

15 To Texas and the Gulf states  
for cropping. The ensuing  
season the plowing or break-  
ing should be done in the  
fall and should be consecutive,  
deeper each fall till a depth  
of one foot is reached.  
I estimate that one foot is  
deep enough to hold all the  
rains of winter without washing.

The plow should be immedi-  
ately followed by machinery  
to crush and pulverize all  
lumps and the surface should  
then be packed. All spring  
cultivation should be shallow  
but sufficient to make a  
perfect seed bed. The lands  
of Texas are <sup>not</sup> upheaved and  
made fertile by deep freezing  
and the plow or disc must  
act as a substitute to increase  
aeration and stimulate the  
agencies that tend to fertility.

Texas Soils



## 16 Texas Soils

are rich in all the material necessary to produce plant food. In a large portion of the state the rainfall is abundant for crops and the temperature is such as to promote extraordinary growth of plants. Every plant has its minimum and optimum of growth. If the lowest temperature at which its seeds will germinate be considered its minimum. Then every degree that is added will increase the rapidity of its growth till an optimum is reached when further heat will do damage. Corn is a tropical plant. Its optimum is in the midwest. During the growing period of corn there are more



17 than three times as many  
hours when the temperature  
is near the optimum in Texas  
than in Iowa and yet Iowa  
averages fifty per cent more  
corn per acre than Texas.

The cause can not lie ~~in~~  
in the failure of the sun's rays  
to stimulate leaf action so  
that the exchanges are promoted  
between the plant and the  
atmosphere. It can not  
lie in lack of soil temperature  
by which root absorption  
is hastened. Then the cause  
must lie in some inferiority  
in the soil conditions and  
in inadequate tillage. Our  
Southern soils lack humus  
with the result that they are  
too wet or too dry - Our strong  
clay soils are pretty or brick  
alternately.



17 They lose their moisture  
too rapidly. There is a  
constant complaint that it  
is too wet or too dry and it  
is practically true. They  
not only lose their moisture  
but they lose their fertility  
with great rapidity. They  
lack the vegetable mould,  
the cushion of humus in the  
<sup>soil</sup> to prevent the soil from  
absorbing the water  
and retard evaporation and  
equalize food distribution and  
absorption. They lack the  
action of frost or in lieu of  
it deeper and more frequent  
tillage. The soils of the  
Texas, which have been  
planted in cotton for  
30 years are not what  
they were. The certainty  
of a crop is much less and  
the product per acre has  
decreased and it is more



18 liable to germ diseases  
like rootrot. The material  
for plant food is by  
no means exhausted nor  
are the vast stores some-  
times impaired. Cotton is a  
crop that taxes the soil,  
leaves it uncovered most  
of the year and even if  
the stalks were plowed  
under restores little to  
it. Hence the soils have  
lost porosity; they retain  
but little hygroscopic water  
and with little humus  
this water is lost with  
great rapidity. In other  
words the functions of  
the soil are weakened  
and it is liable to get  
sick. What is required  
is a deeper and more  
thorough tillage. On  
the Ewa Sugar plantation in  
the Hawaiian Islands they



19 They plow 30 inches deep  
and average to produce  
90 tons of cane per acre  
with a sugar out turn of  
over 11 tons. In India  
and China they average  
to plow 6 times for a crop  
of ~~rice~~ wheat. In Den-  
mark a farmer plows  
his land seven times before  
planting. <sup>fall plowing or</sup>  
<sup>for a spring crop</sup> breaking in ~~the~~ Texas  
should be a foot deep  
and the soil should be  
worked four or five times  
before planting.

2<sup>d</sup> There must be systematic  
rotation of crops and in  
the system of rotation must  
include the deep rooting, nitrogen  
extracting legumes such  
as cow peas and alfalfa.  
The Texas farmer is too  
easily satisfied when he  
congratulates himself on



making a  $\frac{1}{3}$  of a bale  
of cotton and 20 bushels  
of corn per acre - He must  
be made dissatisfied unless  
he makes a bale of cotton  
and 30 bushels of corn

It I have shown that  
The Soil is not the inert  
thing it appears. It is  
<sup>not</sup> a passive composition of rock  
dust, out of which air and  
water and heat extract  
The food of vegetation

It is not simply a stage  
upon which plants perform  
the drama of growth

It is on the contrary, in  
itself, the theater of ceaseless  
activities: The arena of perpetual  
and complicated changes.  
Its complicated machinery



may be abused by  
man till it partially  
or wholly refuses to  
work, but a few kindly  
touches and it responds  
again to his behests and  
yields up its stores of  
treasure at his touch



B. P. I. \_\_\_\_\_

UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF PLANT INDUSTRY,  
Farmers' Cooperative Demonstration Work,  
WASHINGTON, D. C.

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COMMERCIAL FERTILIZERS: THEIR USES AND VALUE.

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Since the prime object in the use of all commercial fertilizer is to increase production, they must be used either to supply plant food directly or to so act upon the soil that a larger quantity of its nutritive elements will be at the disposal of the plant. In actual practice most commercial fertilizers combine both effects. All the substances required by plants except three, nitrogen, phosphoric acid, and potash, are abundant in most soils. The chief function of nitrogen in plants is to promote growth, but it is also of very great importance in the perfection of fruit.

Nitrogen enters largely into the composition of plants, and it follows that everything of vegetable origin is a valuable source of this substance. When vegetable matter is burned, the nitrogen is released from its combination and escapes into the atmosphere and is lost.\* The forms most important to the farmer of the South

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\* It is a bad practice to burn off fields and destroy vegetable matter; better turn it under. The humus in vegetable matter has a value in soil renovation frequently greater than its value as a plant food.



in which nitrogen is available are cotton-seed meal, bone meal, nitrate of soda, sulphate of ammonia, and the products of the slaughter pen in what is known as tankage.

Next in importance as a plant food is phosphoric acid. It is largely required by the plant for growth, but is absolutely essential in the perfection of seed and is a great factor in hastening the maturity of crops. The form of phosphoric acid most accessible to the farmer is known as acid phosphate.

Potash is more directly effective in prompting fruitage, but it is rarely very deficient in soils, and especially in soils of the Gulf States. It is found in abundance in ashes. Commercially it is ~~most commonly~~ <sup>commonly</sup> obtained in the form of kainit <sup>or</sup> *muriate of potash*.

#### WHAT FERTILIZER TO BUY.

Since the elements of plant food above mentioned are required in different quantities by different plants and since the soils vary in their supply, it is well for the farmer to know what his soil and plants need before investing his money in fertilizers. The practical way for the farmer to determine these facts is to observe the growth of the plants on his land. If the plants grow rapidly and make an abundance of leaf and stalk it is evidence of a good supply of nitrogen. If there is not a proportionate amount of fruit, it is a sure indication that the soil needs phosphoric acid. On the other hand, if the plant has not a good color and tends to drop its fruit before it reaches a fair size, it indicates that the soil requires potash.

Most of the soils of the South are deficient in both nitrogen and phosphoric acid, and some in potash. So when we buy commercial



fertilizers we buy them for their content of these substances. If the farmer has saved all his manures and has grown cowpeas abundantly, as he should, he will rarely have to buy nitrogen.

#### HOW TO BUY FERTILIZER.

Commercial plant food, called fertilizer, is never sold pure, but in combination with other substances. The substances with which it is combined are of no value to the farmer, but simply add to the weight. The laws of nearly all of the states now require that on each sack of commercial fertilizer shall be stamped just what plant food it contains. This composition is given in percentages, which means that in a hundred pounds of fertilizer there are so many pounds of the particular substances. For example, a certain fertilizer is offered for sale, on the sack of which is branded the following:

Nitrogen-----	3 per cent.
Soluble phosphoric acid-----	6 per cent.
Reverted phosphoric acid-----	4 per cent.
Available phosphoric acid -----	10 per cent.
Potash-----	2 per cent.

Translated into terms of pounds this means that in a sack weighing 100 pounds there are:

- Three pounds of nitrogen.
- Six pounds of soluble phosphoric acid.
- Four pounds of reverted phosphoric acid.
- Ten pounds of available phosphoric acid.
- Two pounds of potash.

This gives a total of 15 pounds of plant food in a 100-pound sack.



When a ton of such fertilizer is bought, the purchaser secures nitrogen, 60 pounds; soluble phosphoric acid, 120 pounds; reverted phosphoric acid, 80 pounds; and potash, 40 pounds. Notice that what is called "available" is the sum of the soluble and the reverted acid. In this fertilizer we obtain three things that are of use- 3 pounds of nitrogen, 10 pounds of phosphoric acid, and 2 pounds of potash to the hundred pounds.

If cotton seed meal, acid phosphate, and kainit are used to make this fertilizer, it will require the following quantities for one ton of the mixture:

	: Pounds. :	: Price :	: Cost :
		per ton:	
Cotton-seed meal-----	690	\$25.00	\$8.65
Acid phosphate (15 per cent available)---	1,108	15.00	8.31
Kainit-----	202	12.00	1.21
	2,000	-----	18.17

Ammonia is nothing but nitrogen in combination with another substance of no value. Inserting the ammonia in the formula is apt to deceive one who does not know the distinction. Remember that it is the pounds of plant food that are wanted, and not just a sack of stuff, the majority of which is of no value.

Taking acid phosphates as an example, we find that there is a great variation in their composition. Some run as low as 10 pounds of available phosphoric acid to the hundred pounds, while



others contain as much as 14 to 15 pounds. As phosphoric acid generally sells at about 5 cents a pound, the former would be worth 50 cents a hundred, whereas the latter would cost 75 cents. In buying, then, it is economy to take the high-grade goods even though they cost a little more.

An average sample of cotton-seed meal contains the following percentages of plant food:

Nitrogen-----	7.5 per cent
Phosphoric acid-----	2.5 per cent.
Potash-----	1.5 per cent.

A 100-pound sack will therefore contain the following quantities of plant food:

Nitrogen-----	7.5 pounds.
Phosphoric acid-----	2.5 pounds.
Potash-----	1.5 pounds.

The phosphoric acid may be considered as available, as the fermentation renders it so.

#### HOW TO USE COMMERCIAL FERTILIZERS.

If fertilizers are used, the following general rule should govern. On rich lands use mainly fertilizers that will stimulate the fruit and not the stalk growth. On lighter lands use more of the elements to force growth, combined with others which will mature the fruit.

High-grade 14 per cent acid phosphate may be considered a basis for increasing fruit and hastening maturity of crops. Even



on the richest land it has been demonstrated that a small percentage of nitrogen added to the acid phosphate gives better results. Use three parts of acid phosphate and one part of cotton-seed meal for cotton.

A mixture of one part of cotton-seed meal to two parts of high-grade acid phosphate will greatly increase the growing condition and will be better for medium soils.

Air-slaked lime is of value for use on stiff or gummy soils to loosen them up, permit the air to enter, and prevent a sour condition of such soils when too wet.

On thin or impoverished soils, equal quantities of cotton-seed meal and acid phosphate can be used to advantage.

In case the foregoing can not be obtained, standard-grade commercial fertilizers may be used. These should contain in the mixture 8 to 10 per cent of available phosphoric acid, 2 to 3 per cent of nitrogen, and 1-1/2 to 2 per cent of potash, or on some lands a high-grade acid phosphate, 14 per cent, may be used.

On black waxy land the best practice is to have the cotton follow a crop of cowpeas.

Where lands are greatly worn by years of cropping, more fertilizer should be used to the acre, and it should contain about equal parts of cotton-seed meal and high-grade acid phosphate. The beneficial effect of commercial fertilizers depends largely upon the presence of humus in the soil; hence the importance of using stable manure and plowing under green crops.



In applying the foregoing instructions the farmer must use considerable judgment and modify his practice where necessary to fit local conditions.

#### HOW TO APPLY THE FERTILIZER AFTER THE SOIL HAS BEEN THOROUGHLY PULVERIZED.

In the absence of a good machine, apply the fertilizer as follows:

Mark out the rows or bed-up, spacing as specified in the circular of this series containing general instructions (NO. "A"-68), and distribute the fertilizer in rows. Follow after with a bull-tongue or scooter shallowly to thoroughly mix the fertilizer with the soil.

Bedding-up land is a precaution against a heavy rainfall after planting. In sections where there is no danger from excessive moisture, flat planting is preferred, and in some cases it may be necessary to plant a few inches below the surface. Seeds must have moisture, but they must be kept out of standing water in the soil.

The fertilizer should be distributed several days before planting, as there is danger of injuring the seed if brought in immediate contact with strong fertilizer. A very careful mixing of the fertilizer with the soil is necessary for the same reason. On all except very rich waxy lands, it will pay to use commercial fertilizers somewhat liberally.



Where as much as 400 pounds of fertilizer is used for corn, we recommend two applications, one in furrow before planting, and an application of from 150 to 200 pounds of cotton-seed meal in furrow when corn is about one foot high.

Where lime is used scatter it broadcast when the land is plowed, using about 4 barrels of air-slaked lime per acre, or apply in the row about 2 barrels per acre a short time before planting, mixing it thoroughly with the soil.

S. A. KNAPP,  
Special Agent in Charge.

Approved:

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Chief of Bureau.



"The least worthy monument to a man is a granite block or marble shaft. They represent the dead man's money and the kindness of friends. The true monument is what the man has accomplished in life. It may be a better gate, or house, or farm, or factory; put his name on it and let it stand for him". Thus spoke Dr. Seaman A. Knapp, who was born 100 years ago today.

And, what a monument he built for himself! He is the founder of the demonstration method of teaching better farm and home practices, the father of the present nation-wide system of county and home demonstration work. This man, who <sup>has</sup> had so great a hand in leading the farmers of the United States away from peasantry, spent 70 years of his life preparing for the task, and then he lived seven more years perfecting the organization and early work of the cooperative federal and state agricultural extension service, the organization that is playing so vital a part in today's agricultural adjustments.

The entire life of this understanding, deep thinking son of a New York Physician is filled with experiences and accomplishments that touch the emotions of us all. He spent his early life in New York, finished college, married, and taught school there and in Vermont for 10 years. Then due to bad health and an accident that crippled him, he was advised to "Go West". He settled on a farm in Benton County, Iowa.

After three years farming he was elected superintendent of the state college for the blind, but five years later, in 1874, the lure of the farm was too great for him. For five years he raised fine Berkshire hogs and Shorthorn cattle, and during the time he established the Western Stock Journal and Farmer through which he was a great advocate of diversified



farming. In 1879 he was drafted as professor of agriculture at Iowa State College, and five years later he became President of that institution for a short time.

Here he played a prominent part in national educational affairs, but found enough time to establish a systematic course in Agriculture at his own college. Dr. Knapp realizing the great need for agricultural research, drafted a federal-aid experiment station bill in 1882 which paved the way for a later bill that passed.

This ever aggressive leader then went to Lake Charles, La., where he had charge of the agricultural development of a large tract of land. Here he had a real chance to put to a hard test his pet idea of teaching by demonstration. He could not get farmers to settle on this land because the natives' standard of living was poor. He conceived the idea of getting good farmers from the North and giving one of them a tract of land in each section. They were only to make a success of farming to show others that it could be done. The plan was so successful that thousands of northern farmers soon settled in this region.

While this understanding leader was succeeding with his demonstration method in Louisiana, could he have ever realized that he would have the entire United States in which to plan demonstrations?

Most of the farmers in this Louisiana section grew rice, and there developed a great need for improved varieties. The Secretary of Agriculture at that time, James Wilson, who knew Dr. Knapp back on that Iowa farm, sent him to Japan, China and the Philippines in search of better rice varieties. The result was the introduction into this country of some Japanese kinds, and a great expansion in the rice industry.

