guaranteed	8.00	5.00	2.00	7.00	4.00	10.00	Standard Fertz. Co.,
		Found	11.55	7.56	0.63	8.19	3.76	9.05	Gainesville, Fla.
W. F. Hastings Potato Special.	2006	Guaranteed	10.00	6.00	.....	.....	4.00	7.00	Wilson&ToomerFertz.
		Found	5.85	8.43	1.32	9.75	4.03	7.21	Co., Jacks'ville, Fla.
Ideal Vegetable Manure.....	2007	Guaranteed	10.00	6.00	1.00	.....	4.00	8.00	Wilson&ToomerFertz.
		Found	8.50	8.58	0.75	7.83	4.16	7.77	Co., Jacks'ville, Fla.
Ideal Celery Fertilizer	2008	Guaranteed	10.00	3.00	2.00	.....	6.00	7.00	Wilson&ToomerFertz.
		Found	4.97	3.88	2.15	6.03	5.92	8.22	Co., Jacks'ville, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Special Mixture	2009	Guaranteed	10.00	6.00	.....	.....	4.25	7.75	Am. Agri. Chem. Co.,
		Found	5.17	6.29	2.53	8.82	4.55	7.89	Jacksonville, Fla.
Armour's High Grade Blood and Bone	2010	Guaranteed	10.00	3.00	1.50	.....	10.00	.....	Armour's Fertz. Wks.,
		Found	.....	.....	.....	9.45	9.83	.....	Jacksonville, Fla.
Armour's Irish Potato Special..	2011	Guaranteed	10.00	5.50	1.00	.....	3.50	8.50	Armour's Fertz. Wks.,
		Found	4.82	5.66	0.80	6.46	3.25	8.10	Jacksonville, Fla.
Armour's Practical Trucker....	2012	Guaranteed	10.00	6.00	1.00	.....	3.00	10.00	Armour's Fertz. Wks.,
		Found	5.40	6.03	0.57	6.60	3.05	9.17	Jacksonville, Fla.
Gulf Celery Special.....	2013	Guaranteed	10.00	5.00	1.00	6.00	6.00	7.50	The Gulf Fertz. Co.,
		Found	7.65	7.05	0.19	7.24	5.59	9.15	Tampa, Fla.
Gulf Orange Special.....	2014	Guaranteed	10.00	6.00	1.00	7.00	4.00	11.00	The Gulf Fertz. Co.,
		Found	6.06	7.53	0.72	8.25	4.21	11.98	Tampa, Fla.
Southern Tree Grower.....	2015	Guaranteed	8.00	6.00	1.00	.....	4.00	8.00	The Southern Fertz
		Found	6.73	7.10	0.17	7.27	4.04	9.97	Co., Orlando, Fla.

Vegetable Fertilizer	2016	Guaranteed	8.00	6.00	2.00	.....	5.00	6.00	The Southern Fertz.
		Found	7.23	6.49	1.32	7.81	4.84	7.12	Co., Orlando, Fla.
Special Mixture, 4-10-10-A	2017	Guaranteed	.....	.....	.....	10.00	4.00	10.00	E. O. Painter Fertz.
		Found	6.10	7.70	3.62	11.32	4.26	10.45	Co., Jacksonville, Fla.
Germofert Orange Fruiter, Special	2018	Guaranteed	5.00	3.00	9.00	12.00	2.00	16.00	The Tampa Fertilizer
		Found	3.12	6.88	9.15	16.03	2.14	12 27	Co., Tampa, Fla.
Va.-Car. Early Potato Manure	2019	Guaranteed	8.00	7.00	1.00	.....	4.00	7.00	Va.-Car. Chemical Co.,
		Found	3.85	9.22	0.89	10.12	3.90	7.39	Sanford, Fla.
Sun Hastings Potato Fertilizer.	2020	Guaranteed	10.00	7.00	1.00	.....	4.00	7.00	Peninsular Fertz. Co.,
		Found	6.80	7.29	1.24	8.63	4.18	6.98	Palatka, Fla.
Sun Hastings Potato Fertilizer.	2021	Guaranteed	10.00	5.00	1.00	.....	4.50	8.00	Peninsular Fertz. Co.,
		Found	5.62	5.82	0.07	5.89	4.70	9.52	Palatka, Fla.
Acid Phosphate 16%	2022	Guaranteed	10.00	1.60	1.00	.....	.....	.....	Armour's Fertz. Wks.,
		Found	.....	17.82	0.96	18.79	.....	.....	Jacksonville, Fla.
Special Mixture	2023	Guaranteed	10.00	6.50	1.50	.....	4.25	7.50	Armour's Fertz. Wks.,
		Found	5.19	6.79	1.15	7.94	4.68	7.14	Jacksonville, Fla.
Young Tree Fertilizer	2024	Guaranteed	10.00	6.00	1.00	.....	5.00	4.00	Armour's Fertz. Wks.,
		Found	4.66	6.02	0.27	6.29	4.80	4.69	Jacksonville, Fla.
Dixie Trucker Fertilizer	2025	Guaranteed	8.00	6.00	1.00	.....	4.00	8.00	Va.-Car. Chemical Co.,
		Found	4.52	7.16	0.32	6.84	4.94	8.61	Sanford, Fla.
Celery Special	2026	Guaranteed	8.00	6.00	1.00	.....	6.00	8.00	Va.-Car. Chemical Co.,
		Found	6.02	6.68	0.37	7.05	6.39	8.01	Sanford, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Special Formula for Corn.....	2027	Guaranteed	10.00	8.00	.....	.....	2.50	3.50	Wilson&ToomerFertz.
		Found	8.92	9.01	0.96	9.96	2.81	4.83	Co., Jacksonville, Fla.
Ideal Tomato Special.....	2028	Guaranteed	8.00	6.00	.....	.....	5.00	5.00	Wilson&ToomerFertz.
		Found	5.67	7.05	2.14	9.15	5.53	4.79	Co., Jacksonville, Fla.
Ideal Cucumber Special.....	2029	Guaranteed	8.00	5.00	.....	.....	4.00	6.00	Wilson&ToomerFertz.
		Found	8.22	6.72	0.08	6.80	4.08	6.11	Co., Jacksonville, Fla.
Wilson & Toomer's Special Mixture No. 1.....	2030	Guaranteed	8.00	6.00	1.00	.....	5.00	5.00	Wilson&ToomerFertz.
		Found	7.58	7.62	1.72	9.34	5.07	5.55	Co., Jacksonville, Fla.
Germofert H. G. Special.....	2031	Guaranteed	5.00	5.00	7.00	12.00	4.00	6.00	The Tampa Fertz. Co.,
		Found	5.99	6.72	7.83	14.55	3.50	6.88	Tampa, Fla.
Germofert Fruit & Vine No. 2..	2032	Guaranteed	5.00	3.00	.....	12.00	3.00	10.00	The Tampa Fertz. Co.,
		Found	5.68	6.36	6.10	12.46	3.39	11.42	Tampa, Fla.
Germofert Grapefruit Special..	2033	Guaranteed	5.00	3.00	.....	12.00	4.00	10.00	The Tampa Fertz. Co.,
		Found	5.36	5.16	7.27	12.43	4.25	9.41	Tampa, Fla.

