

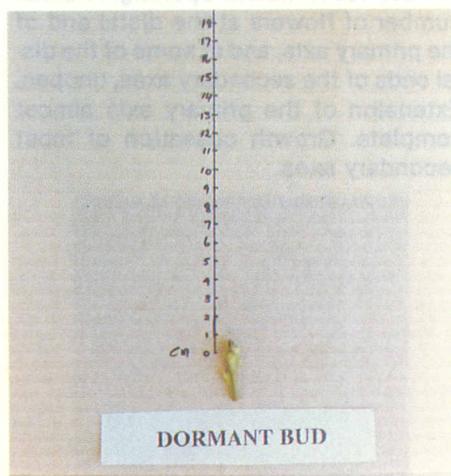
# STAGES OF DEVELOPMENT OF THE MANGO PANICLE

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To facilitate communication relating to mango flowering, it was deemed necessary to identify a number of distinct and distinguishable stages of panicle development in this important crop. Stages were identified in such a way that one stage cannot be easily confused with any other, and there be enough stages, without becoming excessive in this regard, to ensure that the need to identify any intermediary stages not arise. Furthermore, it was contemplated that the name given to a particular stage relate well to it, thus facilitating its recognition. A detailed description of panicle development was not intended here.

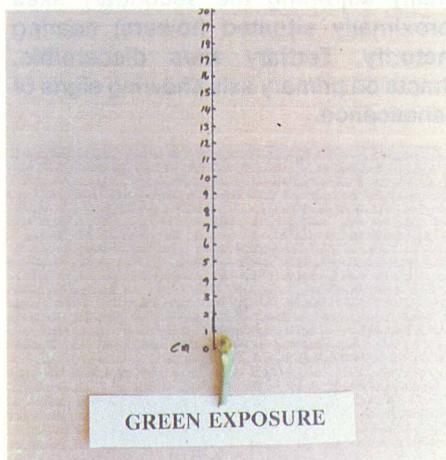
To briefly describe the mango panicle, it consists of a primary axis bearing many secondary axes (primary branches), each of which bears tertiary axes (secondary branches). Further branching gives rise to quaternary (tertiary branches) and higher order axes (according to Singh (1960), branching of the mango panicle is usually tertiary, and rarely quaternary). Each axis terminates in a cyme of three flowers, individual flowers being borne on short bracteolate pedicels. Elongation of the primary and secondary axes occurs to the greatest extent and is prolonged, whereas elongation of the tertiary and quaternary axes is limited and abrupt. Hence, the form of the mango panicle is characterized by the growth of the former axes, and its size determined by the degree to which these axes elongate.

The identified stages of panicle development are as follows:



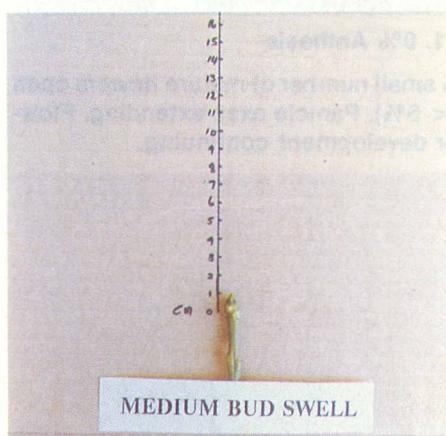
## 1. Dormant Bud

Apical bud enclosed by bud scales. Signs of swell unapparent. Bud length less than 1 cm.



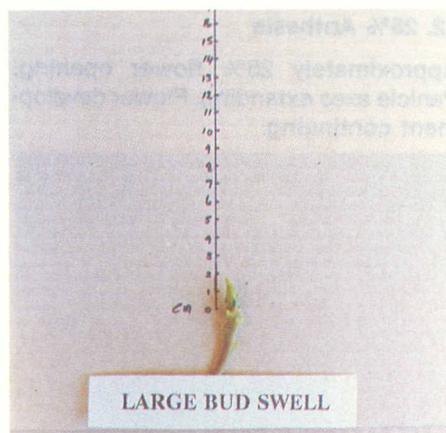
## 2. Green Exposure

Signs of bud swell apparent. Parted bud scales just revealing the "green" of expanding bracts underneath. Bud length less than 1 cm.



