

Phenotypic and genetic correlations among agronomically relevant traits in cassava



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introduction

Cassava (*Manihot esculenta* Crantz) is the fourth most important basic food after rice, wheat and maize and is a fundamental component in the diet of million of people. Although its most common product is the starch root, the foliage has on excellent nutritional quality for animal and human consumption and offers great potential. However, in spite of its importance of this crop, there is a limited knowledge about the inheritance of agronomically relevant traits and their relationship (1). The objective of this study was to estimates phenotypic and genetic correlations among agronomically relevant trials in Cassava.

Material and methods

Thirty-eight elite clones were evaluated in a uniform regional trial across thirteen locations in the northern coast of Colombia. Phenotypic and Genetic correlations were measured in individual location data as well as in the analysis combined across locations.

Table 1. Phenotypic (above diagonal) and Genotypic (below diagonal) correlations coefficients for agronomically relevant traits in cassava evaluated in thirteen environments in the northern coast of Colombia.

Traits	Fresh root	Harvest index	Dry matter content (%)	Fresh foliage	Dry matter yield (t/ha)
Fresh root		0,735	-0,268	-0,237	0,903
Harvest index	0,789		-0,110	-0,786	0,693
Dry matter (%) content	-0,323	-0,124		0,031	0,162
Fresh foliage	-0,375	-0,833	0,031		-0,216
Dry matter yield (t/ha)	0,883	0,770	0,155	-0,370	

Results

In the analysis combined across the thirteen locations, fresh root yield showed the following correlations: fresh foliage productivity – 0.237 (-0.375); harvest index 0.735 (0.789); root dry matter content –0.268 (-0.323) and dry matter yield 0.903 (0.883). Fresh foliage productivity had the following coefficients with other traits: harvest index -0.786 (-0.833), dry root matter content 0.031 (0.031) and dry matter yield –0.216 (-0.370). Phenotypic and genetic correlations between harvest index and root dry matter content were –0.110 and –0.124, respectively. In every case genetic correlations were higher than phenotypic ones. Harvest index showed the highest correlation with fresh root productivity, supporting the findings previously reported at CIAT and highlighting the importance of harvest index as one of the variables that should accompany root productivity in the selection indexes used for improving cassava productivity. As expected, harvest index was negatively associated with fresh foliage productivity. These results are useful for an improved implementation of selection indices in cassava breeding.

(1) Bueno, Alvaro. 1991. Estimaciones de los parámetros genéticos en la yuca. En Mejoramiento Genético de la Yuca en América Latina. Hershey, C.H. (ed). CIAT – Cali, Colombia. P: 197-217.