

npic

NATIONAL
PESTICIDE ● INFORMATION
CENTER

-2016-

Environmental & Molecular Toxicology

Oregon State
UNIVERSITY

OSU

The National Pesticide Information Center (NPIC) is a service that provides a variety of pesticide and related information to the general public and professionals across the United States and its territories. NPIC is a cooperative agreement between Oregon State University and the U.S. Environmental Protection Agency. The 2016 Annual Report covers the period of February 15, 2016 - February 14, 2017.

DISCLAIMER

Material presented in this report is based on information as provided to NPIC by individuals who have contacted NPIC for information or to report a pesticide incident. None of the information reported to NPIC has been verified or substantiated by independent investigation by NPIC staff, laboratory analysis, or any other means. Based on the information provided, NPIC qualifies the information by assigning a certainty index (CI) and a severity index (SI). NPIC makes no claims or guarantees as to the accuracy of the CI, SI, or other information presented in its reports, other than that NPIC has done its best to accurately document and report the information provided to NPIC.

Submitted To:

U.S. Environmental Protection Agency
Office of Pesticide Programs

Submitted By:



Jeff Jenkins, Ph.D.
Project Director

Cooperative Agreement #X8-83560101
Environmental and Molecular Toxicology
Oregon State University
310 Weniger Hall
Corvallis, OR 97331-6502
800-858-7378
npic.orst.edu

NPIC 2016 Annual Report

Table of Contents

DELIVERING OBJECTIVES	4
INTRODUCTION / HISTORY	6
HIGHLIGHTS.....	7
NPIC WEBSITE.....	9
INQUIRY TRENDS.....	10
NPIC INFOGRAPHIC.....	11
PESTICIDE FAQs & COMICS.....	12
SOCIAL MEDIA & VIDEOS	13
WEB APPS & FACT SHEETS.....	14
CONNECTING WITH STAKEHOLDERS	15
CONTINUING EDUCATION & AI FILES	16
QUALITY ASSURANCE / QUALITY CONTROL	17
Introduction to Inquiry Data	18
1. Monthly Inquiries.....	20
2. Type of Inquiry.....	21
3. Origin of Inquiry.....	21
4. Website Access.....	22
5. Type of Inquirer	24
6. Type of Question.....	25
7. Actions Taken.....	26
8. Inquiries by State	27
9. Top 25 Active Ingredients for All Inquiries	28
10. Incident Type.....	29
11. Top 25 Active Ingredients for Incidents.....	30
12. Locations of Exposure or Accident.....	31
13. Environmental Impact	31
14. Certainty Index.....	32
15. Severity Index	33
16. Description of Entities	34
17. Reported Deaths.....	35
18. Entity Age.....	36
19. Notable Exposures.....	37
VETERINARY REPORTING	38
ECOLOGICAL REPORTING.....	40

DELIVERING OBJECTIVES

The cooperative agreement between Oregon State University and the US EPA includes five strategic project objectives. Those objectives are listed below with a summary of measures taken to meet or exceed the goals in our work-plan.

1. To serve as a factual source of information for diverse professional and public audiences on pesticide-related issues.

- In conversations with the public and professionals, NPIC discussed ways to minimize exposure 2,629 times, following the label 2,300 times, IPM concepts 743 times, and environmental protection 159 times.
- NPIC posted new items in social media venues promoting safe use practices, IPM, and pesticide label comprehension. NPIC developed 318 original posts, averaging six posts per week. NPIC engaged with many organizations through social media. Some examples are poison control centers, health departments, vector control agencies, beekeepers, and national agencies including the Natural Resources Conservation Service, the Centers for Disease Control & Prevention, and the US EPA.
- In order to stay current, NPIC staff members participated in 35 events for continuing education, including 21 webinars, 8 off-campus events, 3 on-campus events, and 3 in-house presentations.
- NPIC performed chemical-specific literature searches in order to update 20 active ingredient files and open 5 new AI files. Additionally, NPIC added over 160 new documents to the AI file collection through routine monitoring of the regulatory and scientific literature. On average, NPIC staff invested over 10 hours per week monitoring Federal Register Notices, affiliated dockets, newsletters, and selected journals of relevance.
- NPIC maintains current contact lists for many organizations in order to provide the best local referrals. NPIC staff performed quality assurance to verify/update over 3,300 contacts this year, including county extension. In preparation for spring/summer inquiries regarding Zika, West Nile Virus, and other mosquito-borne diseases, NPIC added over 170 new mosquito/vector control contacts.

2. To operate a toll-free, bilingual telephone information service for all callers in the United States and its territories, Monday through Friday at least 4 hours per day, with accessibility to voicemail during closed hours, and ability to address inquiries through email and social media.

- NPIC operated a toll-free telephone service, including voicemail for off-hour inquiries. The toll-free service was operated Monday through Friday, 8:00-12:00 PT, with bilingual capability maintained throughout.
- NPIC responded immediately to 99% of calls received during open hours. Occasionally, a caller in the queue chose to leave a message.
- NPIC responded to 99% of inquiries within one business day when they were received through voicemail, email, and/or social media.
- NPIC recruited and hired one highly qualified Pesticide Specialist this year. She has a BS in Environmental Earth Science and an MS in Biological Oceanography. She participated in a rigorous, updated training program this year, emphasizing risk communication and pesticide regulation/science.

3. To develop and maintain English and Spanish websites accessible to broad audiences and host NPIC original content, state-of-the-art information technology tools and links to unbiased and authoritative sources of information about pesticides.

- NPIC maintained frequent communication with OPP about proposed projects and priorities for publication development. Examples include NPIC's site visit to OPP in March 2016, three quarterly coordination meetings (QCM), and two webinars developed and delivered in collaboration with OPP entitled, "All About the Herbicide Properties Tool" and "How can NPIC compliment the work of poison centers?"
- NPIC created 25 new web pages this year, including six in Spanish. See page 9.
- Quarterly, NPIC identified 100% of broken links on its website, and removed or replaced each one (323). NPIC added 30 new links to its website when high-quality science and regulatory items were identified. Thirty-seven (37) existing web pages were significantly updated with new content. Thirty of those were NPIC's pest pages, redesigned with tabs to allow users to jump to specific information, including pest images, life cycles, and IPM topics.

DELIVERING OBJECTIVES

3. To develop and maintain English and Spanish websites accessible to broad audiences and host NPIC original content, state-of-the-art information technology tools, and links to unbiased and authoritative sources of information about pesticides (cont'd).

- NPIC developed seven new videos this year, including five frequently asked questions, one web app preview for the HPT, and a video for professionals who work with disinfectants titled, “Reducing Disinfectant Exposures in the Workplace.” See page 13.
- NPIC developed four new fact sheets, including one about cleaning up after indoor pesticide misuse. See page 14.
- NPIC developed eight new FAQs and six new FAQ comics this year. See page 12. FAQ comics are replacing Pestibyte podcasts in the NPIC work-plan because of the podcasts’ declining web traffic.
- Based on user feedback collected in Grant Year 2, NPIC’s English and Spanish websites were redesigned for simpler navigation and is now scalable for easier use on mobile devices. See page 9.

4. To collect robust pesticide incident data through systematic protocols and to disseminate the information through scheduled reporting and by request from the U.S. EPA and partner agencies.

- NPIC updated and executed a rigorous training program for one new Pesticide Specialist, emphasizing risk communication skills and the collection of essential data related to pesticide incidents.
- NPIC used standard operating procedures and rigorous quality control to classify reported signs/symptoms. NPIC assigned a severity index 100% of the time when signs/symptoms were described (820 times). NPIC assigned a certainty index 100% of the time when signs/symptoms were described, and they could be compared to published reports about the active ingredient(s) involved (521 times).
- NPIC discussed inquiry trends and data with OPP at least quarterly. Examples include notification of a flurry of neonicotinoid calls to NPIC in June, discussions about food commodity contamination and reporting in July, and inquiries related to spatial repellents and repellent devices in August.
- NPIC monitored data quality and held routine staff development exercises to ensure high standards were met. Every pesticide incident was reviewed by a QA/QC specialist to ensure coding consistency and compliance with applicable protocols. Routinely, the specialist collaborated with Dr. Berman to evaluate human and animal incidents.
- Each specialist received feedback about their strengths and weaknesses in documenting inquiries. Their performance was scored on 25 distinct measures such as narrative quality, judgment in characterizing symptoms, and accuracy in coding.
- NPIC documented demographic information for 100% of people that may have been exposed to pesticides, product information for 93% of reported incidents, and the location for 95% of incidents.
- NPIC specialists were able to capture the exposure route for 88% of exposed humans/animals, and symptom/scenario information in 96% of cases.
- NPIC provided 21 special reports about incidents and inquiries upon request, including 14 reports for EPA, and 7 reports for federal/state agencies and/or universities. Reports were provided within 10 business days. Quarterly reports were submitted within 30 days of each quarter’s closure, accompanied by all reports received by NPIC through its veterinary and ecological reporting portals.
- NPIC delivered two webinars titled “All About the Herbicide Properties Tool” and “How can NPIC complement the work of poison centers?” The webinars were recorded and posted to the website.

5. To conduct our service professionally, with an emphasis on teamwork, integrity and accountability, and a strong commitment to collaboration and exceptional customer service.

- NPIC evaluated each staff member in the fall, including quantified measures of data collection skills, customer service skills, and continuing education measures.
- Key personnel from NPIC visited OPP on March 10, 2016. Subawards with OHSU and AAPCC were monitored at least quarterly.
- NPIC partnered with the OSU Survey Research Center to collect feedback about NPIC’s customer service. A final report was provided to NPIC specialists in order to incorporate user feedback in the future.

INTRODUCTION / HISTORY

NPIC provides objective, science-based information about pesticides and related topics to enable people to make informed decisions about pesticides and their use. In this, the third year of the project period under cooperative agreement #X8-83560101, Oregon State University provided information to millions by phone, email, social media, data-sharing, mobile web apps, and/or web content.

NPIC supports the US Environmental Protection Agency (EPA)'s Strategic Goal 4: Ensuring the Safety of Chemicals and Preventing Pollution. NPIC also supports the mission of the Oregon State University (OSU) Extension System, conveying research-based knowledge in a way that is useful for people to improve their lives, their homes, and their communities.

The complete record of NPIC accomplishments for the operational year includes this annual report, four quarterly reports, and a quality assurance report. Quarterly and supplemental reports were submitted to the Project Officer within 30 days of the reporting period's closure.

The 12-month reporting period began on February 15, 2016 and ended February 14, 2017.

This period will be referenced as "2016" in this report.

History

The pesticide information service began in 1978 with the Texas Tech University Health Sciences Center associated Pesticide Hazard Assessment Project. This service was used to collect pesticide incident reports in EPA Region VI, but callers began using the service to ask questions about pesticides. The service expanded, and moved to Texas Tech University. It has been known as the National Pesticide Information Clearinghouse (NPIC) and the National Pesticide Telecommunications Network (NPTN). The service moved to Oregon State University (OSU) in 1995. In 2015, NPIC celebrated 20 years at OSU.



The Memorial Union at Oregon State University

Trends in NPIC Data

- During this period, NPIC received 11,337 inquiries.
- Over 75% of the total inquiries were addressed over the telephone.
- About 17% of NPIC inquiries in 2016 were incidents. A pesticide incident is defined as 1) any unintended pesticide exposure, 2) a pesticide exposure with an adverse effect, 3) a spill, and/or 4) a misapplication.
- One human death and 73 animal deaths were reported. See pages 33 and 35.
- The top active ingredients involved with incidents were naphthalene (388), permethrin (136), boric acid (128), paradichlorobenzene (115), and silicon dioxide (96).
- There were 3,019 entities involved in incidents reported to NPIC: 51.5% were human, 17.7% were animals and 30.1% were structural or environmental. See page 34.
- Among the 1,139 single humans involved in pesticide incidents for which the age was captured, 11.3% were children (ages 4 and under) and 28.1% were seniors (ages 65 and over). About 36% of all people reported no symptoms.
- Questions related to health/risk (3,648) and application techniques (1,569) were most common.
- The NPIC website received 6,417,637 page views during this period. There were more than 2.8 million unique visitors, and 126,747 visitors stayed for more than 15 minutes.

Foreign Language Capabilities – NPIC employs three Spanish-speaking pesticide specialists capable of responding to inquiries and translating publications. The NPIC website is also available in Spanish. Under an agreement with Language Line Solutions, NPIC is capable of responding to inquiries in over 240 languages.

This year, NPIC responded to 206 inquiries in Spanish, two in American Sign Language, one in Farsi, one in Indonesian, and one in Mandarin.