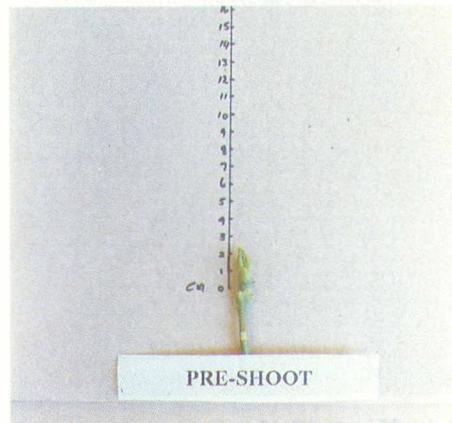
## 3. Medium Bud Swell

Signs of bud swell clearly apparent. Bracts expanding through parted bud scales. Bud length approximately 1cm.



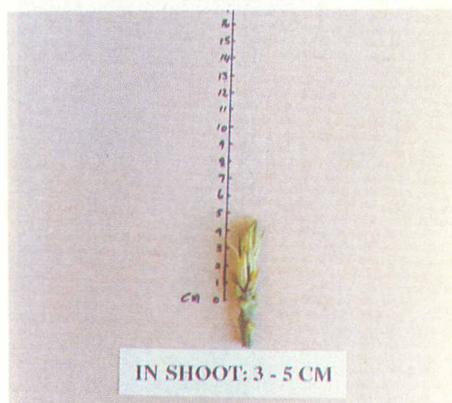
## 4. Large Bud Swell

Bud expanded to the point when bracts about to separate at their distal ends. Bud between 1,5 and 2 cm long.



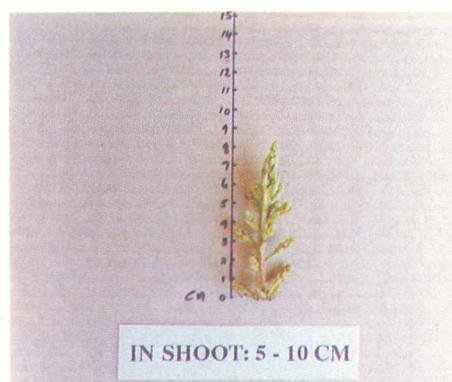
## 5. Pre-shoot

Bracts parted at their distal ends, this marking the start of the rapid phase of primary axis extension. Bracts still appearing to enclose the panicle axes. Bud between 2 and 3 cm long.



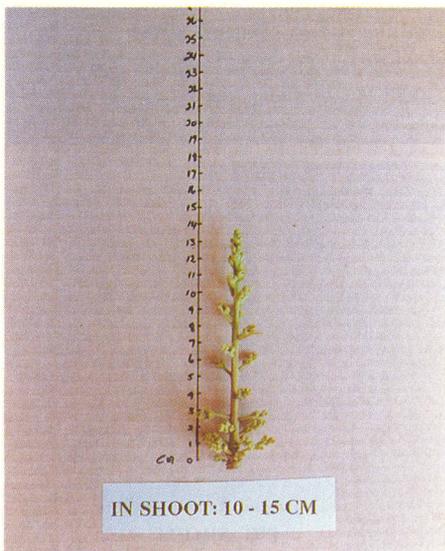
## 6. In Shoot: 3-5 cm

Bracts clearly distinguishable from one another as a result of their separation due to extension of the primary axis. Panicle axes and developing flowers just visible or not yet visible.



