Abstract

Partial diallel crosses using resolvable semi-regular group divisible designs

D. K. Ghosh

Marwadi University, Morvi Road, Rajkot

Diallel crosses play an important role in evaluating the breeding potential of genetic material in plant and animal breeding. Complete diallel cross designs involve equal numbers of occurrences of each of the $p(p-1)/2$ distinct crosses among p inbred lines. If r denotes the number of times that each cross occurs in a complete diallel, then such an experiment requires $rp(p-1)/2$ experimental units (or crosses). However, if p is large, it becomes impractical to carry out a complete diallel cross even for small number of replication (that is, $r = 1$). In such situations, we consider another type of diallel crosses designs where, each crosses do not require occurring an equal number of times. This type of diallel cross is clled Partial Diallel Cross (PDC) designs. In the literature PDC designs have been discussed for $n = ps/2$ ($s < p - 1$) distinct crosses each appearing an equal number $r \geq 1$ times, where $s = 2n/p$ is an integer. In this investigation, we have constructed partial diallel crosses design using one-resolvable semi-regular group divisible designs in completely randomized block designs. The method of construction of partial diallel cross plan is supported by examples. We have obtained the efficiency factor of the pdc plan.

Keywords and phrases: information matrix, incidence matrix, diallel crosses plan, resolvable designs.