

Article title	Internal nutrient efficiencies, fertilizer recovery rates and indigenous nutrient supply of irrigated lowland rice in Sahelian West Africa
Authors	S.M Haefele, M.C.S Wopereis , M.K Ndiaye, S.E Barro & M Ould Isselmou
Keywords	Fertilizer, Rice
Abstract	<p>Grain yield and plant nutrient accumulation in aboveground plant dry matter were measured at physiological maturity of irrigated rice in on-station and on-farm experiments in four West African countries between 1995 and 1998. The complete database included 261 observations from farmers' fields, 261 observations from unfertilized sub-plots in the same fields and 120 observations from on-station experiments. This data base was used to calibrate the model Quantitative Evaluation of the Fertility of Tropical Soils (QUEFTS) for irrigated rice in Sahelian West Africa. The model requires the estimation of borderlines of maximum and minimum internal N, P and K efficiency (IE; kilogram grain per kilogram nutrient in the aboveground dry matter), average recovery fractions of applied fertilizer and indigenous nutrient supply. Using the complete database, IE borderlines were 48 and 112 kg grain kg⁻¹ N, 211 and 586 kg grain kg⁻¹ P, and 32 and 102 kg grain kg⁻¹ K, excluding observations with a harvest index <0.4 and 2.5% of the highest and lowest observations. Average recovery fractions of applied N fertilizer (RFN) were very variable and ranged for different sites from 31 to 50%; the mean for all sites was 36%. Recovery fractions for P and K were determined for on-station trials and ranged between 26 and 43% (P) and between 53 and 65% (K). Indigenous nutrient supply was estimated from plant uptake in aboveground dry matter on unfertilized plots. Mean indigenous N supply ranged from 26 to 62 kg N ha⁻¹. At each site, results for indigenous supply of N, P and K were very variable and no significant relation between indigenous nutrient supply and soil type, cropping intensity or dominant texture group could be detected. The presented data base and resulting parameters can now be used to develop more adequate fertilizer strategies for irrigated rice in Sahelian environments.</p>
Publication date	2003-01-08
Citation	Haefele, S.M., M.C.S. Wopereis, M.K. Ndiaye, S.E. Barro and M. Ould Isselmou. 2003. Internal Nutrient Efficiencies, Fertilizer Recovery Rates and Indigenous Nutrient Supply of Irrigated Lowland Rice in Sahelian West Africa," Field Crops Research, 80:19-32.
Article link	https://doi.org/10.1016/S0378-4290(02)00152-1