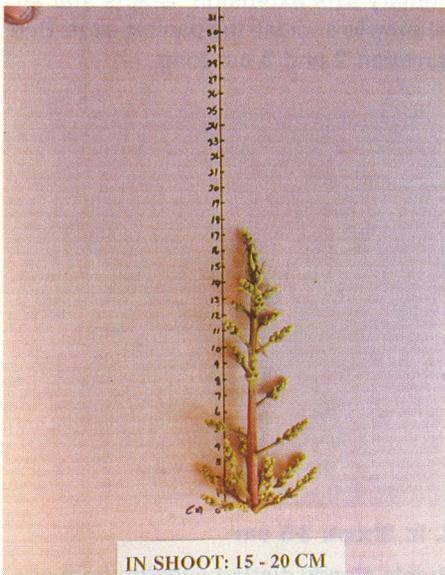
## 7. In Shoot: 5-10 cm

Primary and secondary axes extending. Primary axis, secondary axes and developing flowers visible or becoming visible.



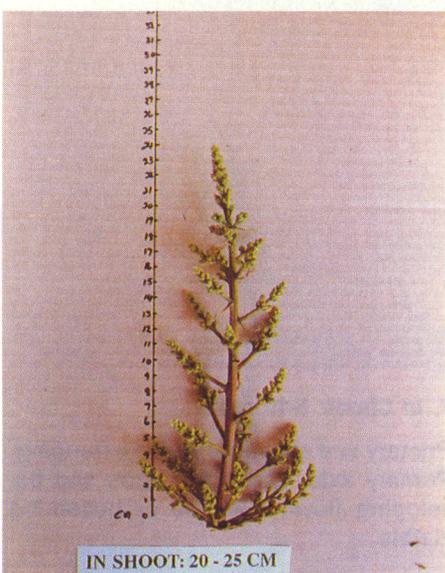
**8. In Shoot: 10-15 cm**

Panicle axes extending. Growth mainly resulting from extension of the primary axis.



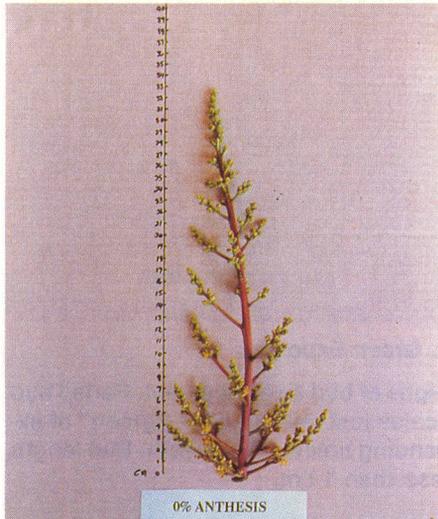
**9. In Shoot: 15-20 cm**

Panicle axes extending. Growth mainly resulting from extension of the primary axis.



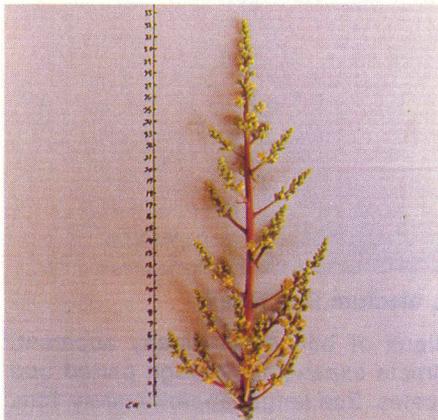
**10. In Shoot: 20-25 cm**

Panicle axes extending. Growth mainly resulting from extension of the primary axis. Flowers subtended by axes proximally adjoining the secondary axes (proximally situated flowers) nearing maturity. Tertiary axes discernible. Bracts on primary axis showing signs of senescence.



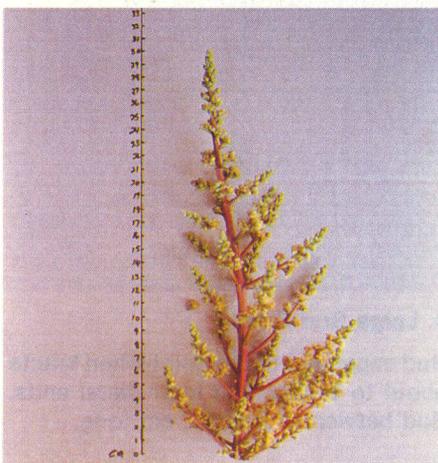
**11. 0% Anthesis**

A small number of mature flowers open (< 5%). Panicle axes extending. Flower development continuing.