Germofert Tampa Fruiter.....	2034	Guaranteed	5.00	3.00	9.00	12.00	4.00	12.00	The Tampa Fertz. Co.,
		Found	3.68	6.17	7.07	13.24	3.75	12.84	Tampa, Fla.
Gulf Fruit and Vine.....	2035	Guaranteed	10.00	6.00	1.00	7.00	3.00	10.00	The Gulf Fertz. Co.,
		Found	4.25	7.41	4.18	11.59	3.20	10.18	Tampa, Fla.
Gulf Sea Fowl Guano.....	2036	Guaranteed	10.00	7.00	1.00	8.00	5.00	8.00	The Gulf Fertz. Co.,
		Found	11.23	8.29	1.83	10.12	4.30	8.26	Tampa, Fla.
Tomato Special	2037	Guaranteed	10.00	5.00	1.00	6.00	4.50	8.00	The Gulf Fertz. Co.,
		Found	9.41	6.07	0.29	6.36	4.29	8.49	Tampa, Fla.
Gulf Citrus Special.....	2038	Guaranteed	8.00	6.00	1.00	7.00	4.00	8.00	The Gulf Fertz. Co.,
		Found	6.35	6.52	1.10	7.62	4.17	10.08	Tampa, Fla.
Special Fruit and Vine.....	2039	Guaranteed	8.00	6.00	1.00	7.00	3.00	13.00	The Gulf Fertz. Co.,
		Found	6.99	7.03	0.09	7.12	3.35	13.82	Tampa, Fla.
Gulf Orange Tree Grower.....	2040	Guaranteed	8.00	6.00	1.00	7.00	5.00	5.00	The Gulf Fertz. Co.,
		Found	9.40	6.48	0.07	6.55	5.78	6.15	Tampa, Fla.
Vegetable Special	2041	Guaranteed	10.00	6.00	1.00	7.00	5.00	5.00	The Gulf Fertz. Co.,
		Found	9.56	7.48	0.92	8.40	5.27	5.53	Tampa, Fla.
German Kainit	2042	Guaranteed	15.00	.....	.....	.....	.....	12.50	The Gulf Fertz. Co.,
		Found	.....	.....	.....	.....	.....	13.01	Tampa, Fla.
Number Three	2043	Guaranteed	8.00	6.00	2.00	.....	4.00	10.00	The Southern Fertz.
		Found	7.19	6.57	0.49	7.06	4.03	11.87	Co., Orlando, Fla.
Bradley Fruit and Vine.....	2044	Guaranteed	10.00	5.50	1.00	.....	2.25	10.00	Am. Agri. Chem. Co.,
		Found	6.98	6.47	0.62	7.09	2.36	10.30	Jacksonville, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Bradley Orange Vine.....	2045	Guaranteed	10.00	6.00	1.00	.....	3.50	5.00	Am. Agri. Chem. Co., Jacksonville, Fla.
		Found	5.95	7.75	0.87	8.60	3.57	4.63	
Armour's Vegetable	2046	Guaranteed	10.00	7.00	1.00	.....	4.00	6.00	Armour's Fertz. Wks., Jacksonville, Fla.
		Found	8.04	8.12	0.69	8.81	3.73	6.22	
Mobile Standard Guano.....	2047	Guaranteed	10.00	8.00	2.00	.....	2.00	2.00	Va.-Car. Chem'cal Co., Montgomery, Ala.
		Found	12.56	8.04	4.41	12.45	2.17	1.65	
Gem Meal Mixture.....	2048	Guaranteed	10.00	10.00	2.00	.....	2.00	2.00	Va.-Car. Chemical Co., Montgomery, Ala.
		Found	10.40	10.36	2.08	12.44	1.89	2.50	
Mapes' Vegetable Manure.....	2049	Guaranteed	12.00	6.00	2.00	.....	5.00	4.00	Mapes For.&Perv. Guano Co., N. Y. City.
		Found	10.21	7.74	3.25	10.99	5.34	5.27	
Mapes' Orange Tree Manure..	2050	Guaranteed	12.00	6.00	2.00	.....	4.00	3.00	Mapes For.&Perv. Guano Co., N. Y. City.
		Found	9.71	7.65	4.18	11.83	4.02	3.37	
Dekle's Corn Maker.....	2051	Guaranteed	10.00	8.00	2.00	.....	2.00	6.00	Gulf Chemical Co., Marianna, Fla.
		Found	7.54	9.28	1.59	10.87	1.77	6.03	

Florida Grange	2052	Guaranteed	10.00	8.00	2.00	.....	2.00	4.00	Gulf Chemical Co.,
		Found	8.07	9.18	0.91	10.09	2.01	4.61	Marianna, Fla.
Marianna Special Guano	2053	Guaranteed	10.00	10.00	2.00	.....	2.00	2.00	Gulf Chemical Co.,
		Found	8.63	10.65	1.06	11.71	2.27	2.70	Marianna, Fla.
Jackson County Mixture	2054	Guaranteed	10.00	10.00	2.00	.....	1.00	3.00	Gulf Chemical Co.,
		Found	8.87	11.17	0.35	11.52	1.05	3.63	Marianna, Fla.
Lawn Special	2055	Guaranteed	10.00	6.00	1.00	7.00	5.00	5.00	Gulf Fertilizer Co.,
		Found	10.62	7.42	2.44	9.86	4.47	6.44	Tampa, Fla.
Gulf Fruit and Vine	2056	Guaranteed	10.00	6.00	1.00	7.00	3.00	10.00	Gulf Fertilizer Co.,
		Found	5.01	8.71	4.26	12.97	3.20	9.52	Tampa, Fla.
Gem Lawn	2057	Guaranteed	10.00	7.00	1.00	.....	6.50	5.00	E. O. Painter Fertz.
		Found	6.12	8.21	1.33	9.54	6.63	5.89	Co., Jacks'ville, Fla.
Simon Pure No. 1	2058	Guaranteed	8.00	6.00	1.00	.....	4.00	12.00	E. O. Painter Fertz.
		Found	6.57	7.23	0.57	7.80	4.54	11.21	Co., Jacks'ville, Fla.
Williams & Clark Florida Vegetable	2059	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Am. Agri. Chem. Co.,
		Found	7.37	7.56	0.71	8.27	3.78	5.30	Jacksonville, Fla.
Gem Grapefruit	2060	Guaranteed	.....	6.00	.....	.....	4.00	12.00	E. O. Painter Fertz.
		Found	6.61	6.38	0.58	6.96	4.00	11.98	Co., Jacks'ville, Fla.
Lawn Fertilizer	2061	Guaranteed	10.00	5.00	1.00	.....	5.00	5.00	Am. Agri. Chem. Co.,
		Found	6.75	6.75	0.33	7.08	4.72	4.81	Jacksonville, Fla.
Cotton Seed Meal	2062	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Fla. Cotton Oil Co.,
		Found	.....	.....	.....	.....	7.16	.....	Tallahassee, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Dunham Brand Sea Island Cotton Seed Meal	2063	Guaranteed	.....	.....	.....	2.50	4.50	1.50	Fla. Cotton Oil Co., Jacksonville, Fla.
		Found	.....	.....	.....	.....	5.11	.....	
Cotton Seed Meal	2064	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Buckeye Oil Co., Macon, Ga.
		Found	.....	.....	.....	.....	7.37	.....	
Cotton Seed Meal	2065	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Buckeye Oil Co., Macon, Ga.
		Found	.....	.....	.....	.....	7.40	.....	
Medium Grade Cotton Seed Meal	2066	Guaranteed	.....	.....	.....	2.00	7.50	1.00	Correy Cotton Oil Co., Eufaula, Ala.
		Found	.....	.....	.....	.....	7.57	.....	
Cotton Seed Meal	2067	Guaranteed	.....	.....	.....	2.50	7.00	1.50	Empire Cotton Oil Co., Quitman, Ga.
		Found	.....	.....	.....	.....	7.47	.....	
Germofert Grapefruit Special	2068	Guaranteed	5.00	3.00	.....	12.00	4.00	10.00	Tampa Fertilizer Co., Tampa, Fla.
		Found	5.52	5.97	5.51	11.48	4.49	10.87	
Germofert Fruit & Vine No. 2	2069	Guaranteed	5.00	3.00	.....	12.00	3.00	10.00	Tampa Fertilizer Co., Tampa, Fla.
		Found	6.51	7.71	6.83	14.54	3.13	9.76	

