

Evaluation of agronomic traits variation in white yam (*D. rotundata*)

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Introduction

- In West Africa, white yam is a highly preferred staple food as well as a cash crop supporting livelihood.
- The technical challenges associated with yam breeding and selection include the long breeding cycle and low multiplication ratio. Determining agronomic values of the phenotypic features of the genebank genotypes would facilitate their efficient use for genetic improvement and unlock the breeding potential.

➤ Thus, diverse white yam genotypes were evaluated to dissect the agronomic value of various traits.

Materials and methods

- Twenty-one genotypes of white yam selected from IITA genetic resource materials were used for this study.
- Field experiment was conducted from Apr. to Dec. 2017.
- Randomized block design with three replications was used.
- Destructive sampling during growth period was carried out to understand the biomass partitioning and tuber index*.

*Tuber index = tuber weight / total plant biomass x 100

- Final tuber yields, number of tuber per plant, growth period were recorded.

Results

Table 1
Varietal difference of agronomic traits among tested genotypes

IITA ID	Origin	Sex	GP (days)	FWA12 (g/plant)	FWT12 (g/plant)	Tin12 (%)
TDr-1489	Togo	Female	197.1	813.0	1085.6	57.2
TDr-1499	Togo	Monoecious	169.6	618.2	1459.2	70.2
TDr-1533	Togo	Male	155.4	620.5	893.5	59.0
TDr-1543	Togo	Female	156.9	278.5	728.5	72.3
TDr-1649	Togo	Male	157.7	673.3	1216.3	64.4
TDr-1709	Togo	Female	153.7	477.7	890.0	65.1
TDr-1711	Togo	Female	189.0	673.2	1060.2	61.2
TDr-1775	Togo	Male	148.4	694.3	999.4	59.0
TDr-1829	Benin	Male	153.3	686.7	990.8	59.1
TDr-1935	Nigeria	Male	160.7	492.0	651.0	57.0
TDr-2029	Togo	Unknow	155.1	767.0	900.8	54.0
TDr-2041	Nigeria	Female	172.6	471.2	837.7	64.0
TDr-2435	Nigeria	Monoecious	155.6	478.2	958.0	66.7
TDr-2439	Togo	Male	167.6	366.7	934.0	71.8
TDr-2713	Togo	Female	150.1	435.0	1044.7	70.6
TDr-2973	Nigeria	Female	162.5	248.2	670.7	73.0
TDr-3325	Ghana	Male	150.8	553.5	1096.4	66.5
TDr-3357	Ghana	Male	162.5	642.3	1272.5	66.5
TDr-3623	Nigeria	Female	170.0	440.2	944.4	68.2
TDr-4155	Nigeria	Male	158.3	328.0	705.3	68.3
TDr-4180	Guinea	Male	161.1	617.5	1039.1	62.7

GP: growth period (days from sprouting to senescence)
FWA12: Fresh weight of aerial part at December
FWT12: Fresh weight of tuber part at December
Tin12: Tuber index at December

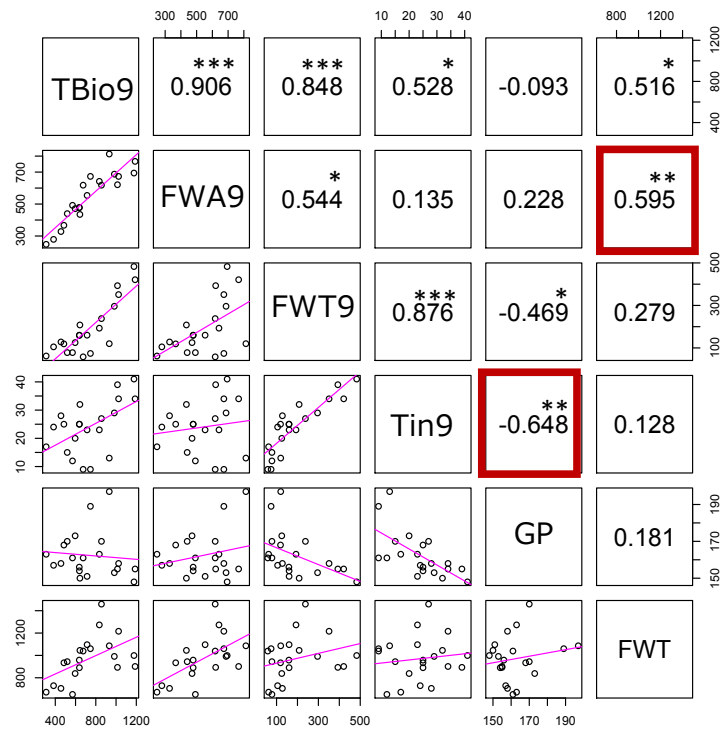


Fig. 1 Correlation analysis among agronomic traits

TBio9: Total biomass at Sep, FWA9: Fresh weight of aerial part at Sep, FWT9: Fresh weight of tuber at Sep, Tin: Tuber index
GP: Growth period, FWT: Fresh tuber weight

Conclusions

A unique genotype which shows high and/or low production efficiency observed from tested genotypes. The tuber index in September was negatively correlated with growth period. The results from this study provide useful information for the yam improvement and development of improved varieties suitable for the region.

