Multi-variable factors in bee decline - points of reference

The issue of bee decline is complex. Accordingly, we feel it is essential that stakeholders are well informed before looking for and deciding on an appropriate course of action or recommendations.

Based on Syngenta's own detailed and expert technical assessment of the issue we believe that a number of variables are potential causal factors. Insecticides, and particularly seed treatments, when used appropriately and in accordance with label and product guidance are not responsible for colony collapse or large scale bee mortality.

Accordingly, we stand by the integrity of our insecticide seed treatments and foliar applied products and believe that they play a significant role in protecting yield and quality and by doing so also play a role in environmental protection, particularly in terms of land sparing.

There is now significant independent research that suggests that bees are impacted by a range of factors. In addition, there is also specific research showing neonicotinoids are not the key variable in bee decline.

We point to the following research papers, which look in detail at the range of likely variables involved in this issue[i].

- **Data showing no effect of field relevant doses of neonicotinoids to bees or papers that state neonicotinoids are unlikely to be responsible for decline in bee health**

  Schneider et al, 2012 (return to hive imidacloprid + Clothianadin) ; Cresswell 2011 (metanalysis of imidacloprid field trials); Cresswell et al, 2012 (neonics in bee food); Blacquiere et al, 2012 (Neonic bee review); Imdorf et al, 2006 (overwintering losses in Switzerland); Oliver, 2012 (bee keeper view of neonics); Pilling et al, 2013; Staveley et al, 2014.

- **Varroa, Viruses or Varroa + disease/virus are the likely main reason for bee decline**

  Dainan et al, 2012; Martin et.al, 2012; Guzman-Nova, et al, 2010; Szabo et al 2012 (bumble bees); Charriere & Neumann, 2010; Nazzi et al, 2012; Genersch, 2010; Rosenkranz et al, 2010; Ravoet et al, 2013.

- **Complicated and multi-variable nature for bee decline**

  van Engelsdorp et al, 2012; Neumann & Carreck, 2010; Carvalheiro et al, 2013.

- **<u>Data showing no effect of field relevent doses of neonics to bees or papers that state neonics are unlikely to be responsible for decline in bee health</u>**

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