APIPOP: "CELLS AVAILABILITY" MODULE

Daniela Laurino, Aulo Manino, Augusto Patetta, Marco Porporato

Dipartimento di Protezione e Valorizzazione delle Risorse Agroforestali, Università di Torino
Via Leonardo da Vinci, 44 – 10095 Grugliasco (Torino), Italia.
E-mail: daniela.laurino@unito.it

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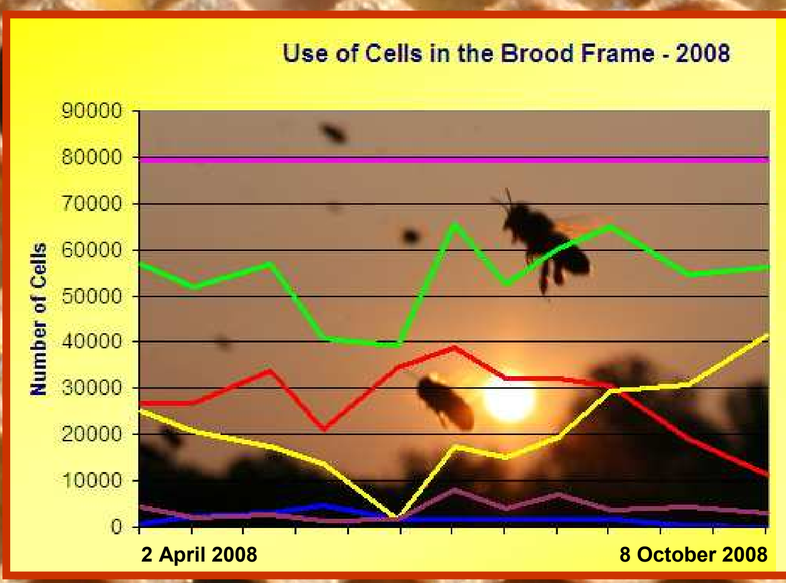
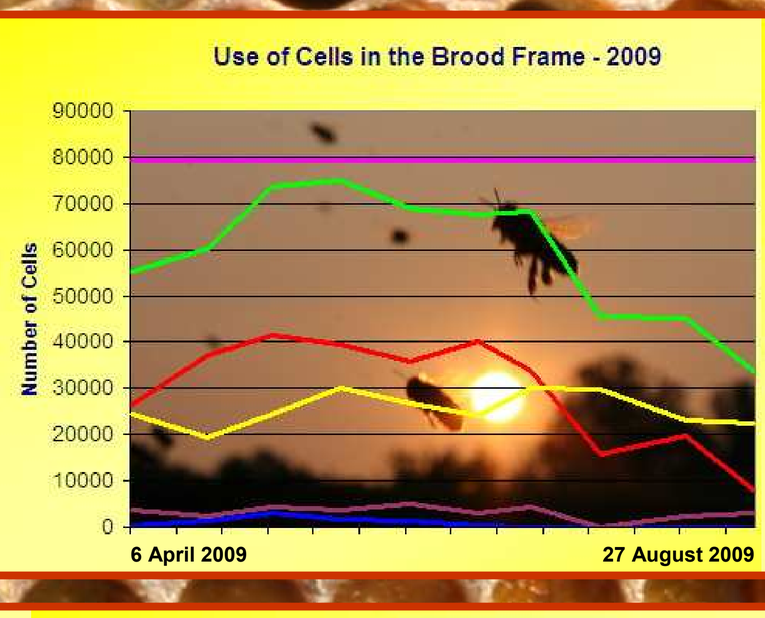
Under the project PRIN 2007 entitled "Integration of bee knowledge through the development and calibration of a model for the simulation of the hive" is used ApiPop computer model, developed with the modelling environment SEMoLa (Simple, Easy to use, MOdelling Language). This is a tool for development and simulation of continuous dynamical systems (flows) or discrete (events), deterministic or stochastic, the objective is to simulate the complex interactions that occur in the hive.

