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Fertilizer Backs Bombs

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ONE SOURCE of "ammunition" for the "war food front" which many an Iowa farmer should seriously consider using this year is commercial fertilizer. If used wisely, it can profitably increase crop production.

Furthermore, the increase in intertilled crops, such as corn and soybeans, and the decrease in small grain and rotation hay and pasture will mean a heavy demand on the fertility reserves in the soil. But the purchasing power of agriculture is greater now than ever before, so that we can afford to spend some of that money to keep up or increase our soil fertility against the day when margins of profit may not be as large as they are today.

Agricultural Experiment Station trials, conducted throughout the state on numerous kinds of soils, and farmers' experiences show that the use of fertilizer is becoming more and more important in increasing yields and producing crops more efficiently.

This need for fertilizer is not a new problem in Iowa. Many Iowa soils were cleared of timber or broken out of prairie 75 to 100 years ago, and intensive cropping since then has reduced fertility reserves to the point where these will need to be replenished at increasing rates as time goes on.

The amount of fertilizer used in Iowa in the past has been quite low, but has increased sharply in the last few years. The accompanying chart shows that there has been nearly an eight-fold increase in 7 years. Some of this increase is due to the activities of the AAA.

Need 390,000 Tons

We estimate that Iowa farmers could use about 390,000 tons of fertilizer to advantage in 1944 on field crops and pastures. This would be an increase of five and one-half to six times that used in 1943. These estimates are based on extensive trials the Iowa Station has conducted throughout the state, and on the expectation that larger acreages will be planted to intertilled crops, that present average yields will need to be maintained or increased and that the carrying capacities of pastures need to be increased markedly.

We estimate that nearly 24 percent of the state's 11½ million acres of corn should be fertilized with commercial fertilizer to obtain maximum production. Likewise, 32 percent of the small grain, 21 percent of the winter wheat, 80 percent of the hemp and 15 percent of the permanent pasture should be fertilized.

The percentage of any crop to be fertilized should vary, however, depending upon the kind of soil and the section of the state. (See the accompanying map of Iowa.) Soils differ greatly in their response to fertilizer. Climatic conditions also have a bearing; greater response is generally obtained where rainfall is plentiful.

In general, the Northeast Dairy area needs fertilizer most, followed in descending order by the Southern Pasture area, the Eastern Livestock area, the Cash Grain area and the Western Livestock area. For instance, 49 percent of the total corn acreage in the Northeast Dairy area should be fer-

A common practice of applying fertilizer is with a planter attachment.
Fertilizer tonnage reported sold in Iowa last year reached a new height. Thirty-eight percent of the corn acreage should be fertilized in the Southern Pasture area, 32 percent in the Eastern Livestock area, 20 percent in the Cash Grain area and 2 percent in the Western Livestock area. Similarly, the percentage of the small grain acreage that should be fertilized is 48 in the Northeast Dairy area, 45 in the Southern Pasture area, 40 in the Eastern Livestock area and 23 in the Cash Grain area and in the Western Livestock area.

The requirement of pasture land for fertilizer also varies, but the order is not the same as for the grain crops. The highest acreage is in southern Iowa, where we estimate one-fourth of the pasture land should be fertilized, largely because many of these grass lands are poor soils and are in poor condition.

Indications are that 15 percent of the pasture land in the Northeast Dairy area, 10 percent in the Eastern Livestock area, 5 percent in the Cash Grain area and in the Western Livestock area should be fertilized for increased production.

The only sizeable acreage of winter wheat occurs in western Iowa, where we estimate 20 percent of the acreage should be fertilized for test production. The hemp acreage is small, but experience of the past year indicates that about 60 percent of this crop should be fertilized in each of the three areas where it is grown.

We estimate that 5 percent of the soybean acreage would need fertilizer for maximum production in 1944 (shown by type of farming areas).

