BUREAU OF PLANT INDUSTRY

WASHINGTON, D. C.

FARMERS' CO-OPERATIVE DEMONSTRATION WORK

ARKANSAS, LOUISIANA MISSISSIPPI, TENNESSEE, TEXAS
INDIAN TERRITORY AND OKLAHOMA

WITH the object of determining, as far as practicable, the per cent. of work accomplished by the "Farmers Co-operative Demonstration Work" since it was inaugurated in Texas and Louisiana by the U. S. Department of Agriculture in January, 1903, I sent to each of our field agents a letter of inquiry, and asked them to go over their respective districts with care and obtain estimates from the best farmers and merchants, tabulate them and forward the results to our office. It was made clear that a plain, cold statement of facts, without bias or coloring, was all that was required.

The following replies were received. In Arkansas, Mississippi, Tennessee and the Territories the work is too recent to determine results at this date.

S. A. KNAPP,
Special Agent in Charge.

Lake Charles, La., May 1, 1906.

College Station, Texas, April 5, 1906

Dr. S. A. Knapp, Lake Charles, La.

Dear Dr. Knapp: Your letter of recent date making inquiry as to influence of the demonstration farm work, received.

In answer to the first question propounded, will say that a very small per cent of the farmers, if any, made a practice of breaking land deeply in the fall and following with light winter cultivation before this method was proposed or introduced by you. Quite a large per cent of the farmers of the state are now following this system. All agree that it is eminently the proper thing to do, but owing to conditions in the fall, the rush of work, picking cotton, gathering corn and other crops and interference of too much rain fall, many do not get to do as they wish.

Queston No. 2, as to intensive cultivation practiced prior to 1903, as a system.—Occasionally you could find a progressive farmer who practiced intensive cultivation as a system, but there were very few farmers who made a practice of intensive culture for either cotton or corn. Usually corn would be plowed about three times and cotton given about four cultivations at most. Now it is a very common practice for farmers to use the intensive methods of culture, plowing corn from four to five times and cotton five or six times, sometimes even more under certain conditions.

Prior to 1903 comparatively a small per cent of farmers selected cotton seed for planting. Quite a number, however, used crib selections for corn, pick-

ing out the largest ears and saving them for seed. The past two or three years farmers are fast realizing the importance of seed selection and are now planting the very best cotton and corn seed obtainable. They are now willing to pay big prices for selected corn and cotton seed. Some make a practice of selecting both corn and cotton from the best plants in the field. This idea is fast growing and I believe has taken root and in a few more years a very large per cent of the farmers of the state will have their seed patches for both corn and cotton and make selections from the field. Your agents have been making quite a point in encouraging the farmers to follow this system. The general improvement in agricultural practice in this state has been very marked in the last three years, and I think much of this is due to the methods proposed and encouraged by your work.

You will note that I have not given percentages in actual figures. I would not care to do this at a guess and is would be more or less a guess. However, I will state that it is easy to see the general improvement in this state in methods practiced by the farmers.

Yours very truly,

J. W. CASSON,
Special Agent.

Belcher, La., April 14, 1906.

Dr. S. A. Knapp, Special Agent in Charge.

Dear Sir: With the close of this week I completed a canvas of my entire territory and must say that I am very much gratified with the progress our work is making in Louisiana. To see the work being done this year in comparison with the old style of farming, say, for instance, prior to 1903. Up to that time I think not over 5 per cent. of the people fall-broke their land and gave any winter cultivation whatever, while at this time at least 60 per cent. of the hill and

95 per cent. of the river farmers follow this method. Prior to 1903 about one in five of our farmers used intensive cultivation as a system, while at this time at least 75 per cent. are now using intensive cultivation more or less. Heretofore they made very little effort to secure improved seed of any kind for planting. Some few old men that had learned the importance of having good seed were the only ones that followed this plan, while at this time every farmer with ordinary intelligence is making strenuous efforts to secure the best selected seed for planting of both corn and cotton that is obtainable.

While a few years ago it was quite a job to get up any interest in improved agriculture, now it is very different. It is rather the order of the day than otherwise. These results have been brought about by the work done by the Department of Agriculture, through the co-operative cotton demonstration work.

Inclosed are a couple of letters from citizens that I think will verify my report.

With kind regards I am, very truly yours,

J. E. WEMPLE,
Special Agent.

Grand Cane, La., April 7, 1806.

Mr. J. E. Wemple, Belcher, La.

Dear Sir: As requested, I will try to answer the following in regard to the effect that the Bureau of Agriculture is having on the farmers in this vicinity.

1st. Fall and winter plowing. Prior to 1903, 10 per cent. followed this method; now I think 75 per cent.

2nd. New methods of farming. Prior to 1903, 10 per cent.; now I think 80 per cent. are trying it.

Those trying to get the best seed. Prior to 1903, 15 per cent.; now 80 per cent are trying to get the best seed.

In conclusion will say that I think the education and new methods of farming to the farmers by the Bureau of Agriculture will result in great benefit to our community.

Yours truly,

L. M. Cook.

Gilliam, La., April 9, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: For nearly 14 years I have been closely associated with the farmers' interests of this portion of the Red River Valley, and until within the last few years, say, since 1903, the old saying "any fool can farm," was seemingly acknowledged a fact, but now it seems that each white farmer, large and small, is putting into his work those elements that go to make the successful men in any vocation.

It would be difficult for me to state with any degree of certainty what per cent of land is winter-broken, what per cent use intensive cultivation as a system, but I can say positively, that previous to 1903 none of this was done, "boat corn" as it was called, was the ideal seed corn because earlier by a few days than home raised. The last picking of cotton was saved for seed, the first being sold, and the cultivation of corn was always neglected for cotton.

I am glad to state, however, that through the efforts of the Department of Agriculture, by its agents, the thinking farmers have been rapidly changing their methods and now spare no pains nor expense to begin early in the fall preparing his land for the next crop, and buys the best seed he can procure. The greatly increased sale of improved agricultural implements is a sure index of the great interest manifested in the new order of things, and is very noticeable to me, having seen so many crops made with a turn plow and a scoop.

The young men of the country should be very grateful to the Department for the unfolding of the vast opportunities that have been opened up to them and should put forth the best efforts of their hands and brains to make their vocation an honored as well as an honorable one.

May the good work continue and may our Southland prosper. Yours sincerely,

R. D. DOUGLAS.

[Letter from Col. W. E. Glassell, President North Louisiana Cotton Growers Association.]

Shreveport, La., April 2, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: The position I have occupied as a commission merchant, supplying goods and cash to planters, and as a farmer myself, has put me in direct contact with the producer. The improvement in cultivation and better plowing has been of considerable interest to me. Fall plowing was unusual, only a few of the most progressive farmers in this section did any fall plowing until recently. Now it is unusual for a planter not to break up his corn land in the fall. Results have been so satisfactory that a great many not only broke up his last year's corn land, but a good proportion of their cotton land was plowed up this winter. The selection of planting seed has become an important matter recently. Very little attention was formerly given to selecting corn or cotton seed. The average farmer would go to a public gin and get any kind of cotton seed to plant (which was the leavings after the oil mills had the best), their seed was thrown down on unprepared lands to be germinated by rains (late rains, late crops.) Now the man who plants selects his best seed or buys seed from his more provident or careful neighbor, and is very particular in selecting the variety. The improvement in

selecting cotton seed and preparing the cotton land is more general than in preparing for corn culture. I could not say to what per cent. the improvement has been, but know that it is considerable. The experimental patches put in by your department has had the effect of not only showing what can be done, but of stimulating a great many others to do better than the government. The trouble in having new models of culture used is the natural independence of the average farmer who feels that his plan of cultivating a crop is the best, because it has been in practice so long. The success of a neighbor who is using the better and later methods of plowing, seed selection and cultivation is a practical evidence of what can be done, and results are beneficial not only to those who take the experimental farms, but to the whole neighborhood where the farms are located.

Permit me to thank you for the interest you are taking in forwarding the interest of the producer, and to express my appreciation of what has been done.

Yours truly,

W. E. GLASSELL.

Palestine, Texas March 3, 1906.

Dr. S. A. Knapp, Lake Charles, La.

My Dear Sir: Yours of the 27th inst. received, and contents fully noted.

1st. Will say that in the southwestern part of my territory the fall plowing and winter harrowing of the soil was practically 100 per cent. and in the central part about 60 per cent of the farmers are using these methods. In the eastern portion not more than about 15 per cent. except in my immediate neighborhood, where it is almost 100 per cent.

I think that probably 60 per cent. of all the farmers are practically using our methods today.

2nd. I do not know of but a few outside of Brazos Co. who were using these methods prior to 1903; not enough to give a per cent.

3rd. I think that about 75 per cent. of the farmers are using the better methods of farming.

4th. Seed selection prior to the last four or five years was not thought of except by very few farmers. Now they all try to get the very best cotton they can procure; even going so far as to pay almost a fabulous price for the seed, and a great deal of imposition has been practiced upon the farmers in some cases by unscrupulous seed dealers. Seed selection is one thing that we cannot give too much attention to. Six years ago, an average yield of 30 per cent. of lint was considered a very good yield of lint; now by a little care and the selection of seed, we often have cotton that yields as high as 38 per cent. of lint. That alone in the cotton crop of the South means a profit or about thirty millions dollars.

As for selecting seed corn, there are very few who select their seed from the field prior to gathering, but there will be a good many who will select their seed corn this year, and also follow up the method of cutting our barren stalks.

There is more attention paid to better methods of cultivation today than the most sanguine people could have hoped for three years ago. I can have all of the above certified to by all of the best farmers and business men throughout the territory in which I travel. In evidence of the above, I will enclose a letter from a gentleman from St. Louis, who was down here a few days ago and expressed very fully what he thinks of the work we are doing. I took him out to my farm and showed him the kind of work I was doing here myself and having done throughout my territory.

Yours truly,

L. J. BERRYMAN.

St. Louis, March 21, 1906.

Mr. L. J. Berryman, Palestine, Texas.

My Dear Mr. Berryman: I want to thank you for the most enjoyable afternoon spent with you last week. I have felt ever since I commenced going down to Palestine that one of the great needs of that section is a place to show prospective purchasers exactly what can be done with good culture and proper management.

I think you ought to be commended in the highest degree for what you are starting out to do in that direction and I believe at the same time that it will prove a paying venture for you. I do not see how such good cultivation and handling can fail to bring satisfactory results financially. * * *

Sincerely yours,

F. W. TAYLOR.

Houston, Texas, March 31, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: In the beginning of my work with the Department of Agriculture in 1903 I found, as a general rule, the farmers following the old method of preparing, planting and cultivating, at least 90 per cent waiting until January and February to begin the preparation for planting, and not infrequently March, whereas, now there must be at least 75 per cent. fall breaking, breaking deeper, using the harrow or disk during the winter months, turning under their roughage and their barn yard fertilizer; and in the black land belt a larger per cent. than above stated, i. e., where the weather has permitted. In the north section of the territory that I cover the rainfall has been excessive each fall and it was with difficulty that our recommendations were carried out to a great extent. And as to the cultivation of the crop, there is a marked improvement. In the first place the lands

are more thoroughly prepared in the beginning; hence it is not so difficult to do more thorough and systematic work. And it also enables them to secure better stands of both cotton and corn, and nearly every farmer has become used to plowing out his crop from 5 to 10 times, while formerly he was usually content to lay by with 2 or 3; and as to seed for planting of both cotton and corn, there never was in the history of Texas such, as we have witnessed this spring, hunting of improved seed, well bred corn and cotton, and since we have distributed small packages among the general farmers I find all are anxious to obtain enough to plant their entire tract, especially is this true of the cotton. The seed we were enabled to give out last season produced from one third to three times as much as the old varieties, and it was to their minds almost an ideal cotton, productive, large bolls and yielding a large per cent of lint; and I am glad to state that a large number of them culled out the very best of the big bolls and will, in the future, plant nothing but selected seed. At Grosbeck, in Limestone county, there will be perhaps not less than 7,000 acres of improved cotton planted this season, and if the season is at all favorable it will result in making 1,000 bales more cotton than it would if planted in the old mixed varieties on the same acreage.

I find, too, there is a deep interest manifested in the study of soils, planting crops best suited to each, and where their soils are defficient in plant food, they supply the same by rotation of crops, turning under such green crops as are convenient to grow, and financially the country is beginning to grow very fast.

