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Has the largest circulation of any family agricultural or political paper published between Richmond and Atlanta

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

Planting overgrown nursery stock, because it can be secured cheaper than young stock, is a serious mistake. In the first place the cost of handling is much greater, and again, such trees will never make the sturdy and vigorous growth of the younger trees. To use them at any price is poor economy

Gleason's Horse Book was first sold exclusively by agents at $2 00 per copy. A new edition has been issued which contains every word and every illustration in the $2 00 edition, but is printed on lighter paper and has a heavy, tough paper binding. Every man who owns a horse should have a copy. Send us $1 in new subscriptions to The Progressive Farmer or $5 in renewals and we will send you a copy free pre-paid. Don't fail to take advantage of this liberal offer at once.

Reports of the Department of Agriculture, Washington, D. C., show that in 1892 there were in the United States 15,498 140 horses valued at $65 01 each or a total of $1 007,893 636, while in 1897 the total number of horses was 14,364 667, their total value only $452,649,396, or $31 51 per head. Where is the supply and demand argument in this? We find a falling off in number of 1,133 473, and a loss in value of $33 50 per head, a total loss of $554,941 240. Whose loss is it, and why? The Progressive Farmer would like to know.

Secretary Wilson states that the investigations of the Department in tobacco ferments have already born fruit and that some important and entirely new ideas have been brought to light in regard to tobacco curing. The Secretary made a trip to Florida last year to see how the Cubans cured their tobacco. He found, he says, 40,000 Cubans in the State, who had come there to engage in cigar making rather than fight, and he found that they knew nothing whatever about their processes. They cured cigar tobacco according to certain rules because their fathers had done so before them, but he could find nothing as the scientific reasons for doing so. He states that something of high importance to tobacco growers may shortly be looked for from his Department.

Ferments in cider is a subject which Secretary Wilson has caused to be investigated during the past year. Thousands of tons of apple parings, corings and dried apples are exported annually to Europe where they are made into cider, furnished with a ferment which European manufacturers have produced after many years of experiment and study, bottled and shipped back to the United States and sold at high prices. The Secretary states that his agents have been making a study of this subject for some time and have now secured some of the ferment, and he proposes that Americans shall manufacture their own high priced champagne and beverages, give them the "boquet," and keep several million dollars at home which now annually goes abroad for these products.

"If our people will drink these sorts of things," he said, in talking on the subject, "I see no reason why we should not keep the industry within our own borders and work up the apple corings, etc., here instead of shipping off this raw material to Europe and then paying six prices for it when returned to us in the form of beverages with foreign labels."

Senator Billy Mason secured permission from Congress, before adjournment, to investigate the food question during the interim between sessions and look into food adulterations of various products subject to inter state commerce. The Senator has gone into the subject with his accustomed vigor and has secured the services of the Chemical Division of the Department of Agriculture for the purpose of analyses. He expects to have a report for the next Congress which will show to what extent some of our common foods are adulterated. All food which is shipped from one State to another, or abroad, is liable to come under his notice. Senator Mason early announced himself as a champion of pure food and this action shows that he is alive to the necessity of gathering evidence.

The National Department of Agriculture is receiving a large number of requests and inquiries from the islands lately acquired by the United States. From Puerto Rico, Hawaii, the Philippines and even Cuba come requests for seeds of various sorts from Americans and natives. Army officers who expect to stay in the islands for some time send home for grass seed and other products; they want their stations to look something like home. As far as is known Bermuda grass is the best grass for the tropics, but it is difficult of propagation on an extensive scale, as this is carried on by means of cuttings. Secretary Wilson says that no one knows much about propagating by seed, but the Department is now making investigations along this line It is proposed to find out what proportion of the seed will germinate, when it will germinate best and under what conditions. Mr. Wilson says that he expects to have this information soon, and then he will buy up all the Bermuda grass seed in the world for distribution among the islands. Investigation, he thinks, will produce other valuable grasses for those sections. Experiment stations should be established, he states, in all the islands, both for the sake of themselves and the States. The subject of conditions there is something of which but little is known by the Department.

