

## **PROBLEMS OF TREE IMPROVEMENT (TREE BREEDING) IN NIGERIA**

1. Non-availability of a genetic base or materials. This is due to exploitation which leads to the loss of gene pool in tree .
2. Lack of adequate information and exchange of information on the breeding systems of native trees. Info' on xtics of local trees.Infor' such as breeding pattern etc.
3. Or in other words scarcity of Basic genetic information about trees.  
Scarcity of trainedstaff .A knowledge of the genetic characteristics to be improved upon.
4. The time factor/ element – Rotation age of trees is an adverse problem for tree improvement.  
Thus the main aim of tree improvement programme is always to reduce the rotation.  
Consider a situation where F1 are raised, the time it will take to raise F2.
5. Inadequate funds.
6. Lack of technology for tree improvement.
7. Lack of favourable government policies.

## **STRATEGY TO COMBAT THESE PROBLEMS**

The national policy should be geared towards leaving the natural forests as they are so as to provide a large genetic base.

Conservation in-situ is very necessary. Control of exploitation should be more effective and no exploitation should be within strict natural reserves (SNR)

## **METHODS OF CONSERVING THE GENETIC RESOURCES OF FOREST TREE SPP**

The meaning of in-situ conservation maintenance and regeneration of the spp involved in their areas of origin or natural occurrence.

In-situ conservation is highly desirable in cases of spp where the appropriate silvicultural or

1. In-situ – (see its meaning)
2. Ex. Situ see storage

## Vegetative propagation

- (a) grafting
- (b) marcotting

This technique is particularly appropriate for spp which produce seeds infrequently and for recalcitrant.

Recalcitrants – Seeds of forest tree spp whose viability could be lost within a short time and unable to withstand either drying or low temperatures or both.

- 3. pollen storage
- 4. Tissue and meristem culture techniques.

## **BREEDING SYSTEMS OR REPRODUCTIVE SYSTEMS**

Knowledge of reproductive systems i.e breeding systems is so clearly fundamental to plant and tree breeding that discussion of them must precede any consideration of breeding methods themselves.

For p/h/tree breeding purposes all plants are divided into two (2) broad groups.

- 1. Self-pollinating plants.
- 2. Cross pollinating plants.

The division of plants into these groups is of great importance because the methods of breeding applicable to the self-pollinating group are for the most part different from these that apply to the cross-pollinated spp.

The important difference between the two groups is related to the influence of inbreeding vs outbreeding on the genetic structure of popns. All plants in popns of outcrossing/cross-pollinating spp are highly heterozygous, while in-breeding/self-pollinating spp often give rise to closely related homozygous lines.

Vegetative propagation (a sexual reproduction) can be used to produce new individuals in some plants.

This could be by

- 1. Budding and grafting (this is possible in pines, *Triplochitonseleoxylon* K. Schum, *Tectonagraundis* L.F, *Gmalinaarborea* Khayaspp etc.)

2. Cuttings (leaf cutting system cutting or root cutting).

Vegetatively propagated spp are highly heterozygous. If selfing is imposed a high degree of segregation or variability is observed. If selfing is imposed heterozygosity is reduced and vigour and yield (in agric crops) will be reduced.

There are some special modes of reproduction.

(1) Apromixis:- This is a type of a sexual reproduction in which seeds are produced but these seeds do not result from normal meiosis and fertilization. They are vegetative seeds.

Apromixis may be of different types.

(a) Parthenocarpy:- This is the development of fruit without fertilization i.e. ovary develops normally into a fruit without fertilization.

(b) Apogamy:- is the development of an embryo from any cell of the gametophyte other than the egg-cell, evidently without the intervention of gametes.

(c) Sporophytic budding:- Formation of an embryo from the diploid cells of the nucellus, as in orange, mango etc or even those of the integument, as in onion.

(2) Apospory (apo, means off or without). Apospory is the development of the gametophyte directly from vegetative cells of the sporophyte without the intervention of a spore.

(3) Polyembryony : - If more than one egg in a gametophyte is fertilized, oen embryo may develop from each. The occurrence of more than one embryo in the seed is known as simple polyembryony. This is common in both dicotyledenous and monocotyledemous spp.

Cleavage Polyembryony refers to those embryos that come from a single egg by splitting after a single fertilization.

A plant is classified accordingly to which of the two broad reproductive systems is prominent.

In cross-pollinating spp, there is a high degree of heterozygosity. If selfing is imposed there will be in-breeding depression i.e reduction or loss of vigour.

In-breeding – occurs when crosses are made between close relatives. The extreme case is selfing, or the crossing of a tree with itself.

Out-breeding- describes crosses made between individuals not closely related.

Cross-pollination may be of the following types

1. Xenogamy – (xenos – stranger) Pollination between flowers borne by 2 different plants of the same spp.
  2. Geitonogamy (geiton-neighbour) BU between flowers borne by the same plants.
  3. Hybridism – Pollination between 2 flowers.
1. Self pollination – transference of pollen gr. From the anther of a flower to the stigma of the same flower, evidently bisexual.
  2. Cross-pollination – transference of pollen gr. From one flower to another flower. Borne by 2 different plants of allied spp or even allied genera.

In self pollinating spp (i.e. autogamous spp) each member of the popn is a vigorous homozygote. These self poll spp reproduce independent of other plants in the population.

In self poll plants there will be no inbreeding depression if the plants should be selfed. If there will be any it will be of insignificant effect.

There are some conditions in plants which impose cross pollination.