Summary of Health-Related Pesticide Incidents Reported in Louisiana, 2007

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INTRODUCTION:

The Office of Public Health's Section of Environmental Epidemiology and Toxicology's (OPH/SEET) Pesticide Program and the Louisiana Department of Agriculture and Forestry's (LDAF) Pesticide and Environmental Programs jointly investigate all Health-Related Pesticide Incident Reports (HRPIRs). Louisiana has been investigating health-related pesticide complaints since 1991 when LDAF and OPH/SEET entered into an interagency agreement. The interagency agreement recognizes the participation and cooperation of both Agencies needed in order to handle health complaints involving possible pesticide exposure. These joint investigations involve the collection and review of environmental and health data relevant to the reported pesticide exposure incident. LDAF determines if a pesticide misapplication has occurred, and OPH/SEET evaluates the health effects associated with a reported pesticide exposure.

Most HRPIRs are initiated when LDAF receives a complaint of adverse health effects possibly associated with pesticide exposure. In November 2002, OPH/SEET began receiving case reports from the Louisiana Poison Control Center (PCC) for calls involving exposure to pesticides. These calls are reviewed by the OPH/SEET and, in some cases, are forwarded to LDAF for investigation. Calls forwarded to LDAF for investigation are based on criteria that consider the location of exposure, pesticide toxicity, and circumstance of exposure. OPH/SEET also forwards calls from their Indoor Air and Hazardous Substances Emergency Events Surveillance (HSEES) programs to LDAF if they involve a pesticide exposure. HSEES events are obtained from the Louisiana Department of Environmental Quality (DEQ) and state police reports.

Information collected by LDAF and/or OPH/SEET includes demographic data, circumstance and route of exposure, pesticide product information, type of application, location of pesticide application, medical signs and symptoms, biological and environmental monitoring information (e.g., results of cholinesterase and swab samples), severity of health effects and healthcare utilization. This information is obtained from a variety of sources: LDAF inspector reports, environmental samples, medical records, pesticide product labels and MSDSs, and complainant interviews. The collected data are entered into a database maintained by OPH/SEET. The database, data coding guides, and case classification and severity criteria were developed by the National Institute for Occupational Safety and Health and are used by most states that have a pesticide surveillance program.

This report presents summary information on HRPIRs for 2007. Referrals of PCC, Indoor Air, and HSEES calls are included in the report if they resulted in an HRPIR. It is important to note that OPH/SEET annually receives hundreds of PCC pesticide exposure calls that are not included in this report because they did not trigger a HRPIR.

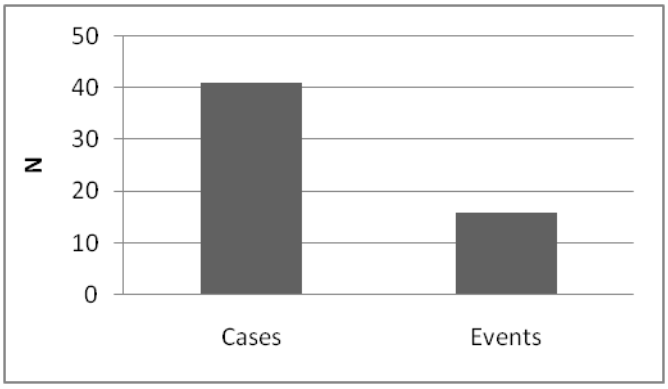
CASES & EVENTS:

Throughout this report, an event is defined as a reported health-related pesticide incident affecting at least one person. Each individual affected by a single health-related pesticide incident is considered a *case*. Therefore, many cases may be included in one event. The health effects associated with a reported health-related pesticide incident are evaluated individually by case.

Table 1: Cases and Events, 2007.

	N
Cases	41
Events	16

Figure 1: Cases and Events, 2007.



Source of Complaint

Source of complaint refers to the agency that initially received the reported health-related pesticide incident. "PCC" refers to Poison Control Center calls, and "Other Agency" refers to OPH/SEET's Indoor Air or Hazardous Substances Emergency Events Surveillance (HSEES) program. Sometimes, the PCC and LDAF both receive complaints regarding the same incident. These are designated as "PCC and LDAF" and are not included in the number of cases reported to a single source.

Table 2: Source of Complaint by Cases and Events, 2007.

Cases	**N**
Source	**41**
LDAF	37
PCC and LDAF	4
PCC	0
Other Agency	0

Events	**N**
Source	**16**
LDAF	14
PCC and LDAF	2
PCC	0
Other Agency	0

Figure 2: Source of Complaint by Cases, 2007.

