DEVICES/CONDITIONS IMPOSING CROSS POLLINATION

(1) Dicling or unisexuality:- Flowers are unisexual i.e. stameus and capele lie in separate flowers – male and female, either borne by the same plants or by two separate plants.

Dicliny or unisexuality is of 2 types.

(a) Monoecious:- when the male and female flowers are on one and the same plants e.g. maize.

(b) Dioecious – when the flowers are on 2 separate plants e.g. carica papaya (pawpaw).

(2) Dichogamy:- This occurs in bisexual flowers. This is the maturity of another and the stigma at different times. There are 2 conditions of ofdichogang.

(a) Protandry:- Male reproductive organ (author) matures before the female reproduction organ (stigma).

(b) Protogymy:- Female reproduction organ (stigma) matures before the male reproductive organ (another).

(3) Self-incompatibility:- This occurs when functional pollen grains of a flower have no fertilizing effect on the stigma of the same flower.

Incomp.is abiochem reaction i.e.certain chemicals inhibit the germination of pollen.

Incomp.is heritable i.e. it is genetical and can therefore be carried from generation to generation. It can take place at any stage between pollution and fertilization.

(i) Fertile pollen gr may not germinate on receptive stigma (stigmatic incompatibility)

(ii) Pollen may germinate, but the growth of pollen tube may be slow and the female egg might have withheld before the pollen tube gets to it.

(iii) Incomp. may be at the ovule. The male and female much may not fuse.

TYPES OF INCOMPATIBILITY

1. Heteromorphic Incomp:- This is caused by difference in the floral morphology. E.gPrimulasinensis has two types of flowers. There is one with long style (Pin) and the other with short style (Thrum) Pollen from the 2 types of flowers cannot function on their stigma.

A to A poll and fert can occur.

A to B poll and fert cannot occur.

2. Homomorphic incompatibility

This is not as a result of variation in floral morphology. It is caused by the gamage of the plants. It can be

(a) Garmetophytic:- In which incompdepends upon the genotype of the gametphyte.

(b) Sporophytic – where the incompatibility is impressed upon the gametophyte by its sporophytic parent.

Male Sterility

In incompatibility functional pollen grains are produced, but under some conditions cannot function. In male sterility the pollen grains are non-functional.

Reasons (i) Chromosomal aberrations can cause male sterility.

(ii) Gene action i.e. presence of certain genes can cause if

(iv) Cytoplasmic factor/influences can also cause male sterility.

Under the situation of male sterility, anthens of some flowers may not contain pollen at all.

Male sterility, unlike incompatibility, is not a regular mechanism fo controlling hybridity in natural populations. Male sterility occurs sporadically i.e. unexpectedily in populations of both self and cross poldinatedspp, presumably as a result of mutation at any one of the many loli that govern difference vital steps in the formation of pollen.

In nature, such mutations are disadvantageous to the plants. But breeders explore this to their advantage when carrying out hybridization. In hybridgization the 1st stage is emasculation. But if male sterility occurs emasculation process which is tedious will not be done, since emasculation has been genetically carried out.

Emasculation:- This is the removal of anthers or male flowers before controlled pollimation.

There are three types of male sterility:

1. Genetic male sterility

2. Cytoplasmic male sterility

3. Cytoplasmic – Genetic male sterility.

PROCEDURE FOR INTRODUCTION OF EXOTIC SPP IN NIGERIA

Wherever man has gone, his plants have gone with him, and this carrying of plants from place to place has been one of the most important features in the development of agriculture generally throughout the world.

What do we understand by introduction of exotic spp? This is the acquisition of superior plants by importing them from other areas.

There are some factors which necessitate the introduction of exotic spp. These include:

1. When the supplies of indigenous timber and other forest products are insufficient to meet the local demand i.e. to enrich the local flora.
2. When the original spp are unsuitable for the locality or object of management. i.e. wood quality.
3. When an inferior vegetation is to be replaced by more valuable ones e.g. conversation of genuine savanna to a plantation.
4. When object of management is to extend the growth of one sp uniformly over a large area.
5. When the fertility of the soil has so deteriorated that the original spp will no longer thrive on it and must give way to less exerting ones.

Among the consideration used choosing ……

The first thing to be done in introducing an exotic sp is forestry is to carry out species trials. This is necessary to determine the suitability of the sp to the new environment.

Generally, species trials involve

1. Elimination trial
2. Growth trial
3. Field/plantation/yield/crop performance trial.

After concluding that an exotic tree sp can do well in the country there will be need to carry out breeding activities on the species with the aim of improving it.

The first stage of the breeding procedure is provenance trail.

What is a provenance? There have been several published definitions of providence. Wright (1976) reported that "provenance" is a synonym for "origin" or "source". He added that the word has been commonly used by tree breeders to mean "ultimate natural origin".

Simply, a provenance is a seed source and it is usually a well defined geographical location.

It is particularly necessary to do provenance testing (provenance trial) prior to more intensive breeding work, especially when dealing with an exotic. However, provenance testing is also desirable native spp.

Provenance testing is usually carried out for the following reasons:

1. Determination of best seed sources to use in different forest areas.
2. Fixing regions where plus tree selection should be concentrated.

Plus tree: These are those trees in a stand that are phenotypically the best. They are xterised by high growth intensity, good stem quality, good health etc.

Provenance selection is usually the first step in any tree breeding programme. The materials so obtained can later be subjected to further improvement by other means.

Provenance selection leads to effective tree improvement when the spp of interest is

1. geographically widespread,
2. occurs in a diversity of ecological conditions
3. has a long period of exposure to a particular environment and
4. where natural or seminatural population of the sp still exists.

After selecting the best provenances, plus trees are then chosen from such produces . Materials from the chosen plus trees are normally used to estab. Seed orchards either by seeds (seedling seed orchard) or by veg. means (grafting chonal seed orhard.

Seed orchards are special plantations managed to provide abundantly genetically superior seeds on a sustained basis.

Seeds collected from such seed orchards are usually used in carrying out progenly trials or progeny test.

Progeny:- The offspring of a particular tree or a particular combination of one female and 1 male tree

Progeny Test:- The method of assessing the genetic xter of an individual by the performance of its progeny.

Progeny Test:- is an expt, usually replicated, to compare the offspring of different parents, or to compare performance of offspring and parents usually confined to seedling offspring.

Progeny testing may serve different purposes:

1 rank established varieties according to yield potential.

2 Assess the breeding value of parent plants.

3 Select superior genotypes both within and between progency families.

4 Provide improved and known seed sources.

Eli tree: This is a tree which has been proved to be genetically superior by a progency test.

(Evaluation of parents by the performance of their sexual progency.)