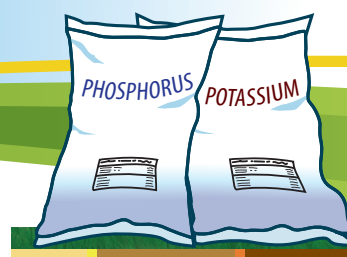


# Soils, Nutrients and Fertiliser Factsheet

# Managing Phosphorus (P) & Potassium (K)

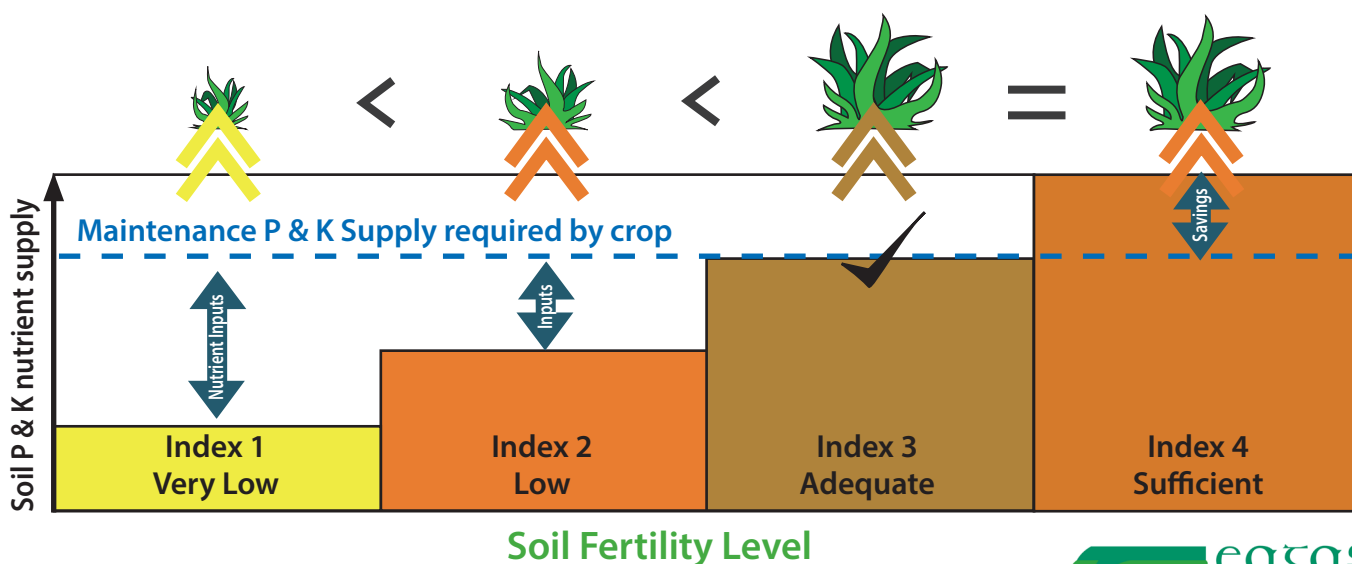


When N-P-K compound fertiliser prices are high, it will be tempting to reduce fertiliser P and K applications. Decisions should only be made based on soil analysis results. In the absence of soil analysis, one must assume soil fertility is at Index 3 and either too little (on Index 1 & 2) or too much (Index 4) P & K fertiliser could be applied, leading to a poor return on investment

**Table 1. Soil phosphorus (P) and potassium (K) Index, response to fertilisers and corresponding soil analysis P and K ranges**

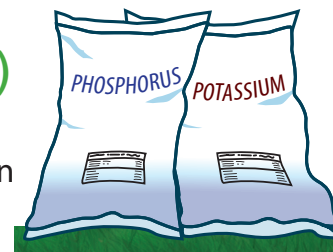
Soil P & K Index	Soil nutrient (P & K) supply	Crop growth response to applied fertilisers	Grasslands soil analysis P level mg/l	Arable soil analysis P level mg/l	4 (kg/ha) mg/l
1	Very low	Definite	0 – 3.0	0 – 3.0	0 – 50
2	Low	Likely	3.1 – 5.0	3.1 – 6.0	51 – 100
3	Adequate	Unlikely	5.1 – 8.0	6.1 – 10.0	101 – 150
4	Sufficient	None	>8.0	>10.0	>150

Source: Wall and Plunkett (2020), Major and micro nutrient advice for productive agricultural crops, Teagasc Johnstown Castle.  
# Soil analysis index ranges are based on Morgan's Extractable P and K test



## P & K fertiliser strategy on low fertility soils (Index 1&2)

The strategy to improve soil fertility on these soils is; firstly, to apply the P and K required to grow the crop during the season and secondly, an additional application of these nutrients is required to build-up soil fertility for future seasons



- At the very least, apply the recommended maintenance P & K rates to meet the crop growing needs during the season
- Target organic manures to these hungry Index 1&2 soils to fully utilise the P and K
- For moderately stocked systems (beef, sheep, or dairy replacements), maintenance application rates of P & K only on the grazing area could be applied in the short term without drastically compromising soil fertility
- Where it is planned to harvest silage or arable crops, it is essential to replenish the large crop P and K offtakes from the soil. Organic manure applications will help to supply the majority of the P and K requirements. A nutrient top-up with a suitable fertiliser compound will balance the N, P, K & S in line with crop demand

## P & K fertiliser strategy on soils with optimum fertility (Index 3)

Index 3 soils have an adequate supply of P and K to sustain grass growth over the season. The fertiliser strategy for these soils is to replace P and K removed and to maintain the optimum soil fertility. Nitrogen use efficiency is also optimised when soil fertility levels are good (Index 3)

- Grazing livestock typically recycle 60% of the P and 90% of the K consumed in dung and urine. Relatively small quantities of P and K maintain fertility on these Index 3 soils
- Adjust the maintenance P and K application rates according to the farming system type (crop > dairy > dry-stock and accounting for difference in stocking rate)
- On a lowly stocked dry-stock farms (<130 kg/ha Organic N) where grass demand is lower, there may be more scope to reduce the maintenance rates (50%) of fertiliser P and K applications for one year only
- All fields where P and K applications were reduced or omitted should be re-sampled next year to monitor and react to changes in soil fertility

## Soils with very high P & K fertility (Index 4)

It is prudent to make P and K savings on all fields with Index 4 soils

- Omit P applications for two to three years and re-sample to monitor changes in soil P levels
- Omit K applications for one year and either re-sample next year or revert to K Index 3 advice until soils are re-sampled
- Apply straight N & S in the form of protected urea to balance crop N & S requirements