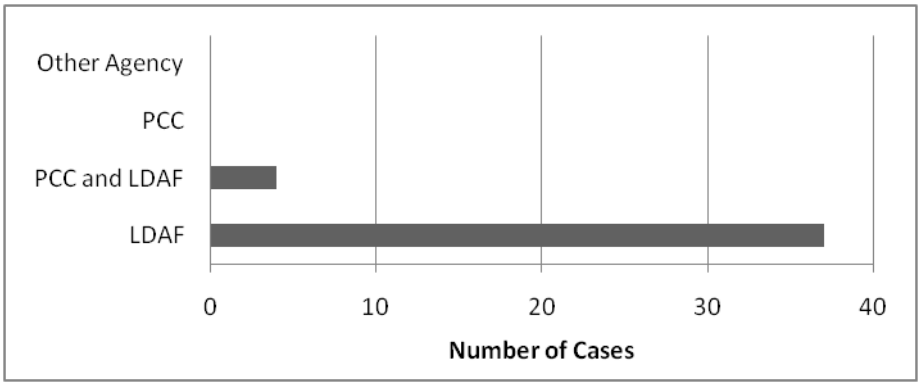
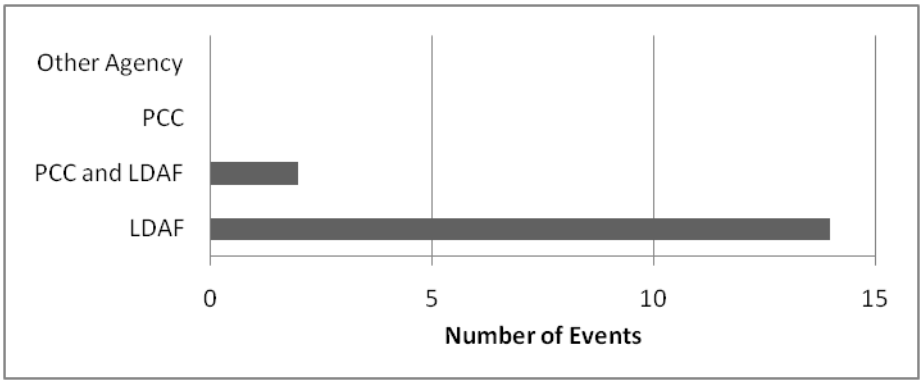


Figure 3: Source of Complaint by Events, 2007.



Cases & Events by Parish

The following table lists the total number of cases and events by parish.

Table 3: Cases & Events by Parish, 2007

Parish Name	Cases	Events
Bossier	1	1
Concordia	1	1
East Baton Rouge	1	1
Franklin	3	1
Iberia	21	1
Jefferson Davis	1	1
Lafayette	2	2
Lafourche	3	2
Madison	1	1
Pointe Coupee	3	1
St. Mary	1	1
Tangipahoa	1	1
Vermilion	1	1
West Carroll	1	1

CASE INFORMATION:

The following tables present information on the 41 cases involved in the reported health-related pesticide incidents.

Demographics:

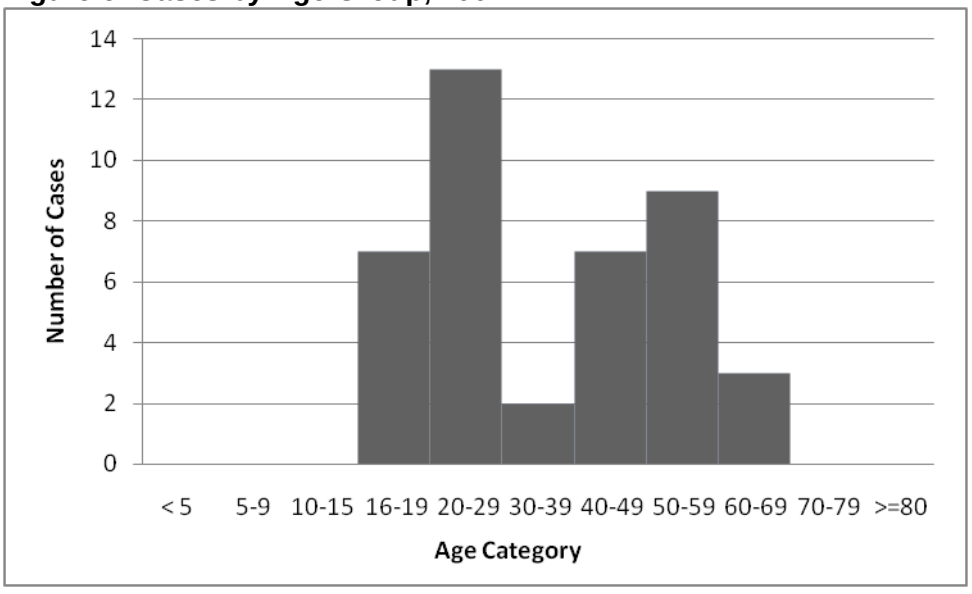
Overall, there were more male cases (61%) than female cases (39%). Thirty-two percent of the cases were between 20 and 29 years. There were no cases less than sixteen years old.

