Manganese deficiency

**Importance**
- Manganese deficiency interferes with photosynthesis and protein synthesis resulting in stunting of plants.

**Prevalence**
- This condition is relatively common in upland rice since its solubility increases under submerged conditions.
- It is prevalent in acid upland weathered soils (ultisols and oxisols).
- Alkaline and calcareous soils with low organic matter status and small amounts of Manganese.
- Degraded paddy soils with large amounts of manganese.

**Deficiency Symptoms**
- Leaves exhibit pale grayish green interveinal chlorosis spreading from the tip to the leaf base.
- Dead brown spots develop later and leaf becomes dark brown.
- Plants are short, stunted, have fewer leaves and small root system at tillering.
- Affected plants are more susceptible to brown spot (Helminthosporium oryzae).

**Management Strategies**
- Test soils and plant tissue for manganese deficiency.
- Apply farm yard manure or rice straw and incorporate it into soil to balance Manganese removal from the soil.
- Use acid forming fertilizers such as Ammonium Sulphate instead of Urea.
- Spray foliar spray of MnSO₄@1-2%.

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