Supplemental Material

Supplemental Material Table 1. Composition of mixture doses.

Pyrethroid	Composition of mixture doses										
	Percent stock	1	4	10	20	30	33	40	50	66	100
Esfenvalerate		0.004	0.016	0.040	0.080	0.120	0.132	0.16	0.20	0.26	0.40
λ-Cyhalothrin		0.004	0.018	0.044	0.088	0.132	0.145	0.18	0.22	0.29	0.44
β-Cyfluthrin		0.007	0.030	0.074	0.148	0.222	0.244	0.30	0.37	0.49	0.74
Tefluthrin		0.008	0.030	0.075	0.150	0.225	0.248	0.30	0.38	0.50	0.75
Deltamethrin		0.008	0.034	0.084	0.168	0.252	0.277	0.34	0.42	0.55	0.84
Bifenthrin		0.011	0.043	0.107	0.214	0.321	0.353	0.43	0.54	0.71	1.07
Fenpropathrin		0.026	0.103	0.257	0.514	0.771	0.848	1.03	1.29	1.70	2.57
Cypermethrin		0.036	0.143	0.357	0.714	1.071	1.178	1.43	1.79	2.36	3.57
Permethrin		0.142	0.568	1.420	2.840	4.260	4.686	5.68	7.10	9.37	14.20
s-Bioallethrin		0.302	1.208	3.020	6.040	9.060	9.966	12.08	15.10	19.93	30.20
Resmethrin		0.976	3.904	9.760	19.520	29.280	32.208	39.04	48.80	64.42	97.60
	Total Mass (mg)	1.52	6.08	15.2	30.4	45.6	50.16	60.8	76	100.32	152

Supplemental Material Table 2. Summary statistics the individual chemical dose response determinations and the two mixture dosing protocols.

Chemical	Dose (mg/kg)	Average Total Activity (%control)	STD Total Activity (%control)	Sample Size
β-Cyfluthrin	0	100.00	13.60	12
β-Cyfluthrin	0.05	87.18	13.94	12
β-Cyfluthrin	0.1	84.27	20.84	8
β-Cyfluthrin	0.5	91.42	13.53	12
β-Cyfluthrin	2.5	75.98	20.11	11
β-Cyfluthrin	5	52.29	13.93	13
β-Cyfluthrin	7.5	36.15	17.45	12
β-Cyfluthrin	10	28.88	18.55	12
β-Cyfluthrin	15	9.88	4.50	4
Bifenthrin	0	100.00	19.29	12
Bifenthrin	0.03	99.16	20.85	8
Bifenthrin	0.1	93.33	19.24	12
Bifenthrin	1	92.59	18.93	12
Bifenthrin	4	79.24	20.47	10
Bifenthrin	8	36.50	22.42	8
Bifenthrin	12	35.92	27.98	12
Bifenthrin	16	32.28	21.41	8
Bifenthrin	24	28.39	15.71	8
s-Bioallethrin	0	100.00	21.93	8
s-Bioallethrin	0.5	101.19	12.23	8
s-Bioallethrin	5	101.23	18.05	8
s-Bioallethrin	25	89.42	14.30	8
s-Bioallethrin	75	88.34	15.23	8
s-Bioallethrin	100	77.76	23.99	8
s-Bioallethrin	125	60.74	23.12	8
s-Bioallethrin	150	60.57	27.77	8

Chemical	Dose (mg/kg)	Average Total Activity (%control)	STD Total Activity (%control)	Sample Size
Cypermethrin	0	100.00	23.33	8
Cypermethrin	0.1	94.45	27.00	8
Cypermethrin	0.5	97.53	19.09	8
Cypermethrin	1	101.75	21.34	8
Cypermethrin	10	83.40	16.95	8
Cypermethrin	40	33.34	19.39	8
Cypermethrin	120	25.05	11.88	8
Deltamethrin	0	100.00	20.05	8
Deltamethrin	0.03	88.79	29.16	8
Deltamethrin	0.1	97.93	13.70	8
Deltamethrin	0.3	90.19	26.88	8
Deltamethrin	1	98.23	22.99	8
Deltamethrin	3	71.76	24.30	8
Deltamethrin	10	34.71	18.30	7
Esfenvalerate	0	100.00	27.93	8
Esfenvalerate	0.03	88.67	22.78	8
Esfenvalerate	0.1	84.92	27.20	8
Esfenvalerate	0.3	86.87	22.58	8
Esfenvalerate	1	74.45	12.46	8
Esfenvalerate	3	50.03	27.69	8
Esfenvalerate	10	30.30	19.29	8
Fenpropathrin	0	100.00	12.64	12
Fenpropathrin	0.01	84.31	19.34	8
Fenpropathrin	0.1	102.71	18.92	12
Fenpropathrin	1	89.78	16.50	12
Fenpropathrin	4	105.20	15.66	8
Fenpropathrin	8	73.22	19.68	11
Fenpropathrin	12	72.03	15.82	12
Fenpropathrin	16	44.30	19.19	12
λ-Cyhalothrin	0	100.00	16.92	18

