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I'm afraid he couldn't BEE here (and other Simpsons jokes): modelling the spread of disease in honeybees in the UK

Abstract

The plight of the honeybee is widely recognised, with global populations suffering huge losses in the last thirty years. One of the major contributors to the decline is disease, although little modelling has previously been performed on honeybees. The work I have done in this field forms part of the Insect Pollinators Initiative, a £10m collaborative scheme funding nine separate projects, each looking at different factors potentially responsible for the marked population decline.

In my talk I will show details of the methods we have used and subsequent findings of studying disease spread in honeybees from an epidemiological point of view. The starting point of the analysis is a 20-year dataset showing incidence of European foulbrood (EFB) and American foulbrood (AFB), two bacterial diseases affecting honeybee larvae and potentially damaging to honeybee colonies. I will give an overview of the mathematical models we have built for simulating the transmission of disease, and the statistical tools used to derive parameter values and effectively "reconstruct" the epidemic. Finally, I will show a few results of our analyses on various control strategies for reducing the sizes of epidemics, and comparing them to current protocols employed by the National Bee Unit in controlling the spread of EFB and AFB.