

Nitrogen deficiency



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What it does

Nitrogen (N) deficient crops have low yield.

Why and where it occurs

N deficiency is one of the most common problems of rice in Asia. It is common in all rice-growing soils where modern varieties are grown without sufficient mineral N fertilizer.

N deficiency may also occur where a large amount of N fertilizer has been applied but at the wrong time or in the wrong way.

How to identify

Check the field for abnormalities. N deficient crops are stunted and discolored. Specifically:

- Older leaves or whole plants are yellowish green
- Old leaves and sometimes all leaves become light green and chlorotic at the tip
- Entire field may appear yellowish

Check the leaves for the following symptoms:

- Leaves can die under severe N stress. Except for young leaves, which are greener, leaves of nitrogen deficient plants are narrow, small, short, erect, and lemon-yellowish green.
- Other symptoms are reduced tillering and reduced grain number.
- Lower yield due to less panicles per unit area are effect of N deficiency.

The visual symptoms of N deficiency can be confused with those of Sulfur (S) deficiency, but S deficiency is less common and tends to first affect younger leaves or all leaves on the plant. Mild N deficiency can be confused with Iron (Fe) deficiency, but the latter affects the emerging leaf first.

To confirm the deficiency, bring soil and plant sample to the laboratory for testing.

How to manage

- Apply N fertilizer efficiently.
- Do not apply large amounts of N to less responsive varieties. Hybrid rice absorbs mineral N more efficiently than inbred rice varieties.
- Keep proper plant and row spacing for each cultivar. Crops with suboptimal plant densities do not use fertilizer N efficiently.
- Adjust the number of splits and timing of N applications according to the crop establishment method. Transplanted and direct-seeded rice require different N management strategies.
- Maintain proper water control, i.e., keep the field flooded to prevent denitrification but avoid N losses from water runoff over bunds immediately following fertilizer application.
- Establish a dense, healthy rice crop by using high-quality seed of a high-yielding variety with multiple pest resistance and a suitable plant density.
- Control weeds that compete with rice for N.



Leaves are yellowish green where N is not applied



In N-deficient plants, leaves are smaller, plants are stunted, tillering is reduced