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ROOT DIVERSITY ANALYSIS OF MAIZE INBRED LINES AND HYBRIDS UNDER LOW AND HIGH PHOSPHORUS

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Weathered tropical soils are characterized by low availability of nutrients, especially phosphorus (P), which is the second largest consumed nutrient in agriculture and is by far the least mobile and least available nutrient to plants in most soil conditions. The P concentration in the soil solution is often low and, consequently, its diffusion to the root surface is slow. The development of maize cultivars with a root system that acquire P more efficiently would provide an alternative that is more sustainable and relatively inexpensive. The objective of this work was to investigate the diversity in root morphology of maize inbred lines and hybrids to help develop more P efficient genotypes. Nine tropical maize lines (L3, L228-3, L36, L5680079, L51502020, L5680084, L22, L53 and L5680067t) and thirty six F1 crosses derived from these lines were used in this study. The parental lines and the F1s from each of the crosses were evaluated in a paper pouch system with Magnavaca's nutrient solution under low (2.5 μM) and high P (250 μM) conditions. The genotypes were analyzed in a completely randomized experimental design with three biological replicates, each composed of three plants per pouch. ANOVA was performed and means were compared using the least significant difference (LSD) test (p