Appendix K
Incident Information from the EIIS Database

Table K.1 Ecological Incidents Associated with *Lambda*-Cyhalothrin

Incident Number (Source)	Taxa Involved	Magnitude	Year	Location	Use	Legality of Use	Certainty Category	Residues	Other Chemicals Involved
I015186-003 (EIIS)	Crayfish	Unknown	2004	TX	Cotton	Registered use	Highly probable	Not available	No
I000922-001 (EIIS)	Catfish, Bream, Large mouth bass	250 (catfish) Hundreds (bream) Many (bass)	1991	GA	Cotton	Registered use	Possible	Not available	Dicrotophos
I003826-029 (EIIS)	Bass	200	1994	NC	Cotton	Registered use	Possible	Sampled, but none were found	No
I005805-003 (EIIS)	No report	No report	1997	IN	No report	Undetermined	Possible	Not available	Tefluthrin
I009314-007 (EIIS)	No report	No report	1997	IN	No report	Undetermined	Possible	Not available	Tefluthrin
I014597-027 (EIIS)	Cotton	78 acres	2003	IA	Cotton	Registered use	Possible	Not available	No
I014597-047	Tobacco	200 acres	2003	KY	Tobacco	Misuse	Possible	Not available	No

(EIIS)									
I016036-006 (EIIS)	Basil	No report	2004	CA	Almonds	Registered use	Possible	0.07-0.27 ppm	Bifenazate
I023107-019 (EIIS)	Bee	92 hives	2011	CA	Nut, pistachio	Undetermined	Possible	Not available	Dimethoate, Methoxyfenozide
I024118-001 (EIIS)	Bee	22 hives	2012	NY	Agricultural area	Undetermined	Possible	Awaiting results	No
I000921-001 (EIIS)	Unknown fish	No report	1991	GA	Cotton	Registered use	Probable	Not available	No
I007650-001 (EIIS)	Crayfish	No report	1998	LA	Pond	Intentional misuse	Probable	0.04-0.93 ppb (water)	No
I007176-001 (EIIS)	Crayfish	90-100 acres	1998	LA	Corn	Registered use	Probable	Not available	No
I007462-001 (EIIS)	Unknown fish	16	1998	MO	Building	Accidental misuse	Probable	Sampled but none were found	Chloropyrifos
I022774-008 (EIIS)	Bee	No report	2010	Canada	Canola/ rapeseed	Misuse	Probable	Not available	No
I024129-001 (EIIS)	Bee	Thousands	2012	NY	Wheat	Undetermined	Probable	Not available	No
I016036-024 (EIIS)	Lettuce	53 acres	2004	CA	Lettuce	Registered use	Unlikely	Sampled but only tribufos found	Tribufos, Diuron, Thidiazuron

Table K.2 Summary of Ecological Incidents Associated with *Lambda*-Cyhalothrin - IDS

	All	Minor Fish and Wildlife	Minor Plant	Other Non-Target
Lambda-cyhalothrin	41	12	26	3
Cyhalothrin	63	10	51	2

The incident data support the idea that *lambda*-cyhalothrin presents risks to freshwater fish and invertebrates; these results can be extended to estuarine/marine fish and invertebrates. The EIIS database provides the most information about individual incidents. Of the seven aquatic incidents, two are not considered further because they were accidental or intentional misuses of the product and deemed reflective of normal use patterns. Two crayfish and three fish incidents remain. In particular, one of the crayfish incidents was categorized as "highly probable," meaning that the only line of evidence missing was *lambda*-cyhalothrin residues in the water. Samples were not taken, so it is unknown if they would have come back positive. The incident involving catfish, bream, and large mouth bass also documented the recent use of dicrotophos, another insecticide. Likewise, the other bass incident documented taking samples for *lambda*-cyhalothrin, but no residues were found in the water. However, the other two incidents (one crayfish and one fish) do not have any of these confounding factors. A total of 22 minor fish and wildlife incidents were reported in the IDS, but incident details are not available (including how many were "fish" incidents). Given that *lambda*-cyhalothrin is known to be very highly toxic to aquatic fish and invertebrates, these incidents generally support the conclusion that its use may cause adverse effects to non-target species.

The incident data suggest that there are probably not adverse effects of *lambda*-cyhalothrin on non-target plants. The EIIS database reported four plant incidents; of these one (tobacco) was identified as a misuse of the product and will not be considered in this analysis. Another (lettuce) was classified as "unlikely" to have caused the damage and will also not be considered. The other two incidents involved cotton, and basil. In the basil incident, another acaricide – bifenazate – was recorded as being applied as well. Thus, the plant damage may be attributed to bifenazate or *lambda*-cyhalothrin; the incident was classified as "possible" because of the ambiguity of the cause of damage. The cotton incident involved the application of *lambda*-cyhalothrin to cotton fields, which is a current registered use; there was no indication that rates were above the label rates. The incident is classified as "possible" rather than

"probable" because there is not enough direct evidence to link the damage to *lambda*-cyhalothrin. Data from the IDS report a total of 77 minor plant incidents; however further details on these incidents are not available and it is not possible to explore their validity. Given that the detailed plant incident reports do not offer strong evidence that *lambda*-cyhalothrin causes adverse effects to plants and that the aggregate incidents from the IDS lack details for an in-depth analysis, it is concluded that *lambda*-cyhalothrin probably does not adversely affect non-target species at the registered application rates.

The incident data suggest that *lambda*-cyhalothrin is toxic to honeybees. The EIIS database contained information on four honeybee incidents. One of these was labeled as a misuse (application occurred during bee foraging) and will not be considered further in this analysis. Of the remaining three, one occurred in conjunction with dimethoate and methoxyfenozide – both insecticides. These chemicals were sprayed on adjacent nut and pistachio orchards; it is uncertain if *lambda*-cyhalothrin or one of the other chemicals (or a combination) was responsible for the mortality and population loss of 92 hives. The other two bee incidents occurred in 2012 in New York and are still undergoing investigation. Each involved the application of only *lambda*-cyhalothrin and samples were collected from dead or dying bees. Thousands of bees were affected in one incident whereas 22 hives was affected in the other. The IDS reports five "other non-target" incidents. These may or may not be attributed to bees/insects; additional information is lacking. Overall, given that *lambda*-cyhalothrin is an insecticide, the incidents reported in the database are not unexpected and suggest *lambda*-cyhalothrin use may adversely affect non-target insects.