

## Challenges of Alternate bearing in mango and methods to increase regular bearing in Darbhanga, India

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### ABSTRACT

The alternate bearing in mango is known to be governed by local weather conditions, which varies from place to place. To some extent it also varies from cultivar varieties other agronomical practices such as manuring, irrigation use of chemicals is crucial events in bud initiation. Naturally occurring growth substances have important role in physiology of flowering in mango. Although work on this problem started more than 550 years before but sufficient information has not been available. Environmental factors are well known in this respect. By manipulating many factors flowering can be enhanced or regulated in alternate bearing varieties upto certain extent.

**Keywords:** *Mangifera indica*, Fruit bud differentiation, Hormonal control of flowering.

### INTRODUCTION

India is the major producer of mango in the world. In the world, although it's relative share in the world production has been gradually decreasing. The decline in production is not only due to the incidence of pest and disease but also because of irregular bearing. Alternate bearer fruit cultivar presents a serious economic problem to fruit growers. The bearing behavior of mango can be affected by the environmental conditions, cultivars, rootstocks, and management (Normand *et al.*, 2006; Young and Souls, 1979 and Souza *et al.*, 2004) Alternate bearing is a term used in pomology to refer to trees that have an irregular crop load from year to year. In the "on" year too much fruit is set, leading to small fruit size. Excess weight in the main branches can be too much for their mechanical resistance, causing them to break. Another major consequence is that flower induction will be lower, and the subsequent year will be 'off' year (too little fruit).

The behavior could be due to plant hormones, particularly gibberellins produced in excess in the 'on' years in the embryos of the young fruit. It could also be caused by depletion of carbohydrate reserves in the tree.

### MATERIALS AND METHODS

The places of work were selected based on the location where different kinds of mango were grown at large scale on commercial and personal level. The identification, extent of disease were based on standard form of literature and previous review of literature (Dambreville *et al.*, 2013 & 2014. Sharma *et al.*, 2015 and Singh, 2002).

Horticultural methods to overcome alternate bearing are:

1. Proper orchard maintenance.

2. Regulation of flowering.
3. Use of chemicals like paclobutrazol.
4. Smudging.
5. Girdling.
5. Delossoming.
6. Thinning of fruit.
7. Selective pruning.
8. Early harvesting.
9. Growing regular bearing cultivars.
10. Use of dwarfing rootstock.

## **RESULTS AND DISCUSSION**

Based on the present study pattern of alternate bearing it was revealed in local available varieties of mango like Maldah, Langra, Gulabkhas, the morphological and biochemical changes which influences the bearing starts from last week of October till last week of January. The initiation process was started from mid November and progressively increased from 15 December to 15 January. Four stages of fruit bud could distinctly be identified in the process of fruit bud differentiation. The first stage was represented by emergence of broad conical protuberances in the axils of scales of fruit bud. In the second stage the bud become plump by 15 January, historically the main axis elongated and become multi lobed due to development of primary branches of flower panicle in the third stage ,the main axis further elongated, whereas, the primary and secondary branches showed lobbing. In the fourth stage, the scales started loosening, with indicate the bud break. The vegetative bud showed hardly any difference between the different stages of development which resemblances to the findings of Dambrevillie *et al.*, 2013 & 2014).

While studying the biochemical factors associated with alternate bearing it was found that total carbohydrate, total nitrogen and ratio of total carbohydrate to total nitrogen have been found decreasing during bud formation.

## **CONCLUSION**

Alternate bearing or biennial bearing is one of the major problems in mango. A biennial cycle is very usual so that on year is followed by off year and so sequence of several years.

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