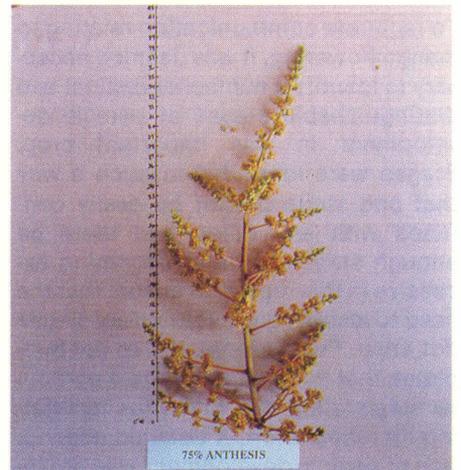
**12. 25% Anthesis**

Approximately 25% flower opening. Panicle axes extending. Flower development continuing.



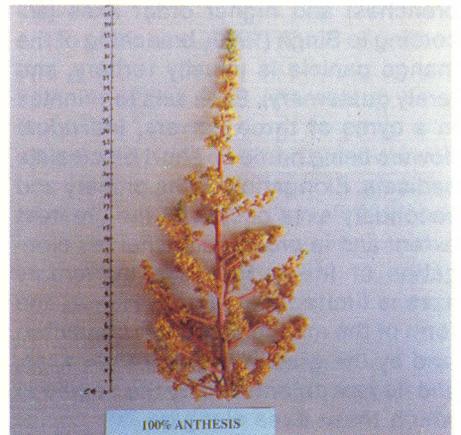
**13. 50% Anthesis**

Approximately 50% flower opening. Panicle axes extending. Flower development continuing.



**14. 75% Anthesis**

Approximately 75% flower opening. Panicle axes extending. Flower development continuing. Open flowers evident approximately three quarters of the way toward the distal ends of the secondary axes.



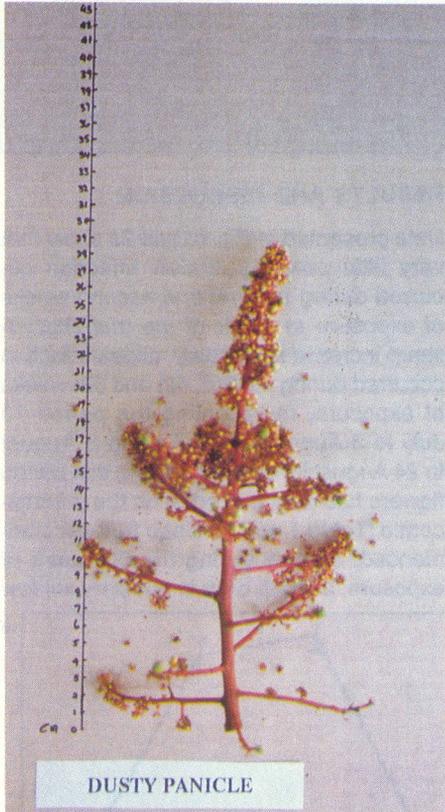
**15. 100% Anthesis**

Almost 100% flower opening. A small number of flowers at the distal end of the primary axis, and at some of the distal ends of the secondary axes, unopen. Extension of the primary axis almost complete. Growth cessation of most secondary axes.



