Silicon Deficiency in Rice

**Symptoms**
- The rice panicle bends over, breaks and dies (a condition known as neck blast)
- Leaves become soft and droopy
- Grain sterility normally observed in deficient plants resulting in empty white spikelets called “white heads”
- Deficient plants often show increased incidences of rice blast (*Magnaporthe oryzae*) and brown spot (*Helminthosporium oryzae*) leading to low yields
- Decreased photosynthetic activity and reduced yields
- Plants are susceptible to lodging and exhibit low number of panicles

**Management Strategies**
- Carry out soil and plant sample testing to confirm Silicon deficiency status
- If deficient, apply silicon at recommended rates (500 kg/ha of Silicon)
- Use recommended rates of nitrogen fertilizer. Do not apply excess of it as it predisposes the crop to insect and disease attack
- Incorporate straw and rice husks into the soil instead of completely removing or burning it
- If available, apply rice hulls and rice hull ash into the soil to replenish Si in the soil
- Incorporate rice straw (5-6% Si) and husks (10% Si) in soil after harvest
- Apply Phosphorus to enhance soil Manganese and Aluminium uptake
- Application of silicon rich materials to enhance yields, biomass production and reduce neck blast infection

**Importance**
- Silicon deficiency negatively affects the development of a thick silicate epidermal cell layers making the plants weak and susceptible to fungal, bacterial diseases, mites, pests
- The deficiency is more common in upland rice than in paddy rice
- Si deficiency also negatively affects development of strong leaves, stems and roots
- It make rice vulnerable to stress like drought, storms and salt

**Prevalence**
- Low levels are found in low silicon weathered soils such as Oxisols and Ultisols
- Deficiency is common in areas with poor soil fertility in upland rice cultivated systems and also in old and degraded paddy soils
- This nutrient is likely in upland rice growing areas of Busia, Kwale and Kilifi counties

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