# Appendix E
# Incident Database Information

## E.1 Discussion of Incidences Associated with Imazapyr

FIFRA 6(a)(2) incident data add lines of evidence to provide evidence that the risk predictions from the screening level assessment are substantiated with actual effects in the field. Twelve incidents resulting from imazapyr and its isopropylamine salt use have been recorded in the Ecological Incident Information System (EIIS) as of February 22, 2007. Incidents reported include possible impacts to terrestrial and aquatic plants, fish and birds. The majority of reported incidents are damage to terrestrial plants, especially food crops as a result of exposure following application of formulations containing imazapyr and other active pesticide ingredients.

### a. Incidents Involving Aquatic Organisms

One incident was reported in which a mixed herbicidal spray, containing a mixture of the isopropylamine salt of imazapyr, diuron and metsulfuron methyl was sprayed onto a fence row and either drifted or ran-off into a pond 60 feet away and caused a fish and algae kill (species unknown). The certainty index is rated possible and the legality is undetermined. It cannot be definitively determined whether or not the fish and algae kill was due to exposure to imazapyr.

A second incident was reported which involved a goldfish kill. There was suspected runoff of drift into the pond following an aerial application of an imazapyr formulation to a nearby 145 acres. The NCDA could not determine the cause of the kill.

### b. Incidents Involving Terrestrial Organisms

#### (1) Animals

The same fencerow incident as listed in the aquatic organism section drifted onto adjacent birdnest boxes and caused a bird kill of nestling and mature birds located from 2-85 feet from the application site. Thirty-two bluebirds, 5 Carolina chickadees and 35 unknown birds were affected. Again, this was a mixture of herbicides. The certainty index is rated possible and the legality is undetermined. It cannot be definitively determined whether or not the bird kill was due to exposure to imazapyr.

### (2) Plants

An incident was reported which involved the spraying of a mixture of glyphosate, the isopropylamine salt of imazapyr and metsulfuron methyl to a right-of-way at a distance of approximately 150 yards from watermelon and cantaloupe crops, and 1/4 of a mile to tomato crops. There was damage to the crops. It cannot be definitively determined whether or not the damage to the crops was due to imazapyr alone since glyphosate and metsulfuron methyl are also herbicides.

In a second incident, there was damage to 3 oak trees, some grape vines and 1.5 acres of beans as a result of spray drift from an application of a formulation containing the isopropylamine salt of imazapyr approximately 150 - 200 feet away. It is probable that this incident was due to exposure to imazapyr.

Nine incidents of damages to plants were reported following application of imazapyr formulations. Several dead or dying cherry and pear trees were reported following root uptake of residual imazapyr applied to an irrigation canal. Low yield in a 120 acre corn crop occurred following application of two herbicidal formulations, one of which contained imazapyr. The certainty index classified these as possibly related to imazapyr exposure. Damage was sustained by winter wheat from carryover of imazapyr which had been applied to peas the previous Spring. Three oaks were injured following a runoff event from an adjacent plant site. The certainty index classified these as probably related to the presence of imazapyr. There was a possible connection to imazapyr to the loss of loblolly pine seedlings in one area. Other pesticides may have been involved as well: glyphosate and hexazinone. Finally, willow and spruce were killed following application of imazapyr to a driveway surface. No other information was provided. The certainty index classified this event as probably related to exposure to imazapyr.

**Table E-1. Incident Reports Involving Imazapyr (04/20/1995 - 03/01/2004)**

| Location and Log # | Organism Involved | Product | Contact with Product/Symptoms |
|---|---|---|---|
| Driveway CO 1006019-001 | Willow and Spruce | Imazapyr | Driveway surface application/Mortality |
| Chelan County WA 1014406-001 | Cherry and pear trees | Imazapyr | Applied in irrigation canal/Several dead or dying cherry and pear tress. |
| Dubuque County IA 1008079-001 | Corn crop | Mixture of Hornet (unknown pesticide) and Lightning (imazapyr) | Post-emergent application/low yield and death |
| Whitman County/ Washington State 1014407-017 | Winter wheat | Imazapyr | Carryover residues from application to peas the previous Spring/damage. Complication assigning causes to the case concerned detection limits for imazapyr. |

**Table E-1. Incident Reports Involving Imazapyr (04/20/1995 - 03/01/2004)**

| Location and Log # | Organism Involved | Product | Contact with Product/Symptoms |
|---|---|---|---|
| Texas 1005972-001 | Live oaks | Imazapyr | Application to neighbor's property/injury to 3 live oaks. |
| Cass County, Texas 1015265-001 | Loblolly pine seedlings | Hexazinone, glyphosate, imazapyr | Hexazinone in soil samples, Onestep (glyphosate and imazapyr) used in site preparation for planting of seedlings/mortality |
| Halifax County, NC 1003826-008 | Goldfish | Arsenal (imazapyr) | Aerially applied to nearby 145 acre area followed by rain 12 days later/mortality. No residues found in area. Cause of mortality not determined. |
| **Incident Reports Involving the Isopropylamine Salt of Imazapyr (05/26/1999 - 06/04/2004)** | | | |
| Aiken County, SC 1000022-001 | Birds and Fish | Arsenal (imazapyr) Karmex (Diuron) Escort (Metsulfuron methyl) | Spray on fence row drifted onto adjacent birdnest boxes located from 2-85 feet of application site; runoff into a pond 60 foot away/bird kill of nesting and mature birds and fish and algae kill in pond. |
| AR 1015280-001 | Tomatoes, Cantaloupes Water-melons | Krenite Arsenal Escort Glyphos (glyphosate, imazapyr, metsulfuron methyl) | Krenite/Arsenal/Escort mixture applied to transmission right-of-way (150 yards to 1/4 mile distance). Glyphos applied to pond levee 30-40 feet from watermelon and cantaloupe fields./Severe curling of oldest leaves on tomato plants with interveinal chlorosis. Mature tomatoes rotted from stem side. Watermelon and cantaloupes aborted blooms and fruit. Pattern of glyphosate drift could be seen across field. No residues of any of applied pesticides found in plant tissues. |
| Washington County Florida 1013550-007 | Beans Oak Trees Grape vines | Garlon 4 Chopper | Spraying to a forest site 150-200 feet away/beans exhibited chlorosis and cupping; grapes were chlorotic, and some oak leaves turned brown. |