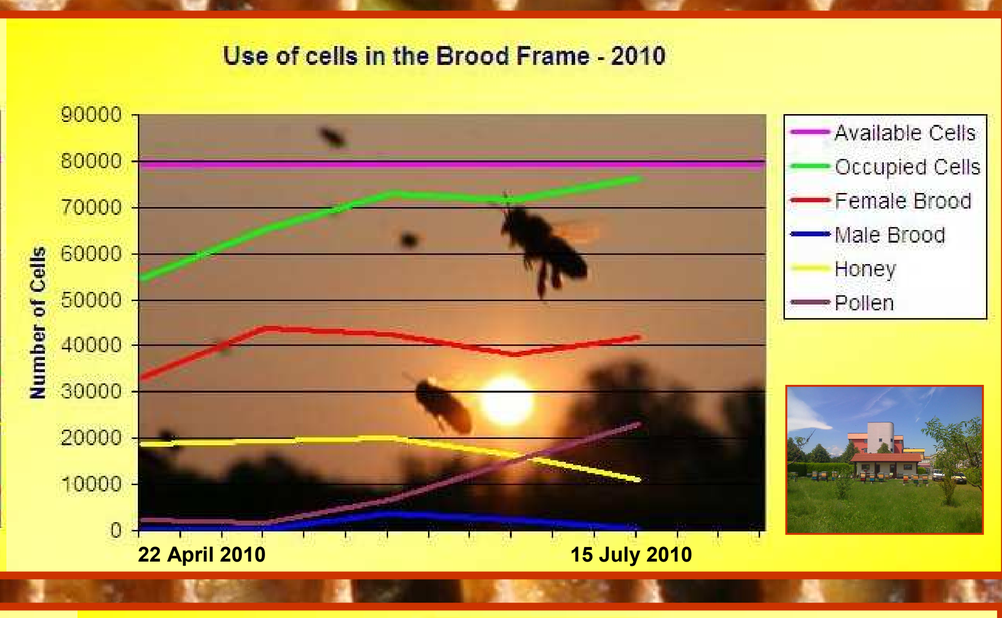
Among the different modules that compose the model, that of the availability of cells is responsible for identifying all the factors (variables, constants, etc..) influencing it, identifying both the quantity of cells in a hive and their availability for the different needs of the colony (brood rearing, storage of honey and pollen).

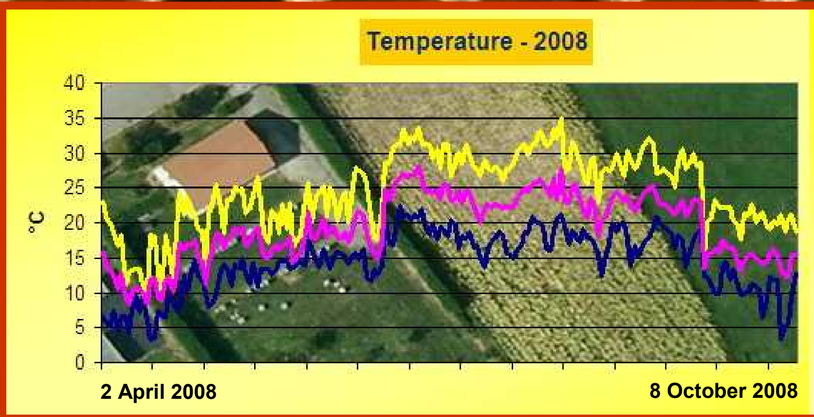
In order to calibrate the model, five hives were monitored in spring and summer of the years 2008 - 2010. As an example, data are shown below of the chronological trend of one of these families relative to the use of cells in the nest, correlated to external temperature and rainfall of the respective periods. In the last year, using special scales, also weight variations were registered.