Chemical	Dose (mg/kg)	Average Total Activity (%control)	STD Total Activity (%control)	Sample Size
λ-Cyhalothrin	0.015	89.53	22.17	16
λ-Cyhalothrin	0.05	103.16	23.26	12
λ-Cyhalothrin	0.15	87.06	29.95	16
λ-Cyhalothrin	0.5	95.33	28.30	12
λ-Cyhalothrin	1.25	72.63	20.49	8
λ-Cyhalothrin	2.5	51.67	20.35	6
λ-Cyhalothrin	3.75	41.39	17.59	8
λ-Cyhalothrin	5	40.76	16.14	12
λ-Cyhalothrin	15	25.62	15.06	11
Permethrin	0	100.00	16.97	12
Permethrin	0.1	89.65	25.86	8
Permethrin	1	88.70	17.27	8
Permethrin	40	92.13	14.73	8
Permethrin	60	63.64	25.13	12
Permethrin	80	61.48	28.74	12
Permethrin	100	53.91	21.56	12
Permethrin	120	34.55	23.89	12
Permethrin	160	29.80	17.81	8
Resmethrin	0	100.00	16.11	12
Resmethrin	0.5	98.78	34.35	8
Resmethrin	2	96.89	21.30	12
Resmethrin	20	97.55	25.96	12
Resmethrin	100	107.89	19.69	4
Resmethrin	150	78.95	12.48	8
Resmethrin	200	78.05	32.71	8
Resmethrin	300	63.03	27.02	8
Resmethrin	400	70.90	21.91	4
Resmethrin	450	57.15	17.32	7
Resmethrin	650	59.74	24.02	8
Resmethrin	900	64.51	44.65	4

Chemical	Dose (mg/kg)	Average Total Activity (%control)	STD Total Activity (%control)	Sample Size
Tefluthrin	0	100.00	22.69	8
Tefluthrin	0.01	95.64	17.65	8
Tefluthrin	0.1	88.01	10.84	8
Tefluthrin	1	100.06	18.65	8
Tefluthrin	3	84.67	14.63	8
Tefluthrin	4.5	62.43	20.99	4
Tefluthrin	6	41.21	35.76	8
Tefluthrin	9	20.38	14.29	8
1st mixture	0	100.00	18.19	12
1st mixture	1.5238	99.16	23.73	11
1st mixture	6.0952	111.93	24.72	12
1st mixture	15.238	90.61	29.61	12
1st mixture	50.2854	75.32	19.89	12
1st mixture	76.19	53.84	21.31	12
1st mixture	100.5708	44.92	15.37	12
1st mixture	152.38	39.75	20.29	12
2nd mixture (sequential exposure)	0	100.00	20.34	12
2nd mixture	1.5238	100.68	29.16	11
(sequential exposure)	6.0952	101.68	26.44	12
2nd mixture	30.476	77.94	29.94	11
(sequential exposure)	45.714	67.67	18.92	12
2nd mixture	60.952	57.47	28.09	12
(sequential exposure)	76.19	42.28	20.76	11
2nd mixture	152.38	43.52	26.19	12

Supplemental Material Table 3. Group mean statistics for the two mixture dose studies.

Exposure Protocol	Mixture Dose (mg/kg)[1]	Motor Activity (% control)	Standard Deviation	N
Simultaneous	0	100.00	18.19	12
	1.52	99.16	23.73	11
	6.10	111.93	24.72	12
	15.24	90.61	29.61	12
	50.29	75.32	19.89	12
	76.19	53.84	21.31	12
	100.57	44.92	15.37	12
	152.38	39.75	20.29	12
Sequential	0	100.00	20.34	12
	1.52	100.68	29.16	11
	6.10	101.68	26.44	12
	30.48	77.94	29.94	11
	45.71	67.67	18.92	12
	60.95	57.47	28.09	12
	76.19	42.28	20.76	11
	152.38	43.52	26.19	12

1 – Dose in mg of total pyrethroids per kg body weight.

Exposure protocols

- Simultaneous = All eleven pyrethroid compounds co-administered at once before testing.
- Sequential = Exposure carried out at three administration times. Each pyrethroid administered at one of these times. For each pyrethroid, administration time was selected based on its TOPE as estimated from single-compound assays.