

VERIFICATION TESTING IS A MUST FOR INFESTATION LEVELS, RESISTANCE & TREATMENT EFFICACY! YOU MUST KNOW WHAT YOU HAVE! TEST CHART FALL - AUGUST TO SEPTEMBER 2003

Hive Number & Location O = Outside circle I = Inside circle Test for Treatment	Natural Drop Aug 30 (11am) to Sept 4 (11am) Total x .2 120Hr 24Hr		Pesticide Drop Sept 4 (11am) to Sept 5 (1 pm) Total x .92 26Hr 24Hr		Treatment Efficacy and Resistance Multiple	Hive Evaluation 2 Story Langstroth Frames of brood Frames of bees top box (lbs) Strength ↓ ↓				
Resistance and Efficacy Apistan 2 strips in top box	O1	10	2	76	69.9	35x	105	STR	9	2
	O2	19	3.8	63	57.9	15.25x	93	STR	9	3
	O3	14	2.8	93	85.56	30.55x	78	STR	8	3
	O4	0	0	57	52.44	50 – inf	83	STR	9	2
	O5	1	0.2	216	198.72	999x	90	STR	9	1
	O6	7	1.4	111	102.12	73x	76	MED	9	4
	O7	9	1.8	147	135.24	75x	89	STR	8	1
	O8	0	0	123	113.16	100–inf	100	STR	9	3
	O9	9	1.8	72	66.24	37x	86	STR	8	3
	O10	7	1.4	74	68.08	48x	81	STR	9	3
Efficacy 21 days 2 pads formic acid 12 gram/day	I 1	4	0.8	54	48.68	62x	78	MED	8	3
	I 2	3	0.6	11	10.12	17x	76	MED	8	2
	I 3	8	1.6	66	60.72	38x	91	STR	8	3
	I 4	3	0.6	138	126.96	212x	80	MED	8	2
	I 5	10	2	57	52.44	26x	87	MED	8	2
formic acid 21 day 3 pads 18 gram/day	I 6	5	1	84	77.28	77x	96	STR	9	2
	I 7	9	1.8	28	25.76	15x	80	MED	8	0
	I 8	3	0.6	42	38.46	65x	86	STR	8	4
	I 9	9	1.8	50	46	25x	65	STR	9	2
	I 10	0	0	72	66.24	66 – inf	88	STR	8	2

Total Natural Drop
Collected for 3 – 5 Days

Natural Drop interpolated to 24 Hours

Pesticide drop interpolated into 24 hours

Pesticide drop collected during the
first 24-48 hours after application

TEST THE SAME HIVES IN THE FALL AND SPRING. WITHOUT TESTING, YOU ARE PLAYING RUSSIAN ROULETTE!

MiteGone™ Enterprises Inc.

VERIFICATION TESTING CHARTS' EVALUATION: FALL CHART DATA EVALUATION: FOR INFESTATION, RESISTANCE AND TREATMENT EFFICACY

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WHAT DO THE 24 HOUR PRORATED NATURAL & PESTICIDE OR ACID DROP TELL YOU?

THE NATURAL DROP: Tells you how high your infestation levels are and what kind of treatment is required. In the case of formic acid and the MiteGone method these are general recommendations:

Natural Drop/24hrs	Infestation Levels	Treatment in spring	Treatment in late summer
0-8	Low	21 day	21 day
8-15	Moderate	21 day	40 day
15-30	High	40 day	80 day
30+	Critical	80 day	80 day*+ 25%

*increase the daily dose by 25-50%

The natural drop will also tell you how well your fall treatment worked in the spring and vice versa.

TREATMENT EFFICACY AND PESTICIDE RESISTANCE MULTIPLE: The “multiple” is obtained by dividing the 24 hour pesticide or acid drop by the 24 hour natural drop. It will tell you if you have resistance to man-made pesticides and how well your treatment is working at the beginning of the treatment. (see the testing chart for examples)

RESISTANCE TO MAN-MADE PESTICIDES (Fluvalinate, Coumaphos, and Amitraz based treatments).

If the “multiple” (the amount of times the pesticide drop is greater than the natural drop) is:

- 20 and more times indicate you have no serious resistance and your treatment will work.
- 10 to 20 times indicate your resistance is building and your treatment may or may not work.
- 5 to 10 times indicates you should switch to another treatment. You will only increase resistance.
- 5 or less times indicate that an alternative treatment is a must.

TREATMENT EFFICACY OF PESTICIDES AND PROLONGED ACID TREATMENTS

If the “multiple” is:

- 30+ times, this is very good and represents 95-100% efficacy.
- 20 to 29 times -this is good be happy at 85-95% efficacy.
- 10 to 20 times – this is satisfactory for low infestation levels at 70-85% efficacy.
- 5 to 10 times – this may or may not be a sufficient treatment at 50-70% efficacy.

WHAT LEVEL OF EFFICACY IS SUFFICIENT WITH NATURAL SUBSTANCES?

