

Genetic Variation and Agronomic Evaluation of Chickpea Cultivars for Grain Yield and Its Components Under Irrigated and Rainfed Growing Conditions

A. S. MOUCHESHI^{1*}, B. HEIDARI^{1**} AND A. DADKHODAIE^{1*}

¹Department of Crop Production and Plant Breeding, College of Agriculture, Shiraz University, Shiraz, I.R.Iran.

ABSTRACT-Water deficit is an important factor limiting crop growth all over the world. In order to evaluate genetic variation, heritability and the interrelationship between agronomic traits, twenty chickpea genotypes were cultivated in two separated randomized complete block experiments with three replications under normal irrigated and rainfed conditions. The experiments were carried out at the Agricultural Research Station of Razi University, Kermanshah, Iran, in the 2004-2005 growing season. Under normal conditions, plants were irrigated at stem elongation, pod appearance and pod filling stages. In rainfed conditions, no irrigation treatment was applied. The results revealed that the genotypes S95274 under irrigated and X95TH69 in rainfed conditions had the highest number of pods per plants (NPP), number of seeds per plant (NSP) and grain yield. The genotypes X96TH54 and X95TH69 produced relatively high grain yield compared to other genotypes in both conditions. The highest genotypic and phenotypic coefficients of variation in irrigated (32.61% and 34.67%, respectively) and in rainfed conditions (47.88% and 49.39%, respectively) and also the highest estimation of heritability in both conditions (88% and 93%, respectively) belonged to grain yield. In rainfed growing conditions, the correlations between grain yield and its components were significantly positive while in irrigated conditions grain yield showed significant correlation with NPP ($r=0.50$) and NSP ($r=0.49$). According to the results of path analysis, the highest direct (0.99 and 0.73 in irrigated and rainfed conditions, respectively) and indirect effects (0.89 in irrigated and 0.71 in rainfed experiments) on grain yield belonged to NSP and NPP respectively. Based on cluster analysis method, genotypes were classified into three and four groups in irrigated and rainfed conditions, respectively. It can be concluded that the NPP and NSP traits could be used as selection criteria for grain yield improvement in both conditions in chickpea breeding programs.

Keywords: Chickpea, Genetic variation, Heritability, Rainfed conditions

INTRODUCTION

Chickpea (*Cicer arietinum* L.) is the second most important legume crop grown in central and west Asia, south Europe, Ethiopia, north Africa, the Americas and Australia (Singh and Ocampo, 1997) and is used to feed both humans and livestock

* Former Graduate Student, Assistant Professors, respectively

** Corresponding Author