

# TREE BREEDING PROGRAMMES (TREE IMPROVEMENT) IN NIGERIA

## SCHEMATIC OUTLINE OF BREEDING PROCEDURE

SPECIES

PROVENANCE

STAND (FOREST, PLANTATION, SEED STAND)

INDIVIDUALS- PLUS TREES (PHENOTYPES)

SEXUAL

PROPAGATION (SEED)

VEGETATIVE PROPAGATION

RECOMBINATION & CREATION

(SLION, BUDWOOD, CUTTINGS

COLLECTION & PRESERVATION

PROGENY

CLONES

1. EVALUATION OF PARENTS

5. CLONE COLLECTION

BY BREEDING

STUDY OF CLONES

(ESTIMATION OF GENOTYPE)

UNDER UNIFORM CONDITIONS

AND REJECTION OF POOREST TREES)

(ESTIMATION OF GENOTYPE)

CONTROLLED POLLINATION

2. SELECTION OF PLUS

6. SEED ORCHARDS

TREES FROM THE

PRODUCTION OF

BEST PROGENIES

IMPROVED SEED

CLONE STUDEIS

SOURCE FOR PROGENY TRIALS

3. IMPROVEMENT OF

ESTABLISHED SEED

ORCHARD

4. CONVERSION OF PROGENY  
TRIALS INTO SEEDLING  
SEED ORCHARD

7. MULTIPLICATION  
GARDEN-COLLECTION  
AND PRODUCTION OF  
BUDWOOD

8. CLONE PLANTING OF  
FORESTRY SCALE

ELIMINATION AND SELECTION  
IMPROVED BREEDING MATERIAL

#### PHASE II

SEXUAL PROPAGATION

PROGENY TRIALS

IN PRINCIPLE SAME PROCEDURE

AS PHASE I EXCEPT

POSSIBLY FOR ITEMS 3

VEGETATIVE

PROPAGATION

CLONES

IN PRINCIPLE THE

IN PRINCIPLE THE

SAME AS IN PHASE I

#### **TREE IMPROVEMENT PROGRAMME IN NIGERIA**

Plantation forestry is a prerequisite to any tree improvement programme because it allows the tree breeder to select and improve on the selected plant materials.

The beginning of plantation forestry in Nigeria was followed by spp introductions and the application of genetic principles for improving our forests. Several exotic spp have featured in the afforestation programmes in the country. Among these spp are *Gmelina arborea*, *Tectona grandis* and pines.

The ever increasing plantation establishment of the spp has necessitated the need to supply improved seed for planting.

As a result of this, various improvement programmes have been initiated at FRIN startx with provenance selection which is the 1<sup>st</sup> stage in any tree improvement provenance trial recorded in Nigeria started in 1968 in Pine.

In 1970, the International provenance trial series of *Pinus caribaea* Mor. and *P. oocarpa* Sch. was organized by Commonwealth Forestry Institute, Oxford and Nigeria has been participating in its programmes. The trials of *P. oocarpa* and *P. caribaea* were first established in Southern Nigeria in 1972 and 1973 respectively. In the same year (1973), the International provenance trials of *Tectona grandis* L. f started in Nigeria, while that of *Gmelina arborea* Roxb. began in 1978.

The best provenances of these spp have been identified, and further improvement work is being centered on their reproductive biology. This is necessary because the knowledge of reproductive biology is so clearly fundamental to plants and tree breeding and improvement in order to design effective breeding programme for them.

Engenti (1976) worked on some aspects of the reproductive biology of *Tectona grandis* L.f and reported the possibilities of using stored pollen of the sp for tree improvement work.

Improvement work on the indigenous hardwood spp is being carried out at the West African Hardwood Improvement Project.

(WAHIP) of the FRIN. The project's activity centres on the improvement of *Triplochiton scleroxylon*, *Terminalia superba*, *Livorensis* Khanyaspp, *Chlorophora excelsa*, *Azelia Africana* and a host of others.

Past and present researchers in the project have and are still doing a lot of work on different areas of improvement of the aforementioned tree spp.

#### Success of Vegetative propagation of some tree spp.

A lot of encouraging results have been obtained on vegetative propagation of *L. scleroxylon* (Howland & Bowen, Ladipo, Oni). Work on clonal selection, branching patterns of *L. scleroxylon* have been successfully carried out by Dr. Ladipo (the former WAHIP project leader).

It has been found possible to root cuttings from *Khanya Senegalensis*, *Chlorophoara excels*, *Manisoniaaltissima* (this was reported by Howland and Bowen 1977, Oni 1984).

Ladipo (1981) reported that veg. propagation in the form of budding and grafting as an additional approach to the tree input of *I. scleroxylon* has allowed candidate plus trees to be propagated successfully and established as seed orchards (in situ and ex-situ) and materials for flower induction experts provided.

Various workers (Howland, 1975, Ikekhuamen and Britnomn) at different time, have recorded successful grafting techniques for the sp. Their result favoured patch budding. Beside patch budding, WAHIP reports (1977) indicated that preliminary trial by the project showed that top cleft and side veneer methods of grafting auto potted seedlings were all, to some degree, successful. Okoro and Omokaro (1975) examined the possibilities of rooting adult stems of *I. scleroxylon* by, marcotting or our-layering. Although the result of this work was not conclusive it however indicated that marcotting is possible in *I. scleroxylon*.

Success has also been achieved in rooting leafy cuttings of this sp. Ladipo (1981) obtained rooting success exceeding 75% for single node leafy cutting treated with 0.1% Naphthalene acetic acid NAA + 0.1% Indole-3-butyric acid (IBA) in industrial methylated spirit.

It is necessary to mention that success has been achieved in certain aspects of veg. prop. Of exotic spp too. For example, Oduwaiye (1981) reported that it is possible to carry out grafting of *Gmalinaarborea* all the year round, though this had not been successful with budding.

Grafting of *Pimuscargan* has also been studied by various workers/researchers in Nigeria (These researchers include Okoro (1976), Oduwaiye (1978), Oduwaiye (1980), Oduwaiye (1983)