Mothball Products – NPIC received 882 inquiries about mothballs, flakes, and bars. Of these, 508 (58%) were incidents. Many reports involved off-label use of mothballs to repel animals in and around the home.

Bed Bugs – NPIC received 627 inquiries related to bed bugs this year. About 13% of these (80) were pesticide incidents. Many of these inquiries were related to the difficulty of pest control and the potential health effects of pesticides.

Zika - NPIC received 98 inquiries where callers discussed the Zika virus specifically. All inquiries related to Zika were informational in nature and were often related to insect repellent use and safety.

What are people saying about NPIC?

“I was very impressed with the service I received from NPIC and expressed this to several of my friends. The person I spoke with was highly informed and was able to communicate this information very effectively and clearly.”

“The service was outstanding. Your representative was caring, knowledgeable, and helpful. Your customer service was superior.”

-NPIC callers

Resources & Facilities

NPIC maintains an extensive collection of hard copy and electronic information. NPIC specialists have access to the full resources of the Oregon State University Library, which includes electronic access to hundreds of academic journals, databases, and indexing services. NPIC's library includes a comprehensive Active Ingredient (AI) file collection with detailed scientific and regulatory information for over 1,000 active ingredients. This collection has been scanned and indexed for desktop access, using software developed by NPIC.

NPIC is housed on the third floor of Weniger Hall in the Department of Environmental and Molecular Toxicology. Allocated spaces include five rooms, two individual offices, and a storage unit.

Funding & Compliance

Funding for NPIC is provided by the US Environmental Protection Agency (US EPA) and Oregon State University.

Throughout the reporting period, NPIC has complied with the requirements of the US EPA regarding Title VI of the Civil Rights Act of 1964 and Section 13 of the FWPCA Amendments of 1972. NPIC has complied with the US EPA Guidelines regarding procurement requirements stipulated in 40 CFR Part 33. NPIC has complied with all requirements specified by the US EPA as part of the funding authorization of this project.

Personnel Update

Dr. Jeff Jenkins, previously NPIC co-investigator, replaced Dr. Dave Stone as NPIC director. Amy Hallman, MS, replaced Kaci Buhl, MS, as NPIC Project Coordinator. Ms. Buhl will remain with NPIC as a member of the Executive Committee (EC). In addition, Dr. Dan Sudakin resigned his position on the EC. The NPIC EC includes the Director and three co-investigators. Dr. Jenkins, Ms. Buhl, and Dr. Craig Marcus hold faculty appointments at OSU, while Dr. Fred Berman, DVM, serves NPIC through a subaward with the Oregon Health & Science University.

One Pesticide Specialist was hired this year, and four were retained. Recruitment for two new specialists was near completion during the 4th quarter of grant year 3. As of February 14, 2017, NPIC staff included five Pesticide Specialists, three supporting staff members, and the Executive Committee.

Standard Operating Procedures

NPIC staff use a variety of standard operating procedures (SOPs) and policies to guide their work and some decision making. This year, three new SOPs were created and 11 were updated. In addition, four policies were updated instructing staff about scheduling, personnel matters, and copyright issues.



Open minds. Open Doors.™

Redesign

NPIC's **English** and **Spanish** websites were redesigned for simpler navigation based on user feedback. NPIC learned more than half of all users visit the NPIC website from a phone or tablet. The website is now scalable for easier use on mobile devices.

Selected new web pages

- **Synergists**
- **Groundwater Ubiquity Score (GUS)**
- **NPIC Professional Resources**

Fact Sheets

- **Piperonyl Butoxide**
- **Sulfuryl Fluoride**
- **Cleaning Up After Indoor Pesticide Misuse**
- **Pesticide Vapor Pressure**

FAQs

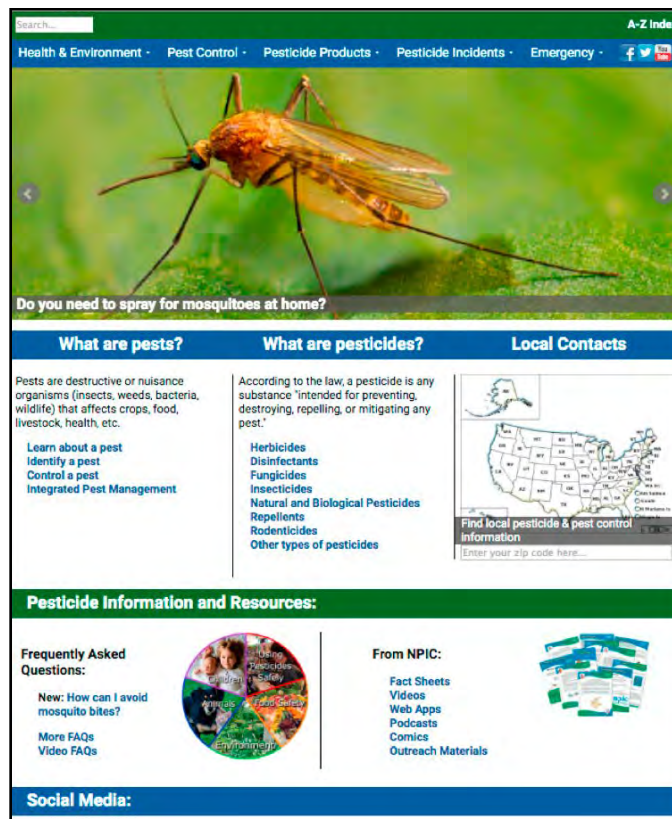
- **How can I avoid mosquito bites?**
- **Do I need to spray for mosquitoes at home?**

Significant updates

- **Home IPM**
- **Head Lice**
- **Pesticide Drift**
- **Risk Assessment**
- **Federal Pesticide Regulation**
- **State Pesticide Regulation**
- **International Pesticide Regulation**



New web page about Synergists



Website

NPIC created 25 new web pages this year, including six in Spanish. Significant updates were made to 37 pages, 30 new links were added when high-quality items were identified, and 100% of broken links (323) were fixed by the end of each quarter.

NPIC received more than 6.4 million page views; up 43% from last year.

Pest Pages

As part of the website redesign, the **pest pages** were significantly updated with tabs to allow users to jump to specific information, including pest images, life cycles, and IPM topics.



Vector Control and Zika

In response to increased calls about the Zika virus and mosquito control, NPIC developed additional materials related to mosquitoes and vector control. NPIC released new FAQs and web pages about mosquitoes (see below), a new video about **DEET** (see page 13), and an infographic developed in collaboration with AAPCC about reading pesticide labels, which focused on insect repellents as an example. The infographic is available in **English** and **Spanish**. NPIC also added new contacts to the list of vector control districts (see page 15). NPIC continues to develop new materials based on the most popular topics discussed with callers.

New and significantly updated mosquito-related pages in 2016:

- [How can I avoid mosquito bites?](#)
- [Do I need to spray for mosquitoes at home?](#)
- [Keeping Mosquitoes Out of Your Yard](#)
- [Automatic Misting Systems](#)



Automatic Misting Systems



Keeping Mosquitoes Out of Your Yard

Existing mosquito-related pages:

- [Mosquitoes](#) (biology and control)
- [Choosing and Using Insect Repellents](#)
- [Permethrin Treated Clothing](#)
- [Pesticides Used in Mosquito Control](#)
- [Diseases Transmitted by Mosquitoes](#)
- [Community Agencies that Manage Public Health Pests](#)

How can I avoid mosquito bites?

Covering up and using mosquito repellents can help you **avoid mosquito bites**. If you are **traveling**, ask your doctor if you should consider getting any vaccines before your trip.

Mosquito Repellents

The **CDC evaluated** information about several repellents registered by EPA, and found that these four active ingredients typically provide 'reasonably' **longer-lasting protection**:

- **DEET**
- **Picaridin**
- **Oil of lemon eucalyptus**
- **IR3535**



Do I need to spray for mosquitoes at home?

It depends. If you're concerned about getting sick with a mosquito-borne **disease**, ask yourself a few questions first.

- Are the mosquitoes in your area the same kind that carry diseases? For example, only two species (see photos) have been linked to **Zika** virus outbreaks. **Here** is a rough map of their ranges in the United States based on suitable temperatures. Another **map** shows their presence by county using data collected by scientists.
- Is your community already controlling mosquitoes with a formal program? **Click on your state** to find out. You might even call the vector control agency in your area and ask what they recommend for mosquito control at home.
- Is it the right time of year? Mosquitoes need warm temperatures and water to thrive.
- After spraying, what about the eggs and larvae that will emerge as adults in the next few weeks?
- Are there some **actions** you can take to change the environment, making it hard for mosquitoes to live and breed in your yard or neighborhood?



Aedes aegypti



Aedes albopictus

Protect Your Health Read the Label



MOSQUITO REPELLENT



KEEP OUT OF REACH OF CHILDREN

WARNING: Read cautions on back.

Active Ingredient:
DEET.....7.0%
Other Ingredients.....93.0%

NET 7.5 FL OZ (222 mL)

SIGNAL WORDS

How toxic is the product?

Caution = mildly toxic

Warning = moderately toxic

Danger = highly toxic



Top three pesticide safety tips:

- 1) Read the entire label
- 2) Only apply where the label says it should be applied
- 3) Keep all pesticides in their original containers

ACTIVE INGREDIENTS



What is in the product?

STORAGE & DISPOSAL



How does this product have to be stored? What should I do with the leftovers I don't need?

EPA REGISTRATION NUMBER



What is the unique product number showing that the EPA has approved it?

Repels Mosquitoes, Ticks,
Biting Flies, Gnats, No-see-ums, Chiggers & Fleas

STOP: Read and Follow all directions and precautions on this product label.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

NOTICE: To the extent consistent with applicable law, buyer assumes all responsibility for safety and use not in accordance with directions.

STORAGE AND DISPOSAL

Storage: Store in a cool, dry place, out of reach of children.

Container Disposal: If empty: _____

If partly filled: _____

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals.

First Aid. If in Eyes: _____

If Swallowed: Call a Poison Control Center or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by a Poison Control Center or doctor.

IF YOU SUSPECT A REACTION TO THIS PRODUCT: Discontinue use. Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a Poison Control Center or doctor for treatment advice.

QUESTIONS: For non-emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-858-7378. For emergencies, call the Poison Control Center 1-800-222-1222. Have the product container or label with you when calling a Poison Control Center or doctor, or going for treatment.

EPA Reg. No. XXX-XX-XX

DIRECTIONS FOR USE



How and where should I use the product? How much is okay?

Not following the product's instructions is not only dangerous, but it is illegal!

PRECAUTIONARY STATEMENTS



How can the product be used safely?

FIRST AID



What should I do if it gets in my eyes, mouth, lungs, or on my skin?

npic
NATIONAL PESTICIDE INFORMATION CENTER

1.800.858.7378

For general questions about pesticides, including the potential risk to humans, pets, or the environment, call NPIC at 1-800-858-7378.

POISON
Help
1-800-222-1222

If someone breathes in, swallows, or gets pesticide in the eyes or on the skin, call a poison control center 24/7 at 1-800-222-1222.

