

**2003 ANNUAL
PESTICIDE POISONING
SURVEILLANCE REPORT**

Pesticide Poisoning Surveillance Program

Division of Environmental Health
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Iowa Annual Pesticide Poisoning Surveillance Report January 1, 2003 through December 31, 2003

Pesticide Poisoning Surveillance Program Overview

Iowa Administrative Code section 641-1.3(1) requires pesticide poisonings to be reported to the Iowa Department of Public Health (IDPH). Pesticides are defined under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) as “any substance or mixture of substances intended to prevent, destroy, repel or mitigate insects, rodents, nematodes, fungi, weeds, microorganisms, or any other form of life declared to be a pest by the Administrator of the U.S. Environmental Protection Agency (EPA) and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pesticides include herbicides, insecticides, rodenticides, fungicides, disinfectants, wood treatment products, growth regulators, insect repellents, etc.”

Pesticide poisonings were added to the list of reportable diseases in *Iowa Administrative Code* section 641-1.3(1) because IDPH was concerned about adverse human health effects from exposure to pesticides. The Pesticide Poisoning Surveillance Program within the Division of Environmental Health of the IDPH monitors, collects, and analyzes pesticide poisonings to determine the extent to which Iowans are being affected by pesticide exposure. The information gathered by this program is disseminated to governmental agencies, the public, and health care professionals. In addition, IDPH is required to submit its findings to the Iowa Department of Agriculture and Land Stewardship annually.

Incident Report Sources for 2003 Reports

In 2003, IDPH received reports primarily from the Iowa Statewide Poison Center.

Pesticide Poisoning Case Classification Criteria

Beginning in 2003, IDPH used the National Institute of Occupational Safety and Health system for case classification. Reports received from the Iowa Statewide Poison Center are scored on three criteria to determine the case classification. Each criterion is scored on a scale of 1 to 4. The three criteria are:

- A. Documentation of pesticide exposure.
 - B. Documentation of adverse health effects.
 - C. Evidence supporting a causal relationship between pesticide exposure and health effects.
- A. Scoring of Documentation of Pesticide Exposure
1. Laboratory, clinical or environmental evidence is available to corroborate exposure to a pesticide. At least one of the following must be satisfied to receive a score of “1”:
 - Analytical results from foliage residue, clothing residue, air, soil, water, or biologic samples showing the presence of a pesticide.
 - Observation of residue and/or contamination, including damage to plant material from herbicides, by a trained professional. This may be a plant pathologist, agricultural inspector, agricultural extension agent, industrial hygienist, or any other licensed or academically trained specialist with expertise in plant pathology and/or environmental effects of

pesticides. A licensed pesticide applicator not directly involved with the application may also be considered a trained professional.

- Biologic evidence of exposure through response to administration of an antidote such as 2-PAM, Vitamin K1, or repeated doses of atropine.
 - Documentation by a licensed health care professional of a characteristic eye injury or dermatologic effects at the site of direct exposure to a pesticide product known to produce such effects.
 - Clinical description by a licensed health care professional of two or more post-exposure health effects, at least one of which is a sign, or an objective finding that can be observed and described by a licensed health care professional.
2. Evidence of exposure based solely upon written or verbal report (at least one of the following must be satisfied to receive a score of "2"):
 - Report by case.
 - Report by witness.
 - Written records of application.
 - Observation of residue and/or contamination, including damage to plant material from herbicides, by other than a trained professional.
 - Other evidence suggesting that an exposure occurred.
 3. Strong evidence that no pesticide exposure occurred.
 4. Insufficient data.

B. Documentation of Adverse Health Effect

1. Two or more new post-exposure abnormal signs (objective findings that can be observed and described by a licensed health care professional) and/or test or laboratory findings reported by a licensed health care professional.
2. Two or more new post-exposure abnormal symptoms, which are subjective evidence of a disease or a condition as perceived and reported by the patient, were reported. When new post-exposure signs and test or laboratory findings are insufficient to satisfy a "1" score, they can be used in lieu of symptoms toward satisfying a "2" score.
3. No new post-exposure abnormal signs, symptoms, or test/laboratory findings were reported.
4. Insufficient data, which includes having only one new post-exposure abnormal sign, symptom, or test or laboratory finding.

C. Evidence Supporting a Causal Relationship between Pesticide Exposure and Health Effects

1. Where the findings documented under the Health Effects criteria are one of the following:
 - Characteristic for the pesticide and the temporal relationship between exposure and health effects is plausible.