Alabama Trucker	2070	Guaranteed	10.00	8.00	2.00	.....	3.00	6.00	So. Cotton Oil Co.,
		Found	7.58	9.70	0.18	9.88	2.08	8.41	Montgomery, Ala.
Quickstep Fertilizer	2071	Guaranteed	10.00	8.00	2.00	.....	2.00	4.00	So. Cotton Oil Co.,
		Found	8.44	11.37	0.85	12.22	1.85	2.99	Montgomery, Ala.
Grasselle's High Grade Blood, Bone and Potash	2072	Guaranteed	12.00	10.00	0.50	.....	2.00	2.00	Grasselli Chem. Co.,
		Found	7.70	10.24	0.70	10.94	1.90	1.69	Birmingham, Ala.
Cotton Seed Meal	2073	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Fla. Cotton Oil Co.,
		Found	.....	.....	.....	.....	7.35	.....	Tallahassee, Fla.
Grasselle's High Grade Fertilizer	2074	Guaranteed	12.00	10.00	5.00	.....	2.00	2.00	Grasselli Chem. Co.,
		Found	10.69	11.16	1.01	12.17	1.92	2.53	Birminham, Ala.
Germofert Cane Special	2075	Guaranteed	5.00	5.00	6.00	.....	5.00	5.00	Tampa Fertilizer Co.,
		Found	5.99	6.64	4.37	11.01	5.80	5.78	Tampa, Fla.
Va.-Car. Fruit and Vine	2076	Guaranteed	8.00	6.00	1.00	.....	2.50	10.00	Fla. Fertz. Co. Branch,
		Found	4.04	7.30	0.75	8.05	2.58	9.84	Gainesville, Fla.
Special Mixture	2077	Guaranteed	12.00	6.00	.....	.....	4.00	12.00	Fla. Fertz. Co. Branch,
		Found	6.37	8.90	0.34	9.24	3.99	13.16	Gainesville, Fla.
Sweet Potato Special	2078	Guaranteed	12.00	6.00	.....	.....	3.00	4.00	Fla. Fertz. Co. Branch,
		Found	6.03	7.45	0.37	7.82	4.10	9.58	Gainesville, Fla.
Va.-Car. Champion Citrus Compound	2079	Guaranteed	10.00	6.00	1.00	.....	3.00	14.00	Fla. Fertz. Co. Branch,
		Found	4.97	7.95	0.29	8.24	3.34	11.81	Gainesville, Fla.
Gaskin's DeSoto Orange Tree Grower	2080	Guaranteed	8.00	6.00	1.00	.....	5.00	6.50	Fla. Fertz. Co. Branch,
		Found	5.88	5.85	0.42	6.27	4.92	6.13	Gainesville, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Sun Trucker Fertilizer.....	2081	Guaranteed	10.00	5.00	1.00	.....	5.00	7.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	7.69	5.78	0.05	5.83	4.69	7.23	
Sun Special Mixture and Fertilizer	2082	Guaranteed	10.00	5.00	1.00	.....	4.00	8.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	6.74	6.08	1.22	7.30	4.36	7.39	
Sun Onion Fertilizer.....	2083	Guaranteed	10.00	5.00	1.00	.....	4.00	10.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	7.01	5.98	0.02	6.00	3.95	9.63	
Sun Vegetable Fertilizer.....	2084	Guaranteed	10.00	5.00	1.00	.....	4.00	6.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	6.86	5.27	0.04	5.31	3.92	6.51	
Sun Bean and Pea Fertilizer..	2085	Guaranteed	10.00	5.00	1.00	.....	5.00	6.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	5.48	6.38	0.84	7.22	4.30	6.67	
Sun Lettuce Fertilizer.....	2086	Guaranteed	10.00	5.00	1.00	.....	6.00	6.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	5.65	6.19	0.57	6.76	6.03	6.61	
Sun Hastings Potato Fertilizer	2087	Guaranteed	10.00	7.00	1.00	.....	4.00	7.00	Peninsular Fertz. Co., Palatka, Fla.
		Found	4.03	7.07	0.57	7.64	4.85	8.16	

Sun Universal Fertilizer.....	2088	Guaranteed	10.00	7.50	1.00	.....	2.00	5.00	Peninsular Fertz. Co.,
		Found	8.18	8.24	0.08	8.32	2.41	5.62	Palatka, Fla.
Germofert Blood, Bone & Potash	2089	Guaranteed	5.00	3.00	9.00	12.00	5.00	4.00	Tampa Fertz. Co.,
		Found	6.48	3.57	11.37	14.94	4.46	5.42	Tampa, Fla.
Germofert Corn Special.....	2090	Guaranteed	5.00	2.00	10.00	12.00	3.00	3.00	Tampa Fertz. Co.,
		Found	6.37	5.28	12.77	18.05	3.47	3.70	Tampa, Fla.
Germofert Orange Tree Grower	2091	Guaranteed	5.00	3.00	9.00	12.00	4.00	5.00	Tampa Fertz. Co.,
		Found	5.04	5.07	9.51	14.58	3.85	5.35	Tampa, Fla.
Favolte Celery Special.....	2092	Guaranteed	10.00	5.00	1.00	.....	8.00	4.00	Independ't Fertz. Co.,
		Found	6.89	6.64	0.25	6.89	7.52	4.63	Jacksonville, Fla.
Favorite Vegetable	2093	Guaranteed	10.00	7.00	2.00	.....	4.00	6.00	Independ't Fertz. Co.,
		Found	6.23	6.71	0.94	7.65	4.45	5.97	Jacksonville, Fla.
Vegetable Special	2094	Guaranteed	10.00	6.00	1.00	7.00	5.00	5.00	Gulf Fertilizer Co.,
		Found	6.46	8.36	0.72	9.08	4.63	5.41	Tampa, Fla.
Gulf Orange Tree Grower.....	2095	Guaranteed	8.00	6.00	1.00	7.00	5.00	5.00	Gulf Fertilizer Co.,
		Found	6.30	8.21	0.57	7.87	4.65	5.64	Tampa, Fla.
Cane and Corn Special.....	2096	Guaranteed	8.00	6.00	1.00	7.00	3.50	5.00	Gulf Fertilizer Co.,
		Found	7.02	9.49	1.32	10.81	3.75	5.80	Tampa, Fla.
High Grade Sulphate of Potash	2097	Guaranteed	10.00	.....	.....	.....	.....	48.00	Gulf Fertilizer Co.,
		Found	.....	.....	.....	.....	.....	50.50	Tampa, Fla.
Cotton Seed Meal.....	2098	Guaranteed	.....	.....	.....	2.00	4.50	1.50	Fla. Cotton Oil Co.,
		Found	.....	.....	.....	.....	4.98	.....	Tallahassee, Fla.

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				Available.	Insoluble.	Total.			
Gulf Citrus Special.....	2099	Guaranteed	8.00	6.00	1.00	7.00	4.00	8.00	Gulf Fertilizer Co., Tampa, Fla.
		Found	5.16	8.39	3.41	11.80	3.78	8.13	
Gulf Orange Fruiter.....	2100	Guaranteed	10.00	6.00	1.00	7.00	4.00	11.00	Gulf Fertilizer Co., Tampa, Fla.
		Found	5.02	7.85	0.05	7.90	4.29	11.96	
Gulf Fruit and Vine.....	2101	Guaranteed	10.00	6.00	1.00	7.00	3.00	10.00	Gulf Fertilizer Co., Tampa, Fla.
		Found	6.20	9.49	3.66	13.15	3.26	9.52	
Special Fruit and Vine.....	2102	Guaranteed	8.00	6.00	1.00	7.00	3.00	12.00	Gulf Fertilizer Co., Tampa, Fla.
		Found	5.18	7.62	0.09	7.72	3.10	14.46	
Cotton Seed Meal.....	2103	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Fla. Cotton Oil Co., Jacksonville, Fla.
		Found	.....	.....	.....	.....	7.26	.....	
Kainit	2104	Guaranteed	.....	.....	.....	.....	.....	12.50	Ocala Fertilizer Co., Ocala, Fla.
		Found	.....	.....	.....	.....	.....	13.74	
Early Bird Fruit and Vine Manure	2105	Guaranteed	10.00	6.00	1.00	.....	2.50	10.00	Osceola Fertz. Co., Jacksonville, Fla.
		Found	6.28	7.06	0.61	7.67	2.82	9.81	