Most every farmer has a small bank account where, formerly, it was all time extension. Rarely do we find that system in vogue to any great extent now.

These are plain facts and can be substantiated by the bankers and merchants of the country and the farmers themselves.

W. F. PROCTOR,
Special Agent.

Marlin, Texes, April 2, 1006.

Dr. S. A. Knapp,
Special Agent, U. S. Dept. of Agriculture.

Dear Sir: Your Mr. Proctor was here Saturday when he and I went over matters pertaining to the Demonstration farm which I have under my superintendence and management. I am glad to note the advanced methods and ideas about farming, which we of this community are getting from your department. Three years ago and prior to the advent of the boll weevil into this country we had very little system in our farming. As to cotton, we planted when we got ready and we picked it when we got ready. As to the corn crop we were contented to streak off the rows across an unprepared field, rough in the seed and practically trust to luck for the harvest.

In the planting of cotton it was no common thing for a farmer to lay off stubble land, after harvesting the oat crop, plant a cotton crop and then rest his case with the seasons and wonderful productiveness of our soil. But there has been a wonderful change come over our farming interests (thanks to the suggestions made by your department) and where you formerly saw the seed being put into unprepared lands you now find everything at planting time in a thorough state of preparation, the lands having been fallowed during the fall and winter preceding.

In addition to your advice as to the preparation of the lands we are also in love with your idea of intensive cultivation of the crops. It is of wonderful educational value to our farmers who have heretofore

qeen too sluggish. We take off our hats to Mr. Wilson, who, we now concede, is doing a great work for the agricultural interests of this country.

Yours very truly,

J. A. DUNKUM.

Waco, Texas, April 9, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: Will write you a short statement in regard to existing conditions among the farmers in Central Texas, especially in the territory over which I have traveled the past two or three years.

Formerly but very little fall plowing was done, sorry to say, not as much now, as should be. From my observation there are perhaps thirty-five per cent of farmers who are doing fall plowing now, but few do systematic winter cultivation. Very few farmers practiced intensive cultivation prior to 1903, perhaps not more than ten per cent; quite a large number are doing better cultivation now, perhaps fifty per cent. Formerly few farmers made any special selection of or planted improved seed, but now nearly all farmers are becoming interested in securing the best cotton seed possible to be had at least seventy-five per cent of them. In some section quite a large number of farmers are doing better farming, planting more improved seed and are making earlier and better preparations and are using better methods in cultivating crops, showing that there is an awakening among the farmers to the importance of improvement and advancement all along the line. The larger per cent of our farmers until recently took even less interest in improving their seed corn, than they did the cotton but some are beginning to realize the importance of planting better seed corn.

Very truly yours,

J. L. QUICKSALL.

April 13, 1906.

I regard this as a safe conservation statement of facts and existing conditions.

G. ROTAN, Cashier First National Bank.
M. A. COOPER, Wholesale Grocer.

We fully concur with Mr. Quicksall's report.

J. S. MCLANDON,
W. O. LACY,
C. J. GEORGE.

Shreveport, La., April 2, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: Yours of 27th of March, in reference to my report on our demonstration work since 1903, at hand and noted. I will confine my report to the territory I have worked. I commenced work in February, 1904, and in 1905 I covered double the amount of territory that I did in 1904. The section that I worked in 1904 did not require so much of my time, as they knew something of our demonstration work. It will be very hard to give the per cent. In 1904 we had 21 farms in 6 parishes. 50 per cent. of the farmers adjacent to these 21 farms are following our plan; while they do not make any report they are following our cultural method.

1st. What per cent of the people in your territory fall-broke their land deeply and gave it light winter cultivation as a preparation for a crop?

In 1903, 2 per cent.

In 1904, 5 per cent.

In 1905, 15 per cent.

In 1906, 30 per cent.

2nd. Give the per cent. that used intensive cultivation prior to 1903, not occasionally, but as a system.

In 1903, 5 per cent.

In 1904, 10 per cent.
In 1905, 20 per cent.
In 1906, 30 per cent.

3rd. "Give the per cent. of farmers that now use intensive cultivation more or less." 30.

4th. "Give the per cent. of farmers that formerly selected the best seed corn and cotton for planting, also the per cent of farmers who are now using the best seed obtainable."

Prior to 1903, not over 5 per cent.
1904, 10 per cent.
1905, 25 per cent.
1906, 40 per cent.

"Finally state the general interest in improved agriculture, as compared with the general interest a few years ago."

In reply will say: In territory in 1904, when I commenced work for the department, I had to be very careful how I approached a farmer. He would say he cared nothing about our book farming. Now they will stop me and ask questions and insist on my going to see them. They want the best seed and to know where it can be bought.

There is 50 per cent improvement in our agriculture as compared with the general interest a few years ago. This applies only where we had demonstration farms in 1904 and 1905. Go out of this territory, where the farmer has not had any demonstration work, and you will not find much improvement, only now and then will you find a first class farm. I have been planting in the territory for forty years and I can say that the money spent for seed and demonstration work in the last three years has accomplished more results with the men that live on the farms than all the money that has been spent by the government prior to 1903. The man that gets a bulletin or

goes to an experiment station, he will say, that is good for a garden but will not do in the field.

We go over the field and show him that we can do the same as shown in the experiment station. Start one and his neighbor will follow suit. So when we get one good farmer to adopt the cultural method we get all his neighbors. Yours truly,

F. A. HILLEY.

Tyler, Texas, April 6, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Dr. Knapp: In answer to your several questions, propounded in your letter of the 27th ult, looking to a comparative statement as to farm conditions now and prior to the commencement of your special work in this territory, I beg to submit the following:

1st. "What per cent of the people of your territory fall-broke their land deeply and gave it light winter cultivation as a preparation for a crop?"

Ans. Not perhaps more than 1 per cent fall-broke their land; and the winter cultivation was scarcely practiced at all.

"Then give the per cent that you think are following this plan at the present time."

Ans. Perhaps 50 per cent broke land in later fall and early winter, not so large a per cent have given winter cultivation, but quite a number have done so.

2nd. "Give the per cent that used intensive cultivation prior to 1903, not occasionally, but as a system."

Ans. Not over 1 per cent. as intensive cultivation is now understood.

3rd. "Give the per cent of farmers that now use intensive cultivation, more or less."

Ans. Not less than 50 per cent, perhaps as high as 75 per cent.

4th. "Give the per cent of farmers that formerly selected the best seed corn and cotton for planting; also the per cent of farmers that are now using the best seed obtainable."

Ans. (a) Common gin-run seed was formerly quite generally used, probably not more than 5 per cent were careful in the selection of their seed.

(b) The interest now as to the importance of using the best, especially the *earliest cotton* seed, is very general, perhaps as much as 75 per cent of them are manifesting marked interest.

There is an increasing interest in better corn seed.

"Finally state the general interest in improved Agriculture as compared with the general interest a few years ago."

Ans. There has been almost an entire revolution.

ED. W. SMITH, Agent.

We, the undersigned, fully endorse the accuracy of the above and foregoing estimates made in response to the accompanying interrogatories, by special agent, Capt. Ed. W. Smith.

A. W. BIRDWELL, Co. Supt. of Pub. Instruction.
JOHN M. LOYAN, Ex-County Judge.
M. A. LONG, Farmer and Architect.
G. R. PHILLIPS, General Merchandise.
BOON, WADEL, CALDWELL & HUGHES,
General Merchandise, Per W. H. Caldwell, Sec.
J. R. GLASS, Farmer.
S. A. LINDSEY, Co. Judge, V.-Pres. Smith Co.
Southern Cotton Association.
A. J. MCMINN, Farmer and Ginner.

[Letter showing the personal element in the demonstration work.]

Tyler, Texas, April 14, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: I have just returned from Gilmer, and Big Sandy, on the Cotton Belt, where I met Demon-

strators L. C. Mitchell, of the former, and N. C. Kay, of the latter place, and took notes on their work. * * *

I remained with each of these men an hour or two and discussed the whole farming situation, special, local and general. I believe in the value of close personal touch among the workers in any co-operative work. As I said to you at Shreveport, I want to cultivate and am cultivating the acquaintance and friendship of each of my men to the end that they may be won and permanently held to the cause of better farming and the upbuilding of the country. The idea has occurred to me that it would be a good thing to have a rally of our classes of farmers at some accessable point, say Pittsburg, at the proper time, where you and other advanced farmers could meet them and have a general interchange of ideas, views, experience, etc. My plan is to talk it up, not as a thing already agreed upon, but as something that we may conclude to have, and to determine whether a sufficient attendance can be secured. If you will give the word of authority I would give it the widest possible publicity and, from my present view, believe we can secure good results from such a meeting. My desire is to set East Texas on fire in the interest of our work. I have another plan I want to broach to you later. I believe that this is the acceptable year of the Lord in the work you have been set to do in the southwest.

It is especially true in my field. As never before, farmers and all classes of society are stirred on the subjects that belong to our work. And you will excuse me for saying that in their awakened interest men are everywhere asking me about you. You know you cannot exclude the personal element from our work, and they make inquiries about you as the head of this work. It all springs, not from the criti-

cal spirit, but from kindly interest and out of good will to your work. But, unfortunately, I do not know much along that line and I wish to ask that you give me all the revelation of yourself that your modesty will permit and that you may think to be of consequence to your work: Of course my inquiry is limited to that.

Hoping that you may not think this inquiry springs from mere curiosity, and that the other matters will be of interest to you, I am most respectfully, Your friend and co-worker,

ED. W. SMITH.

Cooper, Texas, April 5, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: I have learned that there is a disposition in some portions of the east to limit or discontinue the work being done by the agricultural department and I trust that it will in no way affect the work being done in this section of the country. I feel that our people are just beginning to realize the wonderful help you are giving them in your demonstration department, and a desire for better seed and better cultural methods are being manifested all over this country, and the work you have done in the boll weevil district is a monument of the greatest importance. I wish to add my indorsement of the work and would regret to see any reduction in it.

Very respectfully,

JAMES A. SMITH,
Cashier Delta National Bank.

La Grange, Texas, April 8, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: Anyone reviewing our co-operative work and farm conditions generally for the past several years can but note the marked improvement

among our agricultural classes with reference to their financial betterment and methods of farming.

In the first place, three years ago there were not 5 per cent. of the farmers who did any deep fall plowing: today fully 50 per cent. break their land in the fall and a good per cent. of these give more or less winter cultivation. This applies more especially to those who own their farms.

Secondly, while there were practically none who gave their lands intensive cultivation prior to 1903, there are a great many being added to the list annually who believe in and practice intensive cultural methods, advocated by the Department as a preventative or offset to the boll weevil, and very effectually.

In the third place, prior to 1903 there was not 10 per cent. that gave special attention to the selection of seed. Now all are a little particular in their seed selection and fully 75 per cent. are using the very best to be had, and a fair per cent are engaged in breeding their corn and cotton up to a high state of excellence. You will notice great improvement in the selection and use of up-to-date implements and the attention they are giving to the improvement of their homes; in fact it looks as though farmers were beginning to realize the value of farm life.

I think the Agricultural Department is engaged in a great work in Texas, and while great good has been and is being and accomplished through the co-operative plan, I think the demonstation method, now being pursued, will bring much greater results. The Government's furnishing improved seed free imposes a certain amount of responsibility and obligation upon our special demonstration farmers that causes them to use more care in carrying out instructions

successfully, thereby insuring a wider influence among their neighbors.

I think to the work of the Agricultural Department is largely due the constantly growing favoritism to the diversification idea, very few "one-crop" farmers left; a generally better taking care of the soil is noticeable throughout the country, a great interest, not only in better farming, but in the raising of better stock on the farm and having something to market of all farm products.

Pardon me if I add that I think quite a responsibility rests upon the Special Agents in charge of this work, and I think great care should be used in their selection, both as to their ability and integrity; men in whom both the people and the Department can have confidence in their doing their duty faithfully. Yours very respectfully,

G. A. HALL, Special Agent.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: Herewith my report for the week ending April 14, 1906. I have visited and obtained 25 co-operators in the following localities: Arnaudville (St. Landry Parish), Breaux Bridge, Parks, St. Martinsville, Cades (St. Martin parish), and Youngsville (Lafayette parish). Those localities are somewhat behind the northern part of my district, some cotton being not planted yet, and part of the corn just up. This is due in part to the lack of drainage, which did not permit of early preparation of the land, Some improvements are very noticeable since last year, part from our work there and part from their experience last season.

