Iron Deficiency in Rice

Factsheets for Rice Production, East Africa

Fig 1. Iron deficiency in emerging leaves

Fig 2. interveinal chlorosis (crop

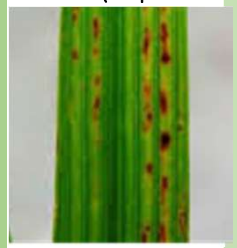

Fig 3. Interveinal chlorosis and necrotic spots (Haifa.group.com)

Importance

- Iron is essential for biological nitrogen fixation, protein synthesis, increases leaf thickness and chlorophyll production
- Iron deficiency is relatively rare in irrigated rice systems but is prevalent in upland and lowland rainfed rice systems
- It is caused by the application of high doses of phosphorus fertilizer, excessive application of lime, low organic matter content and often seen in soils with high soil pH

Prevalence

- Iron deficiency is prevalent in neutral, calcareous and alkaline upland soils in parts of Kwale, Kilifi and Vanga
- It is also common in alkaline and calcareous lowland soils and in soils with low organic matter status in Kwale, Kilifi, Migori and Homabay

Deficiency Symptoms

- Symptoms are first seen in young leaves
- Plant leaves exhibit interveinal yellowing and chlorosis of emerging leaves. (interveinal yellowing while veins remain green)
- In severe deficiency, the leaves become chlorotic then pale (whitish - yellow)
- The deficiency causes decreased plant size, resulting in low dry matter and yield production
- If not corrected, chlorosis results in the eventual death of the entire

Fig 4. Iron deficiency in the field (Agric.wa.gov.au)

Management Strategies

- Regularly monitor fields and conduct soil test analysis to detect the levels of iron in the soil
- Apply iron as foliar feed once symptoms appear on the young plant leaves (as iron sulphate)
- Apply iron chelate fertilizers such as Fe-EDTA (pH <6.0), Fe-DTPA (pH=7), Fe-EDDHA (pH>7)
- Incorporate farm yard manure and crop residues in soils.
- Apply acidifying fertilizers such as ammonium sulphate or ammonium sulphate nitrate on alkaline soils to reduce pH
- Avoid planting rice in calcareous soils and avoid liming as this will increase soil pH
- Judiciously apply P to prevent Fe-induced malnutrition

Contributors: Wandera F., Wasike V., Wasilwa L,. Otipa M., Kimani J., Kega, V., Kundu C. A., Esilaba A.O.,