A VISIT TO MODELLING FIELD JUTE VARIETY TRIALS – INDIAN PERSPECTIVE

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ABSTRACT

The aspect of analysis of experimental design related to the field experiments has been carried out over decades using the procedures laid down by Fisher applying three fundamental principles (traditional analysis). This scenario prevailed all over the world for a long time while towards the later part of the twentieth century the scope and actual existence of correlation among data on yields from neighbouring plots in designed field experiments came to light by practising scientists and statisticians in the western part of the world and in Australia, and, as a sequel, enormous literature on spatial, temporal and analyses of field experimental data to include components in the model to take care of the existence of the above inherent correlation (such methods demonstrated gain in efficiency, over traditional analysis, there by justifying indirectly the existence of the correlation among yields from neighbouring plots) Fisherian analysis commands its major and extensive application on data emanated from designed field experiments till the present time in India. This paper is devoted to an exploration of the application of the spatial and temporal methods on data from varietal trials related to the jute crop (a cash crop, the different parts of the plant being used to produce essential items of daily use for mankind). The objective of this study is to evaluate and compare different spatial (temporal) model-based techniques on the data-sets obtained from jute variety trials (designed and controlled) conducted under All India Network Project (AINP) carried out under the Indian Council of Agricultural Research, GOI, in the years, 2007 and 2008 respectively. Two types of varietal trials were conducted (Initial Evaluation Trials (IET) and Advance Evaluation Trials (AET) with plot sizes, 3mtx1.5mt and 6mt x4.5 mt

respectively, and replications, 6 and 4 respectively) under Randomised Complete Block (RCB) set up. The yield data for each trial were analyzed following the procedure laid down in Section 2,2 in the paper by Resende, et al (2007), and 9 models were examined out of the list of 19 models described (their efficiencies were calculated).The relative efficiency (w.r.t) RCBD were calculated as $1\text{-}SED_{model}/ SED_{RCB..}$ The relative efficiency varied among locations from 28% to 74% (more elimination of heterogeneity).The model Linear trend across rows and columns(not considering spatial structure) has removed residual variation (68%) uniformly in all locations . It has higher value of relative efficiency among other models.