

Bottom Boards – Solid or Screened

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Originally we used solid bottom boards prior to Varroa mites in 1987. Prior to the separated bottom board from the brood chamber, we pulled the frames and scraped out the detritus / debris on the attached bottom board to the brood chamber. The modern Langstroth / Dadant hive incorporated a detachable bottom board from the brood chamber design but detritus / debris still collected on the solid bottom board, resulting in the bottom boards having to be scraped and cleaned every spring.

Early Version of Dadant Hive



Varroa mites were introduced into the United States in 1987. We looked for ways to deal with the mite using Integrated Pest Management Techniques (IPM) in addition to chemicals. Drs. Ellis, Delaplane, and Hood did some pioneering research on screened bottom boards that was published in 2001¹. They found that Varroa populations in colonies treated exclusively with screened bottom boards were 14.9% lower than solid bottom boards; however, the difference was not statistical significant. Also, of significance, screen bottom boards did not require

scraping in the spring, which was a positive side-affect. It was thought that mites would fall thru the bottom board screen and not be able to get back into the hive if there is at least a 2 inch gap under the bottom board, and a mite collection board under the screen would allow collection of mites, for mite infestation testing.

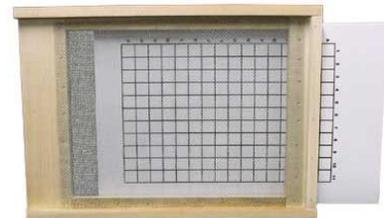
Bee Hive Woodenware – Kelley with a detachable bottom board



Solid Bottom Board – Dadant



Screened Bottom Board – Dadant



The Debate

Since 2001 we have found that hygienic colonies chew the Varroa mite and a lot of the damaged mites fall thru the screen in addition to some healthy mites. We have also found that screened bottom board “sticky” boards tend to be unreliable single point indicators of Varroa levels. This variation is due to colony population level changes with respect to the bee year, hygienic colonies and non-hygienic colonies, dying colonies that result in varroa from the dying colonies invading healthy colonies, and the equipment stack

¹ Ellis, J.D., Jr., K.S. Delaplane, and W.M. Hood. 2001. Efficacy of a bottom screen device, Apistan-J, and Apilife VAR-J in controlling *Varroa destructor*. *American Bee Journal* 141(11): 813-816. August 28, 2001

configuration. Alcohol or detergent wash has been found to be more reliable than sticky boards with the analysis bees typically coming from the brood nest.

We have also found the reduction in the use of the bottom brood chamber due to the bees moving the brood nest further up the equipment stack which results in higher equipment cost.

Screened bottom boards also have additional cost of around \$2.00 to \$3.00 more than solid bottom boards.

These above items are versus the decrease ingress of mites into open brood cells.

Kerry Owen in the upstate area indicated:

- I have both solid and screened. We see no advantage to the screened as far as bees are concerned. However screened bottoms are light and easy on the back.
- We see NO difference in mortality in winter and mites are still there to the degree that some form of treatment is necessary. You have to treat to kill a small amount of mites just as a large amount of mites.
- I actually worked on Dr. Hood's payroll during this time great research.

Kerry Owen

The Bee Well Team www.beewellhoneyfarm.com

Debate – Dr. Delaplane

- All, just catching up on this conversation. The best knowledge I know about this is from Harbo, J.R., and J.W. Harris. "Effect of screen floors on populations of honey bees and parasitic mites (*Varroa destructor*)."
Journal of apicultural research 43.3 (2004): 114-117" © IBRA 2004 in which they conclude screens decrease ingress of mites into open brood cells which, of course, is necessary for mite reproduction. I don't think the "drop through the screen" hypothesis is well-supported.

The data suggest that mites were controlled to a significant degree by open-screen floors in hives. Open screen treatment was associated with the percentage of the mite population in brood (P-MIB) cells, and lower P-MIB has been related to lower mite populations (Harris *et al.*, 2003). A lower P-MIB may be the mechanism that reduces mite populations in colonies with open-screen floors. We found a relationship between the presence of screen floors and a lower percentage of the mite population residing in brood cells. Colonies with open-screen floors produced significantly more brood than colonies with wood floors

Debate Resolution for Me

- I am staying with screened bottom boards but not for the original thought of varroa mites falling thru the screen, but for the lower percentage of mites in brood hypothesis.
- Sticky boards have lost favor for me; with alcohol wash or detergent wash what I am going to use to count my mite loads rather than sticky boards. A wash to determine varroa levels is better and more accurate. A free fall mite drop past top bars / comb / etc. does not make for a very accurate count.
- Several people are using screen bottom boards in conjunction with an oil tray for Small Hive Beetles.