In Arnaudville and Breaux Bridge, as also in Youngsville, where last year more time was devoted to our work, the farmers are improving greatly their

methods and also their seeds, and I expect very good results from our co-operators.

On Sunday, and thanks to the kindness of Rev. P. Morin, I was given opportunity to address the congregation after mass, to which assisted about 300 persons, including at least 75 farmers. Subjects treated: our mission, drainage, fall breaking of land, best varieties of cotton, intensive cultivation and diversification.

While I did not keep them more than one hour, I am satisfied that at my next visit we will be tble to hold aa larger meeting.

On Monday I was called at the plantation of Dr. Martin by his son, lately out of state university, where he attended a course of agriculture. His being young was somewhat against his being listened to by renters and share croppers, and my having been on the plantation last year had given me the confidence of his people. Last year I had to advocate: 1st, drainage; 2nd, more drainage, and 3rd, still better drainage, for a wet or dry year. I was glad to see that that my advice has served his purpose, as the place is today in much better shape than last year. Owing to Mr. W. O. Martin taking charge but late in February, very little work was done in winter, outside of ditching. I talked to the people for about one hour and gave them a good impression on the change necessary to keep up with progress. I also had a talk with Mr. Martin, concerning the gradual means to employ to come to better results.

Respectfully yours,

L. PERRIN.

NOTE:—The territory traveled by L. Perrin is almost exclusively settled by French and it is the custom to hold meetings of general interest on Sunday.

[The following letter from Arkansas gives present conditions, as we have just inaugurated the Demonstration work in that State.]

Little Rock, Ark., April 16, '06

Dr. S. A. Knapp, Special Agent in Charge,
Lake Charles, La.

Dear Sir: In reply to your letter of March 27, 1906, regarding present condition of farming operations in my territory.

Question 1. To what extent have the people in your territory adopted fall plowing and used winter cultivation as best preparation for soil?

Answer. About 5 per cent.

Qnestion 2. How many are using intensive cultivation?

Answer. About 7 per cent.

Question 3. How many are using improved seed for Cotton and Corn?

Answer. About 5 per cent.

Question 4. How many are using fertilizers?

Answer. About 10 per cent.

Question 5. How many are using improved implements?

Answer. About 5 per cent.

This is the present condition as I find it now. Inclosed you will find a note from Judge H. D. Bradford, Commissioner of Agriculture, self explaining.

Yours very truly,
ANTON V. SWATY, Special Agent.

Little Rock, April 16, '06

Mr. A. V. Swaty, Special Agent.

Dear Sir: I have examined your estimate in regards to condition of our farming operations in this state and will say that your per centage is as near correct as can be obtained.

Yours truly,
H. F. BRADFORD, Commissioner of Agri.

[Letters from a co-operator showing the interest taken.]

Belcher, La., March 23, 1906

Dr. S. A. Knapp, Lake Charles, La.

Dr. Sir: I am inclosing a sketch and memorandum of the three plats I intend to work under your instructions this season.

You will note I have no cotton near the cotton plat, as alfalfa is on one side, and two corn plats on the other. I will not have any other corn planted near these plats either.

I took a copy of the special corn instructions, you sent Mr. Wemple, and want to try for a big yield of corn. The ground is in fine condition. I never saw this stiff land as mellow and loose, just like ashes.

If not too expensive, I would like to try the nitrate of soda on one plat of corn anyway. Could you tell me about how much it would cost per acre to put some on one plat? You will note on the cotton plat I put, February 10th, 400 pounds of rotted cotton seed per acre, and today, March 23rd, 200 pounds phosphate per acre.

I hope to plant the cotton in about ten days, or two weeks, perhaps sooner.

I have a fifteen acre cut of five year alfalfa land, that I have in Rowden cotton now. It was broken in November, with a four mule disc plow, disc harrowed in December, rows layed off six feet with middle splitter in January. March 1st, I bedded this cut with eight inch turning plows and twelve inch middle splitter. Harrowed with "A" harrow, March 20th and 21st, and planted March 20th and 21st with Mr. Bill's riding planter.

I don't count this cut in my "Uncle Sam" plats, but will report on the outcome if you wish, as it would give you an idea of the value of alfalfa as a fertilizer, with the cultural methods.

I started planting cotton March 20th, and hope to get through by April 1st. Am planting King's, Shine's and Rowden's on 750 acres or more this year.

I am almost afraid to plant the seed you sent this early, as I would hate to lose them, and the ground is in such perfect condition, thought I would wait until about April 1st.

We had thick ice here Tuesday and Wednesday, temperature about 27 degrees, so it is rather early to risk seed yet, especially very fine ones. The freeze cut down a good deal of corn, but we are hoping it will come out again.

Hope this long letter will not over tax your patience. Very truly yours,

(Signed) ELLISON M. ADGER

Belcher, La. April 24, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: I have your special corn instruction, but I had put out some fertilizer before I reccived same.

I have two plats corn, No. 1 of 4¼ acre, has 750 lbs. rotted cotton seed per acre under drill, applied to land February 10th, (about one month before corn was planted.)

No. 2 has 10 large 2-H. wagon loads of stable manure per acre put on land just before corn was planted.

Very little of this manure was ever exposed to the weather, in fact most of it came from under the mules feed shed.

I would like to have you advise me if you think neccessary to put any more fertilizer on this land, you will note I have not applied any Phosphate to either. I ran a "A" 2-H iron tooth harrow over the corn as weather conditions permitted after corn came up to a fair stand, and replanted the skips with a hoe.

Yesterday and today I am running round the corn and cotton plats with spring tooth cultivation to break crust as we had a fine rain on the 20th. Have a nice stand of cotton up on Gov. plat also, and never saw this stiff land in such fine condition, and never got as good a stand with such a small quantity of seed.

When the land is not well prepared it sometimes took 75 lbs. or more per acre to get a stand.

Do you think it necessary to apply any more fertilizer to my cotton plat? It has about 400 lbs. rotted cotton seed per acre, under bed February 10th and 200 lbs. phosphate about ten days before planting cotton.

I thought the rotted cotton seed would answer for the Cotton Seed Meal, but have a complete (commercial) fertilizer I could apply to it if you think necessary. I have a fine stand of cotton every where and started to cultivating same last week. Also chopping a little this week, but the nights are almost too cool to push chopping yet. We had to replant a good deal of corn, as we tried to be too early this season.

However I just struck it right with my Gov. plats and have a nice stand, and it is growing right off.

I trust you will be able to visit this part of the State sometime and see what we are doing. Would be pleased to have you make headquarters here with me while you are in this section.

Very truly yours,

ELLISON M. ADGER.

Wichita Falls, Tex., April 12, 1906.

Dr. S. A. Knapp, Special Agent.

Dear Sir: The improvement in agricultural methods and conditions in Norhtwest Texas within the last three years has been so great that the evi-

dence of it is apparent to the most casual observer.

Northwest Texas was settled chiefly by farmers from the older sections, fleeing from high priced lands, worn out soil and the dreaded boll weevil, and attracted by a virgin soil where homes could be obtained at comparatively low prices. Their success with this fresh soil and patriotic zeal for their new homes caused the public generally to arrive at incorrect agricultural conclusions. It was a common belief that the soil was so rich that it would never need fertilizing, that rotation of crops to maintain fertility of soil was wholly unnecessary, that with sufficient rain bountiful crops would be grown anyway, be the seed and the cultivation ever so poor; and on these premises nearly all farming operations were conducted. These conditions have contributed largely toward the very low general average of farm crops in the south.

A movement for better agricultural methods was inaugurated when it became evident that the cotton industry was threatened with ruin by the boll weevil. The old methods, under weevil conditions, meant certain ruin, and, as it was early known that the weevil could not be exterminated, better farming became a necessity.

That success has attended this educational movement for better farming is proven by many facts, a few of which I will mention.

In the preparation of the soil for a new crop a very large majority of the farmers plow early and deep as soon as this year's crop is off the land, where formerly it was the custom to plow just before planting or at any time most convenient. Thorough frequent cultivation of crops is fast becoming the rule, where formerly the destruction of weeds was considered the sole purpose of the cultivator. Rotation

of crops and the use of fertilizers for the purpose of maintaining and increasing the fertility of the soil, is receiving careful consideration by farmers, where a very short time ago it was not thought of, in fact, many farmers resented the idea that their lands would ever require fertilizers.

In no particular is the good effects of the educational work of the department of agriculture more apparent than in the increased demand among farmers for the best seed obtainable. The idea that any kind of seed would do is fast becoming obsolete and in its place the feeling is common that good seed is a necessity if profitable crops are to be grown.

In arriving at these conclusions I have not depended entirely on my own observations, but have consulted others whose lines of business are affected by these changes. Several leading farm implement dealers along the Ft. Worth & Denver City Ry. in the wheat belt, report that while a few years ago many carloads of implements which plowed the land and seeded it at the same time were sold, now there is no demand for them, while the demand for harrows and other tools which pulverize the soil has increased manyfold.

Agents of the Ft. Worth & Denver City and Rock Island railroads report several car loads, as well as numerous small shipments, of commercial fertilizer to points on their lines within the last year, little or none ever having been shipped before.

Leading seed dealers report a greatly increased demand for alfalfa seed and the seed of other legumes, as well as for better and more carefully selected seed generally.

Bankers report an increased number of farmer depositors and their financial standing is of the best.

As the aims, purposes, and results of the department's work is becoming known it is approved and appreciated by all. Respectfully yours,

W. D. BENTLEY, Special Agent.

I heartily endorse and concur in the statement set out in the above letter by W. D. Bentley, Special Agent.

R. A. DUNBAR,
County Judge, Hall County, Texas.

GRUNDY BROS, Real Estate.
Memphis, Texas.

N. H. LONG, Farmer.
Newton, Texas.

We take pleasure in testifying to the correctness of above statements.

BANK OF CHILLICOTHE,
By W. E. Oliver, Cashier.

J. A. KEMP,
Pres. City Nat'l Bank of Witchita Falls.

A. H. CARRIGAN,
District Judge, Wichita Falls.

W. M. McGRAYER,
Cashier First Nat'l Bank,

W. R. FERGUSON,
Cashier First National Bank, Iowa Park.

J. D. AVIS,
Co. Com. Pre. No. 1, Wichita Falls.

T. C. THATCHER,
Implements and Vehicles, Wichita Falls.

We endorse every statement made by Mr. Bentley.

WICHITA MILL & E. Co.
By Frank Kell, Pres.

C. H. BOEDEKER,
Pres. City Nat'l Bank, Bowie, Texas.

My observations in this section lead me to believe that the statement above set forth by Mr. Bentley is entirely correct.

WALT. WORLEY,
Editor Bowie Cross Timbers.

I heartily endorse the above.

R. L. MORRIS,
Merchant and Banker, Chico, Wise Co., Tex.

I heartily endorse the above.

G. A. WHEELER,
Cashier Ringgold State Bank, Ringgold, Montague Co., Texas.

J. O. BRYAN,
Real Estate and Farmer, Ringgold, Texas.

I endorse statements in foregoing letter.

S. A. DENNY,
County Judge, Clay County, Texas.

Ft. Worth, Texas, April 23d, 1906.

Dr. S. A. Knapp, Lake Charles, La.

My Dear Doctor: Mr. Bentley has shown me his letter to you on the general conditions throughout the Panhandle country. I agree fully with Mr. Bentley's statement, and believe that he has covered the ground as well as it is possible to do.

It is very difficult, and I might say, impossible, to form any idea of the percentage of farmers who have been benefited by the teachings of your methods. There has been a gradual improvement from year to year. In passing over the line I have noticed these improvements and have talked to the people whom I have met, and while no one can form an idea as to the percentage, all agree that much good has been done,

Very truly yours,

W. F. STERLEY, General Freight Agent.
"The Denver Road."

Houston, Texas, April 23, 1906.

Dr. S. A. Knapp, Lake Charles, La.

Dear Sir: I have just returned from a week of travel through Southwestern Texas, with which section I have been familiar for many years.