There are a number of seedsmen in the country who are not satisfied with making a fair profit on the seeds they sell, but who resort purposely to adulteration. The seed section of the Department of Agriculture is operated expressly for the protection of farmers and gardeners who buy seeds, and its officers invite the attention and co operation of farmers to make its sphere a useful one. The adulteration of fertilizers was at one time a paying business and farmers were defrauded of thousands of dollars by having their fertilizers adulterated with worthless "filling." This practice has been stopped almost entirely by State regulations, with severe penalties attached for adulterations and these regulations provide that any farmer can have a sample of fertilizer analyzed free of charge by the State authorities or the Experiment Station. The government seed testing operations are conducted on the same order. Many seeds of entirely different plants are quite similar in appearance and it requires expert examination to detect the difference so that the farmer is likely to be imposed upon. While the reputable seed houses use every precaution to protect their customers, there are other dealers who are not only careless but who must deliberately adulterate their seeds. Adulteration is practiced in several ways; by using similar but cheaper seed, by using "tailings" and by mixing trash and weed seeds. In some cases the seeds contained in the trash are killed, but in others, they are not, and in the latter case, the farmer not only actually pays dear for the good seed he gets, but he lays up extra work for himself by planting with his crop seeds, countless weed seeds. In some of the samples received by the Department only a small per centage of the true seed is found; in some instances as little as 25 per cent. Mr. Peters in charge of the seed section has recently sent out a circular to all Grange organizations requesting farmers to send him in samples of the seeds the seeds they purchase, and this invitation the Department extends to all other farmers. The Secretary of Agriculture is authorized by Congress to publish the names of seedsmen who are found to be adulterating seeds and Mr. Peters states that without general co-operation of farmers, it cannot be expected that much actual evidence will be obtained.

An instructive remedial treatment for wheat smut is now being carried on by the Department of Agriculture. It involves no new scientific discovery or principle but the process is interesting. It was found that the various Siberian and Russian grains recently procured by Mr. Carleton and which are now being distributed for trial in various sections of the country, were all badly affected with smut. It becomes necessary, therefore, before distributing it, to cleanse it of this fungus, which is being done by the hot water process, as follows: The grain, in bags holding about a bushel each, is first soaked for five hours and then allowed to drain. Then a bag is immersed in a barrel of water at a temperature of 110 to 120 degrees and held there for a part of a minute, when it is removed and plunged into another barrel of water at a temperature of 132 to 133 degrees In this second barrel it is kept for five minutes, being constantly agitated. The water is kept at exactly the right heat by the introduction of steam through a hose pipe connected with steam pipes, running from a boiler. The grain is then taken from the bag and spread out two or three inches deep on wire bottom trays, and dried off rapidly. The grain, when it finally comes from the water has almost the consistency of stiff dough and to the uninformed would appear to be ruined for planting purposes. As a matter of fact, however, grain so treated is not only free from all smut, but it germinates more readily and surely than that which is untreated.

AGRICULTURE.

GOOD ADVICE.

Keep the hoe sharp by filing from the inside of the blade, leaving the side next the ground perfectly level. Keep the corners sharp and square as long as possible, and clean the blade before putting it away. A sharp, bright hoe is a comfortable tool to use, and one with which a great deal of work can be done, No farm tool has ever been invented with which so many kinds of work can successfully be done as with the hand hoe.

When the hoe is bought buy a file to sharpen it with, and the first thing give it a good filing and then rub linseed oil on the handle until no more will soak in. If linseed oil is not handy any kind of oil, or even lard or tallow, will improve it in flexibility and durability. Take pains to get the oil or grease well worked in at the shank so as to prevent water from getting in and loosening the handle. A hoe should be good for several years, and after it has been used for two or three years it will be better than when new, as the blade will become worn thin and it will be lighter to handle, while just as serviceable as when new.—Ex.

BERMUDA GRASS.

Bulletin 44, of the United States Department of Agriculture, "Economic Grasses," contains brief descriptions of the most important grasses of this country or those which have been introduced because possessing some merit. Of Bermuda grass the bulletin says:

A grass widely dispersed over the tropical regions and warmer countries of the globe. It has a creeping habit of growth, extending over the surface of the ground and rooting at the joints. In poor soils the leaves are short and the upright flowering stems are only a few inches high, but on good land it grows to the height of 1 to 2 feet and yields a large amount of excellent hay. It may be cut three or four times during the season. In the Northern States it does not afford a profitable crop and is of little value for pasturage north of Virginia, but in the Southern States and in the warmer regions of the Southwest and on the Pacific slope it is cultivated extensively and is most highly prized, chiefly for grazing, all kinds of stocks being exceedingly fond of it. It grows freely on sandy soils where other grasses will not thrive, and resists extreme drouth and high temperatures. It is particularly a sun loving grass, and will not thrive in the shade. It is useful for binding drifting sands and the loose soil of embankments or those subject to wash. It makes a pleasing lawn grass, and is extensively used for this purpose in the hotter portions of the United States, for it will thrive where the grasses ordinarily employed for lawns could not survive. The yield of hay under good conditions is from 3 to 4 tons to the acre, and as high as 10 tons to the acre have been produced under peculiarly favorable circumstances.

