

# Submission to the Senate Standing Committee on Rural Affairs and Transport re: Asian Bee Eradication

## **Introduction**

I am an amateur beekeeper from Melbourne and wish to make a submission for consideration in the Committee's inquiry into the Science Underpinning the Inability to Eradicate the Asian Honeybee, directed in particular to points (c) *the science relating to the impacts of the spread of the Asian honey bee on biodiversity, pollination and the European honey bee*, and (d) *the cost benefit of eradication of the Asian honey bee*.

Previous submissions have referred to the important role played by European honey bees in pollination services and the probable impact on this from the Varroa mite, which would almost inevitably follow should the Asian honey bee become established. I would like to raise the potential threat from an iridovirus that is carried by the Asian honey bee, which may be instrumental in Colony Collapse Disorder (CCD).

Dr. Whitten has authoritatively addressed a number of other issues I would expect to see considered, however I have a few additional points to add.

## **Iridovirus, Colony Collapse Disorder and the Asian honey bee**

While the impact of the Varroa mite is to weaken colonies, expose them to disease and reduce their viability, the acute loss of honey bees from much of North America is attributed to CCD. CCD appears to be an emergent consequence of a cocktail of factors including management, pathogens and pesticides (including those needed to manage Varroa mite). A recent paper (Bromenshenk et. al. 2010) shows a potential linkage between CCD and the presence of two pathogens in combination, the microsporidian *Nosema ceranae* (now widespread in Australia) and an iridovirus that was not detected in samples of bees from Australia, where North American style CCD is not thought to occur. . I understand from Dr. Anderson that research will soon commence to determine whether this iridovirus is present in Australia.

The natural host of this iridovirus is the Asian honey bee. At present there is no proven causal link between CCD and this combination of pathogens, however consequences could be severe if the linkage does in fact exist. The Asian honey bee would provide a permanent reservoir of infection for both the Varroa mite and the iridovirus. At the present state of knowledge, the prudent and precautionary course of action would be to prevent the establishment and spread of the Asian honey bee to remove opportunity for cross-infection of both mites and virus

## **CCD and Pollination Services**

Pollination services are provided by both managed and feral honey bee colonies. In many circumstances the latter are likely to be the main source of pollinating bees. Studies such as the RIRDC Pollination Aware program have shown that adding managed hives for pollination in crops where this is not usually done can significantly boost yields, suggesting these are already under-pollinated by feral bees and other

insects. The studies also indicate there are insufficient managed hives available today to achieve optimal pollination.

Where CCD occurs, the experience is that feral bees quickly disappear, making it increasingly important to provide pollination services from managed hives. There is a worldwide trend towards a pollination deficit through pollinator loss (Aizen et al.). In Australia, fewer insects have co-evolved with agriculture so fewer alternative pollinators exist for food crops. There is potential for significant drops in crop production from the effects of CCD over and above the losses that might be expected from the weaker bee population that will result if Varroa were present without CCD.

It is not clear to what extent the Asian honey bee or other species could replace the European honey bee as the primary pollinator. At the very least, land area put to crops would have to increase in order to maintain yield, thus raising the cost of production. However, it is very clear that the cost will fall primarily on agriculture (and ultimately on consumers) rather than on beekeepers, and it is logical there should be a proportionate contribution of funds to the eradication program. Likewise, the risks and costs should be assessed against agriculture more generally rather than just against apiculture.

### **More Cost-effective Eradication**

In support of Dr. Whitten's submission, I would like to draw attention to a weakness in the Paskin Report, namely where the analogy between bee colonies and epidemics of disease breaks down. Whilst it is likely the number of colonies of *A. cerana*, and hence the scale of the problem, has been under-estimated just as Dr. Paskin describes, the ability of bees from undetected colonies to actively seek out bait stations has not been modelled. Eradicability should be recalculated in terms of the foraging efficiency of the bees, required density of baiting stations, effort of personnel etc. against the potential for increase. The use of toxic bait stations has not been fully evaluated and it is impossible to say at present that the incursion can not be brought under control, or possibly eradicated, through this means.

Fipronil bait stations are known to have been effective against *A. cerana* in the Soloman Islands. While these may cause some collateral damage to non-target species, they reduce the effort required to destroy colonies in difficult terrain and allow the available personnel to cover a larger geographical area. It might be feasible to make baiting stations particularly attractive to Asian honey bees using pheromones, good design or other means.

### **Conclusion**

In concluding my submission, I think there can be little argument that eradicating the Asian honey bee is by far the best option. The debate is only over whether this is actually achievable. The answer at present is that we can not state conclusively that it is *not* achievable, especially as both the effort applied and methods used to date have not been optimal to attain this result. We can state without a doubt that failure could be enormously costly, and that the cost of some additional effort to attempt eradication by better methods would pale into insignificance by comparison.

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April 18<sup>th</sup> 2011

## **References**

Aizen MA, Garibaldi LA, Cunningham SA and Klein AM (2009) *How much does agriculture depend on pollinators? Lessons from long-term trends in crop production.* *Annals of Botany* 103: 1579–1588,

Bromenshenk JJ, Henderson CB, Wick CH, Stanford MF, Zulich AW, et al. (2010) *Iridovirus and Microsporidian Linked to Honey Bee Colony Decline.* *PLoS ONE* 5(10): e13181.