Table 4: Cases by Age and Gender, 2007.

	N
Age	**41**
< 5	0
5-9	0
10-15	0
16-19	7
20-29	13
30-39	2
40-49	7
50-59	9
60-69	3
70-79	0
>=80	0
Unknown Age	0

	N
Gender	**41**
Male	25
Female	16

Figure 6: Cases by Age Group, 2007.



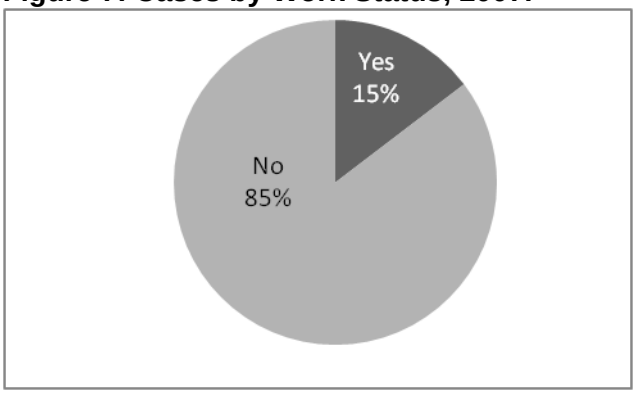
Work Status:

A case is considered work-related if the reported health-related pesticide incident occurred while the individual was working regardless if he/she was the applicator of the pesticide. Overall, 6 of the 41 cases (15%) were work-related.

Table 5: Cases by Work Status, 2007.

	N
Work Status	**41**
Yes	6
No	35

Figure 7: Cases by Work Status, 2007.



Case Classification:

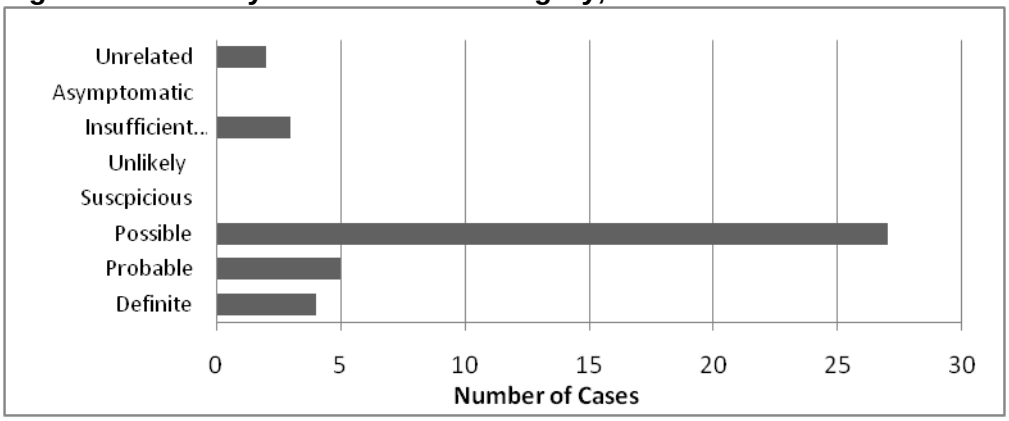
The case classification matrix is used to rank evidence linking the illness and injury to the pesticide exposure. Cases are classified using the National Institute for Occupational Safety and Health's (NIOSH) case definition for acute pesticide-related illness and injury. Classification categories consider the level of certainty of exposure, documentation of health effects, and the plausibility of reported health effects based on the known toxicology of the pesticides. The strongest evidence of pesticide exposure is confirmation of exposure by environmental or biological samples and of health effects by medical records.

