Oral presentation

Bee health monitoring and reporting system in Italy: main outcomes and perspectives

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The National monitoring network of honey bee health in Italy is active since 2009, in the framework of the ApeNet project (2009-2011) and the BeeNet project (since 2011), both funded by the Italian Ministry of Agriculture. The monitored hives increased from 1,350 in 2009 to approximately 3,000 in 2014 and are organised in a network of modules covering all the Italian regions. Each module is visited four times per year to record environmental and beehive data and to sample beebread and honey bees. The level of *Nosema ceranae*, *Nosema apis*, Deformed Wing Virus (DWV), Acute Bee Paralysis Virus (ABPV) and Chronic Bee Paralysis Virus (CBPV) is assessed in alive bees. Samples with more than 1×10^7 spores/bee or viral copies/bee are considered highly-infected. The level of raw proteins as estimation of the nutritional quality and the residues of pesticides are measured in beebread. The Varroa infestation is assessed for each colony with the method of "powdered sugar", in the third visit.

The results for 2012 and 2013 indicate a high pesticide load in beebread (50.4% of positive samples in 2012 and 42.1% in 2013). The incidence of *N. ceranae* was very low (7% and 0% of highly-infected samples in 2012 and 2013, respectively) and *N. apis/N. ceranae* coinfection was detected only in one apiary. The level of DWV infection (30.6% of highly-infected samples in 2012 and 33% in 2013) was higher than ABPV (2.1% in 2012 and 2.5% in 2013) and CBPV (1.9% in 2012 and 4.1% in 2013). Overall, colony losses were slightly higher in 2012 (13.7%) than in 2013 (10.8%).

The monitoring network activity is supported by BEST (Bee Emergency Service Team), which records honey bee mortality and colony losses events from the whole Italian territory, in collaboration with local veterinary services, beekeepers associations and regional extension services. The aims of this service are a) to integrate the data gathered from the BeeNet monitoring network, b) to produce a database of the events of bee mortality and colony losses in Italy and c) to analyse the event in real time, when the phenomenon is still in progress. These objectives are achieved through the on-call intervention and direct inspection of the injured apiary, following the request that may come from every Italian beekeeper.

Since 2012, 219 bee mortality reports have been received. Pesticides were considered to be the main cause of bee mortality in about one third of cases for which analytical results are available. Overall, 57 different active ingredients were found and multi-residual contamination was demonstrated to occur in most cases. Honey bee diseases were associated to the mortality incidents in about 10% of cases and the interaction between pesticides and pathogens is suspected to have caused the colony decline in another 10% of cases. For the other reports it has not been possible to identify the causes of bee mortality or colony losses.

The integration between the monitoring network and the BEST activity provides essential data for scientific research on honey bees but also a valuable service for beekeepers.