

Guide to nutrient deficiencies in Grassland depending on soil factors and plant / animal symptoms & suggested treatments

Nutrient	Soil Factors	Soil Analysis	Visual Symptoms (Plants/ Animals)	Soil treatments	Comments
Sulphur (S)	Light textured soils / low soil organic matter most responsive Responses lower on heavy soils	Poor Indicator Plant analysis best	Slight yellowing of youngest leaf / no leaf necrosis	Grazing apply 15–20 kg S/ha as compound fertiliser between March to May	Apply S as part of fertiliser blend or Urea + S or CAN +S
Magnesium (Mg)	High soil pH / High soil K / Light textured soils/ cold soils / soil compaction / drought	Good Indicator	Interveinal chlorosis of older leaves /“beading” effect of chlorophyll on leaf	Animal treatment / Cal Mg / Magnesium limestone / Magnesium sulphate (Kieserite)	Apply based on soil test level. Magnesium limestone very effective at correcting low Mg soils
Copper (Cu)	Low or high soil pH / Light textured soils / Soils over granite or sandstone / Peaty soils / High Mo	Poor Indicator Plant analysis better with S & Mo levels	Ill thrift & scour in cattle Sway back in sheep Bone deformity in horses	Apply copper sulphate 20 - 40kg/ha at reseeding time & incorporate.	Tight grazing & soil ingestion reduces Cu availability. Address at reseeding (last 5 -10 yrs)
Cobalt (Co)	High soil pH. Typically granite & sandstone soils. High total Mn can reduce Co availability on soils with adequate Co levels	Good Indicator Test for total Mn	Pine & poor thrift in sheep Total Mn >600mg/kg can reduce plant Co uptake.	Apply 3kg/ha of cobalt sulphate to 10-20% of pasture & spray on Alternatively Drench / bolus	At normal pH treatment last 4 years. On high pH soils treat annually.
Zinc (Zn)	Light textured soils with high soil pH (>7.0) + P (>15ppm) or Low soil (<6.0) / High organic matter soils. Clay soils with high Mg can fix Zn	Good Indicator (Deficiency occurs at <0.6mg/l EDTA)	Reduced grass emergence / stunted grass growth Poor hoof & hair growth in cattle & wool in sheep	Apply 5kg/ha zinc sulphate Remove livestock for 3 wks after treatment Treatment will give up to 15 years control	Where Zn levels are low delay treatment of land until housing as it can reduce Cu availability in soil
Selenium (Se)	Soils in Meath, Limerick & Tipperary have excess Se. Deficiency mainly occurs on sandstone soils of Munster & clear-water limestone’s of west Munster & east Galway	Poor indicator Herbage more reliable. Deficiency occurs at <0.1 mg/kg	Causes still births & retention of after births in livestock Poor conception rates & embryonic mortality common.	Pasture treatment Oral application in feeds / mineral licks Fertiliser fortified with Se	Soil testing can be used for Se toxicity - >3 mg/kg is toxic. Se toxicity causes loss of hair & poor hoof development