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ADDRESS DELIVERED BEFORE THE ANTI-BOLL WEEVIL
CONFERENCE FOR THE SOUTHEASTERN STATES, AT
ATLANTA, GEORGIA, NOVEMBER 22D, 1910.

BY DR. SEAMAN A. KNAPP,
BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE.

THE PRODUCTION OF COTTON UNDER BOLL WEEVIL
CONDITIONS.

It is a great pleasure to meet such a representative body of men as this, all interested in agriculture.

The South is making marvelous strides in industrial development and especially in agriculture. She has taken hold of the problem of increasing her production of staple crops and is becoming independent in the matter of food supplies. This is emphasized by the increase of about one hundred and fifty-eight million (158,000,000) bushels of corn in 1910 over the product of 1909 in nine of the Southern States. The South will soon produce her supply of meats, butter and poultry; her fruits and canned goods; her horses, mules and farm supplies, and become industrially independent. A single spot is crossing the sky, otherwise clear and promising; to wit, the Mexican cotton boll weevil. We have met to discuss the portent of this threatened danger. Let us do so with a cold and daring logic which goes to the bottom of causes and discusses dangers regardless of consequences. We will state the case:

First, it is evident that the cotton boll weevil has come to stay.

Second, that it will soon spread practically over the entire cotton-producing portions of the United States.

Third, that at present there is no known method of completely destroying it and consequently it will be a factor in all future cotton production in this country.

Fortunately there are some factors in this apparently hopeless problem which point to results which promise relief. The United States Bureau of Entomology, in its splendid outline of the life history of this pest, has brought out among other things the following facts:

1. That the cotton boll weevil feeds upon nothing but cotton.
2. That it goes into winter quarters mainly in or near the field of its depredations.
3. That a comparatively small per cent of the total weevils survive the winter and emerge in the spring.

4. That the over-wintered weevil feeds upon the terminal buds of the young cotton plants until the forms or squares develop, then the female deposits her eggs in the squares exclusively at first but later may deposit them in the immature bolls.

5. That the life of the adult weevil, when supplied with food, is about seventy days. If deprived of food it lives only six or seven days except in hibernation.

6. For a period after emergence from winter quarters it is comparatively sluggish and while feeding upon the cotton plants it may be picked or poisoned.

7. The weevils remain mainly in the field where they locate in the early spring until they become very numerous. Their principal period of migration is in the fall.

Based upon these life habits of the weevil, the Bureau of Plant Industry has planned its fight for the production of cotton, which may be summarized as follows:

1. Under boll weevil infestation the fields selected for cultivation should be well drained, because a successful crop will then depend upon the possibility of cultivating them at the proper time. The low, poorly drained lands should be devoted to other crops. They have always been an uncertain factor in cotton production. It is not the intention to state that well-drained alluvial lands should not be planted to cotton.

2. The early destruction of the cotton stalks before frost and the burning of all rubbish in and about the infested field are imperative.

3. Break the field deep as early in the fall as possible with an implement that does not bring too much of the subsoil to the surface, and occasionally run a harrow over it in the winter if practicable. Before planting, thoroughly pulverize the soil and make the best seed bed possible.

4. Care must be taken to secure seed of an early maturing variety and of the highest vitality—not necessarily a small-boll variety, for on uplands we have been more successful with some large-boll varieties.

5. Plant as early as the season will permit, in rows somewhat wider apart than under non-boll-weevil conditions; but it is better to delay planting till all danger of frost is past and the soil is warm enough to produce rapid germination and plant growth.

6. The use of the section harrow before planting and after planting, and again just as soon as the plants are well up, is advised.

7. Use intensive, shallow cultivation of the crop and never lay by the cotton till picking commences. Late cultivation is very important.

8. In case it is evident that a large number of weevils have been over-wintered, it is advisable to hand-pick or poison the early appearing weevils.

9. As soon as the weevil commences to work, as evidenced by the punctured squares, attach a pole or brush to the handles of the

cultivator so as to knock the squares off. Most of them will fall of their own accord in a few days after they are punctured.

