AGRI-BRIEFS
AGRONOMIC NEWS ITEMS

From Agronomists of the
Potash & Phosphate Institute (PPI)
655 Engineering Drive, Suite 110
Norcross, Georgia 30092-2843 USA
Phone (770) 447-0335

Spring 2005, No. 2

PHOSPHORUS MOVEMENT IN SOILS – IS IT A PROBLEM?

Recently, there has been some discussion that phosphorus movement in soils has become an issue of environmental concern. No doubt about it, any phosphorus that moves from agricultural lands into water bodies is a concern. Whether it moves with eroded soil particles, or as dissolved phosphorus in runoff, all efforts should be taken to minimize phosphorus loss. However, why are we talking about phosphorus movement given the manner in which it tightly binds to soil particles?

Much of the phosphorus movement discussion is related to soils with excessively high concentrations of phosphorus. Soils that have either received excessive amounts of livestock manure or fertilizer phosphorus have seen soil test phosphorus level rise far above any agronomic response. In these instances, increasing concentrations of phosphorus have been found to move off the field both by overland flow with water and by leaching. Yes, phosphorus can leach in soils which have become saturated with the nutrient so that fixation by aluminum or calcium is no longer an option. However, it is important to remember that we are talking about extremely high levels of soil phosphorus before these conditions exist.

Dealing with soils high in phosphorus is a growing challenge for regulators. With the focus of regulators in reducing phosphorus in many lakes and rivers, there is growing interest in finding ways to reduce the loss from agricultural soils. In many provinces and states, research is being conducted and management options considered that could potentially have an impact on this phosphorus movement from agricultural lands. I mention research because in several instances there is concern that regulations may not actually reduce phosphorus movement, increasing the focus on finding proven means of dealing with the problem.

It is important to keep the reality of soil test phosphorus in perspective. In fact, a 2001 soil test survey showed that between 59 and 86% of all soils on the Canadian Prairies, Montana, and North Dakota tested medium or lower in phosphorus (<20 parts per million modified Kelowna; <15 parts per million Olsen). The 2001 Census of Agriculture in Canada showed that about 5% of lands in Manitoba and Alberta, and less than 3% in Saskatchewan, receive livestock manure. These two sources should provide ample evidence to all involved that high soil test phosphorus is a very limited, site-specific problem. Developing plans to address these problem sites is required, but it involves very few agricultural landowners.

For most farmers, immobility remains their greatest concern about phosphorus. The calcareous soils in the northern Great Plains quickly react with fertilizer phosphorus to form calcium phosphates. These calcium phosphate products become the soil's phosphorus reserve, helping to meet future crop phosphorus requirements. To our advantage, most phosphorus applied to these soils eventually becomes available to future crops.

So, phosphorus does move in soils…but not for the vast majority of farms. Managing fertilizer and manure phosphorus to optimize crop responses remains the priority for most farmers. Dealing with excess soil phosphorus will be a challenge for a few producers.

—AMJ—

For more information, contact Dr. Adrian M. Johnston, Northern Great Plains Director, PPI/PPIC, 12-425 Pinehouse Drive, Saskatoon, Saskatchewan, Canada S7K 5K2. Phone: (306) 956-0619. E-mail: ajohnston@ppi-ppic.org.

Note: *Agri-Briefs* are available online at the PPI website: **www.ppi-ppic.org/agri-briefs**