

Copper Deficiency in Rice

Factsheets for Rice Production, East Africa

Importance

- Copper (Cu) is essential for grain formation, water movement and protein synthesis
- Its deficiency is induced by high soil pH, high zinc in the soil, high lime high nitrogen and phosphorus fertilizer application
- Copper deficiency is relatively rare especially in irrigated rice systems
- Deficiency reduces pollen viability and increase in spikelet sterility, leading to unfilled husk (empty spikelets)
- Deficiency symptoms are common on young leaves

Prevalence

- Soils with high organic matter (Vertisols-black cotton soils) such as those in Mwea, Ahero, Bura irrigation schemes
- In upland lateritic highly weathered soils such as those in Busia, Teso, Homabay, Migori counties
- In sandy textured soils in Kwale, Kilifi counties
- In soils derived from marine sediments and in calcareous soils

Deficiency Symptoms

- Chlorotic streaks on either side of the midrib
- Dark brown necrotic lesions on leaf tips
- Bluish green and chlorotic streaks near the leaf tip
- Rolling of new leaves
- New leaves do not open and the upper portion of leaves having a needle like appearance, while the lower portion of the leaf is normal
- Plants show reduced tillering
- Reduced pollen viability
- The spikelets exhibit unfilled grain

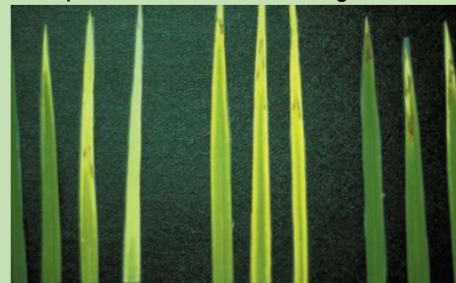


Fig 1 Chlorotic streaks and dark brown lesions on young tips
Source: Dobermann and Fairhurst, (2000)



Fig 2. Wilting leaf tips
(Yara.com.gh/crop-nutrition/rice)

- Copper deficiency is rare in irrigated systems but damage caused by deficiency affects the whole growth cycle

Management Strategies

- Test soil and plant tissue for copper deficiency
- Dip seedling roots in 1% CuSO_4 suspensions for 1 hr before transplanting
- Avoid over liming of acid soils as this inhibits Cu uptake
- Broadcast CuO or CuSO_4 (5–10 kg Cu per hectare at 5-year intervals) for long-term maintenance of soil Copper

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