10. Persistently pick up and burn these fallen squares.

This battle against the weevil is in two divisions:

The first division of the work consists in reducing the number of weevils just as much as possible so that a crop can be made. The second division is to push the cotton plant to maturity as fast as possible and, by extra cultivation and fertilization, cause it to put on more forms or squares than it can mature so that what the weevil takes is only a surplus—of no consideration in making the crop.

The burning of the stalks is enormously destructive to the weevils in the field, but its value depends considerably on the way it is done. It must be done early and before frost. Demonstrations have been made showing that it caused the destruction of as much as ninety-seven per cent if done early and properly, but if delayed it might allow as much as forty-five per cent to escape.

There are several methods of destroying the stalks. First, every third row may be allowed to stand and the row on each side uprooted and thrown against it. Then when the uprooted rows are sufficiently dry, burn them, because the weevils will be concentrated on the rows standing. The second plan is to cut the stalks and pile them before burning and a portion of the adult weevils in such case will collect under the piles. Another plan is practiced where farmers have stock and can let in their cattle to eat up the immature bolls. All rubbish in and about the field should be burned, as stated, and the field immediately broken. If this single instruction could be carried out by every cotton producer it would practically solve the boll weevil problem. It is objected that it would be impossible to pick out the cotton thus early, say by the middle of October, or the twentieth. It would, under the old methods, but fortunately the world is now in possession of a perfect cotton picker, and it will be possible in future to carry out this system of early picking. The difficulty is that only a part follow the plan, and enough weevils are thus carried over to offset in a measure the efforts of the best cultivators.

If delay is made until after a heavy frost and a large portion of the weevils have escaped from the field, either to hibernate or to go elsewhere, then burning is of less value, and it will answer, in sections of considerable winter rainfall, to thoroughly cut the stalks and plow them under, except upon fields where they were unusually rank and can not be plowed under successfully.

The next most important work in eliminating the weevils is in the spring, when the cotton plants begin to put on squares and the infesting weevil punctures them. The cultivator should take note of this and immediately attach a pole to the handles of the cultivator so as to knock the bush and hasten the falling off of the square and then the squares must be carefully picked up and burned. It may answer to destroy them otherwise, but it is a dangerous doctrine to

preach. The burning is sure. In one sense this picking up of squares goes to the root of the matter more than early fall destruction of the stalk, because in the fall destruction only a small per cent of the weevils would live through the winter anyway, while we can rest assured that practically every square not picked up and destroyed, at least in cloudy weather, will result in furnishing a boll weevil to infest the crop. We have hundreds of instances where fields were located in the best situation for weevil depredation, on bottom lands surrounded by heavy timber, rank growth of cotton, no previous preparation, or burning of the stalks, or destruction of the rubbish, and yet by picking up the squares and intensive cultivation a large crop of cotton was made. If care is taken that every punctured square is destroyed a whole generation of weevils will be wiped out in two or three weeks. The old weevils will die and we can go right on making the crop. Of course in sections where there is a very slight rainfall, or in dry periods of wet sections, and the rows are wide enough apart to let the sun in, the sun will cook the weevil larvae in a very short time if the squares are sufficiently exposed to its direct rays.

We therefore wish to emphasize the two points: the early destruction of the stalks in the fall and the picking up and burning of the squares, as of primary importance in making a successful crop of cotton. The early destruction of stalks in the fall has a double advantage. It not only kills the vast number of weevils but it destroys all their supply of food so that such as are not killed by fire mostly perish for lack of food before winter.

On the plant side of the boll weevil fight the old theory that cotton would make some time during the season will not work under boll weevil conditions. The plant must grow off rapidly and produce cotton early. To this end deep fall breaking on uplands is an important step. Deep breaking in the fall provides more plant food and a more uniform supply of moisture in the soil. It also destroys many weevils and gives the soil time to become firm before cotton planting in the spring. It is a mistake to suppose that deep breaking is good at any season of the year. The object of plowing or breaking is to pulverize the soil and in the spring the subsoil is generally too wet to be pulverized, hence deep spring breaking is rather a disadvantage, especially for cotton.

