

PROGRESSIVE FARMER

THE INDUSTRIAL AND EDUCATIONAL INTERESTS OF OUR PEOPLE PARAMOUNT TO ALL OTHER CONSIDERATIONS OF STATE POLICY.

Vol. 15.

Raleigh, N. C., September 18, 1900.

No. 32

Agriculture.

SOUTHERN AGRICULTURAL PROBLEMS.

Improvements Needed to Make Farming in North Carolina and Other Southern States Prosperous—Address of Hon. Jas. Wilson, National Secretary of Agriculture, to Southern Commissioners of Agriculture, Raleigh, N. C., Aug. 28, 1900.

Today I am a North Carolina man, advising you to bring your farms to the very highest condition of production, so that to as great an extent as possible you can feed your own people. You may rest assured the great Northwest will find markets for all its surplus. I have looked carefully into the agricultural productions of North Carolina reported by your statisticians in 1899. You raised in that year 31,953,168 bushels of corn. The Department of Agriculture is co-operating with scientists outside with regard to the improvement of corn. You raised 3,495,598 bushels of wheat, and the Department of Agriculture has now agents in northern Russia seeking wheats that are rust proof, rich in gluten, etc., while the Division of Vegetable Physiology and Pathology is cross breeding wheats in order to get new varieties from which to select something which will be beneficial to the people of the country. I notice that you produce, in considerable quantities, oats, rye, buckwheat, hay, etc. You can extend the production of all these things; you can improve the quality and yield of all these things. If you produced 195,789 bales of hay in 1899, you can grow grasses from which hay is made, indicating that you can extend the production of domestic animals as far as you see fit. You produced 68,529,170 pounds of tobacco in 1896 (the year of your latest report). The Department of Agriculture has tobacco under careful consideration. We are inquiring where the flavor comes from and how that information may be made profitable to the people of the country. You produced 6,000,000 bushels of sweet potatoes in 1899, and I have this to say to you regarding that crop, that we are sending trial shipments to various parts of the world to ascertain whether the people in foreign countries can be taught the value of sweet potatoes, so that we can find a market for you over there. The total value of your corn crop in 1899 was \$3,020,220.

LIVE STOCK.

I find by inquiry into the production of domestic animals that North Carolina must be well adapted to all of them. January 1, 1900, the Department of Agriculture estimates that you had 148,164 horses, 120,512 mules, 243,298 dairy cows, 274,843 other cattle, 235,260 sheep and 1,369,703 hogs, with a total value of \$27,763,774. Your capacity to produce domestic animals of course depends entirely upon the condition of your soil and the standard of your agricultural management.

MAINTAINING SOIL FERTILITY.

Of the reports received by your Labor Commissioner in 1898, 67 per cent. say that the fertility of the land is well maintained, while 33 per cent. report that it is not. My remarks today are for the benefit of the 33 per cent. I find from the same source—your Labor Commissioner—that the greatest industry in the eastern section of your State is the sawing and dressing of lumber, which is only exceeded in the entire State by the manufacture of cotton and tobacco. The time has come when the condition of our forests requires careful inquiry. The destruction is decidedly greater than the growth. The sections lying along the headwaters of your streams are now being considered by the Department of Agriculture in conformity with authority from Congress, in order that those waters, to which you look for power in turning your mills, may not be dried up through the utter destruction of the woods where the streams rise.

LOSS OF HUMUS ON SOILS AND ITS DANGERS.

The Southern States have a much heavier rainfall than the Northern States. For example, the average rainfall in your State of North Carolina is 53 inches annually, while in Iowa it is 30.1 inches. Yet the Southern States suffer much more from drought than do the States of the Mississippi Valley. The cause is found in the conditions of the soil in the two localities. In the newer portions of our country, where there is sufficient rainfall to grow crops, and where there is a deep soil full of humus, much less rainfall will mature crops. The Southern States have been under cultivation for a long time, but humus is becoming scarce in the soil. Humus is decayed vegetation. When the soil is well stored with it, it is able to retain moisture. Continual cultivation oxidizes or burns out the humus and leaves the soil incapable of retaining moisture. The heavy rainfall of the South gives you large streams much larger than are found in portions of the country where the rainfall is less. The plant food formed in your soil from humus that may exist there is washed out much more rapidly into your streams than if the soil were well stored with organic matter. If the waters of your great streams were analyzed when they are flowing thick with soil, it would be found that the plant food is flowing away from the land. Putting the soil in such condition as to retain these things until the plant can use them is an absolute necessity.