PESTICIDE FAQs & COMICS

Frequently Asked Questions (FAQs)

NPIC continued to modernize common pesticide questions and answers by expanding the FAQ web pages. New FAQs were also developed in response to increased interest about Zika and mosquito control, including:

- Do I need to spray for mosquitoes at home? ([English](#) and [Spanish](#))
- How can I keep mosquitoes away while traveling? ([English](#) and [Spanish](#))



Additionally, four new FAQs are now available in Spanish:

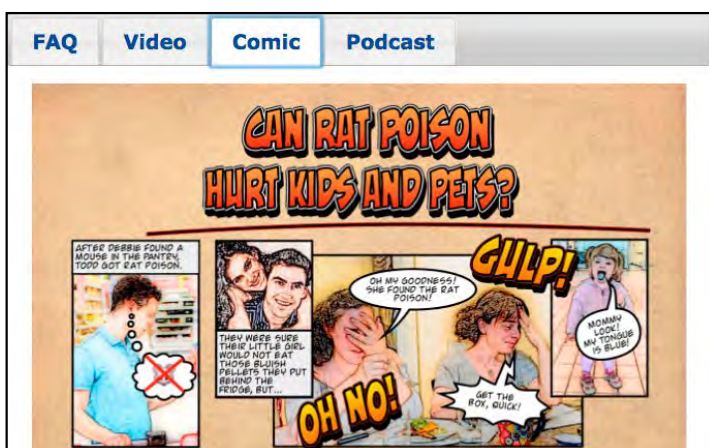
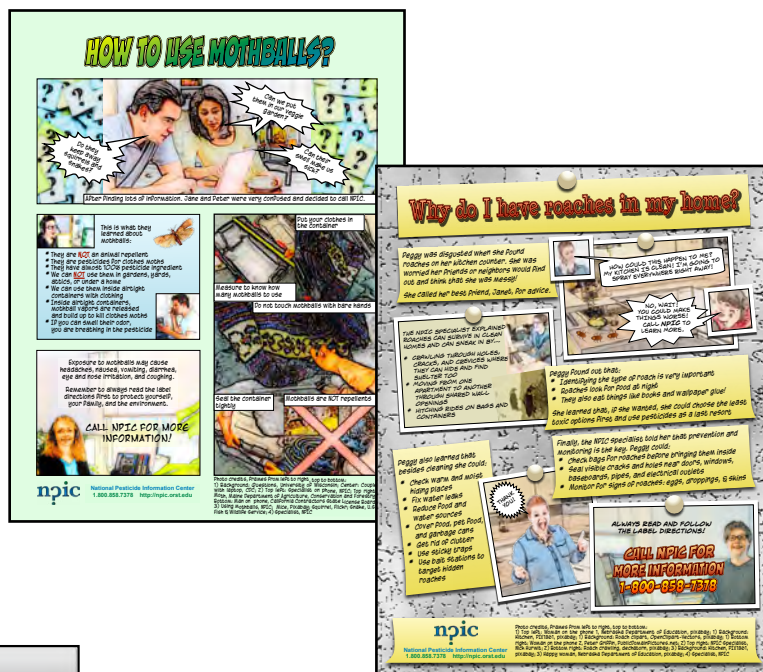
- ¿Cómo puedo lavar pesticidas de mi ropa sucia de trabajo? (How can I wash out pesticides from dirty work clothes?)
- ¿Puedo usar un pesticida si estoy embarazada o tengo un bebé en la casa? (What about using pesticides if I am pregnant or have a baby?)
- ¿Cómo puedo lavar los pesticidas de las frutas y verduras? (How can I wash pesticides from fruit and veggies?)
- ¿Puedo plantar verduras después de usar un herbicida? (Can I plant vegetables after using a weed killer?)

FAQ Comics

NPIC increased efforts to create pesticide FAQ comics, producing three comics in both English and Spanish. New comics are based on topics discussed in NPIC FAQs. Comics are replacing PestiByte podcasts, which had dwindling web traffic compared to previous years. Comics are convenient, one-page topics that can be easily shared and are popular on social media.

This year, NPIC produced three new comics in [English](#) and [Spanish](#).

- How to use mothballs?
- Can rat poison hurt kids and pets?
- Why do I have cockroaches in my home?



Each comic is designed to correspond with a FAQ web page, video, and podcast of the same topic. Suites like these offer a variety of written, visual, and audio content.

SOCIAL MEDIA & VIDEOS

Social Media

NPIC recognizes the importance of social media as a mechanism to provide objective, science-based information about pesticides in a timely way. NPIC is active on [Facebook](#), [Twitter](#), and [YouTube](#).

NPIC developed 318 original posts, averaging six posts per week, and hosted a social media series on permaculture. NPIC engaged with many organizations about Zika by sharing/posting emerging news, tips for reducing mosquito populations, and proper repellent use. Direct inquiries through social media also increased this year.



Through a formal collaboration with the American Association of Poison Control Centers (AAPCC), NPIC amplifies its reach on social media. Weekly meetings are held to coordinate posts around timely topics, and to collaborate on new outreach materials. See the new infographic about reading pesticide labels on page 11.



Videos

In response to increasing interest from the public, NPIC continues to expand its video-based content. This year, NPIC focused on creating short [FAQ videos](#) (1-2 minutes) in English and Spanish about common questions from the public. Additionally, NPIC produced a more detailed video for professionals that work with disinfectants titled "[Reducing Disinfectant Exposures in the Workplace](#)."

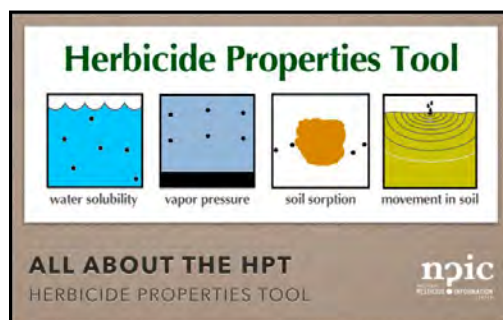


NPIC's most popular new video was about [diatomaceous earth](#) and pesticide safety.



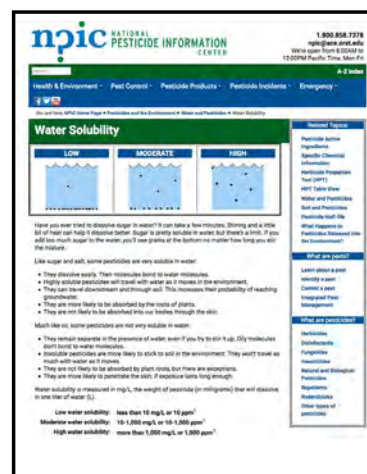
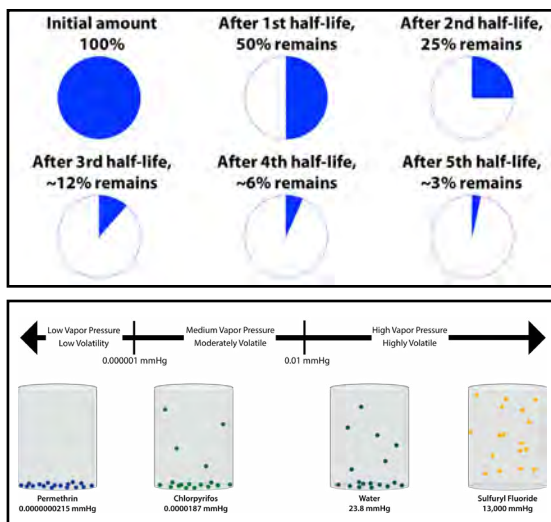
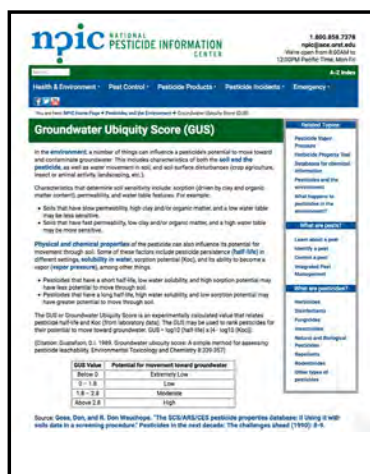
Herbicide Properties Tool (HPT)

Updates were made to the [Herbicide Properties Tool \(HPT\)](#) in 2016. The HPT guides users to scientific data about specific herbicide ingredients. The data, along with the tool's interactive visuals, help users evaluate persistence and the potential for movement of herbicides in the environment. The tool provides values for water solubility, vapor pressure, soil half-life, and more.



NPIC hosted a webinar, titled “[All About the Herbicide Properties Tool](#),” to inform users about source data and tips for using the tool.

Since the HPT's roll out, NPIC has developed a suite of supporting materials to better explain physical and/or chemical properties of herbicides. These include a short [web app preview](#), web pages about [water solubility](#) and [Groundwater Ubiquity Score \(GUS\)](#), as well as fact sheets about [half-life](#) and [vapor pressure](#). Another fact sheet about chemical binding affinity is in production.



Fact Sheets

NPIC developed four new fact sheets relying on up-to-date scientific and regulatory resources. They are written in accessible terms, summarizing complex technical information.

Vapor Pressure

Vapor Pressure	Low	Medium	High
Low Vapor Pressure	Low volatility		
Medium Vapor Pressure		Moderately Volatile	
High Vapor Pressure			Highly Volatile

Sulfuryl Fluoride

What is sulfuryl fluoride?
Sulfuryl fluoride is a colorless, odorless gas. It is used to fumigate buildings and structures to control a wide range of pests. Some of these include bedbugs, termites, ants, and cockroaches.

How does sulfuryl fluoride work?
When sulfuryl fluoride gas is released within a home, it spreads out and seeps into cracks and gaps. This allows it to reach pests throughout the home, including those found within walls and porous materials like wood and fabric. When insects or rodents are exposed to sulfuryl fluoride, it releases fluoride ions into their bodies. With high enough exposure, these ions stop making energy and eventually they die.

Piperonyl Butoxide

What is piperonyl butoxide (PBO)?
Piperonyl butoxide (PBO) is a non-insecticidal synergist. By itself, PBO is not designed to kill insects. Instead, it works with insecticides to increase their effectiveness. PBO is often combined with natural pyrethroids or man-made pyrethroids. It has been used in pesticide products since the 1950s, when it was first registered in the United States.

How does piperonyl butoxide (PBO) work?
PBO is designed to kill insects by itself. It works by blocking the breakdown of some insecticides. PBO stops some of the enzymes and allows insecticides more time to work. This means insects are less likely to recover from the combination of PBO and certain insecticides.

Pesticide Clean-up

How do I clean up pesticides in the home?
If you know which pesticide were used, start by contacting the manufacturer of the product(s). The name of the manufacturer is on the product label. They know whether the product is water-soluble or not. They know all of the product ingredients, and how to clean them up. However, they may not know how to clean up the kind of messes that result from pesticide misuse in homes. For example, it's possible that no one has ever evaluated how agricultural pesticides interact with carpet, linoleum, or wood.

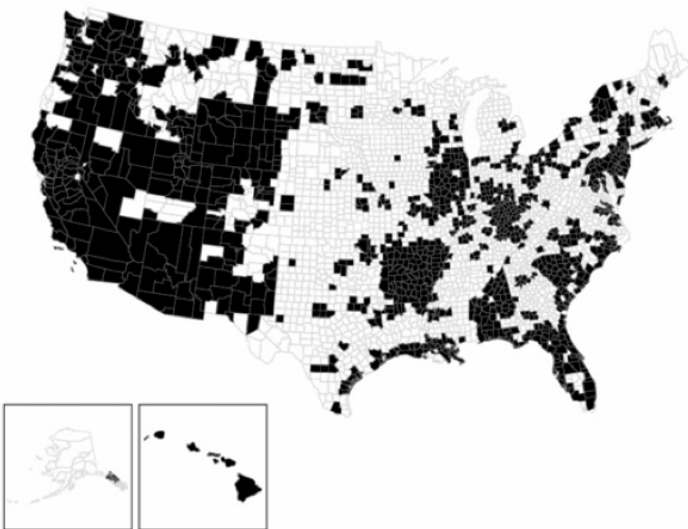
How do I know whether or not cleanup is necessary?
There are no standard cleaning rules for removing unwanted pesticide residue from building materials, and there are many potential dangers to avoid. Consider hiring a professional, especially if pesticides were misused or over-applied in your home.

CONNECTING WITH STAKEHOLDERS

Collaborations - selected examples:

- Colton Bond and Jeff Jenkins collaborated with the Oregon Health Authority to develop an insecticide FAQ about **Japanese beetle eradication**.
- NPIC and AAPCC co-developed an infographic about reading pesticide labels as part of a five-year collaboration. See page 11.
- NPIC collaborated with the Southern IPM Center to embed their pest images into NPIC's new pest pages. See page 9.
- NPIC joined the **National Poisoning Prevention Council** and collaborated with council members to develop and distribute information about poisoning prevention events via social media.
- Alicia Leytem collaborated with petMD.com to develop the article, "**Can boric acid kill fleas?**"
- NPIC collaborated with the Centers for Disease Control & Prevention (CDC) to create a map of vector control districts.

Counties with reported vector control districts (CDC)



Recently, NPIC added 171 new contacts to the list of vector control districts and is communicating with CDC about updating the map.

Japanese Beetle Insecticide FAQs



- What are Japanese Beetles?
- What is Acelepryn G®?
- What is chlorantraniliprole?
- What about the 'other' or so-called inert ingredients in Acelepryn G®?
- When will chlorantraniliprole be applied in my neighborhood? How will it be done?
- What should I do before, during and after the application of Acelepryn G® to my property?



Presentations - selected examples:

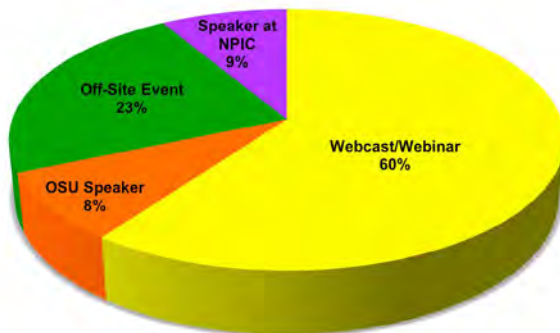
- Alicia Leytem delivered a webinar for Poison Control professionals about NPIC services and registered pesticides titled: **How can NPIC complement the work of poison centers?**
- Kaci Buhl spoke about NPIC (risk communication and cleanup topics) at the Association of Structural Pest Control Regulatory Officials (ASPCRO) annual meeting in Santa Fe, NM.
- Brittany Hanson spoke about available resources for beneficial insects and identifying resource gaps at the National Conference on Urban Entomology in Albuquerque, NM.
- Amy Hallman led a meeting with EPA's Antimicrobial Division to highlight NPIC services and discuss antimicrobial issues and resources.
- Brittany Hanson delivered a workshop/webinar about the Herbicide Properties Tool to answer users' questions and showcase updated features. See page 14.
- Kaci Buhl spoke about NPIC communication methods at the National Conference on Urban Entomology in Albuquerque, NM.