The best seed bed requires well-drained land and a plenty of vegetable matter in the soil. Our attention has been called to many cases where the land was so poorly drained that it was impossible to get into the field to work the crop for ten to fifteen days or more at a time. This gave grass, the arch enemy of a large cotton crop, a great advantage. Besides, under weevil conditions it permitted the rapid increase of the pest. Working the soil two or three times before planting, with a section harrow, is of great advantage.

The next important point is the variety of cotton to be planted. It will not do to continue the too common policy of selecting gin-run seed or any variety only that it be cotton. It must be a

variety of cotton that throws out its fruit limbs close to the ground and has short joints, because the short joint can grow in less time than the long joint. A plant that produces good bolls clear to the end of the limbs and can make a full crop of cotton on the lower half of the plant is what is desired. If the best results are to be achieved it is not only unwise to take gin-run seed but even to depend upon seed selected in the general field. It is important that a special plot of land be set apart as a seed bed and from this every plant which does not meet the requirements should be destroyed, leaving only the best types from which to select seed. Care must be exercised in ginning the seed that it be not mixed with inferior varieties, and careful attention should be given to storing in a dry place and in such a way that it will not heat so as to weaken the germs.

The field should be planted, leaving a somewhat wider space between the rows than in non-infested fields. The object of this is simply to allow more sunshine on the soil so as to assist in destroying the larvae in the squares, as it is helpful to the weevil if the rows are so close that the limbs interlock, providing a shade which is ideal. Use intensive shallow cultivation.

The period of planting has a very important bearing. Very early planting is deprecated because the crop is liable to be injured by frost or retarded by cool weather. If the planting can be delayed a little later than usual until the ground is warm, and germination is rapid, and the plants take on vigorous growth, it is helpful. If universally the planting could be a little later, then many of the early-emerging boll weevils would die for lack of food. It is not meant by this that we advocate extremely late planting, but only a little later than the usual planting. If these directions are followed, more cotton will be made under boll weevil conditions than is now produced, and the boll weevil problem would be practically solved.

It is easy to account for the causes of disaster when the boll weevil first invades a territory. In the main they are as follows: The farmers neglect to inspect their fields and generally, as the invasion is in the fall, they do not observe the presence of the weevil until the second season. Then they use no preventative against its destructive effects and by the end of that season the weevil is fully established and ready to do great damage. In most cases it is difficult to induce farmers to take effective measures until they have lost one or two crops. In the first year or two of the infestation if the farmers promise to follow instructions they mainly follow them only in part, whereas it requires an observance of all of them in order to insure the crop. We have repeatedly noted that it is about the third year after we have commenced our demonstration work before the farmers accept all of our instructions and try to follow closely.

The second cause noted is the lack of confidence, first on the part of the farmer. If a man doesn't believe that he can accomplish a

thing it is about half way towards not doing it at all. He loses force and energy. The second result of the loss of confidence is that the bankers and merchants withhold credits and, since much of the cotton crop is made upon the credit system, the planter is crippled and prevented from planting as many acres as usual. The withholding of credits compels the farm laborers to seek employment elsewhere, so that there is an immense reduction in the amount of land devoted to cotton and in the labor to handle the crop. This loss of confidence greatly encourages diversification—the production of their food supplies and especially crops that may bring a cash income.

The actual damage done by the boll weevil is always vastly over-estimated, first because all reduction in the cotton crop is charged to the weevil. Other pests are ignored; the unfavorable season is not mentioned; and conditions that prior to the advent of the weevil frequently reduced the cotton crop fifty per cent in certain States are forgotten and the crop of one year simply compared with another, and all credited to the invasion of the weevil. In some cases this loss of confidence and the general alarm which arises are more disastrous than the pest itself.

