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

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"I am standing now just behind the curtain, and in full glow of the coming sunset. Behind me are the shadows on the track, before me lies the dark valley and the river. When I mingle with its dark waters I want to cast one lingering look upon a country whose government is of the people, for the people, and by the people."—L. L. Polk, July 4th, 1890

PRACTICAL FARM NOTES.

Written for The Progressive Farmer by the Editors and Hon. Guy E. Mitchell

The enormous tariff which Germany places on American canned goods is sufficient cause for the lack of growth in exportation of these articles. The American Consul at Aix la Chapelle states that he received from the United States for his personal use two dozen cans of pumpkins, two dozen of corn, one dozen of Cove oysters, two dozen of clam chowder and two dozen of peaches, with a total valuation as billed in the United States of $12 10. On these he paid a customs duty of $4 85. They were classed as "conserves" and as such were dutiable at the rate of about seven cents per pound, including packing

A statement is made by Mr George T Powell, a well-known scientific agriculturist, of New York State, that the value of manure produced by the domestic animals of New York is fully $100 000,000 annually, and that through neglect, carelessness and ignorance in the management of these valuable fertilizers, fully fifty per cent. of this value, or $50,000 000 is wasted or lost annually, and the soil thus deprived of the plant food these would supply. When it is considered that this manure is produced largely from the soil of the State, it will be seen to what efforts New York farmers must resort to keep the fertility of their soils from sources outside of the State.

In experiments in growing asparagus at the Nebraska Station, salt as a fertilizer was found, contrary to the general impression, to have no beneficial effect and to be injurious when used in large quantities To test the advisability of deep planting, 200 plants were set, half of them eight to ten inches deep and half of them three to four inches deep. The results are given as follows: "The first difference to appear between these depths of planting was the influence upon earliness. Those plants set shallow yielded decidedly in advance of the ones planted deep, and this difference was not only evident the first year, but has continued in succeeding years. Later in the season comparatively little difference in the vigor of the plants was observed; if any difference existed it was in favor of the shallow set plants.

The Virginia Station has published the results of some experiments with silage for horses. The system of "pulling" fodder from corn is in vogue in many sections of the State and while corn blades make an excellent rough food for horses, they are too costly to gather and the supply is often limited. In the feeding of silage the determination was reached that in beginning to use this feed, it is of the utmost importance to feed a small amount at first and increase gradually as the animals' appetite and condition of pulse may indicate. In the experiment, after the preliminary period of feeding the animals were allowed all the silage they would eat and the belief is that under such conditions horses will eat no more than they can easily assimilate. As a whole it appeared that silage made a good rough age for horses when used in connection with hay or stover and grain, but that the animal should become accustomed to the food by degrees and that this is as important as changing from old to new corn or from hay to grass.

Some extensive investigations have been carried on by the Virginia Experiment Station concerning the San Jose Scale in the State It is found that the scale is quite generally spread over Virginia but that this is due to infested stock introduced from other States. Vigorous treatment has been instituted by the entomologist of the station and excellent results have been obtained from the use of kerosene as a spray. In cases where the scale was found to affect young trees the limbs were severely pruned back and the trees washed with soap or mopped with a soap solution—two pounds to a gallon of water and applied hot. This treatment killed all the scales and the trees put forth vigorously in the following year. Trees when dormant were also painted with kerosene and the scale perfectly eradicated in this manner. Either the kerosene or the soap treatment is recommended at the discretion of the grower. The entomologist states that the Deming pump with kerosene attachment was the best device for using water mixture with kerosene. He recommends a 20 per cent kerosene and water mixture applied twice during the dormant season, and states it as his belief that the scale is within the easy control of any individual or community.

