Gomal Univ.J.Res.(A) 15(1): 13-19, 1995 [Printed in Dec. 1996] ISSN 1019-8180

CONTROL OF FIELD GRADIENTS IN WHEAT YIELD TRIALS

NOOR-UL ISLAM KHAN

Ayub Agricultural Research Institute,Faisalabad.

ABSTRACT

Efficiency of moving mean covariance adjustment (MMCA) was evaluated in controlling experimental error arising from field gradients in 43 wheat yield trials with varying number of entries. MMCA proved more effective in controlling experimental error compared to RCBD in 27 trials. In these 27 trials, field blocking was not effective, coefficient of variation was mostly higher than 10%, and number of entries ranged from 31 to 90.

INTRODUCTION.

Field gradients arises in the field as a result of variation in intrinsic soil fertility, weediness, moisture, compaction, previous cropping practices etc. These factors obscure the results of wheat yield trials, routinely conducted following randomized complete block design (RCBD). The essence of blocking the experimental area in RCBD is that the variation between blocks is maximum while minimum within blocks and randomization of varieties within a block ensures unbiased varietal performance. (Steel and Torrie, 1980).

It has been pointed out from the results of uniformity trials that field variation sometimes is not discrete to allow effective blocking (Mendez 1970). In such situation field gradients may mask the genotypic performance. According to Pearce (1978, 1980) most of the times, blocks are laid out arbitrarily because information on the nature of field gradients are mostly not available to the experimenter. The situation is worse in trials at farmer's field.

Keeping in view the practical limitations in the proper application of RCBD, a continuous function in the form of moving mean of adjacent plot was proposed by Townley-Smith and Hurd (1973). Moving mean for each plot is used as a covariate in an analysis of covariance to obtain experimental error. Townley-Smith and Hurd (1973) from the analysis of 13 wheat trials reported 28% less mean error via moving mean covariance adjustment (MMCA) compared to RCBD. Several other workers evaluated MMCA in field trials and found it better compared to RCBD.