

## ABSTRACT

### Breadfruit (*Artocarpus altilis* Park. Fosberg) Phenology and Growth Responses to Selected Plant Growth Regulators

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The seasonality of production is one of the major constraints to the commercial development of breadfruit. This study was undertaken to evaluate two approaches for extending the production season of breadfruit in Trinidad (10 ° 38" N, 61° 23" W). Firstly, the phenology of the locally preferred cv. Yellow was compared with those of recently introduced, Pii Piia Porohiti and Mein Patak using 4- year old trees. Secondly, the efficacy of plant bioregulators paclobutrazol, ethephon, and methanol in stimulating inflorescence production, when applied in both the dry and wet season, was assessed.

The phenological study was conducted at the University Field Station, Valsayn, from October 1996 to October 1997 and from November 1997 to August 1998. Shoot extension growth and female inflorescence production were measured at 12 to 17 day intervals. The annual pattern of shoot growth (cm.d<sup>-1</sup>) for all cultivars was continuous and cyclic. Maximum air temperature and fruit load were factors that significantly ( $P \leq 0.0001$ ) influenced shoot growth rates across all cultivars.

Female inflorescence production, which marked the beginning of fruiting, was highly seasonal. February to April was the major fruit producing period for cv.

Yellow and the only fruit producing period for the other cultivars. Solar radiation receipt was the environmental variable which significantly ( $P \leq 0.0001$ ) influenced female inflorescence production. Harvesting patterns showed that the use of any of the cvs. Porohiti, Pii Piia and Mein Patak, planted in a mixture with cv. Yellow would extend the period of breadfruit availability by one month during the major production season.

The application of the plant growth retardants, NAA, Ethephon and paclobutrazol, inhibited vegetative growth in breadfruit and failed to stimulate flowering in both the wet and dry seasons. Applications of methanol enhanced both vegetative growth and promoted earlier and greater flowering in the dry season. The growth promotive effects of methanol were accompanied by increased stomatal conductance. During the wet season, methanol application failed to promote either vegetative or reproductive growth.

It was concluded that the use of cultivars with different fruiting and harvesting patterns appears to be more effective in extending breadfruit's production season than the application of paclobutrazol, ethephon, NAA and to a lesser extent methanol at the rates of application used in this study.

**KEY WORDS:** Breadfruit, seasonality, phenology, flowering, methanol, plant bioregulators