Rebuilding Soil Fertility

Greater Yields through the Albrecht Method of Soil Management

by Neal Kinsey

What kind of land should the average farmer or grower expect to have? Most have land that has been in production for many years, often having received at best N-P-K and lime over these years. But many who make their living in agriculture report that in spite of new seed varieties and other innovations, their yields and/or quality have either stagnated or begun to drop, in spite of their having used as much fertilizer as before, if not more. A large number of Kinsey Agricultural Services' clients initially tell us they just want to achieve what they used to with the crops they are growing.

We have clients who sample every different type of soil in every field every year and strive to do all that the soil test indicates needs to be done. In "high dollar" crops this may be followed by several leaf tests per year. Many clients have been amazed at the productivity of their "good soils" after three years of addressing the deficiencies indicated by the soil tests. For yields to reach this point, we find that there is more to building up soil fertility than just adding nitrogen, phosphate and potassium. The higher the yields have been, the more this proves to be the case. Soils do not have an endless supply of nutrients in a form that is available for plant use, other than what is supplied with normal N-P-K fertilization.

Most growers will not be so blessed as to have soils that can be built up or restored to excellent fertility levels on the same fertilizer budget they have been using year to year. The exceptions would be those who have maintained an excellent liming program and/or have been successfully using higher amounts of phosphate and potassium.

However, if you are working with large acreage, just expect that in the beginning it may cost you more than a "sensible" budget will allow — that is, until you can witness on your own land that these expenditures will truly pay for themselves.

If a soil fertility building program makes sense to you, but you have a very limited budget, consider sampling perhaps 10 percent of the acreage to see what is shown to be needed. Do not just sample the worst 10 percent — that will generally be the most expensive soil to correct. Send some good soils, some average areas and some problem soils for testing. This will give an idea of what it will take to address these various situations and provide an opportunity to see what nutrients are in your better soils as compared to the poor ones. Next, determine to set aside enough of your fertilizer budget so as to follow through on the program each year for at least three years. Make the acreage devoted to this program large enough so that you can buy materials in economic quantities and small enough so as not to cause economic hardship for your overall operation. It doesn't have to be the entire acreage you had tested, but it should be substantial enough to validate whether or not the program is helping in regard to the costs involved.

THE ALBRECHT MODEL: SOIL ANALYSIS & RECOMMENDATIONS

The Albrecht method is a soil management program designed for the grower. It measures the nutrients available to the plant from the soil by performing specific nutrient tests, which provide a consistent measurement of changes in the nutrient levels as they occur. Such measurements of actual levels, as related to the soil chemistry, effectively reflects the soil's ability to provide the elements in the form that the plant requires for both top production and top quality.

You cannot manage what you cannot measure. This program measures the productivity and the available nutrient content of each soil as it is sampled. As a test, some provide a map correctly drawn according to GPS yield monitoring, without any hint of yields. The better the yields, the closer the nutrients should be to the required levels shown on the soil analysis. The worse the yields, the more essential nutrients will be lacking. We encourage new clients to ask us which is a good sample and which is not. The Albrecht model of soil analysis is that accurate if the sampling is done as prescribed, and the correct way to interpret the levels is understood.

Every soil testing company will have its own set of numbers, generally very different from those as shown when using the Albrecht model of testing. For example, we express the levels of trace elements such as zinc, copper and manganese in much higher numbers than is normally the case on other soil test reports. But there is a real benefit to using these higher numbers: it allows us to correctly express to clients how much of each trace mineral they have in the soil being tested, in terms of minimum and maximum levels. In other words, this testing shows when soils are deficient, when there is enough, and when there is an excess of minerals in a soil. The accuracy of the test is further verified in the fact that for every pound of plant-nutrient-available material that is applied, the test will correctly show this to be the case, as long as the soil pH is not excessively high. In other words, the test for micronutrients reflects the addition of those elements pound-for-pound in the soil, when they have been properly applied and adequate time has been allowed for the materials to show up as available. Even with a very high pH, you can generally build the levels, it just requires more time and material to do so. From our experience, many growers with excellent yields are still losing out in terms

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of quality and production, because trace elements are so limiting in their soil.

Sometimes our "high" trace element readings can cause alarm to consultants and fertilizer dealers who are used to the much lower numbers shown on most other soil tests. Because they are not trained to know what these levels actually represent, they may try to say that the levels are too high, when in actual fact, the level reflected is still quite deficient. This has happened on a number of occasions in regard to our clients over the years.

The important thing, though, is how well these numbers can be used to interpret what the particular area sampled produces now, what the potential is when the proper levels are achieved, and what is required in terms of materials to achieve those levels. Is the soil test accurate enough? Is the person who uses it to provide advice experienced enough to determine the good production areas from the bad and to explain how the levels on the soil test will be affected by his recommendations? Test your soil tester — that includes us, too, if you wish!

ALBRECHT MODEL CONCEPTS

There are several concepts in reference to the Albrecht model of soil testing which can be verified by the test itself, in addition to the observance of field conditions. Some of those concepts will be briefly mentioned here.

First is the concept of soil balance. Some say there is no such thing as balancing the soil, but in terms of soil testing, measuring the nutrients that are present and what happens when others are added will verify that increasing the availability of one element in the soil will reduce the availability of one or more of the others. In other words, when adding a nutrient to the soil for the plant, that particular nutrient can only be held for use after some other element has been displaced to make room for it.

Soil balance in regard to the Albrecht model is based on this concept. In fact, what happens in terms of that balance is an extremely beneficial principle concerning soil productivity. (A good book with which to begin the study of this principle is *Hands On Agronomy*, by Neal Kinsey and Charles Walters.) The program is built upon the understanding that every time we add an element that is deficient, it will have the greatest effect upon reducing any other element that is excessive in that soil. In other words, if we have too little of one nutrient in the soil, we will have too much of something else. Supplying what is lacking is the primary approach to controlling any excess in the soil.

Keep in mind, then, that it is always best to first correct deficiencies in order to help control any excesses. This may not completely solve the problem, but it is always the best and most efficient beginning. Extreme excesses may require continued use of another element at maximum amounts in order to completely eliminate the excess and the related problems it causes. Balancing soil nutrients, one against the others, is extremely important to fertility and both the quantity and quality of what is produced.

Another vital concept of the Albrecht model of soil building is that of feeding the soil, allowing the soil to then feed the plant. Too many fertilizer programs are built upon trying to feed the plant directly; they would, if possible, by-pass the soil altogether. Essentially, the soil is the plant's stomach. When properly nourished, the soil provides for the biological processes required to completely decompose residues and effectively convert needed nutrients for use by the crop to be grown there. That is why we advocate feeding the entirety of the soil by broadcasting materials that can rebuild soil nutrients levels. Use a leaf analysis to feed the plant and a soil analysis to feed the soil.

The true goal of the Albrecht model is to create the proper environment for soil biology. This is dependent upon the correct soil chemistry (supplying each nutrient in the proper amounts), which determines the physical structure of the soil. When the chemistry is right, only then can the physics be right. And when the chemistry (the right amount of each nutrient) is correct, and the physics (25 percent air, 25 percent water, 45 percent minerals, 5 percent humus) is correct, then we have the proper environment in which the biology can thrive. ❖

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