## WARTIME FERTILIZER RECOMMENDATIONS FOR FIELD CROPS IN IOWA 1944

<table>
<thead>
<tr>
<th>Crop</th>
<th>Kind of Soil</th>
<th>Rate of Application (lbs./acre) (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>Moderately productive or well-manured soils</td>
<td>Drilled or Broadcast</td>
</tr>
<tr>
<td></td>
<td>Soils receiving little manure; sandy and certain slowly-drained soils</td>
<td>0-20-10</td>
</tr>
<tr>
<td></td>
<td>Peaty soils and soils moderately deficient in potash</td>
<td>0-20-20</td>
</tr>
<tr>
<td></td>
<td>High-lime soils with high potash deficiency</td>
<td>0-10-20 or 0-9-27</td>
</tr>
<tr>
<td>Small grain and clover seedings</td>
<td>Moderately productive soils</td>
<td>0-20-0</td>
</tr>
<tr>
<td></td>
<td>Sandy, high-lime, or relatively poor soils</td>
<td>0-20-10</td>
</tr>
<tr>
<td>Alfalfa seedings (with or without nurse crops)</td>
<td>Moderately productive soils</td>
<td>0-20-0</td>
</tr>
<tr>
<td></td>
<td>Sandy, high-lime, or relatively poor soils</td>
<td>0-20-10</td>
</tr>
<tr>
<td>Pasture (renovation)</td>
<td>Unproductive soils</td>
<td>0-20-0</td>
</tr>
<tr>
<td>Sugar beets</td>
<td>Moderately productive soils</td>
<td>0-20-0</td>
</tr>
<tr>
<td>Hemp</td>
<td>Soils that have been manured heavily or had a good stand of alfalfa or clover during the past one or two years</td>
<td>4-16-4 or 0-20-0</td>
</tr>
<tr>
<td></td>
<td>Good soils that have not been manured heavily or have not grown good alfalfa or clover during the past one or two years</td>
<td>10-6-4</td>
</tr>
</tbody>
</table>
| Soybeans                    | Experiments indicate but little effect from direct application of fertilizer, except on relatively poor soils. On such soils, 0-20-0 or 0-20-10 at 150-200 pounds per acre, broadcast, may be desirable.

(1) Refers to grade or analysis. The first figure stands for % total nitrogen (N); the second for % available phosphoric acid (P_2O_5); the third for the % water-soluble potash (K_2O).

(2) When substitutions are made for fertilizers listed above, the rate per acre should be adjusted so as to add approximately the same amount of plant food elements. On poorer soils the higher rate should be used. When rock phosphate is used, the recommended rate is 500 to 1,000 lbs. per acre, per rotation.

(3) If this fertilizer is not available, use a nitrogen fertilizer, such as ammonium sulfate (20-0-0) or ammonium nitrate (31-33%N) at a nitrogen equivalent rate.

Government Regulations

1. P.P.O. 5, Rev. 2, establishes the grades of mixed fertilizers which may be offered for sale in the various states. Superphosphates, rock phosphate, some nitrogen and potassium fertilizers will also be available. 2nd R Rev.

2. The approved Victory Garden fertilizer for 1944 is 4-12-4.

3. Farmers are eligible to use fertilizer in 1944 regardless of whether they used it in previous years.

4. Application for fertilizer must be made on official forms supplied by dealers.
Use Proper Grade

It is important that the proper grade of fertilizer be used so that maximum production and full use of each of the plant food elements added may be obtained. About nine different grades of fertilizer could be used on field crops in Iowa. About 268,000 tons of the fertilizer needed in Iowa should be superphosphate (20 percent P₂O₅). About 56,000 tons should contain phosphorus plus a comparatively high amount of potash such as 0-20-10, 0-20-20 or 0-9-27, about 54,000 tons should be such mixtures as 2-12-6, 3-12-12 or 4-16-4 and about 11,600 tons should contain high amounts of nitrogen such as 10-6-4 or 20-0-0. The kind of fertilizer used will depend largely on the crop and on the soil. (See the accompanying table.)