- Consistent with an exposure-health effect relationship based upon the known toxicology of the pesticide.
2. Evidence of exposure-health effect relationship is not present.
 3. Definite evidence of a non-pesticide causal agent.
 4. Insufficient toxicologic information is available to determine causal relationship between exposure and health effects.

The matrix below provides the case classification categories and the criteria scores needed to place the case into a specific category.

CLASSIFICATION CATEGORIES ¹											
CLASSIFICATION CRITERIA	Definite Case	Probable Case		Possible Case	Suspicious Case	Unlikely Case	Insufficient Information		Not a Case		
									Asymptomatic ²	Unrelated ³	
A. Exposure	1	1	2	2	1 or 2	1 or 2	4	-	-	3	
B. Health Effects	1	2	1	2	1 or 2	1 or 2	-	4	3	-	
C. Casual Relationship	1	1	1	1	4	2	-	-	-	-	3

Case Classification of 2003 Pesticide Poisoning Reports

During 2003, IDPH received 204 reports of pesticide poisoning. Table 1 below shows the case classification of these reports. Of the 204 reports received by IDPH, 141 (69 percent) were classified as “possible” pesticide exposures. “Probable” cases accounted for 44 (21.6 percent) of the reports. Only 10 (five percent) of the reports were classified as “definite” cases. Most of the “possible” cases would probably have been classified as “probable” or “definite” if the person who was exposed had seen a health care provider to verify the signs and symptoms of pesticide exposure in addition to calling the Iowa Statewide Poison Center for information.

Table 1 -- Categories of Pesticide Exposure 2003

Category	Number	Percentage
Definite Case	10	5.0%
Probable Case	44	21.6%
Possible Case	141	69.0%
Unlikely Case	3	1.5%
Asymptomatic	2	1.0%
Insufficient Information	1	0.5%
Unrelated	3	1.0%
Total 2003	204	100%

Class of Pesticides in 2003 Reports

Insecticides accounted for 162 (79.4 percent) of the pesticide poisoning reports received in 2003. Herbicides were named in 31 (15.2 percent) of the reports. A combination of insecticides and fungicides was named in six (2.9 percent) of the reports. Fungicides and fumigants were each

named in two (1 percent) of the pesticide exposure reports, and one (0.5 percent) report named a rodenticide. Table 2 below shows the reports of pesticide poisoning by class in 2003.

Table 2 -- Class of Pesticide for 2003 Reports

Class	Number	Percentage
Fumigant	2	1.0%
Fungicide	2	1.0%
Herbicide	31	15.2%
Insecticide	162	79.4%
Insecticide/Fungicide	6	2.9%
Rodenticide	1	0.5%
Total 2003	204	100%

Pesticides Named in 2003 Reports of Pesticide Poisoning

EPA and IDALS identify a specific pesticide by the EPA Registration Number. It is important to discover the EPA Registration Number for products involved in pesticide poisonings so that IDALS can determine whether there is a pattern of new signs and/or symptoms associated with a specific product. If such a pattern is identified, then IDALS can seek changes in the product label to reduce human exposure and resulting pesticide poisonings. In most of the cases reported in 2003, there was insufficient information to determine the EPA Registration Number of the product, so IDPH has classified products by the general name or type of product. Table 3 below shows the products that accounted for the largest numbers of pesticide poisoning. Table 4 on page 7 shows the products that were named in the pesticide exposure reports.

Table 3 – Type of Product for 2003 Reports

Type of Product	Number of Reports
Insect repellent	45
Home and garden insect control	44
Flea and tick control products	16
Round-up	13
Fogger	9