In the spring of 1904 the Farmers' Cooperative Demonstration Work was inaugurated in the State of Texas. The boll weevil had passed over the prairies of southwest Texas and the people believed that while the pests could be managed in prairie districts that as soon as it entered the rolling sandy loam timbered belts of eastern-central and eastern Texas it would not be possible to make cotton. I recall that in the County of Limestone, on the Houston and Texas Central Railway, where conditions are as described, it was so fixed in the minds of the farmers that they could not make cotton that about one-half of the sandy loam farms were abandoned and a third of the stores in the villages closed. Prior to the advent of the weevil the County of Limestone produced normally from 50,000 to 54,000 bales of cotton. In 1903 this fell to 17,039 bales. We took vigorous measures to alleviate the condition in that section and in 1904 the crop was 41,902, and in 1906 Limestone County produced 72,320 bales of cotton. I recall distinctly the blood-stirring stories that they told at the commencement of our work in that section, with regard to the weevil. One farmer rose in a large meeting and stated that it was impossible to fight the weevil—it was proof against everything that had been tried. He had put them in ninety-five per cent pure alcohol and held them an hour and three-quarters and they were only staggering drunk; he had sealed them in a tin can, threw them onto a brush heap and set it on fire; the solder melted and the red-hot weevils flew out and set his barn on fire. These are simply samples of the stories told about the weevil. As a matter of fact the actual damage done by the weevil doesn't begin to compare with that caused by the deterioration of soils in the cotton States. We have carefully compiled the yield per acre for the State of Texas by decades, commencing in 1867. From that date to 1873

inclusive the yield of lint cotton in Texas was 234 pounds per acre. In the next decade it was 202.9 pounds; in the next decade, to wit,—1884 to 1893 inclusive,—it was 192.3 pounds. In the next decade, closing with the year 1903, it was 172.8 pounds. Thus, in the period named the reduction was nearly three pounds per acre annually less than in the first period and so it continued to decline from one to two pounds per acre annually until 1903. At this time the weevil had invaded about one-half of the cotton area of Texas. In 1904 the Farmers' Cooperative Demonstration Work commenced and we have statistics for six years, including 1909. The average production for those six years was 171.6 pounds per acre. Thus it is shown that the decline in cotton production in Texas for the past six years, when the weevil has been practically over the entire State most of the period, was only 1.2 pounds per acre, whereas according to the general deterioration in soils it should have been over 6 pounds even if the weevil had not been present; while in the decade preceding, when most of the years the weevil had infested only a portion of the cotton area, the decrease was 19.5 pounds for the period. That is, the effective work of demonstration by the Bureau of Plant Industry not only offset the influence of the weevil but very nearly counterbalanced the loss from deterioration of soils.

The exclusive production of cotton has not been favorable to the prosperity of the South. The advent of the weevil has forced diversification and especially the home production of food supplies. Again, prior to weevil invasion the price of cotton was so fluctuating that the farmers either made a large crop and received a small price for it, or made a small crop and rarely obtained its full value. The presence of the weevil has tended to steady the price of cotton and a vote of thanks should be tendered by this convention to the weevil for its effective work in this direction.

On the other hand it must not be considered that the invasion of the weevil is a trifling matter. It requires heroic work. It will not do to continue the practice of any little old slipshod method of making the crop. The farmer must first look to his drainage. Secondly, he must improve in the preparation of his soil and practice the rotation of crops, feeding the soil by the addition of humus. Third, he must look to the selection and preservation of seed with greater care. Fourth, he must become independent and self-supporting by the production of home supplies. Fifth, the system of advances must be relegated to a past era. Sixth, it will not do in future to simply allow a tenant to follow his own methods. There must be universal supervision, and every one must work in accordance with a plan. Finally, all men must be encouraged to use more energy and become more thrifty.

The problems we have discussed are not doubtful in the result. A crop can be profitably made except under conditions so extraordinary that there would be a crop failure even if there were no weevils. In sections of very heavy precipitation there may be

such extraordinary rainfall at the pivotal time in making a crop that it will not be possible to get into the field and work the crop, and hence there may be a failure. But it is rare that there is not some time during the season in which a crop can be made. Therefore, let every man go into his field, even with the worst infestation of the weevil, and commence his work courageously and hopefully.

The following letters from reliable planters and leading citizens in territory of heavy rainfall and fully infested with the boll weevil,—many of them from the alluvial sections,—are self-explanatory. They are fair samples of hundreds in our office.

S. A. KNAPP,
Special Agent in Charge,
Farmers' Cooperative Demonstration Work.

WASHINGTON, D. C.,
November 14, 1910.