Upon his return from this search Dr. Knapp became associated with the



federal Bureau of Plant Industry, and his job was to start some of those demonstrations of his in the South to show farmers the value of growing crops other than all cotton. Farmers were afraid to try the new idea, and finally Dr. Knapp took the matter up with some Texas businessmen and they promised to repay a farmer by the name of Potter for any loss he sustained if he would try the new system. Potter followed the diversified system on his 70 acre farm, and in spite of a bad year made about \$700 more money than he would have made otherwise.

Just as Dr. Knapp was making headway here he was called to a more pressing task. The Mexican cotton boll weevil had gotten into Texas and was threatening ruin to the farmers. The Secretary of Agriculture became alarmed, and he called again on Dr. Knapp. This time our demonstrating professor was to show the farmers of Texas how to raise cotton on their own farms in spite of the weevil. Others had tried to tell them but it did little good. Dr. Knapp was to show them.

And, on and on, we see how this New York boy packed so much into his 77 years. On every trial his demonstration idea gained momentum. It gained the support of the General Education Board, a Rockefeller foundation. Later came the passage of the Smith-Lever Act which he sponsored. It set up the network of county and home demonstration agents over the country on a cooperative federal, state, and county basis.

As stated by Dr. Knapp in 1909, two years before his death, "the aim of the farmers' cooperative demonstration work is to place a practical object lesson before the farm masses, illustrating the best and most profitable methods of producing the standard farm crops, and secure such active participation in the demonstrations as to prove that the farmers can make a much larger annual crop and secure a greater return for their toil".



Before he died, Dr. Knapp lived to see almost 500 of his demonstrating agents scattered over the United States, and the organization of boys' corn clubs and girls' canning clubs. These boys' and girls' clubs have developed into the 4-H club movement, in which today there are nearly a million farm boys and girls of America. This cooperative demonstration idea has grown until today there are 3,800 of these farm demonstrators, and annually they hold close to 50,000 result demonstration meetings, similar to the early meetings of Dr. Knapp. Here the farmers and housewives see just exactly what their neighbors have accomplished following some new and proven practice. These agents last year visited nearly a million farms carrying with them the message of better farming and homemaking in the spirit of "come on, I'll show you". Thus lives today the demonstrative spirit of this New York lad born 100 years ago.

As expressed by Dr. Knapp himself in Lexington, Ky., in 1906: "The environment of men must be penetrated and modified or little permanent change can be made in them. The environment of the farmer is limited generally to a few miles. The demonstration must be carried to this limited area and show how simple and easy it is to restore the virgin fertility of the soil, to multiply the products of the land per acre, to increase the number of acres each laborer can till, and to harvest a profit from untilled fields. This is our farmers' cooperative demonstration work".

How true today is the statement made by this understanding leader back in 1910. "The most failures in farming are on the business side and not on the scientific side". In another of Dr. Knapp's well thought out addresses he said, "The farmer is necessarily conservative, but offer him a genuine thing and prove it and no one is more responsive", and he also said, "A



great nation is not the outgrowth of a few men of genius, but the superlative worth of a great common people".

Those were the ideals upon which Dr. Seaman A. Knapp built his monument. As the poet Ruskin once said: "Careless of monument by the grave, he built it in the world, a monument by which men shall be taught to remember, not where he died, but where he lived".

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## United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Farmers' Cooperative Demonstration Work,

WASHINGTON, D. C.

## FAMILIAR TALKS ON FARMING.

## MORE TEAMS AND GREATER ECONOMY.

Nearly a week after my talk with Uncle John about better cultivation of his crop, I visited him again. It is a good place to go, for with all his mistakes in agriculture he belongs to a royal line of old-time southern planters who confer honor upon the section in which they live and of whom the world has too few. As soon as possible I referred to our former conversation and asked him what he thought about my suggestions, after mature consideration.

He replied, "There may be something in what you say and probably I might get a larger crop by more intensive cultivation, but I have made some estimates which show that the added profits will all be eaten up by the increased cost. Your plan calls for increased expenses in a good many items."

"I am glad to hear you mention this, because it shows you have been thinking the matter over with some care," I replied. "Let us take one thing at a time. Name the principal item of increase in expense under intensive cultivation."

"The main increase," said Uncle John, "is in the number of mules necessary to work my crop. I have 200 acres in cotton and about 100 acres in corn and other crops. It takes 10 mules to do the field work and it costs me at least \$120 a year to keep a mule. I can't keep a mule up for work every day for less than \$12 a month and the least time for work in a year is six months. For the remaining six months the hay, grain, and pasture will cost \$8 a month, making \$120 for the year. As I understand, your plan will require half as many more mules to do the work. The cost of keeping 5 more mules will be \$600. I can't afford it."

"Yes, you can afford it," I replied, "for it will bring you a large profit, but you are mistaken as to the increased cost. I think your estimate on the cost of keeping a mule one year is rather high. It is true that



it is expensive the way you keep animals. Your pastures are mainly weeds and brush. What grass there is does not have much chance to get sunshine enough to mature and become sweet; hence, the richer grasses have gone on a strike and refuse to live there, and the tough and tasteless varieties of the grass family have taken possession. Your hay is poor, and these two causes account for your feeding so much grain, which is expensive. You are mistaken about its requiring 50 per cent more mules to do the same amount of work. It is true I propose to add considerable more mule power, but the better implements fully compensate, so that each man does double or more work per day. Thus your 10 mules hitched in spans to the best implements would enable 5 men to do more and better work than your 10 mules and 10 men now do. The saving of 5 men is something. Suppose, however, you adopt the most improved system and use only machine methods in the production of cotton and corn—not practicable on all lands, but entirely so on yours—and allow 15 mules for your work; there is still a reduction in labor from your present system. You cut out the chopping and hoeing and you use fewer men with teams, so that the cost of producing an acre of cotton would be no more than at present and the average yield would be at least threefold.

“Your plan of keeping mules is too expensive, and you are not alone in this. Probably there is no extravagance on southern farms more universal than allowing the mules to eat up the profits. It is related that once a lady saw a pet turkey swallow her costly diamond. In that case they killed the turkey and recovered the diamond, but the farmer who sees his mule swallow his profits can not kill the mule and find them. A better way is to prevent his swallowing them. The economical keeping of work animals depends upon three things—good pasture, the best hay, and the most economical grain ration. A good pasture is well drained and is free from brush and weeds. Sweet grasses do not grow on wet, sour land; they love sunshine and they are too proud to associate with low weeds.

“There must be a night pasture with an abundance of grass for the mules and a day pasture for off days and Sundays. This plan will save about one-third of the hay and grain during the working season. Poor hay, sun baked till there is no flavor in it, is little better than straw. The quantity of hay an animal will eat depends largely upon the flavor. High-flavored and nutritious hay costs no more, if produced at home, than low-grade hay. As to grain, it is unwise to feed so much corn, for there are other foods more economical. Land that will produce 25 bushels of corn to the acre will produce  $2\frac{1}{2}$  tons of soy bean hay, equal in food value to 70 bushels of corn; or it will produce  $2\frac{1}{2}$  tons of cow-pea hay, equal in value to  $77\frac{1}{2}$  bushels of corn; or 2 tons of peanut hay (Spanish peanut hay with the nuts), equal to  $90\frac{1}{2}$  bushels of corn. It is less labor to work an acre in either of these crops than in corn. They



require less fertilizer and the soil is left in better condition. Much of their value depends upon the way they are cured.

"A working day's ration for a mule with a good night pasture would be: Hay, 6 pounds; soy bean hay, 10 pounds (or cowpea hay, 9 pounds; or peanut hay, 7 pounds); and corn, 4 pounds. The actual cost of this ration to the farmer is about 10 cents, or \$3 a month. For the six working months this would make \$18, and for the six remaining months the mule can be fed on grass and pea vines, pastures, and refuse crops at about \$2 a month, making a total of \$30 a year. For some years I have kept an account of the cost of feeding my mules on this plan, and the total cost has been below this estimate. While we are on the mule question let me suggest that it is always good economy to have 20 per cent more mules than are actually required for the crop, so as to have an extra animal in case of accident or to have an additional team for emergency work."

"You have made a strong argument for the use of mule power," said Uncle John, "and I want to think the matter over. You are a great friend of the mule, I see."

"I am no believer in the economy of mule power," I replied, "except for the coast country and the lumber camps. The upland farmer uses poor economy when he depends upon mules."

"What would you use?" said Uncle John.

"I would use active, blocky, well-bred draft mares or the hackney. The colt raised annually would pay all the expenses and my team work would cost me nothing. That is the French plan, and the peasants of France are the greatest farm economists in the world; but we will talk about that at another time. I must go."

"Come over again," said Uncle John, quite cordially. "That horse talk rather interests me. In the old times before the war we had horses that were horses; now a gentleman has nothing to ride but a plow mule."

S. A. KNAPP,  
*Special Agent in Charge.*

Approved:

B. T. GALLOWAY,  
*Chief of Bureau.*

APRIL 30, 1908.



# The Rice Kitchen at The Pan American Exposition

From a number of  
reliable sources good reports  
had come to me of the  
success of the Rice Kitchen  
but I was not prepared  
for any such extraordinary  
success as has achieved in  
the short time it has been  
in operation. At precisely  
12 o'clock the kitchen  
is opened for dinner  
; within five minutes  
every seat is filled -  
and there are about 70 chairs  
-; in ten minutes the front



2 veranda and all available  
space ~~is~~ within are crowded  
with waiting people. They  
watch individual tables  
and the moment there is  
a vacancy it is instantly  
filled. This gorged  
condition continues about  
two hours and a half, then  
for half an hour the seats  
are only fairly filled.

Dinner service closes at  
3 p.m. During the service  
Col. Eggleston receives  
the patrons and attends  
to seating them; Miss Goned  
sees that the service in the  
kitchen and the waiting in  
the dining room are prompt



3 and satisfactory, and Mr. Clement presides over the cash. The only complaint made by the public is that the kitchen is too small.

The patrons of the kitchen are <sup>among</sup> the best people, who visit the Exposition; ~~and~~ about two thirds ladies - and most of them take a deep interest in the cooking of rice by such attractive and appetizing methods as the kitchen develops.

In analyzing the causes which have contributed to the great popularity of the kitchen it appears



4 To me that the following  
are some of the most influ-  
-ential 1<sup>st</sup> Merit - The  
excellence of the food and  
the service; The cooking  
and the flavoring are  
perfect; The kitchen is  
exquisitely clean; The  
waiters are of more than  
ordinary intelligence and  
there is an air of superior  
quality about every thing  
which impresses every  
one To Miss Ella Whitney  
Gould, the expert in the  
science of domestic economy,  
largely belongs the credit  
of establishing and main-  
-taining this high standard  
of excellence



3. Col Eggleston, The  
Manager, has most-  
devotedly given his energies  
to this work and has  
very successfully  
organized and managed  
the enterprise

2<sup>d</sup> The location near  
the Art building and  
among the state buildings  
tends to attract the  
better classes

3<sup>d</sup> The representatives  
of the press and the  
persons in charge of the  
government and state  
exhibits have from the  
first recommended the  
rice kitchen and labored



6 for its success. Especial credit is due the representatives of the Louisiana exhibit for good words and friendly acts

Dr Stubbs and his associates, who are responsible for the excellence of the Louisiana exhibit deserve a medal

It attracts more attention than all the other State exhibits. It is a remarkable object lesson

In the opinion of all who visited the Rice Kitchen the <sup>people's</sup> money has been well expended



7 with such modification  
as experience may suggest  
The Hitchins should be  
repeated at Charleston  
the ensuing winter

Let us congratulate  
the rice planters of  
Louisiana and Texas  
on the success of this  
great undertaking to  
build up our American  
Sentiment in favor of  
rice as a common  
food

J A Knapp



## THE COTTON AND CORN CROP.

Where our instructions have been followed in the preparation of a seed bed for cotton or corn, the universal report to this Office has been that there was plenty of moisture in the soil to cause germination of the seed even under the drouth conditions prevalent this season in West Texas. This is what might have been expected. The next problems are spacing and cultivation.

All authorities agree and all experience proves that fruiting plants must have ample space of soil for food supply and for the top to obtain sufficient sunlight if the plant is to yield its best results. Cotton is no exception to the law of fruiting plants. Space must then be in proportion to the plant. While definite instructions for all cases can not be given, our general rule for width between rows is, make them a little wider than the cotton usually grows tall. Three and a half foot rows will answer on well-drained loamy lands for cotton, <sup>usually standing</sup> two and a half feet tall; for heavier soils give a little more space. Increase the distance between the rows on each field as required by any greater height and spread of the cotton. On post oak-flats and bottom lands, requiring at times surface drainage, we have made the most cotton by giving not less than five foot space between the rows.



### Distance Between the Plants in the Rows.

On fields tilled under our directions the distance between plants in the rows should never be less than fifteen inches, and generally two feet is better because with our preparation of soil and tillage the plants are vigorous and the varieties of cotton we recommend throw long, well loaded fruit limbs close to the ground. Where cotton grows four feet tall and is an improved variety, thirty inches in the row is sufficiently close. Our demonstrations show that more cotton is produced by giving a fair distance and securing as perfect development in each plant as possible. Many of our Demonstrators produced from a bale and a half to two bales and over per acre last year and it was invariably done on the plan of giving space enough for each plant to produce a maximum yield. Rows five feet apart, with a space of thirty inches between plants in the rows will allow 3,477 plants per acre. With this spacing and the best treatment the plants have been made to average over one pound of ~~Lint~~ <sup>Seed</sup> cotton each. Close planting ultimately deteriorates the cotton in quality, lowers the yield per acre, and is frequently the cause of shedding the bolls.

Only very general suggestions can be made as to width of rows and distance in the row as soils, seasons, and conditions vary so greatly and the farmer should observe under



what conditions of spacing he secures the best results.

Plant early-maturing varieties of cotton. Some large-boll varieties are even better than the small-boll cottons under weevil conditions. This, however, is largely a matter of soil and climate.

#### Cultivation of the Crop.

Several important things must be avoided if the planter expects to make a large crop of cotton or corn.

#### Safe General Directions.

- 1.- The field should never be grassy, from the time of planting the seed till the crop is laid by.
- 2.- Avoid the crusting of the soil.
- 3.- Do just as little of this work with the hoe as possible.
- 4.- Cultivate shallow frequently and continue late as possible.
- 5.- Thin to a stand early as practicable.

One of the best implements on the farm is a smoothing harrow, especially one in sections which allows the teeth to be set at different angles. The use of the harrow just before planting and immediately after, and again at right angles with the rows as soon as the cotton or corn is well out of the ground, will promote growth, destroy weeds, tend to prevent baking of the surface, and save expense with the hoe. Commence cultivation soon as practicable under boll weevil infestation.



Cotton under boll weevil infestation should be forced by cultivating as frequently as once in seven to ten days, depending upon the soil and the weather. Never cultivate when the soil is too wet to ~~have~~<sup>leave</sup> a loose surface, unless unavoidable on account of the grass. This plan allows about nine cultivations after harrowing. The first cultivation of the middles should be deep, later cultivations shallow. On rich moist lands it may be found advisable to cultivate deep later, to give some root-pruning.

#### General Depth of Cultivation.

Depth should be determined by conditions. Where there is excess of moisture in the soil, cultivate shallow as possible; under normal conditions an inch and a half to two inches is ample if the sweep or weeder is used; in periods of drouth two to two and a half inches will give better results, and in sections of slight rainfall a depth of three inches is admissible. These are not exact rules, but guides. The general instructions are to give a little greater depth under drouthy conditions than where there is normal or excessive moisture. For shallow cultivation use the weeder or the sweep. The implements most useful in cotton and corn cultivation are the section, adjustable-tooth harrow, the weeder and the sweep for shallow cultivation, and the disc and *the pointed* blade cultivators for deeper tillage. Where these are not at hand the farmer must use as skillfully as possible such implements as he has.



<sup>1</sup>  
P Watch for the boll weevil when the squares begin to drop from the plant. It may be due either to the weevil, to excessive moisture, excessive drouth, or too close planting. If the boll weevil is the cause, all the punctured squares should be burned for at least the first month after blooming commences, and it will be wise to continue this for a longer period. A good many weevils will thus be destroyed.