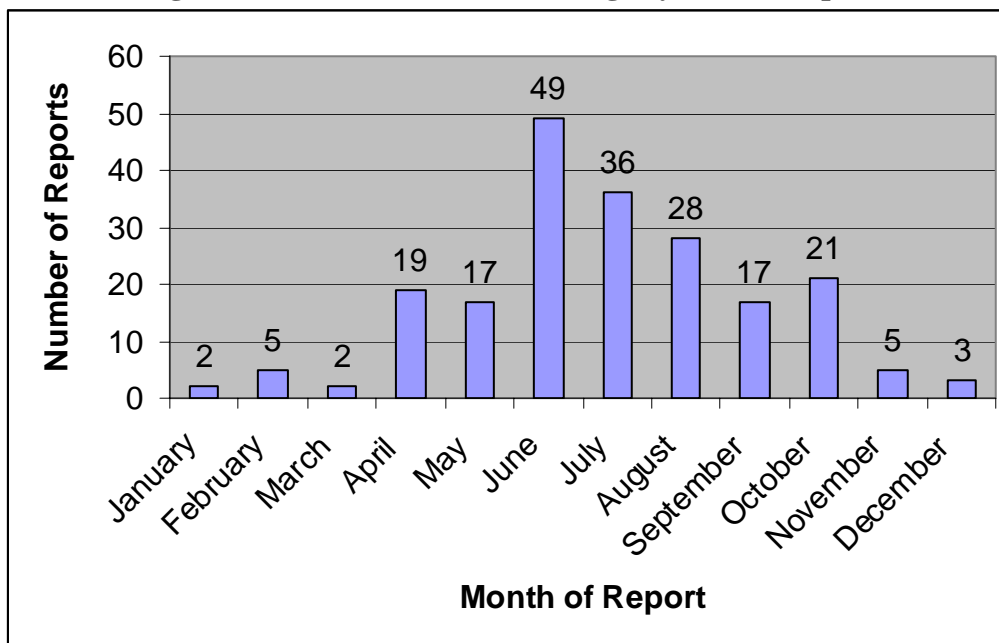
Table 4 -- Pesticides Named in 2003 Pesticide Exposure Reports

Pesticide	Number of Reports
2,4-D	3
Agrox	1
Atrazine	1
Aztec	1
Aztec, Accent, Atrazine, Clarity, Salvo, and Treflan	1
Bat Scat	1
Bicep	2
Citronella	1
Clear Out	1
CV 80D	1
Cyfluthrin	2
D-Con	1
Deltagard	1
Diazinon	2
Dimate	1
Dimethoate	1
Dual	1
Flea and Tick Control Product	16
Flexstar	1
Fogger	9
Force	2
Force, Maxim, and Actellic	1
Fungicide	1
Furadan	2
Greenhouse Insecticide/Miticide	1
Home and Garden Insect Control	44
Insect Repellant	45
Lawn Chemical	3
Lice Control Spray	1
Livestock Insecticide	3
Lorsban	1
Malathion	5
Maxim	1
Maxim and Apron	1
Mothballs	1
Permethrin	1
Pet Miticide	4
Phosphine	1
Phostoxin	1
Placement Propak with Roundup Weathermax	1
Pramitol	1
Ranger and Pramitol	1
Round Up	13
Rozol and Prescription Treatment Pro Control Plus	1
Sevin	2
Strike 3 Ultra	1
Synchrony and Phoenix	1
Tempo	2
Terro Ant Killer	3
Tordon	1
Treflan	1
Ultrathon	2
Unknown Insecticide	3
Vapam	1
Warrior	2
Warrior and Pilot	1
ZEP Metered Mist Insect Killer	1
Total	204

Month of Exposure for 2003 Reports

During 2003, the largest number of pesticide poisoning reports (49) was received in June, followed by July (36), August (28), and October (21). The smallest number of reports was received in January and March (2 each). On average, there were 17 pesticide poisonings reported to IDPH each month. Figure 1 shows the number of reports by month.

Figure 1 – 2003 Pesticide Poisonings by Month Reported



Gender/Age Comparisons for 2003 Reports

The gender classification of 2003 pesticide poisonings included 109 males (53.4 percent) and 94 females (46 percent). In one case, the gender was not included in the report. The number of reports for males was nearly twice that of females for the ages of less than or equal to 5 years and 6 to 19 years. However, the number of reports for females was greater than males for individuals whose age was greater than or equal to 20 years. Of the 204 reports received in 2003, 125 (61.2 percent) were for individuals 20 years of age or older. An additional 16 (30 percent) were for individuals 5 years of age or younger, and 17 (8.3 percent) were for individuals 6 to 19 years of age. Table 5 below details the gender and range of age groups for pesticide poisonings reported in 2003.

