EVALUATION OF NITROGEN AND POTASSIUM LEACHING IN NON-CALCIC BROWN SOILS UNDER IRRIGATED RICE IN MAHAWELI SYSTEM B

By

KONARA MUDIYANSELAGE ABHAYA KENDARAGAMA

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SRI LANKA

Approved :

Supervisor ..... (Dr. A. N. Jayakody)

Examiner ..... (Dr. S.H. Upasena)

Examiner ..... (Dr. G. Keerthisinghe)

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ABSTRACT

A lysimeter experiment was conducted in maha 1985/86 and yala 86 on farmer fields at Aralaganwila to evaluate nitrogen and potassium leaching of Non-Calcic Brown soils in Mahaweli system B. The design was a natural split-plot with upper and middle slopes of the catena as main plots. The subplot treatments were soil alone, soil with crop without fertilizer and soil with crop plus the recommended fertilizers. Each treatment was triplicated. BG 94-1 and BG 34-8 were the rice cultivars in maha and yala, respectively.

Water gains by rain and irrigation, as well as losses through runoff and percolation, were recorded during the vegetation period. The above kinds of water were periodically sampled and analysed for NO_3^--N, NH_4^+-N, NO_2^--N, organic N and potassium. Nitrogen and potassium uptake by the crop at harvest was also determined.

Rain water supplied 0.8 kg N and 2.4 kg K ha^{-1}. Nitrogen and potassium losses through runoff water were similar to gains by rain water. Irrigation water supplied negligible amounts of nitrogen in relation to crop uptake. However, 23.5 kg of potassium were received representing almost half the recommended rate.

Leaching losses of nitrogen and potassium were considerably reduced by presence of a crop, but increased dramatically with application of the respective fertilizers, to around 15 and 17 kg ha^{-1} per season. Leaching losses of both nutrients were positively related ($P=0.001$) with the depth of water percolated.

Nitrate was the dominant nitrogen form in all kinds of water analysed followed by NH_4^+, NO_2^- and organic N.

Since fertilizer application and water percolation played a significant role in nitrogen and potassium leaching, it was concluded that losses could be minimised by proper water and fertilizer management, including addition of organic materials for increased nutrient retention.