West Virginia University
Extension Service

Cooperative
Extension Service

HOW TO CONVERT OUR RECOMMENDATIONS TO YOUR NEEDS?

Note that we give you recommendations for lime and the three major plant nutrients. Then there is a narrative with some general soil management suggestions which may or may not apply to your specific crop or site. We often add to this computer printout by answering your specific questions by hand-written notes or by phoning you.

Lime is recommended whenever the pH drops much below 6.5; but be careful not to add more lime if you did so recently as it wouldn't have had time to react. Also watch if your calcium (Ca) is near 4000 or your Mg is over 500 (lb/A). In those cases, you should not add more lime even if we say so. Instead, you should do a better tillage job and use the nutrients already there. Also, if you grow root and tuber crops or peppers, try to keep your soil pH below 5.6. Most people will buy ground agricultural limestone (aglime) in 50 lb. bags at a feed or garden store. This reacts slowly with the soil, so always apply it in the fall. If your Mg is low (below 100) and you do need lime, we suggest that you choose a magnesium limestone (dolomite with 12% Mg), not regular aglime. Liming acid soil is critical as pH (soil acidity) influences the use of fertilizer nutrients by crops.

Fertilizer is a granular or dissolved material containing one or more crop nutrients, usually sold in 50 lb. bags. The container always lists the quantities in percent nitrogen-phosphate-potash (N-P_2O_5-K_2O). If it only contains nitrogen (e.g., ammonium nitrate), the label would say 33-0-0; i.e., it has 33 percent N = 0.33 x 50 = 16.5 lb. of N in a 50 lb. bag. If you only need nitrogen, you would buy such a fertilizer. How much to buy? Suppose we recommend 2 lbs. of N per 1000 sq. ft., and you have a 4000 sq. ft. area. 2 x 4 = 8 lbs of N is your need, so you buy 8/33 x 100 = about 25 lbs. of 33-0-0 fertilizer. If you can only get a 50 lb bag, you can save the rest for later use. If we recommend all three nutrients (N-P_2O_5-K_2O), buy a fertilizer with a label having the three numbers in roughly the same proportion as our recommendation. First calculate the right amount of nitrogen, and then make sure you have enough or more of the other two than what is recommended. Adding more is okay since phosphate and potash do not leach out of the soil rapidly like nitrogen does.

For example, if we recommend 2 lbs. of N, 4 lb. of P_2O_5 and 2 lbs. of K_2O per 1000 sq. ft., you should buy a 5-10-5 or a 10-20-10 fertilizer; but it is often easier and cheaper to buy 10-20-20. On your 4000 sq. ft. it calls for 4 x 2 = 8 lbs. of N, so you need 8/10 x 100 = 80 lbs. of 10-20-20 to get enough N. You need 4 x 4 = 16 lbs. of phosphate (P_2O_5) and 4 x 2 = 8 lbs. of K_2O; so if you use 80 lbs. of 10-20-20, you apply the correct amount of P_2O_5 but twice the correct amount of K_2O (potash). The extra K_2O is not wasted and will be stored in the soil. So if in doubt or if you can't find the right ratio, always calculate your fertilizer application rate based on the first figure (nitrogen) of the three; then match the other two nutrients as close as you can.

Some labs recommend other nutrients (e.g., sulfur, zinc); but if you do some composting, your soil will normally be sufficient in these. They can be analyzed upon request, but at considerable cost per sample. If you are interested, we can give you more detailed technical information about our soil testing program; or you can visit the lab in the basement of the Agricultural Sciences Building at West Virginia University's Evansdale Campus.

In short:
(a) Calculate square feet of your garden or field → divide by 1000
(b) Multiply (a) by the recommended lb. of nutrient
(c) Divide (b) by the number on the bag for that nutrient and multiply by 100 → gives you lbs. of fertilizer needed

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