Knowing that the work of the U. S. Department of Agriculture the past two years, under your direction, has accomplished much in this section, I was yet surprised and delighted to see how generally the farmers have adopted and are practising the methods recommended.

The improvement in general farm methods within two years has been such as to excite comment from even casual observers.

The most noticeable improvement is in the preparation of the land for planting.

Fall and winter breaking, 4 to 8 inches deep, is becoming quite a common practise. To conserve moisture many farmers also winter cultivate with harrow or disk, and more of them will do so hereafter, as the value of this course was very clearly shown this spring at seeding time.

In hundreds of miles of travel I saw few farms that did not shown evidence of what would heretofore have been unusual care in the preparation of the land. The farmers who have clung to old methods, without attempt to change, are few. Also they have as a rule lost money, or, at least, made none the past two years, while their more progressive neighbors have prospered.

I found everywhere a lively appreciation of the value of improved seed, and many farmers last year for the first time followed with considerable care approved methods of seed selection.

Altogether I believe that in all this territory the average farming of today is better by at least 50 per cent. than that of three years ago. Your struly,

J. A. EVANS, Special Agent.

U. S. Department of Agriculture

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PLAN AND INSTRUCTIONS

1907

S. A. KNAPP, Agent in Charge
Washington, D. C.

NO. 36.

Press  Print

would give the varieties furnished your special attention, collecting all information possible in regard to them, and if the favorable reports are corroborated, it is probable we may use them another year.

It is advisable to exercise a certain amount of caution in the selection of Special Demonstrators. Whenever possible make inquiry about him before deciding. He should not only be a good farmer, but should be one who will and has the ability to carry out instructions, and it is advisable that he be a small farmer. He should be a man of good standing in his community. The accessability of the farms to persons visiting the town or depot is a very important consideration. In order that the best results may be obtained, it will be necessary for the agent to concentrate his attention on these farms. Locate enough of these demonstration farms in each locality so as to do away with the danger of some of them being unable to comply with their agreement; but do not have them so numerous that you will not be able to give them all the attention desired. That the work of this department is bearing good fruit is evidenced not only by the favorable reports constantly coming in, but also by the fact that we are daily receiving requests for its extension into new territory. It is believed that an adherence to the plan outlined above will not only make our work more effective, but will enable us to extend that work, even with the means at our disposal. We know that we will receive from the agents the same enthusiastic support as formerly. In return we hope by better systematizing the work to be able to help them in every way possible. Remember that our work is in no way experimental. Its object is to teach the farmers the best and most improved methods as

THE CO-OPERATIVE PLAN

A Field Agent is a special Agent of the United States Department of Agriculture, who superintendents "The Farmers' Co-Operative Demonstration Work" in a certain district.

A Demonstrator is a practical farmer, who works a portion of his farm under the supervision of a Field Agent, which tract he is expected to inspect at least monthly and report on same.

A Co-Operator is a farmer who agrees to follow the instructions of the Department, and make a general report at the end of the season.

The Field Agent is expected to visit as many centers of influence in his district as possible, and by personal effort secure the co-operation of bankers, merchants and farmers in this co-operative work; also always interest the editor of the local paper. Second, establish near these centers the special dmonstration farms, then secure co-operators. Small, thrifty and energetic farmers will generally do better as special demonstrators. Large farmers have too much business to give our work the requisite attention. The agent must use judgmnt in slecting co-operators and secure men who will follow instructions and report.

Field agents must keep a firm hold of two things to be accomplished:

First, that the special farms and co-operators follow our instructions. Second, they must secure the reports of these farms so as to prove that the increased crop is due to our methods.

SPECIAL DEMONSTRATION FARMS

in any crop for co-operative work. They are to make reports to this department of the growth, cultivation and yield of such at the close of the season, when requested to do so, and are also to agree to follow the instructions of this department or its special agent, in the cultivation and preparation of the agreed area. The department cannot furnish these co-operators with seed, or be to any expense on their account, but will furnish all information and plans for the crop. Each agent should so gauge the number of Special Demonstration Farms, that he will be able to visit them at least one day a month. He should notify all co-operators of that community in advance, just when he expects to be upon the Special Demonsrtation Farm, and request them to meet him at that point. Cards will be furnished for this purpose. Go to the field with the co-operators and demonstrators, and there instruct them just what to do and how to do it. By adopting this plan it will not be necessary to visit the co-operators except in rare instances. This will enable the agent to serve a larger territory at comparatively less expense, as it will largely eliminate the expensive item of team-hire. He will also be able to illustrate the improved methods more effectively, and we think such instructions will be better understood.

In order that we may have this plan inaugurated and running smoothly

in time for spring work it is well that each agent bestir himself towards securing special farms and co-operators in the fall. In doing so, ascertain just what acreage will be put in by the Special Farmer, and how much and what kind of seed will be required for the ensuing season, as nearly as possible, in order that we may purchase them in time. We should be very glad if you would give the varieties furnished your special attention, collecting all information possible in regard to them, and if the favorable reports are corroborated, it is probable we may use them another year.

It is advisable to exercise a certain amount of caution in the selection of Special Demonstrators. Whenever possible make inquiry about him before deciding. He should not only be a good farmer, but should be one who will and has the ability to carry out instructions, and it is advisable that he be a small farmer. He should be a man of good standing in his community. The accessability of the farms to persons visiting the town or depot is a very important consideration. In order that the best results may be obtained, it will be necessary for the agent to concentrate his attention on these farms. Locate enough of these demonstration farms in each locality so as to do away with the danger of some of them being unable to comply with their agreement; but do not have them so numerous that you will not be able to give them all the attention desired. That the work of this department is bearing good fruit is evidenced not only by the favorable reports constantly coming in, but also by the fact that we are daily receiving requests for its extension into new territory. It is believed that an adh rence to the plan outlined above will not only make our work more effective, but will enable us to extend that work, even with the means at our d'sposal. We know that we will receive from the agents the same enthusiastic support as formerly. In return we hope by better systematizing the work to be able to help them in every way possible. Remember that our work is in no way experimental. Its object is to teach the farmers the best and most improved methods as determined by the various experiment station and the U. S. Department of Agriculture. To this end it is well to impress upon all the advisability of not planting too large an area and confine operations to the more common and better known crops, to-wit:

Corn and cotton for money crops, cow peas as soil renovators and a winter cover crop, chiefly oats. If we can effect an improvement in these crops we shall have accomplished a great deal.

FARMERS' CO-OPERATIVE DEMOMSTRATION WORK. PRELIMINARY STATEMENT

There has been some misapprehension among farmers in regard to the Farmers' Co-operative Demonstration Work. Many have supposed that the instructions all come from Washington, and were not adapted to Southern conditions. This is not correct. The instructions given out for this work are made upon the following plan: First a compilation of all the experiments relating to a given crop by the Experiment Stations in the cotton states is carefully made. Then the experience, in planting, of a large number of the best cotton farmers in the South, working along the same lines in cotton, is

carefully noted. In addition to this the observation and experience of all the Traveling Agents of this Department are brought to bear upon the instructions, to correct any defect. Thus our instructions have the following elements of perfection: First, what the Department at Washington knows from its vast stores of information about cotton; secondly, what the State Experiment Stations in the South have demonstrated to be the most advantageous; thirdly, what the best farmers in the South have tested and proven the most successful upon the farm; fourth, the knowledge obtained by the Traveling Agents of our Demonstration Work, who especially visit and have personal knowledge of the States in which they are stationed. Even then our instructions are along the lines of correct principles, leaving many details to the good judgment of the farmer.

In this Co-operative Work great stress is laid upon a more thorough preparation of the soil in the fall, because in our Southern climate, the frosts do not penetrate the soils sufficiently to open them and admit air; we must, therefore, do by plowing in the fall and by some winter cultivation, what nature does in the colder North. In the richest soils there is but little food ready prepared for the plant, and nature's plan is that this food shall be prepared more or less daily by the action of the air, the moisture in the soils and by the sun. These three active forces make ready the food so the plant can be properly nourished. This cannot be done without plowing and cultivating to admit the air, and the earlier this work is commenced in the fall the greater the effect it will have upon the crop of the following season.

The effect of using good seed is not sufficiently appreciated, nor perhaps is it understood just what makes good seed. It must be the best variety, carefully selected, early in the fall, and stored in a dry place. In passing through the States we find very little of the corn fit for seed, because the rain has water-soaked the cob and injured the germs. In many cases it has even caused decay in a portion of the kernel. This could have been prevented had the seed corn been gather in August or September. Our reasons for very frequent cultivation has been explained above, to-wit, the admission of air, the conservation of moisture in the soil and the prevention of surface crust. The farmer may say that this frequent cultivation is so much work for nothing, but he will find, in case of cotton, in the fall, that his plants have fruited closer to the ground and have put on a good many more early bolls than they would have done had he pursued the ordinary methods; and corn will set more ears.

Young plants require an excellent cultivation, just as young animals require the best food and care.

The judicious use of Commercial Fertilizer is one of the most important improvements in modern agriculture, for it furnishes plant food directly and indirectly to the young plants. A small amount, say 200 or 300 pounds per acre, frequently insures an increase of crop from 50 per cent to 100 per cent. In purchasing Commercial Fertilizer, bear in mind that they should be bought judiciously with reference to the requirements of the soil. If the plant grows sufficiently tall and with an abundance of limbs, in case of cotton, or in case of corn, there is a thick, strong stalk, then the main requirements are phos-

phoric acid to insure more bolls of cotton or ears of corn as the case may be. In general it is well to use a little nitrogen. It is either purchased in the complete Commercial Fertilizer or may be added by the use of cotton-seed meal. The use of some potash is advisable, because it improves the fiber in cotton and prevents, to some extent, the shedding of bolls. In purchasing fertilizer it is well to have what is known as a high-grade fertilizer; that is, a high per cent of available phosphoric acid. Available means that it can be dissolved in water, so as to be readily used by the plant for food. No farmer need wait for some chemist to analyze his soil, and tell him what to do. The cotton and corn tell the whole story, and explain to the farmer even more than the chemist can tell. If the plants are vigorous, then a fertilizer with considerable phosphoric acid and very little nitrogen should be used. If the plants lack in size or vigor, then more nitrogen should be used in the fertilizer. Bear in mind that Commercial Fertilizers are mainly a stimulant, and do not in any large measure build up the soil. For soil-building we must largely depend upon barn-yard manure and leguminous plants, such as cow-peas. They put nitrogen in the soil and when plowed under add humus. An intelligent following of the foregoing suggestions will double the cotton and corn crops of the United States.

INSTRUCTIONS TO COTTON FARMERS

Fall Preparation of the Cotton Field Under Boll Weevil Conditions.

As early as possible in the fall, after the cotton crop has been gathered, destroy all the immature bolls. Cattle may be turned in or the bolls may be gathered and burnt; the stalks can then be cut and plowed under. In sections where there is a light rainfall, it is probably better to burn stalks as well as bolls. In the cotton producing States east of the Brazos river, Texas, there is generally enough rainfall in the winter for the complete saturation of the soil, and, if the stalks are cut and plowed under thoroughly in the fall, few weevils will survive for spring depredations. Burn all grass and rubbish on the borders of the field before breaking.

For the best results the field should be plowed in the early fall or winter, not later than the first tothetenth of January, and earlier if possible.

If the farmers must use an ordinary plaw,, then the fall plowing (breaking) should be one to two inches deeper than usual and set the furrows on edge. If a disc plow can be secured, use it, and plow as deep as possible—the deeper the better. In case a disc plow cannot be obtained, use a sub-soil plow after breaking. Following the breaking plow with a narrower plow in the same furrow is better than not to secure depth in plowing, but this is not equal to the use of the disc plow or the sub-soil plow. It is not advisable to throw a large body of cold sub-soil to the surface at one time. Afterward, during the fall and winter the field should be disked or plowed 3½ to 4 inches deep, every three weeks, being governed by soil conditions. It is not well to stir land when it is too wet.

If no fall or winter plowing has been done, plow without delay about one inch deeper than usual and run narrow furrows to set well on edge.

Disc or plow again before planting. Tillage is manure; the soil gets

air by stirring, and plant food becomes available, which would otherwise not be used by the growing crop. Most plants first throw out their feedling roots in the warm surface soil if finely pulverized, and it is best therefore to use a tooth or disc harrow, shallower than plowing, immediately before planting.

