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Using Residual Soil Fertility Effectively

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Department of Agronomy

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USING RESIDUAL SOIL FERTILITY EFFECTIVELY

Grant W. Thomas

During the past 30 years, the use of commercial fertilizer in Kentucky has resulted in increases in the levels of phosphorus and potassium in soils. As might be expected, the soil test levels are higher with tobacco than with any other crop, but all soils for all crops show increases in fertility levels. Comparisons between 1975 and 1985 (the latest year available) show the proportion of samples sent to the University of Kentucky that are medium or high in soil test phosphorus has increased considerably. Even more striking is the decrease in very low values of phosphorus. The distribution of phosphorus values for soils planted to important crops is shown in the table below.

Crop	Percent of Samples Testing Medium or High		Percent of Samples Testing Very Low	
	1975	1985	1975	1985
Burley Tobacco	84	93	9	1
Corn	50	77	33	3
Soybeans	20	76	53	3
Alfalfa	60	76	25	4
Grass-Legume Pasture	30	52	58	15

What does this increase in soil test values mean to the farmer? Without the use of soil tests to plan the proper use of fertilizer, this rise in soil test values is of no use whatsoever. Using soil tests and following recommendations, the farmer can save a lot of money. For example, if a corn grower has been applying 50 lbs of P_2O_5 and K_2O to each crop (a typical rate) and he has a soil test high in both elements he can reduce that rate to zero without suffering any yield loss. His per acre savings will be about \$18.00 at current prices. That means that on a 100 acre cornfield, the savings will be \$1800 and with little chance of yield loss.

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The University of Kentucky and many other state universities recommend fertilizer on a sufficiency basis. That is, fertilizer is recommended only if it is expected that a yield response will result. To take advantage of a fertility buildup in your soils, use a soil test as a guide and do not apply phosphorus or potassium unless they are required. The cash savings can be considerable and the soil will continue to have high fertility for some time. However, it is necessary that you continue to sample your soil and use soil tests as a guide to proper fertilization because repeated cropping will lower soil test levels. Testing your soils on a two- or three-year schedule will keep you aware of your fertilizer needs. Applying fertilizer to already fertile soil is not an economically wise decision. If money is available, consider using it on some of your fields that may not be so fertile.