Early Bird Vegetable Manure..	2106	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fertz. Co.,
		Found	8.34	7.34	0.96	8.25	3.83	5.45	Jacksonville, Fla.
Corn Fertilizer	2107	Guaranteed	10.00	8.00	1.00	.....	2.00	2.00	Am. Agri. Chem. Co.,
		Found	10.86	9.16	1.37	10.53	2.14	2.11	Jacksonville, Fla.
Muriate of Potash.....	2108	Guaranteed	.....	.....	.....	.....	.....	50.00	Am. Agri. Chem. Co.,
		Found	.....	.....	.....	.....	.....	50.90	Jacksonville, Fla.
High Grade Cuke and Lettuce Special	2109	Guaranteed	10.00	4.00	1.00	.....	6.00	5.00	Am. Agri. Chem. Co.,
		Found	5.82	6.15	0.73	6.88	5.54	6.44	Jacksonville, Fla.
High Grade Blood and Bone....	2110	Guaranteed	10.00	.....	.....	8.00	10.00	.....	Am. Agri. Chem. Co.,
		Found	.....	.....	.....	12.31	9.32	.....	Jacksonville, Fla.
Bean Special	2111	Guaranteed	10.00	6.00	1.00	.....	3.00	4.00	Am. Agri. Chem. Co.,
		Found	5.38	7.32	0.68	8.00	3.38	3.82	Jacksonville, Fla.
Watermelon & Cantaloupe Special	2112	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Am. Agri. Chem. Co.,
		Found	7.13	7.95	0.67	8.62	3.85	5.08	Jacksonville, Fla.
High Grade Orange Fruiter....	2113	Guaranteed	10.00	10.00	1.00	.....	3.00	13.00	Am. Agri. Chem. Co.,
		Found	4.08	12.05	0.07	12.12	3.14	12.11	Jacksonville, Fla.
German Kainit	2114	Guaranteed	.....	.....	.....	.....	.....	12.00	Am. Agri. Chem. Co.,
		Found	.....	.....	.....	.....	.....	13.15	Jacksonville, Fla.
Williams & Clark Special Fruit and Vine	2115	Guaranteed	10.00	5.50	3.00	.....	4.25	10.00	Am. Agri. Chem. Co.,
		Found	5.54	7.04	0.90	7.94	4.43	9.91	Jacksonville, Fla.
Bradley Special Fruit and Vine	2116	Guaranteed	10.00	5.50	1.00	.....	4.25	10.00	Am. Agri. Chem. Co.,
		Found	6.66	7.30	0.48	7.78	4.31	9.69	Jacksonville, Fla.

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				Available.	Insoluble.	Total.			
Sea Island Cotton Seed Meal..	2117	Guaranteed	12.00	.....	.....	1.50	4.50	0.75	The Florida Mfg. Co., Madison, Fla.
		Found	.....	.....	.....	.....	4.55	.....	
Armour's Fruit and Vine.....	2118	Guaranteed	10.00	6.00	1.00	.....	2.50	11.00	Armour's Fertz. Wks., Jacksonville, Fla.
		Found	5.29	6.47	0.33	6.80	2.99	.....	
Early Bird Florida Vegetable Manure	2119	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fertz. Co., Jacksonville, Fla.
		Found	7.60	6.97	0.94	7.91	3.78	5.45	
Va.-Car. Fruit and Vine.....	2120	Guaranteed	8.00	6.00	1.00	.....	2.50	10.00	Va.-Car. Chem. Co., Gainesville, Fla.
		Found	3.51	5.46	1.59	7.05	2.95	9.13	
Va.-Car. Tip-Top Tomato Trucker	2121	Guaranteed	5.00	7.00	1.00	.....	4.00	5.00	Va.-Car. Chem. Co., Gainesville, Fla.
		Found	5.26	7.51	0.71	8.22	4.06	4.85	
Va.-Car. Champion Citrus Compound	2122	Guaranteed	10.00	6.00	1.00	.....	3.00	14.00	Va.-Car. Chem. Co., Gainesville, Fa.
		Found	2.86	7.76	0.45	8.21	3.67	13.66	
Cotton Seed Meal.....	2123	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Fla. Cotton Oil Co., Jacksonville, Fla.
		Found	.....	.....	.....	.....	7.49	.....	

Cotton Seed Meal	2124	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Fla. Cotton Oil Co., Jacksonville, Fla.
		Found	.....	.....	.....	.....	8.01	.....	
Special Mixture	2125	Guaranteed	.....	5.00	.....	.....	4.00	12.00	E. O. Painter Fertz. Co., Jacks'ville, Fla.
		Found	6.13	7.34	2.23	9.73	4.29	12.45	
Gem Watermelon	2126	Guaranteed	5.00	6.00	2.00	.....	3.00	10.00	E. O. Painter Fertz. Co., Jacks'ville, Fla.
		Found	7.29	7.23	1.04	8.27	3.68	9.55	
Simon Pure Garden	2127	Guaranteed	8.00	4.00	3.00	.....	6.00	6.50	E. O. Painter Fertz. Co., Jacks'ville, Fla.
		Found	7.42	5.40	2.84	8.24	6.12	7.10	
Special Formula for Corn	2128	Guaranteed	10.00	8.00	.....	.....	2.50	3.50	Wilson&TroonerFertz Co., Jacks'ville, Fla.
		Found	10.02	3.94	2.69	6.63	3.30	4.23	
Favorite Fruit and Vine No. 1	2129	Guaranteed	10.00	6.00	1.00	.....	3.00	10.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	5.67	9.29	0.90	10.19	3.36	9.23	
High Grade Acid Phosphate	2130	Guaranteed	.....	16.00	.....	.....	.....	.....	Ocala Fertilizer Co., Ocala, Fla.
		Found	.....	19.03	0.26	19.29	.....	.....	
Cotton Seed Meal, Forest City Brand	2131	Guaranteed	.....	.....	.....	2.50	4.50	1.50	Southern Cotton Oil Co., Savannah, Ga.
		Found	.....	.....	.....	.....	4.75	.....	
Mapes' Vegetable Manure	2132	Guaranteed	12.00	6.00	2.00	.....	5.00	4.00	Mapes' For.&Perv.Guano Co., N. Y. City.
		Found	10.23	10.23	0.32	10.55	5.07	5.74	
Mapes' Orange Tree Manure	2133	Guaranteed	12.00	6.00	2.00	.....	4.00	3.00	Mapes' For.&Perv.Guano Co., N. Y. City.
		Found	7.75	5.32	4.48	9.80	4.84	3.01	
Complete Sweet Potato Fertilizer	2134	Guaranteed	10.00	8.00	1.00	.....	2.50	3.50	Wilson&TroonerFertz. Co., Jacks'ville, Fla.
		Found	9.61	8.34	1.33	9.67	2.84	4.61	

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				Available.	Insoluble.	Total.			
Mapes' Fruit and Vine Manure.	2135	Guaranteed	10.00	5.00	2.00	.....	2.00	10.00	Mapes' For.&Perv.Guano Co., N. Y. City.
		Found	9.72	5.39	3.38	8.77	2.45	11.04	
Muriate of Potash.....	2136	Guaranteed	.....	.....	.....	.....	.....	48.50	Ocala Fertilizer Co., Ocala, Fla.
		Found	.....	.....	.....	.....	.....	54.80	
Superior Corn Fertilizer.....	2137	Guaranteed	8.00	6.00	1.00	.....	2.50	4.50	Ocala Fertilizer Co., Ocala, Fla.
		Found	13.11	7.48	0.13	7.61	2.32	4.75	
Cotton Seed Meal.....	2138	Guaranteed	.....	.....	.....	2.50	7.00	1.50	Boston Oil & Guano Co., Boston, Ga.
		Found	.....	.....	.....	.....	7.40	.....	
Standard Vegetable No. 1.....	2139	Guaranteed	11.00	5.00	1.00	6.00	4.00	6.00	Standard Fertz. Co., Gainesville, Fla.
		Found	11.35	6.00	0.55	6.55	3.30	8.37	
Standard Tree Grower.....	2140	Guaranteed	7.00	6.00	1.00	7.00	5.00	5.00	Standard Fertz. Co., Gainesville, Fla.
		Found	9.82	7.64	1.87	9.51	3.98	4.81	
Standard Fruit and Vine.....	2141	Guaranteed	5.00	7.00	1.00	8.00	3.00	12.00	Standard Fertz. Co., Gainesville, Fla.
		Found	3.63	7.92	0.35	8.27	3.87	14.43	

