



Laboratory evaluation of Green Blaster against nuisance mosquitoes

Center for Urban and Industrial Pest Management
Department of Entomology
Purdue University

Objective:

- (1) to evaluate the toxicity of Green Blaster Mosquito Blast against three species of nuisance mosquito in laboratory experiments.

Materials and Methods:

Fifteen adult, mixed-sex mosquitoes were placed inside a round plastic dish (1.5 cm high by 9 cm diameter). A piece of filter paper (Whatman #2; 7 cm diameter) was placed in each dish to absorb any excess spray material. The mosquitoes were directly exposed to the insecticide spray. They were sprayed topically using a fine mister (atomizer). Four pumps from the atomizer were delivered for each dish so that all the mosquitoes were uniformly coated with the spray solution. Each pump from the atomizer delivers 130 uL of liquid. Therefore, a total of 520 uL of test material was applied to each dish. This is equivalent to 1 gallon of solution per 500 square feet. The efficacy of two treatments was evaluated: (1) Green Blaster Mosquito Blast Super Concentrated Professional Formula (Product A), (2) Green Blaster Mosquito Blast Super Concentrated Professional Mosquito & Tick Formula (Product B). The mosquitoes were observed continuously until all mosquitoes died and mortality was recorded at 5, 10, and 15 seconds. The mosquitoes were checked again at 24 h to assure that there was no recovery. Each product was evaluated on three species of nuisance mosquitoes: (1) yellow fever mosquitoes (*Aedes aegypti*), southern house mosquitoes (*Culex quinquefasciatus*), and anopheles mosquitoes (*Anopheles quadrimaculatus*). Four replications were performed for each species. All tests were performed in the Urban Entomology Laboratory at Purdue University. The environmental conditions in the laboratory were $25 \pm 2^{\circ}\text{C}$, $60 \pm 10\%$ RH, and 14:10 L:D cycle.

Results:

The results are presented in Tables 1 and 2 below. The results demonstrate that direct spray applications of Green Blaster Mosquito Blast are highly effective at killing mosquitoes in petri dish assays performed under laboratory conditions. Both products were highly effective and killed 100% of all mosquitos within 15 seconds. No difference was detected between product A and product B. All three mosquito species experienced immediate knockdown with both products and 100% mortality was achieved in all mosquito species within 15 seconds. The southern house mosquito (*Culex quinquefasciatus*) was the most susceptible and both products killed all individuals in 5 seconds. Mortality in the other two species was slightly slower, but all mosquitoes died within 15 seconds. Overall, results demonstrate that direct spray applications of Green Blaster Mosquito Blast are highly effective at killing adult mosquitoes under laboratory conditions. However, the efficacy of Green Blaster Mosquito Blast should be further tested to determine its actual use effectiveness. Specifically, testing should be performed to evaluate the residual efficacy of Green Blaster when applied to various surfaces, including fabrics and building materials.

Table 1. Mean cumulative percent mortality (± st dev) in mosquitoes treated with direct spray applications of Green Blaster Mosquito Blast.

Product	Species	5 sec	10 sec	15 sec
A	<i>Aedes aegypti</i>	87 ± 17	96 ± 6	100 ± 0
B	<i>Aedes aegypti</i>	89 ± 15	97 ± 6	100 ± 0
A	<i>Culex quinquefasciatus</i>	100 ± 0	100 ± 0	100 ± 0
B	<i>Culex quinquefasciatus</i>	100 ± 0	100 ± 0	100 ± 0
A	<i>Anopheles quadrimaculatus</i>	79 ± 16	96 ± 6	100 ± 0
B	<i>Anopheles quadrimaculatus</i>	85 ± 14	97 ± 6	100 ± 0

Table 2. Raw data showing mortality in mosquitoes treated with direct spray applications of Green Blaster Mosquito Blast.

Product A: Mosquito Blast Super Concentrated Professional Formula

Product B: Mosquito Blast Super Concentrated Professional Mosquito & Tick Formula

product	species	rep	cumulative mortality			cumulative percent mortality		
			5 sec	10 sec	15 sec	5 sec	10 sec	15 sec
A	<i>Aedes aegypti</i>	1	15	15	15	100	100	100
A	<i>Aedes aegypti</i>	2	14	15	15	93	100	100
A	<i>Aedes aegypti</i>	3	9	12	15	60	80	100
A	<i>Aedes aegypti</i>	4	15	15	15	100	100	100
A	<i>Aedes aegypti</i>	5	12	15	15	80	100	100
		ave	13.0	14.4	15.0	87	96	100
		stdev	2.5	1.3	0.0	17	9	0
B	<i>Aedes aegypti</i>	1	12	15	15	80	100	100
B	<i>Aedes aegypti</i>	2	15	15	15	100	100	100
B	<i>Aedes aegypti</i>	3	10	13	15	67	87	100
B	<i>Aedes aegypti</i>	4	15	15	15	100	100	100
B	<i>Aedes aegypti</i>	5	15	15	15	100	100	100
		ave	13.4	14.6	15.0	89	97	100
		stdev	2.3	0.9	0.0	15	6	0
A	<i>Culex quinquefasciatus</i>	1	15	15	15	100	100	100
A	<i>Culex quinquefasciatus</i>	2	15	15	15	100	100	100
A	<i>Culex quinquefasciatus</i>	3	15	15	15	100	100	100
A	<i>Culex quinquefasciatus</i>	4	15	15	15	100	100	100
A	<i>Culex quinquefasciatus</i>	5	15	15	15	100	100	100
		ave	15.0	15.0	15.0	100	100	100

stdev 0.0 0.0 0.0 0 0 0

B	Culex quinquefasciatus	1	15	15	15
B	Culex quinquefasciatus	2	15	15	15
B	Culex quinquefasciatus	3	15	15	15
B	Culex quinquefasciatus	4	15	15	15
B	Culex quinquefasciatus	5	15	15	15
		ave	15.0	15.0	15.0
		stdev	0.0	0.0	0.0

100	100	100
100	100	100
100	100	100
100	100	100
100	100	100

100 100 100
0 0 0

A	Anopheles quadrimaculatus	1	9	13	15
A	Anopheles quadrimaculatus	2	12	15	15
A	Anopheles quadrimaculatus	3	10	14	15
A	Anopheles quadrimaculatus	4	13	15	15
A	Anopheles quadrimaculatus	5	15	15	15
		ave	11.8	14.4	15.0
		stdev	2.4	0.9	0.0

60	87	100
80	100	100
67	93	100
87	100	100
100	100	100

79 96 100
16 6 0

B	Anopheles quadrimaculatus	1	15	15	15
B	Anopheles quadrimaculatus	2	12	15	15
B	Anopheles quadrimaculatus	3	10	13	15
B	Anopheles quadrimaculatus	4	15	15	15
B	Anopheles quadrimaculatus	5	12	15	15
		ave	12.8	14.6	15.0
		stdev	2.2	0.9	0.0

100	100	100
80	100	100
67	87	100
100	100	100
80	100	100

85 97 100
14 6 0