As a closing gasp Congress authorized the publication of fifty thougand copies of the results of the beet sugar investigation during the past year. The beet sugar question is of added interest to American farmers now that the assurance has been given that the government will stand by its policy of protection, in this respect and refuse the free entry of Philippine or Porto Rican sugar; in other words that American producers need not fear free sugar competition from these islands. Regardless of the conditions brought about by the war with Spain the Department of Agriculture went steadily on making its investigations throughout the country concerning beet sugar, and it can be stated that pretty accurate information has been acquired as to the sections of the country best adapted to beet growing for sugar purposes. The best results in sugar beet experiments have been attained generally in the Northern States. Mr. Charles F Saylor, the beet expert, states that he finds the most favorable conditions for sugar beet growing in New York, part of Pennsylvania, Southern Michigan—very excellent—Southern Wisconsin, Southern Minnesota, South Dakota, Northern Ohio, Northern Indiana, Northern Illinois, Northern Iowa, Northern Nebraska, California, Northern New Mexico, Utah, Montana, Washington and Eastern Oregon, a section forming something of a great S. The entire mountainous sections of the West largely present favorable conditions through irrigation. In some sections of the South, local conditions present favorable aspects for beet raising, these sections corresponding to the sugar beet areas of Germany and France. Very fine results, Mr. Saylor says, are attained with this crop through irrigation and he states that the United States alone uses irrigation for this crop

AGRICULTURE.

PLANT FOOD.

The importance of a correct knowledge of what is required by plants in order to their successful growth is so great, and upon the application of this knowledge so largely depends the profitable management of the farm, that we make no apology for taking up the subject for consideration at this season of the year. Especially do we feel called on to deal with the question because of the fact that so many new readers of The Planter are now coming upon our books. Those who have been readers of the journal in the past have, if diligent students of its pages, long ere this acquired a pretty general knowledge of the subject as it has been constantly kept before them in one form or another, but even to these further information will, we are sure, not come amiss

Plants of all kinds require for their successful growth that the soil should contain a sufficient amount of potash, soda, lime, iron, and a few other minerals, phosporic acid, nitrogen, and organic matter. With the exception of phosphoric acid, potash, nitrogen, and organic matter, most soils contain sufficient of the other ingredients of plant food. Of potash and phosphoric acid, many, if not most soils, also contain ample supplies, but, unfortunately, they are rarely in a form capable of being utilized by the plants in sufficient xuantity for the needs of profitable growth, and therefore require to be supplemented by manure, fertilizers, lime, organic matter, and tillage, which each help to make available these sources of food. Plants can only utilize the food in the soil after it is dissolved, and this fact emphasizes the importance of securing an abundant supply of moisture in the soil throughout the whole growing period of a crop. The only way in which this can be secured is by perfect deep cultivation of the land previous to the planting of the crop, and by subsequent shallow cultivation of the surface, so as by the first means to make the soil capable of holding the rain which falls upon it, and by the latter means to prevent the evaporation of this moisture. Probably the greatest need of all our Southern soils is organic matter—that is to say, the product of the decomposition of animal and vegetable refuse. By long-continued clean cultivation of cotton, corn and tobacco crops, nearly the whole of the organic matter originally contained in our soils has been consumed in the production of these crops. The absence of this matter or humus is disclosed by the baking of the soils, and by their inability to retain moisture. The first step which should be taken with all infertile soils should be their deep breaking and the addition of organic matter, either in the form of farmyard manure or the plowing down of vegetable growths. Until this has been done, it is impossible to say how far it may be necessary to apply nitrogen, phosphoric acid, and potash, in order to secure profitable crops. The part which humus or organic matter plays in promoting fertility is a most important one. It is the great resort of the bacterial forms of life which, by their constant working, make available the organic matter in the soil. These bacteria break down the tissues of all animal and vegetable refuse, and form the acids needed to complete the solution of unavailable matter into readily assimilable plant food. The nitrogen required for the food of plants can be supplied from organic or inorganic sources, and from the atmosphere. The cheapest source is the atmosphere, of which nitrogen forms four fifths. To obtain it from this source, leguminous plants must be grown. Upon the roots of plants of this family, bacteria form nodules, which store the nitrogen, and, as these decay, this nitrogen becomes available for the support of other plant life. In the destruction of animal and vegetable refuse by other bacteria, nitrogen is liberated and becomes available for the crops. Cotton seed meal is also a very easily obtained form of nitrogenous fertilizer in the South. In the inorganic form of nitrate of soda and sulphate of ammonia, nitrogen is also supplied to the soil, and becomes available after being dissolved by moisture. Phosphoric acid is generally most cheaply supplied in the form of acid phosphate. The reason for this is that we have here in the South large beds of phosphate rock, which, when finely ground and treated with sulphuric acid, which is made from pyrites rock, also found in abundance in the South, makes a quickly available form of phosphoric acid. Bone is also another form in which phosphoric acid can be readily supplied to the land but it is more costly than phosphate made from rock on account of the fact that bones are not so abundant as is the rock. Bone also carries with it from 4 to 5 per cent. of nitrogen, and this enhances its cost. The phosphoric acid obtained from the rock is just as valuable as that obtained from the rock is just as valuable as that obtained from bone as a plant food. Potash is most generally supplied to the soil in the form of the German potash salts, muriate of potash, sulphate of potash and kainit. The muriate and sulphate carry generally about 50 per cent. of potash, whilst kainit only carries about 12 per cent. It is, therefore, generally cheaper to use the muriate or sulphate than kainit, as there is so much less material to freight to obtain the same quantity of potash. Hard wood ashes are also a source of potash, but they are not easily obtained in quantity in the South except at a cost too great for their actual value as a source of potash.

