Genotype environment interaction as a tool for screening drought tolerance in coconut (*Cocos nusifera L.*)

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The genotype environment interaction (G×E) derived from gas exchange measurements of four coconut genotypes (the accession Clovis [*CL*] is believed to be tolerant to drought while the rest, Dwarf Green [*DG*], Dwarf Brown [*DB*] and Cameron Red Dwarf [*CRD*] are sensitive) subjected to 80 day natural drought in early 2005 was studied to examine the potential for using G×E as a tool of screening for drought tolerance in coconut. All palms were about 15 years of age and in adjacent plots at the Potthkkulama Research Station, Pallama in IL_1 Agro-Ecological Region (Aquic Quartzipsamments) and under general management practices recommended by Coconut Research

Institute. Eight adjacent palms from each of four genotypes were selected from experimental plots arranged in Completely Randomised Design. Stomatal conductance (g_s), rate of photosynthesis (A), and transpiration (E), were measured during the drought period along with the corresponding soil moisture contents (θ).

More conspicuous varietal differences were shown by the G×E derived from A and instantaneous water use efficiency (A/E). According to the G×E derived from *A, CL* and *DG* showed above average stability and *CRD* and *DB* had below average stability over the range of θ environments. Genotypic differences with A/E also identified *CL*, as a more stable genotype while *DG*, *DB* and *CRD* were grouped together with only minor differences. These four genotypes can be ranked in terms of the degree of drought tolerance based on G×E as *CL>DG>CRD>DB*. These results were consistent with earlier findings and thus, the method appears as a promising tool that can be used in screening coconut genotypes for drought tolerance. However additional research is needed to use this screening tool for drought tolerance in coconut. In particular, further research under longer dry spells is needed to reach a more comprehensive and repeatable results before the application of these findings for practical purposes.

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