Partially balanced block designs with nested rows and columns

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Abstract

A block design with nested rows and columns was defined by Singh and Day (1979). The aim of the research is to study some properties of partially balanced block designs with nested rows and columns which are widely used in experiments carried out on heterogeneous experimental material. Such situation occurs, for example, in plant protection experiments, where localisation plays an important role. The design is considered for near-factorial experiments. Such investigations are carried out for comparing certain ab test treatments (a levels of experimental factor A and b levels of experimental factor B) with one control treatment.

Some constructions of block designs with nested rows and columns are given. For the mixed model of observations (Mejza and Mejza 1994; Kozłowska, 2001), some properties of estimation of treatment contrasts are considered. The efficiencies of estimation of basic contrasts are determined. For instance, the group divisible block designs with nested rows and columns are examined (Bagchi, 2004). There are formulated and proven the necessary and sufficient conditions for some partially balanced divisible block designs with nested rows and columns to be designs possessing special properties.

Keywords

Block design with nested rows and columns, Mixed model, Partially balanced design, Group divisible design, C-design.

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