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The Thesis Submitted for the Degree of M.Sc (Plant Breeding)

Effect of drought stress on yield and yield components of cotton using biplot analysis

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Abstract

In the present study, the respons of ۱۴ cotton cultivars to water stress was determined using an complete randomized block design (RCBD) with three replications in Khorasan jonobi, nehbandan, at Agricultural Research farm of Technical and Vocational Training center on ۲۰۱۱. Variance analysis of traits showed significant diference among cultivars for traits under stress and non-stress conditions. The assessment of simple correlation coifficiente showed that the yield was positively and significantly correlated number of bolls per plant at $p < ۰.۰۱$ level. The stepwise regression analysis showed that number of bolls per plant and number of fruting branch in stress and non-stress conditions can be considered as the best indices for yield improve. In non-stress condition, the Principle component analysis identified four components that explain ۸۳٪ of the total variation and in stress condition identified three components that explain ۷۱% of the total variation. The cluster analysis by Wards method divided the cotton genotypes to three and four distinct clusters in stress and non-stress conditions respectivlly.

The Biplot graphs under non-stress conditions identified bakhtegan, varamin, T۳-۳۹-۸۴ as the best cultivars on both mean and stability. In all conditions the number of fruting branch and number of bolls per plant traits identified as discrimitiveness traits and yield as representativenss trait. In stress condition the best cultivars on both mean and stability were bakhtegan, sahel, T۳-۳۹-۸۴ respectivlly.

The highest yield under non-drought stress conditions related to bakhtegan and in drought stress conditions related to T۳-۳۹-۸۴ cultivar.

Key words: Cotton, Drought stress, Yield,Yield components, Biplot analysis