

Nutrient deficiencies

Although deficiency of a nutrient in plants can be due to its deficiency in the soil, often it occurs when damage to the roots (e.g. by soil pests) or a problem restricting root growth (e.g. soil compaction) affects nutrient uptake from the soil. Where a deficiency has been induced by such problems, applying fertiliser to overcome the problem may be completely ineffective.

Nitrogen deficiency is probably the most common deficiency. It causes the entire leaf to become pale, almost yellow. Once symptoms are observed, a healthy green colour can often be restored by a top dressing of N but it seldom improves yield. The deficiency is a common symptom of rhizomania and other root problems.



Magnesium deficiency appears first as a pale yellow colour around the edges of leaves. The yellowing spreads inwards, between the major veins, and becomes more intense. The yellow tissue quickly dies and turns brown. Foliar applications of Mg soon after symptoms appear can often quickly restore plants to a healthy state. Mg deficiency often results from nematode damage to the roots.



Manganese deficiency first causes numerous yellow spots to develop on the leaves. Often symptoms develop no further, the spots disappearing as the roots grow and take up sufficient Mn to keep pace with growth. However, sometimes they expand into a yellow and green patchwork, with extensive brown areas developing later. The deficiency can be treated with sprays of Mn fertiliser, but on peaty soils this may need to be repeated.



Young beet plants with **phosphorus deficiency** have reddened or yellowed foliage. It is often induced early in the season by problems affecting the roots such as soil compaction, acid soil and herbicide residues. When the deficiency occurs in older plants the leaves become dark green and purple.

Boron is only required in small quantities by sugar beet, yet deficiency of the element is not uncommon. It causes cracks to develop in the leaves, the petioles and root crowns - the root damage being referred to as heart rot. The deficiency also causes leaves to turn yellow. However, the full range of symptoms is seldom present, so it can be tricky to diagnose.



Iron is present in adequate quantities for healthy growth in all UK arable soils, but in alkaline conditions plants are unable to take it up efficiently. So, on chalky soils, Fe deficiency can appear. Usually only isolated plants are affected but if there is another problem affecting plants (e.g. pest damage) the deficiency may be more widespread within a field. Normally symptoms (fine yellow mottling) are transitory, disappearing as roots grow further into the soil.