Plant as early as is safe from frost. The actual date of planting depends on locality,; the important point is to plant as early as possible, weather and soil permitting.

Rich soil will need more space between the rows; thinner soil less.

The general rule for spacing rows, is that the distance between the rows shall be a little more than the cotton in average years. Where cotton generally grows two or three feet high, the rows should be from 3 1-2 to 4 feet apart. Where cotton normally grows about three and one-half feeet high, plant in rows four feet apart; where it grows four or fixe feet high, put the rows five feet apart. It is better to have the spaces between the rows a little too wide than too narrow. Air and sunllight are of the greatest importance in pushing the crop to maturity.

On very fertile and strong lands cotton should have good distance between the rows, but may be slightly crowded in the rows with good results.

Plant early maturing varieties of cotton. Some large boll varieties are even better than the small boll, under weevil conditions, because of a thicker calyx, and consequently the half-grown bolls are less likely to be punctured by the weevil.

If fertilizers are used the following general rules should govern: On rich lands use mainly fertilizers that will stimulate the fruit and not the stalk growth. On lighter lands use more of 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 per cent. of nitrogen added to the acid phosphate gives better results. Mix three-fourths acid phosphate and one-fourth cotton seed meal. This we call "No. 1."

A mixture of 100 pounds of cotton seed meal to 200 pounds of high grade acid phosphate will greatly increase the growing condition and will be better for medium soils. This we call "No. 2." 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. This is "No. 3."

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

Apply as follows:

1. On light sandy or light chocolate land in fair condition apply 200 to 300 pounds of No. 2 per acre, or same quantity of standard fertilizer. On

thin or impoverished soils apply the same quantity of No. 3.

2. On rich sandy dark chocolate or black land apply 200 to 300 pounds of No. 1 per acre.

3. On black waxey land apply three barrels of lime per acre.

4. On alluvial land apply 200 pounds of No. 1 per acre.

On black waxey land the best condition is to have the cotton follow a crop of cow-peas.

Where lands are greatly worn by years of cropping more fertilizer should be used per 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 above instructions, the farmer must use considerable judgment and modify where necessary to fit local conditions.

HOW TO APPLY THE FERTILIZERS AFTER THE SOIL HAS BEEN THOROUGHLY PULVERIZED

Mark out the rows, or bed up, spacing as before stated, and distribute the fertilizer in rows. Distribute with a drill or in any way to secure even distribution in row. Follow after with a shallow bull-tongue or scooter to thoroughly mix the fertilizer with 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 lands, except very rich black waxey and river bottom, it will pay to use not less than 200 to 300 pounds per acre. Where lime is used scatter it broadcast, when the land is plowed, using about three barrels per acre, or apply in the row,, mixing thoroughly with the soil, about two barrels per acre, a short time before planting.

Use the tooth harrow thoroughly before and after planting.

Begin cultivation as soon as cotton is up. A smoothing harrow will do splendid work to loosen the surfance soil at this time.

Let the first cultivation after the harrow be deep, the later cultivations shallow.

Cultivating every seven or ten days, weather and soil conditions permitting, will be best. A narrow winged sweep answers the best purpose for the shallow cultivations, allowing the dirt to fall loosely over it, making a good mulch. It should be run about one and one-half inches deep.

UNDER BOLL WEEVIL CONDITIONS

First. It is usually best to chop cotton at first about eight inches and afterwards thin to sixteen inches in the row. It is safer to thin twice than it is to chop to sixteen inches at the start. Distance of plants in the rows must be, however, determined by the usual growth of plants on such soil.

Second. On rich, strong, moist lands, like alluvial bottoms, it is generally advisable to run a plow close to the plants on each side of the row (bar off) while the plants are not over eight to ten inches tall.

If the plants grow tall anl slender, later, cut the tops at about two and one-half feet high, thus forcing the growth out lower down the stalk.

3. When squares begin to drop from the plant it may be due either to the weevil or other insects, or possibly to weather conditions. In any case it is well to collect and burn all the squares that drop, for at least the first month after bloom commences, and it will be wise to continue this for a longer period. A good many weevils will thus be destroyed. Fertilizing assists in holding the squares under ordinary conditions.

ITEMS TO BE OBSERVED AS SOON AS THE COTTON PLANTS COMMENCE TO FORM SQUARES

1 Look for the boll weevil and other injurious insects.

2. All cultivation from this time must be shallow. Deep cultivation will cause more or less injury.

3. Continue the cultivation as late as possible, being governed by the size of the plant. Cultivate later in dry seasons than in wet.

4. If the boll weevil appears, attach a smooth pole or brush to the cultivator or the whiffletree in such a way as to strike the cotton plants and knock off the punctured squares. This, with the picking up of the squares, is of great service.

Where boll weevils are abundant on early cotton use the tooth harrow, while the plants are small, driving diagonally across the rows and later use brush attached to cultivator. Frequently three rows are brushed at once. Do this once in three days if necessary. Both the harrow and brushing force the weevils to fall upon the hot soil which soon kills them.

OUR CORN (MAIZE) CROP

The average yield per acre in the Southern States is very low. For a period of tend years, ending 1904, the average annual crop in Texas was 9.6 bushels per acre; in Georgia 10.6 bushels, in South Carolina 9.6 bushels. These averages are typical of conditions prevailing in the Gulf and South Atlantic States, and shows that the corn crop, on an average, scarcely pays the cost of production. This condition is the more humiliating because it is totally unnecessary. Under a good system of farming the corn crop of these states should show an increase of 300 per cent.

HOW THE CORN CROP CAN BE INCREASED

First. Improve the condition and fertility of the soil by rotation of crops, planting cow-peas or other legumes, or the use of stable manures.

Second. Break (plow) deeper each fall, untill the depth of eight to ten inches is reached, better use the disc plow or subsoil and go down at once. Harrow occasionally to keep the soil in good tilth and free from weeds. Where the land does not allow of fall plowing, break as early as possible in the spring. Corn requires a fine deep seed bed.

Third. Plant only the best selected seed, such as will produce uniform ears of excellent quality and a large crop.

Fourth. Plant early as practical, in rows four feet apart on well-drained sandy loam soils, and plant cow-peas between the rows at the time the corn is cultivated last. One inch is sufficient depth to plant in well pulverized, moist soil, when the weather is warm. Soils and conditions are so variable that the farmer must use his judgment as to depth of planting.

Fifth. Harrow corn before and after planting to prevent soil crust, then give shallow cultivation once in ten days, and always after a rain, until it is time to lay-by. Deep cultivation or plowing is injurious after the corn is eight inches tall. For cultivation a sweep is better than a plow. Deep plow the middles when the corn is about eight inches tall and keep them well worked.

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On rich lands and on postoak lands nearly level and where the rainfall is heavy, corn rows should be five to six feet apart and cow-peas planted on the side at the time of laying-by.

Seventh. When the ears begin to set, pull the tassel out of all weak stalks showing no ears or only nubbins. This will increase the yield and should be done whether it is the intention to save any of the field for seed or not.

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4th, Fertilization; 5th, Removing the tassels from bastard and inferior stalks.

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

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Till January 1, 1908, address Lake Charles, La.; after that date, Washington, D. C.

U. S. Department of Agriculture

Farmers' Co-Operative Demonstration Work

PLAN AND INSTRUCTIONS

1907

S. A. KNAPP, Agent in Charge
Washington, D. C.

NO. 36.

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GENERAL PLAN

The object of the Farmers' Co-Operative Demonstration Work is not only to place a practical object lesson, illustrating the best methods of producing standard farm crops before the farm masses, and to secure their active participation in such demonstrations, to an extent that will prove that the average farmer can do better work and **will** do it if properly approached. These demonstrations must show that better and larger crops can be raised on the average farm, and at vastly greater net profit per acre. Incidentally they are designed to prove that there is no necessity for this wide-spread deterioration of the farms and the general poverty of the masses on the farms. Like all great reforms, this demonstration work can not be done for the people to be benefited, but it must be done by them to be effective. The sick man must take the proper medicine to effect a cure; it will not do for his neighbor to take it for him.

The remedy for poverty of the farmers is:

1. Better tillage of the soil.
2. Rotation of crops and soil renovation by the use of Legumes and winter cover crops (oats, wheat, etc.)
3. The judicious use of commercial fertilizers.
4. Greater care in selecting and planting seed.
5. The use of more horse power and better machinery.
6. The raising of more and better stock.
7. Keeping an account of the cost of farm operations.

THE CO-OPERATIVE PLAN

A Field Agent is a special Agent of the United States Department of Agriculture, who superintendents "The Farmers' Co-Operative Demonstration Work" in a certain district.

A Demonstrator is a practical farmer, who works a portion of his farm under the supervision of a Field Agent, which tract he is expected to inspect at least monthly and report on same.

A Co-Operator is a farmer who agrees to follow the instructions of the Department, and make a general report at the end of the season.

The Field Agent is expected to visit as many centers of influence in his district as possible, and by personal effort secure the co-operation of bankers, merchants and farmers in this co-operative work; also always interest the editor of the local paper. Second, establish near these centers the special dmonstration farms, then secure co-operators. Small, thrifty and energetic farmers will generally do better as special demonstrators. Large farmers have too much business to give our work the requisite attention. The agent must use judgmnt in slecting co-operators and secure men who will follow instructions and report.

Field agents must keep a firm hold of two things to be accomplished:

First, that the special farms and co-operators follow our instructions. Second, they must secure the reports of these farms so as to prove that the increased crop is due to our methods.

SPECIAL DEM NSTRATION FARMS

It is our plan to stablish in the most advantageous locations, hot less than two Special Demonstration Farms of from one to five acres each, near some small town or trading point. If there are several different types of soil in the community, the number of these farms may be increased, so as to cover each type. The points selected for these farms should be of easy access to the farmers of the community and within walking distance, if possible, of the railroad depot. The party accepting a Special Demonstration Farm is to furnish the land, labor and fertilizers that may be deemed necessary, free of charge. This department will supply him with the seed necessary for planting the agreed area if it is a new Special Farm. Those who conduct special farms for one year, if continued, are supposed to have their own seed and are to use them, unless new varieties are provided. The amount of land agreed upon is to be prepared, planted and cultivated by the owner as directed by this department or its special agent. The owner is also to keep as accurate account as possible of all the soil and crop history, of all cost of cultivation, and of the yield of the crop, and furnish it to this department at the completion of the demonstration. The products of the field belong to the owner.

GO - OPERATORS

In addition to securing these Special Demonstration Farms it is desired to secure as many farmers in the immediate vicinity thereof, as will agree to co-operate with us. These co-operators are to plant any area they may prefer; but it is not best for them to plant more than they can till well in any crop for co-operative work. They are to make reports to this department of the growth, cultivation and yield of such at the close of the season, when requested to do so, and are also to agree to follow the instructions of this department or its special agent, in the cultivation and preparation of the agreed area. The department cannot furnish these co-operators with seed, or be to any expense on their account, but will furnish all information and plans for the crop. Each agent should so gauge the number of Special Demonstration Farms, that he will be able to visit them at least one day a month. He should notify all co-operators of that community in advance, just when he expects to be upon the Special Demonsrtation Farm, and request them to meet him at that point. Cards will be furnished for this purpose. Go to the field with the co-operators and demonstrators, and there instruct them just what to do and how to do it. By adopting this plan it will not be necessary to visit the co-operators except in rare instances. This will enable the agent to serve a larger territory at comparatively less expense, as it will largely eliminate the expensive item of team-hire. He will also be able to illustrate the improved methods more effectively, and we think such instructions will be better understood.

In order that we may have this plan inaugurated and running smoothly

in time for spring work it is well that each agent bestir himself towards securing special farms and co-operators in the fall. In doing so, ascertain just what acreage will be put in by the Special Farmer, and how much and what kind of seed will be required for the ensuing season, as nearly as possible, in order that we may purchase them in time. We should be very glad if you would give the varieties furnished your special attention, collecting all information possible in regard to them, and if the favorable reports are corroborated, it is probable we may use them another year.

