

Selection of Soil Quality Indicators of Rice Cropping Systems Using Minimum Data Set Influenced by Imbalanced Fertilization

Authors : Theresa K., Shanmugasundaram R., Kennedy J. S.

Abstract : Nutrient supplements are indispensable for raising crops and to reap determining productivity. The nutrient imbalance between replenishment and crop uptake is attempted through the input of inorganic fertilizers. Excessive dumping of inorganic nutrients in soil cause stagnant and decline in yield. Imbalanced N-P-K ratio in the soil exacerbates and agitates the soil ecosystems. The study evaluated the fertilization practices of conventional (CFs), organic and Integrated Nutrient Management system (INM) on soil quality using key indicators and soil quality indices. Twelve rice farming fields of which, ten fields were having conventional cultivation practices, one field each was organic farming based and INM based cultivated under monocropping sequence in the Thondamuthur block of Coimbatore district were fixed and properties viz., physical, chemical and biological were studied for four cropping seasons to determine soil quality index (SQI). SQI was computed for conventional, organic and INM fields. Comparing conventional farming (CF) with organic and INM, CF was recorded with a lower soil quality index. While in organic and INM fields, the higher SQI value of 0.99 and 0.88 respectively were registered. CF₄ received with a super-optimal dose of N (250%) showed a lesser SQI value (0.573) as well as the yield (3.20 t ha⁻¹) and the CF₆ which received 125 % N recorded the highest SQI (0.715) and yield (6.20 t ha⁻¹). Likewise, most of the CFs received higher N beyond the level of 125 % except CF₃ and CF₉, which recorded lower yields. CFs which received super-optimal P in the order of CF₆&CF₇>CF₁&CF₁₀ recorded lesser yields except for CF₆. Super-optimal K application also recorded lesser yield in CF₄, CF₇ and CF₉.

Keywords : rice cropping system, soil quality indicators, imbalanced fertilization, yield

Conference Title : ICSSM 2022 : International Conference on Soil Science and Management

Conference Location : Bali, Indonesia

Conference Dates : January 14-15, 2022