We have, as yet, said nothing as to the value of barnyard manure as a plant food. In our opinion, this is, perhaps, the most important of all foods for plants—first, because it is in the power of every farmer to have it, and to have it in a much larger quantity than the majority now have it, at only the cost of care and labor; and, secondly, because it is a product having all the elements required in plant food—nitrogen, phosphoric acid, and potash; and, third, because it has also that other most important content, humus making matter which our soils most lack. It is true that it lacks phosphoric acid and potash in sufficient quantity to make it absolutely a complete fertilizer, but these are easily and cheaply added in the form of acid phosphate and kainit or muriate of potash, and this done, the product can never be used without advantage to the soil and crop. Even without these additions, it is of the highest value, and should never be wasted.

In what proportions the several plant foods we have mentioned should be used depends largely on the condition of the soil and the crop to be produced. We do know what proportion of these plant foods are taken from the soil by the different crops, but only actual experiment with the land can determine which, and how much of which, it is necessary to supply in order to secure a maximum yield. The absence of previous experience with the particular soil is the cause of most of the complaints of the failure of fertilizers to give the returns expected. No one can determine this but the farmer himself.—Planter.

SAVING FERTILITY AT HOME.

The prominence recently given the fertilizer question in these columns has brought to mind my experience in saving fertility at home. I desire to say in the first place, that owing to a lack of judicious management there is a vast amount of fertility wasted on most farms, which if properly cared for and applied. would eventually obviate the necessity of purchasing any great quantity of the commercial article. This statement has been so often made in these columns that the mere repetition may seem superfluous; but since the subject is so important, and I have found the statement to be a fact by my own observation and experience, I think it will bear repeating. I well remember how I used to—when a boy—clean my stables and throw my manure into the open yard in heaps, which were usually shaped to contain the largest possible quantity of water to aid decomposition in a dry season. I also remember the pains I took to save the finest and driest of the manure in rail pens for garden and potato patch; being totally oblivious to the fact that most of the elements of fertility had been leached out and were gone to enrich the field of a neighbor some rods distant, and that the manure I had been so careful to save was little more than a pile of decomposed matter with scarcely any practical value as a soil enricher. I was then obliged to purchase large quantities of phosphate to supply the deficiency, the cost of which frequently absorbed the entire proceeds from the sale of crops. As may be supposed, under such management, I found farming a failure. All this was several years ago. Since then I have made a great improvement over my former methods. Not having a manure shed, I haul the manure direct from stable to field and apply on the ground intended for corn next spring. And I fully believe it will not pay to use commercial fertilizer on that corn, since I have found by actual experiment that there is practically no difference in the yield where commercial fertilizer is applied. After the corn is off in the fall I seed to wheat, using about 300 pounds of acid phosphate per acre. I then seed to clover in the spring, and seldom miss having a good stand. Last season I cut over three tons of hay per acre, where under my former management I could not get clover to grow. I am now raising more than double the yields per acre that I formerly raised, and, better still, I am doing this at less than half the former expense for commercial fertilizers.—Elmer E. Shaver, in Practical Farmer.

