

# Apple Fruit may Inhibit Development of Following Year's Inflorescences through Induction of a Flowering Repressor

Amnon Haberman<sup>1</sup>, Michal Ackerman<sup>1</sup>, Jean-Jacques Kelner<sup>2</sup>, Evelyne Costes<sup>2</sup>, and Alon Samach<sup>1</sup>

<sup>1</sup>The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Rehovot, Israel.

<sup>5</sup>INRA, UMR AGAP, AFEF team (Architecture and functioning of fruit species), Montpellier, France.

## **Abstract:**

In agriculture, the objective of growing various fruit trees is maximizing fruit production. Today's cultivars can yield huge amounts of fruit, which are dependent on high flowering volumes. However, in a consecutive year to a heavy fruit load, a drastic reduction in flowering volume is common in many species. This habit of yield fluctuations on a biennial cycle is referred as "alternate bearing" and poses a serious problem for the agricultural sector, which struggle to regulate levels of fruit production.

In apple (*Malus domestica*), presence of developing fruit inhibits the formation of inflorescences needed for following year's yield. Exogenous application of gibberellic acid inhibits flowering in apple.

Here we describe a series of experiments in apple, conducted in agricultural field conditions during several years in different cultivars, in which we studied the effect of different fruit loads and GA treatments on return flowering and gene expression. We present data suggesting that expression of a gene encoding a protein similar to a known regulator of flowering is affected by both fruit load and GA application, and this suggests that it might act as a mediator in this process.