Attach a smooth pole to the cultivator or to the whiffletrees in such a way as to strike the plants and knock off the punctured squares. If these can be swept into the middles the larvae will soon be killed by the heat of the sun and thus save picking up and burning the squares. On sandy loam land frequent brushing of the cotton seems to be helpful. Such weevils as fall into the hot sand in the middles are soon dead.

Cotton not under boll weevil infestation should be cultivated intensively to secure the best results, but as early maturity is not so essential five or six cultivations will generally perfect the crop. Methods of cultivation are the same. The exact number of cultivations can never be justly advised in all cases. If there is any doubt, always incline to the greater number.

The foregoing advices are solely for the guidance of our Demonstrators and Cooperators. It is assumed that they all have some good implements for rapid cultivation and that they are men of judgement and can vary the instructions according to conditions of soil, weather, moisture, etc.



## THE CORN CROP.

Improve the condition and fertility of the soil by rotation of crops, by planting cow peas or other legumes, or by the use of stable manure or compost. Corn requires a deep and thoroughly pulverized seed bed. For the best results the seed bed should be not less than ten inches deep and in some soils deeper than this. How and when to do this is explained in Circular #A-64.

In Virginia and the Carolinas deep breaking and the planting of crimson clover as a winter cover crop are approved by all authorities and have been widely practiced by the farmers with excellent yield and greater profit. Under this system farmers have produced over seventy bushels of corn per acre on good up lands, without the use of commercial fertilizers.

Always plant, if possible, a winter cover crop. If

crimson clover does well, by all means use it; further South *where conditions are less favorable for clover plant* ~~winter oats and barley can be substituted.~~ For corn, plow under in the spring. In case no cover crop is used, harrow the field occasionally in the winter.

Plant only the best selected seed, such as will produce uniform ears of excellent quality and a large crop if given *Home produced seed, if carefully selected and of some approved variety is generally the best.* ~~good conditions.~~ <sup>To firm</sup> Plant as early as the season will allow in rows four <sup>to five</sup> feet apart on well-drained ~~loam~~ <sup>loam</sup> soils, and plant cowpeas, or crimson clover according to <sup>climate</sup> ~~conditions~~, between the rows at the time the corn is cultivated last. When

*Distance to be governed by strength of soil -6-*



the weather is warm one inch is sufficient depth to plant in well-pulverized moist soil for perfect germination and the strongest plants, but no definite rule of depth for planting corn can be given for all territory, owing to difference in depth of soil-moisture and other local conditions. This, however, may be suggested:- Do not plant so shallow as not to reach the influences of soil-moisture, nor so deep as to retard germination. The general tendency in the South has been to plant too deep, causing rotting of the seed or slow germination which adds to the grass problem. Here, as in all cases, the farmer must use judgement.

On rich bottom lands and on post-oak lands nearly level where the rainfall is heavy, corn rows should be five to six feet apart, using the broad ridge system, and cowpeas should be planted on the side at the time of laying by. This method *to give better surface drainage, where surplus water must* is ~~only~~ advised where the conditions of drainage admit ~~no~~ *mainly be removed by surface drainage* other. It is the universal plan for corn and cotton in the rice and sugar districts of the Gulf Coast.

Harrow corn before and after planting to prevent the formation of a soil crust. Then give shallow cultivation once in ten days, and always after a rain, until it is time to lay by. Close deep cultivation or plowing is injurious after the corn is eight inches tall. For the after cultivation the weeder or shallow spring tooth cultivator is better than the sweep, the ordinary or blade cultivator, or the plow.

~~Work~~ *The ordinary way* Plow the middles ~~deep~~ when the corn is about eight inches



tall, and keep them well worked.

Thin ~~before~~ the corn <sup>as early as practicable</sup> is eight inches tall to a single stalk fifteen inches in the row when there is high fertilization, intensive cultivation, and the soil is good. When the corn is on land long in cultivation and but little fertilizer is used, two feet in the row will be nearer right. On very rich soil properly prepared and tilled and progressively fertilized, the stalks may stand singly a foot apart in the row, but if a large crop of corn is expected there must be a good stand and more stalks left in the row than usual. The thicker stand is supported by better cultivation and fertilizing. <sup>P</sup> It pays to use commercial fertilizer on corn. The corn crop requires more nitrogen than cotton. It should be fertilized liberally. The kind of fertilizer used, the quantity, and the time of application must be determined by the soil, climate, season, and other conditions and can not be stated in any general rule. In fact, all the foregoing directions are subject to some modifications to meet conditions of climate, soil, season, etc. Generally a fertilizer that analyzes nine to ten per cent of phosphoric acid, three per cent of nitrogen, and two per cent of potash, does well for corn. A mixture of equal parts of high grade acid phosphate and cotton seed meal is generally advisable for up land corn. Well rotted stable manure is good and produces better results if applied in the winter, so as to become incorporated with the soil.



The items to be emphasized in making a corn crop are the following: (1) Plenty of humus in the soil; (2) good drainage; (3) soil preparation; (4) selection of seed; (5) excellent cultivation; (6) fertilization.

A good corn crop is a basis of prosperity and ranks next to a good cotton crop.

*J. A. H. H. H. H.*  
*Special Agent*  
*in charge*



## Notes on the Farm

### The Corn Crop

The great American grain food for men and stock upon the farm is corn. Therefore, its abundant supply is one of the essentials to good farming.

Corn is a tropical plant, and all other things being equal, it should thrive better in the Southern States than in the Northern; but it does not. What is the reason? The main cause is lack of a suitable seed bed. Experiments have shown that while the corn plant sends many of its roots three or four feet deep, it places the great body of its feeding roots from three to twelve inches below the surface, where the soil is made loose enough by plowing or by frost to permit it. The roots send out from their surfaces in every direction an infinite number of hair-like growths which absorb moisture and food. On soils properly prepared, the feeding ground for corn is usually from two to twelve inches below the surface. This is strictly true in the great corn belt of the Northwest. In the South, there has been too much shallow plowing. Three or four-inch breaking is not deep enough to make a suitable feeding place for corn roots; on average lands it does not furnish enough food or moisture for the plant to do its best. The trouble with a shallow seed bed is that it is too wet under heavy rainfall, and too dry in periods of drouth.



By making a deeper seed bed, suited to the requirements of the corn plant, filling this with vegetable matter, giving it good drainage, using the best seed, and doing intensive cultivation, a long advance will be made towards increasing the average yield five-fold. The disc plow, the adjustable tooth harrow, and the weeder, have been valuable aids to the corn crop.

### The Cowpea

The cowpea is a part of the corn problem in the South, and the plan generally adopted of broadcasting a bushel to a bushel and a half per acre, and cultivating in at the time of the last working of the corn, has given good results.

Pick the corn as early as practicable, and turn in the stock. Fortunate is the man who has tight fencing, so that the pigs can have a chance at the peas, as well as the work stock and cattle. On some of the poorer lands, if the corn rows are made 6 feet apart, and a row of peanuts planted between them, it will add to the value of the fall pasture.

As soon as the crop of cowpeas has been fairly well grazed, deep break, setting the furrows on edge, harrow and sow to oats, winter barley or rye, and turn this under in the spring. This plan will economically improve the soil and greatly increase the average crop production.



Where the season is too short to successfully carry out the foregoing plan, it has been found that planting vetch and rye, or crimson clover, in the corn, and turning them under in the spring rapidly builds up the soil, and is much more economic than the use of large quantities of commercial fertilizers. The general object is to keep the land occupied summer and winter, producing something of value for food or fertilizer, and to do just as much of the work with machinery as possible.

This plan will require more horse-power on the farm. More horse-power, and less man-power, per acre, or quit farming, is what is confronting the South.

There should be more mares on the farm. In the future farming, few small farmers will find it profitable to keep mules; the colt must pay the expense of more horse-power. In this connection, the more economic feeding of the work stock on the farm is of primary importance. Feeding a horse or mule on pulled corn fodder and corn is so expensive and out of date, that it is surprising to find any one doing it. Farmers have fully proven that the pasture for summer and the well-cured hay for winter should be the main reliance. By a pasture is not meant a brush patch, nor a field of weeds; but a tract of land well set in nutritious grasses, and conveniently located, so as to be at all times usable. The best results are obtained by providing two pastures, so as to alternate in



their use, and especially to allow one to have quite a growth of grass for late fall feeding. Some farmers use one pasture for late fall and spring use, and the other during the summer and early fall months. Note rotations. Others believe that the best results are obtained by using each pasture about one month alternately. It is just as injurious to the rapid growth of grass to keep it close grazed as it would be to a bush to cut it off every morning. It is estimated that three or four times as many animals can be grazed on a given number of acres by dividing them into two pastures and alternating the grazing. It is certain that the stock do better.

### The Hay Crop

The permanent meadow is one of the most economic sources of food for animals known, where it can be secured. In the extreme South, alfalfa and Japan clover, where the soil is adapted to them, rank high. Further North, there are standard grasses which produce well. But if a farmer does not have a permanent meadow of any kind, what then? Plow up some field, and plant to sorghum or cowpeas (1/2 bu. of sorghum and 1 1/2 bu. of cowpeas per acre, broadcast). Two to four tons of superior hay can be secured in this way. It is one of the best hay crops known if properly cured. The sorghum gives flavor to the peas, and balances the ration. It should be cured without being wet, and without too long exposure to the sun, so as to retain all



its nutritive value and flavor.

It should be a discredit to any farmer to buy hay or corn for his farm, unless under exceptional circumstances.

S. A. KNAPP.



WHAT THE STATE EXPERIMENTS TEACH  
IN REGARD TO  
PREPARATION OF SOIL FOR CORN AND COTTON.

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Extract from North Carolina Bulletin, Issued Feb., 1905.-  
Pages 49 -54.

FERTILIZATION AND CULTIVATION OF CORN AND COTTON.

CORN.

CULTURE.- It unquestionably pays well to thoroughly break and broadcast-harrow land for corn. Using a two-horse plow and running it 8 to 10 inches deep, and afterwards harrowing with large smoothing harrow, puts the land in nice condition. It is also well to run a small-tooth harrow across corn rows about the time the plants are coming up, and even after they are several inches high, slanting the teeth of the harrow backward. Harrowing in this way saves after-cultivation, and is a quick and comparatively inexpensive way of getting over the land. The land being thoroughly broken before the corn is put in the ground, only shallow, level cultivation with some one of the considerable number of good cultivators need be given the crop during the growing season. The one-horse cultivators cover corn rows in two to three furrows, and the two-horse ones at a single trip. The cultivations should be frequent,- about every ten days- and if possible just after



rains, so as to break any crust formed by showers, leaving a dust mulch to retard the loss of moisture added to the soil in the previous rains. Toward the end of the growing season the cultivators should only be run one to one and a half inches deep, so as to disturb as little as possible the roots of the plants which, by that time, are well into the middle of the rows.

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### COTTON.

CULTURE.- The remarks regarding the preparation and cultivation of corn also apply with equal force to cotton, unless it be the part regarding breaking the land well before planting. Some doubt the necessity of this for cotton. Cotton is generally grown on ridges. This is necessary on wet soils, but on all fairly well-drained upland and sandy soils we are convinced that level and frequent shallow cultivation, as was indicated for corn, is the best and most economical method to follow in growing cotton. Ridge culture may give better results in very wet years, but taking the seasons as they come the advantage will lie, we think, with flat culture.



PREPARATION AND CULTIVATION OF SOIL FOR CORN.

The plats were all broke alike with a two-horse turning plow 8 to 10 inches deep during January, and then followed by a good harrowing. Just before ready for planting the rows were run 4 to 5 inches deep and 4 feet apart, with a one-horse plow. The fertilizer mixtures for the different plats were applied uniformly in these drills by hand and covered by means of cultivators, having the wings on and straddling the rows. On the slight ridges thus formed the corn was planted a little below the level, all tests of the same kind at the same farm being given the same treatment as to time of planting and otherwise. All cultivations were as nearly level as possible and rather deep early in the season, with the small hoes of the Planet Jr. Cultivator, but became shallower, using the large hoes as the season advanced and the roots extended towards the middle of the rows and nearer the surface. This system of cultivation afforded pretty thorough breaking of the land early in the season and prevented the disturbance of the root systems of the plants later. An effort was made to cultivate every ten or twelve days, as far as the weather would permit, and especially immediately after rains, in order to produce a fine dust mulch with the shallow-running plows, to retard the evaporation of the recently-added moisture.



## PREPARATION AND CULTIVATION OF SOIL FOR COTTON.

All plats devoted to these fertilizer tests were broke 8 to 10 inches deep during January or February in the respective years except where otherwise designated at both the Edgecombe and Iredell farms. Just before laying off the rows, which was from the last of April to the middle of May, the ground was "gone over" with a smoothing harrow. The rows were run 5 to 7 inches deep with an 8-inch shovel and the different fertilizer applications per plat made in the furrows thus made. The fertilizer was covered as in the corn, and the cotton planted on the level or slightly above the level. One or two cultivations were given the cotton before it came up, using the weeder or light harrow, depending upon which did the most effective and satisfactory work.



-21-

Results Secured.

~~1st~~! The result is better preparation of the soil, earlier planting, the use of better seed, more intensive and careful cultivation of cotton and generally of all other crops.



<sup>2d</sup>  
~~1st~~. Success brings confidence and confidence restores credit.

<sup>3d</sup>  
~~2nd~~. Incidentally and unavoidably instruction was given in regard to the other crops, which fact leads to diversification. As a result, more farmers in the boll weevil sections produced the foods required for the use of the farms, and many produced minor cash crops to meet current expenses. Thus at the end of the season they found they had produced a fair cotton crop with less indebtedness than ever before. Their statements are confirmed by the banks and the merchants and it was generally agreed that for the first time within the recollection of men, farmers on all occasions discussed the raising of cotton, and they gave to their farms a more undivided attention than ever before. As the season progressed there was a general revival of business in the towns and minor cities of the boll weevil sections, where the Department plans were followed, and before half the season was gone, some of the worst stricken sections had apparently recovered prosperity. As indicative of the wide influence and helpful character of the work I append a letter from one of the most intelligent and prominent merchants of North Texas.

The writer voluntarily organized a club of sixty farmers to follow our Department instructions, and hence his statements possess special value.



Greenville, Texas, 10/14/04.

Dr. S. A. Knapp,  
Houston, Texas.

Dear Sir:-

I take the privilege of offering you my observation on results of the work you have done along the agricultural line in this section. I do this as a supplement of your present knowledge of the general situation in order that you may be more fully advised as to local conditions. The work has been far reaching in this section and has been of more moment than one should think for, taking observation only from the surface.

We have never in the history of this country had such thorough preparation and cultivation as we have had this year, and it can be truthfully said that we have never had a crop before so uniform and so good, all circumstances considered. Many of those agreeing to cultivate small plats have observed the rules with reasonable strictness, and have, in almost all instances, gotten results entirely satisfactory, while some failed to regard the instructions with inevitable results. However, the small plat system has been of great good to our people, as it led directly to the wide spread good that every farmer unconsciously became a party to. I am sure the work so far accomplished is far in excess of all reasonable expectation. I have one man in mind while I write this letter who planted one



acre of King cotton, plowed it twelve times and has so far gathered 2800 pounds of cotton off of it. He also has four acres planted to the native cotton, which he gave the usual cultivation, and he has not gathered as much from the four acres as he gathered from the one, well cultivated. x x .

Our people are quite well under the influence of the diversification idea and are showing great industry along this line. I feel that you have great cause to feel gratified with your labor. Your enterprise was vast, your opportunities burdened in many ways, yet in spite of every adverse condition you have made phenomenal progress.

I should be very glad to be with you on the 19th, but I cannot possibly be away from home at that time. I predict, however, that you will have a good meeting, and one that will bring to you even more satisfaction than your present knowledge of the good of your labor allows me.

