

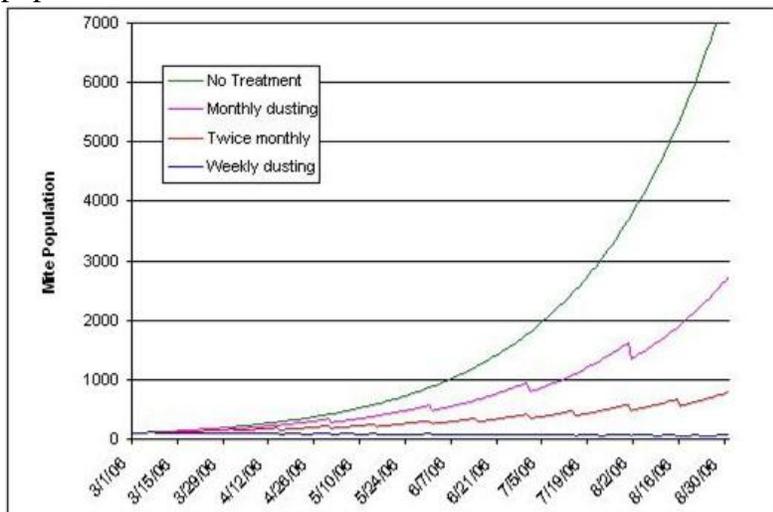
Icing sugar dusting
By Amanda Millar
Updated Jan 2015

It is now widely believed that high varroa levels, with the associated viruses (DWV, BPV) are the main reason for colony loss over winter. Some treatments are themselves hazardous to the bees and beekeeper so I have been using icing sugar for spring and late autumn treatments after the Apiguard, and in the summer if high drop indicates a problem. I commonly find an increase in mites after the August treatment due to robbing or collapse of nearby feral or neglected colonies and the mites invading. Having investigated how it is supposed to be administered and how effective it is, I share it with you. In order to keep this article short I will summarise the findings but urge you to read the original information, especially Randy Oliver's Scientific Beekeeping site whose writings I find very useful

<http://scientificbeekeeping.com/fighting-varroa-biotechnical-tactics-ii/2/> (and the end of page 1 on this site)
<http://scientificbeekeeping.com/powdered-sugar-dusting-sweet-and-safe-but-does-it-really-work-part-1/>
<http://scientificbeekeeping.com/powdered-sugar-dusting-sweet-and-safe-but-does-it-really-work-part-2/>
<http://scientificbeekeeping.com/powdered-sugar-dusting-sweet-and-safe-but-does-it-really-work-part-3/>

I discovered there has been a little scientific research; for example, forcing all the bees into a box and dousing them with powdered sugar removes 76% of mites, but this is very invasive. Other research suggested that dusting them every 2 weeks for 11 months had no effect on the bees, nor did it have any effect on the mites, but this was done in Florida where the mite populations fluctuate in a different way to temperate regions. Randy Oliver did his own tests, to destruction; by dusting the bees, counting mite fall and then killing them all and washing to remove any remaining mites. He found that dusting removed about 30% to 50% of the phoretic mites (ie those clinging on to the bees). He also found that the majority (80%) of the mites fell within an hour of the dusting and after 24 hours the drop was back to the normal background mite drop. His research indicates that a powdered sugar dusting gives a quicker estimate of mite level in the hive and more accurate than either natural mite fall or washing 300 bees in alcohol.

Here is a graph from Scientific Beekeeping indicating the likely effect of regular dustings on a population of mites.



The estimated effect of powdered sugar dusting over a screened bottom on mite population growth, based upon a starting population of 100 mites, a daily intrinsic mite growth rate of 2.4%, and an estimated kill of 50% of the phoretic mites per dusting treatment. Note that weekly dustings would result in a slight decrease in the mite population. These curves are based upon very crude model, and are only for general illustrative purposes, although they tend to match actual field experience. By Randy Oliver

How does it work – the fine powder causes the mites to lose their grip, it also promotes bee grooming and more get knocked off. It only affects phoretic mites (carried on the bees), not those in the brood cells.