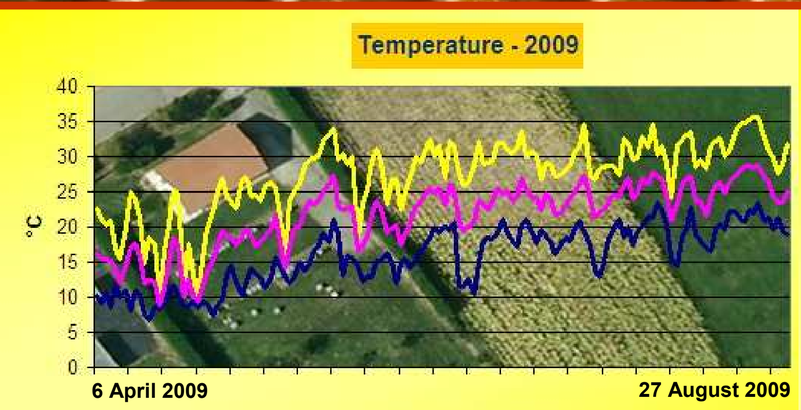
From the data acquired in the test hives variations in the number of cells for the brood (female and male) and the number of cells occupied by stocks (honey and pollen) could be determined within each year. The results, which are dependent by the strength of the colony, the health of bees, the use of food resources to the season and climate, were used for the implementation of the theoretical model.

