

THE INFLUENCE OF BUDWOOD PHYSIOLOGY ON THE GESTATION PERIOD OF FRUIT TREE CROPS: STUDIES ON *TRECVLIA AFRICANA* (AFRICAN BREADFRUIT)

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ABSTRACT

rent types of Treculia budwoods. The results indicate that B1 - trees and B2 - trees fruited within 2-2½ years and 5 years respectively at very low heights. It was concluded that budding Treculia and other fruit tree crops with budwood obtained when the trees are in flower could provide further improvement in propagating the species vegetatively, and should be adopted in the routine practices, since it could be relied upon for early bearing at very low heights.

INTRODUCTION

Treculia africana (Decne), Breadfruit, Moraceae, is one of the indigenous, tropical rainforest, tree crop species of nutritional and dietary importance. The pulpy mesh containing the seed is scooped out, and washed in water. To free the seeds from the slimy pulpy-mesh, the scoopate is robbed between sand or coarse leaves, such as bamboo leaves. Extracted seeds are spread in an airy space to dry before packaging or conversion to food.

The importance of the seeds in the dietary and nutritional needs of man cannot be over looked. The presence of 11.32% oil, 69.08% carbohydrate, 14.6% proteins, traces of fibre, and varying amounts of mineral salts and vitamins in the seed of *Traculia* have been reported (Ejiofor and Okafor, 1997; Okafor, 1985). Okafor and Okala (1997) itemized different ways the seeds are utilized as food, the seed can be fried and eaten alone, with palm kernel or coconut bread, boiled and eaten as porridge. As food supplement, the seeds can be boiled together with tender fresh maize grains.

In most rural dwellings, the seeds are boiled and converted to powered food, this is the food often given to children under 10 years of age. Generally, *Treculia* meal is tasty, with good aroma. The husk is used as poultry feed and the moist pulpy materials are excellent livestock feed. The wood has been reported to be an excellent source of high quality pulp for paper-making (Okafor, 1981). The wood also is an important source of energy when used as firewood.

The species is mainly propagated by the seed. Mabo et al (1988) reported that in the wild, the trees grow up to 42m with girth of 1.8m - 2.5m. The trees take about 8-10 years to start bearing fruit at the height of about 12m-18m (Okafor, 1981). The wide tree's gestation period as reported, is long, and the growth height and size, enormous. The danger posed by the dropping fruits scare people from planting the trees within their premises or even

utilize the tree in landscaping despite its rich ornamented attributes. The importance attached to the seeds as food has led to the improvement of the vegetative propagation of the species by budding and or grafting. Okafor (1985) emphasized the use of budwoods/graftwoods from already fruiting trees. Budded *Treculia* starts bearing 4-5 years after planting. However, information on the physiological status of budwood and its influence on the gestation period and growth size of *Treculia* appear scarce or even not available. It is possible that budwoods collected when the trees are in flower could further reduce the gestation period and bearing heights of budded *Treculia*. It is against this background that this study was undertaken. The aim of this work is therefore to assess the possibility of budwoods collected at two different physiological phases of the trees influencing reduction in the gestation period and bearing heights of *Treculia africana*.

MATERIALS AND METHODS

Two hundred and forty (240) seedlings of *Treculia africana* at the age of two weeks were used for this study. The seedlings were divided into three batches of 80 seedlings each. The first batch served as rootstock for budwoods collected when the trees were in flower (B₁), the second batch served the same purpose for budwoods collected when the trees were not in flowers (B₂), while the third batch, the control was grown unbudded. The seedlings were raised in 2.5ha. for 8 months before budding was done. This was to allow them develop buddable girth of 3.5cm - 5cm (Okafor, 1985). The experimental design was a complete randomized block. The treatments were replicated four times and each replicate contained 20 seedlings. Buddable girths were induced by planting the seedlings in holes partially filled with 1.5kg of goat droppings. Patch budding technique was adopted (Okafor et al, 1997).

Fertilizer (NPK) application was done twice in the first year after planting and only once in the second year, at the rate of 100g NPK per seedlings. During the dry season, water was applied by mechanized technique, involving sprinklers and other irrigation facilities. Watering was done at 2 days intervals (evenings) and each watering period lasted for 3 hours. The plantation was constantly kept weed free. Weeds obtained after slashing were gathered around each seedling. The study was done at the National Horticultural Research Institute Okigwe and lasted for 5 years (1999-2003).

RESULTS AND DISCUSSION

The results obtained by budding *Treculia* with two morphologically different types of budwoods, showed the differences in the fruiting periods of the trees. The control, the unbudded trees, did not fruit within five years, suggesting that the tree required longer period of growth to attain fruiting phase. The results agreed with the report that unbudded *Treculia* tree take 8-10 years to bear fruits (Okafor, 1981). On the other hand, B₁ trees fruited 2-2½ years while B₂ trees fruited 5 years after budding. The result obtained with (B₂) agreed with the report that the trees fruited within the period earlier reported for budded trees (Okafor, 1981). The results obtained with B₁ disagreed with earlier reports

and appears new. The early fruiting observed in B₁ related to the physiological phase of the budwoods, since B₁ was obtained during flowering. Flowering hormone, florigen once produced spreads to the branches, that the hormones were self-replicating (Ujoh, 1987, Wareing et al, 1977). Florigen contain in B₁ exerted strong influence in the early bearing of the B₁ - trees. The finding that *Treculiar* seedlings budded with budwoods obtained when the trees were in flowers fruited within 2-2½ years. This is a further improvement in the vegetative propagation of the species. The results further suggests that budding *Treculia* or other indigenous fruit trees with budwoods obtained when the parent plants were in flowers could be relied upon for early bearing of such budded trees.

The results of the analysis of the tree's growth parameters show that the tree heights ranged from 12m to 14m, mean girth ranged 38-50cm - 38.70m bearing heights, 0.72m-0.74m and mean height at first branch formation, 0.45m-0.65m (Table 1). The results also revealed that the trees had reduced growth heights and sizes at bearing. Information regarding the species growth parameters show that in the wild, the tree attains height of 38-42m and bears fruits from heights of 22m-28m, hence the dropping fruits land with heavy noise. There is no earlier similar data on the growth parameters of the budded trees of the species.

Table 1: Growth parameters of budded *Treculiar africana* Trees

Budwood	Mean tree Height (m)	Mean bearing Height (m)	Mean Girth (cm)	Mean Height at Branching (m)
B ₁	12	0.72	38.50	0.60
B ₂	14	0.74	38.70	0.45

Source: Extrapolated from the result

The result that the budded trees fruited at significantly very low heights could remove the danger associated with the dropping of the massive fruit head. Further the results of the analysis of the growth parameters, which revealed reductions in the trees growth and size, implied that the tree could be planted around residential and public premises, not only for its fruits but also for its ornamental values.

Based on the results of this study, it can be concluded that budwoods of the species obtained when the parents trees are in flowers, could be use in routine vegetative propagation of the species, since it could be relied upon for obtaining trees that would bear early and at greatly reduced growth heights and sizes.

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