Productivity and Fertility Buildup of Soils in Diversed Cropping Sequence as Influenced by Integrated Nutrient Management

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Abstract—*A field experiment was carried out during 2006-07 and 2007-08 at Block Seed Farm, Adisaptagram, Hooghly, West Bengal to assess the performance and maintaining soil fertility of various potato based cropping systems involving legume and non-legume crops in the summer season and rice, as the main crop in kharif season under integrated nutrient management practices. The experiment was laid out in split plot design with three replications. Four different cropping systems, viz. potato-cowpea-rice, potato-greengram-rice, potato-groundnut-rice and potato-sesame-rice were randomly allotted in four main plots. Five sub-plot treatments consisted of two levels (75 and 100%) of recommended dose (RD) of NPK alone or in combination with FYM @ 10 t ha^{-1} applied only to potato. Composite inoculum of bio-fertilizers (Azotobacter and Phosphobacteria) and Neemcake @ 1 t ha^{-1} along with 75% RD of NPK applied to potato crop. Potato-cowpea-rice sequence recorded the highest average productivity in terms of potato equivalent yield (PEY) of 81.61 t ha^{-1} which was 90, 70, and 101% higher as compared to potato-greengram-rice, potato-groundnut-rice and potato-sesame-rice, respectively. The maximum system productivity (PEY) to the extent of 56.57 t ha^{-1} was recorded from the treatment with 75% RD of NPK in conjunction with 10 t FYM applied only to potato crop. Integrated use of NPK fertilizers and FYM increased the system productivity (PEY) by 56.57 t ha^{-1} as compared to the 100% RD of NPK fertilizers applied alone .The highest productivity was obtained from potato-cowpea-rice sequence but higher nutrient balance were obtained from potato-greengram-rice sequence receiving 75% recommended dose of N, P and K along with FYM @ 10 t ha^{-1}.*