FARMER BRAWLEY'S METHODS.

Full Details of His Operations--A Charlotte Observer Representative Visits the Iredell County Man Who Has Gained Prominence Through His Success in Raising Cotton at 2 97 Cents a Pound---An Interesting Account of Mr. Brawley's System of Farming and How He Manages Affairs

When he buys a piece of land, he opens an account with it and charges it with all that goes on it and credits it with all that comes off. In looking over the accounts of one farm I saw a credit of twelve rails that were taken to another farm. In riding over his farms I was struck with the neat and healthy look of the land. The edges of every field were shaped and cleaned. It was evident from the apparance of the soil that it is growing more fertile year by year. On most farms quite the reverse is true. Mr. Brawley buys most of his land in a run down condition for cash, and builds it up. Three years ago I rode over his farms with him. At that time he had just bought several worn out farms. I remembered one in particular as being badly washed and cut in sections by gullies. I hardly knew that farm when there the other day. The thin places have fattened and the gullies have been filled and the land levelled. To begin with, the gullies were filled in, the fields plowed deep with a two horse plow, and peas sown with a hundred pounds of commercial fertilizer per acre. Mr. Brawley's method of improving land is after this fashion: He takes the poor land, sows it in rye with 200 pounds of guano and and a ton of lime per acre. The lime is put on in the winter. In the spring the rye is turned under. The lime keeps it from souring. After the rye, cow peas are sown with 400 pounds of acid and potash per acre. The peas are mowed and the land is sowed in wheat and clover, with 200 to 300 pounds of acid and potash. This gets the land on its feet again, as it were. From this stage the land is improved more and more by rotation of crops. Mr. Brawley's system of rotation is now under test. So far he likes it. It is a six year process. The first year cotton alone is grown on the land, the second year cotton and crimson clover, the clover being sown when the cotton is worked for the last time; corn and cow peas the third year, with a heavy spread of rough stable manure; small grain and red clover the fourth year; red clover the fifth year, followed by wheat and then peas the sixth year. A person who knows anything whatever about land would be convinced of the wisdom of such a system of up building if he were to see the fine condition of Mr Brawley's farms.

Cotton is Mr. Brawley's main money crop. Of last year's crop, he has already sold 124 bales. To produce this crop he grows all of his home supplies Besides cotton last year he raised: 888½ bushels of wheat; sufficient corn, oats, barley, peas, clover and grasses for the farm hands and stock; 5,000 pounds of pork; sold $300 worth of milk cows, and sells 10 pounds of butter each week. His purpose is to raise enough for the farm and have a small surplus of each product for the market.

Mr. Brawley uses the best and latest improved labor saving machinery. His plows are large and long. They stir the ground well and deep. Under his sheds I saw a drag, a disc and a cultivator harrow; a guano distributor, which opens the furrow and scatters the guano at one and the same time, thereby saving a hand; a corn planter, a reaper and binder, a grain drill, a mower, a broad tired wagon, and near by a corn mill, which grinds the corn and cob both into a rough meal, used to feed cattle and hogs. The nutriment in ten corn cobs is equal to the nutriment in the grain from one cob. Mr. Brawley saves the cob. It makes a fine feed and the mill is easily managed, and not costly.

One of the most interesting features of Mr. Brawley's work is the way in which he buys and uses his fertilizers. He buys the ingredients and mixes them himself, having a house for the purpose. Most farmers buy their fertilizers ready mixed. They pay from $18 to $22.50 per ton. Last year Mr. Brawley's fertilizers cost him $1,008 82 laid down at Mooresville. The ingredients to make his guanos cost $794 39, and freight on the same was $214 43. Besides his cotton seed meal cost him $72. Hence the cost per ton was $15 78 With the aid of bulletins from the experiment station at Raleigh any farmer can mix his own fertilizers, and by so doing save from $3 to $5 per ton. The Agricultural Departments of the State and Nation are for the benefit of the farmers. They furnish all kinds of valuable information on application. Mr. Brawley takes advantage of this fact and consults their bulletins for information and advice. Below are some of his fertilizer formulas. For cotton he uses two kinds. The following is put in with a guano distributor behind the opening furrow:

