

The simulation of flowering (bunch emergence) in plant crops of banana (*Musa sp*)

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Flower initiation in banana is of interest since it is believed to be insensitive to photoperiod and therefore cannot be linked to a specific external stimulus(1). There are 30-60 leaves produced by a growing point before it becomes reproductive.

We thought it would be useful to explore concepts which might influence the number of leaves produced, even at the simple level of a simulation model.

Methods

The rate at which new leaves appear is strongly influenced by temperature, and this can be a measure of the rate at which a plant matures.

We explored models which were based on degree days and physiological time based on temperature, because we thought that temperature was the most important environmental factor influencing development. These models were matched against plant crop data from three planting dates in Northern N.S.W.(1)

We also explored the possibility that transition from the vegetative to the reproductive state may be related to the size of the apical dome. We modified the model of flowering in chrysanthemum proposed by Charles-Edwards et al (2).

Results and discussion

The degree day and physiological time models failed to account for differences in leaf number associated with different planting dates. The apex model simulated flowering times which were within 3,3 and 6% of the observed flowering times for a November, January and March planting dates respectively. The apex model achieved this because the cooler growing conditions of winter reduced the size of the growing point. It then took much longer to reach the critical size needed for flowering.

1. Turner, D.W., and Hunt, N. (1987). *Scientia Horticulturae* 32, p. 233-248.

2. Charles-Edwards, D.A., Cockshull, N.E., Horridge, J.S., and Thornley, J.H.M. (1979). *Annals of Botany* 44, p 547-556.