

# 5

A Catalogue of Three-Associate Class Partially Balanced Incomplete Block Designs

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Number of Designs Found for  $v \geq 25$  are 343

| S.No. | v  | b | r | k  | N  | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | $n_1$ | $n_2$ | $n_3$ | Type     |
|-------|----|---|---|----|----|-------------|-------------|-------------|-------|-------|-------|----------|
| 1     | 25 | 5 | 2 | 10 | 50 | 2           | 1           | 0           | 4     | 10    | 10    | Circular |
| 2     | 25 | 5 | 3 | 15 | 75 | 3           | 2           | 1           | 4     | 10    | 10    | Circular |

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This is a compilation of three-associate class Partially Balanced Incomplete Block (PBIB(3)) designs that are widely used. The catalogue contains the parameters, viz. number of treatments (v), number of blocks (b), number of block size (k), total number of observations (N), number of first associates ( $n_1$ ), number of second associates ( $n_2$ ), number of third associates ( $n_3$ ), number of blocks in which any two treatments that are first associates to each other occur together ( $\lambda_1$ ), number of blocks in which any two treatments that are second associates to each other occur together ( $\lambda_2$ ), number of blocks in which any two treatments that are third associates to each other occur together ( $\lambda_3$ ). In total, 623 PBIB(3) designs in the range of  $v, b \leq 100$  and  $k \leq 10$  are included in this catalogue.

## Technology Assessed and Transferred

### National Research Centre on Rapeseed and Mustard

$\alpha$ -designs have been suggested to be used in the experiments conducted by National Research Centre on Rapeseed and Mustard. These designs are resolvable incomplete block designs and a Monograph has been published for the benefit of the experimenters. The parameters for which alpha designs were recommended are: (i)  $v = 12, b = 6, r = 3$ ; (ii)  $v = 15, b = 9, r = 3$ ; (iii)  $v = 18, b = 9, r = 3$ ; (iv)  $v = 21, b = 9, r = 3$ ; (v)  $v = 24, b = 12, r = 3$  and (vi)  $v = 28, b = 12, r = 3$ . These designs were developed during the preparation of Monograph on alpha designs.

### Rice-Wheat Consortium for Indo-Gangetic Plains

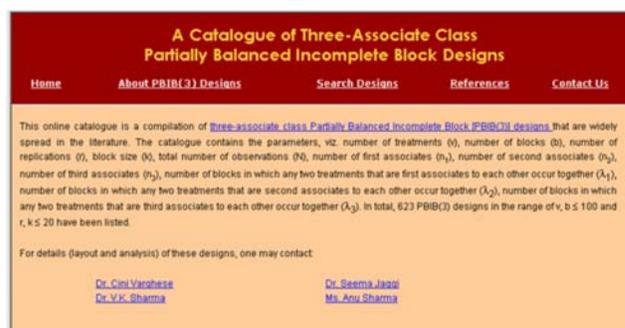
Farmers' Participatory Research Trials in Indo-Gangetic Plains for conservation agriculture are designed and managed by farmers, the researchers have only advisory role in the selection of the resource conservation technologies (RCT). Farmer has full

control over the selection of treatments to be tested on his/her field(s). The main objective of these trials is to establish and demonstrate the benefits of resource conservation technologies such as zero tillage, furrow irrigated raised bed planting system, fresh beds, reduced tillage, etc. over the conventional tillage practices. In these trials, farmers are briefed about new practices. The participating farmers are given full control over the selection of subset of resource conservation technologies to be tested on their fields with a view to assess farmer innovation and acceptability. They are also given the freedom to modify the treatments such as number of ploughings in reduced tillage, number of ploughings in conventional tillage, number of irrigation, leaving residue in the field, complete burning of the residue, zero tillage with different machines such as double disc, happy seeder, etc. as per their choice and availability of equipments. Further, date of sowing vary widely over years from treatment to treatment. Often as many treatments will arise as there are farmers.

