

Using Fertilizers Profitably

"Making More Money From Farming in 1922" Would Not be Complete Without Some Suggestions for the Better Use of Fertilizers

WOULD you be willing to give a ton of nitrate of soda costing about \$60 for 3,220 pounds of seed cotton worth about \$193? Would you be willing to give a ton of acid phosphate costing about \$15 for 733 pounds of seed cotton worth about \$44? Or would you be willing to give one ton of kainit costing about \$12, in exchange for 1,080 pounds of cotton worth about \$65? The chances are you would be willing to make any or all these exchanges. And that is just what some farmers in the central part of Alabama have been doing under the direction of the Alabama Experiment Station.

The figures mentioned above are not fictitious. Neither do they represent an isolated incident or accident. They represent the average increases in production of cotton from the use of these fertilizers in 48 field tests. This particular group of tests was confined to one of the several general soil divisions of the state. Moreover, they covered a period of 11 years. They offer a splendid guide for fertilizing practice in that section.

The figures quoted above are given here primarily to show that fertilizers, properly used, pay well. In many sections of the South the farmers are already convinced of that fact. In others they are not so sure. The uppermost question in the minds of most farmers is how to use fertilizers to get best value from them.

The fertilizer question in the South long years ago resolved itself into a question of phosphorus, nitrogen and potash and how to use them. The quantities of each to use and especially the relative proportion of each to use has been the object of endless experimentation.

Sources of Fertilizer Elements

ACID phosphate is the standard source of phosphorus in the South. There is no need for entering into a discussion of the relative merits of other sources. Acid phosphate has definitely established and proved itself in the South.

Southern farmers are at a loss sometimes to know what to choose as a source of nitrogen. Relative costs have much to do with this. This phase of the question was discussed in a previous article in this series.

It is usually assumed that a pound of nitrogen in cottonseed meal and a pound of nitrogen in nitrate of soda or ammonium sulphate are of equal value in producing crops. As a general thing, this may be accepted as true. But unpublished data developed by the Alabama Experiment Station show that on soils of five out of the seven general soil divisions of the state, a pound of nitrogen in cottonseed meal produces more pounds of seed cotton than a pound of nitrogen from nitrate of soda. This might be explained by the greater ease with which nitrate of soda is leached from the soil. On one soil division the nitrogen from nitrate of soda showed up slightly better than that from cottonseed meal, while on still another it made a remarkably superior showing. But when costs were figured on the basis of \$40 per ton for meal and \$60 per ton for nitrate of soda, it was found that \$1 invested in nitrate of soda made more pounds of cotton in every division but two than did the cottonseed meal. One of these two divisions, unfavorable to nitrate of soda, the black belt, showed no profit from the use of nitrogenous fertilizers. One small soil division in the extreme northwest section of the state showed so much greater benefit from the use of cottonseed meal as a source of nitrogen that that source proved more profitable at \$40 per ton than nitrate of soda at \$60. In this case, the most expensive source of nitrogen proved to be most profitable. But this is contrary to the rule, and it probably would be well for each farmer who does not know for certain that this is true on his farm to use the cheaper source.

There is no evidence at hand as to the most desirable source of potash.

Usually however, the high-grade material is cheaper because of the lesser freight charges and less hauling.

Potash Pays on Many Soils

FOR several years past there has been a doubt in the minds of many farmers and investigators as to whether the use of potash fertilizers paid on any but the exceptional soils. A summary of the results of 212 fertilizer tests in Alabama throws much light on this question and offers some tangible suggestions. One outstanding fact developed by these tests, running through a period of 11 years, is that when properly applied under cotton, potash paid a good profit on every principal soil division in the state of Alabama. However, when applied under corn it showed a profit on only 3 of the 7 general soil divisions of the state. Under sweet potatoes potash usually paid a handsome profit.

But what is meant by proper application. For in every soil division, except one, the kainit paid better when applied at the rate of 100 pounds per acre than when the rate was doubled. When the rate was doubled the proportionate increase in yield was much less. In one soil region increasing the application of kainit actually decreased the yield of cotton, yet applied at the rate of 100 pounds per acre it paid quite a nice profit. In one large region one ton, \$12 worth of kainit, applied at the rate of 100 pounds per acre, gave an increased yield of about \$83 worth of cotton while when applied at the rate of 200 pounds per acre, one ton returned an increase of only \$18 worth of cotton. The only exception to this general rule in the State of Alabama, was in the Black Belt where a ton applied at the 200-pound rate gave three times the value of the ton applied at the rate of 100 pounds per acre.