A drought where rainfall is heavy is followed by different consequences from a drought where rainfall is light. In the latter condition the nitrates and other plant food remain in the soil; in the former they have been washed away. Drought on an exhausted soil where the humus has been washed out, scorches while it lasts, leaving the soil no better from arrested growth, but drought on a soil full of humus arrests growth for the time being, while the plant food remains ready for use as soon as moisture is supplied to liquify the nitrates and minerals and prepare them for the use of the plant.

In 1894 we had a drought in Iowa of such severity as practically to destroy the corn crop. In 1895, as soon as the moisture came, our crops were the heaviest in the history of the State, showing conclusively that the effect of the drought in 1894 was merely to lock up the plant food and let it remain until the following year. During several months of the winter the soil was frozen solid, when no loss of plant food could take place. It is different with you in the South. Your soil does not freeze up in the winter, while you have rains that wash out the plant food.

HOW GRASSES GROW.

We find it necessary in the North, in order to maintain the fertility of our soils, to rotate crops, so that grazing crops shall occupy the ground at least one-third of the time. We get our greatest crops from plowing up our pastures. I think it is entirely practicable for Southern cultivators to replace the humus in their soil by growing grasses and legumes, because there is a great demand at the present time, and probably always will be, for first-class horses, cattle, sheep and other grazing animals, and the Southern cultivator is famed for his excellence as flock-master.

The cotton crop of the South has been suffering on account of drought and on account of heavy rains. I will not at the present time discuss the latter condition. There are, of course, methods by which the bad effects of heavy rains on bottom lands can be avoided, that are no doubt well known to intelligent cultivators in the South. A greater problem is the loss of crops from drought and the necessity of adopting systems of management that will prepare the soil to resist to as great an extent as possible the effect of long-continued droughts. Soils that have had their humus or decaying plant food oxidized and burnt out by perpetual cultivation, when put into cultivated crops like cotton or corn are much more subject to losses than soils that are full of plant roots that enable them to retain moisture. I think it would be entirely practicable on your light hilly lands to double the amount of cotton grown by putting the lands into grazing

pastures or even into meadow condition, where the crop is taken off by the mower, or by green manuring.

The methods by which fertilizers are applied to Southern soils require consideration and careful analysis. Where nitrogen, potash, phosphoric acid and other elements of plant food are applied as commercial fertilizers they are much more emphatically at the mercy of heavy rains than where they are applied otherwise. Where the fertilizer is applied in the shape of barnyard manure or green manure or grazing, it cannot be washed out by rains as readily as where it is applied as superphosphates. I have observed in many places ridges made across the face of hillsides to prevent the soil from flowing away during heavy rains. The recourse is doubtless wise, but the seeding-down of the hillsides to grasses and legumes suitable to the latitude would be much more effectual in arresting the flow of soil towards your streams. An old hillside, cultivated again and again for many years, with its humus gone, would grow a good crop, no doubt, if sufficient commercial fertilizer were applied. The operation would be entirely successful if it did not rain too much, but the nitrate is subject to being washed away into the sandy and gravelly subsoil and taken beyond the reach of the plant. This will occur much more certainly in the old cultivated field than in a newly-broken up pasture field.

METHODS OF TILLAGE.

It is necessary to continue the cultivation of crops during a drought longer than we are in the habit of doing. It is customary with most of us to give the land so much cultivation and then lay the crop by. If the crop has shaded the ground to protect it from the rays of the sun, so that evaporation will not take place, followed by the cracking of the soil which is the result of evaporation, then the cultivation might be stopped. But if the ground is bare, then cultivation should continue, and a dust mulch be maintained until the crop does shade the soil. I remember planting crops of several kinds in a dry year at the Iowa Experiment Station, after a two-inch rain the last of June. The crops were turnips and cabbage for cow feed, planted for the purpose of ascertaining the effect of the volatile acids of those roots on the flavor of butter. Sweet corn and tomatoes were planted for the college kitchen. I was entirely aware that without cultivation the soil would lose all its moisture inside of ten days and the crops must perish for want of it. I set about maintaining a dust mulch of perhaps two and a half inches, and in order to maintain it, cultivated twice a week until rain came, which was only after seven weeks' drought. I succeeded in my object and good crops were the result. That kind of cultivation is much more necessary in the South than it is in the North, because you have a warmer sun and generally lighter soils.

We have been importing fine table grapes from Europe lately, and sending them down to your State. I saw a pomologist visit them lately and found them suffering from drought. The mulching process is precisely what they need, either by application of a mulch to the soil or by continual cultivation that will maintain a dust mulch.