Gem Sweet Potato No. 2.....	2142	Guaranteed	.....	.....	.....	3.00	2.00	5.00	E. O. Painter Fertz.
		Found	5.56	6.03	0.57	6.60	3.73	7.23	Jacks'ville, Fla.
Gem Orange Tree.....	2143	Guaranteed	5.00	5.00	3.09	.....	4.00	6.00	E. O. Painter Fertz.
		Found	6.23	6.35	4.37	10.72	4.40	6.75	Co., Jacks'ville, Fla.
Cotton Seed Meal.....	2144	Guaranteed	.....	.....	.....	2.50	7.50	1.50	Valdosta Oil Mill,
		Found	.....	.....	.....	.....	6.88	.....	Valdosta, Ga.
Armour's Blood, Bone & Potash	2145	Guaranteed	10.00	8.00	1.00	.....	5.00	7.00	Armour Fertz. Wks.,
		Found	7.15	8.02	1.73	9.75	5.05	7.45	Jacksonville, Fla.
Armour's Sugar Cane.....	2146	Guaranteed	10.00	8.00	1.00	.....	5.00	8.00	Armour Fertz. Wks.,
		Found	7.93	6.62	0.27	6.89	4.45	7.62	Jacksonville, Fla.
Wilson & Toomer's Special Mixture	2147	Guaranteed	8.00	6.00	1.00	.....	5.00	5.00	Wilson&ToomerFertz.
		Found	9.99	6.76	1.76	8.52	4.68	5.56	Co., Jacks'ville, Fla.
Medium Grade Cotton Seed Meal	2148	Guaranteed	.....	.....	.....	2.30	7.50	1.20	Planters' Oil Co.,
		Found	.....	.....	.....	.....	7.27	.....	Albany, Ga.
Ideal Sugar Cane Fertilizer....	2149	Guaranteed	10.00	7.00	.....	.....	3.00	4.00	Wilson&ToomerFertz.
		Found	8.19	6.80	1.44	8.24	3.03	5.60	Co., Jacks'ville, Fla.
Cotton Seed Meal.....	2150	Guaranteed	.....	.....	.....	2.50	7.00	1.50	Boston Oil & Guano
		Found	.....	.....	.....	.....	7.18	.....	Co., Boston, Ga.
Early Bird Florida Vegetable..	2151	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fertz. Co.,
		Found	5.69	6.47	0.49	6.96	3.76	5.31	Jacksonville, Fla.
Early Bird Fruit & Vine Manure	2152	Guaranteed	10.00	6.00	1.00	.....	2.50	10.00	Osceola Fertz. Co.,
		Found	6.07	6.92	0.45	7.37	2.45	9.85	Jacksonville, Fla.

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Moisture.	Phosphoric Acid.			Ammonia.	Potash (K_2O).	BY WHOM AND WHERE MANUFACTURED.
				Available.	Insoluble.	Total.			
Early Bird Orange Tree Manure	2153	Guaranteed	10.00	6.00	1.00	.....	4.00	5.00	Osceola Fertz. Co., Jacksonville, Fla.
		Found	6.95	6.75	0.56	7.31	3.74	5.20	
Ground Castor Pomace.....	2154	Guaranteed	10.00	.....	.....	1.50	6.00	1.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	.....	.....	.....	.....	5.84	.....	
Pace's Lettuce Special.....	2155	Guaranteed	10.00	5.00	.....	.....	5.00	5.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	9.75	3.51	0.99	4.50	4.98	5.08	
Favorite Sweet Potato Special.	2156	Guaranteed	10.00	7.00	1.00	.....	2.00	4.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	9.47	6.43	0.88	7.31	2.99	4.46	
Favorite Vegetable	2157	Guaranteed	10.00	7.00	2.00	.....	4.00	6.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	8.95	7.56	0.94	8.50	3.91	6.98	
Favorite Corn Grower.....	2158	Guaranteed	10.00	5.00	1.00	.....	3.00	2.00	Independ't Fertz. Co., Jacksonville, Fla.
		Found	6.73	4.90	0.83	5.73	2.99	2.28	

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 Sugar. (Nitrogen Free Extr't.)	Fat.	Ash.	BY WHOM SENT.
Mixed Feed	290	4.02	11.14	69.25	4.12	2.00	M. Houghton, Ocala, Fla.
"I. S." Oats	291	Tested for sulphur dioxide					Wilson & Parker Co., Jacksonville, Fla.
Oats, Car No. 6051 F. E. C.	292	Tested for sulphur dioxide					J. K. Williams, Jacksonville, Fla.
Maiden Cane	293	29.95	11.02	42.68	2.92	3.22	John M. Scott, Gainesville, Fla.
Oats	294	Tested for sulphur dioxide					F. Sausey & Co., Jacksonville, Fla.
Oats, Car No. 6051 F. E. C.	295	Tested for sulphur dioxide					J. K. Williams, Jacksonville, Fla.
Maiden Cane	296	29.30	9.83	44.28	2.37	2.65	John M. Scott, Gainesville,
Feed	297	9.98	11.76	53.90	2.62	5.66	W. A. Register, Woodville,
Chops	298	2.45	10.53	70.24	4.02	1.45	Lewis-Bear Co., Pensacola, Fla.
Wheat	299	4.65	13.42	64.99	2.25	4.80	Stalnaker Bros., Tampa, Fla.
Para Grass Hay	300	30.28	7.90	47.26	1.87	7.02	W. S. Jennings, Jacksonville, 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 Extract.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
Golden Grain Feed.....	1770	Guaranteed	12.00	9.00	55.00	1.50	.....	Golden Grain Milling Co., East St. Louis, Mo.
		Found	12.41	12.08	53.53	2.10	5.68	
"Milo" Stock Feed.....	1771	Guaranteed	14.00	10.00	52.00	3.50	.....	Milam-Morgan Co., New Orleans, La.
		Found	10.37	11.00	57.02	2.98	5.47	
Big Mule Molasses Feed.....	1772	Guaranteed	15.00	10.00	50.00	3.00	.....	The Quaker Oats Co., Chicago, Ill.
		Found	7.95	10.27	55.72	3.28	7.16	
Besto Dairy Feed.....	1773	Guaranteed	12.00	12.00	50.00	4.00	.....	J. T. Gibbons, New Orleans, La.
		Found	9.80	15.92	51.08	5.52	6.44	
Little Jo Horse Feed.....	1774	Guaranteed	12.00	10.00	52.00	3.00	.....	Just Mills, Nashville, Tenn.
		Found	7.23	10.04	59.88	3.39	7.40	
Perfection Horse Feed.....	1775	Guaranteed	12.00	10.00	55.00	2.00	.....	Omaha Alfalfa Milling Co., Omaha, Neb.
		Found	8.35	10.50	69.08	2.05	6.91	

