How to diagnose soil nutrient deficiencies using plant symptoms

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Why should one know deficiency symptoms in plants?
Plants require a given quantity and mix of nutrients to flourish. Shortage of one or more nutrients can slow plant growth resulting in decreased yields.

Visual clues of plant nutrient deficient symptoms can alert farmers and other service providers on the type of nutrient deficiencies in soil. If identified early enough, corrective measures can be taken during the growing season to correct the negative impact of such deficiencies.

To achieve high yields, plant nutrients must be available in correct quantities, proportions and at the right time.

Nutrient deficiency symptoms and corrective measures

Phosphorus
Symptoms are evident in old and young leaves which can be smaller than normal and often purplish. Severely deficient plants are stunted.

Maize leaves deficient in phosphorus
▪ Apply 4-5 tonnes of manure per acre in the planting holes or in planting furrows

▪ Add one bag per acre of 20:20:0 or 23:23:0 or TSP for cereals and DAP for legumes in planting holes or in the planting furrows

▪ Mix the manure and fertiliser with soil before planting

**Nitrogen**

- Plants are stunted during early growth
- There is loss of green colour, yellow discolouration of leaves from tip backward
- Older leaves turn brown and lower leaves may die early while the top of the plant remains green

*Maize plants in a soil deficient of Nitrogen*
• Topdress with one bag of CAN per acre when plants have 6-8 leaves and when soil has adequate moisture

![CAN fertilizer bag](image)

• Weed with an oxen plough to cover fertiliser and make furrow to harvest rain water

### Potassium
Symptoms are more evident in older leaves which show marginal yellowing and/or browning. If the deficiency is severe affected areas die.

![Maize plants deficient in Potassium](image)

**Maize plants in a soil deficient of Potassium**
• Apply 4-5 tonnes of manure per acre in planting holes or in planting furrows

• Add one bag of 17:17:17 or 23:23:23 per acre in the planting holes or in planting furrows

• Mix manure and fertiliser with soil before planting.

Better soil fertility results in improved plant growth; a denser root system, especially when phosphates are applied making plant roots to use a greater volume of soil thus making better use of soil water.

To obtain higher yields, use of a combination of organic manures and commercial fertilisers with improved soil water management is recommended.

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Healthy maize plants