Continuing Education

NPIC places emphasis on continuing education for pesticide specialists in order to maintain the highest level of service, relying on the most up-to-date science and regulatory information. Building and maintaining a strong knowledge base is a significant part of each specialist's position description (25%).

Examples of events attended by NPIC staff in 2016 include a Brain and Behavior Psychology course at OSU, a webinar titled "A Strategy for Making Online Content Accessible" from Michigan State University Extension, and a Zika virtual workshop titled "Providing PMPs with Business, Technical, and Messaging Expertise in Preparation for the Mosquito Season" by the National Pest Management Association (NPMA).

NPIC staff attended 35 events for continuing education this year.



Oregon State University provided diverse opportunities for continued learning, including graduate seminars, visiting lecturers, faculty presentations, and regional conferences. Weekly staff meetings allow NPIC staff to discuss coding consistency, trends in inquiries, and new research findings.

Specialists stay current with the scientific, regulatory, and industry aspects of pesticides by monitoring relevant journals, pest control industry magazines, social media, and list-serves. Each day, a staff member monitors the headlines to identify pesticide-related news items and distributes the most relevant items to the team.

Active Ingredient (AI) Files

Piperonyl Butoxide

Mecoprop

Prodiamine

Chlorothalonil

NPIC monitors the Federal Register and evaluates relevant dockets for new science and regulatory information. Documents are captured for quick reference in our collection of Active Ingredient (AI) files. In 2016, NPIC added over 160 new documents to AI files. The collection now includes over 15,000 documents in 1,092 AI files.

NPIC performed chemical-specific literature searches in order to update 20 active ingredient files and open five additional new files. On average, NPIC staff invested over 10 hours per week monitoring Federal Register Notices, affiliated dockets, newsletters, and selected journals of relevance.

NPIC also takes advantage of the Oregon State University Library, monitoring a wide variety of peer-reviewed sources for the latest research on toxicology, ecological impacts, and pest management science.

QUALITY ASSURANCE / QUALITY CONTROL

Pesticide Inquiry Database (PID)

Pesticide Specialists perform data entry on a daily basis, documenting inquiries and incidents. A Quality Assurance/Quality Control specialist reviews the data, making corrections as needed to maintain a consistent approach. The specialist collaborates with Dr. Fred Berman (DVM) on human and animal incidents. NPIC follows a quality assurance plan that includes annual staff evaluations, quantitative scores for 25 measures of data quality, and routine log coding exercises with staff.

Over 1,900 pesticide-related incidents were documented and reviewed this year. See pages 18-37 for detailed information about the wide range of inquiries and incidents. In addition to quarterly and annual reporting, NPIC provided 21 special reports about incidents and inquiries upon request, including 14 reports for EPA and 7 reports for federal/state agencies and/or universities. All reports were provided within ten business days, unless otherwise negotiated. Selected examples are highlighted in the text box below.

Special Reports from the PID, selected examples (data recipient):

- Human pesticide incidents in Georgia 2013-2015 (Georgia Department of Agriculture)
- Mothball incidents 2011-2015 (US EPA)
- Aluminum phosphide incidents 2006-2015 (Colorado Department of Agriculture)
- All human incidents related to atrazine, simazine, and propazine (US EPA)
- Incidents related to total release foggers (US EPA)
- Flea and tick spot-on incidents in Oregon 2011-2015 (Oregon Department of Agriculture)
- Veterinary incidents related to aerial vector control applications (Centers for Disease Control and Prevention)
- Incidents related to 25(b) minimum risk products nationwide and in New York state (Cornell University with New York State Department of Environmental Conservation)

Local Contacts

NPIC maintains current contact lists for many organizations in order to provide the best local referrals. NPIC staff performed quality assurance to verify/update 3,300 contacts this year. In preparation for questions about Zika and mosquito control, NPIC completed a thorough search of vector control districts across the US, adding 171 new contacts to the already-extensive contact list. See page 15.

Pesticide Regulatory Agencies

State Environmental Agencies

County Extension Offices

State Health Departments

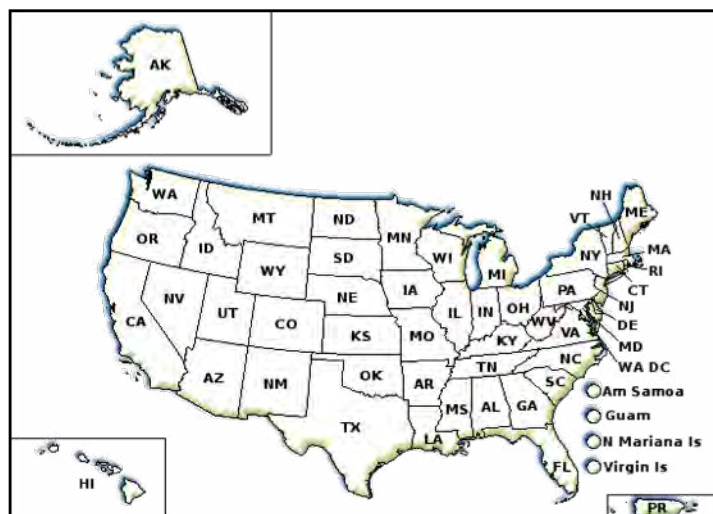
Mosquito/Vector Control Agencies

Regional EPA Contacts

Master Gardener Coordinators

Contacts for Information about the Worker Protection Standard in Agriculture & Forestry

Household and Hazardous Waste



Introduction to Inquiry Data

Pesticide specialists create a record for every inquiry, which is entered into the NPIC Pesticide Inquiry Database (PID). The PID is a relational database, designed and built by NPIC. Custom reports may be available based on many of the following items listed below.

There are three types of inquiries received by NPIC:

- Requests for information about pesticides and related issues
- Inquiries or reports about pesticide incidents
- Issues that are not related to pesticides

The type and amount of information entered into the PID depends on the type of inquiry.

NPIC aims to collect the following information for all pesticide-related inquiries:

- The inquirer's zip code or state
- The type of person (general public, government, or medical personnel, etc.)
- The type of question (health risk, regulatory compliance, label clarity, etc.)
- The EPA Registration number, product name and/or active ingredient name(s)
- The actions performed (verbal information, referrals, transfers, etc.)
- The way the person found NPIC (internet, phone book, etc.)

For pesticide incidents, NPIC makes every effort to collect these additional data:

- The type of incident (exposure route, misapplication, spill, etc.)
- The type of exposed entity (person, animal, building, etc.)
- The location of the incident (home inside, home outside, retail store, school, etc.)

If a person or animal was exposed to a pesticide, NPIC specialists attempt to collect additional information. However, they may not ask for all of these items during emergent medical events.

- A time line describing the exposure duration, symptom onset, and resolution
- The person or animal's age, symptoms, and gender
- The species, breed, and weight of animals

When symptoms are reported and the active ingredient(s) are known, specialists evaluate the relationship between them to assign a **certainty** index. The certainty index is an estimate by NPIC as to whether the reported symptoms were consistent or inconsistent with published reports/materials, in the context of the reported pesticide exposure, or whether the signs and symptoms were unrelated. Specialists use the following tools when assigning the certainty index:

- A standard set of criteria, defined in NPIC training and procedures
- Published exposure reports and case studies
- Input from Dr. Fred Berman for human and animal exposure incidents
- Input from the PID QA/QC specialist

Symptoms are also characterized in terms of their **severity** in the PID. The criteria for defining major, moderate, and minor symptoms were adapted from similar mechanisms used by poison control centers in the National Poison Data System, and by the U.S. EPA in the Incident Data System.

The following pages include details about the incidents and inquiries documented by NPIC from February 15, 2016 to February 14, 2017.

Disclaimers and explanatory information:

- Material presented in this report is based on information provided to NPIC by individuals who contacted NPIC, primarily by phone or email.
- None of the information has been verified or substantiated by independent investigation by NPIC staff, laboratory analyses, or by any other means. This is similar to other self-reported public health monitoring programs, including the incident data recorded by poison control centers.
- If a person alleges/reports a pesticide incident, it will likely be recorded as an incident by NPIC. To meet the criteria, the person must have sufficient knowledge about the scenario, and it must be reported within two years of its occurrence.
- NPIC defines an incident in terms of public health. The NPIC definition includes any unintended exposure (i.e., child ate a mothball), intended exposures with adverse effects (i.e., illness in pets treated with flea/tick products), spills, and potential misapplications (i.e., product intended for ornamental plants was applied to vegetables in the home garden.)
- Less than 2% of the time, callers indicate their main purpose for contacting NPIC was to report a pesticide incident. More often, they indicate their main purpose for contacting NPIC is to obtain technical information. See Table 6 on page 25. Regardless, NPIC specialists make every effort to collect complete information about scenarios that meet the NPIC incident definition. Approximately 17% of inquiries to NPIC are coded as incidents.
- NPIC specialists are trained to recognize scenarios that could potentially lead to enforcement actions. In these cases, the standard operating procedure requires a referral to the appropriate State Lead Agency. See Table 7.3 on page 26.
- NPIC qualifies the information received by assigning a certainty index. The certainty index is an estimate by NPIC as to the likelihood that the reported signs and symptoms were consistent or inconsistent with published reports/materials, in the context of the reported pesticide exposure. See page 32.
- NPIC makes no claims or guarantees as to the accuracy of the CI or other information presented in its reports, other than that NPIC has done its best to accurately document the information provided to NPIC.
- It is occasionally necessary to collect personally identifiable information (PII) in order to respond to inquiries, for example, by voice-mail, email, or mail. Users of web-based incident reporting portals may have the option to submit PII as part of their reports. In all other cases, it is NPIC policy to refrain from collecting/documenting PII from people who contact NPIC through public channels.
- Through its cooperative agreement with EPA, NPIC provides special reports upon request. Special reports may also be provided to other cooperative agreement holders with EPA, such as state-level Departments of Agriculture/Environmental Protection. Other entities with interest in special reports should contact NPIC to inquire about the procedure and possible costs.

MONTHLY INQUIRIES

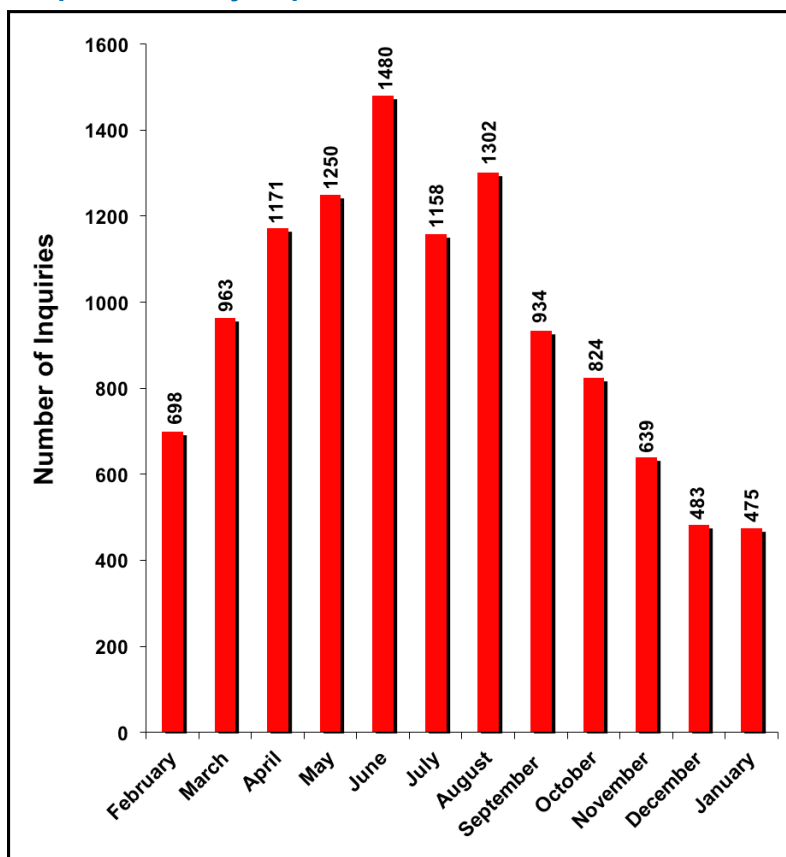
1. Monthly Inquiries

NPIC received 11,337 inquiries during this grant year. Graph 1 shows the number of inquiries received for each month. Seventy-one percent (71%) of the inquiries were received between April and October, concurrent with the part of the year when pest pressures are highest.