[COPY]

THE COMMISSIONER OF AGRICULTURE,
AUSTIN, TEXAS.

ED R. KONE, Commissioner.
SAM H. DIXON, Chief Clerk.

October 9, 1910.

DR. S. A. KNAPP,
Room 434, Agricultural Building,
Washington, D. C.

MY DEAR SIR: I desire to express my endorsement of the splendid work you are doing in behalf of the agricultural development of our splendid State. Your Demonstration agents are rendering great service to the State and deserve the cooperation of every patriotic citizen.

I wish to state that this Department appreciates the magnificent services you are rendering the American farmer and the Southern farmer in particular, and that anything that I can do to aid in the general work in Texas I shall gladly do. Is there any suggestion that you can make that will enable this Department to more closely cooperate with you and your staff of agents in furthering the work you have inaugurated to improve agricultural conditions in this State?

I have had the cooperation of some of your demonstration agents in the Institute work I have been carrying on for the past eighteen months, and splendid results have been secured.

I have lent the influence of this Department to the organization of Boys' Corn Clubs, but realizing that this work was inaugurated under your guiding hand I have not attempted to supplant your efforts by any independent movement; and shall not do so.

I have had many years experience on Texas farms both in growing the staple crops of the State and the care of livestock, and indorse your cultural teachings in full. I know the principles advocated by you are sound.

Respectfully,
(Signed) ED R. KONE,
Commissioner.

[COPY]

FIRST BAPTIST CHURCH,
W. F. FRASIER, Pastor.

TIMPSON, TEXAS, October 18, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: I feel it my duty to express to you my appreciation of the valuable work of the Farmers' Cooperative Demonstration Work in my section of Texas.

Though not a farmer myself, no man feels a greater interest in it than I. A few years ago our section of the State suffered materially from the boll weevil. Your Demonstration Work has proven beyond question that cotton can be successfully grown despite the weevil.

Your local representative, Mr. G. W. Orms, in his persistent work among the farmers has stimulated every phase of the farm life, as evidenced by the great display of agricultural products at our fair this season. It was my pleasure to

handle and aid in arranging practically every product on exhibition and the praise accorded east Texas exhibits were profuse.

This work, I believe, is doing an untold amount of good to the country and we are to be congratulated on having such assistance as the Department is giving us.

I just feel as though I *must* write you is the reason I do so. It is seldom a town preacher takes stock in such developments as these, but I do and am willing to talk "farming" and assist this work in any way possible.

Very truly yours,
 (Signed) W. F. FRASIER, *Pastor*,
 First Baptist Church.

[COPY]

THE PEOPLE'S SAVINGS BANK
 NATCHEZ, MISSISSIPPI.

E. E. BROWN, Prest.
 W. H. PRITCHARTT, Vice Prest.
 C. H. BYRNES, Sec. and Treas.
 H. E. COFER, Ass't Sec. and Treas.

October 19, 1910.

MR. G. H. ALFORD, District Agent,
 Farmers' Cooperative Demonstration Work,
 West Jackson, Miss.

MY DEAR MR. ALFORD:

* * * * *

In this (Adams) County, we are just closing our second year of serious disaster from this little pest. We show a decided improvement in 1910 over the year 1909. Our acreage is about one-half of what it was last year and we will make about the same crop as last year. In my individual case, I made last year seventeen bales on one hundred and fifty acres; this year I will make the same crop on eighty acres. You are aware that I do not live on my farm and have only negro tenants. I have directed the management by not exceeding two visits to the farm each week during the working season and have followed the Government directions as well as I could, situated as I am. If I had lived on my farm far better results could have been obtained. I have now more corn than I will require for next year's crop and a good start of hogs and cattle. My farm has been more than self-sustaining this year and I believe I will have a splendid return next year as I have so little to buy.