While this grass will survive the winters of the latitude of Philadelphia, the leafage is very sensitive to cold and turns brown with the first frosts. This fact renders it objectionable as a lawn grass, except in regions where the winter season is very mild. In many portions of the Southern States there is probably no grass equal to Bermuda for summer pastures, and none which will better resist the trampling of stock. Bermuda does not mature seed except in the southern portion of our country, but seed obtained from more Southern latitudes is offered for sale by some of our leading seed dealers. The most direct and certain method of propagation is by transplanting which may be effected by cutting up Bermuda turf into small pieces, scattering these along shallow furrows and covering them lightly. When once established, Bermuda grass is very persistent and difficult to eradicate, and it should not be introduced upon land which is likely to used for other crops.

UNNEIGHBORLY ACTS.

It is not much trouble to be neighborly, which is simply practicing the golden rule. But there are some things that some people do that are not considered unneighborly and yet they are. It is a most unneighborly act to permit a scrub male animal to run in the highways and break in among thoroughbred stock. There is scarcely anything a man can do that is more vexatious. Certainly he will hardly do anything that is more seriously disastrous to financial interests of his neighbor. The chronic borrower is not neighborly; far from it. People do not like to refuse to loan things when asked, but usually they would prefer not to do it, especially if the borrower is a chronic one. But it seems that some people do not hesitate to borrow anything from an expensive piece of machinery to a rake or hoe. As a rule this is not the result of inability to purchase, but an utter carelessness to provide himself with what he needs. It is unneighborly to live otherwise than with a regard for public opinion. We may not believe as the rest or the community does in regard to certain matters, and it is our right to dissent from their belief, if we wish to, but it is unkind and unneighborly to purposely wound the feelings of other or to shock the community' sense of propriety.—Francis King.

EXPERIMENTS IN CORN CULTIVATION.

During 1897 the most exhaustive experiment ever conducted by the Illinois Agricultural Experiment Station in the cultivation of corn was carried on under the direction of Prof. Holden.

From a circular sent out by the director last spring we learn that these experiments were undertaken in order to determine the effect of different depths of cultivation upon the growth, development and yield of corn; to find the influence of several of the most important cultivators in common use upon the moisture of the soil; to test their efficiency in removing weeds and their final effect upon the soil; to note the condition of the soil at the end of the season, and the yield of ears and stalks as the result of the various methods of cultivation.

The plan of the experiment was as follows: A piece of ground was selected that was as nearly level as possible. It was plowed about six inches deep with a three horse breaking plow the last of April and harrowed immediately after plowing. The corn was planted the 8th day of May and after it came up the whole field was harrowed once and then rolled. Four rows running the length of the field were devoted to each kind of treatment, and each treatment of four rows was divided into twenty divisions, one of which was cut out to find the effect of the cultivations upon ground on which no crop was grown. In this way each experiment was divided into twenty sections, in order that any difference in yield that might be due to a possible difference in soil could be detected and eliminated. Four rows on either side of the field were cultivated in the ordinary way, about three inches deep with a small shovel cultivator through the season in order to get a standard for comparison. In finding the yield, the two inside rows of each treatment were taken and the outside rows discarded, for the reason that they might have been influenced by the different treatments of the rows adjoining. The weight and number of ears, and the weight of stalks were found separately for each plant. The yields added together gave the total yield for each treatment.

The per centage of moisture in the soil under the various systems of treatment was found by accurately testing the amount of moisture of the ground for three depths—nine, eighteen and twenty-seven inches, respectively. This was done for each kind of cultivation, once a week during the entire season, and the results here given are the totals for the season.

TABLE SHOWING EFFECT OF DIFFERENT DEPTHS OF CULTIVATION.

	2 in.	4 in.	6 in.
W't of ears, lb	466 5	466	437
W't of stalks, lb	465	485	431
Numbers of ears	1003	1086	1168
Per cent. of moisture	451	474	468.5

An ordinary small shovel cultivator with four shovels on a side, was so arranged that the shovels could be set to run accurately at 2, 4 or 6 inches in depth and maintain this depth throughout the cultivation.

The shallow, or two inch cultivation required hand-weeding, but the deeper cultivations thoroughly removed all of the weeds. The deep cultivation left the ground ridged at the end of the season, while the shallow cultivation left the soil in a level condition. The corn grew most rapidly during the early part of the season upon the deeply cultivated plats, but during the latter part of the season the corn on the shallow cultivated plats developed most rapidly. The vigorous early development of the corn on the deep cultivated plats was due to the opening up of the soil to the air and sunshine, while root pruning at the latter end of the season tends to retard growth. Briefly summing up the results of the different depths of cultivation we can say that these facts seem to indicate that deep cultivation removes weeds thoroughly and tends to conserve soil moisture, but that it leaves the ground in a bad condition at the end of the season, and by reason of severe root pruning injures the plant so much that the yield of ears and stalks is greatly reduced. Shallow cultivation does not thoroughly remove weeds, is not as efficient in conserving moisture, does not tend to induce as vigorous early development as does deep cultivation, but it leaves the ground in good condition at the end of the season, and does not injure the plant by root pruning as does deep cultivation.

