
IAIN MOYLES, York University

A model of phosphorus recycling at the plant scale

We present a model of phosphorus in soil that is taken up by a plant through its root systems. We consider the transformation of nutrient from labile forms in soil to above-ground biomass which is lost as leaf litter and is re-supplied to soil due to bacterial degradation. Since the plant roots are of a finite length, the removal term is discontinuous across the soil domain. Asymptotic analysis allows us to perform a model reduction that captures the phosphorus profile in various aspects of the soil. This has important implications in regional phosphorus management.