

## Means to Control Flower and Fruit Abortion in Sweet Pepper

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Sweet pepper shows cyclic fluctuations in yield, resulting from fluctuations in abortion and fruit set. Our experiments showed that decreasing plant source strength or increasing plant sink strength increased flower and fruit abortion. Abortion increased when plant source strength was decreased by decreasing inter-plant distance, decreasing CO<sub>2</sub>, decreasing light intensity or by leaf removal. Abortion also increased when plant sink strength increased by higher temperature or higher number of competing fruits on the plant. Abortion varied with the position of competing fruits. Large-fruited cultivars with a high fruit sink strength showed stronger fruit set variation than cultivars with lower fruit sink strength. This variation in individual fruit sink strength combined with the source: sink threshold for fruit set could explain observed genotypic differences in fruit set patterns. Parthenocarpy (production of fruit without fertilization) did also reduce fluctuations in fruit set, because fruits with higher seed numbers have higher inhibitory effect on set and growth of later developing fruits. In several genotypes a large fraction of fruits was parthenocarpic when grown at low night temperature. This could be due to non-viable pollen. The capacity to produce parthenocarpic fruits showed genotypic variation and seemed correlated to the capacity to develop carpel-like structures inside the fruit. Time patterns of average rate of fruit set could be simulated with the crop simulation model INTKAM based upon plant source and sink strength. Introduction of a stochastic function obtained with survival analysis resulted in a realistic simulation of fruit set patterns over time and its variation around the weekly average fruit set. The model appeared to be a valuable tool to develop strategies with respect to climate control and crop management for controlling flower and fruit abortion in sweet pepper.