Table 1. Monthly inquiries

Month	Total
February	698
March	963
April	1171
May	1250
June	1480
July	1158
August	1302
September	934
October	824
November	639
December	483
January	475

Graph 1. Monthly inquiries



TYPE OF INQUIRY / ORIGIN OF INQUIRY

2. Type of Inquiry

NPIC classifies inquiries as information, incident, or other (non-pesticide) inquiries. A pesticide spill, misapplication, contamination of a non-target entity, or any purported exposure to a pesticide, regardless of injury, is classified as an incident.

The types of inquiries are summarized in Table 2 and Chart 2.

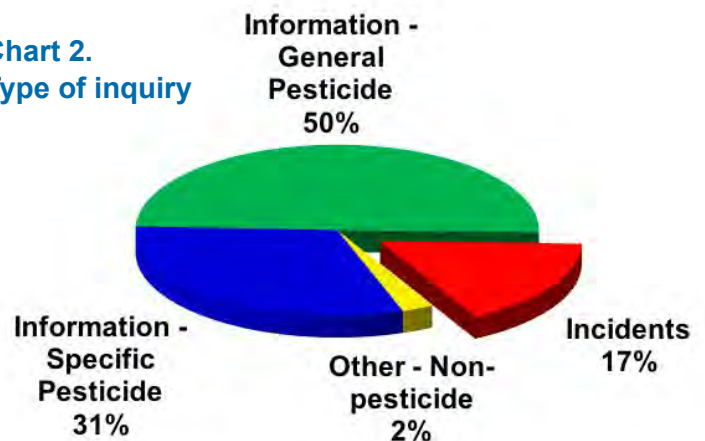
The majority of inquiries (9,149 or 81%) were informational inquiries about pesticides or related issues (Chart 2). NPIC responded to 3,513 (31%) information inquiries about specific pesticides. NPIC responded to 5,636 (50%) information inquiries relating to pesticides in general.

NPIC documented 1,903 incidents involving pesticides (17%). Pesticide Specialists routinely provide requested information, evaluated the need for any referrals, and asked several scoping questions to document the circumstances surrounding the reported incidents.

Table 2. Type of inquiry

Type of Inquiry	Total
Information - General Pesticide	5636
Information - Specific Pesticide	3513
Incidents	1903
Other - Non-Pesticide	285
Total =	11337

Chart 2. Type of inquiry



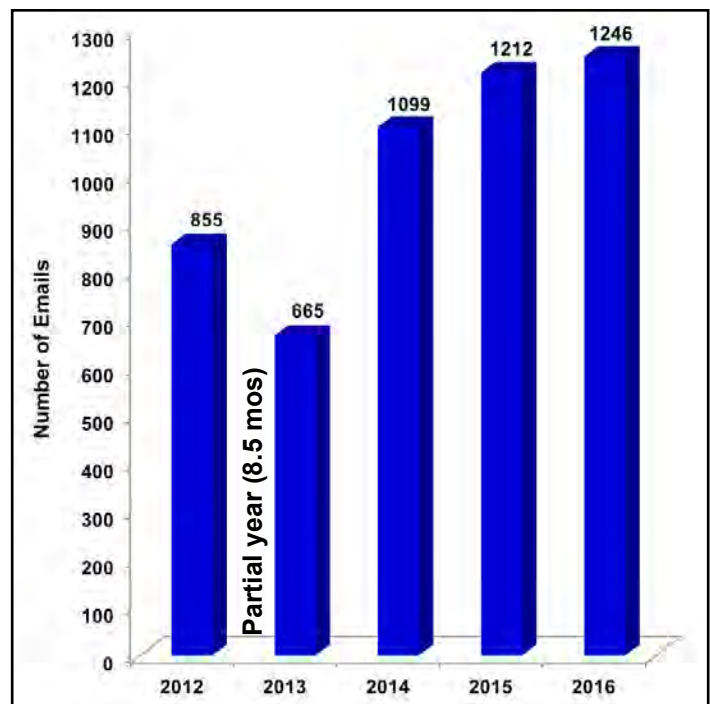
3. Origin of Inquiry

Table 3 summarizes the origin of inquiries received by NPIC. Over 75% of inquiries were received by telephone.

Table 3. Origin of inquiry

Origin of Inquiry	Total
Telephone	8772
Voice Mail	1313
Email	1246
Mail	6
Total =	11337

Graph 3. Inquiries received by email



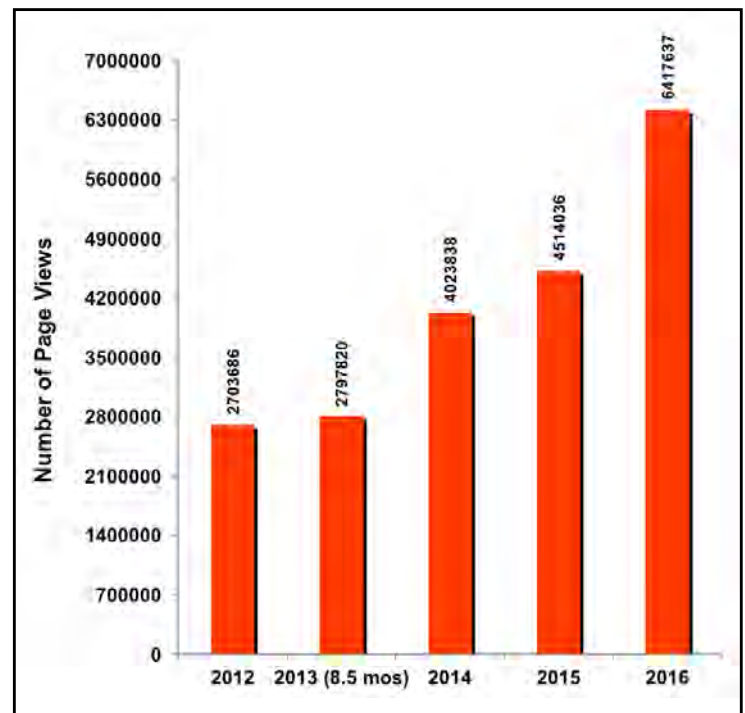
4. Website Access

The NPIC website attracted more than 2.8 million unique visitors viewing 6,417,637 pages during this period.

Almost all of the page views originated from queries on popular search sites (46.5%), or were connected with NPIC from a bookmark (43%) or other direct link (i.e., shared via email). The most popular search terms used to reach NPIC were “diatomaceous earth,” “DDT,” and “glyphosate.”

Visits to the website varied greatly in duration, with 126,747 visits lasting longer than 15 minutes. The average visit duration was approximately 2 minutes.

Graph 4.1. Page views

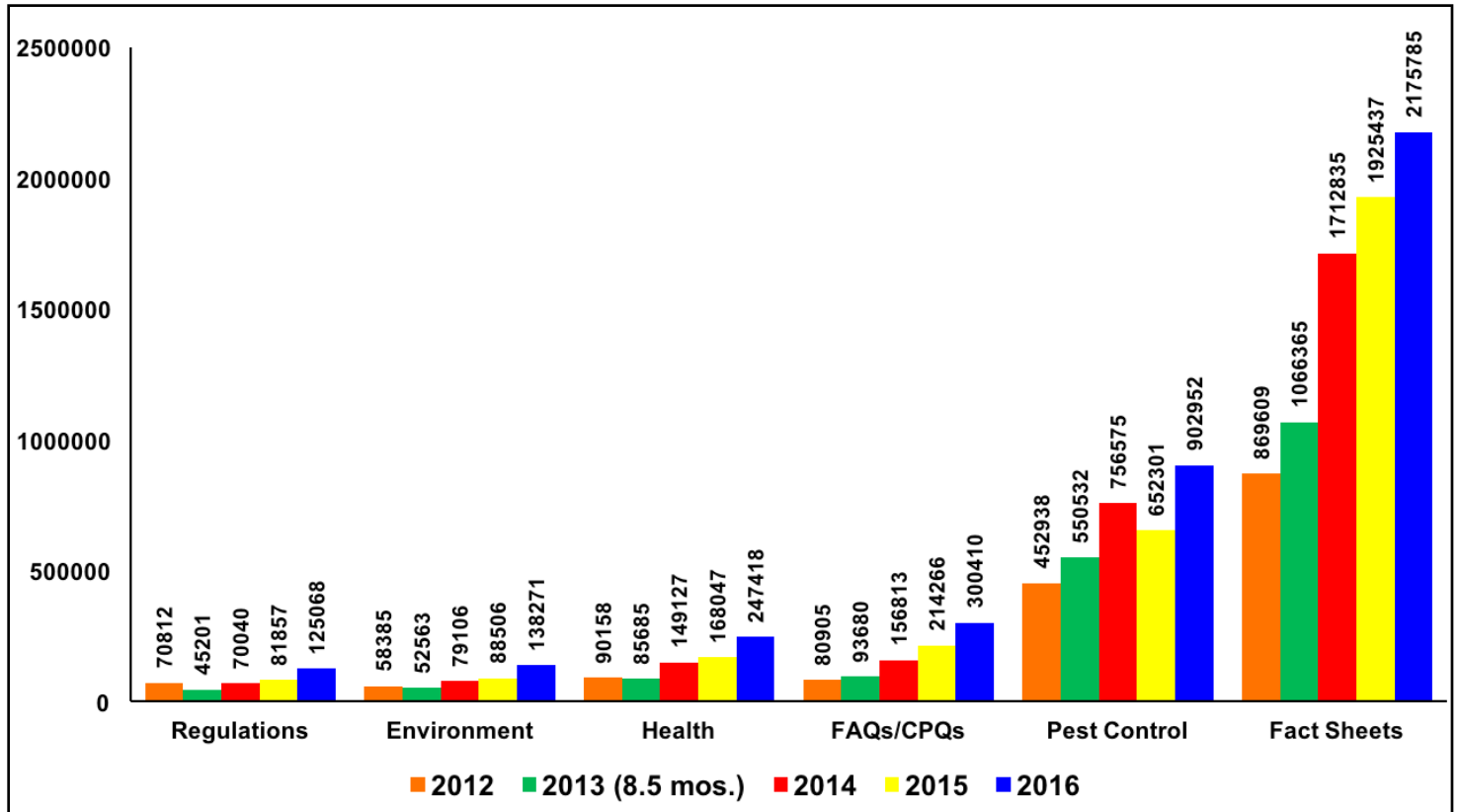


The most popular pages viewed were Local Contacts (353,667 views), the NPIC home page (296,801 views), and the Diatomaceous Earth general fact sheet (205,217 views).

