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Drought tolerance indices in Mexican soybean genotypes

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The aim of this study was to measure eight drought tolerance indices on 14 Mexican soybean genotypes considering two years with contrasting precipitation during growing season: 2012 (827 mm, well-watered) and 2015 (528 mm, drought). The study was carried out in Altamira, Tamaulipas, Mexico. In 2012, the precipitation was well distributed, meanwhile in 2015, the first half of the precipitation occurred in June and the second half during July to November. So, the moisture deficiencies occurred during the reproductive stage of the crop, mainly. Stress Susceptibility Index (SSI), Stress Tolerance Index (STI), Stress Tolerance (TOL), Yield Index (YI), Yield Stability Index (YSI), Geometric Mean Productivity (GMP), Mean Productivity (MP), and Mean Harmonic (MH) were calculated using the grain yield. The analysis of variance showed that there were differences between genotypes for STI, GMP and MP indices. Genotype H02-1337 was the most tolerant to drought according to these indices (Tukey, $p \leq 0.05$). However, considering 20% of the genotypes with the highest index values as a cut-off, H02-1337, H98-1052 and Tamesi were the top three genotypes and can be considered as the drought tolerant ones. Additionally, H98-1052 recorded the least difference in grain yield between the moisture conditions (TOL). These genotypes were in the group with fewer days to R2, demonstrating that they took advantage of the precipitation occurred at the beginning of the 2015 growing season, in order to achieve a better grain yield. Pearson's correlation coefficient demonstrated that the best indices in genotype discrimination were STI, GMP, and MP because they showed to be related to grain yield in both moisture conditions. These preliminary results indicated that the evaluated indices are useful for selecting drought-tolerant soybean genotypes under rain fed conditions, where we are interested in genotypes that lose less grain yield in a year with drought.