One hundred pounds of kainit contains 12 pounds of potash (K₂O). The above means that in general the application of 12 pounds of potash per acre is profitable while a heavier application is likely to be much less profitable. A very common commercial fertilizer in the South is what is known as a 10-2-2. The potash results referred to above would indicate that so far as the potash content is concerned one can apply as much as 600 pounds per acre under cotton with expectation of a reasonable profit, but that higher applications would be risky. The occasional man who wants to use more than 600 pounds of fertilizer per acre had better use a formula with less potash unless he knows that the larger amounts of potash pay on his soil.

The fertilizer problem of the entire South is not necessarily the same as that of Alabama. But the general soil divisions of Alabama are much the same as general soil types in other states.

For specific recommendations turn to page 27 of the Reference Special and read, "Fertilizer Formulas for North Carolina, South Carolina, and Virginia." For your convenience we reprint the following parts of that article.

"If a soil is rich in humus or organic matter—is high naturally, or has been made high by the use of manures, or from plowing in a leguminous crop like cowpeas, soy beans, and clovers—then nitrogen may be entirely left out or certainly reduced to a very small amount."

For ordinary soils in the Carolinas and Virginia, however, the following or similar mixtures are recommended for application in the drill at planting:

Formulas for Sandy and Sandy Loam Soils on Coastal Plain:

Crop	Acid Phos.	Nitro-gen	Potash	Lbs. Per Acre
*Corn	6 to 7	4 to 5	.....	200 to 400
*Cotton	7 to 8	4 to 6	2 to 3	500 to 800
*Small grain	6 to 7	4 to 5	.....	200 to 400
*Legumes	16	.....	.....	200 to 400
Tobacco	6 to 8	3 to 4	3 to 4	800 to 1000

*On very sandy soils increase potash for cotton to 3 per cent and add 2 per cent potash for corn and small grain. Also for legumes, on very poor soils 1 to 2 per cent each of nitrogen and potash may be added.

Formulas for Piedmont and Mountain Soils:

Crop	Acid Phos.	Nitro-gen	Potash	Lbs. Per Acre
Cotton	10 to 12	2 to 3	.....	600 to 800
Corn	10 to 12	3 to 5	.....	200 to 400
Small grain	10 to 12	3 to 5	.....	200 to 400
Grasses	10 to 12	3 to 5	.....	200 to 400
Legumes	16	.....	.....	200 to 300
Tobacco	8	3 to 4	3 to 4	800 to 1000

When to Apply Fertilizers

THERE is no question as to when to apply fertilizers containing acid phosphate, potash, and cottonseed meal. Without exception these fertilizers should be applied at the time the crop is planted or before. Quite a few people especially those on the heavier types of soil are applying their nitrate of soda on cotton and corn land before planting. They feel that the loss by leaching is fully offset by the greater economy in applying all the fertilizer at one time. However, there is the best of evidence that sodium nitrate leaches exceedingly rapidly on soils of the sandy type. In fact, preliminary tests by the Alabama station show that greater increases in yields from nitrate of soda on cotton are secured when it is applied at the time of the first plowing after the cotton is chopped or on corn if applied when the corn is about knee high. These tests are to be continued to get the average comparison for a number of years. In the meantime each farmer will have to use his own judgment as to whether to apply his nitrate of soda, sulphate of ammonia, or nitrate of lime at or just before time of planting, or when the crop is up and ready to begin rather extensive feeding. Bear in mind that late applications do not pay.

Top Dressing Grains

MOST good farmers now know that top dressing wheat and oats with nitrate of soda or sulphate of ammonia in early March pays. There is reason to believe that nitrate of lime will do equally as well. Apply these fertilizers broadcast over the growing grain. Use from 100 to 200 pounds per acre, unless the soil is already rich in nitrogen.

