the loss of apparently insignificant quantity of adult bees in early spring, i.e. in the conditions of low external temperatures, could impede to maintain the brood at the constant optimal temperature. It was hypothesised that the honey bees deriving from the brood kept at suboptimal temperature might be characterised by lower fitness and by higher susceptibility to pesticide intoxication. This could lead to consistent adult bee losses delayed in time. In previous studies, adult bees, reared at suboptimal temperature during pupal development, showed decrement in short-term learning and memory capacities. These bees could have difficulties to carry out thermoregulation behaviour causing, again, reduced brood rearing temperature.

The present study was aimed to investigate if the decrease of the brood rearing temperature of only 2°C may have effects on the larval mortality and on the adult emergence and life parameters. Moreover the susceptibility to the intoxication by pesticides was studied both on the larvae and on the adults emerged from the brood reared at the tested temperatures. For this purpose, lab trials were conducted basing on Aupinel's protocol for the *in vitro* rearing of honeybee larvae. The larvae were exposed to two temperatures: 35°C (optimal) and 33°C (suboptimal) from 12h after hatching until 15 days of age. According to the experiment, dimethoate was administered either to larvae or to adults. Larval mortality, adult emergence and longevity were measured. The mortality both of the larvae and of the adults after the dimethoate administration was also recorded.

Our results showed that the lower rearing temperature has no negative influence on the larval susceptibility to the intoxication with dimethoate. The LD50 (48h and 72h) was even higher for the larvae reared at lower temperature than for those reared at the optimal temperature. The adult emergence doesn't seem to be influenced by the rearing temperature, but the longevity is strongly reduced in the bees deriving from the cool-reared brood. The mortality rate of adults emerged from larvae reared at the suboptimal temperature is comparable to that of adults intoxicated with the LD50 of dimethoate emerged from larvae reared at the optimal temperature. Thus the low-temperature-brood-rearing seems to be an important stressing factors with the effects on the adults.

Field testing methodology for investigating the effect of systemic insecticides on honey bees

I. Tornier, (Eurofins Agroscience Services), M. Coulson (Syngenta), S. Hecht-Rost (Eurofins Agroscience Services), N. Ruddle (Syngenta)

Abstract

Elsewhere at this symposium risk assessment schemes are being proposed for systemic insecticides. The purpose of this presentation is to demonstrate methodologies already used for systemic seed treatment insecticides. Investigations involved two main designs:

- semi field (tunnel) trials, assessing residues in plants, pollen, and various hive products;
- open field studies investigation the long term developments of honey bee colonies. Colnies were followed for a long time period, including overwintering. Parameters studied included: mortality, foraging activity, brood development, hive weights, disease analysis (e.g. *Nosema apis*, *Varroa destructor*, American foulbrood, bee viruses).