1. **LOCATION OF SEED COLLECTION AREAS**

Areas where seed crop is sufficiently heavy to make collection profitable should be chosen; and while making this choice, attention should be paid to the abundance and the quality of the seed. Every attempt should be made to collect seeds from suitable sources which go a long way to minimize seedling variation. To this end, **seed orchard**is the ideal place and in the absence of this, pure stands of desired species will also yield good result. It is however highly undesirable to collect seed from isolated tress/plants .e.g. arboretum. Arboretum trees are not ideal for collection of seeds because:

a) Self-pollination which leads to reduction of seed quality may result,
b) Cross-pollination which different species may take place.

When a good source has been discovered; trees of good form in the area which produce abundant seed of high quality should be selected and preserved as a future **Seed production area(Seed Stand)** from then on. Such stands are then thinned (rogued) to reduce phenotypic variation among the trees and to give the seed trees sufficient room for proper crown development. Such areas are managed on **Silvicultural rotation** basis. The ideal source of high quality seed in modern silviculture is the **Seed orchard.** This is a plantation of genetically superior trees, isolated to reduce pollination from genetically inferior outside sources and it is intensively managed to produce frequent, abundant and easily harvested seed crops.

***Seed production areas (Seed Stands)**– are good stands, chosen by phenotypic characteristics, that are thinned or otherwise treated to stimulate seed production; sometimes poor phenotypes are removed.

** **Seed orchard –** is restricted to stands planted for seed production and composedof trees known to be of desirable genotypes from tests of their progeny. They are usually established by vegetative propagation from the chosen genotypes and must be isolated from sources of contaminating pollen.

2. **TIME FOR SEED COLLECTION**

Harvesting of seeds should take place after the seeds have accumulated sufficient reserve materials and should also be delayed until the state of ripeness is such that harvesting is facilitated. In other words we should not harvest under- and over-matured seeds. Seeds or fruits should usually be collected just as they reached full ripeness and before natural dispersal begins. Seed of broadleaves should be collected during the period between embryo maturation and seed dispersal. This period varies considerably in the different tree species; and with local climatic conditions. The ripeness of the seeds or fruits is often judged by the colour of fruits but the surest check of seed ripeness is to cut fruits into two length-wise with a sharp knife and examine the seeds which occur on the outer surface. By this method, the number of fully developed seedsper fruit can be counted at the same time. A ripe seed is normally known by its hardness and changes in colour. For example, ripe fruit of *Chrysophyllumalbidum* is yellow and copiously milky while the immature fruit is greenish grey. Seeds of *Tectonagrandis*L.f (Teak) are ready for collection when the lustrous green husks of the fruit turn brown. Green *Nauclea* fruit changes to orange while the pinkish unripe fruit of *Dacryodesedulis* becomes deep blue at maturity. The unripe fruits of *Terminaliaivorensis, Terminaliasuperba* and *Triplochitonscleroxylon* which are green turn grey to brown when ripe.

3. **METHODS OF SEED COLLECTION**

There is a great variety of methods and equipment available for collection of fruits and the choice depends on a number of factors which may be summarized as follows:

a) Relative size and number of natural dispersal units and of the units which can be conveniently collected by man.
b) Characteristics of the fruits: size, number, position and distribution of fruits, resistance of peduncles to shaking, pulling, breaking/cutting, interval between ripening and opening
c) Characteristics of the tree: diameter, shape and length of bole, bark thickness, shape of crown, size, angle, density and resistance to breakage of branches, density of foliage and depth of crown.
d) Characteristics of the stand: distribution and stocking of trees (e.g. isolated trees, open or dense stand) density of understorey and ground vegetation.

e) Characteristics of the site: slope, accessibility.

The various seed collection methods could be classified in to the following:

1. Collection of fallen fruits/seeds from the forest floor.
2. Collection from the crowns of felled trees.
3. Collection from standing trees with access from the ground.
4. Collection from standing trees with access by climbing.
5. Collecting from standing trees with other means of access.

4. HANDLING COLLECTED SEEDS AND FRUITS AND SEED EXTRACTION

After collection, fruits are generally packed in sacks to facilitate transportation to places where they will be subjected to further treatments. Extent to which sacking can be done before deterioration sets in is dependent on the nature of the species. Generally however, immediate transportation after sacking is highly advocated. It is vital importance to label each container/sack thus:

i) Kind of forest tree seed
ii) Date of collection
iii) Place/area in which the seed was collected
iv) Name and address of collector.

If tree seeds cannot be transported at once to the storage point; provisional storage (emergency storage) should be arranged locally in huts under some kind of shelter which should be dry and airy.

In any case, sacks/containers should not be stored in large amount over a long period. Available means of transportation should be used to convey the harvested fruits and seeds to storage point as soon as it is found possible. Artificial drying should therefore follow as much as possible the natural process. Fruits or tree seeds should undergo progressive/gradual drying by continuous release of moisture from them. Air coming in contact with fruits or seeds should always be drier than the fruits and this is made possible by providing ample air circulation in any room where seeds are stored either naturally or artificially.

When fruits/seeds get to the processing point, the method of treatments wil depend chiefly upon the character of the fruit. Examples

1. *Nauclea* and *Tectonagrandis*storable in dry condition – so spread out in thin layer in the open sun/airy room until the pulpy exterior thoroughly dries over the seed, then store.
2. *Militia* and *Gmelina* – Macerate fruit in water, mash and stir in water, the seeds are then washed out. The pulp rises and seeds sink. Then spread out the seeds in thin layer to dry.

5.SEED EXTRACTION

In some species it is also the fruits which are sown in the nursery and they are often referred to loosely as ‘seeds’, e.g. *Tectonagrandis* L. f. In the majority of species, however, fruits are collected but seeds are sown, therefore at some stage the seeds must be extracted from their covering of fruits. **The separation of the seed from other parts of the reproductive organ is called SEED EXTRACTION.**Extraction is sometimes done close to the site of collection, but is frequently carried out at a central processing and storage depot. The purpose of extraction and associated processes is the maximum production of clean seed having high viability. The processes involved include one or more of the following: maceration and depulping, drying, separation, tumbling and threshing, de-winging and cleaning.

Seed extraction machines should be centralized between point of collection and distribution to reduce cost of transportation most especially for the bulky fruits. For winged seeds or fruits, methods currently employed include:

1. In small scale – Rub seed through sieve in which mesh is sufficiently small to prevent the passage of seed with attached wings. Seeds could also be rubbed between hands or against a screen or roughened surface or by hand-rubbing in a cloth bag or by rolling them between two cloth sheets or in a cloth bag between a rubber surface below and a roller above.

2. For large quantities of seeds, special de-winging machines are used. De-winging machines range from those which are hand operated to large semi-automatic equipment which gives a continuous output.

Corn mixers and cement mixers are frequently used. Mechanical de-winging, if carelessly done, may cause damage to seeds by crushing, cracking or abrasion. Mechanical injury can be avoided in some cases by moist de-winging.

CLEANING- Seeds can be separated from chaffs by:

i) Winnowing
ii) Slowly pouring them from one basket to another through a current of air.
iii) On large scale basis, mechanical treatments are employed.