

Correlation Studies and Heritability Estimates among Onion (*Allium Cepa* L.) Cultivars of North Western Nigeria

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Abstract : Onion (*Allium cepa* var. *cepa* L.), is the most important species of the *Allium* group belonging to family Alliaceae and genus *Allium*. It can be regarded as the single important vegetable species in the world after tomatoes. Despite the similarities, which bring the species together, the genus is a strikingly diverse one, with more than five hundred species, which are perennial and mostly bulbous plants. Out of these, only seven species are in cultivation, and five are the most important species of the cultivated *Allium*. However, *Allium cepa* (onion) and *Allium sativum* (Garlic) are the two major cultivated species grown all over the world of which the onion crop is the most important. Heritability defined as the proportion of the observed total variability that is genetic, and its estimates from variance components give more useful information of genotypic variation from the total phenotypic differences and environmental effects on the individuals or families. It therefore guide the breeder with respect to the ease with which selection of traits can be carried out. Heritability estimates guide the breeder with respect to ease of selection of traits while correlations suggest how selection among characters can be practiced. Correlations explain relationship between characters and suggest how selection among characters can be practiced in breeding programmes. Highly significant correlations have been reported, between yield, maturity, rings/bulb and storage loss in onions. Similarly significant positive correlation exists between total bulb yield and plant height, leaf number/plant, bulb diameter and bulb yield/plant. Moderate positive correlations have been observed between maturity date and yield, dry matter content was highly correlated with soluble solids, and higher correlations were also observed between storage loss and soluble solids. The objective of the study is to determine heritability estimates and correlations for characters among onion cultivars of North Western Nigeria. This is envisaged will assist in the breeding of superior onion cultivars within the zone. Thirteen onion cultivars were collected during an expedition covering north western Nigeria and Southern part of Niger Republic during 2013, which are areas noted for onion production. The cultivars were evaluated at two locations; Sokoto, in Sokoto State and Jega in Kebbi State all in Nigeria during the 2013/14 onion season (dry season) under irrigation. Combined analysis of the results revealed fresh bulb yield is highly significantly positively correlated with bulb height and cured bulb yield, and significant positive correlation with plant height and bulb diameter. It also recorded significant negative correlation with mean No. of leaves/plant and non significant negative correlation with bolting %. Cured bulb yield (marketable yield) had highly significant positive correlation with mean bulb weight and fresh bulb yield/ha, with significant positive correlation with bulb height. It also recorded highly significant negative correlation with No. of leaves/plant and significant negative correlation with bolting % and non significant positive correlation with plant height and non significant negative correlation with bulb diameter. High broad sense heritability estimates were recorded for plant height, fresh bulb yield, number of leaves/plant, bolting % and cured bulb yield. Medium to low broad sense heritabilities were also observed for mean bulb weight, plant height and bulb diameter.

Keywords : correlation, heritability, onions, North Western Nigeria

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