
Leaf Colour Chart – Eco-Friendly Tool for Farmer

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INTRODUCTION

Leaf colour chart (LCC) is a low cost and easy to handle diagnostic tool for real-time or crop-need-based nitrogen (N) management in rice, wheat, maize and cotton crops. LCC used as quick and reliable intelligent tool and helps rice, wheat, maize and cotton farmers to visually assess the leaf N status and to apply the nitrogenous fertilizers for these crops at different growth stages. LCC is usually a plastic, ruler-shaped strip containing 4 to 6 panels that range in colour from yellowish green to dark green.

The colour panels of the LCC are designed to indicate whether rice, wheat and maize crop plants are hungry or over-fed by nitrogenous fertilizer. By matching the colour of the rice, wheat and maize leaf to the colour on the LCC, farmers can decide proper time and amount of N fertilizer for application. LCC ensures only need-based optimum application of chemical fertilizer (urea) and reduces pesticide use in agriculture and enhances farmers' income as well as food quality.

LCC never aims reduction in fertilizer nitrogen application at the cost of reduction in yield. In fact, purpose of using LCC is to apply adequate amount of nitrogen and avoid

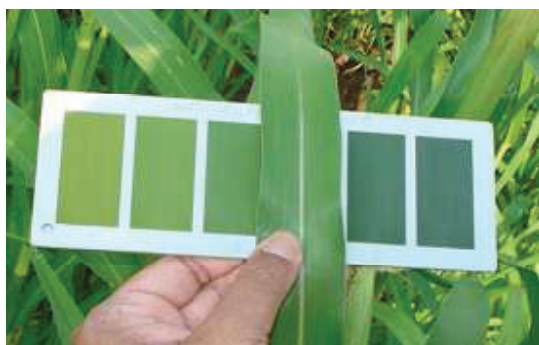
application of fertilizer more than required. Use of LCC helps to determine nitrogen demand of the crop and guide right time of fertilizer nitrogen application so as to prevent unwanted nitrogen losses and their serious impact on the ecosystem. Generally it reduces fertilizer nitrogen requirement because farmers often apply nitrogen fertilizers in excess. But, if under certain circumstances farmers are using nitrogenous fertilizers less than the crop requirement, LCC based technology will guide to apply more fertilizer nitrogen and would certainly improve yield.

A case study in West Bengal, India indicated that, in all three rice seasons, LCC adopter farmers used significantly less N fertilizer than nonadopters. Reduced N use by LCC adopters did not affect grain yield in any of the seasons. Rather, the adopters produced slightly higher yields than did nonadopters—about 19, 43, and 95 kg/ha higher in the *pre-kharif*, *kharif*, and *boro* season, respectively. N fertilizer savings by LCC adopters were on average 25 kg N/ha (54 kg urea/ha), a 19% saving over the farmers' practice. The rates of N savings in the different rice seasons were similar—this was highest at 31 kg N/ha (67 kg urea/ha) in the *boro* season, followed by 23 kg N/ha (50 kg urea/ha) in the *pre-kharif* season, and 20 kg N/ha (44 kg urea/ha) during *kharif*.

Adopter farmers also reported low insect-pest incidence in fields where N fertilizers were used according to LCC readings. Farmers reduced the number of insecticide sprays from an average of 2.55 per season to 1.28 (n=148). The LCC adopters reduced insecticide sprays by 50%, which was significantly lower than what they used to apply before LCC adoption. The average number of sprays made by nonadopter farmers was similar to that by adopter farmers before the introduction of the LCC (2.56 sprays per season).

The Consultative Group on International Agricultural Research (CGIAR) Research Program on Climate Change, Agriculture and Food Security (CCAFS) introduced the model of “Climate Smart Villages (CSVs)” in Bihar, India. The idea was to raise awareness among farming communities in South Asia about LCC and various technological, institutional and policy-oriented options that have the potential to increase their climatic resilience, adaptation, agricultural productivity and income, while reducing emissions of greenhouse gases.

According to the Punjab Agricultural University the use of LCC in Punjab for rice, wheat, maize and cotton crops, can result in saving of around rupees 170 crore annually as well as the environment.



LEAF COLOUR CHART (LCC)

By using LCC in irrigated rice, let us assume a potential saving of 23 kg N or 50 kg urea/ha/season. The estimated annual saving of urea is 834,000 tons for India if 50% of farmers use LCC in the irrigated rice area of 22.3 million ha.

Leaf color chart has been successfully evaluated and recommended for need based nitrogen application in rice, wheat and maize crops.

It has also been observed that the principles of using LCC for monitoring crop nitrogen demand can work in sugarcane, potato, cotton, cassava, vegetables, mustard, oilpalm etc., as well. The research is in progress and appropriate technology may emerge for these crops in the near future. If it happens then we are going to have more nutritious and good quality food and food products

CONCLUSION

Leaf color chart has been successfully evaluated and recommended for need based nitrogen application in rice, wheat maize and cotton crops. It has also been observed that the principles of using LCC for monitoring crop nitrogen demand can work in sugarcane, potato, cassava, vegetables, mustard, oilpalm etc. as well. The research is in progress and appropriate technology may emerge for these crops in the near future. If it happens then we are going to have more nutritious and good quality food and food products.

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