My success is due to the aid of Government instructions. To illustate: One of my negro tenants, when I told him in the month of May that he must send his entire family into his cotton patch and pick every punctured square from the cotton stalks and burn them, and also kill all the weevil to be found, objected; said he did not believe in it. I replied that the instructions were not original with me, that they were from the United States Government after a fifteen years' study of the boll weevil, and if he thought he knew more about it than the Government I would try to place him in the employ of the Government and get one of their men to come and work his crop under his (the tenant's) direction. This remark had the desired effect; he got the weevil and will make three bales of cotton on eight acres, while he made only one and one-half bales on sixteen acres last year.

Being a member of our Board of Supervisors, I insisted that our President, manager of the convict farm, plant five acres in cotton and work it under Government instruction. He was opposed to planting any cotton. I insisted on it, stating that I was not after the money it would bring but wanted it as an experiment and aid to our farmers, knowing that the labor was there under absolute control, and that there would be no reason why it could not be properly farmed. The five acres were planted and properly worked—two heavy bales have been ginned and another light bale will be picked. Now, this was on thin upland, fertilized and worked as you would have directed. Splendid result, is it not?

You are aware that this year and last year gave us too much rain in our section to successfully combat the weevil, but we have doubled the yield under similar conditions for each year and this increase is certainly due to the good work done by the Government in our behalf.

Many more farmers will next year follow more closely your directions and if we can get a normal season as to rainfall the cotton crop will, in my opinion, show much more decidedly the value of the Government's work.

* * * * *

No doubt but this pest will spread until it covers the entire cotton belt of the South. I can see work for you all the way to the Atlantic sea-board—work in front

of you and work behind you. Have you ever thought what a barren waste there might have been in the wake of this little giant were it not for the valuable assistance rendered by our Government? As it is, we cover up his tracks almost as fast as as they are made.

* * * * *

Stand by us until we are able to stand alone. Then you and all connected with you in this good work will forever have the heartfelt thanks of all the farmers here.

Sincerely yours,

(Signed) C. R. BYRNES.

[COPY]

VICKSBURG, MISS., *August 8, 1910.*

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: I have just received a copy of your Circular No. 32 entitled "Cotton, the Greatest of Cash Crops" and write to ask if it is possible to mail me one hundred copies of same, to distribute to my tenants and others. I read it at the time you made the address at Greenville, but realize its importance more since I am in the fight against the weevil.

I have found by following your advice I have been able to keep the weevils almost entirely out of fields, while fields adjoining are almost destroyed. You are doing a great work but it is hard to make our negroes learn at once. Most of them have to learn by experience, which is expensive. The cotton in this section is generally a failure when it could have been saved by following your advice. I have considerable cotton that at present looks to make a full crop, where crops surrounding it are failures.

Hoping you will be able to let me have one hundred copies of your address, I am,

Respectfully,

(Signed) W. F. BRABSTON.

If you can't mail, express at my expense. Send to Vicksburg, Miss.

[COPY]

LIVINGSTON, TEXAS, *October 17, 1910.*

MR. W. F. PROCTER, State Agent,
Farmers' Cooperative Demonstration Work,
Tyler, Texas.

DEAR MR. PROCTER: I am sending you, under separate cover, photographs of cotton made in the field of Mr. K. W. Jackson, of Livingston, Texas. Mr. Jackson grew this cotton on his Trinity River Bottom farm, eight miles west of Livingston.

Now, as to conditions and yield will say: that I have never seen cotton grown under more adverse conditions in east Texas than this was. This farm is one of those low bottoms that is surrounded by a very heavy timber growth which makes an ideal place for weevils to hibernate. This land was not kept very clear of weeds, burrs and grass last season so there was quite a lot of litter that furnished them additional quarters. This cotton was planted about the 10th of April but the frost that fell the night of the 25th ruined the stand and Mr. Jackson replanted this field the last days of April. This second planting came up to a very good stand and grew off well until about the 8th of June, at about which date the weevils began to show up in goodly numbers and we had a very heavy rain which was followed up by rain and showers very nearly every day until the 10th of July. This gave the weevils full sway for a month with the very best weather for them to multiply and very adverse conditions for culture. It looked as though there were ten weevils for every form and the prospects for any crop at all were very poor. Yet Mr. Jackson continued the fight right ahead, plowing with his brush attached, when possible, using the hoe and catching weevils when it was impossible to plow, making unrelenting war on this pest at all times and continuing the fight right up to the day he began picking, and succeeded in producing a good crop. Off the eight acres in the block from which this photograph was taken he will average 1,600 pounds seed cotton per acre. This is ginning him about 36% lint or 576 pounds lint cotton per acre. And off his entire farm of more than 150 acres he will produce an average of about 1,000 pounds seed cotton per acre. Mr. Jackson

says that if he had cultivated all his farm as he did the eight acres he would have averaged more than one bale per acre.

