

## A Simplified Method of Conducting Yield Trials on Cultivator's Fields.

By M. B. V. NARASINGA RAO, B.A., B. Sc. (Ag.), Asso., I A. R. I.,

*Assistant Paddy Specialist, Pattambi.*

It has been found by experience that, at least in rice, it is never safe to introduce a variety or strain without thorough trials in the tract, where its distribution is proposed. The object of introducing new strains especially in India for a long time to come, must be their capacity to yield well. It has also been found that strains which yield well in one season may be poor in others; such strains are also not desirable. It is therefore obvious, that a strain before it is released for general cultivation should be consistent in its high performance over the local standards in all seasons and all places. This can be judged only by yield trials conducted in as many representative localities as possible, run for at least three seasons to sample out seasonal conditions. The plant breeder is also interested in these trials as he will then be able to spot out the best cosmopolitan strain from amongst the cultures, all of which may be yielding well on his Research Station.

In the isolation of a high yielding strain in a variety a large number of selections is made to start with. This number is brought down to four or five by a series of trials extending over three or four years at an Agricultural Research Station. When the number of strains is reduced to a manageable limit, say four or five, they will require extensive testing in ryots' fields. However the number of experimental stations are few and it is possible that all of them may not be fully representative of the respective tracts. Hence it is imperative that the few promising cultures are again tried out on cultivators' fields to enable us to pick out the most cosmopolitan of the group. Endeavours were being made till recently to lay in each cultivator's fields a replicated trial as is done on a Research Station keeping the size of plots to the required minimum, but it is now found that it is difficult to carry out these trials due to several causes and sometimes one has to be satisfied with one or two such trials. Thus thorough testing of the strains in as many representative places as possible, is not achieved. A modified method of gaining this end is given below. The trial is split up into pairs of blocks and each pair of blocks can then be distributed to an individual cultivator who will plant them in one field or even two adjacent fields. For example we may fix a minimum of four cultivators in different representative areas where the variety is common and entrust to each one pair of blocks containing the strains to be tested and the standard variety. Thus we will be having in all, eight replications. Though six replications are generally adequate, it is better to provide for two extra number of blocks as it may not be that all the blocks may be carried to a successful end. If a pair of blocks is laid out in each village we will be gathering additional useful information on the interaction between strains and places. This will throw

some light on the cosmopolitan nature of a particular strain. The pair of blocks may not be in the same field and it is enough even if two ryots in a village take each a block fairly close together. The cultivator can manage a single block more easily and appreciate the differences between strains much better. Even the separate harvesting of plots and their weighing, if need be, may be entrusted to him with some safety if an emergency arises. The size of the plots for trials with rice may be uniformly 5 cents and planting may be done according to the cultivator's usual practice.

This type of trials may also be adopted to ascertain differences in cultural and manurial practices. In such cases a single block comprising of the several treatments, laid out in typical centres of a tract will, not only provide a valid statistical analysis of results but will serve the purpose of demonstration plots. In the conduct of these multiple trials the following precautions have to be taken.

(1) The size and shape of the plots and blocks in all places and shape of the plots and blocks in all places and years may be similar as otherwise there is difficulty in combining these results and

(2) The blocks should be randomised separately each time for each place.

The statistical computation of the results is quite straightforward provided the precautions mentioned above are taken. Supposing there are five varieties (four strains and one standard) run in duplicate plots in four centres for three seasons, the analysis of variance will be of the form

Source of error.		D. F.
(a)	Varieties ... ..	4
(b)	Centres ... ..	3
(c)	Seasons ... ..	2
(d)	Varieties × centres ... ..	12
(e)	Varieties × seasons ... ..	8
(f)	Centres × seasons ... ..	6
(g)	Varieties × centres × seasons ... ..	24
(h)	Error ... ..	60
Total ... ..		119

Of the several effects we are interested in (a), (d) and (e). If effects (d) and (e) are significant indicating differential response of strains to season and centres, recommendations should not be based on average differences of strains over all the seasons or centres. If (d) and (e) are significant, the mean square of varieties (a) must then be compared with (d) or (e) as the case may be and only when it is significant, a particular strain can confidently be recommended as being useful over all the tract where the trials were conducted. It is hoped that this simplification of trials will be appreciated by those who have to arrange for large scale yield trials and being less laborious, they can be adopted to cover a wider area than is possible with replicated randomised trials run at one or two centres.