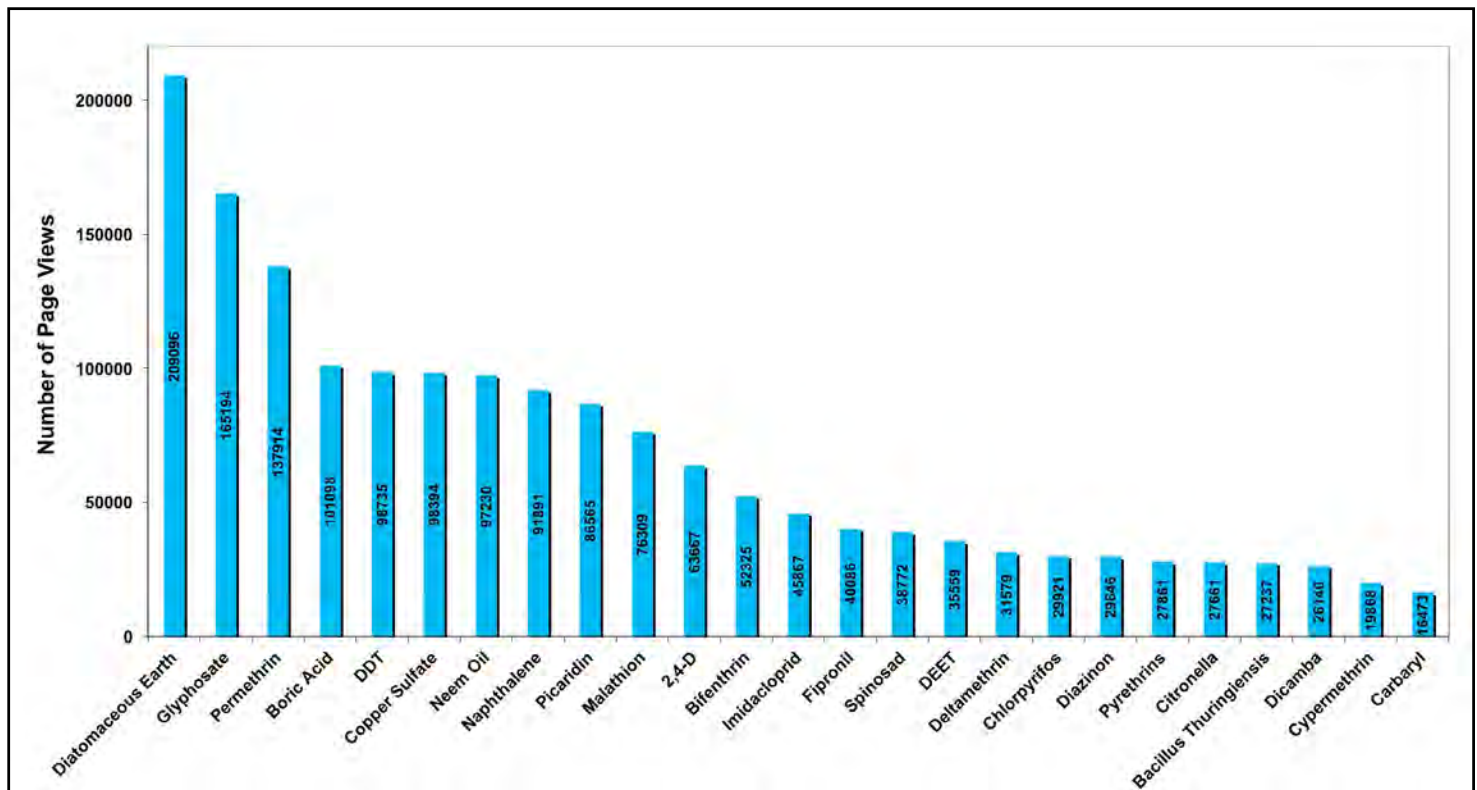
Table 4. Selected page views

Page Accessed	English page views	Number of pages available	Spanish page views	Number of pages available
Fact Sheets	2,151,901	191	23,884	6
Pest Control	662,638	59	240,314	36
Health and Safety	219,796	27	27,622	21
FAQs/CPQs	142,656	76	157,754	75
Regulations	113,065	24	12,003	6
Environment	107,301	28	30,970	7

Graph 4.2. Top 6 web pages viewed



Graph 4.3. Top 25 active ingredient fact sheet pages viewed



TYPE OF INQUIRER

5. Type of Inquirer

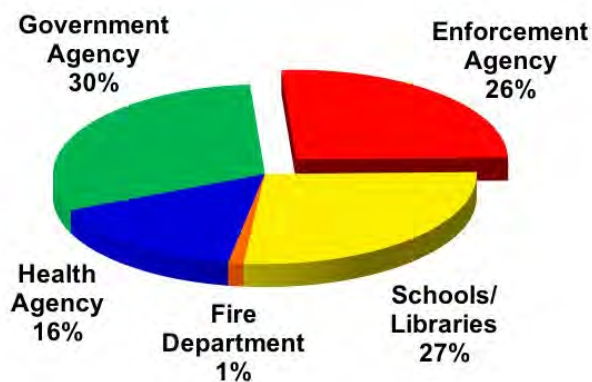
Table 5 summarizes the profession/ occupation of individuals contacting NPIC. The majority of inquiries to NPIC are from the general public. Of the 11,337 inquiries received, there were 9,966 (88%) from the general public, 256 (2.3%) from federal, state or local government agencies, 214 (1.9%) from pesticide manufacturers, and 159 (1.5%) from human and animal medical personnel.

Chart 5 summarizes the 256 governmental entities that contacted NPIC during the grant year. Health agencies include health departments and WIC personnel. Government agencies include city, county, and other government entities without enforcement roles. Enforcement agencies include the U.S. EPA, state pesticide regulatory agencies, and police, among others.

Table 5. Type of inquirer

Type of Inquirer	Total
General Public	9966
Federal/State/Local Agencies	
Government Agencies	78
Schools/Libraries	69
Enforcement Agencies	66
Health Agencies	40
Fire Department	3
Medical Personnel	
Human Medical	118
Animal Vet./Clinic	53
Migrant Clinic	1
Other	
Pesticide Mfg./Mktg. Co.	214
Pest Control	102
Farm	72
Lab./Consulting	66
Media	64
Retail Store	59
Unions/Info. Service	36
Lawyer/Insurance	18
Environmental Org.	18
Non-migrant Ag. Worker	10
Master Gardener	7
Other	277
Grant Year Total =	11337

Chart 5. Inquiries from federal / state / local agencies (Total: 256)



TYPE OF QUESTION

6. Type of Question

The questions received at NPIC are most often related to health (e.g., effects, risk, etc.) and application (e.g., methods, label clarity, etc.). “Other” questions (1,960) include all wrong numbers and people seeking their pest control companies.

Questions about regulations (1,149) range from “How do I get a new product registered?” to “Can the authorities make my neighbor stop spraying?” Questions about how to follow pesticide label directions were coded as ‘Application’ questions (1,569).

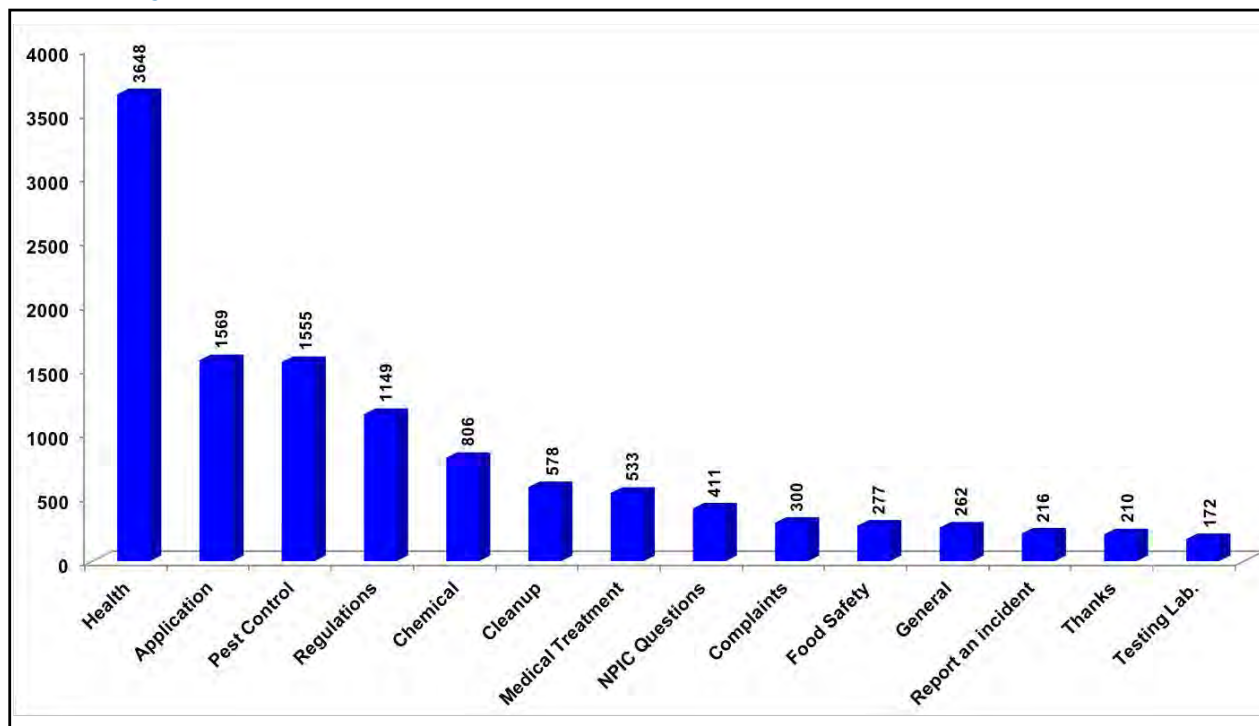
People contacted NPIC in order to report a pesticide incident 216 times with no specific question. In these cases, NPIC provides appropriate local referrals for enforcement, as needed.

Inquiries may often involve more than one type of question. Inquirers asked 13,959 questions during this grant year in the course of 11,337 inquiries.

Table 6. Type of question

Type of Question	Total
Health	3648
Safety/Application	1569
Pest/Crop	1555
Regulations	1149
Chemical	806
Cleanup	578
Treatment	533
NPIC Questions	411
Complaints	300
Food Safety	277
General	262
Report an incident	216
Thanks	210
Testing Lab.	172
Disposal	122
Harvest Intervals	67
Pros and Cons	58
Inerts	55
WPS	11

Graph 6. Type of question



ACTIONS TAKEN

7. Actions Taken

Primary actions:

NPIC Specialists respond to inquiries in a variety of ways. The primary actions are summarized in Table 7.1. Most inquiries (9,980) were answered by providing verbal communication. Information was also sent via email in 1,425 cases, and by mail in 88 cases. Upon request, NPIC brochures and other promotional materials were mailed to people seven times in this period.

Table 7.1. Primary action taken

Primary Action Taken	Number of Inquiries
	2016
Verbal Info	9980
Emailed Info	1425
Transferred to Specialist / Voicemail	155
Handled Inquiry in Spanish	145
Mailed Info	88
Transferred to EC / PC	43
Sent NPIC Outreach Material(s)	7
Interpreted via Language Line Svs	6
Faxed Info	3

Risk reduction actions:

NPIC keeps track of certain conversation topics aimed at reducing pesticide risk. Specialists documented 5,831 risk reduction actions, detailed in Table 7.2.

Table 7.2. Risk reduction actions

Risk Reduction Action Taken	Number of Inquiries
	2016
Discussed Ways to Minimize Exp.	2629
Discussed Following the Label	2300
Discussed IPM Concepts	743
Discussed Environmental Protection	159

Referrals to other organizations:

The number of referrals to various organizations is presented in Table 7.3. Specialists use their training and SOPs to evaluate the need for referrals, providing them only when the requested information is outside NPIC boundaries and there is an appropriate resource available to provide the information (i.e., “manufacturer/distributor” for detailed application instructions and product complaints, “cooperative extension” for pest control advice, and “state pesticide regulatory agencies” for enforcement).

Local resources are provided whenever possible, and contact information is included. See page 17 for information about how NPIC maintains and delivers appropriate referral information.

Table 7.3. Referrals to other organizations

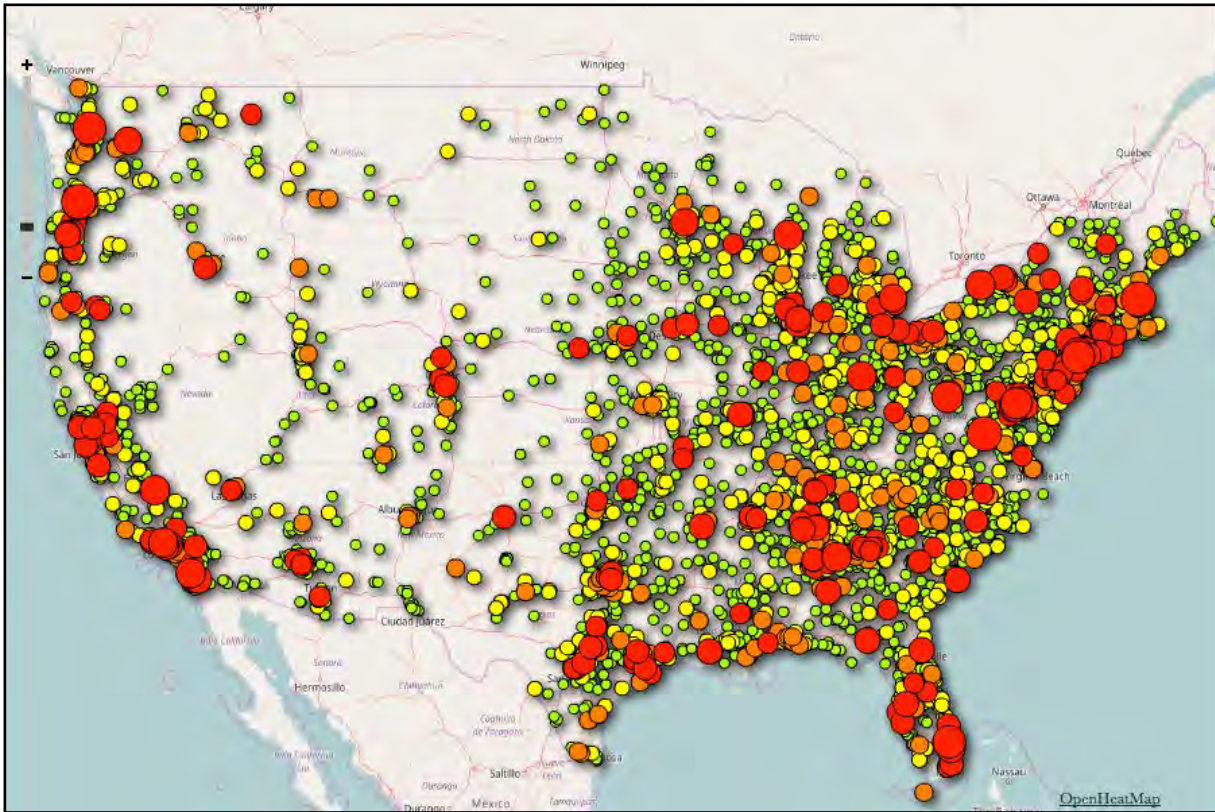
Organization Name	Number of Inquiries
	2016
Manuf. / Distributor Contact	2548
NPIC Website	1286
County Extension Contact	1067
State Lead Contact	908
Other Org. Contact	606
Poison Control Contact	586
EPA Website	350
Dept of Health Contact	283
EPA HQ / OPP Contact	276
EPA Region Contact	208
Other State Agency Contact	143
Hazardous Waste Contact	126
Other Fed Agency Contact	92
Animal Poison Contact	90
OSHA Contact	12