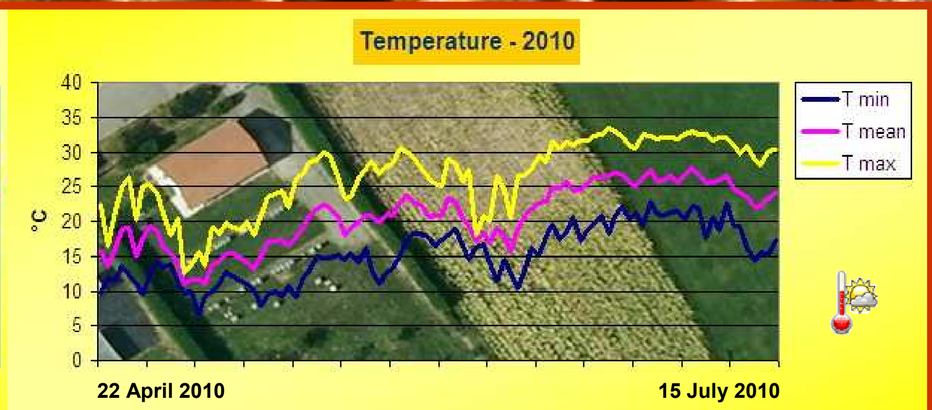


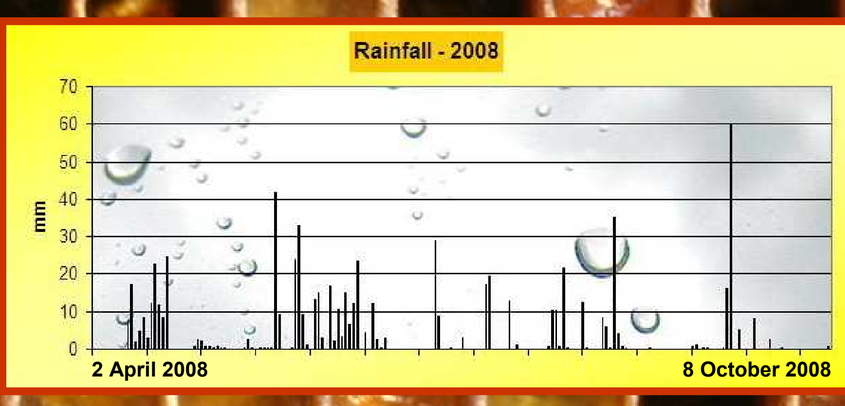


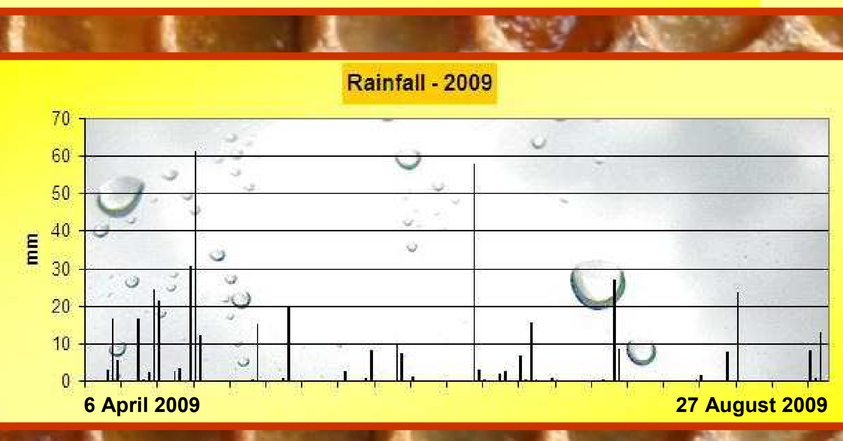


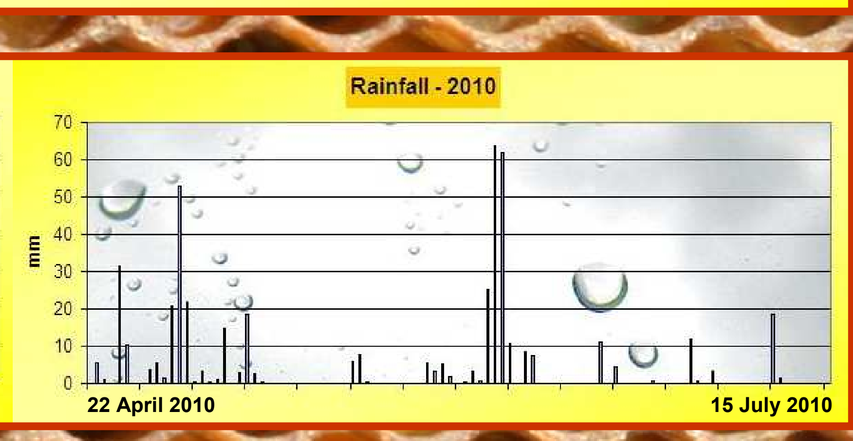


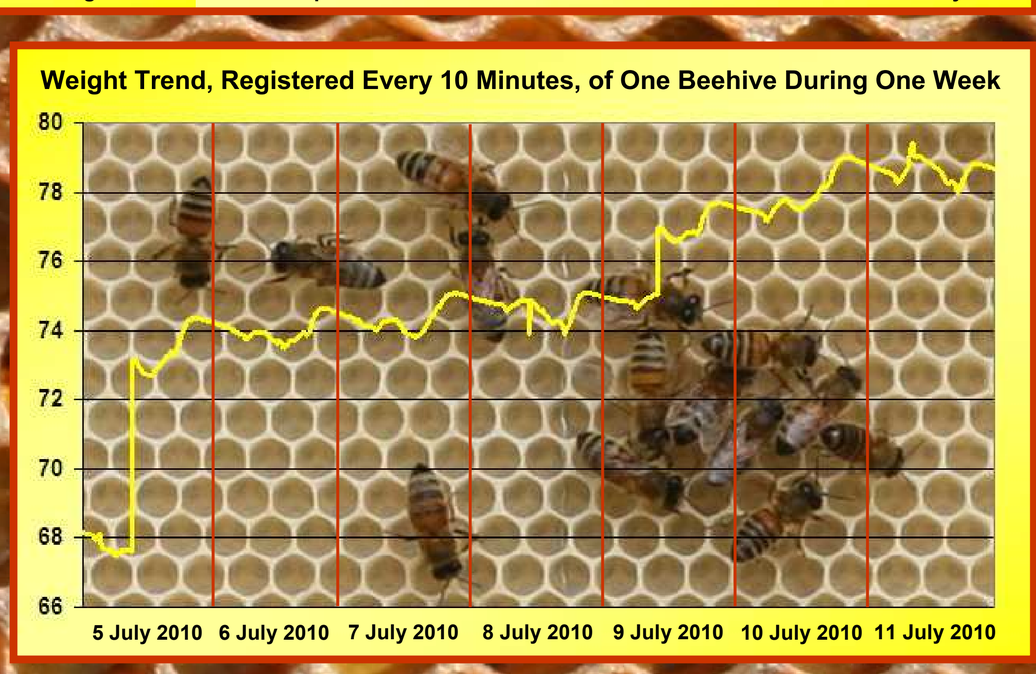












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