RECTANGULAR EXPERIMENTS: RESTRICTED RANDOMIZATION OR ROW-COLUMN DESIGNS?

R. A. Bailey

Queen Mary, University of London, U.K.

[†]E-mail: *r.a.bailey@qmul.ac.uk*

Many agricultural experiments have say 7–12 treatments in 3–5 replicates, and are laid out in a rectangle. Is it better to do a standard randomized complete block design in rows, or a complete block design in rows but with restricted randomization, or an efficient rowcolumn design? These approaches differ in the variance of the estimate of a difference between two treatments, and in the bias of the estimator of that variance, as well as in the mechanics of constructing the design and analysing the data. I conclude that when inter-column correlations are high then the row-column design is best but that when they are moderate the best procedure is to use an improved version of restricted randomization, which gives an unbiased estimator of the average variance in the single experiment performed.