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"Competition for Resources in a Changing World:
New Drive for Rural Development"

The Molecular Basis of Flowering in Longan

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Abstract

Longan (*Dimorcarpus longan* Lour.) is a commercial fruit crop mainly cultivated in subtropical countries of Southeast Asia. In Thailand, longan flowers from late December to late February due to flower inducing climatic conditions with a relatively dry and cool(<18°C) environment throughout the natural period of flower induction from mid November to mid December. However, the application of potassium chlorate ($KClO_3$) can induce off-season flowering within 20–30 days even so climatic conditions may not be suitable. Thus, this chemical offers a unique opportunity not only to improve the irrigular bearing behaviour of longan but also to use it as a potent inducer of longan flowering all year. It is hypothesised that an alteration in the hormonal status triggers the programmed sequential morphogenetic events and turns the switch from vegetative to reproductive bud meristem. Specific genes, coding for hormone biosynthesis and/or flowering will therefore be up-regulated, temporarily or spatially, with the transition to flowering in tree crops. Several genes involved in the switch from vegetative to floral bud meristem have already been identified and characterised in Arabidopsis. Some of the molecular basis in this flowering process has been shown to play a similar role in other annuals. A central protein in this process is flowering locus T (FT), which trigger flowering once it accumulates to high levels in plant tissue.We attempt to identify the molecular basis of flower induction in Longan by expression patterns of genes that encode for proteins similar to Arabidopsis flowering genes. Six-year-old potted longan trees were grown at at Chiangmai University, Thailand conducted to compare the effects of $KClO_3$ application on flower induction in between longan and litchee trees. Six-year-old potted longan trees were grown in Horticulture station, Faculty of Agriculture. Potassium chlorate was applied at 15 g pot^{-1} to fully mature plants as soil drench in April 2008. Samples for RNA extraction from terminal buds and leaves were collected 6 times at 7 day intervals following application. Eight degenerate primers of FT (FTDEG) were designed by using five highly conserved regions of *Arabidopsis thaliana*, *Vitis vinifera*, *Citrus unshiu*, *Oryza sativa* and *Hordeum vulgare*. Four of the FTDEG primers were successfully amplified in Longan and fragments were subsequently cloned and sequenced.

Keywords: Degenerate primers, flowering locus, longan, off-season fruit

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