TAMIL NADU AGRICULTURAL UNIVERSITY

COMPLETION REPORT

Validation of LCC for Newly Released Rice Varieties and Hybrids of TNAU

Submitted by

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ABSTRACT

Bioefficacy study was carried out in TNAU, Coimbatore by the Department of Soil Science & Agricultural Chemistry during November 2020 to March, 2022 sponsored by M/s.Nitrogen Parameters, Chennai with a budget outlay of Rs.5.97 lakhs to validate the LCC tool for the newly released Rice varieties and hybrids of TNAU (F37AKK). Field experiments were carried out at Wetland Farms of Tamil Nadu Agricultural University, Coimbatore in clay loam soil (*Typic haplustalf*) during two seasons *viz., Samba/Navarai and Kuruvai*, 2021 with newly released rice genotypes with varied crop duration of short, medium and long including ruling varieties and hybrids in a factorial randomized block design (FRBD) replicated twice. Ten genotypes in season 1 and 7 genotypes in season 2 as factor A and four treatments, as factor B *viz*., 1) control 2) soil test based fertilizer application (STCR) 3) RDF as per crop production guide (CPG) and 4) LCC based N application.

The results revealed that LCC based nitrogen management (T_4) produced significantly higher plant height, number of tillers, productive tillers, panicle length, 1000 grain weight, grain, straw yield, nitrogen uptake in grain and straw and total N uptake followed by RDF as per CPG where in N was applied as 4 equal splits (T_3) than soil test crop response based nitrogen application (T_2). Among the newly released varieties and hybrid tested, ADT 54 (V_8) recorded maximum plant height, number of tillers, productive tillers, panicle length, 1000 grain weight, grain, straw yield, nitrogen uptake in grain and straw and total N uptake followed by CO 52 (V_6) in season 1,while CO 53 (V_1) followed by ADT 53 (V_6) showed higher biometric and yield parameters in season 2. Total N uptake was higher by CO 53 (V_1) followed by TPS 5(V_7), total P uptake was higher in CO 53 (V_1) followed by CO 51(V_3) and total K uptake was higher by CO 53 (V_1) followed by ADT 53(V_6).

In season 1, the NUE was highest in ADT 54 (V_8) followed by CO 52 (V_6) and PUE was highest in CO 52 (V_6) followed by ADT 54 (V_8). In season 2, the NUE was highest in MDU 6 (V_4) followed by CORH 4 (V_5) and PUE was highest in ADT 53 (V_6) followed by CO 53 (V_1). All the genotypes out performed in LCC based N management (T_4) compared to other three treatments.

The post harvest soil available nutrient status also sustained in both the seasons. The NH_4-N concentration was highest in ADT 53 (V_6) followed by CORH 4(V_5) whereas NO_3-N was highest in TPS 5(V_7) which was on par with ADT 53 (V_6). This was explicit in LCC based N management treatment (T_4). The existing LCC critical values of 4 proved efficient for LCC based N management for newly released varieties and for the ruling rice hybrid (CORH4) both during Navarai and Kuruvai season of rice cultivated at Coimbatore tract.

Over the seasons, LCC based N management could able to save 52 kg N ha^{-1}. Hence it can be inferred from the results of the two field experiments with the newly released Rice varieties and hybrids of TNAU that, LCC based N management at a critical value of 4 may be recommended to obtain higher yield of rice.

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