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## Time For More P Fertiliser?

Because NZ soils are generally quite low in phosphorus (P), fertiliser P inputs have been a major factor in NZ agriculture for many years.

As a general rule, P is not very mobile within the soil, seldom moving very far from the fertiliser supply source. Typically, the only true P losses off a farm are in product removed and a small amount of erosion loss. Most of the fertiliser P added over the years remains there!

This raises an obvious question: “Are fertiliser P additions required every year?” Depending on whom you ask, a typical answer might be: either generally speaking, “it is better to be sure than sorry”, or technically speaking, “because as much as 75% of the fertiliser P may be “fixed” by the soil, you need to keep adding more soluble fertiliser P.” If you’re talking to a fertiliser rep, you might get either answer but presented as a plausible way to sell you more fertiliser!

After P fertiliser is applied, there is an initial increase in the concentration of P in soil solution. However, this can be quickly reduced. The actual concentration of P in soil solution and the movement of P within the soil are influenced by two main factors: the *solubility* of the P containing compounds present in the soil and the degree of *fixation* (or adsorption) that occurs. These processes are impacted by other factors i.e. the type and amount of clay minerals present, pH, climate, soil physical properties (structure, porosity etc), soil biological properties (organic matter, C/N ratio, type and number of living soil organisms). As a general rule, P availability is greatest when any of the following apply: pH 6-7, good levels of organic matter/organic P, friable structure, active soil biomass.

The actual level of plant available P is strongly correlated to climatic conditions (temperature, moisture) which drive both the rate at which the above chemical/biochemical processes operate, as well as the rate at which the plant extracts P from soil solution.

Before you order more P fertiliser this year, think about the situation in your soil. Remember that *the ability of plant roots to locate sources of P is enhanced by good soil physical properties and conditions which favour the proliferation of soil microbes*, which, in association with other soil animals, not only facilitate the decomposition of organic material but also aid the plant root in extracting P from the soil via fungal hyphae etc. Maybe you don’t need more fertiliser P! Maybe you have enough already and all you need is to get your soil functioning better!