INQUIRIES BY STATE

8. Inquiries by State

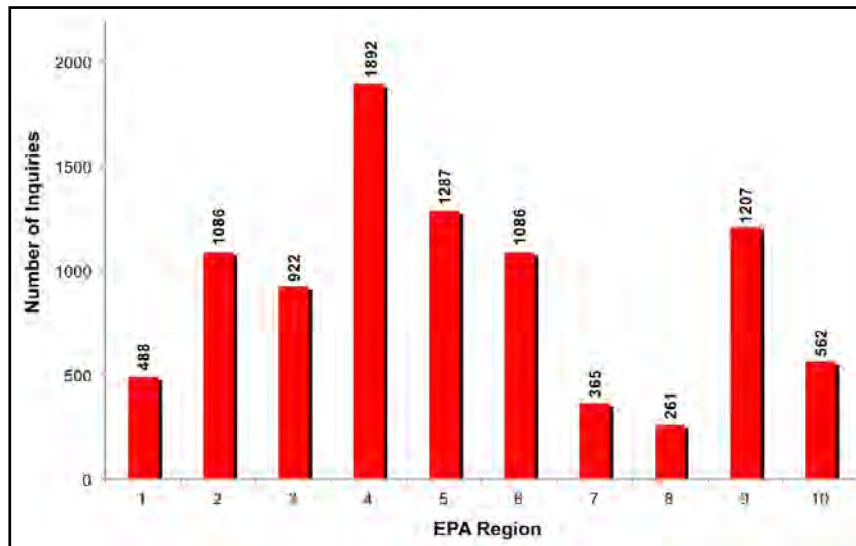
The map below shows the number of inquiries received by NPIC from each state. The largest number of inquiries came from California, followed by Texas, New York, and Florida. In addition to the states, NPIC received inquiries from Canada (76) and other countries (265).

The map below represents origin of call by zip code; green dots represent one inquiry, yellow dots represent two inquiries, orange dots represent three inquiries, and red dots represent four inquiries.



Graph 8 summarizes inquiries by EPA region. NPIC received 20.6% of inquiries from Region 4, 14.1% from Region 5, 13.2% from Region 9, 11.9% from Region 2, and 11.9% from Region 6.

Graph 8. Inquiries by EPA region



TOP 25 AIs FOR ALL INQUIRIES

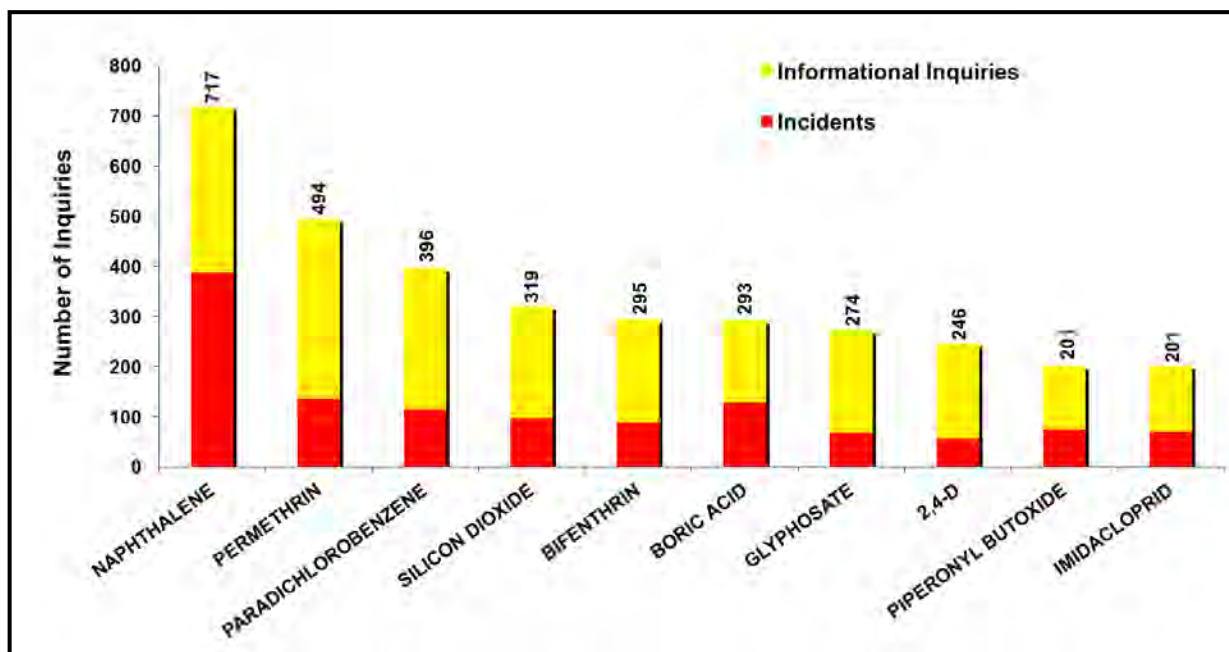
9. Top 25 Active Ingredients for All Inquiries

When inquiries to NPIC involve discussion of a specific product or active ingredient, Specialists record the product and the active ingredient in the PID. Naphthalene was discussed in more inquiries than any other single active ingredient this year (Table 9, Graph 9). Of the 717 inquiries involving naphthalene, 388 (54.1%) were incidents. Note that an inquiry may involve discussion of several active ingredients. Graph 9 illustrates the number of informational inquiries and incident inquiries for the top active ingredients that NPIC received during the grant year.

Table 9. Top 25 active ingredients for all inquiries

Active Ingredient	Total Inquiries	Incidents	Information Inquiries
NAPHTHALENE	717	388	329
PERMETHRIN	494	136	358
PARADICHLOROENZENE	396	115	281
SILICON DIOXIDE	319	96	223
BIFENTHRIN	295	88	207
BORIC ACID	293	128	165
GLYPHOSATE	274	69	205
2,4-D	246	56	190
PIPERONYL BUTOXIDE	201	75	126
IMIDACLOPRID	201	70	131
MALATHION	184	63	121
PYRETHRINS	182	50	132
FIPRONIL	176	32	144
DELTAMETHRIN	172	45	127
DICAMBA	170	43	127
CYFLUTHRIN	138	50	88
MECOPROP	129	26	103
CARBARYL	105	37	68
SULFUR	100	60	40
LAMBDA-CYHALOTHRIN	99	33	66
NEEM OIL	99	24	75
BACILLUS THURINGIENSIS	93	8	85
PYRIPROXYFEN	88	32	56
COPPER SULFATE	85	9	76
CYPERMETHRIN	82	43	39

Graph 9. Top 10 pesticide active ingredients for all inquiries



INCIDENT TYPE

10. Incident Type

A pesticide incident may involve a spill, misapplication, exposure, or any combination of these events.

There were 2,577 pesticide exposures and 921 accidents. Charts 10.1 and 10.2 provide further details. Among reported exposures, inhalation was the most common route of exposure (50.5%), followed by dermal contact (21.2%) and ingestion (15.2%). When a specific exposure route could not be identified, specialists documented an “unknown/many” exposure route (4.0%).

Indoor spills (70) were reported more often than outdoor spills (29). Among reported misapplications (751), 80% were misapplications by the homeowner or resident. Misapplications by the homeowner increased in 2016 (622) compared to 2015 (515), and the number of incidents involving drift increased from 2015 (40) to 2016 (71).

Chart 10.1. Pesticide exposures (Total: 2,577)

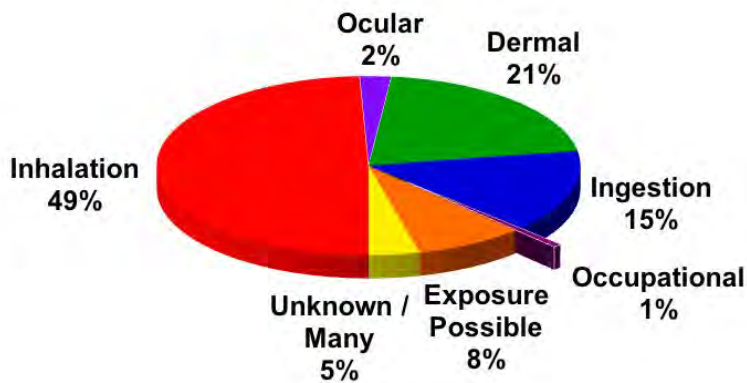


Chart 10.2. Pesticide accidents (Total: 921)

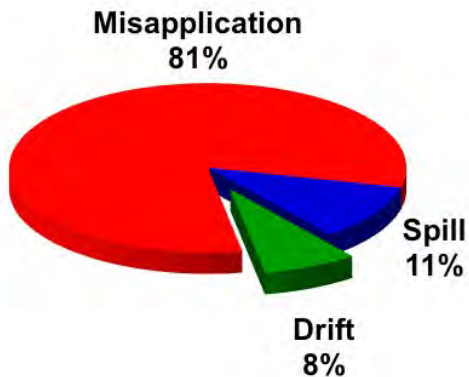


Table 10. Incident Type

Type of Incident	Total
Exposures	
Inhalation	1271
Dermal	532
Ingestion	382
Exposure Possible	213
Unknown/Many	100
Ocular	62
Occupational	17
Accidents	
Misapp. - Homeowner	622
Misapp. - Other	88
Drift	71
Spill - Indoor	70
Misapp. - PCO	41
Spill - Outdoor	29
Fire - Home	0
Fire - Other	0
Industrial Accident	0
Other	109
Total =	3607

TOP 25 AIs FOR INCIDENTS

11. Top 25 Active Ingredients for Incidents

The most common active ingredients reported during incident inquiries are listed in Table 11. The table identifies the number of exposures or accidents involving humans, animals, and other entities, such as environmental entities and property. Naphthalene and paradichlorobenzene were involved in more reported exposures/accidents than any other active ingredients which are both commonly found in mothballs and similar products.

In Table 11, the top 3 active ingredients for human and animal exposures are highlighted below. Naphthalene, paradichlorobenzene, and boric acid were involved in the highest number of exposures for human and animal incidents.

Table 11. Top 25 active ingredients for incidents to NPIC¹

Active Ingredient	Total	Human Exposures	Animal Exposures	Other Accidents
NAPHTHALENE	1179	549	62	443
PARADICHLOROBENZENE	866	393	44	338
BORIC ACID	229	83	41	13
PERMETHRIN	196	81	34	36
BIFENTHRIN	143	64	25	24
SILICON DIOXIDE	142	67	20	18
IMIDACLOPRID	130	43	32	16
GLYPHOSATE	108	35	17	22
PIPERONYL BUTOXIDE	101	54	19	10
2,4-D	87	34	8	19
SULFUR	85	37	4	29
CYFLUTHRIN	81	50	7	15
PYRETHRINS	76	39	11	9
MALATHION	74	34	4	25
BROMETHALIN	73	2	35	1
DICAMBA	70	17	9	18
DELTAMETHRIN	68	38	9	7
CYPERMETHRIN	61	28	9	13
CAPSAICIN	55	30	2	9
IRON PHOSPHATE	55	2	25	3
ZINC PHOSPHIDE	55	2	14	14
LAMBDA-CYHALOTHRIN	53	16	10	13
FIPRONIL	52	18	10	8
PYRIPROXYFEN	51	18	15	2
METHOPRENE	506	9	22	2

¹ Note that incidents may include multiple humans, animals, and other entities. See Table 9 for a count of incident inquiries by active ingredient.