How to apply it – The easiest way is to dust it over the top bars of the brood box where most of the phoretic mites are. Use 125g (1/4lb) icing sugar per brood box. If you have used sufficient icing sugar you should see lines of it on the insert. Randy uses a travel screen mesh to brush it through, and then brush any sugar on the top bars into the seams. (See Randy Oliver's Biotechnical Tactics II, good pictures) Or you could use a sugar shaker, or stainless steel flour sieve/shaker which I found worked well and rapidly. There is no need to take out each frame and dust it. It works well without disturbing the nest and this is particularly important if done in autumn/winter. In USA and Europe there are mechanical bellows you can blow the powder in but apparently this is a technique which needs to be mastered, see video

<http://www.youtube.com/watch?v=FIQKrcON6tk>

There is no need to dust the supers during a flow.

When to apply – any time of the year, including in the honey flow (but no need to dust the honey supers), and late autumn, probably does not work very well when they are in a tight winter cluster and rather disturbing but I have done it successfully on mild November and December days when the temp is over 8 degrees C, or the bees are flying. Also do it whenever there is a brood break and the mites are mostly on the bees and at their most vulnerable to this treatment, eg do on a swarm or artificial swarm.

How often – If you think you have a high number of mites, for example more than 10 mites, 20 mins after the first dusting, you may need to dust again every week for a month, and then reduce to once a month to keep levels low. Randy suggests 2 or 3 dusts in the spring and 2-3 in the autumn to keep on top of the mites. It only affects the phoretic mites and every day new mites are hatching so a one off dusting is only going to reach a small proportion of the mites, but as the mother mites only return to lay in cells after several days, doing a dust every 4-5 days for a whole brood cycle should really knock them down.

Health hazards – none to the bees, research shows the dust does not enter their trachea, no affect on bees or capped brood, heavy and frequent dusting might lose some easily replaced eggs. No hazards to humans.

Cost – About £2.00 for 500g, suitable for 4 dustings.

Type of sugar – Pure icing sugar, with no additives like dicalcium phosphate or silicon dioxide or glycerine which may be toxic to bees, so avoid the fondant icing etc. Keep it dry.

Precautions – If you have applied sufficient it will come through onto the insert.

It is important to put the insert in before applying it to collect the sugar and the mites. (I am assuming you have mesh floors or it will have little effect as it does not kill the mites, merely knocks them off.) This needs to be disposed of away from the bees and the inserts washed and best not to put them back on the hive as any sweetness attracts wasps. Avoid windy days and wet days or the powder will clog and reduce effectiveness. It can attract ants and I found several wasps on each insert, and apparently it can stimulate robbing if there is a nectar dearth, so avoid spilling sugar and take anti-robbing precautions. Do not leave sugary inserts under the hive.

Time taken – 2 minutes per hive or less

Disturbance to bees – minimum if the frames are not disturbed and you work quickly. I have had no problems when using it with a queen cell or virgin in the colony, and it is particularly effective in these circumstances as there may be little brood and the mites are mainly on the bees. My bees were a little annoyed when I took the crown board off but settled quickly. So have the sugar ready in the shaker and dust as soon as you lift the crownboard. I used a temperature probe in a brood box, and dusting only raised the temperature of the colony about half a degree centigrade for less than an hour in summer, for slightly longer in winter.

Things to improve its effectiveness – Make sure the top bars are clean of burr comb, which makes it difficult to brush surplus icing sugar into the seams, burr also might cause bees to be squashed when crown board replaced. Have the sugar in the shaker all ready to dust as soon as the crown board is lifted, to prevent the bees flying up, then no smoke is required. Brace comb between frames can lodge the icing sugar and reduce the effectiveness, so cut this down with the hive tool first.

No need to dust the honey supers, only the boxes with brood in, but do all the boxes they are wintering on. If you run a brood and a half then unless you have identical spacing and all the frames are pushed to the same side it will not work well as it gets lodged on the top bars of the lower box if frames are not aligned. So if you have, for example, Hoffman below and standard spacers above, start by dusting the upper box, wait 5 minutes, then lift it off and rest on upturned roof or spare crown board (to collect dusty bees which fall off) then dust the lower box, brushing the dust off the top bars, shut up hive and wait at least 20 mins. Alternatively put identical metal or plastic spacers on the Hoffman frames if you intend to dust on a regular basis.

In autumn/winter dust at the warmest time on a calm sunny day about midday; as the flying bees may beard at the entrance for a few minutes grooming themselves before going inside and you would not want any which fly up to chill and be unable to return to the hive.