With best wishes for your health and success, I remain,

Very truly yours,

"G. H. Collins."

Dr. S. A. Knapp,

Houston, Texas.

I, R. L. Furgeson a planter, do certify that I cultivated a cotton crop of nine acres under the cultural system, and succeeded in raising #1400 seed cotton per acre, much to my surprise.



I therefore endorse the cultural methods recommended by the U. S. Department of Agriculture to all intents and purposes and believe it the only safe method to raise cotton in the boll weevil district.

R. L. Furgeson,  
Corsicana, Texas.

The Work Outside the Boll Weevil Territory.

The Co-operative cotton demonstration work outside the boll weevil infested districts was even more striking and satisfactory than within. Some portions of North Texas are in evidence. These demonstrate that farmers in Texas are making only about one-third the cotton they could, and would make if they followed the Department's methods.

Louisiana.

In Louisiana there was no attempt made to enlist the cotton farmers on a general co-operative scheme, as in Texas. It was thought best simply to establish several hundred sample farms of five or ten acres each, to be fertilized and worked on our plans simply as a demonstration of what could be done on the various soils of that State and to so acquaint the people of that State with the Department's methods of making cotton that when the boll weevil should reach them, there should be no loss of laborers, nor stampede of tenant farmers, nor paralysis of



credits, as occurred in Texas. The capable manner in which the field agents have handled that territory has been most gratifying and has resulted in great good to all.

### Special Difficulties.

In the Southern and South Western portions of Texas the work was less effective than in the great cotton producing counties North of the Southern Pacific Railway for the following reasons:

1st. Before the work could be organized and field agents reach the farmers many of them had planted cotton (planting as early as Feb.15th), and it was impossible for them to comply with the Department plan as to variety planted, width of rows or fertilization, and not having started in line they mostly failed to take hold of it properly.

2nd. In South Western Texas it is quite a common plan to leave the old stalks over winter and raise a crop of cotton from them the second year, thus wintering over multitudes of boll weevils and also failing to give the soil proper cultivation. This portion of the State suffered more from the weevil pest than any other.

3d. In nearly all portions of Texas the co-operative campaign was not commenced early enough to greatly influence the width of rows, and in many sections it was too late to secure fertilizers.



UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF PLANT INDUSTRY.  
FARMERS' COOPERATIVE DEMONSTRATION WORK.

HOW TO MAKE A GOOD CROP OF COTTON OR CORN.

It is impossible to lay down rules applicable to all climates, soils, and conditions; hence good judgment should always be used in application of any instructions. The following suggestions can generally be followed with profit:

(1) We prefer deep fall breaking(plowing) for both cotton or corn.

(2) It should be done with a disc or sub-soil plow so as not to bring to the surface too much of the unaired subsoil.

(3) In sections of very light winter rainfall, the field should be disced or harrowed at once after breaking, but where the winter rains are abundant, the breaking should be left in the furrow.

(4) If no fall breaking was done, commence as early as conditions permit in the spring and for cotton break about four or five inches deep; for corn break 8 to 10 inches deep with a disc or subsoil plow and cross plow once with the same implements.

(5) Then whether fall or spring broken, work the land with disc or harrow and continue till the soil is fine as powder. Repeat the process just before planting. Pulverizing with the harrow should be about 4 inches deep.

These instructions where cotton is to be planted do not apply to semi-arid lands, not to rich, moist, nearly virgin, alluvial bottoms, nor black prairies of great depth of soil,



where there is plenty of moisture and an excess of plant food. The object in such cases is to reduce the supply of available plant food and of the moisture by shallow spring breaking, two to two and one half inches deep.

#### BEDDING UP.

Bedding up for cotton or corn is always advisable in territory of considerable rainfall; with lighter precipitation and good drainage on loamy soils, flat planting is the better. In either case the seed bed should be thoroughly pulverized. Delay planting cotton till safe from frost.

#### DISTANCE BETWEEN ROWS.

For fruit producing plants, two things must be observed. The plant must have space in proportion to its size and the ground should not be entirely shaded by the plants for the greatest fruit production. It is better to give cotton a fair distance between the rows even if there is a little crowding in the row to compensate. The space between the rows should be from  $3\frac{1}{2}$  to 6 feet, depending upon the draigane, soil, and probable size of the plant. On rich bottom lands where the rows are so close as to prevent adequate ridging in case of protracted wet weather, the shedding of cotton bolls is greatly increased and the number of bolls the plant produces considerably decreased. Space between the plants in the rows should vary from 15 to 20 inches, according to the size of the plant. Under boll weevil conditions, more space between the rows is required for cotton, because the soil must be dried rapidly. On well drained up-lands,  $3\frac{1}{2}$  to 4 feet between



the rows answers for cotton or corn, but on coast lands, post oak flats and rich bottom lands, requiring surface drainage, the rows should be 5 to 6 feet apart and compensate by less space in the rows. For corn if land will not make large ears on every stalk when standing 20 inches apart in the row, it should be summer fallowed and a crop of sorghum and cowpeas turned under.

There is more waste of good labor on poor corn fields in the south than on any other crop.

#### TEST THE SEED.

Whether cotton or corn is to be planted, test the seed for germination. A box with garden soil in it will answer. Place in a warm room.

#### PLANT SHALLOW.

The main causes of so many poor stands are a poor seed bed, bad seed and deep planting. Planting from  $\frac{1}{2}$  to 1 inch deep is better than deeper in most soils and climates for both cotton and corn and the seed bed must be high enough not to be water soaked.

A poor stand is a bad start for a good crop.



USE THE TOOTH HARROW.

The use of the tooth or smoothing harrow just before and immediately after planting by crossing the furrows is an excellent practice and again as soon as the cotton is up commence to cultivate immediately and thin to a stand early as practicable.

S. A. Knapp,

Farmers' Cooperative Demonstration Work.



## Select Your Seed Early for Next Year's Crop.

For the amount of labor involved no work upon the farm pays better than seed selection. Within a seed is the minute germ that has all the characteristics of the preceding generations of that species with the modifications which previous culture, soil, climate and selection have given it and these it transmits to the future plants. In addition the seed contains a little food to help the germ till it can get established in the soil.

While the types in seed are persistent along general lines; within these limits they admit of great modifications by selection and cultivation. In cotton, the size of the boll, the length and quality of lint, the time of maturity, the tendency to abundant fruitage, the height and form of stalks and other plant characteristics may be modified at the will of the farmer.

When a farmer buys a high grade seed at a large price he is simply paying another man for using his brain to do what he can do just as well if he will.

Careless cotton farming and gin run seed are responsible for a lot of short cotton crops. There is but little pure bred seed planted and that little has been generally more or less mixed in the field and at the gin.

Five points should be carefully noted in cotton seed improvement; type, variety, selection, ginning and storing. A farmer should determine the type of cotton he wants to produce.



He can in the end produce what he wants to if he studies and works for it. By type is meant the kind of stalks, boll, lint and etc., The type generally preferred is a strong, short, vigorous stalk, with plenty of fruit limbs on the lower half; fruit limbs short jointed but extending to the outer border of the plant and fruiting to the end; large bolls; storm resisting; lint heavy per cent; staple at least 1-1/8 inches and strong; plant hardy; early prolific.

#### VARIETY.

Plant seed of a variety that produces cotton as near the type you want as possible. It will not be exact but if good seed and of the right variety it will come nearer.

Plant this seed on a separate tract of land, called plat, so it will not be mixed by insects. Every farmer needs a seed plat just as much as he needs a well bred male, if he is going to improve his stock. Thin and cultivate this in the best way.

#### SELECTION.

Let us go personally on to the seed plat in the fall with the sack over our shoulder and make selection. Here is an ideal stalk about three feet tall, loaded with choice bolls. There will be more than a pound of lint cotton on it at maturity.

Round the heart of the plant we select the best bolls, rejecting the bolls on the ends of the limbs and near the top and a few that are so low as to nearly touch the ground. The top



and end bolls tend to later maturity and the seed in bolls too near the ground absorb the moisture and are not as vital.

The next stalk, is not quite so perfect but is pretty good and we take a few of the best bolls. On the next stalk are four or five great fine bolls. My man was along with a sack and he was just about to pick them; in fact his fingers had closed over one - "Let them alone," I called out. Look at that stalk. It never thought about going into the cotton business till it was half grown. There is only about an eighth of a pound of cotton on it if all the bolls mature. That plant has some bad blood in it or it is a black sheep in a good flock. We do not want to raise that kind."

Then we passed several plants not very good and not very poor; just a few feet along the row I noticed two remarkably fine bolls near the top of a stalk. Something called my attention and when I looked back my man had them. "Aint they fine?" he remarked and he gave a smile of satisfaction. Right, "I replied?" if you do not see the plant. They grow too near the top and will tend to make our crop late." "If you are going to be so particular we shan't get much cotton seed," he answered sort of short. "Bob," I replied, "I am through making these quarter of a bale cotton crops. They say that like produces like. Now, that first stalk of cotton we picked had over a pound on it and if all the stalks in this plat were just like it we should get two and one half bales of cotton per acre.



I intend to make a two and a half bale crop, and I am going to commence by selecting the right seed to do it." The next plant was loaded with bolls, but it did not stand over eighteen inches high. "That is a perfect plant," I remarked, "but we will not take any bolls from it. It is too small. Never select a runt pig for a prize winner at the fair. If I had an acre of such plants they would not hold as much cotton as I want. In this way we went over the two acre plat and secured two hundred pounds of seed cotton. This was carefully stored and ginned. The next year there were three times as many perfect stalks in the field. In three years nearly every plant was model and we had a two and one half bale crop.

Seed selection, - never pick a boll for seed except from a plant that is just what you want your crop to be next year. You can not buy such seed. Raise it.

#### GINNING.

Store your selected seed in a dry place and wait till the steam gins are nearly through; then carefully clean the gin, put down a sheet to catch the seed and run your selected lot through - Store in a dry place till planting.

Before planting run this seed through a fanning mill and blow out any seed that may be by accident light and screen out any that are too small. Follow this method just as closely as possible. A peck of such seed will produce more strong plants than a bushel of the seed commonly planted.



U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF PLANT INDUSTRY,  
FARMERS' COOPERATIVE DEMONSTRATION WORK.

HOW TO MAKE A CROP OF COTTON REGARDLESS OF THE BOLL WEEVIL.

The plan that has proven eminently successful is briefly outlined as follows:

(1) The destruction of the weevils in the fall by burning all rubbish and material in and about the field which might serve for hibernating quarters of the weevils.

(2) Break (plow) the soil as deep as conditions will allow.

(3) The shallow winter cultivation of the soil.

(4) As early planting as the season will allow with safety to the crop.

(5) The planting of early-maturing varieties of cotton.

(6) The use of fertilizers.

(7) Leaving more space between the rows, and on ordinary uplands having a greater distance between plants in the row than is usually allowed. On rich or highly fertilized lands it is better to crowd the plants slightly in the rows.

(8) The use of the tooth harrow before and after planting and on the young cotton.

(9) Intensive shallow cultivation.

(10) Agitation of the stalks by means of brush attached to the single-trees and to the cultivator.

(11) Picking up and burning the squares that fall under weevil conditions, especially during the first thirty or forty days of infestation.

(12) Controlling the growth of the plant if excessive by barring off.

(13) Selecting the seed.

(14) The rotation of crops and the use of legumes.

It will be noted that the system as outlined has a twofold object: (1) To reduce the number of weevils and (2) to aid early maturity in order to obtain a crop in advance of the weevil.

The foregoing methods may require modification to suit the soil and climate.

THE COTTON PLANT ON VERY RICH AND MOIST LANDS OR WHEREVER

THERE IS A TENDENCY TO EXCESSIVE GROWTH OF STALK.

The object of deep fall plowing is mainly to increase the supply of plant food and the storage of moisture in the soil. While this preparation is of great value on rolling lands and nearly all fields so long in cultivation that plant growth is medium or less, there are some soils that for the production of cotton better not be deep fall broken, such as very rich and moist river bottoms, and the virgin black land prairies of the Gulf States, for the evident reason that there is too much plant food for cotton already available in the soil with abundant moisture; conditions that make for an excessive growth of the cotton stalks and a consequent decrease in fruitage, even under ordinary conditions.

When the cotton boll weevil attacks the plants, the punctured squares soon fall and the plant takes on an extraordinary growth. Cotton plants which usually



grow four or five feet tall will shoot up eight and ten feet and their lateral branches will interlock across the rows, forming ideal conditions for the maturing of the weevils. It is impossible to apply the cultural methods under such conditions.

Where there is too much food and a surplus of moisture available for cotton in any soil, common sense dictates that these conditions should not be increased by deep plowing.

We therefore advise the following plan under boll weevil conditions on such lands:

(1) Burn all the cotton stalks and the rubbish in and on the border of the field as early in the fall as possible. In the spring, bed on the firm ground giving at least six feet space between the rows. Prepare a good seed bed before planting and maintain ridge cultivation through the season.

The foregoing is especially for lands where, under weevil conditions, there is an excess of plant growth.

(2) Follow instructions 4, 5, 7, 8, 9 & 10 on lowlands the same as upon uplands.

(3) Thin to a stand as early as conditions permit.

(4) When the plants are a foot high bar off on each side the rows at a distance of five inches, using a small plow or a colter and going deep enough to cut all the cross row laterals. When the plants are two feet high bar off again ten inches from the row on each side and when the plants are three feet high bar off again fifteen inches from the row on each side. If this root pruning does not hold the plant down to about  $3\frac{1}{2}$  feet tall, then prune more severely. The object of successive pruning is to make better formed plants and promote fruitage. Intensive cultivation is followed during the season. A colter can be attached to the cultivator beam in front of the sweep so as to make no additional expense in root pruning the first time. At the second and third root prunings the lateral roots should not only be cut but there should be a furrow to slightly dry the plant ridge, if the cotton plants show too rapid growth at that time. If a cultivator is used a sweep can be put on one of the two standards or feet and a sharp cultivator blade on the other, low enough to make a narrow but deep furrow at the required distance.

(5) On sandy or sandy loam lands with good space between the rows and with shallow cultivation and brushing the stalks, it is not necessary to pick up the squares in reasonably dry weather, for the hot sand will kill the larvae in the squares as well as the adult weevils that fall. On clay or clay loam soils it is advisable to pick up and burn the squares if possible in wet weather.

(6) When the weevils appear on the young cotton plants in the spring before squares form, if in considerable number, it may be advisable to use poison.

S. A. KNAPP,

Special Agent in Charge.

January 9, 1909.



## Cooperative Extension Work in Agriculture and Home Economics.

U. S. DEPARTMENT OF AGRICULTURE  
AND STATE AGRICULTURAL COLLEGES  
COOPERATING.

STATES RELATIONS SERVICE,  
OFFICE OF EXTENSION WORK, SOUTH.  
FARMERS' COOPERATIVE DEMONSTRATION WORK,  
Washington, D. C.

### DR. S. A. KNAPP'S TEN COMMANDMENTS OF AGRICULTURE.

At an early period it was found necessary to evolve from the mass of ethical teaching a few general rules for living, called "The Ten Commandments", by which a man could be moral without going through a course in theology. Just so, in order to instruct the average farmer how to successfully conduct his farm operations so as to secure a greater net gain from the farm, it is necessary to first deduce from the mass of agricultural teachings a few general rules of procedure. They are called "The Ten Commandments of Agriculture", by the practice of which a man may be a good farmer in any State without being a graduate from a college of agriculture.

