

Title Innovation-oriented analysis of critical control points (IACCP): Who wishes to solve sweet pepper yield oscillations?

Authors H. Schepers, W. Kromdijk, O. van Kooten

Citation ISHS Acta Horticulturae 712: 83-90. 2006

Keywords Capsicum annuum; innovation strategy; chain collaboration; crop growth model; yield oscillations

Abstract

A generic program for mathematical model-supported innovation profiling in fresh food supply chains is presented. Building on top of a crop growth model, strategies to address the problem of sweet pepper yield oscillations (flushes) are analysed quantitatively from both isolated or combined perspectives of the chain players: plant breeders, horticultural growers and traders. Yield oscillations in sweet pepper production, caused by crop physiology, and presumably synchronized by weather conditions, result in periodic oversupply at the market level. Growers try to desynchronise their own temporal yield pattern from that of the market, in order to target higher prices during low supply periods. A complication is that the quality of fruit products, in terms of size and colour/ripeness, may be affected when altering growing practices such as pruning, harvest timing, and climate control. Upstream, breeders can change physiological constants. Downstream, post harvest storage may produce value by better price targeting. The IACCP approach is presented, and is based on systematic decomposition of income, profits, cost and revenues with help of a simulation model. Especially the decomposition of revenues into isolated effects of production yield, price targeting, and various quality characteristics such as fruit size and fruit ripeness/colour shows how synergies between innovation strategies of collaborating (or competing!) players within a supply chain are created (or destroyed). Although the model is not yet fully validated in detail, such simulations may well support discussions on collaborative innovation strategies and on prioritisation of the research agenda.