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THE LONG AND SHORT OF POTASSIUM FERTILIZATION

Farmers have flexibility in managing soil K. They can choose short-term or long-term strategies.

A single application of K can increase crop yields for many seasons. How long this impact lasts depends at least in part on the rate applied. Higher rates are longer lasting and will be reflected in higher subsequent soil tests.

Studies that look at long-term residual effects of a fertilizer application are rare. The study below compared 1) annual applications of K to 2) an initial build up of soil K followed by no subsequent applications. The total amount of K applied was the same. It just took the annual application 10 years to reach the total amount of K applied in the initial build up applications. The total increase in yield for both corn and soybean were not significantly different, regardless of approach.

A comparison, at the end of ten years, of corn and soybean responses and agronomic efficiency of 600 lb K₂O/A applied by the initiation of the experiment to that of annual applications of 48 to 72 lb K₂O/A applied each year (Mallarino et al., 1991. J. Prod. Agric. 4:562-466).

Fertilizer rate	Total K applied after 10 years	Cumulative yield response of the 5 corn years	Cumulative yield response of the 5 soybean years	Total corn and soybean yield response after 10 years	Agronomic efficiency
	lb K ₂ O/A	----- bu/A -----			bu/lb K ₂ O
Annual applications (48 to 72 lb K ₂ O/A)	600	83	28.6	111.6	0.19
Residual effects (600 lb K ₂ O/A)	600	89	17.6	106.6	0.18

Note: Corn grain yield was adjusted to 15.5% moisture, but soybean grain yield was not adjusted for moisture content. Initial soil test levels for the annual K applications were approximately 50 ppm K. Soil test levels after the application of 600 lb K₂O/A before the study were approximately 100 ppm K. Soil K was extracted on field moist samples.

This study demonstrates that there is flexibility in how to apply K. Farmers can apply for a single cropping season or for many seasons to come.

Which approach to choose depends heavily on land ownership, the amount of operating capital available, crop prices, fertilizer prices, and market volatility. When K fertilizer becomes cheaper, investing in larger, build-up applications can produce greater net returns over time than when annual purchases of K are made in volatile markets that include periods of K fertilizer prices that are high enough to outweigh periods of lower prices. On the other hand, annual applications allow the farmer to evaluate the current economic environment before making any short-term investments.

Regardless of which approach is better for an individual farmer or an individual field that a farmer manages, the lasting effects of larger rates of K provide flexibility in management, and that's the long and short of it.

–TSM –

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Abbreviations: K = potassium.

Note: *Plant Nutrition TODAY* articles are available online at the IPNI website: www.ipni.net/pnt