Sulphur deficiency in Rice

Factsheets for Rice Production, East Africa

Importance

- Sulphur (S) is a key constituent of chlorophyll and affects protein synthesis, plant function and structure.
- Its deficiency can lead to delayed plant development, maturity and yield
- Sulphur deficient rice plants confer less resistance to adverse conditions such as cold temperatures
- Sulphur deficiency symptoms are often confused with those of nitrogen deficiency

Prevalence

- Sulphur deficiency is not common in irrigated rice
- In soils containing allophane
- In soils with low organic matter status
- Highly weathered soils with large amounts of iron oxides
- Low levels of Sulphur are found in Coastal sandy soils of Kwale and Kilifi counties

Symptoms Deficiency

- Symptoms appear first on young leaves as opposed to N deficiency which appears first on old leaves
- In the nursery, seedlings appear yellowish, and stunted growth
- Young leaves are chlorotic or light green colored with the tips becoming necrotic (dead)
- Yellowing or pale green color of the whole plant
- Lower older leaves do not show necrosis
- Reduced plant height and stunted growth (but plants are not as dark-colored as in Phosphorus or Potassium deficiency)
- Reduced number of tillers, fewer and shorter panicles, reduced number of spikelets per panicle
- Delayed maturity by 1-2 weeks

Fig 1. Yellowing of young leaves
Source: Dobermann and Fairhurst, (2000)

Management Strategies

- Test soils and leaf samples for deficiency in Sulphur
- Apply Sulfur containing fertilizers (ammonium sulfate, single super phosphate) on rice nurseries
- Apply N and P fertilizers that contain sulphur such as Ammonium sulfate [24% S], single super phosphate) as sources of nutrients
- Incorporate straw instead of completely removing or burning it
- Maintain sufficient percolation (~5mm per day), to avoid excessive soil reduction
- Carry out dry tillage after harvesting, to increase the rate of sulfide oxidation during the follow period

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