It is advisable to exercise a certain amount of caution in the selection of Special Demonstrators. Whenever possible make inquiry about him before deciding. He should not only be a good farmer, but should be one who will and has the ability to carry out instructions, and it is advisable that he be a small farmer. He should be a man of good standing in his community. The accessability of the farms to persons visiting the town or depot is a very important consideration. In order that the best results may be obtained, it will be necessary for the agent to concentrate his attention on these farms. Locate enough of these demonstration farms in each locality so as to do away with the danger of some of them being unable to comply with their agreement; but do not have them so numerous that you will not be able to give them all the attention desired. That the work of this department is bearing good fruit is evidenced not only by the favorable reports constantly coming in, but also by the fact that we are daily receiving requests for its extension into new territory. It is believed that an adh rence to the plan outlined above will not only make our work more effective, but will enable us to extend that work, even with the means at our d'sposal. We know that we will receive from the agents the same enthusiastic support as formerly. In return we hope by better systematizing the work to be able to help them in every way possible. Remember that our work is in no way experimental. Its object is to teach the farmers the best and most improved methods as determined by the various experiment station and the U. S. Department of Agriculture. To this end it is well to impress upon all the advisability of not planting too large an area and confine operations to the more common and better known crops, to-wit:

Corn and cotton for money crops, cow peas as soil renovators and a winter cover crop, chiefly oats. If we can effect an improvement in these crops we shall have accomplished a great deal.

FARMERS' CO-OPERATIVE DEMONSTRATION WORK
PRELIMINARY STATEMENT

There has been some misapprehension among farmers in regard to the Farmers' Co-operative Demonstration Work. Many have supposed that the instructions all come from Washington, and were not adapted to Southern conditions. This is not correct. The instructions given out for this work are made upon the following plan: First a compilation of all the experiments relating to a given crop by the Experiment Stations in the cotton states is carefully made. Then the experience, in planting, of a large number of the best cotton farmers in the South, working along the same lines in cotton, is

carefully noted. In addition to this the observation and experience of all the Traveling Agents of this Department are brought to bear upon the instructions, to correct any defect. Thus our instructions have the following elements of perfection: First, what the Department at Washington knows from its vast stores of information about cotton; secondly, what the State Experiment Stations in the South have demonstrated to be the most advantageous; thirdly, what the best farmers in the South have tested and proven the most successful upon the farm; fourth, the knowledge obtained by the Traveling Agents of our Demonstration Work, who especially visit and have personal knowledge of the States in which they are stationed. Even then our instructions are along the lines of correct principles, leaving many details to the good judgment of the farmer.

In this Co-operative Work great stress is laid upon a more thorough preparation of the soil in the fall, because in our Southern climate, the frosts do not penetrate the soils sufficiently to open them and admit air; we must, therefore, do by plowing in the fall and by some winter cultivation, what nature does in the colder North. In the richest soils there is but little food ready prepared for the plant, and nature's plan is that this food shall be prepared more or less daily by the action of the air, the moisture in the soils and by the sun. These three active forces make ready the food so the plant can be properly nourished. This cannot be done without plowing and cultivating to admit the air, and the earlier this work is commenced in the fall the greater the effect it will have upon the crop of the following season.

The effect of using good seed is not sufficiently appreciated, nor perhaps is it understood just what makes good seed. It must be the best variety, carefully selected, early in the fall, and stored in a dry place. In passing through the States we find very little of the corn fit for seed, because the rain has water-soaked the cob and injured the germs. In many cases it has even caused decay in a portion of the kernel. This could have been prevented had the seed corn been gather in August or September. Our reasons for very frequent cultivation has been explained above, to-wit, the admission of air, the conservation of moisture in the soil and the prevention of surface crust. The farmer may say that this frequent cultivation is so much work for nothing, but he will find, in case of cotton, in the fall, that his plants have fruited closer to the ground and have put on a good many more early bolls than they would have done had he pursued the ordinary methods; and corn will set more ears.

Young plants require an excellent cultivation, just as young animals require the best food and care.

The judicious use of Commercial Fertilizer is one of the most important improvements in modern agriculture, for it furnishes plant food directly and indirectly to the young plants. A small amount, say 200 or 300 pounds per acre, frequently insures an increase of crop from 50 per cent to 100 per cent. In purchasing Commercial Fertilizer, bear in mind that they should be bought judiciously with reference to the requirements of the soil. If the plant grows sufficiently tall and with an abundance of limbs, in case of cotton, or in case of corn, there is a thick, strong stalk, then the main requirements are phos-

phoric acid to insure more bolls of cotton or ears of corn as the case may be. In general it is well to use a little nitrogen. It is either purchased in the complete Commercial Fertilizer or may be added by the use of cotton-seed meal. The use of some potash is advisable, because it improves the fiber in cotton and prevents, to some extent, the shedding of bolls. In purchasing fertilizer it is well to have what is known as a high-grade fertilizer; that is, a high per cent of available phosphoric acid. Available means that it can be dissolved in water, so as to be readily used by the plant for food. No farmer need wait for some chemist to analyze his soil, and tell him what to do. The cotton and corn tell the whole story, and explain to the farmer even more than the chemist can tell. If the plants are vigorous, then a fertilizer with considerable phosphoric acid and very little nitrogen should be used. If the plants lack in size or vigor, then more nitrogen should be used in the fertilizer. Bear in mind that Commercial Fertilizers are mainly a stimulant, and do not in any large measure build up the soil. For soil-building we must largely depend upon barn-yard manure and leguminous plants, such as cow-peas. They put nitrogen in the soil and when plowed under add humus. An intelligent following of the foregoing suggestions will double the cotton and corn crops of the United States.

INSTRUCTIONS TO COTTON FARMERS

Fall Preparation of the Cotton Field Under Boll Weevil Conditions.

As early as possible in the fall, after the cotton crop has been gathered, destroy all the immature bolls. Cattle may be turned in or the bolls may be gathered and burnt; the stalks can then be cut and plowed under. In sections where there is a light rainfall, it is probably better to burn stalks as well as bolls. In the cotton producing States east of the Brazos river, Texas, there is generally enough rainfall in the winter for the complete saturation of the soil, and, if the stalks are cut and plowed under thoroughly in the fall, few weevils will survive for spring depredations. Burn all grass and rubbish on the borders of the field before breaking.

For the best results the field should be plowed in the early fall or winter, not later than the first tothetenth of January, and earlier if possible.

If the farmers must use an ordinary plaw,, then the fall plowing (breaking) should be one to two inches deeper than usual and set the furrows on edge. If a disc plow can be secured, use it, and plow as deep as possible—the deeper the better. In case a disc plow cannot be obtained, use a sub-soil plow after breaking. Following the breaking plow with a narrower plow in the same furrow is better than not to secure depth in plowing, but this is not equal to the use of the disc plow or the sub-soil plow. It is not advisable to throw a large body of cold sub-soil to the surface at one time. Afterward, during the fall and winter the field should be disked or plowed 3½ to 4 inches deep, every three weeks, being governed by soil conditions. It is not well to stir land when it is too wet.

If no fall or winter plowing has been done, plow without delay about one inch deeper than usual and run narrow furrows to set well on edge.

Disc or plow again before planting. Tillage is manure; the soil gets

air by stirring, and plant food becomes available, which would otherwise not be used by the growing crop. Most plants first throw out their feedling roots in the warm surface soil if finely pulverized, and it is best therefore to use a tooth or disc harrow, shallower than plowing, immediately before planting.

Plant as early as is safe from frost. The actual date of planting depends on locality,; the important point is to plant as early as possible, weather and soil permitting.

Rich soil will need more space between the rows; thinner soil less.

The general rule for spacing rows, is that the distance between the rows shall be a little more than the cotton in average years. Where cotton generally grows two or three feet high, the rows should be from 3 1-2 to 4 feet apart. Where cotton normally grows about three and one-half feeet high, plant in rows four feet apart; where it grows four or fixe feet high, put the rows five feet apart. It is better to have the spaces between the rows a little too wide than too narrow. Air and sunllight are of the greatest importance in pushing the crop to maturity.

On very fertile and strong lands cotton should have good distance between the rows, but may be slightly crowded in the rows with good results.

Plant early maturing varieties of cotton. Some large boll varieties are even better than the small boll, under weevil conditions, because of a thicker calyx, and consequently the half-grown bolls are less likely to be punctured by the weevil.

If fertilizers are used the following general rules should govern: On rich lands use mainly fertilizers that will stimulate the fruit and not the stalk growth. On lighter lands use more of 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 per cent. of nitrogen added to the acid phosphate gives better results. Mix three-fourths acid phosphate and one-fourth cotton seed meal. This we call "No. 1."

A mixture of 100 pounds of cotton seed meal to 200 pounds of high grade acid phosphate will greatly increase the growing condition and will be better for medium soils. This we call "No. 2." 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. This is "No. 3."

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

Apply as follows:

1. On light sandy or light chocolate land in fair condition apply 200 to 300 pounds of No. 2 per acre, or same quantity of standard fertilizer. On

thin or impoverished soils apply the same quantity of No. 3.

2. On rich sandy dark chocolate or black land apply 200 to 300 pounds of No. 1 per acre.

3. On black waxey land apply three barrels of lime per acre.

4. On alluvial land apply 200 pounds of No. 1 per acre.

On black waxey land the best condition is to have the cotton follow a crop of cow-peas.

Where lands are greatly worn by years of cropping more fertilizer should be used per 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 above instructions, the farmer must use considerable judgment and modify where necessary to fit local conditions.

HOW TO APPLY THE FERTILIZERS AFTER THE SOIL HAS BEEN THOROUGHLY PULVERIZED

Mark out the rows, or bed up, spacing as before stated, and distribute the fertilizer in rows. Distribute with a drill or in any way to secure even distribution in row. Follow after with a shallow bull-tongue or scooter to thoroughly mix the fertilizer with 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 lands, except very rich black waxey and river bottom, it will pay to use not less than 200 to 300 pounds per acre. Where lime is used scatter it broadcast, when the land is plowed, using about three barrels per acre, or apply in the row,, mixing thoroughly with the soil, about two barrels per acre, a short time before planting.

Use the tooth harrow thoroughly before and after planting.

Begin cultivation as soon as cotton is up. A smoothing harrow will do splendid work to loosen the surfance soil at this time.

Let the first cultivation after the harrow be deep, the later cultivations shallow.

Cultivating every seven or ten days, weather and soil conditions permitting, will be best. A narrow winged sweep answers the best purpose for the shallow cultivations, allowing the dirt to fall loosely over it, making a good mulch. It should be run about one and one-half inches deep.

UNDER BOLL WEEVIL CONDITIONS

First. It is usually best to chop cotton at first about eight inches and afterwards thin to sixteen inches in the row. It is safer to thin twice than it is to chop to sixteen inches at the start. Distance of plants in the rows must be, however, determined by the usual growth of plants on such soil.

Second. On rich, strong, moist lands, like alluvial bottoms, it is generally advisable to run a plow close to the plants on each side of the row (bar off) while the plants are not over eight to ten inches tall.

If the plants grow tall and slender, later, cut the tops at about two and one-half feet high, thus forcing the growth out lower down the stalk.

3. When squares begin to drop from the plant it may be due either to the weevil or other insects, or possibly to weather conditions. In any case it is well to collect and burn all the squares that drop, for at least the first month after bloom commences, and it will be wise to continue this for a longer period. A good many weevils will thus be destroyed. Fertilizing assists in holding the squares under ordinary conditions.

ITEMS TO BE OBSERVED AS SOON AS THE COTTON PLANTS COMMENCE TO FORM SQUARES

1 Look for the boll weevil and other injurious insects.

2. All cultivation from this time must be shallow. Deep cultivation will cause more or less injury.

3. Continue the cultivation as late as possible, being governed by the size of the plant. Cultivate later in dry seasons than in wet.

4. If the boll weevil appears, attach a smooth pole or brush to the cultivator or the whiffletree in such a way as to strike the cotton plants and knock off the punctured squares. This, with the picking up of the squares, is of great service.

Where boll weevils are abundant on early cotton use the tooth harrow, while the plants are small, driving diagonally across the rows and later use brush attached to cultivator. Frequently three rows are brushed at once. Do this once in three days if necessary. Both the harrow and brushing force the weevils to fall upon the hot soil which soon kills them.

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S. A. KNAPP,

Special Agent in Charge Farmers' Co-operative Demonstration Work, United States Department of Agriculture.

Till January 1, 1908, address Lake Charles, La.; after that date, Washington, D. C.

Y. B. Separate 501.

THE FARMERS' COOPERATIVE DEMONSTRATION WORK.

