Environmental Management of Phosphorus Fertilizers

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Phosphorus (P) has long been recognized as an essential nutrient for crop and livestock production and farmers have been actively encouraged to build up soil P fertility to provide optimum nutrient supply for healthy root growth and crop establishment. However, as profit margins have tightened, more judicious use of P (as with other nutrients) has become an essential part of modern soil and crop management. Soil nutrient surveys in many countries indicate that many agricultural soils have built up soil P fertility to a level where the application of large ‘insurance’ dressings of P fertilizer may no longer be warranted. In recent years, there has also been increasing concern over the management of P inputs in fertilizers and manures, and the excessive build-up of P fertility in soils, in relation to potential adverse effects on water quality and biological diversity. About 15 Tg of fertilizers are used each year (Food and Agriculture Organization, 2001). Since fertilizer P use has been linked to nutrient enrichment of streams draining agricultural watersheds (Calhoun et al., 2002; Sharpley and Syers, 1979), the possible environmental consequences of their indiscriminate use are significant (Sharpley et al., 1987).

Phosphorus is an important nutrient that affects the ecological balance of aquatic and terrestrial habitats. The accelerated enrichment of water with P causes numerous undesirable symptoms that are usually encompassed in the term eutrophication, and that ultimately result in a loss of biodiversity (Correll, 1998; Mainstone and Parr, 2002; van Dijk et al., 1994; Foy, 2005, in this publication). Voluntary and legislative controls over both P inputs to farmland, and P losses to