Further, Farmers Participatory Research Trials are conducted over different regions and over years. The RCT options may have an interaction with regions and/or years. It is desired to identify the RCT options that are suitable over regions/years. It is desired to identify the varieties that are most suitable for zero tillage, bed planting systems, etc. Therefore, different varieties are included in Farmers Participatory Research Trials. Generally, the variety to be used is the prerogative of the participatory farmer. Farmers Participatory Research Trials may have different soil types or land leveling. The aim is to study the interaction between treatments and varieties/soil types/land leveling. When varieties, soil types, years, regions, land leveling, etc. are considered as environments and RCT options as treatments then it amounts to studying the treatment  $\times$  environment interactions. If there is no treatment  $\times$  environment interaction then the best RCT option may be identified by averaging over the environments. If treatment  $\times$  environment interaction is present then first one needs to identify whether the interaction is a cross-over (treatment ranks change from one environment to another) or non-cross-over type where treatment difference change in magnitude but not in direction among environments. In non-cross-over interaction the treatments with superior mean can be used in all the environments. If there is cross-over interaction, then the subsets of treatments are to be recommended only for certain environments. Therefore, it is important to test for cross-over interactions. In case of cross-over interactions, one-way to identify the subsets of treatments for certain environments is to use the technique of biplot. Analytical techniques using linear mixed effects models and biplots have been developed for the analysis of data from these trials. These techniques have been passed on to the research personnel involved in conduct of Farmers Participatory Research Trials in association with Rice-Wheat Consortium for Indo-Gangetic Plains.

A web-based catalogue of “**Three-associate Class Partially Balanced Incomplete Block [PBIB(3)] Designs**” has been developed for the benefit of the agricultural scientists and made available in the Institute’s website (www.iasri.res.in).

A draft manual on “**Methodologies for Assessing Impact of Fisheries Research**” was developed in collaboration with NAARM, Hyderabad under the



Search options provided for viewing the list of design(s)

| S.No. | v  | b   | r  | k  | N   | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | $n_1$ | $n_2$ | $n_3$ | Type        |
|-------|----|-----|----|----|-----|-------------|-------------|-------------|-------|-------|-------|-------------|
| 1     | 25 | 5   | 2  | 10 | 50  | 2           | 1           | 0           | 4     | 10    | 10    | Circular    |
| 2     | 25 | 5   | 3  | 15 | 75  | 3           | 2           | 1           | 4     | 10    | 10    | Circular    |
| 3     | 25 | 5   | 4  | 20 | 100 | 4           | 3           | 3           | 4     | 10    | 10    | Circular    |
| 4     | 25 | 100 | 12 | 3  | 300 | 2           | 1           | 0           | 8     | 8     | 8     | NC3 Cyclic  |
| 5     | 25 | 50  | 16 | 8  | 400 | 12          | 4           | 3           | 4     | 4     | 16    | Rectangular |
| 6     | 25 | 50  | 18 | 9  | 450 | 7           | 10          | 4           | 8     | 4     | 12    | Square      |
| 7     | 25 | 20  | 8  | 10 | 200 | 8           | 5           | 2           | 1     | 6     | 17    | Diagonal    |
| 8     | 26 | 26  | 12 | 12 | 312 | 0           | 5           | 6           | 1     | 12    | 12    | Rectangular |
| 9     | 27 | 36  | 8  | 6  | 216 | 0           | 1           | 2           | 2     | 8     | 16    | Rectangular |
| 10    | 27 | 27  | 13 | 13 | 351 | 4           | 7           | 6           | 6     | 12    | 8     | Cubic       |

Output displaying parameters of the sorted out designs

project, “Impact Assessment of Fisheries Research in India”. This methodological manual will assist the researchers, academicians, policy makers and planners in assessing the impact of the technologies developed specially in fisheries sector for future planning.

**Expert System on Wheat Crop Management** is a tool that will transfer and extend technology to the farmers on wheat crop management.