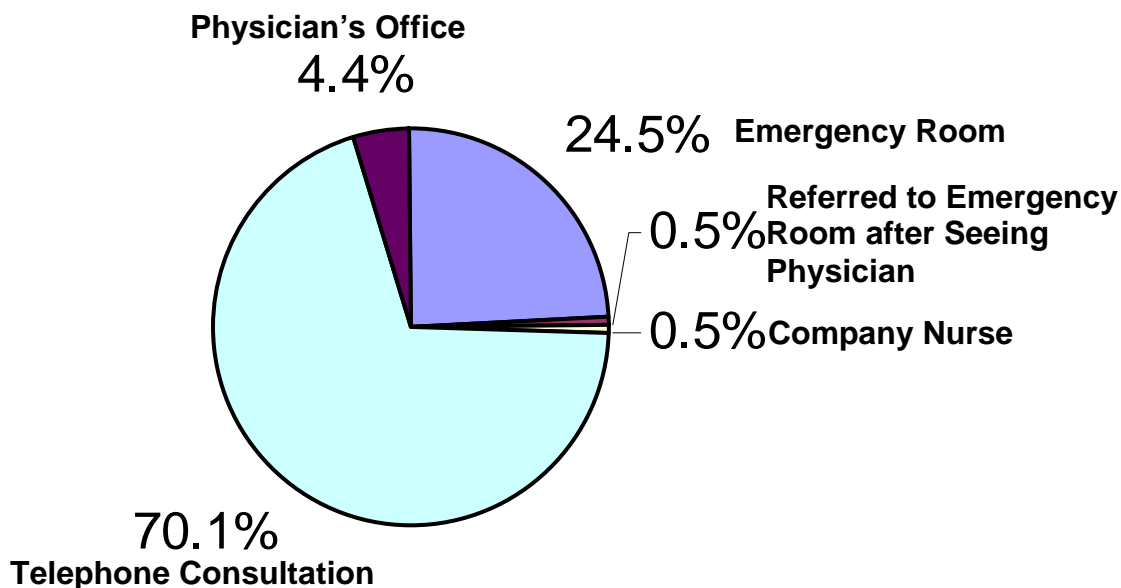
Table 5 -- Gender/Age Comparisons of 2003 Pesticide Poisonings

Age	Sex			Total
	Female	Male	Unknown	
≤5 years	21	40	0	61
6-19 years	6	11	0	17
≥20 years	67	58	0	125
Unknown	0	0	1	1
Total 2003	94	109	1	204

Source of Health Care for 2003 Pesticide Poisonings

Phone consultations were the source of health care for 143 (70.1 percent) of the pesticide poisoning reports. Emergency rooms were the source of health care for 50 (24.5 percent) of the reports, and physicians were the source of care for 9 (4.4 percent) of the reports. In one case, the person saw a physician and was then referred to the emergency room, and in another case, the person saw a company nurse at the workplace. Figure 2 shows the type of health care sought for pesticide exposures in 2003.

Figure 2 – Source of Health Care for 2003 Reports



Type of Exposure for 2003 Reports

Ocular exposures accounted for 92 pesticide poisoning reports (35.5 percent) received by IDPH. The next most common type of exposure was dermal at 74 reports (28.6 percent). Inhalation exposures accounted for 61 (23.6 percent) of the reports, and ingestion accounted for 32 (12.4 percent) of the reports. The sum of the types of exposure is greater than the number of reports because many reports listed more than one mode of exposure. Table 6 lists the types of pesticide exposure in further detail.

Table 6 -- Type of Pesticide Exposure for 2003 Reports

Type of Exposure	Number	Percentage
Dermal	74	28.6%
Ingestion	32	12.4%
Inhalation	61	23.6%
Ocular	92	35.5%
Total 2003	259*	100%

*Adds up to more than 204 because many reports contained more than one source of exposure.

Signs and/or Symptoms of Pesticide Poisoning for 2003 Reports

The most common sign and/or symptom reported in 2003 was eye irritation with 88 reports (39.1 percent). The next most common signs and/or symptoms were respiratory symptoms with 38 reports (16.9 percent), skin irritation with 33 reports (14.7 percent), gastrointestinal with 23 reports (10.2 percent), and central nervous system effects with 13 reports (5.8 percent). Table 7 shows the signs and/or symptoms reported in 2003.

Table 7 -- Signs and/or Symptoms in 2003 Reports of Pesticide Poisoning

Sign and/or Symptom	Number	Percentage
Chest pain	1	0.45%
Central nervous system	13	5.80%
Elevated partial thromboplastin time	1	0.45%
Euphoria	1	0.45%
Eye irritation	88	39.10%
Gastrointestinal (nausea, vomiting)	23	10.20%
Headache	5	2.20%
Oral irritation	19	8.40%
Respiratory (coughing, wheezing, shortness of breath)	38	16.90%
Skin irritation	33	14.70%
Testicular pain	1	0.45%
None	2	0.90%
Total 2003	225**	100.00%

**The total number is more than 204 because many reports listed more than one sign and/or symptom.

Site of Pesticide Poisoning for 2003 Reports

The home or the immediate surrounding area of the residence (house, lawn, garage, and garden) was the site of pesticide poisoning for 165 (80.9 percent) of the reports in 2003. A farm workplace was the site for 21 (10.3 percent) of the reports in 2003, while other workplaces accounted for 15 (7.3 percent) of reports in 2003 and 3 (1.5 percent) of the pesticide poisonings occurred in public areas.

