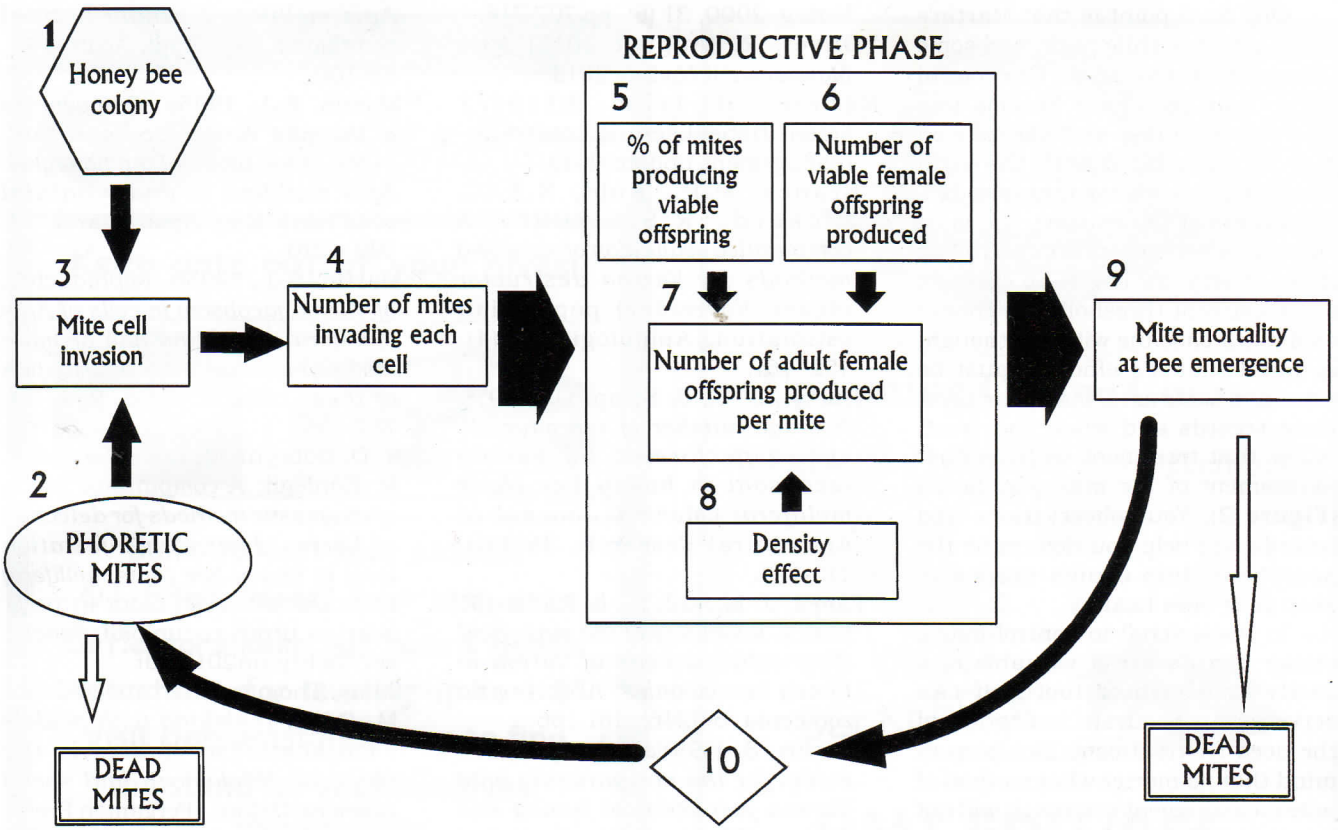

*Figure 5. *Treatment threshold values were obtained from a separate paper by Martin, (Martin, S. (1998b). Varroa jacobsoni: monitoring and forecasting mite populations within honey bee colonies in Britain. MAFF). Martin's total mite population treatment thresholds establish that no treatment is needed as long as the total mite population is below the number listed for each month. Total mite populations are calculated by multiplying daily drop averages by the monthly multiplier.*

rally occurring mite and bee brood cycles **(see Figure 4)**. The total mite population can then be used to determine a treatment threshold based on the season **(see Figure 5)**.

As discussed, support of Martin's hypothesis that natural mite drops correlate with total mite population is found in the work of Branco et al. (2006) and Flores et al. (2015). In both these field studies, mites were allowed to drop naturally, and daily counts were compared to the colony's total mites population. To determine the total mite population all the mites in the colonies were killed then counted. In each study, linear regression revealed that sticky board natural mite drops are highly correlated with the total population.

How to Use Sticky Board Drop Counts

Here's one way you could use your sticky board mite counts to determine treatment thresholds using Martin's multipliers. First, you would do a four-day mite drop and count all the mites, and then that number would be divided by four to get the average daily mite drop. The daily mite drop is the first data point.

Example:

Step 1: If a four-day drop resulted in a 40 mite count, then the daily average drop would equal 40 divided by 4 or 10 mites.

Step 2: Take the daily average drop of 10 and multiply it by the seasonal multiplier found in Figure 4. In this case, we'll say it's the month of May. May's multiplier, according to Martin, is 30. The result would be 300 (30x10), which is the second data point.

Step 3: This is just a simple look-up that's found in Figure 5. In this case, Martin's threshold for treatment in May is 170 mites. Therefore using this example, with the result of 300 mites, the colony would need treatment.

Doing these three steps is faithful to Martin's research, but there's another way to condense the process a little further. If you do the calculations backward meaning starting with the total mite population treatment threshold and then dividing each by its seasonal multiplier, you have a list of the maximum allowable daily drop averages for each month. For example, using May with a treatment threshold of 170 and dividing by its monthly multiplier of 30, the maximum daily average drop is approximately six. Knowing that you can read a treatment threshold right off the drop board. If you do a four-day drop the natural mite fall for the entire drop period must be less than 6x4 or 24 mites. You can do the same calculation for any total drop.

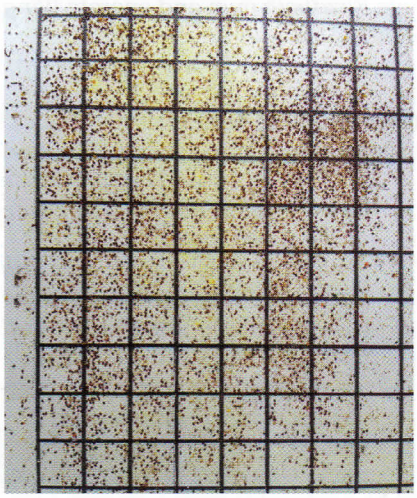

Figure 2. A typical sticky board with detritus and mites.