

Threshold P Survey

John A. Lory and Peter C. Scharf

University of Missouri-Columbia

Environmental soil test phosphorus was initially developed to identify fields with a high potential for elevated soluble phosphorus in surface-water runoff. We were interested in how many states have explicitly extended the use of this tool to limit manure applications on fields with high soil test phosphorus.

A 6-question survey was circulated to one university-based nutrient management specialist in each of the 50 states. Thirty-eight or 76% of the selected state representatives responded to the survey.

Seven of the respondents (states) have a regulatory requirement to limit or eliminate manure applications if soil test phosphorus was above some critical threshold (Table 1, Fig. 1). Two additional states (Illinois and Vermont) have such limitations under active consideration. The threshold level was associated with a phosphorus index in Maryland. Three of the states used regional runoff potential or watershed sensitivity criteria to adjust the phosphorus threshold.

Twenty-three of the respondents anticipate consideration of a regulatory phosphorus threshold for manure application within the next few years in their state. Three of the states with existing limits expect further expansion of their manure phosphorus threshold regulations. Six of the state respondents reported that such regulatory restrictions had been considered in the past but had not been implemented.

Most states recommend no further applications of any phosphorus source above critical phosphorus level based on a low probability for an agronomic response. A number of states have explicitly added an environmental threshold soil test phosphorus within this system above which they recommend reducing or eliminating manure applications. Included on this list were Alabama (250 lb acre⁻¹ Mehlich-III P, plow layer depth sample), Arkansas (300 lb acre⁻¹ Mehlich-III P, 6-inch sample), Indiana (150 to 200 lb acre⁻¹ Mehlich-III P), Michigan (300 lb acre⁻¹ Bray-I P, 8-inch sample), Ohio (eliminate at 250 to 300 lbs acre⁻¹, 6- to 8-inch sample) and Utah (100 mg kg⁻¹ NaHCO₃ P, 12-inch sample).

Figure 1. States that responded and states that have regulatory phosphorus thresholds above which manure applications are reduced or eliminated.

Maine	100 lb acre ⁻¹ (non-sensitive watersheds), 40 lb acre ⁻¹ (sensitive watersheds) modified-Morgan P	6 to 8 inches	Apply manure at P removal rate above threshold level.
Maryland	Approx. 75 mg kg ⁻¹ Mehlich-III P	8 inches	Must use P index above threshold. Soils with high index must reduce or eliminate manure applications.
Mississippi	144 lb acre ⁻¹ Lancaster P	6 inches	Nutrients not to be applied above the threshold.
Oklahoma	200 (statewide) and 150 (impaired watersheds) mg kg ⁻¹ Mehlich-III P	6 inches	Manure applications eliminated above the threshold.
Texas	200 mg kg ⁻¹ Texas A&M extract, Mehlich-III or Bray-I P	6 inches	Manure applications eliminated above the threshold.