

# Why We Should Fertilize the Soil

By BURT E. POWELL

MOTHER'S best friend is his mother—the earth. All she asks is the opportunity and she will yield him the wealth of an account that has been growing for ages. And he has treated her as he usually treats his best friends. He has taken all she had to give, bought an automobile and a house in town and then hid his address from his relatives of the soil for fear they would bring their earthy smell into his new residence.

With quiet indifference old Mother Earth endures this ingratitude, but the time comes when she has nothing for his greed. What happens then? Look to India for one answer. Ten million of our own Aryan blood starve there in a single famine year—starve upon a soil that once was, and still could be, almost inconceivably fertile.

Russia offers another reply, where with stomachs empty men enter a world that never fills them. Yet another answer, centuries old, may be found in the Tigris-Euphrates valley, which, once marvelously fertile, now scorches uselessly in the tropic sun. The necessity of man forged a weapon that brought him plenty; but the greed of man forged a weapon that brought him penury. For do you think there can be prosperity when the earth no longer yields? Do not forget that the shame of Rome was coincident with the time when one bushel of seed returned but four in the harvest. When the soil exploited, that is when it is so farmed that the essential elements are taken out in crops and nothing returned to build it up, the result

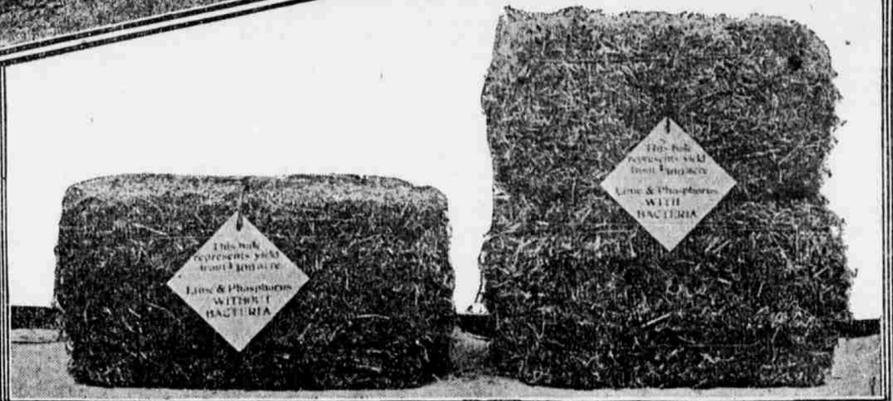


TWO FIELDS OF CLOVER IN SOUTHERN ILLINOIS SHOWING EFFECT OF USING LIME STONE ROCK PHOSPHATE IN ADDITION TO MANURE



CORNFIELD IN URBANA, ILL. 3 YEAR ROTATION, NO TREATMENT

is exactly the same as when men are exploited in workshops and nothing returned to build up their bodies. You cannot haul phosphorus and nitrogen in oats and wheat and corn from your farms year after year and maintain the fertility of the soil, if you give back no phosphorus and nitrogen in return. Twelve thousand abandoned farms in the state of New York alone testify to this. After sixty years of cultivation the lands of the corn belt are beginning to hint at the same thing.



ALFALFA—SHOWING ADVANTAGE OF HAVING THE SOIL INOCULATED WITH BACTERIA

We all feel the results; and it is not the man with the hayseed in his hair who feels it first but the man with the pen behind his ear. Month by month the price of each separate commodity puts a little large puncture in his salary, until by the end of the year his savings, which began hopefully, as an unknown quantity, have ended as "X=nothing." He it is who knows the cold dread of middle age; for unless the land can be induced to yield abundantly prices will not settle down to the point where the man on a moderate salary can live free from fear. Farmer and clerk alike, we are all vitally concerned in this problem of maintaining and increasing the fertility of the soil that is fertile, and of restoring soils that have been cruelly exploited. Fortunately they can be restored. Intelligence is more potent than avarice and can undo the evil it has wrought. Even those soils that have been exploited to the point of apparent ruin can be nursed back to health. Dr. Cyril Hopkins, head of the agronomy department of the University of Illinois, a soil specialist of national reputation and the author of numerous pamphlets and a book entitled "Soil Fertility and Permanent Agriculture," is one of the most enthusiastic workers along this line. He is a man of hard facts and loves pretty theories even as the devil loves holy water. Every fact that he gives out must prove itself over and over again in tests upon his own farms, or those belonging to the university or upon one of the various experimental plots. There are about thirty of these plots scattered through the state of Illinois, where the soils are carefully examined and then cropped according to their needs. I could tell you tales of what Mother Earth has done in the way of corn, wheat, oats, or clover when she has received proper treatment that would set you to building castles in the air upon an earthy foundation. The corn yield upon one of the university farms in 1909 was 87 bushels to the acre, due to treatments with limestone and phosphorus. But before we go farther

let us consider a few fundamentals of crop growing. First, there are six positive, absolutely essential factors. They are: (1) the seed, (2) the plant home, (3) the food of which the plant is made, (4) moisture, (5) heat, (6) light. Now, except in the case of the seed and plant food these factors are largely beyond the farmer's control. Dame Nature can, however, be trusted to attend to them satisfactorily. How, then, has the farmer made use of his ability to control the two factors? By exercising judgment and care in the selection of seed and by ignoring the matter of plant food entirely. The result? When the land was worn out and had no plant food to give the good seed the agriculturist arose irately in farmers' institute and told what he thought of the seed seller. The trouble all the time was not with the seed but with the soil, which had had the elements of plant food removed in previous crops, and as a consequence could not respond to the call of the seed.