Figure 8 -- Location of Exposure in 2003 Reports

Location	Number	Percentage
Farm	21	10.3%
Home	165	80.9%
Public area	3	1.5%
Workplace	15	7.3%
Total 2003	204	100%

County Reported for 2003 Reports of Pesticide Poisoning

The 204 reports of pesticide poisoning for 2003 occurred in 72 counties. Polk County, a densely populated county, reported 29 pesticide poisonings. Scott County reported 11, Linn County reported 9, and Woodbury County reported 8. The map on the next page shows 2003 reports of pesticide poisoning by county.

Noteworthy Case

In August 2003, nine Hispanic males went to an emergency room with nausea and vomiting after entering a field where Furadan had been applied. The individuals had been told to wait 48 hours before entering the field and stated that they had followed these instructions. All of the patients received showers and their clothing was bagged. Five of the patients required treatment with atropine. Unfortunately, this case was not reported to IDPH until early in 2004. At that time, it was too late for IDPH or IDALS to collect additional environmental and medical information to determine whether the Furadan had been used according to its approved label.

Conclusions and Recommendations

During 2003, IDPH received 204 reports of pesticide poisoning. Of the 204 reports received by IDPH, 141 (69 percent) were classified as “possible” pesticide exposures. “Probable” cases accounted for 44 (21.6 percent) of the reports. Only 10 (5 percent) of the reports were classified as “definite” cases. Most of the “possible” cases would probably have been classified as “probable” or “definite” if the person who was exposed had seen a health care provider to verify the signs and symptoms of pesticide exposure in addition to calling the Iowa Statewide Poison Center for information.

Insecticides accounted for 79.4 percent of the pesticide poisoning reports in 2003. Insect repellants, home and garden insect control products, flea and tick control products, Round-up, and foggers were the products most often named in the reports. The largest number of pesticide poisonings was reported in the late spring and early summer months. Pesticide poisonings were more likely to occur in the home or in the immediate areas surrounding the residence (ex: lawn, garden, garage, or garden) than in other areas. Most people contacted the Iowa Statewide Poison Center by telephone and did not seek medical attention after a pesticide exposure.

Overall, the number of reports for males was nearly twice that of females for the ages of ≤ 5 years and 6 to 19 years. However, the number of reports for females was greater than males for the age of ≥ 20 years. Overall, the number of reports for males was slightly greater for males than for females. Of the 204 reports received in 2003, 125 (61.2 percent) were for individuals 20 years of age or older. An additional 16 (30 percent) were for individuals 5 years of age or young, and 17 (8.3 percent) were for individuals 6 to 19 years of age.

Ocular exposures accounted for 92 reports (35.5 percent) received by IDPH. The next most common type of exposure was dermal at 74 reports (28.6 percent). Inhalation exposures accounted for 61 (23.6 percent) of the reports, and ingestion accounted for 32 (12.4 percent) of the reports. The most common sign and/or symptom of pesticide poisoning reported in 2003 was eye irritation with 88 reports (39.1 percent). The next most common signs and/or symptoms were respiratory symptoms with 38 reports (16.9 percent), skin irritation with 33 reports (14.7 percent), gastrointestinal with 23 reports (10.2 percent), and central nervous system effects with 13 reports (5.8 percent).

In the future, more must be done to protect the public from pesticide exposures. First, since 81 percent of the pesticide poisonings reported in 2003 occurred in or around the home, IDPH must educate the public about the proper usage of pesticides. Second, reports of pesticide poisonings must be sent to IDPH immediately and must contain the EPA registration number so that IDPH

and IDALS can immediately take necessary follow-up actions. The Iowa Statewide Poison Center is using a new data system that will allow IDPH to receive reports much more quickly than in the past, and IDALS, along with Iowa State University Extension, have worked with the staff of the Iowa Statewide Poison Center to emphasize the need to get the EPA Registration Number for products involved in pesticide poisonings. Finally, IDPH is emphasizing reporting by health care professionals. A new poster that has been distributed statewide lists the requirements for environmental disease reporting. In addition, physicians are encouraged to contact the Iowa Statewide Poison Center whenever they have a case of pesticide exposure or pesticide poisoning since IDPH automatically receives reports from the Iowa Statewide Poison Center.