**Variability studies on treatment combinations of *Glomus clarum*, *Leucena leucocephala* and character associations in *Amarantus* germplasm**

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**Abstract**

The variability response of *Amaranthus* genotypes to treatment combinations of Arbuscular mycorrhizal fungus (*Glomus clarum*) and Green manure (*Leucaena leucocephala*) was investigated in this study.

The study was conducted at the Research farm of the Department of Botany, University of Ibadan, and an open field experiment was laid out in complete randomized design (CRD) with three replicates. Five genotypes of *Amaranthus* spp; NGBO 1644, NGBO 1234, NGBO 1613, NGBO 1662 and NGBO 1271 were treated with 5g each of *L. leucocephala* and *G. clarum* and combination of 2.5g of *L. leucocephala* and *G. clarum*, while untreated plant served as control. Data analysis was done by Analysis of variance using SAS 2.0 package. The result showed that the genotypes had significant (p<0.05) effect on fruit characters except number of fruits and leaf biomass, while the interaction of Genotype x treatment was expressed on fruit biomass.

The combinations of *G. clarum* + *L. leucocephala* was significantly higher on growth characters and number of fruits per stand for NGBO 1644, NGBO 1234 and NGBO 1271 than other genotypes. *L. leucocephala* was significantly higher in plant height for NGBO 1644, leaf length and leaf width for NGBO 1613 and NGBO 1271, stem girth for NGBO 1271 and number of fruits for NGBO 1613, while *G. clarum* was higher in number of leaves for NGBO 1613, plant height for NGBO 1234, stem girth for NGBO 1234 and NGBO 1662 and number of fruit for NGBO 1613. The result of character association in *Amaranthus* also revealed that the stem length is positive and strongly correlated with plant height (r= 0.97; p< 0.01), while leaf width is related to stem girth (r= 0.66). There were positive associations between the fruit length and stem length (r= 0.58) and fruit colour at r= 0.70, while the fruit width is related to plant height, fruit colour and fruit length at r= 0.51, 0.67 and 0.86 respectively. The combined effects of *G. clarum* + *L. leucocephala* greatly enhanced the morphological traits of genotypes of *Amaranthus* spp in its fair use to ensure food security. It is therefore recommended for *Amaranthus* producers.

**Keywords:**  *Amaranthus*, variability, arbuscular mycorrhizal fungus, *Leucaena leucocephala*

 resources