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## Comments on the Powdered Sugar Roll

The powdered sugar roll is a good monitoring mechanism, but there are a couple issues to be aware of with it.

1) **Variability in mite removal.** Depending on the circumstances, there can be variability in the removal of the mites. Some researchers claim the method will remove 80-90% of the mites from the sample of bees. Others will say it is lower, only 65-70%. A lot of this discrepancy is due to all the variables that exist when sampling and testing, regardless of whether one uses powdered sugar, ether roll or alcohol wash. Last year we collected samples from 17 hives and ran the powdered sugar roll (collect from center brood frames, dust with sugar, shake, let stand 2-3 minutes, shake out mites and sugar, let stand another minute, shake out again). We then took that same sample of bees and did the alcohol wash to see if we could dislodge more mites. In general we found and felt that the powdered sugar did a good job in that we would find sometimes 1 or 2 more mites after alcohol washing in the sample of 300ish bees

2) **Treatment threshold level.** The general thought is that with a sugar, ether or alcohol roll, whatever your mite count comes out to be per 100 bees you have to at least double it since you are capturing information about mites on adult bees, not mites in brood. Depending on who you read you will see a range of ideas on the percentage of mites on adult bees to mites in brood from 50% of the mites are on the adult bees and 50% of the mites are in the brood to 25% on adults, 75% in brood. Some will argue, correctly so, that this ratio changes throughout the season with 67% of the mites in with brood (33% on adult bees) during the summer and as brood rearing declines into fall the ratio swings the other direction.

As an example, say you did a powdered sugar roll and found 6 mites in 300 bees, that is 2 mites per 100 or 2%. Doubling that to account for mites in brood means your hive infestation is about 4%. If you err on the high side (the 25%-75% idea since we are close to peak, or probably just past peak now of brood rearing) then it is 6% infestation (and depending on how well you think the powdered sugar is removing your mites, you may have bump the number up) Typically the researchers feel that when the total mite load (on the adult bees and in the brood) is in the 8-12% range one should treat to prevent collapse.

Some argue that treatment should start at a much lower threshold level, maybe 6%. Some argue that the threshold changes with the seasons with a lower tolerance, 1-2 mites in a powdered sugar sample of 300 bees in spring, a little higher allowance in peak of summer 4-5 mites, and same 4-5 or lower going into fall.

If you sample drone brood, the thought is that the mites have a 10:1 preference for drone over worker brood, so you can work out the math for total hive infestation level



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from a sample of 100 drone brood as well.

3) **You are your bees patient advocate and their doctor.** You need to monitor the situation closely, testing, questioning etc. If you tested for the ailment, established a threshold level for treatment, treated the ailment and tested again to find the technique or treatment (or combination thereof) didn't accomplish what was needed then just like a good doctor your next step is to "adjust the prescription" to manage the ailment.