

ABSTRACT

Low phytic acid in soybean [*Glycine max* (L.) Merrill] is a significant attribute to its dietary consumption. The presence of high phytic acid in soybean impacts negatively on the bioavailability of minerals and protein digestion for humans and livestock. Understanding the stability of phytic acid accumulation in soybean varieties is essential for formulating genetic improvement strategies to develop cultivars with reduced phytic acid. The objectives of this study were to determine genotypic variation of soybean genotypes for seed phytic acid content, assess its stability, and seed yield in multi-environments. Forty-eight soybean genotypes were evaluated in an Alpha Lattice design across three locations over two cropping seasons. Genotype was the main determinant of the variation in phytic acid content. However, environmental factors significantly contributed to the phenotype mean value for phytic acid across environments. Commercial genotypes Hill, EAI 3600, DPSB 19, and SC Saga had lower mean phytic acid content of 3.6, 3.5, 3.5, and 3.2 mg g⁻¹, respectively, than the mean (3.8 mg g⁻¹). However, all the commercial genotypes had higher phytic acid content (3.2–4 mg g⁻¹) compared to the mean (1.5 mg g⁻¹) of N6003LP, the check genotype. The mean yield across sites ranged from low (0.3 t ha⁻¹) for N6003LP to 1.5 t ha⁻¹ for genotype NJSB 6. The results provide critical information for planning a breeding strategy for low phytic acid cultivars.