## E.2 Uncertainties Related to the Use of Incident Information from the Ecological Incident Information System

Incident data are used in risk assessments to provide evidence that the risk predictions from the screening level assessment are supported by actual effects in the field. Incident reports submitted to EPA since approximately 1994 have been tracked by assignment of incident numbers in an Incident Data System (IDS), microfiched, and then entered to a second database, the Ecological Incident Information System (EIIS). Additionally, there is an on-going effort to enter information to EIIS on incident reports received prior to establishment of current databases. Incident reports are not received in a consistent format (*e.g.*, states and various labs usually have their own formats), may involve multiple incidents involving multiple chemicals in one report, and may report on only part of a given incident investigation (*e.g.*, residues).

Incidents entered into EIIS are categorized into one of several certainty levels regarding the likelihood that a particular pesticide is associated with the incident: highly probable, probable, possible, unlikely, or unrelated. In brief, "highly probable" incidents usually require carcass residues and/or clear circumstances regarding the exposure. "Probable" incidents include those where residues were not available and/or circumstances were less clear than for "highly probable." "Possible" incidents include those where multiple chemicals may have been involved and it is not clear what the contribution was of a given chemical. The "unlikely" category is used, for example, where a given chemical is practically nontoxic to the category of organism killed and/or the chemical was tested for but not detected in samples. "Unrelated" incidents are those that have been confirmed to be not pesticide-related.

The National Pesticide Information Center (NPIC) prepares summaries of information provided by individuals who have contacted NPIC for information or to report a pesticide incident. None of this information has been verified or substantiated by independent investigations of NPIC staff, laboratory analysis, or any other means. Thus, if a person alleges/reports a pesticide incident, it will likely be recorded as an incident by NPIC.

Incidents entered into the EIIS are also categorized as to use/misuse. Unless specifically confirmed by a state or federal agency to be misuse, or there was very clear misuse such as intentional baiting to kill wildlife, incidents are not typically considered misuse.

The number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides. Mortality incidents must be seen, reported, investigated, and have investigation reports submitted to EPA to have the potential for entry into the database. Incidents often are not seen, due to scavenger removal of carcasses, decay in the field, or simply because carcasses may be hard to see on many sites and/or few people are systematically looking. Poisoned animals may also move off-site to less conspicuous areas before dying. Incidents may not get reported to appropriate authorities capable of investigating the incident for a variety of reasons including the finder may not know of the importance of reporting incidents, may not know who to call, may not feel they have the time or desire to call, or may hesitate to call because of their own involvement in the kill. Incidents reported may not get investigated if resources are limited or may not get investigated thoroughly, with residue analyses, for example. Also, if kills are not reported and investigated promptly, there will be little chance of documenting the cause, since tissues and residues may deteriorate quickly. Reports of investigated incidents often do not get submitted to EPA, since reporting by states is voluntary.

Furthermore, the database relies heavily on registrant-submitted incident reports, and registrants are currently only required to submit detailed information on 'major' ecological incidents, while 'minor' incidents are reported aggregately.

Based on the 40 CFR (§159.184 Toxic or adverse effect incident reports), an ecological incident is considered 'major' if any of the following criteria are met:

*Fish or wildlife:*

(A) Involves any incident caused by a pesticide currently in Formal Review for ecological concerns.

(B) Fish: Affected 1,000 or more individuals of a schooling species or 50 or more individuals of a non-schooling species.

(C) Birds: Affected 200 or more individuals of a flocking species, or 50 or more individuals of a songbird species, or 5 or more individuals of a predatory species.

(D) Mammals, reptiles, amphibians: Affected 50 or more individuals of a relatively common or herding species or 5 or more individuals of a rare or solitary species.

(E) Involves effects to, or illegal pesticide treatment (misuse) of a substantial tract of habitat (greater than or equal to 10 acres, terrestrial or aquatic).

*Plants*:

(A) The effect is alleged to have occurred on more than 45 percent of the acreage exposed to the pesticide.

All other ecological incidents are considered 'minor' and only need to be aggregately reported. 'Minor' incidents reported by the registrants are not included in the EIIS database. Therefore, for example, an incident could affect 900 fish, 150 birds, 45 mammals, and 40% of an exposed crop and not be included in the EIIS database [unless is it reported by a non-registrant (*e.g.*, an incident submitted by a state agency – which are not systematically collected)]. Therefore, because the number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides, absence of reports does not necessarily provide evidence of an absence of incidents.