Split plot design :

For example, factors like dates of sowing, level of irrigation, depth of ploughing set cannot be applied conveniently to smaller experimental units and therefore require large experimental units (plots) for their application, while there are some factors like nitrogen, phosphorous etc, whose level (doses) can be applied easily to smaller experimental units (plots). There are other factors like micronutrients whose levels (doses) require still smaller experimental units for their application. It is, therefore, concluded that different types of factors can be categorised as follows.

Factors of the first type: These are factors that produce much larger differences ie; the extent of the difference between the effect of differ levels is quite large or they require experimental units (plots) of much larger size for their application.

Factors of Second type: These are the factors that produce smaller differences ie., the magnitude of the difference between the effects of different levels is small or they require experimental units (plots) of small size for their application.

In order to adjust both these type factors in an experiment we use split plot design. In such a design each replicate is divided into different number of plots, called main plots to receive that treatments which require either larger experimental material or area or is to be compared with less precision. These main plots are further divided into smaller sub plots to accomodate those treatment that require smaller area or experimental material for their application or to be considered with higher precisions. The procedure for layout and analysis of split plot design is given below:

Layout and Statistical Analysis:

The procedure of comparing two factors A (with m levels) and B (with n levels) in Split plot design with r replications are

[A] Layout:

For this purpose each block is divided into a number of plots, called main plots, equal to the number (say m) of the levels of the factor A of the first type which produce larger differences or require the experimental units of large size. All the ~~levels~~ levels of this factor are allocated randomly to these main plots.

Then each main plot in each block is sub divided into a number of plots, called sub plots, equal to the number (say n) of levels of the factor B of second type, which produces smaller differences or require experimental units of smaller size. All the levels of this factor are allocated randomly to these sub-plots in each main plots.