Old Ned Sweet Feed	1776	Guaranteed	12.00	9.00	60.00	2.75	.....	Webb & Maury, Memphis, Tenn.
		Found	10.14	10.35	52.17	4.54	9.89	
Homcoltne Feed	1777	Guaranteed	.....	17.00	.....	5.00	.....	American Hominy Co., Indianapolis, Ind.
		Found	4.97	20.80	54.76	6.85	6.25	
Kowmele Feed	1778	Guaranteed	15.00	25.00	38.00	4.00	.....	G. R. Patteson & Co., Memphis, Tenn.
		Found	13 57	25.29	44.19	4.25	4.85	
Gonzalez Cow Feed	1779	Guaranteed	.....	16.15	51.40	5.65	.....	The M. F. Gonzalez Co., Pensacola, Fla.
		Found	8.35	20.62	49.29	6.97	4.67	
Pure Wheat Bran	1780	Guaranteed	8.91	15.47	53.52	4.33	.....	Sunny Side Mills, Evansville, Ind.
		Found	10.21	15.36	55.24	3.96	5.85	
Acmo Alfalfa Feed	1781	Guaranteed	12.00	10.00	50.00	3.50	.....	Alabama Corn Mills Co., Mobile, Ala.
		Found	7.00	11.41	64.90	3.12	4.20	
Wheat Middlings	1782	Guaranteed	10.00	14.50	.....	5.10	.....	Hubbard Milling Co., Mankanto, Minn.
		Found	6.62	18.69	54.07	6.42	4.25	
Cotton Seed Meal	1783	Guaranteed	.....	38.62	.....	.....	.....	Florida Cotton Oil Co., Jacksonville, Fla.
		Found	7.90	41.16	28.95	9.30	5.85	
Cotton Seed Feed Meal	1784	Guaranteed	.....	20.00	39.00	5.00	.....	Tennessee Fiber Co., Memphis, Tenn.
		Found	21.17	23.96	36.73	4.72	4.82	
Shipstuff	1785	Guaranteed	8.00	14.50	57.00	3.50	.....	Atlanta Milling Co., Atlanta, Ga.
		Found	4.00	15.53	62.86	4.50	3.47	
Sterling Horse Feed	1786	Guaranteed	8.00	9.25	64.50	8.00	.....	The Quaker Oats Co., Chicago, Ill.
		Found	8.42	10.79	74.44	8.42	3.13	

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.
Molases Horse & Mule Feed....	1787	Guaranteed	16.00	10.00	50.00	4.00	.....	American Milling Co., Peoria, Ill.
		Found	13.34	9.78	47.60	7.75	6.67	
International Horse & Mule Feed	1788	Guaranteed	12.00	12.00	50.00	3.50	.....	International Sugar Feed Co., Memphis, Tenn.
		Found	12.17	14.02	51.59	2.91	8.60	
K. & S. Wheat Middlings.....	1789	Guaranteed	9.50	15.00	.....	5.00	.....	Kensch & Swartz Co., New York, N. Y.
		Found	9.05	16.58	55.69	3.87	4.61	
Ceralfa Stock Feed.....	1790	Guaranteed	11.50	13.00	55.00	3.50	.....	Edgar-Morgan Co., Memphis, Tenn.
		Found	8.55	13.43	58.19	3.42	5.29	
Big Egg Scratch Grains.....	1791	Guaranteed	5.00	10.00	60.00	2.50	.....	The Quaker Oats Co., Chicago, Ill.
		Found	3.40	10.18	64.55	4.30	8.57	
Dixie Chick Feed.....	1792	Guaranteed	3.50	10.00	60.00	3.50	.....	Webb & Maury, Memphis, Tenn.
		Found	5.97	12.81	64.47	3.97	2.90	
Wheel Horse Feed.....	1793	Guaranteed	17.50	11.00	50.00	3.00	.....	Commonwealth Feed Mills Co., St. Louis, Mo.
		Found	20.37	11.41	47.42	4.35	6.07	
Purity Horse and Cattle Feed..	1794	Guaranteed	12.00	10.00	50.00	2.50	.....	Great Western Feed Co., St. Louis, Mo.
		Found	15.00	12.37	53.77	3.52	5.27	

Cotton Seed Meal	1795	Guaranteed	29.00	20.00	28.00	5.00	.....	Memphis Manufacturing Co.,
		Found	26.75	17.99	28.82	3.88	9.56	Memphis, Tenn.
Ballard's Bran	1796	Guaranteed	8.04	15.78	53.00	4.42	.....	Ballard & Ballard Co., Louis-
		Found	9.20	14.48	56.70	4.95	6.70	ville, Ky.
Challenge Horse & Mule Feed	1797	Guaranteed	12.00	9.00	55.00	2.25	.....	The Superior Feed Co., Mem-
		Found	9.31	8.53	61.84	1.98	5.58	phis, Tenn.
Moca Dry Feed	1798	Guaranteed	12.00	11.00	58.00	3.50	.....	J. T. Gibbons, New Orleans,
		Found	10.20	14.48	56.30	3.37	5.05	La.
Purina Feed	1799	Guaranteed	9.80	12.00	58.00	4.00	.....	Purina Mills, St. Louis, Mo.
		Found	12.92	13.62	53.29	3.25	5.67	
Ballard's Ky. Farm Feed	1800	Guaranteed	6.42	16.45	58.00	4.60	.....	Ballard & Ballard Co., Louis-
		Found	4.40	15.34	62.24	3.53	4.25	ville, Ky.
Star Middlings	1801	Guaranteed	8.00	15.00	54.00	4.00	.....	Star & Crescent Milling Co.,
		Found	7.10	16.94	56.64	5.03	5.25	Chicago, Ill.
Wheat Bran	1802	Guaranteed	9.50	14.50	54.00	4.00	.....	Standard-Tilton Milling Co.,
		Found	7.95	15.69	52.04	3.96	7.26	St. Louis, Mo.
Supreme Horse & Mule Feed	1803	Guaranteed	12.00	11.00	50.00	2.50	.....	The Superior Feed Co.,
		Found	10.39	10.47	59 99	3.75	4.07	Memphis, Tenn.
Excello Horse Feed	1804	Guaranteed	15.00	10.00	58.41	3.00	.....	Excello Feed Milling Co.,
		Found	10.06	10.73	53.79	1.84	6.13	St. Joseph, Mo.
Sho-Me Horse Feed	1805	Guaranteed	15.00	10.00	52.00	3.00	.....	Excello Feed Milling Co.,
		Found	17.11	11.32	52.04	1.95	5.39	St. Joseph, Mo.

OFFICIAL FEEDING STUFF ANALYSES, 1914—Continued.

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.
Just Dairy Feed.....	1806	Guaranteed	12.00	20.00	54.00	3.50	.....	Just Mills, Nashville, Tenn.
		Found	11.92	17.00	48 57	3.11	7.46	
Freco H. & M. Molasses Feed..	1807	Guaranteed	12.00	10.00	55.00	3.50	.....	Freeman & Co., Tampa, Fla.
		Found	9.02	10.69	58.93	4.08	5.58	
Molasco	1808	Guaranteed	12.00	10.00	55.00	3.50	.....	National Oats Co., St. Louis,
		Found	12.83	9.55	53.76	1.72	3.09	Mo.
Corno Horse & Mule Feed.....	1809	Guaranteed	12.00	10.00	53.50	3.50	.....	The Cairo Mills Co., St.
		Found	12.25	10.97	57.48	2.75	2.65	Louis, Mo.
"Alfo" Horse & Mule Feed....	1810	Guaranteed	12.00	11.00	58.00	3.50	.....	E. E. Freeman & Co., Tampa,
		Found	16.18	14.22	48.51	4.40	7.32	Fla.
Purina Chicken Chowder Feed.	1811	Guaranteed	9.00	17.00	56.00	3.00	.....	Purina Mills, St. Louis, Mo.
		Found	7.27	19.57	48.69	4.45	9.02	
Thoroughbred Feed.....	1812	Guaranteed	7.09	15.75	63.62	3.83	.....	Lexington Roller Mills Co.,
		Found	6.35	15.01	55.72	4.25	7.92	Lexington, Ky.
Graino Dry Feed.....	1813	Guaranteed	12.00	10.00	55.00	3.00	.....	National Milling Co., Macon,
		Found	11.95	9.56	60.80	2.57	5.05	Ga.

