Phosphorus Deficiency in Rice Production

Importance
- Phosphorus (P) is important for root formation, flowering, tillering and ripening.
- Deficiency is widespread in both upland and irrigated rice and is a major growth-limiting factor in acid upland soils.
- It may be as a result of low P uptake due to soil acidity (low pH), iron toxicity, zinc deficiency, and soil salinity, and/or low use of phosphorus fertilizer.
- Carrying away of grains and straw lead to P mining resulting in its deficiency in the soil.

Prevalence
- Course-textured calcareous soils with low organic matter and small P-reserves in areas such as Kilifi, Kwale and Vanga.
- Highly weathered clayey acid upland soils with high P-fixation in areas such as Embu, Busia, Siaya, Homabay, Migori counties.

Deficiency Symptoms
Common indicators of P deficiency are:
- Stunted, retarded plants with reduced tillering
- Red-purple colouration on leaf margins moving towards the midrib
- Narrow, short, and erect older leaves
- Thin and spindly stems
- Poor grain filling and delayed maturity
- In severe phosphorus deficiency, plants fail to flower or husks remain empty.

Deficiency Symptoms Image:
![Deficiency Symptoms Image](https://www.google.com/search?q=P+deficiency+in+rice)

Effects excessive application
- Application of excess P fertilizers may result in lowering of grain iron (Fe) content in rice (Binay et al, 2012)

Management Strategies
- Analyze soils (at least in every three years) and plant tissue (whenever symptoms are noticed) to establish P status in soils.
- Replenish P removed in crop products by applying P fertilizers based on soil test report.
- Apply optimum doses of N and K and correct micronutrient deficiencies that trigger phosphorus immobilization.
- Apply farm yard compost manure or apply lime in acid upland soils.
- On acid, low-fertility rainfed lowland and upland soils, correct soil fertility problems as per the soil test report for positive phosphorus response.
- Judiciously apply P to prevent Fe-induced malnutrition.
- Incorporate rice straw to help maintain a positive P balance.

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