What are these elements? There are ten in the list, but eight are provided abundantly. Three—oxygen, hydrogen and carbon—come directly from the air and water. Most normal soils contain enough potassium, magnesium, iron, calcium and sulphur, although sometimes the first must be supplied. The problem of plant food, therefore, narrows itself, in most cases, to maintaining and increasing the phosphorus and nitrogen.

Now nitrogen is as easy to catch as the measles if one knows how. The air contains it in inconceivable amounts. Dr. Hopkins has estimated that the air above an acre of ground contains about \$10,000,000 worth, if sold over the counter at ordinary commercial rates. In order to induce this nitrogen to enter the earth, where it may reappear as food for man, all that is necessary is to plant clover, alfalfa, peas or any legume. By means of the bacteria upon the roots these legumes draw the nitrogen into the soil. How necessary the element

of nitrogen is may be seen from the fact that a 100-bushel crop of corn takes from the soil almost 100 pounds of nitrogen in the corn and about 48 pounds in the stalks. Rich, well-balanced land in the corn belt contains about 8,000 pounds of nitrogen. Therefore, if the process of subtraction of nitrogen goes on year after year with never an addition, it can be seen clearly that the farmer's finances cannot multiply. Rotation plans for grain farmers always should include a crop of legumes. Wheat, corn, oats and clover is a satisfactory rotation; also wheat, corn and cow peas; also cotton, corn and oats and cow peas. The first of these rotations should include a catch crop of clover seeded the first year and plowed under for corn as late as practicable the second year. The other two should include catch crops of legumes whenever possible. Legumes when plowed under perform valuable services besides supplying the soil with nitrogen—as they decay they supply organic matter to the soil which helps other elements of plant food to free themselves from the earth and into the farmer's bank account.

Now that the question of nitrogen has been outlined, suppose we turn to the problem of phosphorus, the only element of plant food we ever shall have to buy. As to the importance of the use of phosphorus upon the common soils of the United States, Dr. Hopkins has this to say:

"Phosphorus is the key to permanent agriculture on these lands. To maintain or increase the amount of phosphorus in the soil makes possible the growth of clover or other legumes and the consequent addition of nitrogen from the inexhaustible supply in the air; and with the addition of decaying organic matter in the residues of clover and other crops and in manure, made in large part from clover, hay and pasture, and from the larger crops of corn and other grains which clover helps to produce comes the possibility of liberating from the immense supplies in the soil sufficient

potassium, magnesium and other essential abundant elements supplemented by the amounts returned in manure and crop residues for the production of large crops at least for thousands of years; whereas if the supply of phosphorus in the soil is steadily decreased in the future in accordance with the past and present most common farm practice, then poverty is the only future for the people who till the common agricultural lands of the United States."

Phosphorus may be applied in liberal amounts—as much as 1,000 pounds to the acre every three or four years—and it costs about \$7 a ton.

After the problem of returning the elements to the soil has been solved the farmer may find another condition of the soil which must be corrected before his farm will produce as it should. This is the tendency of certain soils to acidity. Clover, alfalfa and other valuable legumes cannot thrive upon soil that is sour. Sometimes on acid soils when applications of farm manure are made, the legumes will seem to grow well, but examination reveals the fact that the nitrogen gathering bacteria fail to develop properly. Hence the most valuable contribution the legumes have to make to the soil is largely lost. Upon certain fields belonging to one of the most famous agricultural stations in the world, that of Rothamstead, England, applications of natural limestone were made a century ago. They are still moderately productive, although other fields near by, which have never received the application, are extremely unproductive.

Care should be taken that limestone is used for the one and only purpose of correcting soil acidity.

And while we are upon this subject of soil stimulation, have you ever thought that most of our improvements have that in view and that only? Improved seed, improved machinery, irrigation, even crop rotation, all are means for extracting from the soil the richness that is in it, not for returning any of the food elements of grain building. All of these methods of soil stimulation are excellent in their way, if used in connection with methods of returning the elements of plant food; but if used without them they are means of hastening the impoverishment of the soil.

To return to the question of limestone, one ton to the acre finely ground will correct the acid condition of most soils. It is, however, in the end cheaper and easier to apply more and to apply it less often. As much as ten tons to the acre was applied to the soil of one of the experiment fields in southern Illinois and the crop yields there have been greater than upon any other fields in that district.

