

Lime



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SERVICE

- Not a nutrient taken up by the plant
- Regulates soil acidity measured as pH
- Scottish soils naturally acidic and require lime to maintain soil at optimum pH for nutrient availability and uptake
- Liming materials effectiveness determined by Neutralising Value (NV) Calcium Calcium Limestone 50% Magnesian Limestone 50 – 55%
- In ground products particle size important to speed of neutralising action
- Micronized granulated products (Calciprill) can be applied by fertiliser spreader
- Raising low pH soils also increases availability of Phosphate



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2007-2013
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Nitrogen



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- Yield driver
- Key in chlorophyll production and protein (amino acid) synthesis.
- Deficiency symptoms – pale older leaves and stunted growth.

Supplied to plant as;

- Nitrate (NO_3) most readily form taken up by plant.
- Ammonium NH_4 but toxic to plant so NH_4 converted by soil microbes to nitrate NO_3 (nitrification).
- Urea (NH_2) convert to NH_4 then NO_3 (soil enzymes) some lost to environment as NH_3 (volatilisation).

Loss greater on high pH soils >6.5 and also dry warm conditions.

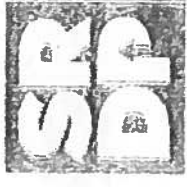


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Phosphorus



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- Key for root development (early growth) and ripening process
- Deficiency symptoms – dull blue green purple leaf, delayed ripening.
- Finite non renewable resource, calcium phosphate 30% P_2O_5 (ground rock phosphate).
- Soluble forms -treat with acid to increase concentration and availability. Triple super phosphate 46% P_2O_5 (95% water soluble).
- Phosphate sorption capacity (lock up) dependant on soil type
- Timing important if deficient - seedling establishment, early spring growth, dry soil condition in spring sown crops. (FYM contains 3kg/ton)
- Grassland target status: Moderate (-) or ADAS index 2
- Losses occur when washed out in soil sediment. Can causes nutrient enrichment in water course and algal growths.



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Potassium



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- Key for water regulation in cell sap, osmotic potential plant turgidity and enzymes for photosynthesis
- Deficiency symptoms – lighter older leaves + scorched tip similar to frost damage, older leaves can become totally white.
- Potash natural resource mined as Murate of Potash 60% K_2O or manufactured as Potassium Sulphate 50% K_2O + sulphur
- Water soluble, large amounts taken up by vegetative growth so immature harvested crops e.g. silage, remove high levels from soil reserves and can reduce soil status over time.
- FYM is good source of Potassium (8kg/ton)



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Sulphur - Secondary Nutrient



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- Deficiency symptoms – pale younger leaves, also stunted crop in cereals.
Deficiency more likely on sandy, shallow or soils low in organic matter.
Soil analysis helps to identify high risk soils with low or very low status
- Supplied as elemental sulphur (slow release) or in readily available sulphate form in fertilisers e.g. ammonium sulphate. Grass 40kg S/ha per season or per cut
- Apply in spring as very little taken up by leaf (2%), main uptake by roots from soil
- Muck and slurry is useful source of sulphur



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