Genetic variability analysis and selection of pisifera palms for commercial production of high yielding and dwarf oil palm planting materials

ABSTRACT

This study was carried out to evaluate the performance of pisifera (male parent) palms, their general combining ability, and to identify suitable pisifera palms for large scale production of oil palm planting materials. Twenty-four (24) Deli dura palms were nested into 10 Nigerian pisifera male parent palms to produce 1056 tenera (D × P) palms. Tenera palms were planted in two replicates with 16 palms/progeny/replicate. Data collection on yield and yield component traits carried out consecutively for six years. Analysis of variance (ANOVA) followed by the mean comparison and general combining ability were carried out. These were done to know the performance of each of the pisifera parent palms. Additionally, multivariate analysis in form of cluster analysis was done using the quantitative traits. ANOVA showed significant variability among the pisifera palms based on the traits. Fresh fruit bunch (FFB) of each pisifera palm ranged from 173.80 to 211.46 kg/palm/year (kg/p/yr) with a trial mean of 191.92 kg/p/yr, while the oil yield (OY) ranged from 60.24 to 44.06 kg/p/yr with a trial mean of 53.72 kg/p/yr. Based on their mean comparison and the general combining ability, four palms (P01, P03, P09 and P06) have been ranked to be high yielding and good general combiner for FFB and oil yield. While palm P04, P06 and P09 were found to be good combiners for palm height. From these result, four pisifera palms (P01, P03, P09 and P06) have been identified to be high yielding (in terms of FFB and OY), dwarf height and suitable as pollen sources for commercial production of D × P planting materials.

Keyword: Germplasm; Elaeis guineensis Jacq.; Oil yield; Genetic diversity; General combining ability