

FREQUENTLY ASKED QUESTIONS ABOUT FORMIC ACID AND MITEGONE™

1. How does formic acid kill mites?

Formic acid is believed to act as an asphyxiant. However, one German researcher believes the formic fumes kill the mites (but not the bees) because the mites' exoskeletons or skins are much thinner than that of the bees, allowing the fumes to penetrate their bodies.

2. Do I need to use menthol to treat for Tracheal mites if I use formic acid and MiteGone?

No. MiteGone will do a good job of eliminating Tracheal mites, even in colder weather when menthol will not work at all.

3. Can the acid and MiteGone be used in both the spring and the fall?

Yes. There are countries in Europe, such as Denmark, that have used only formic acid for mite control. Organophosphates, such as CheckMite, and pyrethroids, such as Apistan, are not allowed in beehives. With resistance to both pesticides, acid is now successfully used twice a year.

4. Why don't mites develop resistance to formic acid (as they do to other miticides)?

Eventually mites may develop a resistance; however, after forty years of use in Europe, no resistance has yet developed. Until scientists agree on how exactly formic acid kills mites, they will not be able to pin down what physiological changes in the mites would be necessary to bring about resistance to formic acid. They agree that resistance in the near future is very unlikely.

5. Can formic acid and MiteGone be used in conjunction with other acaricides?

Yes. If Apistan is still working to control Varroa mites, formic acid and MiteGone shall be used in the spring to control Tracheal mites at the same time, while killing surviving Varroa and postponing resistance. I will not use COUMAPOSE it contaminates hives.

6. When alternating the use of formic acid and MiteGone with another miticide, is it better to use formic acid in the spring or the fall?

It is better to use formic acid in the spring before the main brooding season.

7. Does formic acid kill mites on the brood in capped cells or does it only kill mites on adult bees?

There are conflicting reports in the literature. Brushing liquid acid on Sealed brood provides good control, while others report poor control. It is better to assume that FUMIGATION Varroa control is limited to mites on adult bees, and to regard any control of mites in sealed brood as a bonus. In the case of Tracheal mites, the mites are killed in the Tracheal tubes of adult bees. There are no Tracheal mites present in the brood.

8. Should I expect queen losses when treating with Formic Acid and MiteGone Method?

Queen losses and damage to the hive were observed with blast methods and the use of 85% acid and in colonies with old queens. With the use of 65% acid and a continuous low dose release method, we have experienced no young queen losses due to Formic Acid applications since 1995. Keep in mind that you should go into winter with new queens. It guarantees the best wintering results; we do.

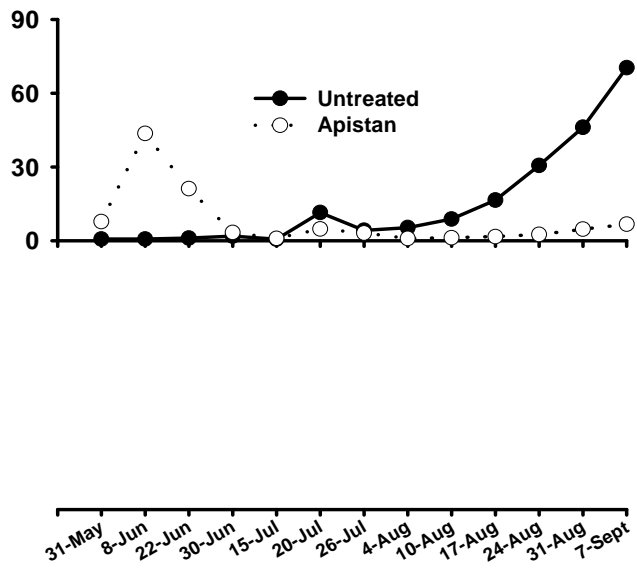
9. What is the efficacy of formic acid compared to that of pesticides?

Formic acid kills mites slowly, therefore tests before and immediately after treatment may be very misleading. Only tests before treatments in the spring and late summer will tell you how well your last treatment worked. Depending on the application method, other treatments can provide a “reduction” or efficacy of 70-100%.

MiteGone reached 95-100% efficacy in tests in recent years and can, with two treatments a year, keep mites below the 8-10 mites economic damage threshold level. See Testing Charts since 2002 in the Testing section.

10. When do I have to take the pads out of the hive? What happens if I don't?

It is not necessary to remove the pads. We leave pads in from late summer to spring. When we reuse them by re-cutting the evaporation surfaces and re-soaking in acid, it is the best way to reuse pads. IN spring, after the acid evaporates, the bees will chew up most of the pad and throw it out of the hive. If there is pad remaining in the hive, you



- If you pre-cut the pads, the plastic wrap surrounding the pad may shrink and slide off the pre-filled pads. Carrying pre-filled pads in pails is very dangerous. If the vehicle you are carrying the pads in is in a motor vehicle accident, the pads may become a deadly projectile.
- Incorporate cutting, filling, and installation of the pads into your regular bee management routine in the open space and breeze of your bee yard; this is the safest way to work with acid.
- Wet pads are heavy and fragile. They will break, crack, and lose their function if just thrown into buckets. Carrying filled and dripped off pads in dripping baskets within the yard eliminates this damage. You must be gentle and careful when installing the pads while you are stapling and inserting them into the hives. **Damaged, squashed, torn, and unwrapped pads will not provide the desired treatment. You may lose your bees or queens. See Pre-filling Pads.**

13. I live in a subtropical or Tropical climate, when should I treat?

In subtropical climates, select the driest period for treatment. For example, in Florida, the best time to treat is mid-October and in mid-May. In Tropical climate is the same but you may extend the treatment to whole year .(see tropical instructions.)