The improvement of Southern soils brings into consideration the money crops that can be grown from them outside of cotton. There is a great demand abroad for first-class horses, and for such horses as are more common to the South than to any part of the United States. The road horse, the carriage horse, the gaited horse, are all in demand. We sold 64,709 horses last year, and received \$7,512,056 for them. The demand will be continuous, and the Southern States can well give attention to the production of such horses as are needed in other countries. It would be wise for us to produce what the merchant wants and not what we think he should buy. The principal basis of the horse is pasture,

and while the grasses and legumes I am speaking of are filling the Southern soil with humus, they can be grazed by the brood mare that will produce high-selling horses. We sold 396,977 cattle in 1900 and received \$30,628,768 for them. In addition to this we sold many cattle products. We can produce such cattle meats as are wanted in foreign countries, and bring the best prices there, cheaper than they can be produced elsewhere; and while the humus is being put back into the worn-out fields of the South, the dairy cow and feeding steer can turn the grasses into money.

THE EARLY SPRING LAMBS. The Southern States can just as well furnish the Northern markets with early spring lamb as they can with early vegetables and fruits; and while grasses and legumes are replacing the humus in the Southern soils, high-selling sheep can be grazing there pretty much the year round.

BACON VS. LARD HOGS. The bacon hog is a peculiarity of the South, and has been for many years. The finest bacon hams of which we have any knowledge have been produced in the South and are produced there now. The bacon hog is a product of nitrogenous feeding—of grazing, of pasturing in the woods, etc. It consumes the by-products of the dairy, and sells for one-third more money than is received for the lard hog. The South perhaps could not compete successfully with the Northern States in the production of the lard hog, but the South can compete successfully in the production of fine bacon hams.

VALUE OF COTTON SEED. When we consider the production of meats and dairy products, we find it necessary to have at hand an abundance of nitrogenous grains. Last year's cotton crop amounted to nine million bales. The cotton seed that grew when the lint grew amounted to 4,500,000 tons. This is an amount of first-class nitrogenous food stuff so vast that it is difficult to grasp the idea of it. We might make some comparison. If the 396,977 head of cattle we shipped abroad last year to foreign countries, bringing back to us a return of over thirty million dollars, had all been finished with cotton seed meal, and hulls, they would have used only a small percent of the cotton seed meal of the South. It has been demonstrated by actual trial and careful experiment that cotton seed meal stands at the head of all nitrogenous by-products. It is more effective than corn or bran or flax meal or by any other by-product of the mills. The fertility of Southern fields can be recovered by growing grasses and feeding them to grazing cattle, with cotton seed meal as a grain ration. The Southern farmer should not permit a single pound of this food to go any where else in the world. Northern people who have abundance of cheap corn find it profitable to feed it.

People in foreign countries, who make meats and dairy products to compete with ours; in the world's markets, find it profitable to feed it. But it is just as wise for the Southern producer to utilize his cotton seed meal at home as it is to build factories to work up the fiber of the plant.

THE SUPERIOR GRAPE GROWING. The superior flavor and high quality of the choice varieties of European table grapes have long tempted fruit growers to undertake their production in the eastern United States. Experiments along this line have been conducted at various places from time to time since the days of the earliest settlers. These experiments have almost invariably resulted in failure and the death of the vines within a few years after planting. The exact causes of failure are not clearly understood. In some regions the principal cause was undoubtedly by phylloxera, a minute insect, which does its worst injury to the root of the vine, in others the failure was probably due to the severity of the winters, and in still others there is now reason to believe that the principal cause of failure was the prevalence of fungous dis-

eases, such as black rot and mildew, which damage both foliage and fruit, and which if left unchecked ultimately cause the death of the vine. The discovery that by grafting on phylloxera-resistant American stocks the ravages of that insect can be prevented, has removed one element of doubt from the problem. Whether by thorough and systematic spraying with fungicides the troublesome diseases may be kept in control at a cost sufficiently low to warrant the effort, is now the subject of a co-operative test in the vineyard of Dr. B. Von Herff, near Southern Pines, under the direction of the Division of Pomology. At the same time all varieties likely to be found valuable, either because of the superior quality of their fruit or their resistance to disease, are being introduced for testing. About 150 such varieties are now under test and more have been ordered for planting the coming season. About forty varieties grafted on Niagara stocks are in fruit this year and but for the intense heat and drought which prevailed at the most critical period of the season it is believed that the possibility of production of choice fruit of several sorts would have been demonstrated this season.

It is not considered probable that these varieties, if successful, will supplant the standard native sorts like Delaware and Niagara now so largely grown in North Carolina, but rather that they will satisfy a demand for fruit of superior quality in the large city markets at higher prices and in this way make greater diversification of fruit crops possible. The climatic conditions existing in the sand hill region of North Carolina and South Carolina are believed to be more favorable to these grapes than most other sections and it is for this reason that the experiment was located in the former State. A similar test is being made in Florida, and a few small plantings in other States.

