

P and K Fertilization for Corn and Soybeans in 1994

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FOR CROP PRODUCTION, 1993 was an extraordinary year. Floods in the Midwest and drought in the South and Southeast cut yields in some areas and destroyed crops in others. As corn and soybean farmers plan for the 1994 crop year, an important management decision will be how to handle phosphorus (P) and potassium (K) fertilization. Several factors need to be included in the decision-making process.

First, P and K requirements are site specific as well as crop specific. That means soil testing is the first step in knowing where the investment in PK fertilization should be made. In weather stricken areas, if soil tests were not done last fall, they should be done now. They will show what nutrients were carried over in soils because of drought. On flooded soils, a farmer might be looking at a whole new soil fertility regime. Soils should be tested as a matter of routine if current tests are more than a couple of years old.

Consider the following factors, along with soil tests, in determining P and K needs in 1994.

- **Soil tests, cropping systems, fallow, soil temperature, compaction, planting date, yield history and yield goal . . . all affect PK needs.** Responses to additional P and K on high testing soils may occur due to many of these factors.
- **Conservation tillage makes starters important even when soil tests are high.** Cool, wet, compacted soils and nutrient stratification depress nutrient uptake.
- **Starter fertilization, especially P, might be critical on soils which were flooded in 1993.** Flooding and fallow-

ing interfere with important soil fungi (mycorrhizae) activities which aid in the uptake of P and other nutrients. Use of a P starter, at rates of 40 to 70 lb P_2O_5/A , usually corrects P deficiency under these conditions.

- **Research has documented the importance of banded K in ridge-till systems . . . even when K soil tests are adequate.** Starter K is particularly important when soils are compacted, wet and/or cold.
- **Starter response is greatest when environmental conditions result in high nutrient demand relative to the root system's capacity to take up nutrients.** Cold soils lower uptake, slow nutrient movement in the soil and decrease nutrient movement from roots to above-ground plant parts.
- **Conservation tillage increases the importance of fertilizer K.** Potassium deficiencies in conservation tillage systems are becoming more common, especially under stress conditions.
- **P and K fertilization should be a long-term production input.** In a 20-year Kansas study, adequate P and K gave a 16 bu/A soybean yield increase in a good production year, on a soil which tested adequate for both nutrients at the beginning of the study. That emphasizes the importance of having everything in place to take advantage of outstanding grain conditions.

Finally, P and K fertilization should be balanced with other nutrients and needed lime for highest use efficiency. Fertilizer P and K can be real profit makers in 1994, so this critical management input should be given proper attention. ■

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