Nutrient Budget . . . from page 17

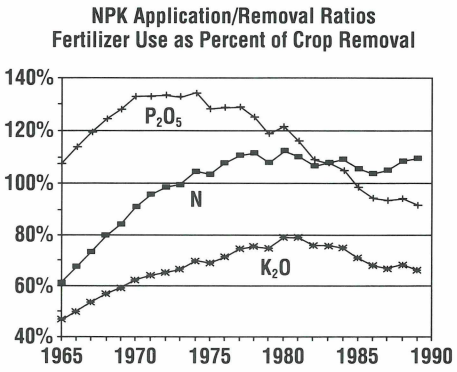


Figure 2. Fertilizer use as a percentage of crop removal for 20 major U.S. crops, 1965-1989. The percentages or ratios were obtained by dividing nutrient consumption by crop removal. The data shown are 5-year running averages.

soils testing high in P or K, a red flag should be raised anytime the application rate is less than crop removal. The danger is that the long-term sustainability of agriculture may be jeopardized by attempts to achieve short-term economic gains.

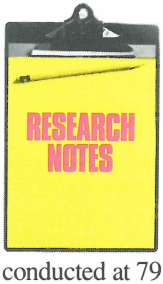
Selection of Nutrient Sources

From the standpoint of plant nutrition, the source used to replace nutrients makes no difference long-term. The challenge is to select the most efficient and environmentally sound technology to replace nutrients in order to maintain soil fertility and productivity. A corn plant responds equally well to K, for example, whether it is applied to the soil in the form of manure or commercial fertilizer.

Systems which encourage nutrient recycling help to lessen the need to import off-farm sources. Nutrient sources produced on the farm should receive first attention in recycling efforts. Returning nutrients contained in animal manures, livestock bedding, and plant residues to the soil, for example, is economically wise and environmentally responsible. With regards to sewage sludge and manufacturing by-products, high transportation costs and limited availability in agricultural regions have discouraged their widespread use as off-farm nutrient sources.

In the long-run, it is not the source but the quantity of nutrients applied that determines if soil fertility and productivity can be sustained. Most farmers find commercial fertilizer to be the most desirable nutrient source because of its relatively low cost, wide availability, high analysis, ease of handling and application, and predictable nutrient availability. ■

Nebraska



Nitrogen and Irrigation Management Practices to Minimize Nitrate Leaching from Irrigated Corn

PRACTICES related to management of fertilizer nitrogen (N) and irrigation water for corn were evaluated in a series of studies conducted at 79 sites in Nebraska from 1984 through 1988. Practices evaluated included N credit from nitrate (NO_3^-) in soil, N credit from NO_3^- in irrigation water, realistic yield goal selection, and irrigation scheduling according to crop water use. The procedure for determining the recommended fertilizer N rate provided adequate N without reducing yields. Averaged over the 79 sites, yield goal was 170 bu/A; recommended fertilizer N rate was 130 lb/A. Average yield was 173 bu/A, and fertilizer N reduction due to accounting for various N sources was 45 lb/A. This study emphasizes the importance of crediting other N sources in order to maximize crop production efficiency and minimize NO_3^- losses. ■

Source: R.B. Ferguson, C.A. Shapiro, G.W. Hergert, W.L. Kranz, N.L. Klocke, and D.H. Crull, Institute of Agricultural and Natural Resources, University of Nebraska. Published in J. Prod. Agric. 4:186-192 (1991).