**16. Small Fruit Set**

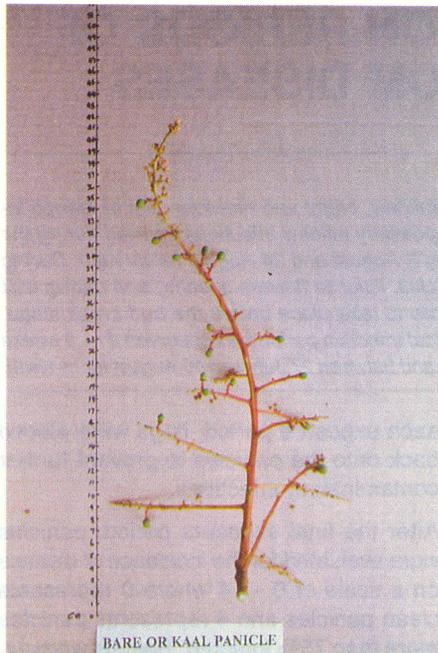
Small fruitlets visible in many of the flower axils. Petals and sepals of ageing flowers showing signs of senescence. Extension of secondary axes complete. Extension of primary axis almost complete or complete.



**17. Dusty Panicle**

Senescence of flower parts general, this giving the panicle a "dusty" appearance. Fruitlet and flower drop commencing.

The transition from this stage to the next is marked by the progressive abscission of the various panicle parts. Abscission of the secondary axes generally occurs last, the primary axis remaining intact. Fruitlet growth is irregular, with the result that certain fruitlets become more prominent than others. Abscission of axis sections linking prominent fruitlets to the primary axis is inhibited.



**18. Bare or Kaal Panicle**

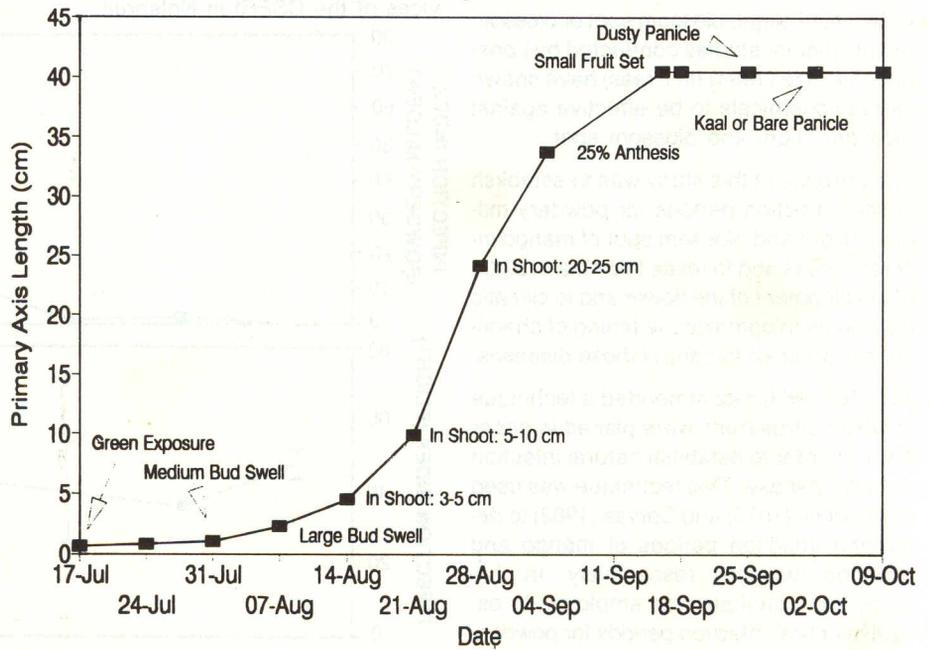
Flower drop and drop of axis sections advanced. Retention of axis sections linking prominent fruitlets to the primary axis.

Panicles often vary greatly in size. The essential difference between panicles of various sizes, is the number of "in shoot" stages that materialize, this number being greater for larger as opposed to smaller panicles. Fig.1 shows the growth in length of an "average" mango panicle, and the relationship between length and the various stages identified.

**REFERENCE**

SINGH, L B, 1960. The Mango; Botany, Cultivation and Utilization. Leonard Hill [Books] Limited, London; Interscience Publishers, Inc. New York.

**Growth of an "Average" Mango Panicle**



**Fig 1** Growth in length of a mango panicle, and the relationship with the various stages identified.

**OPKOMS**



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