Definitions of case classification categories:
Definite: Objective evidence confirms the exposure and illness, and the temporally related illness is consistent with the known toxicology of the pesticide.
Probable: Objective evidence of either the pesticide exposure or the health effects is available, and the temporally related illness is consistent with the known toxicology of the pesticide.
Possible: Only subjective evidence of exposure and illness is available, and the temporally related symptoms are consistent with the known toxicology of the pesticide.
Suspicious: Insufficient toxicological information is available to determine whether a causal relationship exists between the pesticide exposure and the health effects.
Unlikely: The relationship between the reported exposure and illness is not consistent with the known toxicology of the pesticide.
Insufficient Information: Insufficient documentation was obtained about the exposure or health effects to determine whether the health effects were related to a pesticide exposure.
Asymptomatic: A case reported exposure to a pesticide, but was asymptomatic.
Unrelated: It was determined that health effects were due to a condition other than a pesticide exposure.

Table 6: Cases by Classification Category, 2007.

	N
Case Classification	**41**
Definite	4
Probable	5
Possible	27
Suscpicious	0
Unlikely	0
Insufficient Information	3
Asymptomatic	0
Unrelated	2

Figure 8: Cases by Classification Category, 2007.



Severity:

Severity of pesticide exposure or illness is determined for each case. Severity depends on signs and symptoms, healthcare utilization, length of hospital stay, and lost time from work or disruption in normal activities due to pesticide exposure. Severity was not determined for cases that were classified as unlikely, insufficient information, asymptomatic, or unrelated.

Definitions of the severity categories:
Death: Pesticide exposure resulted in a fatality.
High: Symptoms due to pesticide exposure were life-threatening and medical treatment commonly involving hospitalization was required. Leave from work or inability to carry out normal activity was for an extended period of time (more than five days).
Moderate: Symptoms were less severe than life-threatening, but treatment is usually required. Less time is lost from work or normal activities (3-5 days) compared to "high" severity cases. No residual impairment is present although effects may be persistent.
Low: Exposure caused benign reactions to the skin, eye, or respiratory tract. Typically the illness or injury resolves without medical treatment, and fewer than three days of work or normal activity was lost.

Table 7: Cases by Severity, 2007.

	N*						
Severity	**36**						
Moderate	1						
Low	35						
** 5 cases were classified as 'insufficient information/unrelated' therefore severity was not calculated*							

EVENT INFORMATION:

Data for the 16 events are presented in the following tables.

Circumstance of Reported Exposure:

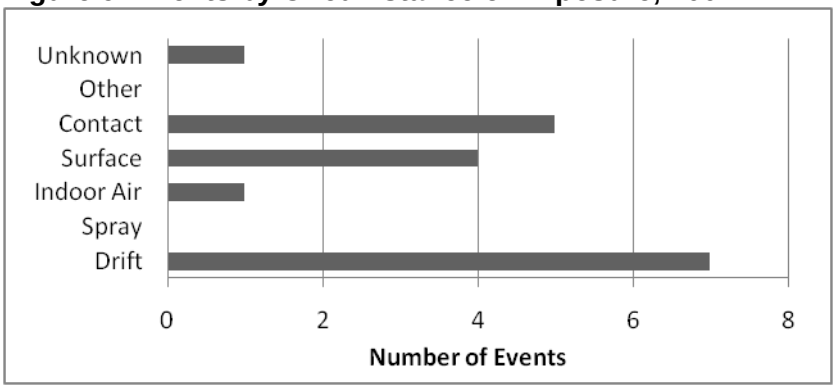
Events are classified based on the circumstance or manner in which the reported pesticide exposure occurred. Some events involved more than one mode of exposure. For these events, each circumstance is counted independently.

Definitions of circumstance of exposure categories:
Drift: Individual exposed by drift (ground or aerial application).
Spray: Individual exposed by direct spray.
Indoor Air: Individual exposed by indoor air contamination (residential, commercial, greenhouse).
Surface: Individual exposed by contact with a previously treated surface (plant material, carpets, treated animal) or entry into an outdoor previously treated area.
Contact: Individual exposed by direct contact during application to contaminated equipment or surface. Individuals exposed directly to pesticide leaks or spills are also included in this definition.
Other: Type of exposure does not fit any of the previously defined categories.
Unknown: Type of exposure is unknown.

Table 8: Events by Circumstance of Exposure, 2007.

	N
Circumstance of Exposure	**18**
Drift	7
Spray	0
Indoor Air	1
Surface	4
Contact	5
Other	0
Unknown	1
** 1 event may involve several circumstances of exposure*	

Figure 9: Events by Circumstance of Exposure, 2007.



