MIXING FERTILIZERS AT HOME

A radio talk by Dr. C. C. Fletcher, Bureau of Chemistry and Soils, delivered, in the National Farm and Home Hour, through WRC and 32 other associated stations of the National Broadcasting Company, 1:15 p. m., Eastern Standard Time, Monday, February 24, 1930.

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I suspect that I'm creating a lot of work for myself by making this radio talk.

In our office we know there is widespread interest in mixing fertilizers at home. Our correspondence, part of it probably with many of you now listening, is heavy. We send out information regarding fertilizer materials, methods of mixing, and prices and sources of materials. The letters asking such information come from all over the country.

Probably the flow of letters will increase for a time as some of you listeners today become interested. But send your inquiries along. We've prepared a mimeographed statement to answer them.

The reasons why different individuals want to mix fertilizers at home are various. Where the price per unit of fertilizer in factory-mixed and in home-mixed goods is about the same, farmers are inclined to use the factory-mixed. But where home-mixing can work a saving, naturally, farmers want to practice home-mixing. A good many individuals want to home-mix just to learn the game and for the joy of doing things themselves with little thought of profit.

Our experiments in the Bureau of Chemistry and Soils indicate that home-mixed fertilizers, composed of standard materials, and put together according to instructions, are just as well and uniformly mixed as factory goods; also that it is possible to make a complete mixture in spare time in the winter, store it in the barn, and find it in satisfactory condition for use in the spring.

One new development in the fertilizer industry probably will bring about renewed interest in home mixing. That is the tendency toward concentrated fertilizer. Presumably the freight-rate per unit will be lower on concentrated goods than on the older formulas. So renewed interest in home-mixing may be expected in places where there are cheap local supplies of low-grade fertilizer materials to mix with the higher-priced high-grade goods shipped in.

You all know that commercial fertilizers are usually mixtures of materials containing nitrogen, phosphoric acid, and potash. One of the advantages of home-mixing is that you are certain of what you are using. Especially, in many cases, is it important to know what form of nitrogen is used. For some crops you want a quick-acting nitrogen carrier; for another you may find better a slow-acting carrier, which makes the nitrogen available gradually throughout the season. The home mixer can buy nitrate of soda or ammonium sulphate and be certain that he is using high-grade materials, and that he is getting just the sort of nitrogen carrier his crop demands for best results.

Now this is not to say that home-mixing does not require study and effort. It does. Home mixing is a good thing for the farmer who will give it study and effort. But if you are not in a position to study the subject and mix some brains with the fertilizer, it is probably best to buy complete factory mixtures. Or, if you need only a small amount of fertilizer, probably it's better to buy the complete mixture.

Now, I'm going to give you a brief outline of the principles of mixing fertilizer at home. If you want to study the operation in detail, better write me for that mimeographed statement. My aim just now is to indicate to you what is necessary so that you can see how the thing works and whether or not you want to attempt it.

Let's start with the materials -- the carriers of the three essential elements -- nitrogen, phosphoric acid, and potash. I'll name some of them to you, but shan't try to give you the percentages of nitrogen, phosphoric acid, or potash carried in each one. You can get that information from the mimeographed circular.

Carriers of nitrogen include nitrate of soda, sulphate of ammonia, dried blood, concentrated tankage, tankage, dried fish scrap, cottonseed meal, castor pomace, and calcium cyanamid. Carriers of phosphoric acid commonly used are superphosphate, ground bone, basic slag, treble superphosphate, and raw ground phosphate rock. Commonly used potash carriers are potassium sulphate, potassium muriate, and Kainit.

You see, you have a wide range of materials to choose from. Some carry much of the fertilizing elements you want, some little. The point here is to use good business judgment in buying materials. Seek wide competition. Get prices from local merchants and from large fertilizer firms in your region. You can get lists of firms from your county agent, the State experiment station director, and from the U. S. Department of Agriculture. Buy for cash to get the best prices. Buy well in advance. This not only insures a better price, but permits the use of farm labor in winter when it is often not occupied profitably. You can do home-mixing in the barn when the weather is too inclement for outside work.

Now about making the formula you want to use. This is another place where brains come into the business of home-mixing.

A general rule to use in making up formulas is first to decide what percentages you want, then to decide what materials shall be used to make up a ton or batch. Say we're making up a ton. Start with the phosphoric acid. Superphosphate is almost universally used for this. With 16 per cent goods, and 8 per cent of phosphoric acid desired in the mixture, here is the line of reasoning: If the whole mixture were superphosphate it would contain 16 per cent; as 8 per cent is desired, we take 8/16, or one-half of the superphosphate, or 1,000 pounds; if we wanted 12 per cent phosphoric acid, we would take 12/16, or 3/4, in other words, 1,500 pounds of the superphosphate.

Similarly with nitrogen. If we use nitrate of soda, carrying 15.65 per cent of nitrogen, and we want 2 per cent of nitrogen in the mixture, the amount of our nitrate of soda to use is 2/15.65, or approximately one-eighth of the mixture. That means 250 pounds to the ton.

And similarly with potash. Say our carrier is potassium chloride analyzing 50 per cent of potash and we want 5 per cent of potash in the mixture, we put in 5/50, or one-tenth -- in other words, 200 pounds of potassium chloride.

That's the process in general. It is not necessary to be exact down to the fraction of a percent, as fertilizer application is not an exact science, and a slight variation in the calculation will not usually cause any loss in the agricultural value of the mixture.

Get this caution: to avoid caking and loss, do not use certain ingredients together in the same mixture. This especially applies to materials carrying free lime when mixed with ammonium sulphate. You can avoid much of the trouble of caking by using in the mixture some organic ammoniates such as cottonseed meal or dried fish.

An example may be of interest. To make a ton of 5-8-5 fertilizer, mix together:

200 pounds of nitrate of soda; 200 pounds of sulphate of ammonia; 400 pounds of fish scrap; 1,000 pounds of superphosphate; and 200 pounds of sulphate of potash.

This is a good garden fertilizer having nitrogen in different degrees of availability.

The mixing of the materials is comparatively simple. Use the tools you have at hand, and do the mixing on any tight floor or wagon box. Spread the materials in layers, usually placing the most bulky on the bottom. Then shovel the pile thoroughly together. Pass the mixture through a screen, and break up any lumps with a tamper or the back of a shovel. For mixing, I use a very large, long-handled mortar hoe. You may find this a convenient tool, but it isn't necessary to buy it especially for fertilizer mixing.

If you are planning to mix large amounts, it probably will pay to buy a small rotary mixer, such as is sold for concrete mixing on the farm. Whatever tools you use, continue the mixing until the material is fine and uniform. Then you may bag the mixture and store it in a dry place until you are ready to use it.

It is difficult to give an exact estimate as to the profits to be expected from home mixing. In normal times, these have often been from $5.00 to $10.00 per ton. Under favorable conditions the saving usually is substantial. This is true especially where farmers pool their orders or buy large amounts.

If you are interested in home mixing I suggest you make a real study of the fertilizer question. Consult your county agent. Talk to your fertilizer dealers. Write to your State experiment station. We, in the national Department of Agriculture at Washington, will be glad to hear from you and will gladly send you publications on fertilizers and home-mixing and put you in touch with firms selling fertilizers.