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The study on "productivity of irrigated mustard through organic sources and secondary nutrients" conducted during 2022-23 revealed that application of recommended dose of fertiliser with vermicompost @2.5tones/ha in combination with lime@0.2 LR and sulphur @45kg/ha is the best treatment combination which had maximum plant height, highest LAI, Dry matter, CGR, RGR and NAR and chlorophyll. The same treatment had highest yield attribute contributing to maximum grain yield, straw yield, biological yield, net monitor return and B:C ratio. This was closely followed by application of RDF along with FYM @5tones/ha combined with the secondary nutrients i.e lime @0.2LR and sulphur @45kg/ha.

ENERGY AND RESOURCES USE EFFICIENCY NEXUS IN RICE (*Oryza sativa*)–GROUNDNUT (*Arachis hypogaea*) CROPPING SYSTEM UNDER NUTRIENT MANAGEMENT AND RICE-ESTABLISHMENT METHODS

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Rice (*Oryza sativa* L.) and rice-based cropping systems are an integral part of Agriculture. India occupies the world's largest area (47.82 mha) under rice and is the second highest producer (137.83 mt) followed by China, contributing 26% of global rice production and groundnut is grown in 4.71 mha area with production of 10.2 mt (DES, 2024). Rice has versatile characteristics of suitability and adaptability to varied ecosystems and groundnut is preferred after harvest of rice, as it meets the demand for vegetable oil and fortifies soil, which is energy-efficient, economically viable and environmentally safer, also it promotes sustainable production of the cropping system.Suitable component crop is an important factor towards efficient utilization of resources and overall productivity of a cropping system (Patra *et al.*, 2019).Therefore, the present investigation was undertaken to identify the best option of nutrient management and rice- establishment methods to improve productivity, profitability, energetics and resource use efficiency by rice – groundnut system.

A field experiment was conducted during *kharif* and *rabi* seasons of 2019-20 and 2020-21 at Odisha University of Agriculture and Technology, Bhubaneswar, Odisha to study the effect of two rice establishment methods namely, direct seeding (DSR) and puddled transplanting (TPR) and three nutrient management practices [inorganic–100% soil test based fertilizers (STBF), organic–green manuring + 1/3rd soil test based nitrogen(STBN) through vermicompost + 1/3rd STBN through neem oil cake and integrated nutrient management (INM) –green manuring + 50 % STBN + 100% P_2O_5 + 100% K_2O] in rice and three nutrient management practices [75% STBF (inorganic), 100% STBF (inorganic) and INM-75% STBN + 25% STBN (FYM) + lime 0.2 LR + biofertilisers (*Rhizobium*+PSB) + 100% P_2O_5 + 100% K_2O] in groundnut on productivity, profitability, energetics and resource use efficiency of rice–groundnutsystem under split–plot design with three replications. Rice (CR DHAN 307) and groundnut (ICGV 91114) were grown with recommended package of practices.

The pooled data presented in Table 1, revealed that direct seeded rice recorded 6.8 per cent higher system yield (12.51 t REY/ha)than transplanted rice system with more partial factor productivity (43.97 kg REY/kg NPK added), heat use efficiency (1.01 kg/m^3/^{0} day) and benefit: cost ratio (1.71) might be due to breakdown