

Alcohol Washes, January, 2007

Twenty hives were treated with 90ml 50% formic acid + 15ml HBH-LG, 1:00pm, 2 Jan, 2007.

To obtain an estimate of the number of varroa mites on adult worker honey bees in the brood nest, about 400 - 500 bees (1/3 of a pint jar) were washed in alcohol . Bees were covered with alcohol and shaken vigorously with a solid lid, then with a mason ring-lid holding 1/8" hardware cloth in place, the bees were shaken into a light colored plastic container (6" diameter x 9" tall) for counting. Excess alcohol was poured back over the bees, extra alcohol added and the bees shaken again with a solid lid, and then shaken into the viewing container through the screened lid. This was done a third time, except that the bees were swirled in the alcohol instead of shaken, then shaken into the viewing container. The mites were counted and number recorded.

Samples were taken just before treatment on 2 Jan 07, on the day after treatment on 3 Jan 07, and a week later on 10 Jan 07.

Results of the alcohol washes in January 2007:

	<u>2Jan</u>	<u>3 Jan</u>	<u>10 Jan</u>
FA1	4	0	0
FA2	9	1	0
FA3	19	0	3
FA4	11	0	3
FA5	19	1	2
FA6	20	5	4
FA7	9	3	4
FA8	14	-	9
FA9	17	3	5
FA10	18	1	2
FA11	38	16	5
FA12	38	1	5
FA13	9	2	2
FA14	23	4	3
FA15	16	1	0
FA16	0	1	1
FA17	7	0	1
FA18	16	0	1
FA19	35	1	6
FA20	<u>15</u>	<u>4</u>	<u>2</u>
Avg	16.85	2.20	2.90
Sum	337	44	58

Descriptive Statistics of the results of the alcohol washes, Formic Acid Treated Hives, 2-10 Jan,2007

	Pretreatment 2 Jan 2007	Posttreatment 3 Jan 2007	Posttreatment 10 Jan 2007
Mean	<u>16.85</u>	<u>2.20</u>	<u>2.90</u>
Standard Error	2.33	0.80	0.52
Median	16.00	1.00	2.50
Mode	9.00	1.00	2.00
Standard Deviation	10.41	3.59	2.31
Variance	108.45	12.91	5.36
Kurtosis	0.39	11.82	0.97
Skewness	0.81	3.20	0.90
Range	38	16	9
Minimum	0	0	0
Maximum	38	16	9
Sum	337	44	58
Count	20	20	20
Confidence Level (0.95)	4.56402	1.574405	1.014449

A week later (10Jan07), numbers remained relatively low, but an increased influx of varroa mites is apparent. Mites invade the treated colonies on robbers foraging on mite-infested colonies and by invasion of lost bees from collapsing colonies in the neighborhood.

Analysis of Variance: One Way.

Summary

Groups	Count	Sum	Average	Variance
Column 1	20	337	16.850	108.450
Column 2	20	44	2.200	12.905
Column 3	20	58	2.900	5.358

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Between Groups	2731.433	2	1365.717	32.334	4.12 ⁻¹⁰	3.159
Within Groups	2407.550	57	42.238			
Total	5138.983	59				

F (32.334) >> 3.159 ; there is a seven-fold reduction in varroa mites in the alcohol washes.

Ten control hives were treated with 90ml of water + 15ml HBH-LG, 3:30pm, 2 Jan, 2007.

Samples were taken just before treatment on 2 Jan 07, on the day after treatment on 3 Jan 07, and a week later on 10 Jan 07.

	<u>2Jan</u>	<u>3 Jan</u>	<u>10 Jan</u>
C1	31	24	38
C2	17	11	7
C3	40	54	48
C4	34	28	34
C5	32	27	18
C6	4	12	8
C7	20	13	17
C8	29	32	37
C9	18	19	20
C10	25	38	20
Avg	25.00	25.80	24.70
Sum	250	258	247

**Descriptive Statistics of the results of the alcohol washes,
Formic Acid Control Hives, 2-10 Jan, 2007.**

Mean	25.000	25.800	24.700
Standard Error	3.310	4.232	4.344
Median	27.000	25.500	20
Mode	NA	NA	20
Standard Deviation	10.467	13.382	13.736
Variance	109.556	179.067	188.678
Kurtosis	0.438	0.897	-1.036
Skewness	-0.668	0.939	0.348
Range	36	43	41
Minimum	4	11	7
Maximum	40	54	48
Sum	250	258	247
Count	10	10	10
Confidence Level (0.95)	6.4873	8.2938	8.5135

Analysis of Variance:One Way

Summary

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	10	250	25	109.556
Column 2	10	258	25.8	179.067
Column 3	10	247	24.7	188.678

Analysis of Variance

Source of Variation

	SS	df	MS	F	P-value	F-crit
Betw Groups	6.467	2	3.233	0.02032	0.9798974	3.3541
<u>Within Groups</u>	<u>4295.7</u>	<u>27</u>	<u>159.1</u>			
Total	4302.167	29				

3.35 > F; There are no differences between the three treatments.