The small grain crop, which is primarily oats in which legume seedings are made, should be fertilized largely with superphosphate if the soils are average and fairly well managed. But on sandy, relatively poor or high-lime soils, 0-20-10 should be used. About half the fertilizer used on winter wheat should be superphosphate and the other half 4-16-4.

Corn needs a wider variety of grades. Slightly more than one-third of the fertilizer used on corn should be superphosphate (20 percent P₂O₅). About one-sixth used should be 0-20-10. According to Experiment Station trials, a fertilizer containing both phosphorus and potash, such as 0-20-10, will give good returns on some of the more poorly drained soils of northeastern Iowa and on the heavy clay-pan soils of southern Iowa. Very good results with 0-20-10 have also been obtained on the Carryington soils of northeast Iowa.

Corn grown on the high-lime areas of northern Iowa usually requires a fertilizer containing some superphosphate and a considerable quantity of potash. Fertilizers such as 0-20-20 and 0-9-27 are needed for this purpose. In many parts of the state, especially in the eastern third, other grades shown in the table have been found to be beneficial. These grades, which may be 2-12-6, 3-12-12 or 4-16-4, contain a small amount of nitrogen in addition to the phosphorus and potash.

About 10,000 tons of ammonium sulfate or its equivalent (20-0-0) could be used advantageously for corn. Most of this would be used on third-year corn when previous crops have used much of the available nitrogen supply. It takes a lot of nitrogen to produce a good crop of corn, so the nitrogen fertilizer would be used to balance the plant nutrients and to guarantee that the most benefit would be obtained from any other fertilizers applied.

Our experience of the past year indicates that hemp when grown on average soils requires substantial quantities of a fertilizer high in nitrogen such as a 10-6-4 grade, while if the soils have been manured, a grade such as 4-16-4 is satisfactory.

Superphosphate should be used on permanent pastures, especially for renovation of poorer soils such as those found in southern Iowa. These pastures can be made to produce much more efficiently if fertilized and reseeded.

Rates of application will need to vary depending on the soil fertility, on the crop, on the grade of fertilizer and on the method of application. Larger amounts are used when the soils are poorer, when the concentrations are lower and when the fertilizer is drilled or broadcast rather than applied in the hill. Rates should be higher for small grain than for corn, especially when legumes are seeded, and should be still higher for alfalfa seedings, for pasture renovation and for hemp.

Get Order in Early

We should like to be able to tell every farmer whether he should use fertilizer and how much. But the answer is not that simple when we are talking about all areas of Iowa. If there ever was a year when farmers could afford to try fertilizer, surely this is the one. Income is good and we need to make certain every acre counts to the utmost.

The fertilizer needs we have discussed are potential needs and the fertilizer industry may not be able to supply the demand. Because of transportation, labor and storage difficulties, it will be necessary for farmers to make application early to insure delivery. When fertilizer is bought early, it is important to provide dry storage. New fertilizer distributors also should be ordered early.

We are certain that fertilizer, used in the right manner, will "back the bullets" and help many a farmer financially.

Know and Guard Your Electrical Equipment

WITH THE CONVENIENCES that rural electrification has brought to farm homes in the past few years have come added responsibilities. This is especially true in the use of electrical appliances — irons, toasters, mixers, waffle irons, sweepers and washers.

Electrical appliances in the home have been built for use under certain limiting conditions. These conditions usually are stated on the name plate or somewhere on the appliance. The information on the name plate contains either all or some of the following facts:

1. The grade of fertilizer refers to the percentage composition of the material. According to law the content of each plant food element must be stated on each label. Such figures as 0-20-5, 0-20-10, 2-12-6, etc., refer to the percentage composition; thus, a 12-6 grade contains 12 percent total nitrogen (N), 6 percent available phosphoric acid (P₂O₅), and 6 percent water soluble potash (K₂O).