1. Prepare a deep and thoroughly pulverized seed bed, well drained; break in the fall to the depth of 8, 10 or 12 inches, according to the soil, with implements that will not bring too much of the subsoil to the surface (the foregoing depths should be reached gradually).
2. Use seed of the best variety, intelligently selected and carefully stored.
3. In cultivated crops, give rows and the plants in the rows a space suited to the plant, the soil and the climate.
4. Use intensive tillage during the growing period of the crops.
5. Secure a high content of humus in the soil by the use of legumes, barnyard manure, farm refuse, and commercial fertilizers.
6. Carry out a systematic crop rotation with a winter cover crop on southern farms.
7. Accomplish more work in a day by using more horse power and better implements.
8. Increase the farm stock to the extent of utilizing all the waste products and idle lands of the farm.
9. Produce all the food required for the men and animals on the farm.
10. Keep an account of each farm product, in order to know from which the gain or loss arises.



U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF PLANT INDUSTRY,  
B. T. GALLOWAY, CHIEF.

SEED AND PLANT INTRODUCTION  
AND DISTRIBUTION.  
A. J. PIETERS,  
BOTANIST IN CHARGE.

SEAMAN A. KNAPP,  
SPECIAL AGENT.

Lake Charles, La.,



Rice Industry  
November 1902.

Chicago Visitors.

Some lessons on rice  
culture from the East Coast  
S.A.K.

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four companies, with an ownership aggregating 60,000 acres of land, valued at \$1,500,000. He organized the Moore-Cortes Canal Co. with 17,000 acres and was elected president, organized the Trinity Rice, Land & Irrigation Co., with 15,000 acres, and was elected vice-president; organized the Texas Rice Development Co., with 20,000 acres, and was elected vice-president; and became interested in the Hill-Brown Irrigation Co., and was elected vice-president also of that company, making him today the most extensive rice planter in Texas.

Col. J. W. Roach, general manager and superintendent of the Trespacious Rice and Irrigation Company, which company is now constructing one of the best canals in the rice belt, on the west side of the Colorado river in Matagorda county, was in Houston about the middle of the month on business for his company. The levees of the canal of this company will have a crown of eight feet in width, so that a man can drive in a buggy on the top of the levee the entire length of the canal. In addition to building one of the best and most substantial canals, this company will build immense reservoirs, which will be filled with water and held for use in case of emergency.

Mr. Theo. Schaedel, manager for the Moore-Cortes Canal Co., of Matagorda county, was in this city a few days ago, stopping over here en route to his former home in Crowley, La., to which place he was called on business. Mr. Schaedel says there can be no question but what the yield on the lands watered by the Moore-Cortes Canal Company was fully ten sacks per acre, but owing to the continued rains and the roads being impassable, it will be impossible to get that yield to the market. He says there will be a great deal of damaged rice, but that his company has many thousands of sacks of first-class grain safely stowed in its warehouses.

#### Committee on Program and Arrangements.

At the regular monthly meeting of the board of directors of the Rice Association of America, held at Jennings, La., on the 19th inst., the following named directors of the association were appointed to prepare a program and arrange for the annual meeting, to be held in Houston, Texas, on Jan. 20, 1903:

De L. Evans, Houston, Texas.  
S. F. B. Morse, Houston, Texas.  
W. C. Moore, Houston, Texas.  
F. N. Gray, Houston, Texas.  
B. L. Vineyard, Eagle Lake, Texas.  
J. E. Broussard, Beaumont, Texas.

## SOME LESSONS ON RICE CULTURE FROM THE LAST CENSUS.

BY DR. S. A. KNAPP.

(Special Correspondence Rice Industry.)

The total acreage devoted to rice culture in the United States for the crop of 1899 was 351,344. The total number of farms was 5,717, distributed among the States as follows: Alabama, 33; Florida, 65; Georgia, 624; North Carolina, 412; South Carolina, 1,206; Louisiana, 2,733; Mississippi, 19; Texas, 125; Hawaii, 500. The above must be understood as the farms devoted to rice or contributing to the commercial crop, because a great many more farms were reported as raising some rice. In South Carolina alone 23,726 farms were reported as producing some rice. Most of these farms, however, simply raised a small amount for home consumption.

Omitting Hawaii the total crop of rice for 1899 expressed in clean was 250,280,227 pounds.

The number of acres in each State cultivated in rice in 1879, the total product and the average yield per acre is expressed in the following table:

	Acres.	Lbs.	Lbs. per a.
Alabama ....	2,329	926,746	398.0
Arkansas ...	25	8,630	345.2
Florida .....	5,410	2,254,492	416.7
Georgia ....	21,998	11,174,562	508.0
Hawaii .....	9,120	33,442,400	3,662.9
Louisiana ..	201,685	272,732,430	856.4
Mississippi .	2,095	739,222	352.9
N. Carolina..	22,279	7,892,580	354.3
S. Carolina ..	77,657	47,360,128	609.9
Texas .....	8,741	7,186,863	825.0
Virginia ....	12	4,374	175.0

At first glance one is surprised at the low average per acre; but this is pounds of cleaned rice and may be considered as representing a barrel of paddy for each hundred pounds; thus the yield of Texas was 8 1-4 bushels of paddy.

All the census reports in my possession indicate that there has never been a rice crop in any State that averaged nine barrels per acre. Single acres might yield 15, 20 or 25 barrels, but 8 barrels is a high average for any State in a good season. I am not speaking of what ought to be produced nor what could be, but what the census says. The census of 1880 reports only 5.52 barrels for the average of 1879 in Louisiana, while Georgia produced 7 1-4. By the last census the average of Alabama, Arkansas, Mississippi and North Carolina are less than 4 barrels,

Georgia just 5 and South Carolina barely 6.

In estimating the rice crop in merchantable milled product the estimate is low, because all shrinkages and wastes by storms and otherwise are deducted from the gross product. The amount of weed seeds and light rice taken out by the mills is very large. But all those wastes and by-products rightfully should not be estimated, increasing erroneously the gross product—and are not so estimated by the census—because they are not marketed and have no actual bearing on the merchantable product and price. The census makes an allowance for the amount reserved for seed.

In ordinary crop estimates the amount reserved for seed should not be included, because it simply pads the report. It can not enter into consumption, but must be buried in the ground to produce the next crop. For these reasons the milled product is the true crop, so far as the public is concerned, and on it the price should be based, and not on what can never go into market. It is readily seen from this how equally honest judges may differ widely on a crop estimate during the growing season. One man is an optimist and believes the fall weather will be fair—at least he makes no allowance for bad weather, winds or floods—for imperfect grain on land not watered, for trash in the sacks at threshing and for rice reserved for seed never weighed nor intended for the market. The other makes average allowance for all these items. The result is a difference of half a million or more barrels in the United States.

Another surprise in this table is the very low average product in the several States as compared with Hawaii. Hawaii produces annually more than six times as much per acre as South Carolina and more than ten times as much as North Carolina, and about four times as much as Louisiana or Texas. This great difference is due in part to Hawaii making two crops per year. Divide these annual product per acre for Hawaii by two and still the difference is from two to one to five to one in favor of the Chinese in Hawaii. Their enormous average crop



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Will bring it to the surface and flood your lands. Investigate it before buying.

I am the manufacturer, also manufacturers' agent for Engines, Boilers and Saw Mills, and will make close estimates on complete plants. Call to see me; information cheerfully given, correspondence solicited.

### R. H. CHATHAM,

1017 TEXAS AVENUE. HOUSTON, TEXAS.

explains why the farmers of these islands can pay \$5 per acre annual rent for rice lands and still make money.

It points in a startling way to one fact. If we expect to make the rice industry permanently profitable we must work in the direction of higher quality and larger yield per acre.

The delusion of acres is plainly seen by noting that the 77,657 acres in South Carolina only produced one-third more rice than the 9,120 acres in Hawaii.

Comparing quality, the rice of Hawaii averaged 5 cents per pound, and that of South Carolina 3 cents. A Carolina acre of rice averaged to bring a gross annual income of \$17.00; one in Hawaii averaged \$171, or \$85.50 for each crop. It shows that the Hawaiian crop turns out nearly all head rice.

Another fact brought out by the census is that tenant farming tends to reduce the yield per acre; also that farms worked by share tenants produced considerably less per acre on an average than those worked by tenants paying cash; and the difference in yield on farms under all kinds of tenant farming and on farms under a manager is most extraordinary.

Another item: In 1850 South Caro-

lina produced 74.3 of all the rice in the United States and Louisiana 2.1; in 1900 the ratio of South Carolina was 16.7 and of Louisiana 60.9.

Texas is omitted in these comparisons because the last census is for the crop of 1899 and her wonderful development had just commenced.

It is gratifying to note that the census authorities have finally recognized that rice is one of the great cereals of the United States.

In regard to farm and farming, some general facts are furnished which are significant. In 1850 the total number of farms in the United States was 1,449,073; in 1900 there were 5,739,657—that is while the population only increased little over three fold, the number of farms increased about four fold. In 1850 there was one farm for every sixteen persons in the United States; in 1900 there was a farm for every 13.3 persons. If only the population of persons residing outside cities of 8,000 and over be considered, there was a farm in 1850 for every fourteen comprising the population, and in 1900 one farm for every 8.9 persons. The value of farms, farm implements and stock, including all farm property, increased more rapidly than the population. These facts are of great importance,

showing that agriculture has held its own notwithstanding the abnormal growth of cities in the past half century.

#### The Rice Belt March.

With pleasure we acknowledge the receipt from the publishers, J. C. Groene & Co., Cincinnati, Ohio, of a copy of "The Rice Belt March," a very pretty and we learn to be a very popular piece of music. This beautiful march was composed by a resident of this city who is an earnest and zealous worker in the advancement and development of the rice industry. Good judges of good music say that it is an excellent composition and that the author showed fine musical taste, excellent judgment and a decidedly musical education in the commingling of so many fine parts without the least discord. The parts are all in sweet harmony, making "The Rice Belt March" one of the choicest sheets of music that has been issued from the popular house of J. C. Groene & Co.

Send for large list of bargains in farms, ranches, city properties, etc. J. C. Crisp, Beeville, Texas.





# W. Z. Haight,

Manager and Immigration Agent

## North and South Land Co.

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Dealers in Farming Lands suitable for wheat, corn, cotton, cane, fruit, vegetables, rice culture and stock raising in large or small tracts. Facilities unexcelled for handling Southern Lands. If you wish to buy or sell, correspondence solicited. Agent for East Houston property. Solicit work for rice, ar asian, farm and railroad wells. Complete pumping plants put in for any number of acres.

### CHICAGO VISITORS.

#### "Rice Feast" at the Crowley Rice Mill, A Brilliant Success.

(Crowley, La., Signal.)

The Chicago visitors spent almost three hours in Crowley Wednesday as guests of the Rice Association of America, after which they left for New Orleans.

The special train did not reach Crowley at 6 o'clock, as was expected, owing to a more extended program at Orange being carried out than had first been anticipated. It was 9:10 when the train crossed the western boundary of the city, which was the signal for Crowley's welcome to begin. As the handsome train moved swiftly toward the depot, the occupants of the cars were greeted with the blowing of whistles, ringing of bells and music of bands. As the train stopped at the station and the guests began to alight, the band struck up that old familiar and ever-soul-stirring song so dear to the hearts of all Southerners, "Dixie," and as the harmony rang out in the clear night it was greeted by the united shouts and cheers of the gentlemen from Chicago.

Hon. C. C. Duson, who joined the party at Beaumont, quickly introduced Mayor Chappuis, who requested the party to cross the tracks to the Independent Rice Mill, where C. J. Bier and A. Kaplan showed the Chicagoans through the big institution and explained the process of milling as thoroughly as it could be done in such a limited time. Punch was served in the offices of the mill where each of the party was presented with a handsome souvenir in the form of a small box containing six apartments, showing the flaky cereal at all stages while undergoing milling.

Leaving the People's Independent mill, the reception committee ushered their guests over to the Crowley Rice Mill, where the banquet was to be served. The idea of serving a real rice meal in a real rice warehouse was indeed a happy thought, and as appropriate as it was original. But the transformation that was made ere the guests were seated to dine is beyond the comprehension of all except those who had an opportunity of viewing the pretty and artistic appearance it presented. The decorating was under the supervision of Mr. Ike Schwartz,

of the J. Frankel Company, Ltd., and it was astonishing what a vast change was brought about. The walls were prettily covered with bunting, rice sheaves and evergreens, while the pillars throughout the section in which the banquet was served were covered with flowers. The room was well lighted with many special lights that had been strewn through the hall for the occasion.

Mr. R. N. Sims, president of the Donaldsonville rice mill, was asked to preside as toastmaster, which he did in a most graceful and becoming manner.

Mayor Chappuis, who welcomed the party to Crowley, delivered a hearty greeting and one in every way befitting the occasion. He spoke of the city's hospitality and the generosity that has always been characterized by its citizens, attributing much of its success to that fact. The city was quickly reviewed from the time of the town-site was laid out up to the present day, and the marvelous strides in development laid bare for observation.

Toasts and responses were then made by J. G. Shedd, of Marshall Field & Co.; John A. Roche, ex-mayor of Chicago; Charles F. Gunther, of Charles F. Gunther & Co.; A. A. Sprague, of Sprague, Karner & Co., of the visitors; Colonel S. F. B. Morse, of the Southern Pacific and Mr. Wortham, chairman of the Texas delegation, on behalf of Texas, and Hon. R. N. Sims, of Donaldsonville, and Prof. S. A. Knapp, president of the Rice Association of America, of Lake Charles, on behalf of Louisiana.

The banquet, or "Rice Feast," as it has been termed, was a decidedly neat affair, and thoroughly enjoyed by those in whose honor it was given. Each guest was provided with a neat menu card, upon which was printed the following:

Compliments of the Rice Association of America. A Rice Feast a l'Americaine, a la Creole et a l'Espagnol.

#### MENU.

Crab Gumbo with Rice.

#### Entree.

Roast Turkey with Rice Dressing.  
Chicken Salad.

#### Eat Rice for Health.

Rice. Jambalaya, with Oysters.  
Rice Jambalaya with Jam.  
Rice au Gratin.  
Rice with Red Kidney Beans.

Rice Curry. Rice Croquettes au Paris.  
Dessert.  
Rice Griddle Cakes.  
Rice Custard Pie.  
Coffee a la Creole.  
Cigars.

Crowley, La., Nov. 12, 1902.

At the conclusion of the feast, Toastmaster Sims rose and stated that the medal was about to be awarded to the gentleman who had been successful in consuming the greatest amount of rice at the banquet table. Mr. Sims stated that the committee appointed to pick the successful competitor had learned that Mr. J. G. Shedd, of Marshall, Field & Co., chairman of the Chicago delegation, had eaten exactly thirteen pounds and twelve ounces of the flaky cereal. A number of the Chicago party good naturedly protested against their chairman receiving the award without further investigation on the part of the committee, and one of the gentlemen from the Windy City went so far as to declare that Mr. Shedd should tell his natural weight and prove his claim to the medal on the scales. The medal was of leather, large and oval shaped with a silver rim, and bore the following inscription:

"Champion Rice Eater

Crowley, La.,

November 12, 1902.

Rice Association of America."

After the presentation of the medal Mr. Shedd rose and thanked the Association and especially the committee for their excellent judgment.

Over one hundred and twenty covers were set and the long table was artistically decorated with roses and pretty cut flowers.

It was 12 o'clock when the guests rose from the table, after having repeatedly thanked the Rice Association of America for the most excellent and thoroughly enjoyable entertainment given them in Crowley.

The following is the personnel of the party:

J. G. Shedd, Marshall Field & Co., chairman.

B. A. Eckhart, Eckhart & Swan Milling Company.

J. V. Farwell, Jr., John V. Farwell Company.

D. R. Forgan, First National Bank.

J. Harry Self, Self-Schwab Company.

W. B. Conkey, W. B. Conkey Company.

Paul Morton, Atchison, Topeka & Santa Fe Railway Company.

A. C. Bartlett, Hibbard, Spencer, Bartlett & Co.

J. C. Stubbs, Southern Pacific Company.

Leo Wampold, Cahn, Wampold & Co.

