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Timely Farm Suggestions

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AS YET few, even of our best farmers have appreciated the amount of humus forming material which must be added to our soils to supply the demands of large and profitable crop production. It is this almost complete absence of anything like a true idea of the amount of feeding our soils require that is our justification for eternally and everywhere insisting on a more liberal treatment of our soils.

What About a 10-4-4 Fertilizer?

A GEORGIA reader asks if a 10-4-4 fertilizer, using 1,000 pounds per acre, will be good to use on cotton and corn.

On the same sort of soil we think a fertilizer for corn should contain rather more nitrogen or a larger proportion of nitrogen than one for cotton. Unless the land is very thin we think 4 per cent of nitrogen rather large in proportion to the other plant foods in this fertilizer and if the land is thin 1,000 pounds is very heavy fertilization, possibly too heavy to be the most profitable on such a thin soil.

On a fairly good soil 1,000 pounds of fertilizer containing 10 per cent of phosphoric acid and 4 per cent of potash may prove profitable, but we doubt if for cotton it will pay best to use 40 pounds of nitrogen, which is the amount of nitrogen in 1,000 pounds of a fertilizer containing 4 per cent of this plant food.

For corn, we think the plant foods in a 10-4-4 fertilizer better proportioned, but if the season is not ideal as regards moisture supply we doubt if it will be most profitable to use 1,000 pounds of such a fertilizer on corn. The cost of the 100 pounds of phosphoric acid at 4½ cents, 40 pounds of nitrogen at 20 cents, and 40 pounds of potash at 5 cents (last year's prices), amounts to \$14.50. At 60 cents a bushel, the increase in yield will have to be 24½ bushels to pay for the fertilizer alone. On fairly good land and a favorable season such an increase in yield might be obtained, but the risk is too great to justify such expensive fertilization of corn on average soil an ordinary year. We would advise the use of not more than 400 or 500 pounds of such of a mixture. If, however, increase in yield, regardless of cost, is the object, it is probable that 1,000 pounds of the fertilizer will produce a larger yield.

Where Nitrogen Is Not Needed for Cotton

A LOUISIANA reader writes as follows: "I have a four-acre plat that I am going to plant in staple cotton. Last year the land grew oats followed by peas, peas were removed and stubble turned under in November. I have applied five tons of stable manure per acre, broken 10 inches deep and disked and harrowed. I have recently come to the place and there is fertilizer on hand, but I do not know the analysis. I am instructed to put on 900 pounds of this commercial fertilizer per acre. The land looks rich and I believe 900 pounds of commercial fertilizer too much to apply. What do you think?"

Land which "looks rich," grew a crop of peas last summer and has had five tons of stable manure applied to the acre certainly should not need any nitrogen applied in commercial form for cotton. This commercial fertilizer on hand is assumed to be a complete fertilizer, and therefore, it

seems probable that if 900 pounds is applied per acre, somewhere between 15 pounds and 25 pounds of nitrogen will be added in this fertilizer at a cost of from \$2.50 to \$5 per acre.

We would save this fertilizer for some crop on land that had not recently grown a crop of cowpeas and had an application of stable manure, and apply to this plat of cotton 500 to 600 pounds of acid phosphate per acre in the drill before planting. If there is any tendency for the cotton on this land to suffer from rust we would add 100 pounds of kainit per acre.

This advice is given with the idea that the land in question responds to the use of commercial fertilizers. There are stiff buckshot lands in Louisiana which may give no profitable increase in yield from commercial fertilizers, but will be benefited very much by the peas and stable manure.

Another Fertilizer Problem

A MISSISSIPPI reader says he has the following fertilizer, but thinks 100 pounds of kainit should be added to 200 pounds of the fertilizer, and when thus mixed he proposes to use 400 pounds to 450 pounds per acre:

Water soluble phosphoric acid	8 per cent
Citrate soluble phosphoric acid	2 per cent
Nitrogen	1.65 per cent
Potash	1.50 per cent

He also asks if "we get any good from the citrate soluble phosphoric acid."

The land on which this fertilizer is to be used grows sufficient stalk and our opinion is asked of the whole problem.

In the first place, all experiments at the experiment stations of Mississippi indicate that a fertilizer for cotton needs no potash at all, unless it is used on land where the cotton suffers from rust. We, therefore, think that the 1.5 per cent of potash already in the fertilizer will be wasted and the addition of kainit will simply increase the waste, unless the cotton on this land suffers from rust. Even if the cotton is likely to suffer from rust, the amount of kainit suggested, added to the potash already in the fertilizer, is more potash than is probably necessary.

If the bottom lands make sufficient growth of stalk without fertilizer the nitrogen applied will also probably be wasted, for it will serve to increase the growth of stalk. On such land phosphoric acid alone is probably all the fertilizer needed except when the cotton rusts and then, as stated, about 100 pounds of kainit per acre should probably be used. On lands that usually make sufficient growth of stalk we advise using no nitrogen in the fertilizer before planting, but if when the cotton is about to begin blooming it shows it is not making a sufficient growth of stalk a side dressing of from 50 to 100 pounds of nitrate of soda per acre may be given.