More and more scientists are advising beekeepers that it is not necessary to kill everything at once with 100% efficacy as pesticides originally did. Pesticides act on a narrow band of nerve genes that easily mutate and mites build resistance quickly. 100% resistance to fluvalinate and coumaphos and 80% resistance to Amitraz was found in Florida in December of 2001. Scientists are advising beekeepers to use natural substances like Tymol, formic acid, and oxalic acid, which depending on application, have 70-100% efficacy. Since natural substances act on a very wide spectrum of genes from respiration, reproduction, and skin, mites are very unlikely to build resistance quickly. A treatment with 70% efficacy used twice a year can keep mites below the economic damage threshold.

Keep mites below the 8-10 mite natural drop. A low presence of mites may also allow bees to build up resistance to mites by increasing bee grooming and building natural defences against mites. All of Brazil has a natural selection population of bees and mites that exist together and Brazilian beekeepers do not treat at all. Unfortunately, having 90% of colonies die through natural selection is not an option in North America.

EFFICACY OF FORMIC ACID TREATMENT DEPENDS ON THE DELIVERY:

- **Generally** the higher the infestation of mites the stronger or longer the treatments you need. Retest and continue treatments if infestation persists.
- **In short blast methods** (soaked towels, cardboard, napkins, etc) you can increase efficacy by repeating treatment more times (i.e. 7-8 instead of 5 times).
- **In prolonged blast methods** (newspaper pouches, MiteAway, Gel Packs) extra slots / cuts can be made to increase the evaporation rate but generally these methods are not easily adaptable to various hive sizes and conditions. Modifications often shorten the length of treatment.
- **A low dose continuous formic acid application using the Mitegone method** has the advantage of ultimate adaptability. If your acid induced drop is 5 times the natural drop, increase your dosage by 1 pad. If it is 10-20 times, your treatment is working at 75-85% efficacy. You may be happy with these results or you may choose to increase the dosage by 1 pad.

WHAT CAUSES LOW EFFICACY IN ACID TREATMENTS?

The low efficacy is often due to equipment, bees, or temperature and humidity. Often acid is lost and wasted through unsealed holes in the hive body or cracks in the bottom board. Also, some bees may ventilate too vigorously causing the acid to be ventilated out of the hive. Large, strong hives (over 30,000 bees) will require larger amounts of acid. For example; a hive that is twice as strong may require 4 times or more acid. Extremely large strong hives are difficult to treat.

Placement, internal temperature and the humidity of the hive affect the evaporation rate of the applicator. In temperate climates the bees keep constant temperatures and humidity between the combs but not on the bottom board or under the top cover. They have no means of lowering high humidity in a hot climate. This causes a drop in the evaporation rate and can cease evaporation all together.

To offset the internal reduction of evaporation and humidity, simply cut the MiteGone pads into quarters or thirds which will increase the evaporating surface. Recommendation for “Preparing Hives For Treatment” and “Modifying Treatment For Your Conditions” are on our website www.mitegone.com. Print and read our manual (link at the top of the home page).

WHAT ELSE THE 2003 FALL TEST CHART TELLS US:

FORMIC ACID TREATMENTS CAN HAVE 95 – 100% EFFICACY.

- I test for Apistan resistance with statistically corrected (delete low and high) multiple of 30-75. I have no resistance and 95-100% efficacy. I use fluvalinate in the fall as long as it works.
- I will not consider using coumaphos. Organo phosphate residues exclude honey from the health food and European markets and the wax from cosmetic use.
- To prepare for resistance and test fall treatments, I treat one yard of 40 hives with acid each year. In the test hives I apply 2 pads delivering 12 grams of acid per day to 5 hives and 3 pads delivering 18 grams of acid per day to other 5 hives. The chart shows the multiple of both acid groups at the same level and over 20 times, the 2 pad treatment is working well. If the 3 pad treatment delivering 18 grams will have a higher multiple and 2 pads will be below 20 times I am either loosing acid and more acid is necessary or evaporation is low and I will modify the treatment accordingly.(see Instructions document)
- The chart also provides a very interesting conclusion. In statistically corrected averages, both acid treatments are in the same efficacy as the Apistan treatment having a 25-75 multiple range.
- **Therefore, efficacy of 95-100% can be achieved with formic acid and the MiteGone method.**

THE BEST PART OF TESTING IS THAT YOU KNOW THE RESULTS OF YOUR PROPOSED TREATMENT BEFORE YOU TREAT YOUR ENTIRE OPERATION AND YOU CAN DECIDE ON THE APPROPRIATE TREATMENT BEFORE YOU SPEND MONEY ON SUPPLIES.

The average handyman can make 24 test boards and screens for less than \$50. Then, just buy a counter for \$2 and glasses for \$15. I sell boards and screens to my neighbours for \$5. You may consider doing the same or spread the word so everyone in your area tests and treats properly. Re-infestation is not as big a problem but if it can be avoided, avoid it by teaching and helping your neighbour.

PLEASE START TESTING! IT WILL SAVE YOU MONEY AND YOUR BEES!