14. Can I use MiteGone in the fall/late summer instead of pesticides?

- In temperate climates start the fall treatment as early as August after the honey is off. The outside temperature will not affect the MiteGone applicator. The graph in section 11 showing the placing of pads on the top and side shows MiteGone's use starting on May 27 applying the acid for twenty one days to June 14. At that time, Kelowna's temperature reaches highs of 30 degrees Celsius or 90 degrees Fahrenheit; this temperature did not affect the success of the treatment.
- Apply the pads to the hives in the early morning to avoid the midday heat.

15. I have a high infestation of mites and / or my mites are resistant to pesticides. What should I do?

Generally, authorities agree that Formic Acid kills mites in a way that the mites should not become resistant to. In lay terms, if you hit a mite with a hammer, there is no way the mite can become resistant to it; therefore, keep hitting the mite with acid. The acid will kill 70-80% of the mites being born in each generation. Treating with acid long enough will reduce high infestation levels.

In Dadant or Shallow boxes, using half-pad treatment can be extended by pulling the pads out of the hive after 19 or 20 days and by re-cutting the evaporating surface and re-soaking the pads in acid. You can also replace the pads after 30 days with new half pads for an additional 21 day treatment. In standard Landstroth boxes, you can use a 40 day full-pad treatment by cutting off the end of the 10 inch pad to expose the evaporating surface. Soak the remaining 9 ½ inches of pad in acid and install it the same way as the half pads. A taller soaking bucket (11 inches) is required for this method. You may increase the number of pads used, too (See Treatment Selection).

16. How do entrance and bottom “gadgets” affect the Formic Acid treatment with MiteGone?

As long as these entrance “gadgets” like; entrance reducers, pollination gates, and pollen inserts do not fully restrict the entrance and ventilation, they can be used. We recommend their use to create a “tray” out of the bottom board collecting and retaining the heavy acid fumes; they are actually beneficial to the treatment as mites that fall to the bottom board also fall into a pool of heavily concentrated acid fumes and die there. **The slanted wooden pollen insert is ideal for this function. Tilting the hive back can also be used as an option in dry climates. Screened bottoms should not be used as they leak acid out of hives and sealing them is often very difficult, but the ventilation must be at the bottom (See Hive & Equipment).**

17. How do I treat my nuclei or hives of other sizes?

The rate of evaporation is directly related to the size of the evaporating surface. 1”x3/8 surface evaporates 1.5 grams of acid each day. The total amount of acid required is directly related to the size of the hive.

The standard Landstroth box and its shorter version like the Dadant or Shallow, when full of drawn comb, all have a relatively similar space between the combs so in combination with a standard Landstroth box they are considered to be a standard box for treating with MiteGone. Alone, three Dadants or three Shallows are equivalent to two standard boxes.

A four frame nuclei in half a standard box will do well with one half-pad. For baby nucs, use a 1” corner cut off of the sealed end of a half-pad (See Other Uses and Cuttings of Pads).

18. Why should I use a cutting box and a knife to cut the pad? Why can't I shear the pad?

If you use any type of shear to cut the pad you may tear the wrapping and you will crush the pad destroying the ends of the capillary tubes preventing effective evaporation of acid. The cutting box acts as a guide for your knife allowing you to easily cut the pad at the

right place and avoid damaging the pad. Be sure that you are cutting the pad with a sharp blade. **Do not move the blade up and down.**

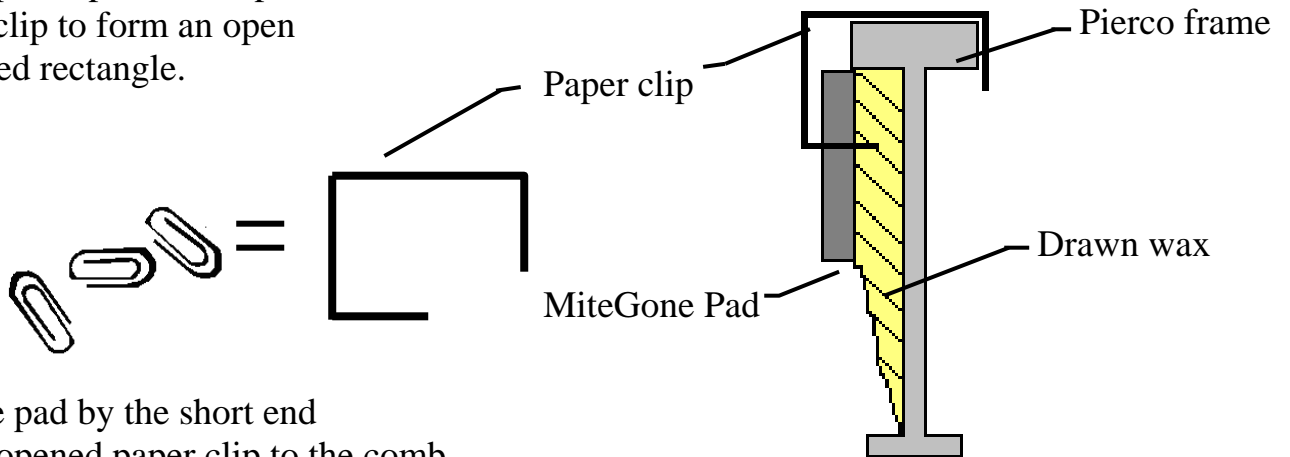


DO NOT
UNWRAP PADS

19. I have Pierco plastic frames with no honey and / or foundation combs only.

Nails or toothpicks will not hold the pad to the weak wax. What should I do?

You can pin pads to the walls of the super or, use paper clips! Unwrap a standard metal clip to form an open cornered rectangle.



Pin the pad by the short end of the opened paper clip to the comb while wrapping the long end of the paper clip around the top bar.

Sectional View of Installation