

## Abstract

*Calotropis procera* is a wild species that is drought-resistant and important in production of wool, fibre, biomass among other uses. There exist high demand of the wool in Asian countries and collection from the wild has been going on in Kenya and other countries. However, this collection does not meet the quantity required. Domestication of the species may be the key in bridging the quality and quantity demands for the wool. A study is being undertaken to evaluate growth, phenology and wool productivity of selected provenances of *C. procera* in dry lands of S. Eastern Kenya. The research site is situated between 01.31358<sup>0</sup>S, 037.75546<sup>0</sup> E and 01.31422<sup>0</sup>S, 037.75576<sup>0</sup>E and elevation of 1173m a.s.l in South Eastern Kenya University (SEKU), Kitui County, Kenya. The research started in January 2015 with the main focus on monitoring the growth, phenological characteristics and wool productivity of the species in a typical farm setting. This paper focuses on growth characterization of three provenances of *C. procera* under different spacings (1.5mx1.5m, 2mx2m and 3mx3m). Results indicate that the species can be domesticated, it is hardy and capable of achieving an average field survival of over 97%. The species is multi-stemmed with Tharaka provenance showing highest mean branching of 13.25 followed by Baringo (12.22) then Kibwezi (11.98). Kibwezi recorded a slightly higher DBH growth of 3.90cm followed by Baringo (3.83) then Tharaka (3.82). Tharaka had highest mean height of 187.89cm, Baringo (184.25) and Kibwezi (182.63). Test of homogeneity of variances showed significant statistical differences ( $P < 0.5$ ) with Kibwezi being the least significant (0.043), Baringo (0.01) and Tharaka (0.000). All provenances showed a strong positive correlation (Pearson,  $P < 0.01$ ,  $n = 12$ ) of branching, DBH and Height with Kibwezi recording  $r_s = 0.975$ , Baringo ( $r_s = 0.988$ ) and Tharaka ( $r_s = 0.996$ ). Differences in spacing levels started affecting growth parameters from the age of ten months with 3x3 showing highest DBH followed by 2x2 then 1.5x1.5. In terms of height, 1.5x1.5 has the highest (182.85cm), 2x2 (172.42) and 3x3 (168.65). 3x3 was not statistically significant (0.806,  $P < 0.05$ ) while 2x2 and 1.5x1.5 had significance of 0.001 and 0.000 respectively. All spacing levels showed strong positive correlations (Spearman,  $P < 0.01$ ,  $n = 12$ ) of the study parameters where 1.5x1.5 had  $r_s = 0.614$ , 2x2 ( $r_s = 0.972$ ) and 3x3 ( $r_s = 0.986$ ) all at  $P < 0.01$ . The study can authoritatively conclude that the species can establish and grow well in a typical farm setting in dry lands. Spacing affects growth parameters from the age of 10 months. Baringo provenance and 2x2 spacing have performed best. The study recommends analysis of wool productivity to justify the best provenance and spacing.