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Farm Extension Service

By H. H. ELLIS, County Agent

USE OF FERTILIZERS

As it is now near time to plant corn, many of us are wondering what fertilizer will pay best, if any. In the discussion of fertilizer it is necessary that all know the meaning of certain terms used.

Phosphorus is a mineral element that is not present in most soils in sufficient quantities in available form to produce a maximum crop. This element is supplied alone in the form of "acid" phosphate.

Potassium, commonly known and represented on fertilizer bags as

potash, is also a mineral element not present in sufficient available form in some soils to produce maximum yields of some crops.

Nitrogen is also an element in the soil. It is seldom present in the so-called "poor" soils and run-down soils in sufficient quantities to produce maximum crops. It is the most expensive element of fertility we have to buy when procured in form of commercial fertilizer. However, fortunately, there is a family of plants, known as legumes (clovers, peas and beans) which when inoculated with the proper bacteria which

live on the roots and gather nitrogen from the air, that will add this element to the soil if they be turned under or cut and fed to livestock and the manure returned to the land from which the hay came. They may be also grazed by livestock to advantage and a large part of the nitrogen retained. The art of keeping the soil well supplied with cheap nitrogen is one that should be acquired by every farmer if he would be successful.

Calcium is also sometimes lacking in the soil and is supplied in form of lime which also has the power to sweeten sour soil and make possible the growing of certain legumes which supply the land with cheap nitrogen.

Humus is also an important factor in the soil but it is not a chemical element. It is decayed or decaying organic (vegetable) matter in

the soil. It has the effect of preventing the soil from running together and adds to the water holding capacity of the soil. In other words it improves the physical condition of the soil. Makes it easy to work. When fully decayed it releases nitrogen in the soil but unless the humus came from turning under a legume crop or manure, no nitrogen is added to the total amount in the soil. That is with the understanding, however, that all the vegetable matter that went to form the humus grew on the land in question. If it came from another field it would add to the field on which it is turned under but take from the field on which it grew. It is necessary to have plenty of humus in most soils to get a maximum yield.

You can see that only with a clear understanding of the above terms

can we proceed with a discussion of the use of fertilizer and get any benefit from it. So far as practical purposes are concerned then, the only chemical elements that are ever lacking in the soil are phosphorus, nitrogen, potassium (potash), and calcium. Of these the first are the only ones to consider in commercial fertilizer. The other is supplied in form of lime which should be applied to all sour soils that will not grow a good crop of clover. The three are seldom all lacking in any country. Sandy land usually needs all three elements. Most clay soils have plenty of potash for general field crops except a heavy crop of Irish potatoes. Most soils of this type need phosphorus and, if poor or run-down, nitrogen also. The soils of this county belong to this type. There are a few favored soils that need only have the nitrogen supply kept up. Since our soils are supplied with potash, we do not need to buy a complete fertilizer except for potatoes or vegetable crops. By a complete fertilizer, we mean a fertilizer as 8-2-2, containing phosphorus 8 per cent, nitrogen 2 per cent, and potash 2 per cent. Other examples of complete fertilizers are 10-2-2, 8-3-3, 10-4-4, 8-3-5, etc. Anything containing the last of the three figures we do not need. To buy a complete fertilizer then for a field crop, except potatoes and vegetables, would be to buy one element that we could not use in this county. If one desires then to use a mixed fertilizer it should have the last "0", as 10-3-0, which would mean that it contained 10 per cent phosphorus, 3 per cent nitrogen and no potash. It usually pays when buying a mixed fertilizer to buy as high grade as obtainable because in the low grades one has to pay freight on a lot of sand "filler." It usually pays still better to buy straight grade material and mix your own fertilizer. However, in this case it is necessary to study the amounts to mix to get the proper amount of each element in the mixture. Phosphorus can be bought in form of acid phosphate. Nitrogen is usually obtained in form of nitrate of soda, and potash in the form of potash or sulphate of potash. I would be glad to assist anyone who wishes to mix their own fertilizer in getting materials and compounding proper amounts, etc.

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From the foregoing it requires but little study to see that it does not pay to put a lot of acid phosphate on land too poor in nitrogen and humus to make a good crop possible. Acid phosphate is a cheap fertilizer but a good one, if supplied to land that is well supplied with humus and nitrogen. No corn should be put in in this county on land that is good enough to make corn at all without from 200 to 500 pounds of acid phosphate. On most land it will pay to top dress twice with nitrate of soda. Once with 100 pounds at first cultivation, and once with 100 pounds at last cultivation. This is especially valuable when it is desired to grow corn on land too poor to make a good crop without some kind of nitrate fertilizer. On land which has had a good legume crop turned under or a heavy application of manure, it is not so important to top dress with nitrate of soda but acid phosphate should be used in larger applications than where the land is not well supplied with nitrogen. Go easy with the acid phosphate on poor land where you do not expect to use a top dressing of nitrate of soda. Some acid should be used under a legume crop grown for the improvement of the soil. I should like to repeat again that nitrogen is an expensive fertilizer when bought in form of commercial fertilizer and one should add this by growing peas, soy beans, or clovers, and turn them under, graze them off or cut them for hay and feed them to livestock, returning the manure to the field from whence it came. Take good care of the manure so that no fertility is lost. Do not pile manure up in a loose pile, either under a shed or out in the open, but move it directly from the stable to the field scatter it and turn it under or disc it in. No fertility is added by growing soy beans or cow peas on land and cutting them off unless they are returned in form manure. There is considerable loss of fertility instead.

It is my advice in a general way to lime the land if it needs it to grow a good crop of clover, grow clover and feed or turn it under, use liberal applications of acid phosphate, and in some cases top-dress with nitrate of soda. In connection with this use GOOD livestock. But that is another question I wish to discuss at a different time.