By

S. A. KNAPP,

Special Agent in Charge of Farmers' Cooperative Demonstration Work, Bureau of Plant Industry.

[From Yearbook of Department of Agriculture for 1909.]

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PURPOSE OF THE WORK.

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 to secure such active participation in the demonstrations as to prove that the farmers can make a much larger average annual crop and secure a greater return for their toil.

This work shows also that there is no necessity for the general deterioration of farms and the too common poverty of the rural masses.

Briefly stated, the salient features of the rural lessons given by the farm demonstration work are as follows:

(1) Better drainage of the soil.

(2) A deeper and more thoroughly pulverized seed bed; deep fall breaking (plowing) with implements that will not bring the subsoil to the surface.

(3) The use of seed of the best variety, intelligently selected and carefully stored.

(4) In cultivated crops, giving the rows and the plants in the rows a space suited to the plant, the soil, and the climate.

(5) Intensive tillage during the growing period of the crops.

(6) The importance of a high content of humus in the soil; the use of legumes, barnyard manure, farm refuse, and commercial fertilizers.

(7) The value of crop rotation and a winter cover crop on southern farms.

(8) The accomplishing of more work in a day by each laborer by using more horsepower and better implements.

(9) The importance of increasing the farm stock to the extent of utilizing all the waste products and idle lands of the farm.

(10) The production of all food required for the men and animals on the farm.

(11) The keeping of an account with each farm product, in order to know from which the gain or loss arises.

PLAN OF ORGANIZATION.

The Farmers' Cooperative Demonstration Work is conducted by a special agent in charge, who reports directly to the Chief of the Bureau of Plant Industry. There are five general assistants and a full office force; also a corps of field agents is employed, classified according to territory in charge, as state, district, and county agents. These agents are selected with special reference to a thorough knowledge of improved agriculture and practical experience in farming in the sections to which appointed. The county agents are appointed mainly on the advice of local committees of prominent business men and farmers conversant with the territory to be worked. Each agent has in charge the practical work in one or more counties, strictly under such general directions as may be issued from the central office at Washington, D. C. District agents are expected to have not only a knowledge of scientific agriculture, but to be practical farmers and to have had considerable experience in the demonstration work. State agents are strong and capable men, who have shown their ability to carry out successfully the instructions of the central office over a large territory, and they are especially qualified for the work by the possession of the tact necessary to influence men.

The term "demonstration farm" is used to designate a portion of land on a farm that is worked strictly according to our instructions. This is visited by an agent as often as once a month, if possible, to see that these instructions are carried out and to give any further advice necessary.

A "cooperator" is a farmer who agrees to work a part or all of his crop according to our instructions.

The Farmers' Cooperative Demonstration Work now covers portions of 12 States, employs 375 traveling agents, has many thousand demonstration farms, and potentially influences, through boys' corn clubs, field schools, and cooperators, a much larger number than are classed as demonstrators. At present it has close cooperation with six agricultural colleges and a large number of rural schools, assisting the latter to make field demonstrations. It also cooperates with state and county superintendents of public instruction in demonstrations for boys' corn clubs.

This work is supported by Congressional appropriation, by liberal contributions from the General Education Board, by county aid, and by donations from boards of trade and private individuals.

A REAL RURAL SCHOOL FOR THE MAN WITH THE PLOW.

The demonstration work may be regarded as a system of adult education given to the farmer upon his farm by means of object lessons in the soil, prepared under his observation and generally by his own hand.

The teaching by object lessons is more effective where it is simple, direct, and limited to a few common field crops, such as cotton, corn, cowpeas, and oats in the South, so that the comparisons may be evident and accepted at a glance. If general success can be secured with these standard crops, further diversification follows as a natural result.

The instruction given for the first year mainly refers to the method of making a larger and more profitable crop at a reduced cost of production, and consists of four lessons, called "the primary lessons:" (1) The best seed bed and how to make it; (2) the best seed of its variety and how to obtain it; (3) frequent and mainly shallow cultivation of the crop—how and why; (4) the use of better teams and tools to secure more economic production.

The principal defects in the seed bed for farm crops in the South are shallow breaking (plowing), failure to fully pulverize the soil before planting, insufficient humus in the soil, and defective drainage. Such a seed bed can never produce maximum crops. It carries insufficient moisture for periods of drought and has an excess under heavy precipitation. During most of the period of growth the plants are insufficiently nourished, either from inability to obtain sufficient food through lack of moisture or a too diluted nourishment through excess of moisture. The result is a small crop.

The simple remedy is deeper breaking in the fall, thorough use of disk and harrow, plowing under of green crops at frequent periods, and an improvement of the drainage by ditches or tiles.

One cause of the general shallow breaking in the Southern States is the single mule used on many farms (see Pl. I, fig. 1) and the light mules where they are used double. The introduction of the disk plow, as shown in Plate I, figure 2, enables one man to do nine times the work in a day of the one man shown in Plate I, figure 1, and do it easier. The one man with one mule is expected to break an acre a day 3 inches deep; one man with a disk plow and four large mules will average 3 acres a day 9 inches deep on rather stiff soil and do a better job.

SEED.

Prior to the commencement of the demonstration work the average farmer in the South gave little attention to seed selection. Corn was culled in the spring from the crib and cotton from the gin-run pile and planted without testing. The result was a poor stand—a condition that can rarely be remedied.

The demonstration work requires seed of a known type, carefully selected, graded, and stored for the first year's planting, and for each succeeding year the planting of a small field remote from any grain crop of the same type; this seed patch to be specially prepared, fertilized, and planted with the seed selected in the field the previous fall when the grain was ripe and afterwards stored in a dry place.

CULTIVATION.

Great use is made of the section harrow before and after planting and when the plants are quite small. Cultivation of cotton or corn in rows is at first deep, but shallow and frequent after the plants are 10 inches tall. This conserves the moisture.

In the practical application of these instructions it has been found that the best seed bed added 100 per cent to the average crop on similar lands with an average preparation; planting the best seed made a gain of 50 per cent, and shallow, frequent cultivation was equal to another 50 per cent, making a total gain of 200 per cent, or a crop three times the average. With better teams and implements this greater crop is made at less cost an acre. The profit increases faster than the yield. If the net profits on a crop of corn yielding 20 bushels an acre, valued at 75 cents a bushel, be $3, on a crop of 60 bushels the net profit would be $33 an acre; that is, the profit is tenfold where the gain in yield is threefold.

It generally requires from two to three years to thoroughly impress the farmer that this lesson of making a greater yield per acre is a practical method of farming applicable to his entire farm. The first year he rarely carries out the entire plan. He has not quite faith enough, or possibly the season is adverse, but he generally succeeds so much better than he expected that the second year's trial is more thorough, with a correspondingly increased gain.

The farmer is a natural doubter. When he has harvested the larger crop the second year, he is frequently inclined to attribute it to one thing, generally the seed, because this is most in evidence, instead of distributing the credit between the better seed bed, the better seed, and the intensive cultivation. Frequently his neighbors, full of the one-idea merit, offer $5 a bushel for the seed, thinking that the seed alone will make the crop. The third year the demonstration farmer is generally more of a convert and enlarges his trial area, frequently including his entire farm. In the meantime his neighbors have been observing and have commenced to inquire and follow his example.

It requires from three to five years to have the increased yield show a considerable average gain in the local markets. This depends, however, somewhat upon the number of demonstrations established in a county. Where one can be placed in each neighborhood the progress is rapid, because the interest soon becomes intense. If only one or two demonstration farms are established in a county, the work does not create interest enough to arouse public sentiment and produce at once a strong opinion in its favor.

As soon as the primary lessons, as above explained, have been accepted and tested by a farmer, a secondary series is commenced, which includes—

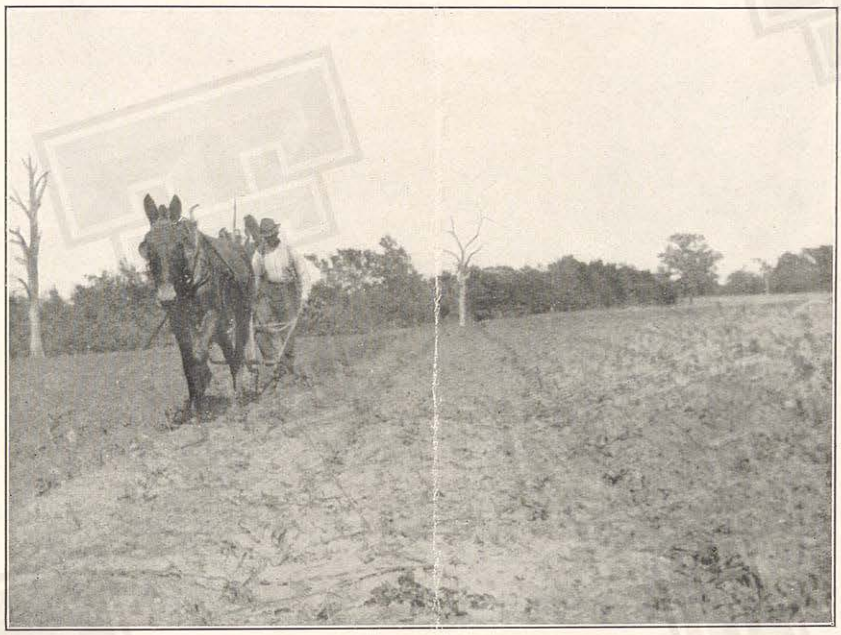


FIG. 1.—MAN WITH MULE PLOWING, SHOWING OLD METHOD USED FOR BREAKING LAND IN THE SOUTHERN STATES—ONE ACRE A DAY THREE INCHES DEEP.

FIG. 2.—MAN WITH A DISK PLOW AND FOUR MULES PLOWING, SHOWING A LATER METHOD OF BREAKING LAND—THREE ACRES A DAY TEN INCHES DEEP.

FIG. 1.—CORNFIELD ON A DEMONSTRATION FARM, SHOWING A SCHOOL FOR FARMERS ENGAGED IN SELECTING CORN.