As to yields on adjoining farms where they have not used intensive methods of culture, I find that they are producing about one bale to every four acres. Of course some are doing far better than this, but this will be a general rule. Some of the farmers who are not cooperating with us directly have gotten better seed and are unconsciously following out our instructions to a very great extent, and they are invariably getting better crops than the fellow who "sticks to the same old rut."

Mr. Procter, I could have found fields that have been worked under our instructions that have made better yields than this one has, but I think that it would be impossible to find one anywhere where the weevil infestation was greater and where the prospects were more gloomy in June and July than they were in this particular field.

Yours very truly,
(Signed) T. O. WALTON,
Local Agent.

[COPY]

GILBERT, LA., Oct. 21, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: I have rigidly adopted your methods of raising cotton under boll weevil conditions, with the result that I will get eighty-eight (88) five-hundred-pound bales on about ninety (90) acres of land. The making of cotton under weevil conditions with your methods is a certainty where the seasons are normal.

Yours very truly,
(Signed) L. M. CALHOUN, JR.

[COPY]

GILBERT, LA., Nov. 10, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR DR. KNAPP: I inclose you a picture of my demonstration cotton taken October 1, 1910. One picking had been taken off of this cotton before the picture was taken. We ginned 79 bales of 500 pounds each off of 80 acres. It seems that with your methods cotton can be made on the rich, fresh alluvial lands of the Delta country profitably, regardless of the boll weevil.

Yours truly,
(Signed) L. M. CALHOUN, *District Agent,*
Farmers' Cooperative Demonstration Work.

[COPY]

GRAND CANE, LA., 10 | 10, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: My place near Grand Cane is hill land of a sandy nature, red clay subsoil, about twenty-five years in cultivation. I break my land in the fall and winter, and generally re-break in the spring. Use generally 300 pounds of fertilizer,—cottonseed meal and acid phosphate,—per acre. I pick up the squares until late, cultivate shallow and often and late, and have never made less than half a bale per acre since the advent of the boll weevil.

I am planting rye and oats this fall for winter grazing and winter cover crop. I plant peas thick in my corn when I lay by the corn. I find the Bunch variety of clay pea to be the surest seeder on hill land.

I am cultivating 40 acres in cotton this year; have gathered 22 bales of cotton and am about done. Triumph cotton is my favorite.

Respectfully,
(Signed) G. W. TULL.

[COPY]

LOGANSPOUT, LA., 10 | 17, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: I have been farming according to suggestions of the local Demonstration Agent for three years—that is, preparing my land deep, early and thoroughly; planting best early-maturing seed; cultivating shallow, and all the time until late in the growing season. I have made each year not less than 1,000 lbs. seed cotton per acre. My land is sandy hill soil, about 20 years in cultivation. I use 200 lbs. commercial fertilizer per acre. Under the old method of farming it takes from 3 to 5 acres of such land as mine to make one bale of cotton.

(Signed) H. C. CLARK.

[COPY]

BROOKE & WOOLWORTH
ATTORNEYS AND COUNSELLORS AT LAW
ROOMS 1, 2, 3 M & F NAT'L BANK BLD'G
CARTHAGE, TEXAS.

October 24, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: While I am not a farmer, still, having lived in an agricultural country all my life I watch the doings and progress of that class of our citizens more than any other, and note with delight the steady improvement which has been made along agricultural lines since the advent of the boll weevil in this county.

I do not think that the work of your Department, in its demonstration work, which has been done through your Mr. Orms, can be too highly commended, and I think that much lasting good has been accomplished. The farmers as a class are in better shape financially at the present time, in my opinion, than for years.

