

Effect of different locations on yield and yield trial of potato (*Solanum tuberosum* L.)

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ABSTRACT

Statistical Analysis of 12 varieties of potato to study the effect of five different locations on its yield was conducted during 2005-2006. The analysis was conducted on 12 varieties of potato viz., Gulmarg Special (GS), Gulmarg Special-1 (GS1), Gulmarg Special-2 (GS2), Gulmarg Special-3 (GS3), Gulmarg Special-4 (GS4), Gulmarg Special-5 (GS5), Kufri Jyoti (K.Jyoti), PP48 (PP48), Kufri Badsha (K.Badsha), PP250 (PP2500), L.Hirpura (L. Hirpura), Kufri Giriraj (K.Giriraj) replicated thrice with a Randomized Block Design (RBD). Among locations Larnoo and amongst genotypes GS-3 was found best in terms of yield. The interaction effect GS*Gulmarg recorded 9qt/ha higher yield.

Key words : Analysis of variance, Differences of means, Contrast comparison

INTRODUCTION

The potato (*Solanum tuberosum*) is a starchy, tuberous crop from the perennial of the Solanaceae family. It is extensively grown in Kashmir, Himachal Pradesh etc. It is an allopolyploid with a chromosome number of 48. It is propagated by stem tubers as well as by seed. It is the richest source of carbohydrate. The predominant form of this carbohydrate is starch. Yield data of potato needs to be analyzed statistically so that relevant information regarding relative performance of different varieties at different locations can be obtained. The analysis of variance model is typically concerned with comparison of k treatments for which the mean responses are $\mu = (\mu_1, \mu_2, \dots, \mu_k)^T$ (Box and Tiao, 1973). Henderson (1953) was the landmark paper dealing with methods for the estimation of variance components using unbalanced data. Harville (1977) deals with the ML and REML estimation of variance components from a non Bayesian view point. The distribution of μ is multivariate t distribution discovered independently by Cornish (1954) and by Dunnett and Sobel (1954). In practice, we are most often concerned with questions as "How different are the effects of the treatments?" Such questions must be answered in terms of comparison among the μ s. Taking all these views in consideration the present investigation was carried out to see the effect of locations on the yield and yield trial of Potato.

MATERIALS AND METHODS

To investigate the effect of locations on yield of potato an experiment was conducted at five different research stations of SKUAST (K) namely Shalimar, Tangmarg, Gurez, Larnoo and Gulmarg during the year 2005-2006. The design of experiment was Randomized

Block Design with three replications. Twelve genotypes of potato viz., Gulmarg-Special (GS), (GS-1), (GS-2), (GS-3), (GS-4), (GS-5), Kufri Jyoti (K.Jyoti), PP-48, Kufri-Badsha, PP2500, L.Hirpura Kufri Giriraj were tried at five research stations of SKUAST-K Shalimar. This experiment was carried out to find the best genotype and the best location among the given genotypes and locations. The seed rate comprises of 20-25qt/ha, with a spacing of 20cms plant to plant and 60cms row to row.

All recommended cultural operations were done in time and plant protection measures were adopted as and when required. The data of yield, Tuber weight, Average Tuber No. of each genotype at different locations was collected and analyzed statistically using R and S-plus software's. Three fundamental books written by Becker *et al.* (1988), Chambers and Hastie (1992) and Venables and Ripley (2004) are of immense use for understanding these softwares. Khan and Mir (2005) discussed in detail the application of R- software in agricultural data analyses. One of the important feature of R- software is that it is an Open Source and freely available on website <http://cran-project.org>.

RESULTS AND DISCUSSION

The graphical results pertaining to analysis of variance is presented in Table 1. Plots in Fig. (a) are known as box plots. Box plots are one of the comprehensive presentations of a data. It shows centre as well as spread of a distribution. Thus, variability can also be depicted along with point of centrality. A line in the box is placed at the median value. The width of the box is equal to interquartile range IQR, which is the difference between the third and first quartiles. Thus, width of the box shows the variability present within the

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