



## Leaf Color Chart (LCC) for Fertilizer Nitrogen Management in Rice

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The leaf color chart (LCC) is an easy-to-use and inexpensive diagnostic tool for monitoring the relative greenness of a rice leaf as an indicator of the plant N status. Leaf N status of rice is closely related to photosynthetic rate and biomass production, and it is a sensitive indicator of changes in crop N demand within a growing season. A tool to rapidly assess leaf N status and thereby guide the application of fertilizer N to maintain an optimal leaf N content can consequently be vital for achieving high rice yield with effective N management. A chlorophyll meter provides a rapid and non-destructive method for estimating leaf N content but its high cost prevents its use by farmers. The LCC is usually a plastic, ruler-shaped strip containing four or more panels that range in color from yellowish green to dark green. Several types of LCCs with varying shades of color have been developed and distributed to rice farmers. This created uncertainties regarding which LCC to use and led to requests for a standardized LCC that serves as a reference in cross calibrating threshold values among LCCs. The standardized LCC (photo above) is five inches long, made of high-quality plastic, consisting of four color shades from yellowish green (No. 2) to dark green (No. 5). The color strips are fabricated with veins resembling rice leaves.

### How to use the LCC Conclusion

Take the first LCC reading at 14 days after transplanting (DAT). • For direct wet-seeded rice, start taking readings at 21 days after direct wet seeding.

1. Randomly select 10 healthy plants in your field where plant distribution is uniform.
2. Select the topmost, fully expanded, and healthy leaf of each of the 10 plants. Take LCC readings by placing the middle part of the leaf on top of the LCC's colour strips for comparison. Do not detach the leaf and do not expose the LCC to direct sunlight during readings. The same person should take the LCC readings at same time of the day between 8:00 a.m. and 10:00 a.m. from first up to the last reading.
3. If more than 5 out of 10 leaves have readings below 4 in transplanted rice and below 3 in direct wet-seeded rice, apply 30 kg N/ha during dry season (DS) or 23 kg N/ha during wet season (WS).
4. Repeat LCC readings every seven days until the first flowering. Different sets of 10 leaves can be used for each weekly reading.

### Merits of LCC

1. LCC is an uncomplicated and effortless tool for the farmers to measure nitrogen status of the leaf and to identify the instance for top dressing of N to paddy.
2. LCC is cheap and portable thus, making it easy to carry to field for estimating N status of the leaf.
3. It is a non-destructive method and doesn't involve any laboratory analysis.
4. Any specific knowledge or skill is not require for using LCC because it depends only in comparing the colour and computing the scale of the leaf with standard chart.

**Demerits of LCC**

1. LCC Fail to specify minor variations in leaf greenness as the color shades lies in between two shades. The comparative accurateness of LCC to measure the leaf N status can be estimated only when it is equated and interrelated with chlorophyll meter readings and adjusted accurately with the plant groups.
2. LCC is resorted only to adjust the top dressed N but fail to adopt the basal N appliance by LCC.
3. LCC can be better suited in site-specific nutrient management approach wherein to realise optimal reaction to N fertilizer, other nutrients need not be restricting. Hence, sufficient levels of other nutrients need to apply on basis of soil tests results.
4. P or K deficits make dimmer leaf colour leading to inaccurate LCC interpretations.