Site of Pesticide Event:

The site of the pesticide event is the location where the pesticide application or event (e.g., airplane application, spill) occurred. Note that the location of the event may differ from the location where the person was exposed such as when someone is exposed via aerial drift. In some instances, the event site could not be determined. For example, a complainant reports symptoms but there is no identified pesticide application.

Table 9: Events by Site of Pesticide Application, 2007.

	N
Event Site	**16**
Farm	5
Nursery	1
Forest	0
Single Family Home	3
Mobile Home	0
Multi-unit housing	0
Residential Institution	0
School	0
Prison	0
Other Institution	0
Pesticide Mfg/Form Facility	0
Office/Business	0
Retail Establishment	0
Along Road/Rail	2
Park	0
Private vehicle	0
Other	3
More than one site	0
Not Applicable	1
Unknown	1

Equipment Used For Application:

This variable refers to the type of equipment or application method used in the event. Equipment is coded regardless of whether it was used by the exposed individual or another individual who performed the pesticide application.

Definitions of equipment categories:
Aerial application equipment: Application by a fixed-wing plane or helicopter.
Pressurized can or aerosol bomb: Pesticides that are combined with an inert compressed gas propellant in a disposable or refillable self-dispensing container. The container may release the pesticide as a spray, mist or fog. Aerosol foggers or bombs are single use disposable units designed for total release of the contents in a single use.
Aerosol generator or fogger (thermal or cold): Equipment designed to disperse pesticide as small airborne droplets into confined spaces such as greenhouses and warehouses or for outdoor control of mosquitoes and other public health or nuisance insects.
Soil injector: Any mechanism used to inject fumigant or other pesticide material into soil, e.g. chisel cultivator, blade or shovel, sweep cultivator shovels, planter shoes, plow.
Handheld granular or dust applicator: Squeeze bulb, bellows, tube, shaker, sliding tube, or fan powered by a hand crank.
Spray line, hand held: Hose end sprayers, handheld lines attached to powered spray tanks.
Trigger pump, push-pull, or compressed air hand sprayer: Handheld units used for spot spraying.
Ground sprayer not otherwise specified: Sprayers attached to or pulled by tractor or ATV.
Manual placement: Circumstances where pesticide is poured directly onto a target surface from a container (e.g. gopher bomb, bait station, pellets, hand toss of briquette, placement of fumigant pellet packs).
Dip tank or tray: Dipping of animals, produce, bulbs, plant material, etc.
More than one type of application equipment used
Other: All other equipment such as non-handheld mechanical granule applicators.

Table 10: Event by Pesticide Application Equipment, 2007.

	N
Equipment	**16**
Aerial application equipment	6
Pressurized can/bomb	0
Aerosol generator/fogger	1
Soil injector	0
Handheld granular/dust applic.	0
Spray line, hand held	2
Trigger pump/compressed air	1
Ground sprayer, NEC	3
Manual Placement	1
Dip take or tray	0
More then on type of equip.	0
Other	0
Not applicable	0
Unknown	2

Target:

Target refers to the actual or intended target of the pesticide application. Definitions are included for targets requiring explanation.

Definitions of target categories:
Building structure: Applications to the building structure including wall void injection, treatment of structural building members to eradicate pests, crack and crevice treatment as well as treatment of air conditioning systems and heating ducts.
Building surface: Applications to building surfaces such as spraying of carpets, flea foggers, interior area surface sprays in living/working areas other than crack and crevice.
Building space treatment: Structural applications to residences or commercial buildings using fumigants.
Undesired plant: Spot weed control applications.
Aquatic: Pond, stream, lake, irrigation canal, waste pond.
Other: Mixed crop and non-crop areas, mammal feeding and nesting areas (if mammals are the target pest), industrial or food processing equipment, boats and docks antifouling treatments, disinfection of medical equipment, toilets, and materials in beauty and barber shops, morgues, mortuaries and funeral homes, and other special target sites not otherwise specified.
Community-wide application: Mosquito or boll weevil control
Not applicable: Application not involved (e.g., preparing pesticide solutions, accidental ingestion).

Table 11: Events by Target, 2007.

