Ad hoc support

Hortimodel 2016: models for plantgrowth, environment control and farming management in protected cultivation

ABSTRACT

Hortimodel is an international congress organised every 4-5 years under the aegis of the ISHS (International Society for Horticultural Science) and which involves the "Modelling Plant Growth, Environmental Control, Greenhouse Environment" working group and the "Horticultural Engineering" commission. The PSH unit is organising the fifth edition of this congress in September 2016 (http://www.ishs.org/symposium/455) in the prestigious Palais des Papes in Avignon.

Horticulture under cover is an important economic sector that is constantly evolving in the world. Currently, this sector is experiencing the same constraints as other production sectors. On the one hand, it is necessary to reduce the use of inputs (water, fertilisers, pesticides) and to minimise the impact of practices on the environment; on the other hand, innovative technologies and practices must allow, in this new context, the maintenance of high levels of production, as well as a good organoleptic and nutritional quality of the harvested products. Crops grown under cover allow fine control of the production process and should make it easier to meet the growing demands of modern agriculture in terms of timing, quantity and quality of production. Hortimodel2016 is part of this context of innovation and adaptation of plants and production systems under shelter.

Modelling is at the heart of this new challenge. Numerous studies have shown the interest and potential of models to predict the behaviour of complex systems, integrate multi-scale knowledge or simulate the responses of the systems studied to the environment (Baldazzi et al. 2012; Bertin et al. 2010). The models developed to understand, analyse and manage horticultural production systems integrate, depending on the local and disciplinary context, different scales and degrees of complexity and embrace different levels of integration. Therefore, interactions between different research actors in this field should not only enrich our scientific approaches but also facilitate the transfer of knowledge between disciplines. In particular, major efforts are needed to understand the functioning of horticultural production systems in a more integrated manner. These efforts should lead to an optimisation of the use of the various levers such as genetics, cultivation practices, climate control and metrology. Hortimodel2016 will address different aspects of modelling, and will focus on the evolution of models to describe the multiple interactions between the physiological processes involved at different scales of the plant and the organ, to optimise shelter technology, and to anticipate the fluctuations and impact of the abiotic and biotic environment under these shelters in order to propose efficient control and management of production systems.

Year : 2015
Project number : 1500-022
Type of funding : SP
Project type : PC
Research units in the network : AGAP GAFL LEPSE
Start date : 2015-12-01
End date : 2016-09-30
Flagship project : no

Project leader : Nadia Bertin
Project leader's institution : INRA-INRAE
Project leader's RU : PSH

Budget allocated : 10000 €
Total budget allocated (including co-financing) : 10000 €
Funding : Labex

GOAL

Hortimodel2016's main objective is to promote disciplinary (ecophysiology, bioclimatology, genetics, physics, mathematics) and interdisciplinary exchanges, both scientific and technological, around the modelling and optimisation of horticultural crop systems under shelter. On the other hand, we would like to encourage new exchanges between scientific communities involved in modelling the functioning of the plant but on different production systems or different model plants, notably around multi-scale integration approaches and the prediction of genotype x environment interactions. In fact, these scientific communities are strongly present within the Agropolis network, but structured in a relatively independent manner, and traditionally loyal to various international conferences on modelling.