J. T. Harrahan, Illinois Central Railway.

Charles H. Deere, Deere & Co., Moline, Ill.

James H. Eckles, Commercial National Bank.

John C. Black, Continental National Bank.

Samuel R. Flynn, National Livestock Bank.

John R. Morron, Diamond Glue Company.

Edward Tilden, Libby, McNeil & Libby.

Helge A. Haughan, State Bank of



Chicago.

Dr. Homer M. Thomas.  
Charles H. Thorne, Montgomery,  
Ward & Co.

John R. Walsh, Chicago National  
Bank.

Jay Morton, Jay Morton & Co.

E. J. Kohn, Kohn Bros.

J. M. Studebaker, Studebaker Bros.  
Manufacturing Company, South Bend,  
Ind.

A. A. Sprague, Sprague, Warner &  
Co.

Frank H. Armstrong, Ried Murdock  
& Co.

William T. Baker, J. Harley Bradley,  
David Bradley Manufacturing Com-  
pany.

William H. Bush, William H. Bush  
Company.

Edward B. Butler, Joseph T. Ryson  
& Son.

Ernest A. Hamill, Commercial Ex-  
change National Bank.

La Verne W. Noyes, Aermoter Com-  
pany.

Byron L. Smith, Northern Trust  
Company.

Bernard E. Sunny, General Electric  
Company.

John W. Scott, Carson, Pirie & Co.  
Graeme Stewart, W. M. Hoyt & Co.

T. P. Stanwood, Edwards-Stanwood  
Shoe Company.

C. F. Mathersmith, Brander, Smith  
& Co.

Isaac N. Perry, National Bank of  
North America.

John H. Pierce, Western Tube Com-  
pany, Kewanee.

Charles A. Plamondon, Plamondon  
Manufacturing Company.

Carson Smith, Merchants Loan and  
Trust Company.

William J. Chalmers, Allis-Chalmers  
Company.

F. S. Cable, the Cable Company.

William T. Fenton, National Bank of  
the Republic.

Arthur G. Leonard, general manager  
Union Stockyards and Transit Com-  
pany.

Edward A. Turner, Link Belt Ma-  
chinery Company.

Edwin A. Potter, American Trust  
and Savings Bank.

E. W. Gillett.

William E. Clow, James B. Clow &  
Sons.

Charles G. Dawes, Central Trust  
Company Bank.

John A. Roche, Otis Elevator Com-  
pany.

Thomas P. Phillips, Federal Trust  
Company of Illinois.

William S. Warren, Hulburd-War-  
ren & Co.

The following composed the commit-  
tee who had charge of the reception of  
the visitors:

Hon. P. J. Chappius, chairman; F.  
Shultz, J. T. Nixon, Prof. S. A. Knapp,  
Lake Charles; W. W. Duson, Dr. J. F.  
Naftel, Hon. H. C. Drew, Lake Charles;  
C. J. Feeland, O. R. Hopson, E. Dabo-  
val, Jr., Rayne; W. P. Campbell, F. C.  
Labit, E. C. McMurtry, Jennings; M.  
Abbott, B. M. Lambert, C. S. Morse,  
Jennings; A. Kaplan, C. J. Bier, Geo.  
Ferre, Decatur, Ill.; H. W. Carver, Jno.  
Green, W. J. Naftel, Pomona, Calif.;  
J. D. Belton, J. B. Foley, Gus E. Fon-  
tenot, J. D. Marks, W. H. Hunter, Jr.,  
A. B. Allison, Geo. E. Sears, Jno. W.  
Roller, Jno. Marshall, Jno. F. Shoe-

maker, R. T. Clark, G. Watkins, P. S.  
Levell, Judge DeBallon, Lafayette;  
W. E. Ellis, Hon. Wm. P. Campbell,  
Lafayette; J. Frankel, J. E. Porter, W.  
E. Lawson, B. E. Black, T. J. Toler, M.  
D. Abbott, P. L. Lawrence, P. S. Pugh,  
C. C. Duson, C. D. McAyeal, Dan Blum,  
Asa S. Kennedy, Gueydan, La.; H. L.  
Gueydan, Gueydan, La.; Ben. Gold-  
stein, W. L. Doss, Gueydan, La.; Hon.  
H. Story, Joe Sabatier, Iota, La.; J. G.  
Medlenka, Henry Kaplan, Estherwood,  
La.; A. P. Holt, J. M. Grabtree, Morse,  
La.; R. S. Gregg, C. F. Matthews,  
Morse, La.; D. S. Lyons, Jno. McAyeal,  
J. P. Haber, Jennings, La.; L. S. Scott,  
Capt. C. A. Lowry, Jennings, La.

#### THE BIGGEST AND BEST.

**Chesterville Prairie Has More Real  
Advantages Than Any Other  
Section.**

The advantages of Chesterville prairie, and its excellent rice lands, were never brought into greater prominence or so forcibly presented to the close observer, the prospective home-seeker, capitalist and investor, than during the long continued and excessive rainy season which has prevailed over the rice belt for the past month or six weeks. While other sections were flooded, with water standing in the fields to such a depth that the rice was seriously damaged, nothing of the kind existed on Chesterville prairie. True, there was as much rain there as elsewhere, but the natural drainage which these lands have, ran the water off almost as fast as it fell, and in a few hours after a heavy rain, Mr. Linderholm could drive all over his lands in a buggy. The result of this natural drainage is that Chesterville prairie will furnish less damaged rice to the market this year than probably any other section. Not only this, but the rice grown on this prairie has been of a better quality and commanded a better price than the average. It is such advantages as this that makes the Chesterville prairie lands so desirable. With an elevation of 175 feet above the sea level, beyond all danger of overflow, in one of the very healthiest locations in the entire rice belt, clear of malaria, free from all sorts of disease, it seems that these lands should be eagerly sought after and grabbed up with avidity by the home-seeker and investor. They are by odds the most desirable and possess many advantages which should put the price even above what Mr. Linderholm is asking for them. Every acre is already proven, and there is no question about securing an abundant supply of water at a very shallow depth. Wells have been sunk in every direction on this prairie. Every well

has proven a success, and not one of them is over forty-four feet deep. This makes Chesterville prairie the shallow well proposition of the rice belt, with every acre proven territory, so far as water is concerned.

The home-seeker, the man of moderate means, can secure a rice farm on this prairie, either improved or unimproved, and of any size desired. He can get it with a home already built, the wells sunk and the pumps and engines in, or he can get the raw land and make his own improvements. In securing a home here he at once has all the comforts of a home, a good neighborhood already built up, with good neighbors on all sides, a thriving, prosperous town at Chesterville, at which to do his trading, all built up with northern people with northern ideas and northern manners, mostly from Illinois and Iowa. Could a man from that section coming into a new country to seek a home and livelihood, ask more? It is the healthiest, the most desirable and the best section of the rice belt, with rich, productive lands, and thrifty, industrious, progressive people.

But while it presents so many advantages sought by the home-seeker from the North, it is, as an entirety, to be managed and controlled by a company, that it presents the biggest and best paying proposition to be had anywhere. No better proposition can be offered. Mr. Linderholm has expended thousands of dollars in the way of improvements on these lands, has given them every test that could be demanded of lands, and by doing so has proven them to be all that is claimed for them, and put them in the pink of condition. This has been done with a view to holding on to them, and in after years fully realizing the profit and reward for his years of labor and energy. The loss of his son, and other family afflictions, has caused Mr. Linderholm to determine to dispose of the entire property, or at least the control of it, as, should a company be formed to purchase these lands, Mr. Linderholm is desirous of holding one-half of the stock, but wants nothing to do with the management of it. Chesterville prairie as an entirety in the hands of a well managed company would prove one of the biggest and best paying investments in the Lone Star State.

#### Comparative Rice Values.

Rough Honduras rice was quoted on November 29, 1901, in the New Orleans market at \$1.75a\$4.00 per bbl. On the same day this year the quotations were in the same market, \$2.00a\$4.25 per bbl.

Clean Honduras was 5a5 3-4 cents in 1901, as against 5a6 3-16 cents on the same date this year.



FARMERS' COOPERATIVE DEMONSTRATION WORK,  
U. S. DEPARTMENT OF AGRICULTURE.

At an early period it was found necessary to evolve from the mass of ethical teaching, a few general rules for living, called "The Ten Commandments", by which a man could be moral without going through a course in theology. Just so, in order to instruct the average farmer how to successfully conduct his farm operations so as to secure a greater net gain from the farm, it is necessary to first deduce from the mass of agricultural teachings a few general rules of procedure. They are called "The Ten Commandments of Agriculture," by the practice of which a man may be a good farmer in any state without being a graduate from a college of Agriculture.

THE TEN COMMANDMENTS OF AGRICULTURE.

- (1) Prepare a deep and thoroughly pulverized seed bed, well drained; break in the fall to the depth of 8, 10 or 12 inches, according to the soil, with implements that will not bring too much of the subsoil to the surface; (the foregoing depths should be reached gradually.)
- (2) Use seed of the best variety, intelligently selected and carefully stored.
- (3) In cultivated crops, give the rows and the plants in the rows a space suited to the plant, the soil and the climate.
- (4) Use intensive tillage during the growing period of the crops.
- (5) Secure a high content of humus in the soil by the use of legumes, barnyard manure, farm refuse, and commercial fertilizers.
- (6) Carry out a systematic crop rotation with a winter cover crop on southern farms.
- (7) Accomplish more work in a day by using more horse power and better implements.
- (8) Increase the farm stock to the extent of utilizing all the waste products and idle lands of the farm.
- (9) Produce all the food required for the men and animals on the farm.
- (10) Keep an account of each farm product, in order to know from which the gain or loss arises.

Washington, D. C.,  
July, 1908.

S. A. Knapp.



THE EFFECT OF  
THE FARMERS' COOPERATIVE DEMONSTRATION WORK  
UPON RURAL CONDITIONS.

---ooOee---

1. What percent of the farmers in the territory where you conduct Demonstration Work have adopted our intensive method of farming? 75
2. One of our cardinal teachings being that every farmer should produce at home the food for his family and for his work animals and farm stock, what percent of the small farmers and tenants in your territory kept a cow, or cows, pigs, and chickens enough to supply their families, prior to the Demonstration Work ? 40  
(b) What percent now keep them? 90
3. What percent of the same class of farmers had gardens summer and winter for the family use, prior to the starting of the Demonstration Work 50% (By a garden is meant a full supply of sweet and Irish potatoes, cabbage, onions, lettuce, beets, carrots, greens, okra, peas, beans, etc., enough at least for a family.) 50  
(b) What percent now have them? 70
4. What percent of the same class of farmers had any fenced pastures for cows or pigs, prior to the starting of the Demonstration Work? 5  
(b) What percent now have them? 10  
(no stock law.)
5. What percent of the same class raised enough corn, grain, hay etc., for their teams and stock, prior to the starting of the Demonstration Work? 20 (b) What percent now raise enough? 40
6. Has the Farmers' Cooperative Demonstrative Work enabled any of the small farmers to get out of debt to the merchants and bankers? yes Give percent and specific instances. 50%
7. Has there been a perceptible increase of better teams and tools as a result of our work? yes Give percent and, if possible, a statement from merchants showing increase of sales of tools. answer on extra sheet
8. Have the rural schools conditions been improved, and have the better and earlier-maturing varieties of cotton which we have widely introduced, helped to get the crop picked out earlier so



so that the children could go to school more months? *yes*  
Give specific instances, especially where school terms have been lengthened.

9. Has the improved condition of farmers influenced them to cooperate more in buying and selling, especially in the purchase of thoroughbred males? *yes especially Bulls and Boars*

10. What increase has there been in the homecanning of vegetables and fruit? *about 10%*

11. Have the farmers improved their homes more than usual, especially in the way of painting and whitewashing, and building better houses? *yes*

12. What effect has our work had on bettering the highways, the construction of telephones, and upon rural free delivery of mails, and general home contentment? *Answer on 4th sheet*

13. Has there been any advance in the value of farm lands, and if so, do you think it has been caused by our work? *I certainly do.*  
Give specific instances showing actual increase in prices.

14. Has there been any perceptible number of tenants that have able to purchase farms? *yes - Could give specific instances, if I had time.*



Ans.2- A great percent of the, small farmers and tenants keep a cow or cows and chickens, but a small percent raise their own meat. There will be more of them raise their meat and feed stuffs now than prior years.

- 3- I should think that 90% have gardens and potatoes for summer use, but few if any have gardens for winter. Improvements along this line has improved 10% over 1st year.
- 4- About 20% of this class, and I should judge about 30% now are providing pastures for their stock.
- 5- I presume about 10% of this class. I should think about 15% will raise their corn and feed this year.
- 6- This being second year and first year that many have taken part in this good work that it could not be given a fair test. I know that many have resolved to adopt this method and get out of debt.
- 7- Our work has done a great deal towards getting better teams and tools, but since this work is in its infancy, and the agriculture so far behind with so many farmers in this State I cant say that it has done much yet. This work needs pushing and more of it.
- 8- This being the first year we have gotten the earlier cotton introduced, and then it is not general enough to arrive at benefit of rural school conditions. I know that it will have that effect on school conditions.
- 9- A continuation of present work by which improved conditions will be brought about will certainly have the desired effect...
- 10- About 20% over last year.
- 11- Some improvements, but poor conditions of above class defers this. They will reach it all right.
- 12- This work has had a four fold effect on the bettering of the highways, telephones and Rural free mail.
- 13- Were it not for the panic last year, which is not over, our lands would have advanced in price. They have held their own, while some have advanced in price.
- 14- The tenants are growing dissatisfied and are looking out for permanent homes, and will arrange to buy as fast as they can. I have often times suggested that I would lend personal aid and advice to any one without a home, and have been consulted relative to same.

These questions are rather hard and difficult to answer from the fact that I only entered this work last spring, and where I had five Demonstrators in my territory I now have something over three hundred, so you can tell how the people are taking hold of it. I have not sought the best farmers always, but have gone out and worked with the small farmer and tenants, hence this is a slow work in an educational way and I dont think that we may expect too great a change in such a short while. It is going to take time to build up Arkansas Agriculture.

W. J. Apple  
Special Agent



Bi-414  
Oct. '19

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF BIOLOGICAL SURVEY

DIRECTIONS FOR POISONING RATS WITH BARIUM CARBONATE.

Rats vary their diet according to the season and local conditions, and for this reason trials should be made to find what baits they will eat at any particular time or place. One bait from each of the three following classes should be treated with barium carbonate, thus making up three separate kinds of poisoned bait.

KINDS OF BAITS:

Meats: Hamburg steak, sausage, fish, fish offal, crab meat, fresh liver, broken fresh eggs, bacon.

Vegetables and fruits: Cantaloupe, apple, tomato, or cucumber, in thin slices; green corn, cut from cob; banana, boiled carrot, or baked sweet potato, mashed.

Other foods: Toasted bread, cheese, rolled oats, cereals, peanut butter.

TREATMENT WITH BARIUM CARBONATE:

Mix barium carbonate thoroughly through the soft baits with the hands or with a spoon in the proportion of one part barium carbonate to four parts of bait. Add water when necessary to make them moist.

Sift barium carbonate over the sliced baits and rub it into them with fingers or knife.

DISTRIBUTION OF PREPARED BAITS:

A teaspoonful, or small portion, of each of the three separate baits should be set in runways or other places frequented by rats. Set groups of these three baits on strips of paper or board at intervals of 10 to 20 feet.

For any uneaten bait, substitute on the following night another from its class. If none are eaten, substitute an entirely new series. Continue to set poison at frequent intervals until all rats disappear.

To set poison in poultry inclosures: Over the poisoned bait place a small box with holes of 2-inch diameter at each end, and then over the small box place a large box with holes of 2-inch diameter at each side. The bait should be very wet or of such consistency that the rats can not drag it from under the boxes.

GENERAL RULES:

Remove so far as practicable all accessible food before poison is used.  
All baits must be fresh and of good quality.