	N
Target	**16**
Landscape/ornamentals	1
Forest trees/land	0
Build structure	0
Building surface	1
Building space treatment	0
Undesired plant	2
Aquatic-pond,stream,lake,canal	1
Soil injector	0
Wood product	0
Tree nuts	0
Vegetable crops (corn, etc)	0
Curcurbit vegetables (canteloupe)	0
Root/tuber vegetables	1
Seed/pod vegetables - BEANS	0
Grain/grass/fiber crops	1
Fiber crops - COTTON	1
Forage,fodder,silage legumes-	0
Cereal grain crops RICE	1
Sugar crops - SUGARCANE	1
Misc Field Crops	1
Human-skin/hair	1
Community-wide applications	2
Other	0
Not applicable	1
Unknown	1

Pesticide Product Information:

This section presents the distribution of pesticide active ingredients classified by type of pesticide: insecticide, herbicide, fungicide, and other. Types of pesticides are further categorized by class of pesticide such as organophosphate, pyrethroids, etc. The pesticide type 'other' includes pesticides that do not fall in any other classification. Some events involved reported exposure to non-pesticidial products such as fertilizer or dust. Information on these products is not included in this section.

Each event may involve multiple products and each product may contain multiple active ingredients. For example, the herbicide Misty Repco Kill contains both bromacil and 2,4-D. Because each event may involve multiple ingredients, the active ingredient totals are greater than the number of events.

Figure 10 displays the overall distribution of types of active ingredients involved in the 16 events. Tables 12 through 14 display the breakdown of specific active ingredients.

Figure 10: Active Ingredients by Pesticide Type, 2007.

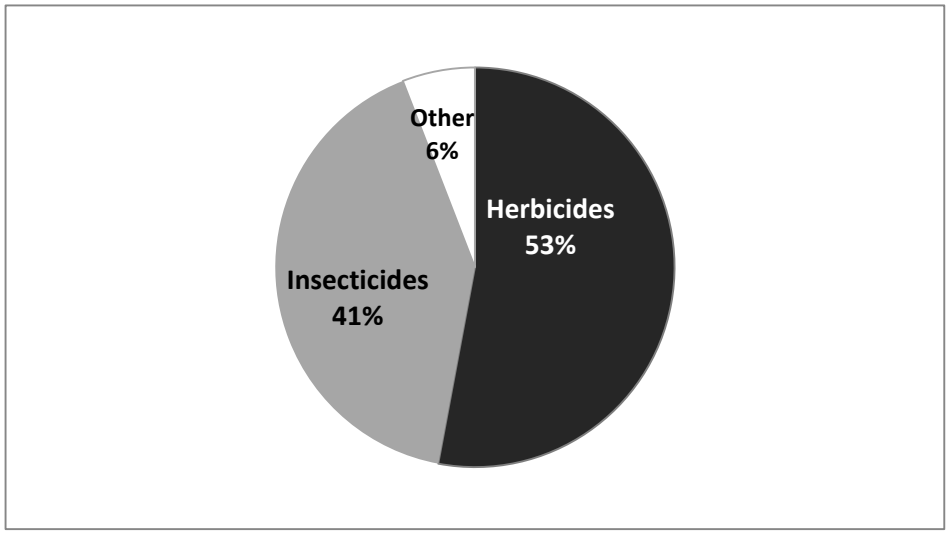


Table 12: Insecticides, 2007.

	N
Total	**7**
Organophosphorous Compounds	**4**
Malathion	2
Methyl parathion	1
Naled	1
N-methyl carbamates	**1**
Carbofuran	1
Pyrethroids	**2**
Bifenthrin	1
Permethrin, mixed cis/trans	1

Table 13: Herbicides, 2007.

	N
Total	**9**
Chlorophenoxy Compounds	**3**
2,4-D	3
Triazines	**2**
Atrazine	1
Prometon	1
Other	**4**
Clethodim	1
Glyphosate	3

Table 14: Other Pesticides, 2007.

	N
Insect Repellent	
DEET	1

SUMMARY:

For the year 2007, 16 reported health-related pesticide incidents or events resulting in 41 cases were investigated by OPH/SEET and LDAF. Most of the reported health-related pesticide incidents originated from a complainant directly contacting LDAF. The Poison Control Center was the other source for reported exposures. Fourteen parishes had a reported health-related pesticide incident for 2007.

Overall, there were more male cases (61%) than female cases (39%). Thirty-two percent of the cases were between 20 and 29 years of age. None of the cases was less than sixteen years old. Six cases (15%) were working when the reported pesticide exposure occurred. Ninety-seven percent of the cases had health effects of low severity.

The main circumstance of exposure was drift (44%, or seven events), followed by contact (31%, or five events). The most common site of an event was a farm (31%, or five events). Applications via aerial application equipment accounted for 38% of the events (six events). The most frequently occuring active ingredients include organophosphorus compounds, 2,4-D, and glyphosate.