Southern Dairy Feed.....	1814	Guaranteed	9.00	9.00	55.00	6.00	.....	Western Grain Co., Birmingham, Ala.
		Found	8.37	10.79	62.36	5.27	2.42	
Sugaration Stock Feed.....	1815	Guaranteed	11.04	11.65	64.00	3.00	.....	G. E. Patteson & Co., Memphis, Tenn.
		Found	10.47	13.28	58.69	4.77	2.50	
Mogul Molasses Feed.....	1816	Guaranteed	15.00	10.00	50.00	3.00	.....	The Quaker Oats Co., Chicago, Ill.
		Found	10.80	11.12	59.28	2.81	4.97	
"Arab" Horse Feed.....	1817	Guaranteed	15.00	9.00	59.00	2.00	.....	M. C. Peters Mill Co., Omaha Neb.
		Found	11.14	11.33	54.09	2.87	6.47	
Big Four Molasses Feed.....	1818	Guaranteed	12.00	10.50	55.00	2.50	.....	The Cairo Milling Co., Cairo, Ill.
		Found	8.14	10.04	59.35	3.54	4.99	
Star Feed with Molasses.....	1819	Guaranteed	12.00	9.00	59.00	1.50	.....	Illinois Feed Mills, St. Louis, Mo.
		Found	13.50	10.61	53.43	2.63	5.65	
Beef Scrap	1820	Guaranteed	.....	.....	.....	.....	.....	Cyphers Incubator Co., Chicago, Ill.
		Found	1.34	54.39	4.46	11.12	19.32	
Chicken Feed	1821	Guaranteed	.....	.....	.....	.....	.....	Cyphers Incubator Co., Chicago, Ill.
		Found	2.72	11.93	72.00	2.76	1.06	
Beef Scrap	1822	Guaranteed	.....	.....	.....	.....	.....	Swift & Co., East St. Louis, Ill.
		Found	0.99	51.74	3.48	10.54	24.99	
Anchor Brand Scratch Feed....	1823	Guaranteed	6.00	12.00	.....	3.00	.....	Globe Elevator Co., Buffalo, N. Y.
		Found	2.45	13.45	68.55	2.00	68.55	
Wheat Bran	1824	Guaranteed	9.50	14.50	55.00	4.00	.....	Washburn - Crosby Milling Co., Louisville, Ky.
		Found	9.22	14.39	53.53	3.77	9.12	

NAME, OR BRAND.	Laboratory Number.	Analyses, Guaranteed and Found.	Fibre.	Protein.	Starch and sugar. (Nitrogen Free Extract.)	Fat.	Ash.	NAME AND ADDRESS OF MANUFACTURER.
"Rex" Dry Stock Feed.....	1825	Guaranteed	10.00	11.00	55.00	4.00	.....	Milam-Morgan Co., New Orleans, La.
		Found	11.20	14.13	53.06	3.82	7.37	
St. Elmo H. & M. Molasses Feed	1826	Guaranteed	12.00	10.00	55.00	3.50	.....	J. T. Gibbons, New Orleans, La.
		Found	10.26	11.55	56.33	2.94	2.92	
Molasses Horse & Mule Feed..	1827	Guaranteed	16.00	10.00	50.00	4.00	.....	American Milling Co., Peoria, Ill.
		Found	12.01	11.10	49.75	2.96	8.19	
Mustang Molasses Feed.....	1828	Guaranteed	12.00	9.00	55.00	3.00	.....	National Milling Co., Macon, Ga.
		Found	8.24	9.42	57.09	2.68	7.73	
Save More Molasses Feed.....	1829	Guaranteed	12.00	9.00	55.00	3.00	.....	National Milling Co., Macon, Ga.
		Found	10.89	9.08	51.77	2.27	9.45	
"Jim Dandy" Molasses Feed..	1830	Guaranteed	12.00	10.00	55.00	2.50	.....	Cairo Milling Co., Cairo, Ill.
		Found	10.51	9.41	55.54	4.53	5.80	
Dan Patch Special Feed.....	1831	Guaranteed	12.50	10.00	61.00	3.00	.....	International Sugar Co., Memphis, Tenn.
		Found	10.76	9.81	50.51	6.29	7.87	
M. Middlings	1832	Guaranteed	6.50	16.80	55.11	5.00	.....	Hecker-Jones-Jewell Milling Co., New York, N. Y.
		Found	5.57	18.08	55.38	5.32	5.73	

Danco Feed	1833	Guaranteed	4.00	9.00	65.00	8.50	.....	Dahnke-Walker Milling Co.,
		Found	7.22	11.23	58.71	5.06	6.27	Union City, Tenn.
Make-M-Lay Poultry Feed	1834	Guaranteed	5.00	9.00	55.00	3.00	.....	Allneeds Mills Co., East St.
		Found	3.70	10.79	69.29	3.00	2.25	Louis, Ill.
Tampa Special Hen Feed	1835	Guaranteed	5.00	10.50	67.50	3.75	.....	The Florida Milling Co.,
		Found	2.37	10.35	72.12	2.82	2.47	Tampa, Fla.
Wheat Bran	1836	Guaranteed	9.50	14.50	55.00	4.00	.....	Washburn - Crosby Milling
		Found	9.97	14.30	54.14	4.02	7.52	Co., Louisville, Ky.
Florida Hen Feed	1837	Guaranteed	6.50	13.75	65.00	3.60	.....	The Florida Milling Co.,
		Found	2.47	10.97	68.97	2.35	5.12	Tampa, Fla.
"Rex" Dry Stock Feed	1838	Guaranteed	10.00	11.00	55.00	4.60	.....	Milam-Morgan Co., New Or-
		Found	10.06	12.64	56.02	4.22	6.24	leans, La.
Pure Wheat Bran & Screenings	1839	Guaranteed	9.50	14.50	50.00	4.00	.....	Liberty Mills, Nashville,
		Found	8.89	14.74	56.11	3.12	7.37	Tenn.
Florida Scratch Feed	1840	Guaranteed	7.50	13.50	60.00	4.00	.....	The Florida Milling Co.,
		Found	7.97	16.32	57.44	3.87	5.02	Tampa, Fla.
Tip Top Chick Feed	1841	Guaranteed	5.00	10.00	65.00	2.50	.....	The American Milling Co.,
		Found	4.96	9.92	59 93	2.02	10.95	Peoria, Ill.
Sterling Horse Feed	1842	Guaranteed	8.00	9.25	64.50	3.25	.....	The Quaker Oats Co., Chi-
		Found	5.65	10.53	67.75	3.73	2.97	cago, Ill.
Milco Feed Meal	1843	Guaranteed	17.40	26.00	14.50	6.50	.....	Empire Cotton Oil Co., At-
		Found	17.11	24.56	38.79	5.87	5.62	lanta, Ga.

OFFICIAL FEEDING STUFF ANALYSES, 1914.—Continued.

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.
M. Middlings	1844	Guaranteed	6.50	16.80	55.11	5.60	.....	Hecker-Jones-Jewell Milling Co., New York, N. Y.
		Found	4.17	15.88	56.58	4.17	5.52	
Larro Feed	1845	Guaranteed	14.00	19.00	50.00	3.00	3.50	The Larrowe Milling Co., Detroit, Mich.
		Found	10.82	21.06	50.86	3.25	4.27	
Kowmele Feed	1846	Guaranteed	15.00	25.00	38.00	4.00	.....	G. E. Patteson & Co., Memphis, Tenn.
		Found	12.53	25.27	43.74	4.05	5.52	
Shorts	1847	Guaranteed	6.50	16.80	55.11	5.60	.....	Hecker-Jones-Jewell Milling Co., New York, N. Y.
		Found	5.03	17.55	54.85	5.03	5.00	

DEPARTMENT OF AGRICULTURE—DIVISION OF CHEMISTRY.

FOOD AND DRUG SECTION.