The citrate-soluble phosphoric acid is probably as valuable as the water-soluble and is always included in the "available" phosphoric acid in a fertilizer. The guarantee on this fertilizer might as well have been:

Available phosphoric acid	10.00 per cent
Nitrogen	1.65 per cent
Potash	1.50 per cent

If 100 pounds of kainit is added to 200 pounds of this mixed fertilizer the 300-pound mixture will have the following analysis:

Available phosphoric acid	6.67 per cent
Nitrogen	1.10 per cent
Potash	5.17 per cent

A FERTILIZER ANALYSIS THAT MISLEADS

Confusing Fertilizer Formulas Are Sometimes Made So Intentionally—Misleading Statements Should Be Prohibited by Law

A READER sends the following guaranteed analysis of a fertilizer and asks for information regarding it:

7 PER CENT POTATO GUANO	
Guaranteed Analysis	
Nitrogen	5.76 per cent
Ammonia	7.00 per cent
Soluble phosphoric acid	3.00 per cent
Reverted phosphoric acid	3.00 per cent
Available phosphoric acid	6.00 per cent
Insoluble phosphoric acid	3.00 per cent
Equal to bone phosphate of lime	17.00 per cent
Potash (actual)	5.00 per cent
Equal to sulphate of potash	9.25 per cent

1. "The analysis states:

5.76 per cent of nitrogen;
7.00 per cent of ammonia;

"Am I getting 12.76 per cent of plant food or 5.76 per cent as I understand it? From what source is the ammonia and is it soluble or insoluble?"

2. The analysis gives:

Potash (actual), 5 per cent;
Equal to sulphate of potash, 9.25 per cent.

"Am I getting 14.25 per cent of plant food or 5 per cent, as I understand it? What is meant by 'equal to sulphate of potash 9.25 per cent?'"

This is rather an extreme case of a "guarantee," stated in such a manner as to mislead the average farmer. If there is any good purpose in stating a guarantee of this fertilizer it is to give the farmer or buyer information regarding its composition or the plant foods it contains. This guarantee gives a part of the information required, but adds other useless statements which, while adding nothing to the information conveyed to the man familiar with such matters, mislead and confuse those less familiar, such as the average users of commercial fertilizers.

All that this guarantee tells about the nitrogen it contains is included in, "nitrogen 5.76 per cent."

The addition of "ammonia 7 per cent" tells nothing that is not told in the statement of the nitrogen. In fact, there is really no "ammonia" in the fertilizer. The nitrogen in this fertilizer (5.76 per cent) if combined with hydrogen to form ammonia would form a certain amount of ammonia. In other words 5.76 pounds of nitrogen if combined with hydrogen to form ammonia (which is not the case in the fertilizer) would form about seven pounds of ammonia.

In short, the addition of "ammonia 7 per cent" furnishes absolutely no information of value not furnished by "nitrogen 5.76 per cent," and since it serves no purpose except to confuse and mislead the uneducated (uneducated in this particular line), it should be prohibited by law.

There is nothing in this guarantee to indicate the source or availability of the nitrogen in the fertilizer. Some of our readers have indicated that they think the nitrogen in a fertilizer should be soluble in water. This is not necessary nor would it be desirable in all cases. It is sufficient if it becomes soluble in the soil water rapidly enough to feed the plants as they need it during the period of their growth. The nitrogen in materials like nitrate of soda is freely soluble in water, while that in many other valuable materials, like cottonseed meal, blood, tankage, etc., becomes so by decay in the soil. That is, it becomes available more slowly in these materials, but if it becomes available as the plants need it this is sufficient, and with crops having a long growing season it may actually be an advantage, especially on light soils during very wet seasons. In this fertilizer

our reader will only get 5.76 per cent of nitrogen and not 12.76 per cent.

2. The guarantee regarding the potash may cause somewhat similar confusion.

In reality there is no "actual" potash (potassium oxide) in the fertilizer, while there may be sulphate of potassium. The more accurate method would be to state the per cent of "potassium" in the fertilizer, but the custom of stating the potassium in terms of "potash" is so general that there is less objection to it than in the case of "ammonia" used as a means of the nitrogen. Potash actually contains only a little over 83 per cent of potassium (the balance being oxygen which is not a so-called plant food); but as stated the term "potash" is used by practically all in stating the amount of this plant food in fertilizer guarantees.

In view of this well established practice other statements regarding the amount of potassium in the fertilizer should be prohibited by law, because they serve no purpose except to confuse and mislead. But if the source of the potassium, that is, whether in the form of kainit, so-called muriate of potash, or sulphate of potash, were stated it would be of value in some cases.

But in this particular guarantee the addition of "equal to sulphate of potash, 9.25 per cent" tells nothing not told by "potash (actual) 5 per cent," and simply serves to confuse. It does not even mean that the potassium in this fertilizer is in the form of sulphate. If it means anything it means that the potassium in 9.25 pounds of potassium sulphate is equal to the amount of potassium in five pounds of potash. It is probably used because it is likely to mislead the buyer into believing that he is getting more plant food than he would in a fertilizer in which the guarantee simply indicated 5 per cent of potash, and for this reason should be prohibited in a fertilizer guarantee. Our reader is only getting 5 per cent of potash, not 14.25 per cent.

The same is true of the statement, "equal to bone phosphate of lime 17 per cent." This merely means that the phosphorus in this fertilizer, if combined with the materials to form "bone phosphate of lime," would form 17 pounds of this material for every seven pounds of phosphoric acid in the fertilizer.

This guarantee would have told every bit as much of value to the farmer and have been less misleading if it had been stated as follows:

Nitrogen	5.76 per cent
Available phosphoric acid	6.00 per cent
Potash	5.00 per cent

In stating the phosphoric acid, all the facts necessary from any standpoint would have been contained in the following, and could not have been misleading: Phosphoric acid, 7 per cent, of which 6 per cent is available and 1 per cent insoluble. Or if further information is desired it might have been added that of the 6 per cent regarded as "available," 3 per cent is "soluble" and 3 per cent "reverted."

But when stated as in this guarantee the farmer sometimes thinks he is getting more than 7 per cent of phosphoric acid, 6 per cent of which is available, and this is the reason for using the confusing method and also the reason why it should be prohibited by law.

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