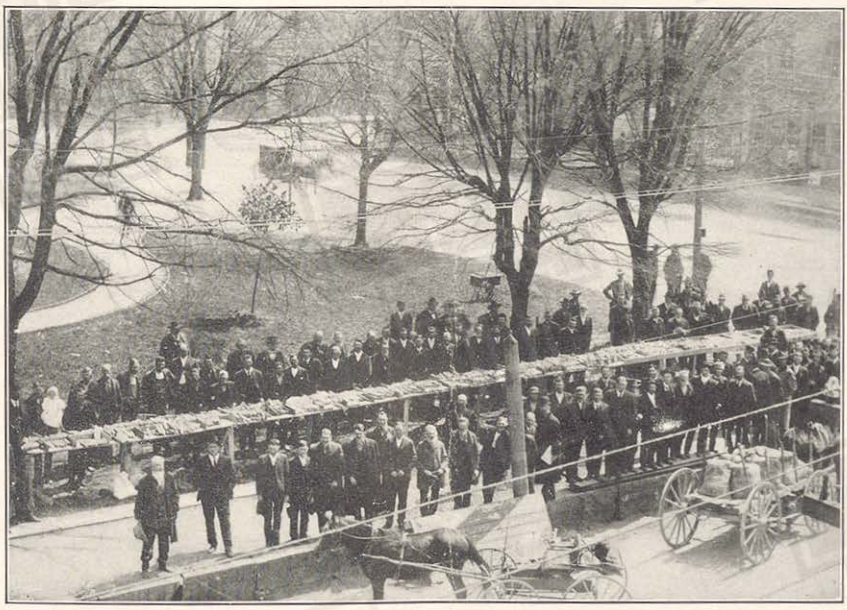
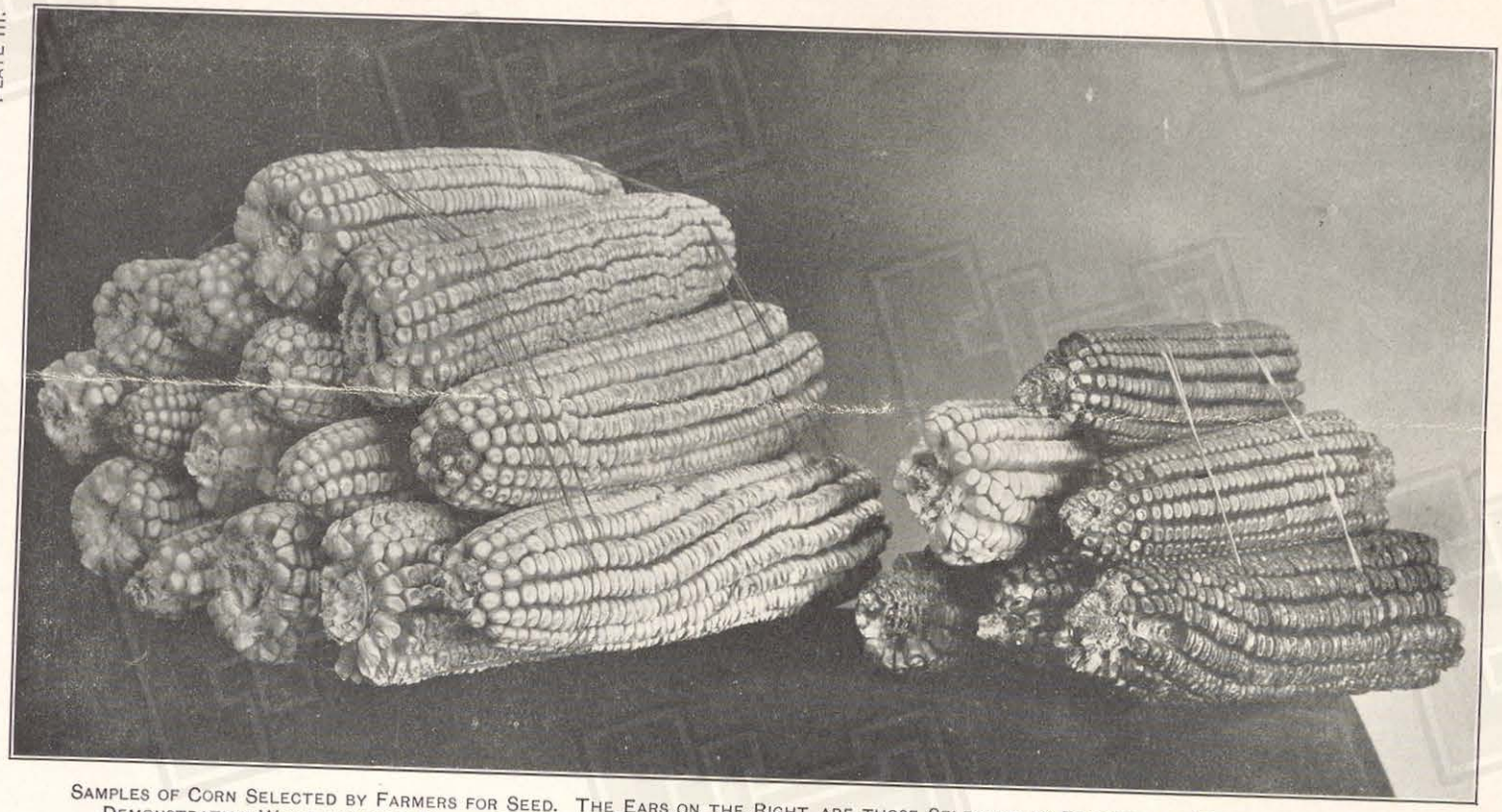


FIG. 2.—CORN DAY AT MONROE, N. C., SHOWING TWO HUNDRED FARMERS SELECTING AND TESTING CORN FOR PLANTING.

PLATE III.



Yearbook U. S. Dept. of Agriculture, 1909.

SAMPLES OF CORN SELECTED BY FARMERS FOR SEED. THE EARS ON THE RIGHT ARE THOSE SELECTED BY FARMERS IN A TERRITORY IN WHICH NO DEMONSTRATION WORK HAS BEEN DONE. THOSE ON THE LEFT WERE SELECTED BY FARMERS IN A TERRITORY WHERE DEMONSTRATION WORK HAS BEEN CONDUCTED ONE YEAR.

FIG. 1.—MEMBERS OF A BOYS' CORN CLUB AT TYLER, TEX. A REAL SCHOOL OF AGRICULTURE.

FIG. 2.—HOW TO MAKE A FARMER. THE BOY WHO GREW THE CORN SHOWN IS STANDING IN HIS DEMONSTRATION PATCH.

(1) Demonstrations in conserving and enriching the soil by the use of legumes and winter cover crops. These involve simple crop rotation and the turning under of green crops; also the prevention of soil waste by erosion.

(2) The value and uses of barnyard manures and commercial fertilizers, and how to apply them.

(3) Simple methods of farm drainage.

The third series of lessons relates to better pastures and meadows and how to secure them; the most economic grain crops for work animals or to produce flesh as a supplement to the pasture and meadow grasses. This line of instruction is necessary, because the economic production of farm crops depends in a great measure upon an economic support of the work teams.

The general method among the small farmers of the South was to depend mainly upon corn fodder and corn. Some had pastures, but rarely a good pasture. This method is expensive and causes a reduction in the number of animals kept for work to the smallest number possible and a corresponding substitution of hand labor. Modern methods of farming require considerable increase in the number and strength of teams. Profitable farming has become a team and implement problem. The improved pasture and cover-cured hay furnish foods of great economy and are sufficiently nutritious for the ordinary support of work stock. For heavy work a small addition of grain to the ration is required.

If it be necessary in the interests of economy to produce upon the farm the food for the work animals it is still more important to produce, as far as possible, the food required by all the laborers and their families. The family garden, the poultry, and the cow are great cash economizers and pocketbook conservers and may be classed with the better teams and tools as essential to better farm equipment.

FIELD SCHOOLS.

A very valuable method of instruction introduced by the demonstration work is the field school. Previous to the time the local agent of the work expects to visit a demonstrator he notifies all the cooperators in the vicinity to meet him there on a certain date at a given hour. Thus, a number of good farmers discuss the methods and, by comparison, place a value upon the work done. The same method is employed in the selection of seed corn. (See Pl. II, fig. 1.)

Plate II, figure 2, represents a meeting of farmers called to compare with each other the seed corn they expected to plant. Such is the isolated situation of the average farmer that he may continue for years to believe he has the best seed of the several crops he produces unless he is brought into direct public comparison and competition with other

farmers—not in a fair or exhibition where prizes are to be awarded and only the best specimens are brought, but in a mere exhibit of what the farmers expect to plant without any assorting. The farmers in the First Congressional District in North Carolina were invited to assemble in March, 1909, at central points and each bring about 50 ears of the seed corn they expected to plant. These ears were arranged on a long table in the public square, the owner's name being conspicuously attached to each pile. (See samples, Pl. III.) Expert judges were present to select and test. Some corn was brought that tested less than 45 per cent of fertile grains. At the close of the meeting over 90 per cent of the corn samples went for stock feed and was replaced by purchasing a better variety or quality.

BOYS' CORN CLUBS.

One of the greatest problems before the American people has been how to interest in rural life and attach to the farm the young man who has acquired a liberal education and displayed a capacity for leadership. The loss of rural leaders by emigration to the city has been one of the most serious retrogressive factors in our whole civilization. The Farmers' Cooperative Demonstration Work has solved the problem. These young men left the farm because they were repelled by the hardships, excessive toil, and meager gains on the farm and were allured by a seemingly greater opportunity to acquire wealth, influence, and position in the city. The demonstration work undertakes to create in the schoolboy a love of the farm and a new hope by showing the wonderful possibilities of the soil when properly managed and the ease with which wealth and distinction are achieved in rural life when science and art join hands. This is worked out by the cooperation of the demonstration workers, the county superintendent of public instruction, and the rural teachers.

The superintendent and teachers organize the schoolboys over 10 years of age into clubs (see Pl. IV, fig. 1); the demonstration work furnishes the plan of organization and the instructions (which the boys agree to observe); the respective parents furnish land, teams, and implements; the merchants and bankers provide the prizes, and the local papers give the publicity. Each boy must personally work 1 acre under the same regulations governing all other contestants. The result of 300 to 400 boys entering such a contest in a county arouses intense interest. The boy learns the best way to raise corn or cotton and his appreciation of the farm is greatly enhanced. (See Pl. IV, fig. 2.)

In 1909 the boys in the corn contest of one county in Mississippi averaged a production of 74 bushels of corn per acre, while the farmers averaged less than 20. In South Carolina one boy raised

152½ bushels on a measured acre, while the state average was less than 16.

INCIDENTAL TEACHING.

In addition to the demonstrations made to teach the best methods of securing the largest yields of field crops with the greatest economy, incidentally there is much instruction along the lines of rural improvement, the better home, its equipment and environment, the country roads, the school at the crossroads, rural society, etc. The average farmer takes it for granted that an agent of the Department of Agriculture is an authority upon all lines of husbandry, and innumerable inquiries are made of him about the dairy, the breeding and management of farm stock, horticulture, market gardening, insect pests, etc. All this incidental teaching is done without demonstration by referring the inquirers to the several bureaus in the United States Department of Agriculture, or request is made that bulletins covering the subject of inquiry be forwarded to them by mail.

In still another way the Farmers' Cooperative Demonstration Work is helpful. The many scientific divisions of the Bureau of Plant Industry are annually making discoveries of great value, and the problem has been how to get these to the farmers in a way so effective that they will adopt them. A bulletin does not do this with the average farmer. The agents of the Farmers' Cooperative Demonstration Work can place these improvements or discoveries in the hands of men who will utilize them to advantage because these agents are in touch with all the people. Thus the demonstration work is a means of disseminating information for all the bureaus of the Department that are close to rural life.

DEMONSTRATION WORK HELPFUL IN OTHER WAYS.

In the Southern States, where there are some white and many negro farmers who can not read, there is liable to sweep over a section a wave of depression amounting to a doubt about making a crop, which may cause a perceptible reduction in the acreage planted if the depression is felt prior to planting, or if later it may reduce the tillage of the crop or may result in its total abandonment. Nor is this wave of pessimism confined to the unlettered. Where crops are made on the advance system it may take such a hold of the merchant and the banker that they refuse to make the necessary advances, which forces the laborer and the tenant farmer to remove to territory where the advances can be obtained. In Harrison County, Tex., in 1907, about 500 tenants and laborers were preparing to abandon the farms after the cotton crop was up, through fear that they could not succeed in

making it. The same cause enormously reduced the cotton acreage in Louisiana and Mississippi in 1909. The agents of the Farmers' Cooperative Demonstration Work have been exceedingly influential in restoring and maintaining confidence among all classes.

TWO VIEWPOINTS.

The Farmers' Cooperative Demonstration Work may be regarded as a method of increasing farm crops and as logically the first step toward a true uplift, or it may be considered a system of rural education for boys and adults by which a readjustment of country life can be effected and placed upon a higher plane of profit, comfort, culture, influence, and power.

Because the first feature of this demonstration work is to show the farmer how he may more than double his crop at a reduced cost of production, it has been regarded by some solely as a method of increasing farm crops by applying scientific principles to the problem. This would be of great value to the world and would stand as a sufficient justification for the efforts put forth and the expenditures involved, but such a conception would fail to convey the broader purpose of this work.

There is much knowledge applicable and helpful to husbandry that is annually worked out and made available by the scientists in the United States Department of Agriculture and in the state experiment stations and by individual farmers upon their farms, which is sufficient to readjust agriculture and place it upon a basis of greater profit, to reconstruct the rural home, and to give to country life an attraction, a dignity, and a potential influence it has never received. This body of knowledge can not be conveyed and delivered by a written message to the people in such a way that they will accept and adopt it. This can only be done by personal appeal and ocular demonstrations. This is the mission of the Farmers' Cooperative Demonstration Work, and it has justified its claims by the results.

It is noteworthy that the sciences adopted the demonstration method of instruction long since. The chemist and the physicist require their students to work out their problems in the laboratory, the doctor and surgeon must practice in the hospital, and the mechanical engineer must show efficiency in the shop to complete his education. The Farmers' Cooperative Demonstration Work seeks to apply the same scientific methods to farmers by requiring them to work out their problems in the soil and obtain the answer in the crib. The soil is the farmers' laboratory.

The demonstration method of reaching and influencing the men on the farms is destined ultimately to be adopted by most civilized nations as a part of a great system of rural education.

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