

# Flowering of Bamboos

## Introduction

Flowering of bamboos is a rare phenomenon. Generally it occurs at long intervals. Because of the long gap between two successive flowering of a particular species our knowledge of bamboo flowering is not thorough. However, phenology—the study of periodic biological phenomena such as migration of birds, breeding dormancy, in relation to changes in climate or other physical factors gives an idea about the changes which the plants undergo. The apical stem meristems go on growing as such indefinitely, but then a time comes in the life history of a large number of flowering plants when these regions of growth get transformed into reproductive meristems. Such conditions are caused partly due to genetics and partly by environmental characters. There are great metabolic changes in the young developing flower centres of the plant in the brief period of floral differentiation where hormones also play a vital role in their initiation. During process of flowering assimilatory rates are high and there is continuous movement of food, water, organic and inorganic compounds and hormones towards regions of reproductive growth.

## Symptoms

Although symptoms of flowering are obscure but by long association with and experience in bamboo

forests one can visualise the apparent changes that the bamboo culms undergo. Some of the significant points are:—

- (i) the branches tend to be stunted and bushy.
- (ii) in general production of new shoots stops.
- (iii) colour of the stem becomes dull and all freshness and vigour disappears thereby giving an overall sickly look to the clump.
- (iv) in several cases yellow/whitish vertical streaks develop on the stems.

Flowering is generally preceded by leaf-fall and after seed formation the culms die.

All the culms of a clump, flower simultaneously, but there are instances when only a few of the lot have flowered and died and nature has temporarily spared the life of others. An imbalance in the factors of environment may shorten the time of flowering.

## Death

Exact reasons of the death of bamboos are so far unknown because of lack of ample research in this direction. It may however be safely assumed that death ensues due to sudden loss of all the stored food which is consumed in flowering and fruiting resulting in sheer exhaustion of the culms. This assumption of the author is endorsed by Dr Jackson of the Plant Physiology Department, University College of

North Wales. Almost all the bamboo species die in the year of flowering except *B. arundinacea* where flowering continues for 3 years and then the culms die. Author has noticed a clump which flowered for 4 years and then died.

It is a common belief and correct too that drought and famines go together with gregarious flowering of bamboo. Elders still remember the days when there was great famine and the villagers used to take bread of the flour of bamboo seeds.

## Types of flowering

Flowering may be gregarious where large areas or the entire Forest flowers. It may be sporadic where patches of clumps flower resembling pepper pot opening. To these two main types another type i.e. extensive intensive flowering is suggested to indicate sub gregarious or very heavy sporadic flowering where the size and intensity of patches is large enough to differentiate it from sporadic type and small enough to distinguish it from gregarious type.

## Characteristic of some important bamboo species

Gamble has enumerated 115 species of bamboos occurring in India, Pakistan, Burma and Old Malaya. In other words they are found in all the tropical and subtropical regions of the world specially in Asia and South America. A chart giving the list of bamboos, their occurrence and their flowering characteristics is annexed hereto.

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### Management in the event of flowering

Management is one of the important aspects in Forestry. Every forest has its own individuality and should be treated accordingly. In the management of any type of forests preconceived ideas and foregone conclusions are of great risk and should always be avoided. Like other forests, the aim of management of bamboo forests is to get perpetual sustained yield, Flowering of bamboo forests may be beneficial, problematic and disadvantageous as discussed later on.

### The benefits

In case of gregarious flowering:

- (a) Immediate availability of raw material to the starving industry.
- (b) Exploitation of felled stocks is concentrated.
- (c) There is an increase in employment potential.
- (d) Protection measures against biotic factors for the rehabilitation of flowered areas is easy and effective.
- (e) Supervision on clear felling of bamboos is easy and economical.

In case of sporadic and extensive intensive types of flowering supply position of the raw material is not much effected. Under favourable conditions both above and below the ground, regeneration of bamboos is profuse. Rehabilitation of the flowered areas though difficult yet it is less cumbersome and more effective. Seeds of bamboos are available every year for their further disposal and propagation.

### The disadvantages and the problems

In case of gregarious flowering:—

Problems of management takes serious turn and these may go on multiplying. These include—

- (a) Non-availability of felling and Dragging labour.
- (b) Difficulty in making available sufficient supervisory staff.
- (c) Increased risk of fires, insects and fungi.
- (d) Transportation will cause problem due to non-availability of vehicles Railway wagons etc.
- (e) Storage of bamboos is likely to cause headache. There may be difficulty in arranging sufficient storage space in the forests, rail-heads and at the Factories. Normally no industry is ready to meet such a situation and hurried arrangements are required which may fail and may prove costly.

Considerable reduction in weight of flowered bamboo has been noticed if the cut pieces bundles are left in the forest to face rainy season besides fluctuations in temperature and humidity. These are also subjected to insect and fungus attack. The Research cell in the Forest Organisation of Straw Products Limited have collected data from the bamboo forest leases that the loss of material on storage for one year in the forest is upto 5% and for two years it rises to 12-15%.

In case of sporadic and extensive intensive types of flowering:—

- (a) Working of scattered patches is difficult in coupes other than the current year coupes.
- (b) Supervision on the extraction of flowered patches will be costly.
- (c) Regeneration of scattered patches by artificial means will be difficult and costly.
- (d) Loss in bamboo regeneration due to forest or due to seed wash during rains or due to insect or animal damage.

### The solution

1. In current year coupes working of green clumps should be suspended till March so that all the clumps which were to come into bloom have done so. As soon as seed fall is over all manpower is to be diverted to clearfell the flowered bamboo clumps.

2. Thorough fire protection measures should be taken up. Fires are one of the most destructive agents no matter if these are ground fires or crown fires. All bamboos are fire tender and even minor fires may cause damage. In order to protect the forests and stocks against fires, working places should have special fire plans and Annual fire plans. In case fire plans are not there, the long term losses may prepare similar plans, giving in details of the areas which are more susceptible to seasonal fires and the measures which are to be adopted. Main fire lines should be cut around

the coupe is divided into small sections by creating intermediate lines. For this purpose, use can be made of natural features such as roads, rides, footpaths etc.

3. Apart from fire lines, protection of the felled material is also necessary. The cut stock should be removed during the season of felling. Old stocks should be stacked in large sized depots after clearing and burning of the depot site.

4. Early removal of stocks shall reduce losses due to insect and fungus attack. The results of field experiments conducted by the Forest Organisation of Straw Products Limited indicate that spray of chemicals has helped in reducing the losses from 2% to 0.1% after one year of storage and from 10-15% to 3%-5% if stored for 2-3 years. It

is therefore suggested that judicious use of chemicals is made use of in case of flowered bamboos to save the stocks from decay.

5. Restocking of the flowered areas by sowing and planting.

6. Introduction of different age groups of the same species of bamboos by either sowing or planting will ensure sustained yield. Though it may not be possible in all cases, but wherever possible artificial regeneration of large flowered areas by introducing seeds and rhizomes of other bamboo stock and mixture of different species will ensure perpetual sustained yield. In this case all will depend on the selection of species. All species of bamboos have their own individual requirements of site, Micro and Macro climates. Therefore thorough know-

ledge of their habits and habitant is necessary.

7. In case of sporadic flowering artificial regeneration in grids will prove useful. In this method, the flowered area is divided into grids of convenient sizes and each grid or a group of grids are taken as units of working for their amelioration. This method is also useful for enrichment planting of non-flowered bamboo forests as well.

Often records of Forest History are not properly maintained inasmuch as the phenomena of bamboo flowering escapes the observations of working plan office. It is now necessary on the part of the Lessees that all such cases are reported to the Forest Department for record purposes.