How to Apply Fertilizers

SOME people in preparing for cotton open up a deep furrow, distribute the fertilizers in the bottom, throw up a high bed over it, and plant. It is doubtful if this is best under boll weevil conditions. The plant roots can hardly get to the fertilizer in time to get the early push-off they need if they are to beat the boll weevil. Others use the one-horse fertilizer distributor to lay off the rows. This usually puts the fertilizer in a rather shallow furrow over which a low bed is thrown. Unless drainage conditions require planting on high beds, this method is probably better than the first mentioned. Still others bed their land early and apply the fertilizer at the time the cotton is planted. To do this they use planters with a fertilizer attachment.

Putting the seed down in direct contact with the fertilizers is risky, especially when the rate of application is heavy. The strong fertilizer solution is likely to delay germination or even to kill the seedlings. Some device to mix the fertilizer with the soil and running just ahead of the falling seed will largely obviate that. One big advantage of this method is that it permits earlier preparation of the land which is important in (1) lightening the pressure of work around planting time and (2) making it possible to plant on a firm seed bed.

Fertilizers for Corn

FERTILIZERS under corn do not produce as good profits as under cotton, sweet potatoes, Irish potatoes, and other high-value-per-acre crops. Of the three important elements nitrogen pays by far the best profits. And as between cottonseed meal and nitrate of soda the latter outstrips the cottonseed meal so far on most soils in making more bushels of corn that it can be urgently recommended in preference to the former. In Alabama the Black Belt is the only soil division on which cottonseed meal makes more corn per dollar expended than does nitrate of soda. In fact, in four of the remaining big divisions nitrate of soda under corn is used profitably while cottonseed meal is used at a loss.

Acid phosphate and potash do not always pay under corn. On some classes of soils both pay, but on others which make up a considerable part of the farm land of the South it is exceedingly doubtful if one or the other or both will pay. The only safe guide is your state experiment station which undoubtedly has worked out the requirements for most general crops.

Feeding Hogs Economically

IN A test conducted recently by the Missouri Experiment Station, hogs gained 32.6 per cent faster on corn and tankage than on corn alone. With corn selling at 75 cents per bushel, one ton of tankage saved \$126 worth of corn. On the basis of 60-cent corn, the tankage was worth \$100.80 per ton. The profit to the farmer in feeding the tankage would be the difference between the above values, based on the price of corn, and the actual cost of the tankage. With a corn ration it is a question of whether a farmer can afford not to feed a supplement.

Speaking broadly, tankage and fish meal are considered equal; skim milk and buttermilk are equal in value and whey is about one-half the value per 100 pounds of either of the above named dairy by-products. In comparing skim milk and tankage, feeding tests have shown that nine pounds of the former are equal to one pound of tankage. What supplement to use will depend upon the price and what is available.

G. C. HERRING.
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Boll Weevil Means End of Old Credit System

WE MUST realize that the destructive and iniquitous "credit system" is a thing of the past, and that henceforth we will be on a constructive and helpful cash basis. We must at once adapt ourselves to our changed conditions.

Our credit system has caused us to live in the future on what we hoped to have and ahead of our time. The gap caused by the change from living ahead to the cash system is going to be the hardest part for us to overcome. We must practice the most rigid economy and frugality until we accomplish this task.

We have lived 6 to 12 months ahead of our stations. We have been riding over a system or route which allowed us to pay at the other end of the line—and some folks got off before the conductor came around. We are now going to travel on the "pay-as-you-go" line. That is the only line in operation in Georgia, Alabama, and Mississippi, and it has proved to be by far the best and safest line, and makes the surest connections with the fewest stop-overs. Everybody who rides pays full fare; no free passes; and the honest traveler does not have to pay for the rides of the deadbeats. It comes cheaper to all.—Bright Williamson, President of the Bank of Darlington, Darlington, S. C.

THE BUSINESS FARMER'S CALENDAR: THINGS TO DO THIS WEEK AND NEXT

- 1. PUSH** the spring plowing every day the land can be worked.
- 2. Push** the sowing of spring oats until the required acreage is planted.
- 3. Sow alfalfa, red clover, and lespedeza** on the soils suited to each.
- 4. In the Coastal Plain region** sow carpet grass, Dallis grass, and lespedeza on moist soils for permanent pasture.

- 5. Early-hatched pullets** make the best layers next winter. If you haven't an incubator watch for hens that want to set and keep them busy.
- 6. Two dozen or more kinds of vegetables** should be planted in the garden right now if they are not already planted. See the list in our Garden and Orchard Column, page 7.