HUMUS.

All animal life is nourished and sustained by what it eats and drinks and the air it breathes. So is plant life nourished and sustained by what is digested for it out of solid substances, the moisture in the soil, and the air plants breathe through their leaves, which are the lungs of plant life. Until farmers comprehend the philosophy of animal and plant food digestion they are walking up hill, and backwards at that.

The mistaken conclusions in the farm world to day is the result of trying to get at the truth by reasoning backwards and inwards—from results and effects to cause. The progressive farmer reverses that—begins with cause and reasons forward and outward to results or effects.

Humus is defined as a brown or black refuse of animal or vegetable matter. It is infinitely more, and the object of this series of papers is to invest it with a dignity it deserves. When the farmer sees its usefulness and importance and his dependence upon it, and how easily and cheaply he can fill his soil with it, then his pockets will begin to fill with gold.

The earth is the first in importance in plant growth. The earth is the womb of the world for seeds and plant germs. Out of which they come in a form of life each its own.

Next to the earth, humus is second in importance. It is the basis for the development of the forces that utilize the sunshine—heat, light, air, organic life, electricity, nitrogen, the phosphates, potash—in fact all the elements that enter into plants after and through the plants into animal life, and that help to build up the soil.

Humus is also the seat of plant intelligence that guides and controls the forces that send the quality that makes leaf, stem, root, seed or fruit, to its allotted places. Humus is the carbon (fire property) of animal or vegetable refuse. It is the coal of fire; burning very slowly, as it does, it assists in the oxydation or burning up of this refuse. It is the concentrated heat or stored-up sunshine or "storage battery." The slow fire it keeps up makes a proper temperature to act as "culture" or "hot bed" for the germs of organic life, some of which are always present except in soil absolutely barren. Humus is that which these forms of life can attach themselves to or cling to. It is a home for them—a hive in which they can work.

The presence of humus is an absolute requirement in plant growth of the kinds farmers grow. These life mites have their digestive functions and a capacity for breathing air or fixing nitrogen. Therefore, a soil rich in humus, teeming with life, has the ability and raise the temperature of the soil several degrees. And we call it a warm, rich, live soil.

On the other hand, a soil deficient humus does not invite this form of life. There is nothing for it to cling to, no basis upon which it can develop, no culture plant or hot bed to warm into life these dormant germs. And we call such a soil cold, clammy—a poor, dead soil—and speak the truth. It will be upon such soils (without humus) you will find "toad hair," wire grass, sour sorrel—and they only grow upon sour soils, acid soils.

Each of the plants (there are many others) develop the peculiar conditions that brought them into existence, and at the same time develop other conditions that destroy other better types of vegetation. And it is where the plants named grow the acids that sour the soil are developed. And you can't grow sweet, nutritious plants upon such land. The corn, wheat, oats or grass grown there partakes of like qualities.

Aerate this soil by filling it with decaying animal or vegetable matter (humus), fertilize it, ond you kill out the "toad hair," wire grass and sour sorrel, and sweeten the soil, and the clovers come seemingly of themselves. We must remember clover is somewhat of an aristocrat. It must have good food, clean soil, pure air and humus. It won't grow on poverty points.

If plants and animals live upon food, drink and air, how do they change them into animal forms, or plant growth? To know how will help us to see the necessity of humus, and the waste of plant food and animal food, and how it takes place.

What the progressive farmer ought to be seeking for in these times of low prices and sharp competition is the way to get maximum crops at a minimum expense.

The mission of the agricultural press and farm institutes is to help him.

R. S. Cook, of Kansas, took first prize at the World's Fair on "pigs" over five and under twelve months old. It was awarded to five of his "pigs" eleven months old; the average weight was 528 pounds.

The most startling thing about it is that this phenomenal result was made on less rich concentrated food than the average farmer feeds out to get 200 to 300 pound "hogs."

One purpose of these papers is to show farmers how Mr. Cook got 528 pound "pigs" and "why" the average farmer only gets 300 pound "hogs." Also why one farmer will get double the results out of the same quantity of manure or fertilizing materials, and often at a less expense. The secret of this is the "why" one farmer fails and "how" another succeeds

Mr. Cook made and maintained almost perfect conditions. Other feeders do not educate themselves to their importance and are indifferent as to results. If our animals are made out of plants, then, to get the most animals we must get the most plants. It follows that to get the most plants we must make and keep up the best soil conditions.

[CONTINUED ON PAGE 8.]