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Agronomic Assessment of Cold Tolerant Chickpea Genotypes in Fall Sowing at Mashhad Conditions

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Abstract

In order to evaluate agronomic characteristics of chickpea (*Cicer arietinum* L.) cold tolerant genotypes in fall sowing, a field trial was carried out in 2002–2003, 2003–2004 and 2004–2005 at the experimental field of College of Agriculture, Ferdowsi University of Mashhad. This study was performed under rainfed conditions with only two times irrigation at planting stage and 20 days after planting. In the first year (2002–2003), 46 chickpea genotypes (30 cold tolerant accessions resulted from previous studies at Mashhad and some genotypes from ICARDA and Canada) were planted based on Randomised Complete Block Design with three replications. In the first year, cold injury caused complete loss, so, in the next two years, by adding 106 other accessions, totally, 152 chickpea genotypes with 4 checks were evaluated based on the Augmented Preliminarily Design. In each year, genotypes were categorized according to their seed yields to some groups, and some statistical indices such as mean, standard deviation and range were calculated for each group. There were significant differences ($p \leq 0.05$) among genotypes on yield, yield components and plant height. In the second year (2003–2004), the range of seed yield among the first group with the highest yields (39.5% of all genotypes) was from 251 to 622 g m⁻², while in the third year (2004–2005), this range among the first group with the highest yields (20% of all genotypes) was from 254 to 442 g m⁻². Finally, 20 chickpea genotypes with the highest yields for each year were selected and introduced the next studies. Considering the importance of field investigations, these results are important to continue research and development programs on the subject of chickpea cold tolerance.

Keywords: Augmented preliminarily design, plant height, rainfed, yield and yield components