Fourteen per cent. acid phosphate, 1,150 pounds; 10 per cent. fish scrap, 400 pounds; cotton seed meal 100 pounds; 12 per cent. kainit 350 pounds—total 2 000 pounds; per cent of acid 8 19; ammonia 2 35; potash 2 19. Two hundred pounds per acre is used. When the cotton is planted 200 pounds of this is used:

Fourteen per cent. acid phosphate, 1,200 pounds; 10 per cent. fish scrap, 200 pounds; 19 per cent nitrate of soda, 100 pounds; 12 per cent. kainit, 500 pounds—total 2 000 pounds; per cent. of acid 8 04; ammonia 1 95; potash 3. This mixture cost $15 85 per ton.

For corn Mr. Brawley used this last year:

Fourteen per cent. acid phosphate, 1,100 pounds; cotton seed meal 550 pounds; 19 per cent. nitrate of soda, 50 pounds; 82 per cent. nitrate of potash, 300 pounds—total 2 000 pounds; per cent. of acid 8 45; ammonia 2 42; potash 7 99. This mixture cost $19 63, and Mr. Brawley intended most of it for the peas sown with the corn. It is put down in the ground and well mixed before the corn is put in.

For peas on poor land: Fourteen per cent. acid phosphate, 1,400 pounds; cotton seed meal 400 pounds; 82 per cent. muriate of potash, 200 pounds—total 2 000 pounds; per cent. of acid 10 46; ammonia 1 41; potash 5 36. From 300 to 400 pounds per acre are used.

Below is a special formula for wheat on pea and clover land: 14 per cent. acid phosphate, 1 500 pounds; 12 per cent. kainit, 500 pounds. From 200 to 400 pounds are used on an acre.—H. E. C. Bryant.

SORGHUM FOR SWINE.

Mary Best, of Medicine Lodge, Barber county, Kansas, who for years has realized very satisfactory results from rearing swine on sorghum, both as pasturage and grain, has written some of her experience to Secretary Coburn, of the Kansas Board of Agriculture, from which the following is taken:

Our experience in rearing hogs on sorghum has been very satisfactory and has proved for this district the best way of handling them. We have a hog lot of about four acres including a good orchard, and keep about an average of 100 hogs on hand the year around, selling a bunch say every two months, the little ones that come replacing those sold. The lot is situated on bluffs of the river. The high part is perfectly drained and is never muddy, while the bluffs and trees afford excellent shelter in both summer and winter. In addition to this natural protection we also have warm, dry houses for the hogs in winter.

A general outline of our method is as follows: About April 15th we plowed the lot and drilled it with Folger's Early sorghum, using a bushel or more of seed per acre. This variety grows very rapidly, and within three weeks the hogs were eating the young plants. They rooted some up, of course, but not much, and the growth was such that it kept ahead all summer and afforded excellent feed. If convenient it would be well to keep the hogs out until the cane is a few inches high, at least. In September we fenced off half the lot, where the orchard is, plowed it, and drilled in rye. When a few inches high we let the hogs graze on the green rye, and it made good pasture until May. In the winter we fed fifty cows in the lot outside of the orchard, on sorghum with all its seed on. This was Colman's, and had been listed in, six pounds to the acre. It was very sweet and tender, and yielded at least thirty bushels of seed per acre. Hogs and cattle alike ate it with great relish. Up to April 1st we fed this, two thirds sorghum forage to one third good corn fodder with considerable of the corn left in it. Nothing was wasted except corn stalks, and the animals gained all the time. Then, as soon as the cows were moved from the two acres used as a feed lot, it was plowed up, and after a heavy rain was drilled very thickly with Folger's Early sorghum again. By the middle of May the hogs had deserted the rye patch almost entirely

[CONTINUED ON PAGE 8.]