Soil Testing Interpretations:
Sufficiency vs. Build-up
and Maintenance

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Very little research on calibration of soil testing had been done prior to the 1950s and little faith existed among most professional agronomists except for its use in the diagnosis of acid and alkali conditions. During the intervening years, most of the background research validating soil testing as a means for predicting crop nutrient needs has been equated with the sufficiency concept for interpreting test results. Primary ranges were established of low, medium, high with respective interpretations of crop response to applied nutrient being assured, possible, and unlikely, accordingly, a concept of “fertilizing the crop.”

The above-noted historical approach to soil test interpretation has been modified toward the build-up and maintenance concept by many laboratories, one of “fertilizing the soil,” contributing to the vast increase that has occurred in fertilizer consumption in the past 30 years. This approach affords a much more liberal fertilizer recommendation because there is no real cut-off level—even with a high test, nutrients are recommended to replace the amount likely to be removed by the crop to be grown. The native capacity of a majority of arable soils to support modest crop yields from native mineral/organic nutrient reserves is thereby discounted. Furthermore, in order to be completely honest, the use of this concept should advocate replacing (maintaining) all of the 13 soil-derived nutrients that the crop is projected to remove and not just nitrogen (N), phosphorus (P), and potassium (K).

Clearly there are vested interests that prefer the build-up and maintenance approach over the sufficiency concept in soil test interpretation; the more fertilizer sold the better the immediate business of the fertilizer dealer and his supplier. This has led to the impasse that presently exists between some commercial enterprises and university agronomists on soil test interpretation. There are, of course, major inherent soil differences that exist locally and regionally from pedogenic processes that impact on the situation. Soils of

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