R. E. ROSE, State Chemist. SPECIAL FOOD AND DRUG ANALYSES, 1914. L. HEIMBURGER, Asst. Chemist.

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

ALCOHOLIC DRINKS.

Number.	LABEL.	MANUFACTURER OR DISTRIBUTOR.	Alcohol (per cent by volume), (as found).	Net Measure (as found).	BY WHOM SENT.	REMARKS.
1511	Teddy Beer. Contents 12 ozs. Alcohol less than 2%.	The Consumer's Brewing Co., New Orleans, La., Distributors.	0.62	12, ½ ozs.	N. Goldring, Pensacola.	Legal.
1513	Rief's Special. Contains less than ½ of 1% alcohol. Contents 12 ozs.	The Purity Extract & Tonic Co., Chattanooga, Tenn., Distributors.	0.68	12, ½ ozs.	The Magic City Bottling Works, Miami.	Illegal. Misbranded and adulterated. Incorrect statement of alcohol.

ALCOHOLIC DRINKS—Continued.

Number.	LABEL.	MANUFACTURER OR DISTRIBUTOR.	Alcohol (per cent. by volume), (as found).	Net Measure (as found).	BY WHOM SENT.	REMARKS.
1514	(No. 1) Golden Robin. 12 ozs.	Monarch Soda Water Co., Council Bluffs, Iowa, Distributors.	2.06	12, ½ ozs.	R. A. Walters, Midway.	Illegal. Misbranded. Adulterated. Percentage of alcohol not stated on label. An ordinary light beer.
1515	(No. 2) Golden Robin. 12 ozs.	Monarch Soda Water Co., Council Bluffs, Iowa, Distributors.	4.14	12, ½ ozs.	R. A. Walters, Midway.	Illegal. Misbranded. Adulterated. Percentage of alcohol not stated on label. A strong beer, having a maximum amount of alcohol.
1516	Called Hilo Beverage (taken from bulk).	Not stated	10.00	.....	S. C. M. Thomas, Dunnellon.	An imitation cider, reinforced with 20% of common whiskey. Illegal. Misbranded. Adulterated. No statement of alcohol. A compound, without the address of manufacturer or distributor.

1517	Called "Hilo Beverage."	Not stated.....	1.17	.....	S. C. M. Thomas, Dunnellon.	An imitation cider, with 20% or more of common whiskey. Illegal. Adulterated. Misbranded. No statement of alcohol. A compound, without the address of the manufacturer or distributor.
1518	Near it. Light Brew. Contains less than 2% alcohol. Average contents 12 ozs.	Bottled for Charles Blum Co., Jacksonville, Fla., by the Atlanta Brewing & Ice Co., Atlanta, Ga.	2.03	13, 2 ozs.	G. H. Mills, Bushnell.	Legal.
1519	Berliner Brand Brew. Contents 12 ozs. Less than 2% alcohol.	New Orleans Brewing Co., Guarantors.	2.27	12, 2 ozs.	R. Mugge, Tampa.	Illegal. Percentage of alcohol greater than guaranteed.
1520	Ricentrine. Malt liquor. Less than 2% alcohol.	Houston Ice & Brewing Co., Houston, Texas.	2.72	12, 2 ozs.	Atkinson, Gramling & Burdine, Miami.	Illegal. Misbranded. Alcoholic strength under-stated on label and no net mesure statement on label.
1521	Florida Bud. 12 ozs. Guaranteed less than 2% alcohol.	The Florida Brewing Co., Tampa, Fla.	2.41	13, 2 ozs.	Atkinson, Gramling & Burdine, Miami.	Illegal. Misbranded. Alcoholic strength under-stated on label.

ALCOHOLIC DRINKS—Continued.

Number.	LABEL.	MANUFACTURER OR DISTRIBUTOR.	Alcohol (per cent by volume), (as found).	Net Measure (as found).	BY WHOM SENT.	REMARKS.
1522	Teddy Beer. Contents 12 ozs. Alcohol less than 2%	The Consumer's Brewing Co., New Orleans, La., Distributors.	2.17	11, ⅞ ozs.	William McMullian, Sneads.	Illegal. Percentage of alcohol greater than guaranteed.
1523	Red Heart Brew. Contents 12 ozs. 1, 7-10% alcohol.	The Jung Brewing Co., Cincinnati, O., Guarantors.	2.36	12, ⅞ ozs.	Dan Hardie, Miami.	Illegal. Misbranded. Percentage of alcohol greater than guaranteed.
1524	Florida Bud. 12 ozs. Guaranteed less than 2% alcohol.	The Florida Brewing Co., Tampa, Fla.	2.87	12, ⅞ ozs.	Dan Hardie, Miami.	Illegal. Misbranded. Alcohol percentage greater than guaranteed.

1525	Ricentrine, Malt liquor, less than 2% alcohol.	Houston Ice & Brewing Co., Houston, Texas.	2.81	12, ½ ozs.	Dan Hardie, Miami.	Illegal. Misbranded. Alcoholic percentage greater than guaranteed. No statement of net measure on label.
1526	Golden Ribbon, 12 ozs.	Golden Ribbon Beverage Assn., Council Bluffs, Iowa., Distributors.	0.27	12, ½ ozs.	Dan Hardie, Miami.	Illegal. No statement of percentage of alcohol on label.
1527	Golden Robin, 12 ozs.	Monarch Soda Water Co., Council Bluffs, Iowa, Distributors.	1.87	12, ½ ozs.	Dan Hardie, Miami.	Illegal. No statement of percentage of alcohol on label.
1528	Red Heart Brew, Contents 12 ozs. 1, 7-10% alcohol.	The Jung Brewing Co., Cincinnati, Guarantors.	2.15	12, ½ ozs.	Dan Hardie, Miami.	Illegal. Percentage of alcohol greater than guarantee.
1529	Florida Bud. 12 ozs. Guaranteed less than 2% alcohol.	The Florida Brewing Co., Tampa, Fla.	2.46	12 ozs.	Dan Hardie, Miami.	Illegal. Misbranded. Alcohol percentage greater than guaranteed.
1530	National Brand Beverage (from bulk.	Not stated.....	9.61	.....	Liberty Grocery Co., Jacksonville.	Illegal. Misbranded. No statement of percentage of alcohol on label. An intoxicating liquor.

ALCOHOLIC DRINKS—Continued.

Number.	LABEL.	MANUFACTURER OR DISTRIBUTOR.	Alcohol (per cent by volume), (as found).	Net Measure (as found).	BY WHOM SENT.	REMARKS.
1531	Called "Hilo."	Not stated.....	9.68	.....	Liberty Grocery Co., Jacksonville.	Illegal. Misbranded. No statement of percentage of alcohol on label. An intoxicating liquor.
1534	Beer (No. 1).	Not stated.....	5.29	.....	W. S. Whidden, Perry.	Illegal. Misbranded. No alcoholic statement. No statement of net measure.
1535	Beer (No. 2.)	Not stated.....	1.90	.....	W. S. Whidden, Perry.	Illegal. Misbranded. No alcoholic statement. No statement of net measure.
1609	"Beer substitute."	Not stated.....	4.40	12.½ ozs.	O. L. Nelson, Panama City.	Illegal. Misbranded. No alcoholic statement. No net measure. No statement of alcohol.

1610	"Beer Substitute."	Not stated.....	4.43	12, ½ ozs.	O. L. Nelson, Panama City.	Illegal. Misbranded. No label. No statement of net measure. No statement of alcohol.

SPECIAL FOOD ANALYSES—Continued.

MISCELLANEOUS.

No.	LABEL.	ANALYSIS.	FROM	REMARKS.
1512	No label, but called butter. (Compound butter, emulsified butter, homogenized butter).	Moisture (%).....=47.57 Total solids (%)....=52.43 Butter fat (%).....=46.67 Casein (%).....= 4.14 Ash (%) .....= 1.62	Fred D. Wyndham, Jacksonville.	Cannot be sold as butter. An emulsion of butter, milk and water, with 46.67% butter fat. Standard butter contains 82.5% butter fat.