A question that has been given much attention lately is the question of crop rotation. Undoubtedly it is absolutely essential for successful grain farming, but it is not the universal panacea some would have us believe. For instance, a group of theorists have declared that fertilization is unnecessary, that crop rotation will keep the soils in perfect condition. The idea is that plants do not injure the soil because they use its plant food elements but because they throw off poisonous excreta as animals do. Therefore a so-called worn-out soil simply has become saturated with this excreta. Plant a crop which will neutralize the poison of the last crop and the soil will be sweetened and the breasts of Mother Earth kept dripping with plenty forever. This is very attractive—as a theory. It has, however, no foundation in fact. As Dr. Hopkins has said, the rotation of crops has just the same effect upon wealth in the soil as the rotation of the check book among the members of the family has upon the wealth in the bank. Plant food elements cannot be used up and not returned without resulting in impoverishment of the soil.

## WHAT HE CONSIDERED FAIR

Mr. Olsen's Offer Must Have Come As Surprise Even to Persuasive Claim Agent.

Up in Minnesota Mr. Olsen had a cow killed by a railroad train. In due season the claim agent for the railroad called.

"We understand, of course," said the deceased was a very docile and valuable animal," said the claim agent in his most persuasive claim-agently manner, "and we sympathize with you and your family in your loss. But, Mr. Olsen, you must remember this: Your cow had no business being upon our tracks. Those tracks are our private property and when she invaded them she became a trespasser. Technically speaking, you, as her owner, became a trespasser also. But we have no desire to carry the issue into court, and possibly give you trouble. Now, then what would you regard as a fair settlement between you and the railroad company?"

"Well," said Mr. Olsen slowly, "Ay baen poor Swede farmer, but Aye shall give you two dollars."—Everybody's.

### Wrong Guess.

It was exhibition day at No. 3, and as the parents of Jack Grady, the dullest pupil, were listening hopefully, the teacher tried her best to help the boy. "How did Charles I. of England die?" she asked, assigning the easiest question on her list to Jack. As he looked at her, with no indication of a coming answer, the teacher put her hand up to her neck. Jack saw the movement and understood its meaning, as he thought, "Charles I. of England died of cholera," he announced briskly.—Youth's Companion.

### \$100 Reward, \$100.

The readers of this paper will be pleased to learn that there is at least one dread disease that science has been able to cure in all its stages, and that of Catarrh. Hall's Catarrh Cure is the only positive cure now known to the medical fraternity. Catarrh being a constitutional disease, requires a constitutional treatment. Hall's Catarrh Cure is taken internally, acting directly upon the blood and mucous surfaces of the system, thereby destroying the foundation of the disease, and giving the patient strength by building up the constitution and assisting nature in doing its work. The proprietors have so much faith in its curative powers that they offer One Hundred Dollars for any case that it fails to cure. Send for list of testimonials. Address F. J. CLEGG & CO., Toledo, O. Sold by all Druggists. Take Hall's Family Pills for constipation.

### She Probably Could.

Senator La Follette, apropos of certain scandals, said at a dinner in Madison: "These things recall the legislator who remarked to his wife, with a look of disgust: 'One of those land lobbyists approached me today with another insulting proposition.'"

"The wife, a young and pretty woman, clasped her hands. 'Oh, good!' she cried. 'Then I can't have that sable stole, after all, can't I, dear?'"

### "SPOHN'S."

This is the name of the greatest of all remedies for Diarrhea, Pink Eye, Hoarseness, and the like among all ages of horses. Sold by Druggists, Harness Makers, or sent to the manufacturers, \$2.50 and \$1.00 a bottle. Agents wanted. Send for free book. Spohn Medical Co., Spec. Contagious Diseases, Goshen, Ind.

### So They Say.

Stranger—I say, my lad, what is considered a good score on these links?

Caddy—Well, sir, most of the gents here tries to do it in as few strokes as they can, but it generally takes a few more.—Scottish American.

**TRY MURINE EYE REMEDY** for Red, Weak, Watery, Watery Eyes and Granulated Eyelids. Murine Doesn't Smart—Soothes Eye Pain. Druggists Sell Murine Eye Remedy, Liquid, 25c, 50c, \$1.00. Murine Eye Salve in Aseptic Tubes, 25c, \$1.00. Eye Books and Eye Advice Free by Mail. Murine Eye Remedy Co., Chicago.

### Her Tribute.

Randall—How did you like the military parade, Ida?

Miss Rogers—Glorious! I never saw enough men in all my life before.—Harper's Bazar.

Mrs. Winslow's Soothing Syrup. For children teething, softens the gums, reduces inflammation, allays pain, cures wind colic. 25c a bottle.

When a man dresses like a slouch it's a pretty good sign that he either ought to get married or get divorced.

Many who used to smoke 100 cigars now buy Lewis' Single Binder straight 50.

A woman hates her enemies longer than she loves her friends.

**A TRULY BENEFICIAL AID** in cases of Poor Appetite, Headache, Heartburn, Sour Risings, Bloating, Indigestion, Dyspepsia, Costiveness, Biliousness and Malaria, Fever and Ague is Hostetter's Stomach Bitters. For over 57 years it has been assisting sickly and run-down people back to health, and its friends are therefore, legion. You really ought to try this wonderful remedy at once and be satisfied that it is the only one you need to keep you healthy.

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