Premises should be inspected each day to remove dead rats and to pick up and destroy uneaten baits.

**CAUTION:** Keep barium carbonate out of reach of children and irresponsible persons and from domestic animals and fowls.

**ANTIDOTE FOR BARIUM CARBONATE:** Give an emetic of salt, mustard, and water followed by Epsom salts or Glauber's salts. Call a physician or veterinarian as the case may require.



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UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF PLANT INDUSTRY,  
FARMERS' COOPERATIVE COTTON DEMONSTRATION WORK.

Helps to Corn and Cotton Planters.

The past winter has been so wet that there has been less than usual opportunity to prepare the land for this year's crop. The rains have continued so late that many fields are still very wet. These conditions make it all the more necessary that the soil be well prepared before planting. In the impatience to commence planting the temptation to plow before the land is dry enough is very great. Against this we issue a work of warning. There are few more injurious farm practices. Land plowed wet at this time is injured for the whole season. Such land is, more than likely to be cloddy, and a clod in the field is of little use to plants. Cloddy land is hard to work and seldom gives a good stand. It furnishes a minimum of food to the plants and is exceedingly subject to drought.

While it is desirable, especially in the boll-weevil sections, to plant cotton as early as possible, yet there is nothing gained by placing the seed in the ground before the latter is warm enough to cause it to germinate and grow; or before the soil is thoroughly prepared. This was strongly illustrated last year in the boll weevil sections. Where the land was properly prepared before planting, even though this preparation caused a delay in putting the seed into the ground, the yield was much better than where attention was not given to this detail. A thorough preparation is more than half the cultivation. Do not plant either cotton or corn before the land is worked into a fine seed bed even if planting is a little late.



Last spring a great amount of trouble was experienced in securing stands, especially of cotton. This was primarily due to a late, wet spring; but there were other contributing factors, including poor preparation of land, improper depth of planting and poor seed. The farmers seem fairly well aroused to the importance of good seed. To be good the seed must not only be from a good variety but must have been carefully selected and cared for that they have strong vitality. Be sure the seeds planted have not been damaged from any cause. Prepare the land thoroughly and sufficiently in advance of planting so that there is a firm seed bed. Then avoid one of the most common causes of loss of stand -- that of planting too deep.

With well-prepared land good cotton seed, if properly planted, will germinate even in a dry spring when covered to no greater depth than one-fourth inch. Many of the cotton-planting machines on the market are faulty in that it is almost impossible to gauge the depth at which the seeds are placed in the ground. This defect is only increased if the seed bed is loose. Further, while the seed may not actually be covered to a great depth, many leave them in a trench with hills of loose dirt on each side. The first good rain washes this dirt into the trench and buries the seed too deep. This should be avoided. A light roller should always follow the planting so as to press the ground close to the seed.

It is best even where it is not necessary to plant upon beds, to place the seed upon a slight ridge, especially in planting early. This insures drainage and warmth and consequently a good stand. There are more stands lost in planting cotton by using too much than too little seed. When a bushel of seed is used it is very often a detriment, because the seeds are so close that when they germinate they lift the soil in the whole top of the row. If dry or a little cool weather follows the soil immediately around the young plant dries out or is



chilled by the cool nights, and the plants die. If this does not occur the farmer is obliged to thin the cotton when very young, while the plants are delicate and are easily injured. Perfect stands of cotton have been obtained with four pounds of seed and if the seed has been properly selected and preserved it should never require more than a peck per acre, provided the land is in good condition and the seed is properly planted.

Prepare the land thoroughly before planting.

Use selected seed of known parentage and good quality.

Plant shallow--- not over  $\frac{1}{4}$  inch in depth on a firm bed.

Follow planting with a roller and use care that the seed drill is not in a trench.

Be sure the seed bed is well drained.

With these precautions there should be no difficulty in securing a stand of either cotton or corn this year. These directions are for normal conditions and are applicable with all ordinary seasons and soils.

#### Width of Rows and Distances of Plants in the Row.

Owing to the differences in soil fertility and varieties of cotton, it is impossible to give any general rule for distances between the rows and for spacing of the plants in the row. However, as some guide we give the following:

On good uplands ordinarily producing one-half to three-fourths of a bale of cotton per acre, plant in rows four feet apart and give not less than sixteen inches space between plants in the row.



On rich bottom lands where excessive stalks are produced, plant in rows not less than five feet apart and give two feet space between plants in the row. Increase or decrease these distances (rows and spaces) according to the strength of the soil and the usual size of the cotton plants.

On post oak flats and alluvial lands like the Mississippi bottoms, give full distance between the rows so as to make a broad ridge for the plants and provide for surface drainage.

D. N. Barrow

APProved:

Assistant in Charge of Instructions.

S. A. Knapp,  
In Charge.



plows, harrows, and cultivators have been sold as were sold before the demonstration work was introduced.

The following figures were given me by Wild Bros. Hdw. Co., Evergreen, Ala.

Seasons	1905-06	Disc Plows sold	--- none
"	1906-07	" " "	18
"	1907-08	" "	60
"	1907-08	One hundred percent <sup>more</sup> sold than formerly.	
"	1907-08	twentyfive per cent more walking plows than formerly.	

During the past season, larger and better horses and mules were bought in this district and some interest has been manifested to the breeding of mules. The small cotton mule is the thing of the past, and our farmers are buying high priced mules, paying four hundred dollars per pair. During 1907 more thorough bred horses were imported into this district than in the past forty years. Much interest is also being taken in the raising of cattle, especially the dairy breeds.

5-----The farmers and citizens of Evergreen have contributed \$50.00 in cash for prize money. \$25.00 of this money will be given to the demonstrator or cooperator who shall make the largest yield of cotton on his demonstration farm. The demonstrator or cooperator who raises the largest yield of corn will receive \$25.00. The competitors for these prizes will submit an affidavit that they have followed out methods strictly according to directions. The judges will be appointed by a majority of the demonstrators and myself.

\$25.00 has also been raised for the purchase of seed cotton of the Triumph variety.

Mr. H. J. Coxwell in Menee County contributed twenty bushels of T<sup>o</sup>-1 cotton and about ten bushels of selected Mesby corn for the demonstrators and cooperators in his county.

1907 d rs have done their part in distrib-

five bush of 1-



-----4  
of Mosby corn and ten bushels of Denny's Prolific corn . They above  
seed were furnished by the Department.

I was not able to supply all the demands made on me for  
improved seeds, but a large number were influenced to buy improved  
varieties of cotton and corn by <sup>the</sup> education of the demonstration work.  
The most popular varieties of cotton are: Teele , Cook, Triumph, Bank  
Account, Mortgage Lifter, Hacking, and Truitt. Very few farmers have  
planted the long staple, and I have only one demonstration of this  
variety.

The Mosby corn is very prolific and seems to be best adapted  
to this section, but the farmers object to it because it is subject  
to the attack of the weevil.

I have in my office thirty eight bushels of Columbia  
Long Staple cotton furnished by the Department. The demonstrators  
refused to plant this cotton owing to the fact that much Florida  
cotton had been planted by farmers who paid little attention to seed  
selection. The one demonstration that I have with the Columbia long  
staple will no doubt make it popular next year, and I will be able to  
dispose of the seed in the new territory that has been added to my  
district.

The Columbia long staple cotton has proved to be hardy, very  
prolific, good per cent of lint, large bolls and adapted to many different  
soils.

Mr. J. A. Wade Dist. Agent of Alexander City Ala., pronounces  
it to be the best long staple that has been introduced in this state .  
6-----The Board of Supervisors in none of the counties of my district  
have appropriated money for the demonstration work , but it is because  
the question has not been put squarely before them. I am confident  
however, that I will be able to raise money in many counties of my  
district , not only by this method , but by contributions from all classes  
7-----I feel safe in saying that not only the farmers, but all  
classes are interested in the demonstration work; lawyers, doctors, bankers  
and the business men are endorsing this new method of teaching the  
farmer, which is shown by the testimonials herewith attached.

*Testimonials  
in hand of  
H. E. Savely.*



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8-----EXAMPLES OF TWO OR MORE CROPS RAISED ON LAND DURING THE SAME YEAR.

Answer to  
question # 6.  
All were in debt.

*Hunter Vann*  
Mr. ~~Hunter Vann~~ of Greenville, Ala., planted radishes in February and harvested a net profit of \$36.00 per acre by April 1st, planted snap beans on May 10th, planted cotton between the bean rows <sup>second</sup> the ~~xxxx~~ week in June. The beans were harvested by the middle of May yielding a ~~net~~ profit of about \$30.00 per acre. The cotton will make about one half bale per acre. *Raph Irwin*, Evergreen, Ala. planted radishes Feb. 14th, and made a success, fully equal to Mr. Vann.

J. P. Kendall, Evergreen, Ala. planted sweet corn about the middle of Feb. in rows six feet apart. On May 4th planted cotton between the corn rows, gathered about forty bushels per acre, ploughed out the middles, worked his cotton and will make three fourths of a bale per acre. Mr. Kendall also planted snap beans April 1st, on May 1st planted cotton between the bean rows. Before the first day of June he harvested a net profit of \$40.00 per acre of beans, ploughed out the bean stalks and planted peanuts between the cotton. He will make probably a bale of cotton per acre, and a nice crop of peanuts. All of the above farmers can yet plant a crop of Rape or turnips and mature them before the end of the year on the same land, thus making four standard crops on the same land within this calendar year.

It is very common for the farmers in Butler, Conecuh and Baldwin counties to make a large crop of tomatoes and follow it with a good crop of cotton.

*Evergreen, Ala.*  
Mr. L. T. Rhodes, and Mr. Jno. Roundtree in co-partnership, harvested five hundred dollars worth of tomatoes and made nearly a bale of cotton on this same land by planting the cotton between the six foot tomato rows. All the above can be verified by the citizens of this section.

The above gentlemen are connected with the demonstration work.

9-----Conservative estimate have shown that at least six hundred thousand dollars worth of feed stuffs are imported annually into Conecuh County alone, this only includes corn, oats, hay, bacon and lard, all of which can be produced here cheaper than any where else in the United States. This is a serious reflection on the farmers of this section, but at the present time they are planting velvet beans, soy beans, vetches, clovers,



-----6  
cow peas, rape, Kaffir corn, and other ~~forage~~ crops never before planted in this section.

neglected  
Altho our farmers have ~~missed~~ the home supplies in the past, they have made a wonderful improvement within the past three years. The fact that they live in a region that affords such a wide variety of crops has made them improvident, and they have not been forced to raise their feed stuffs for home consumption. They have depended on cotton so long for a money crop that their attention has been diverted from the many valuable crops enumerated above.

10-----We have no Beard of Trade outside of the counties of Montgomery and Mobile, which heretofore were not included in my territory, but I will endeavor to enlist the cooperation of the above organizations as soon as the demonstration work is introduced, and in these Counties. xxx

11-----

It is a ~~fact~~ that the rural population in my district have more comfortable homes, better schools, improved highways, telephones and free delivery of mails.

most the improvement  
The important step taken by the counties in this district is ~~the~~ of country roads. In Conecuh County, the citizens have voted a \$100000.00 bond issue to build sand-clay roads from Evergreen to the important towns in the county.

The natives of this section who have been absent for several years have all testified on their return home, that a wonderful change for the better has taken place among the farmers.

Manufactures, railroads, immigration, schools, colleges etc. have all been great factors in developing our resources and building up cities, but I do not believe that any other agency of civilization, in so short a time, could have changed the economic equilibrium of the rural population of this section of Alabama like the Farmers' Cooperative Demonstration Work.



The list of questions submitted covers the questions involved in most cases, but I do not believe that it is a complete index of the demonstration work in my district, therefore, I herewith append a few statements not applicable to other sections.

INSTRUCTIONS ON COTTON DISEASES: Fields of cotton in this section of Alabama have been damaged by insects, bell rot and other diseases. The diseased bolls of cotton on my demonstration farms, (but mostly in other fields), appear to have bell rot followed by insects. (According to the Auburn Experiment Station, bell rot is caused by a fungus known to the biologists as *Gossypinus*) I have received many stalks of cotton affected with bell rot, and have given my demonstrators a course of instructions as to preventative measures. This disease has been so wide spread in this section that I deemed it necessary to give special instructions, and I have, therefore, advised them as follows:

1st, as far as possible avoid planting cotton on land that produces too much weed, unless the fertilizers can be balanced.

2nd; give more space between the rows and plants in the drill, <sup>than</sup> that is the common practice.

3rd: on such land, mostly in Monroe county, I have advised them to use acid phosphate freely and no other fertilizer.

4th: to plant the short growing, early maturing varieties, rather than the rank long limb <sup>or late</sup> kinds, and in this connection, I have found the Triumph cotton the most resistant. In many cases they have confused the bell rot with rust and wilt, but by a systematic effort I have enabled them to understand the nature of the said diseases. All this has resulted in getting them to select their seed, plant improved varieties and to give more space to their cotton. Within the <sup>last</sup> thirty days I have <sup>been</sup> in most of the Counties of Alabama and have found that the Cook cotton is more subject to bell rot than any other variety I saw. On <sup>the</sup> demonstration farm visited recently, the Triumph and Steele were found to be the least affected with bell rot. I pronounce the Triumph cotton to be the best variety, not only for resisting all kind of diseases, but also for size of boll, shape of stalk, quality of lint,



-----8

percentage of lint, and yield per acre. It is not classed as a long staple cotton but the fibres measure one inch to one and one-fourth inches, and I have reminded the farmers that they should get two cents a pound more for the Triumph than for ordinary upland cotton. The Triumph cotton was originated by Mr. A. D. Mabane of Leakehart, Tex. Who developed it from a single plant found in his general crop of 1899. It is supposed by him to be an accidental cross between the Boykin Stern Proof and Peterkin Cotton.

As most farmers know, the Peterkin cotton is noted for small bolls and high per cent of lint. The High per cent of lint is a ~~undesirable~~ quality, but small bolls are not wanted, therefore in order to keep the Triumph pure to type and to prevent its breeding back to its small belled ancestors, it is necessary to select the seed in the field. In most cases my demonstrators have been sending a reliable picker ahead of the other hands to pick the largest five lock bolls from the best shape healthiest stalks. Full instructions for seed selection <sup>information</sup> have been given to all demonstrators, and co-operators, which is contained in bulletin A-63.

THE DEMONSTRATION IDEA. The Board of Control of the district Agricultural Schools have in most cases converted the school farms into demonstration farms. They have decided that Dr. Knapp's method of teaching the farmers can be applied to better advantage on these school farms than the so called "Re-search work" which has been attempted on small funds. The Agricultural School Farm at Evergreen has been converted into a demonstration farm, and the Prof. of Agriculture is conducting a demonstration according to our methods. The Agriculturists at all the District Agricultural schools have discontinued most of their experimental work and have placed the farms on a paying basis by conducting demonstrations.

The Bay Minette Land Co., Bay Minette, Ala., has employed a graduate of the Mississippi A&M College to conduct a large demonstration farm on their land during 1908-09. All this proves that the demonstration spirit is taking hold of keen business men who have recognized its value as a means of selling real estate.



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The people no longer regard the work as theoretical, or experimental, but now realize that it is practical and profitable and should be adopted by all progressive farmers.

It is impossible to enumerate all the advantages of the Farmers' Cooperative Demonstration Work to this district, but I think it is safe to say that the two items of thorough preparation of the soil and seed selection, have saved our farmers many thousands of dollars, and <sup>will</sup> justify the extension and continuance of the Farmers Cooperative Demonstration Work in Alabama.

Respectfully submitted,

*J. Phelps*

District Agent.



Charleston, S. C. Aug. 20/04.

Gov. D. C. Heyward;

Chairman of Meeting for the advancement of Rice.

