



## NOTES ON THE USE OF DICHLORVOS IN LEAFCUTTER BEE INCUBATION

This spring I had the opportunity to personally examine several bee incubators across Southern Alberta, and I made some observations that should be useful for safe and effective application of Vapona (Dichlorvos). When checking the incubators, I carried with me an electronic thermometer to test the temperature variations throughout, and a MiniRae3000 VOC monitor to observe the dispersal of Vapona, which is commonly used for parasite control. In general the temperature was well maintained and rather even throughout each incubator. The vapona on the other hand had some issues. Below I outline a few recommendations gleaned from my observations.

**Pay attention to the manufacturing date.** The first thing that was apparent is the Vapona impregnated strips are in no way standardised; while some of the strips were off-gassing rather high levels, others (in the same incubator) were off-gassing half as much, and some were completely undetectable. I tested this further by opening three “new” strips and holding the VOC meter directly over the center plastic of the strip for about thirty seconds while the numbers leveled out. While all three were emitting Vapona, they were all emitting a different amount. One was producing 4.0ppm, the second 2.3ppm, and the last, 3.3ppm. This may not seem like a large discrepancy, but 2.3 is almost half of 4.0 and that will make a big difference when applied to a large area.

I contacted ‘Scotts’ (The Manufacturer) to clarify a few questions regarding the Vapona strips and this is what they told me: the strips only have a shelf life of five years, over which time they slowly lose potency, thus there may be big differences between boxes depending on the manufacturing date. To be sure, check the manufacturing date on the side of the box (the foil package does not have the date) then add five years.

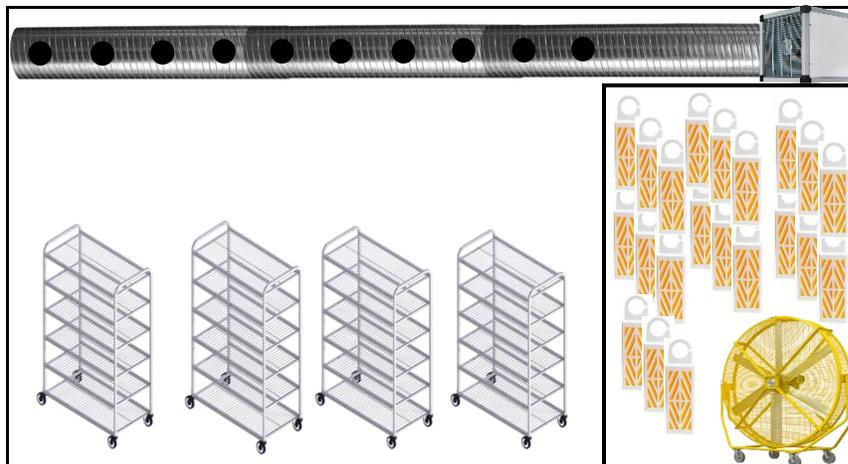
**Don't reuse strips.** At room temperature (~21°C), the strips are good for a maximum of four months after the package has been opened. Incubators are much warmer than this which causes the Dichlorvos to volatilize much more quickly. Some producers may be tempted to try saving the clips to re-use them but this is not recommended. Even if the clips are making a smell this doesn't ensure there is any chemical left. In fact, the package even says that the clips are “virtually odorless” and at room temperature they are; the smell that we all associate with these strips is not a reliable indicator of chemical content.

**Hang a clip with each light trap.** As can be expected, even with good circulation in the incubator, there is a gradient of chemical that increases as you approach the clips. There also seems to be a chemical gradient within the incubators, with very little chemical along the floors, increasing as you rise in height. This means that there is often less Vapona down on the floor where the light traps are. We know from the work that Danica Baines has done for us, that there is an increase in parasitism as you approach the light traps; perhaps it would be a good idea to hang a clip with each trap.



**Ensure good air circulation.**

Some incubators have all the vapona strips in a separate room from which the air is circulated throughout the incubator. These incubators had a much more even distribution of vapona throughout the trays. There wasn't a gradient in height and the trays were all receiving the same treatment, although the corners could sometimes have less chemical. This method is very effective from what I could tell, and it removes the issue of having an ineffective clip in one area.



**Good ventilation is crucial in work spaces attached to incubators.** I visited one location that had a large shop with incubators attached. There wasn't any vapona put in the shop itself, yet the meter continued to read high levels of Vapona throughout the entire large room. We tested several other objects in the shop to rule out a false reading: we tested the chemical room, newly built potato boxes, wood, and glue, but there wasn't anything else found in the shop that could be giving a false reading. Somehow the air in the incubators is mixing with the air in



the shop and this is exposing workers to Vapona unintentionally, which comes with serious health risks. I thought that this was likely happening through the ceiling but the producer informed me that each incubator is completely sealed off and, in theory, there is no shared air. It would be advisable then, as an added precaution, to always have the shop doors open while working in a space attached to active incubation rooms.

In summary, for best results when using Vapona, pay attention to the manufacturer date; don't reuse the strips; hang a clip with each light trap; ensure good air circulation; and maintain good ventilation in any work spaces attached to incubators. Applying these few recommendations will significantly increase the efficacy and safety of Vapona, which will yield superior results in the incubation process.

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