HOME MARKET FOR FARM PRODUCTS. The Southern States are turning their attention to manufacturing. Raw materials of many kinds are so abundant that it must be profitable to manufacture them where they are found. The field, the forest, and the mine furnish such material in very great abundance. A large percent of Southern workers will in future devote their lives to manufacturing. There will be a home demand created for food for those who work in the factories and shops. The farmer will find a home market, which is the best of all markets; grains, meats, dairy products, fruits, etc., will be produced much more profitably in the South in the future, than in the past. The grass plant will be found the readiest and most valuable agent for maintaining the fertility of the soil, and the cheapest basis of all farm products. Recognizing this, the Department of Agriculture is giving special attention and study to the introduction of suitable grasses from all parts of the Old World into the several States of the Union. The last session of Congress increased very considerably our appropriation for the study of grasses, enabling us to enter into co-operation with the experiment stations of the States and with individual farmers of an inquiring turn of mind. The vast cattle ranges of the West have been overstocked. The grasses have been destroyed, and many States west of the Mississippi river maintain less than fifty percent of the cattle heretofore found there. There is not, up to this time, any indication of a change in the processes that are destroying the grasses of the ranges. This is one of the reasons why meats are higher and will continue higher. Beef and mutton can be produced on the farms east of the Missouri river, and will be so produced.

All the States east and south of the Alleghany Mountains will find a gradual lessening of the severe competition that has heretofore existed between their products and those of the Mississippi Valley. As the productions of the Great Valley turn westward more and more, to find markets in the mountain States, on the Pacific coast, and in the far

Orient, this competition, that has kept down the prices of farm products east of the Alleghany Mountains, ever since railroads entered the Mississippi Valley, will be gradually lessened.

So that we find two influences at work to help the farmers of the Southern States. One is a better home market, and the other is less competition from the great West. The Southern farmer will get all the assistance we can possibly give him in ascertaining what grasses and legumes are best suited to grazing purposes and hay making purposes.

DEPARTMENT WORK. The Division of Vegetable Physiology and Pathology is conducting investigations in several of the Southern States, looking to the securing of better oranges, pineapples, and other fruits through hybridization. The diseases of cultivated grapes peculiar to the South are being carefully studied. Systematic investigations are being conducted regarding the tobaccos of the country. The cause of the aromas which give to certain foreign tobaccos their peculiar value, has been discovered, and efforts are being made to put this discovery to practical use in the production of domestic tobaccos. Systematic investigations are being conducted along the line of producing our teas in the Southern States. Experimental tea gardens have been planted in co-operation with the experiment stations of the Gulf States. The money paid to foreign countries, now running from eleven million to fourteen million dollars annually, can be earned in the South, and a class of labor that is now non-productive, set to work. Very promising results are being had in South Carolina, and the Federal Government has appropriated money to assist in these investigations.

HEMP GROWING. The United States imports from Italy and southern Russia nearly a million dollars' worth of hemp per annum. This is a high grade hemp, for which our people pay about seven cents a pound, and it is used chiefly in the manufacture of carpet warps. The Department of Agriculture is trying to find out why American hemp growers continue to produce three-cent hemp, when by a little more care and expense they could produce this seven-cent hemp, for which there is already a market in the United States. We are asking the question also, why does the American hemp grower content himself with a hemp which grows seven feet high, when eastern Asia grows a strain of hemp which is twice as tall and produces nearly twice as much fiber per acre. And again we are asking, why is it that the Southern States, instead of buying jute butts from India with which to make cotton bagging and rice sacks do not try the experiment of making these articles out of home-grown fiber. There is a fair probability that with these giant Asiatic varieties of hemp planted in the rich alluvial bottom lands of the South Atlantic seaboard, with deep ploughing and a liberal application of cotton seed hulls, such heavy crops of hump can be produced that it can be sold to the bagging manufacturers at a price that will compete with jute. And if hemp cannot be produced at quite the price to compete with jute, it almost certainly can be produced profitably for use in the manufacture of cotton sacks.

In preparing land for wheat, if the land is not naturally underdrained, it should be done with tiles. Then it should be plowed as soon after harvest as possible. The plow should be followed by the harrow, after which nothing more should be done until about two weeks before sowing. Then harrow until the soil is thoroughly fine and compacted to the depth of three or four inches. As there is a longer period between sowing and harvesting wheat than almost any crop, it is evident that this work—which is all the cultivation the crop receives—should be done well. Wheat should always be drilled when possible, together with not less than 200 pounds good commercial fertilizer—H. H. Greene, Watanga, Co., N. C.