Dear Sir:-

As requested by the meeting over which you presided, I left Charleston August 8th for an inspecting tour of the rice sections of Louisiana and Texas and there to collect such data as would give an insight to the rice growers and all others interested in the rice industry in South Carolina; as to how the grain is planted and treated during its growth; how harvested and marketed and what is the general opinion for the future of rice, in those states.

I proceeded direct to Crowley, La. and there got in touch at once with mill men and farmers. I found matters pretty blue; the depression being shared alike by all parties interested in rice. The Chief cause of the depression being the very large surplus of last season's crop still in the mills and being carried over and the knowledge of a fine crop about to be harvested, which in a few weeks would be added to that already on hand, was, I admit, calculated to produce anything but encouragement in the rice business. I am indebted to Mr. J.B. Foley, Mngr. of the Union Rice Milling Co. for many courtesies and information as to the stock on hand of old stock. All sections agree that the surplus to be carried over of 1,000,000 sacks or 4,000,000 bushels is not overdrawn, and of that amount Crowley holds over fifty per cent, the other mills in Louisiana, the remainder; Texas being pretty well cleaned up and prepared for receiving the new crop.



Unlike most other places, the Milling Cos. at Crowley advance to, and assist the planters in raising rice as is done here, only in a different manner. They advance in money at the rate of \$1.50 to \$2.00 per sack of four bushels and they admit in some instances, even more; the planter giving such security as he may possess, but principally a mortgage on his crop and the obligation to send his entire crop to the Milling Co. making the advance: then he pays the mill charges for handling the crop until sold, which is as follows:-

40¢ for cleaning 162 lbs. of rough rice.  
 2-1/2 per cent for handling  
 All of the flour, chaff, or by-product.  
 All insurance while in mill.  
 8 ¢ for sacks; and as all rice is handled in sacks,  
 this alone is quite an item in the general make up  
 of expenses.

Permit me while in this line, to complete the expenses of the planter by giving his other charges; if he leases land from the Irrigation and Drainage Cos., he pays one fifth of his entire crop for land rent, then another fifth for furnishing water. As to planting, say they take a section of 640 acres of fresh land and with a large plow drawn by several mules, plow up a bank, which in addition is dressed by a scraper; then should the land be uneven, check dams are made in the same manner. As the land is of a sticky clay substance it readily holds what water is necessary. No drainage ditches being cut, they proceed to plow, which costs them \$1.00 per acre, and at intervals simply plow water furrows, then the harrowing is done with disc harrows at a cost of fifty cents per acre. The planting is done with drills at such close intervals as to practically broadcast the seed, this with the covering costs about fifty cents per acre; 1-1/2 bushels of good seed is used per acre at an estimated cost of \$1.50.



They are entirely dependent upon the rains or moisture in the lands to germinate the grains, hence you see everywhere, immense fields ripening unevenly.

Water is too expensive there to be used for the sprout flow as we do here.

When the rice gets about six inches high, the Irrigation Co. is notified that the planter is ready to be supplied with water, and it is turned on from large canals and that water is never run off until the crop is ready for the reaper and binder; hence you see the effects of the maggots in all directions from the water becoming stale or sour.

No cultivation is done during the growing season as the rice is broadcasted and they do not consider it necessary.

The Harvesting costs about \$2.00 per acre and the threshing, where the mill is hired, about 2-1/2 cents per bushel or ten cents per sack of four bushels.

I found the soil in Louisiana and Texas about the same; of a rich dark clay mixture, capable of growing anything, but the cultivation the rudest and worst I ever saw. God has favored those sections with a magnificent climate which in connection with the soil and proper cultivation will eventually make them the finest grain, cotton and fruit growing countries of our continent. They need drainage sadly and that is most neglected.

I found volunteer or red rice everywhere and where it became too bad, those sections were thrown out or rested, and cattle, mules and horses allowed to feed or pasture in it, which treatment, I would say, requires about three years to eradicate and then not entirely. The red rice apparently does not concern them as seriously there as it does here.



The information gotten from all sections of Louisiana agree that the acreage is very nearly the same as the previous season and the crop prospects slightly below that of last year.

It has been raining over the entire rice belt in showers for a month previous to Aug. 12th, when the weather conditions became more favorable for harvesting; and should good weather continue, the outlook for another large <sup>Crop</sup> is assured.

I saw no gold seed rice planted there; the two varieties being Honduras and Japan; and large areas of rice nearly ready to be harvested that would be considered here good for fifty bushels per acre.

The maggot is a visitor of recent years and apparently becoming more destructive each season.

After getting such data as I thought sufficient at Crowley? I proceeded on my trip to Lake Charles, Louisiana, and was quite fortunate in being taken charge of by Mr. Foster, Gen. Manager of the Lake Charles Rice Mill, who afforded me every opportunity of getting the information I sought. He laid aside work, showed me over his elegant mill and then drove me into town and placed me in touch with intelligent planters and business men. I found the outlook more hopeful than at Crowley from the fact that they have none of the old crop on hand and were ready for business. The expenses of the planters and their general conditions were the same as at Crowley only they got no advances from the mills. The mills purchased what rice they handled or cleaned in toll at the same charges as their neighbors. Matters being alike I continued on to Beaumont, Texas; which is to Texas what New Orleans and Crowley are to Louisiana. There you could see more confidence in the rice industry than was noticeable elsewhere.



There is in course of construction, one of the largest and costliest rice mills in the United States, with the latest improvements and everything up-to-date. The capacity of this mill is 12,000 bushels of rice per day, and the owners are the McFaddin-Wiens Kyle Rice Milling Co.; in addition, they own and plant 18,000 acres of rice, from which they expect a yield of fifty bushels. When you look at this tract there seems to be no limit to its extent. I would say from my observations, their estimate is not far wrong. Attached to this immense estate is a pumping plant driven by four Hamilton-Corliss engines of 400 H.P. each, and capable of lifting 170,000 gals. per minute with four units. This plant cost upwards of \$100,000.

The charge for water at Beaumont is eight (8) bushels per acre and land rent the same, regardless of what the crop may yield, which differs somewhat from the charges at Crowley.

The San Jacinto Rice Co. is another large rice planting interest controlled by Mr. W. B. Dunlap. They are planting 8,000 acres and consider their prospects as good as last year, when they shipped to mill 288,000 bushels from 6,000 acres.

By the middle of September there will be three large mills running at this place. The acreage here is large; has been much increased during the present season and can be further increased to almost any extent. I was shown many courtesies here.

My next point to reach was Houston, Texas, where a large amount of rice business is done and where I promptly called on Dr. Knapp, who is considered the Father of the rice industry in Texas. It was indeed delightful to be thrown with one so absolutely at ease in imparting information desired, and who understood thoroughly the situation pertaining to rice in every particular and whose ideas are unquestionably



correct in unravelling this knotty problem of over production and an insufficiency of consumption. He has been advising a reduction in planting rice or in other words, diversifying crops until the consumption of rice is increased or other markets found. He advised also what we have repeatedly discussed here, the getting together of all rice interests; creating a fund and put intelligent men on the road and educate people in using the product. As he properly says it is useless to continue raising millions of bushels of rice and not getting a market for it. Every effort, he says, should be made to control the Cuban market, also increase our trade with Porto Rico. Dr. Knapp is working energetically in the right direction.

Now summing up the result of my trip, I found the condition of affairs much worse in Louisiana than in Texas. In the former state, my information derived from intelligent planters, was to the effect that the acreage had gotten this season, to the limit of production; that it cost them as much to place rice on the market there as is required here; that while it cost them much less to make the crop than it does us, the water charges, milling and handling are very heavy indeed; and as all indications point to low prices, the planters will not be able to get sufficient accommodations another year and the acreage will be largely reduced.

They look upon Crowley as largely responsible for the low prices and serious condition of the rice market by holding on to such an enormous quantity of rice and not placing it on the market even at low prices. The opinion in New Orleans is that this surplus of old rice will largely regulate the price of the new crop and the tendency will be downwards.

In Texas the disposition is to go ahead and take the chances.



The Feeling is very hopeful and until there is considerable loss of money to check this increase of production it will go steadily on. They have not had the experience of thir brother planters in Louisiana .

There is no concerted plan in either state, no organization that amounts to anything; the consequence is, they appear to be at sea and each acting independently of the other.

Before leaving this matter, from the planters standpoint I will give you his expenses in an itemized form.

Pocket holding 100 lbs	.08
Plowing per acre	\$1.00
Harrowing and smoothing	.50
Planting and Covering	.50
Seed, 1-1/2 bus.	1.50
Harvesting	2.00
Hauling to Thresher <i>etc</i>	1.00
Threshing (sack of 4 bu)	.10
Price of sack	.08
Hauling to mill	.10
Milling per sack of 4 bu.	.40

All flour or by-products taken by the mill.

Commissions for handling and selling 2-1/2 %

Water charges per acre 1/5 of yield

Land rent per acre, 1/5 of Yield

Insurance - - - - -

Add to these charges the cost of keeping up the farms, cost of animal power, impliments, machinery, feed etc. etc. and you will readily see that the farmers are not like <sup>ly</sup> to become millionaires at the present prices. They all agree that they cannot make rice to sell at a profit below 50¢ per bushel or \$2.00 per sack as they measure, even with all of this it looks as if South Carolina is up against a serious proposition. Should the prices become again remunerative, Louisiana may "stand pat", but Texas will increase her acreage to an enormous extent. They are opening now for rice a large territory along the



Rio Grande river, which is said to be some of the finest lands in the state; and the water unlimited.

On my return I stopped at New Orleans for a day to look into the matter of machinery etc., and after being introduced to the members of the Board of Trade and ascertaining the views of several of the members on the rice situation, called on Mr. Phillip Rahm, who is considered the best authority on rice mills, and get his opinion on small mills. He advised against their use unless all parts are adjusted, but stated that a complete mill could be built at a cost of between \$8,000 and \$10,000 capable of doing the best of work and turning out 1200 bushels per day.. Allow me to remark here that the prevailing idea among planters and mill men in South Carolina; that Louisiana and Texas cannot produce as good rice or compete with us in the milling, is a delusion.

I have labored industriously to accomplish what I was requested to do. There was no pleasure attached to this; I sought information from the most intelligent source, and if the result of my mission is criticised adversely, it is from lack of ability as my intentions were of the best.

With every consideration of respect, I am

Yours very truly,

*Robert W. Warlick*



Tooe Hasciations  
Hesperant



WANTED:

A FERTILIZER WITH THE FOLLOWING ANALYSIS:

Nitrogen 3%, Phosphoric Acid 10%, Potash 2%.

There are available the following materials of which to make this fertilizer,- analyzing as follows:

Cotton Seed Meal 7.5% Nitrogen, 2.5% Phosphoric Acid, 1.5% Potash

Acid Phosphate ----- 14% available " " -----

Kainite-----12 % "

A ton of each of these goods will contain:

60 lbs. Nitrogen  
200 lbs. available Phosphoric Acid  
40 lbs. Potash

Since Cotton Seed Meal contains all three ingredients but is the only one supplying Nitrogen, we will determine how much of it is necessary to give the requisite amount of Nitrogen, then-

Since 100 lbs. of C. S. Meal contains 7.5 lbs. of Nitrogen,

$7.5 : 100 :: 60 \text{ lbs. (no. lbs. required)} : x.$

$x \ 800 \text{ lbs.}$

It will therefore require 800 lbs. of Cotton Seed Meal to supply 60 lbs. of Nitrogen. 800 lbs. of Cotton Seed Meal also supplies Phosphoric Acid and Potash.

	<u>Nitrogen</u>	<u>Available Phos. Acid.</u>	<u>Potash.</u>
We need-----	60 lbs.	200 lbs.	40 lbs.
800 lbs. Meal			
Supplies-----	60 "	20 "	12 "
Leaving	0 "	150 "	28 "

to be supplied from the other ingredients.



Since 100 lbs. Acid Phosphate contain 14 lbs. Available Phosphoric Acid, then-

$$14 : 100 :: 180 \text{ (amt. required)} : x.$$

x therefore equals 1285 lbs., which is equal to the amt. Acid Phosphate required.

Since 100 lbs. Kainite contain 12 Lbs. Potash, then-

$$12 : 100 :: 28 \text{ (amt. Potash required)} : z.$$

x therefore equals 233 lbs., which is equal to amt. Kainite required.

We now have:

	<u>Nitrogen</u>	<u>Avail. Phos. Acid</u>	<u>Potash</u>
800 lbs. Cotton Seed Meal = 60 lbs.		20 lbs.	12 lbs.
1285 " Acid Phosphate =		179 "	
233 lbs. Kainite =			27.8 "
<hr/>			
2318 "	60 lbs.	199 lbs.	39.8 "

When well mixed together, this should have the required analysis, i.e.-

Nitrogen 3%, Available Phosphoric Acid 10%, Potash 2%.

Now if it is desired to mix only a sufficient quantity of these substances to make just a ton, we ascertain the desired quantities by the following proportions:

Let x = quantity of Cotton Seed Meal necessary.

" " y = " " Acid Phosphate "

" " z = " " Potash "

$$\text{Then } x = \frac{800 \times 2000}{2318} \quad 690 \text{ lbs. } 690.2$$

$$y = \frac{1285 \times 2000}{2318} \quad 1082 \text{ " } 1108.7$$

$$z = \frac{233 \times 2000}{2318} \quad 201 \text{ " } 201.1$$

$$\underline{1973 \text{ lbs. } 2000}$$



Reduced to pounds:

To one pound of Cotton Seed Meal use 1 lb. eight and eight-tenths ounces Acid Phosphate and four and eight-tenth ounces of Kainite.

Should it be desired to supply a portion of the Nitrogen in some other form, then the Meal should be decreased in proportion to the Nitrogen so supplied and the amount of Phosphate and Kainite increased in like proportion to make up for the deficiency in the Meal. Suppose we wish to supply 1% of the Nitrogen in the form of Nitrate of Soda containing 15% Nitrogen, then-

$$15 : 100 :: 20 : x.$$

$$x \ 133.$$

133 lbs. Nitrate supplies 20 lbs. Nitrogen, leaving 40 lbs. to be supplied in the Meal. Then-

$$x \ \frac{40 \times 100}{75} \quad 533.3 \text{ lbs. supplies Nitrogen } 40 \text{ lbs.}$$

	<u>Nitrogen</u>	<u>Phosphoric Acid</u>	<u>Potash</u>
Needed	60 lbs.	200 lbs.	40 lbs.
533.3 lbs. C. S. Meal supplies---40 lbs.)		13.3 "	8 "
133 lbs. Nitrate supplies-----20 lb. )	60 "		
Leaving to be supplied	0 lbs.	186.7 lbs.	32 lbs.
Then,- $\frac{186.7 \times 100}{14}$	1333.3 lbs. Acid Phos.	186.7 lbs. Phos. Acid	
and,- $\frac{32 \times 100}{12}$	265 lbs. Kainite	32 lbs. Potash.	



		<u>Nitrogen</u>	<u>Phosphoric Acid</u>	<u>Potash</u>
Then 133.3 lbs. Nitrate Soda		20 lbs.		
533.3 " C. S. Meal		40 "	13.3 lbs.	8 lbs.
1333.3 " Acid Phos.		186.7	186.7 "	
265 " Kainite				32 lbs.
<hr/> 2264.9 "		60 lbs.	200 lbs.	40 lbs.

Then 2000 x 133.3

2269.9

112 Nitrate Soda.

2000 x 533.3  
2264.9

471 Cotton Seed Meal.

2000 x 1333.3  
2264.9

1133.2 lbs. Acid Phosphate

2000 x 265  
2264.9

234 lbs. Kainite

1951.2 *quantity* Required.



Required

Fertilizer Analysis

Nitrogen 2% Phosphoric Acid 8% Potash 2%

= 533.3 Lbs C S meal

1047.5 Acid Phos

245 Kainit

1173.9 Filler

21000

✓ 
$$\begin{array}{r} 690. \\ 23. \\ \hline 440 \end{array}$$