This letter is written simply as a citizen who appreciates the efforts of your Department in this county.

Yours very truly,

(Signed) J. G. WOOLWORTH.

[COPY]

GILBERT, LA., Oct. 21, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: This community has rigidly adhered to your recommendations as to how to raise cotton under boll weevil conditions, with the result that they have made a profitable crop this year—many of them as much as a bale per acre. I feel no hesitancy in saying that any farmer can make a profitable crop of cotton under weevil conditions with the methods you recommend. The work has been of incalculable value to the farmers here.

Yours truly,

(Signed) R. M. WARD.

[COPY]

TIMPSON, TEXAS, October 18, 1910.

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: As a young man deeply interested in the development of the agricultural industry in the South and especially of this portion of east Texas, I desire to volunteer a letter of appreciation of what the Farmers' Cooperative Demonstration Work and its able representatives here have already done and are now doing in this field.

As a demonstrator myself I speak from experience; and yet one has but to open his eyes and behold the wonderful development that has been brought about since what we call the "Agricultural Agent" entered this section about four years ago. Under their method of cultivation—by putting in less acres, giving more intensive cultivation, using fertilizer, giving more space to the individual stalk, making more preparations prior to planting and stirring the soil later in summer—

we are now raising, notwithstanding the boll weevil, even more cotton per acre than was made before the weevil invasion.

Again, diversified feed crops have been introduced and in addition to the old staple corn crop, numbers of farmers are harvesting quantities of oats, rye, barley, peanuts and cowpeas, bermuda and clover hay, etc., winter pasturage has also been introduced and is now beyond the experimental stage.

The farmers in general are in a very much more prosperous condition than ever before and there is no question to the fact that it has been largely brought about by this work, and locally we feel that it has been materially furthered by the personality and interest of the local agent, Mr. G. W. Orms.

Very truly yours,

(Signed) J. R. NICHOLS.

[COPY]

MOUND, LA., *October 26, 1910.*

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: I have followed your teachings and instructions just as closely as possible to do on a large plantation with negro labor.

I destroyed the stalks by burning just as early as possible and broke up all the land I could in the fall and planted Simpkins' cotton seed early on a considerably reduced acreage that was thoroughly drained and cultivated rapidly, and picked up and destroyed the punctured squares up to about the first of August.

I am making on all of my properties 300 lbs. of lint to the acre. I am convinced that we can succeed in planting cotton provided we follow your methods.

Yours very truly,

(Signed) F. L. MAXWELL.

[COPY]

WISNER, LA., *10 | 24, 1910.*

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: Inasmuch as we followed the advice of your Department in the planting and cultivation of the present cotton crop, we feel that you are entitled to a report on same.

We destroyed all stalks last fall and plowed most of the land in December and January; planted early in April but on account of killing frost about April 25th had to plant over practically everything, beginning the last week in April and rushing to completion. We used an early variety of seed and cultivated every six or eight days till August 15th. We are making from $\frac{1}{2}$ to a full bale with an average of $\frac{3}{4}$ of a bale to the acre on about 1,000 acres.

Yours truly,

(Signed) T. D. GILBERT & COMPANY.

[COPY]

CALVIN, LA., *10 | 14, 1910.*

DR. S. A. KNAPP,
Washington, D. C.

DEAR SIR: It is my desire to give expression to my appreciation of the aid the Government is rendering the cotton farmers in this section. Because of the ravages of the boll weevil the farmers in Winn Parish had abandoned the planting and cultivation of cotton for the last two years, but in February of this year Mr. S. B. Alsop, Special Agent of the Government's Farmers' Cooperative Demonstration Work, came to me and arranged to establish a Demonstration plot of cotton with me. I agreed to plant one acre and cultivate it under his instructions. I did so and made one thousand lbs. of seed cotton per acre. My neighbors planted one acre adjoining mine and made about one hundred lbs. per acre. I consider this Demonstration Work of the Government to be of untold benefit to the farmers of the boll weevil districts.

This work has shown the farmers what can be done and there will be much more cotton planted in this section next year than was this.

Very truly yours,

(Signed) E. C. BOTT.