LOCATION & ENVIRONMENTAL IMPACT

12. Locations of Exposure or Accident

For incidents, specialists record the location of exposure or accident. Of the 3,347 locations where exposures or accidents were documented, 90.1% occurred in the home or yard, and 2.2% occurred in an agricultural setting. Table 12 identifies the number of exposures or accidents reported to NPIC in a variety of other locations.

Table 12. Location of exposure/accident

Location	Total
Home or Yard	3017
Agriculturally Related	74
Office Building/School	66
Other	42
Roadside/Right-of-Way	35
Nursery, Greenhouse	25
Retail Store/Business	24
Park/Golf Course	22
Industrially Related	18
Pond, Lake, Stream Related	8
Food Service/Restaurants	6
Health Care Facility	5
Treated Water	5
Total =	3347

13. Environmental Impact

Table 13 presents the type of incidents reported for each kind of environmental entity. The most common environmental incident reported to NPIC involves pesticide misapplications to buildings by the residents (330). Many of these are related to mothballs and similar products.

Table 13 - Reported environmental impacts

	Misapplication by Resident	Misapplication by PCO	Misapplication by Other	Misapplication by Unknown	Spill - Indoor	Spill - Outdoor	Drift	Plant Exposure	Other
Agricultural Crop	4	1	1	2	0	0	10	7	0
Building-Home/Office	330	12	53	4	48	4	3	0	1
Home Garden	95	9	4	1	0	0	14	39	3
Home Lawn	53	4	5	1	0	7	13	18	1
Natural Water	1	0	0	0	0	1	1	0	0
Property	39	7	3	1	14	4	5	0	0
Soil/Plants/Trees	63	5	6	1	0	9	18	38	0
Treated Water	6	1	0	0	0	0	0	0	2
Vehicle	8	2	3	0	4	1	5	0	0

CERTAINTY INDEX

14. Certainty Index

Table 14 and Graph 14 summarize the certainty index (CI) assignments for all incidents that were eligible to be classified. An incident is eligible to be classified if there was an exposed person or animal with reported signs/symptoms, and at least one active ingredient was known.

Of the total number of entities assigned a CI (3,019), 17.3% of the cases were assigned an index of consistent, 9.9% were assigned an index of inconsistent, and 72.8% were considered unclassifiable. Because none of the information reported to NPIC has been verified or substantiated by independent investigation, uncertainty is common. This is the case with many forms of self-reported data, which are often used for monitoring public health. As a result, the certainty index assignment for definite is rarely assigned.

All certainty index assignments are reviewed by quality assurance specialists. Dr. Berman provides additional consultation for human and animal incidents.

What is the Certainty Index?

The certainty index is an estimate by NPIC as to the likelihood that the reported signs and symptoms were **consistent** or **inconsistent** with published reports/materials, in the context of the reported pesticide exposure.

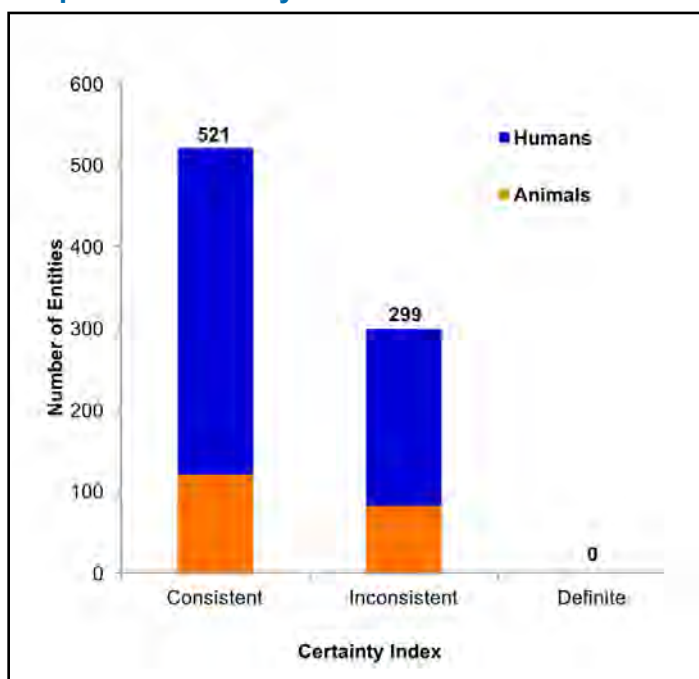
The certainty index is unclassifiable when one or more of the following criteria apply:

- An exposure occurred, but no symptoms were reported
- No active ingredient could be identified
- The presence or absence of symptoms was unknown

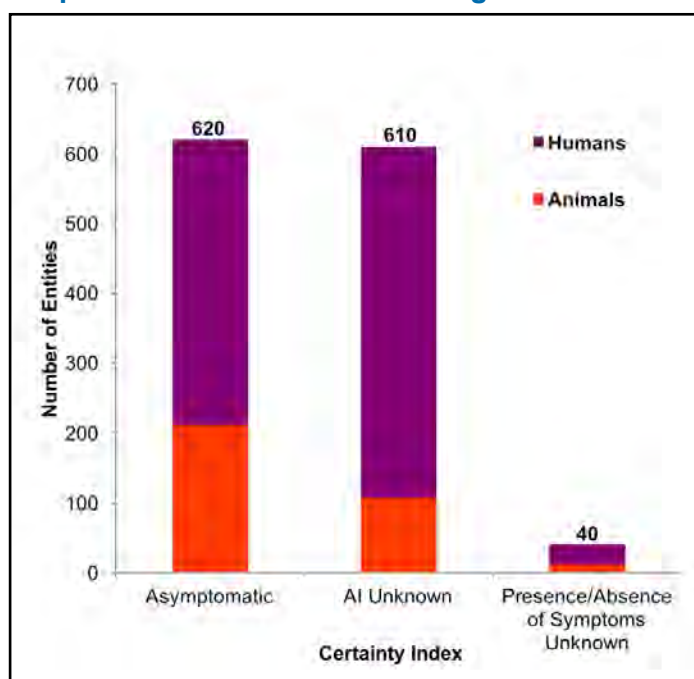
Table 14. Incident inquiries by certainty index (CI)

CI for All Categories of Entities					Breakdown of Human-Entity Incident Inquiries			
Certainty Index (CI)	Humans	Animals	Other	Total	Male	Female	Groups	Gender Not Stated
Unclassifiable	939	331	929	2199	284	481	172	2
Definite	0	0	0	0	0	0	0	0
Consistent	400	121	0	521	136	238	24	2
Inconsistent	216	83	0	299	78	129	9	0

Graph 14.1 Certainty index for incidents



Graph 14.2 Unclassifiable CI categories



SEVERITY INDEX

15. Severity Index

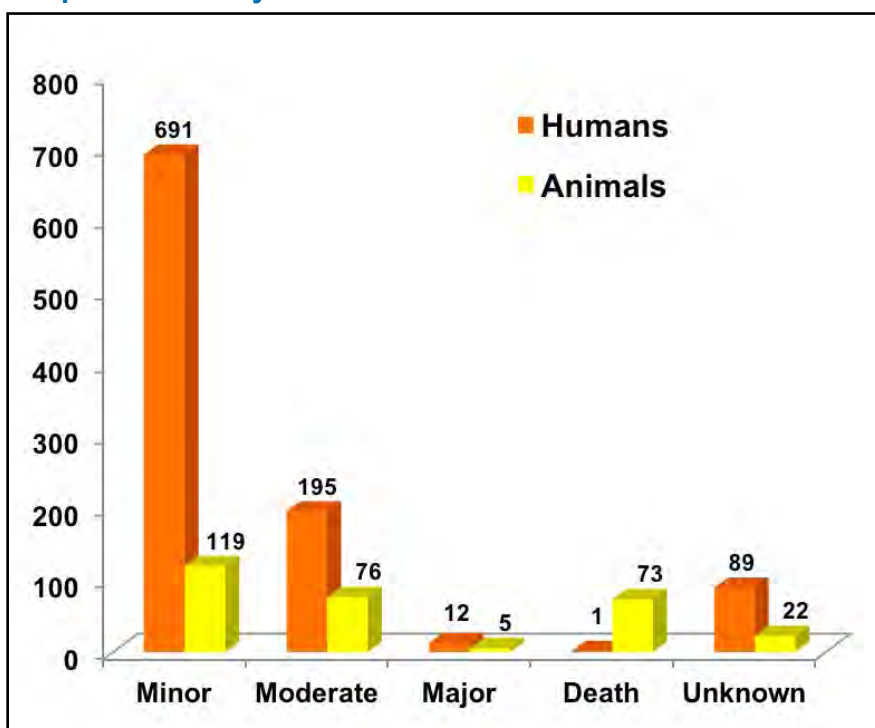
Table and Graph 15 summarize the severity of symptoms for all human and animal incidents reported to NPIC.

For all human pesticide incidents with reported exposures, 44.4% had minor symptoms, 12.6% had moderate symptoms, and 0.8% had major symptoms. One human death was reported (see page 35). Symptoms were unknown in 5.7% of human incidents. In 36.4% of human exposure incidents, the person reported that they did not experience any symptoms.

Table 15. Human and animal incidents by severity index (SI)

SI for All Categories of Entities				Breakdown of Human-Entity Incident Inquiries			
Severity Index (SI)	Humans	Animals	Total	Male	Female	Groups	Gender Not Stated
Minor	691	119	810	217	428	45	1
Moderate	195	76	271	68	121	4	2
Major	12	5	17	3	7	2	0
Death	1	73	74	1	0	0	0
Unknown	89	22	111	18	42	29	0
Asymptomatic	566	238	804	191	249	125	1

Graph 15. Severity index for human and animal incidents



What is the Severity Index?

The severity index is an estimate by NPIC as to the severity of signs/symptoms reported for incidents. The severity of signs/symptoms can be categorized as minor, moderate, major, death, unknown, or asymptomatic. The NPIC severity index is based on criteria used by poison control centers in their National Poison Data System (NPDS).

DESCRIPTION OF ENTITIES

16. Description of Entities

The chart and graphs below provide a summary of entities involved in pesticide incidents. Of the 3,019 entities involved in incidents reported to NPIC during this period, 51.5% were human, 17.7% were animals, and 30.1% were environmental non-target entities. Other entities (19) are miscellaneous items (i.e., sidewalk, food). Pesticide incidents may involve multiple entities.

Graph 16.1. Humans

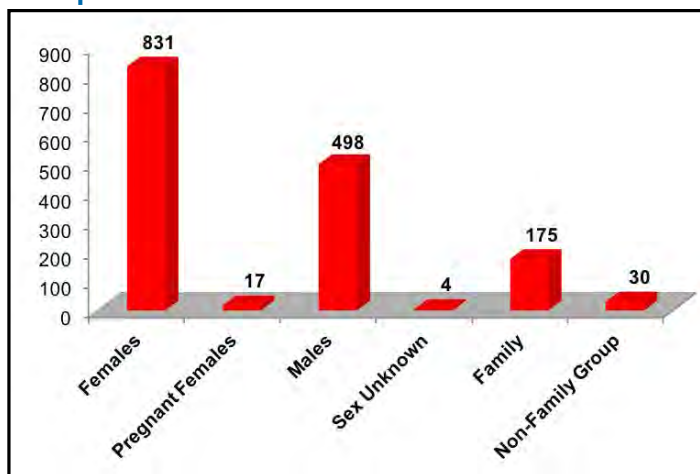
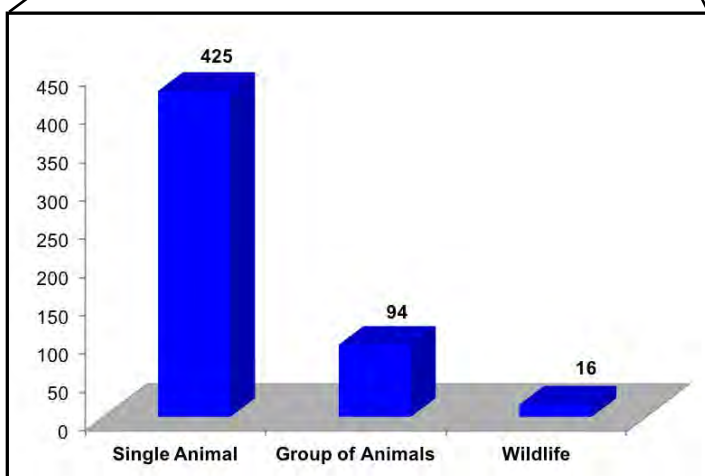
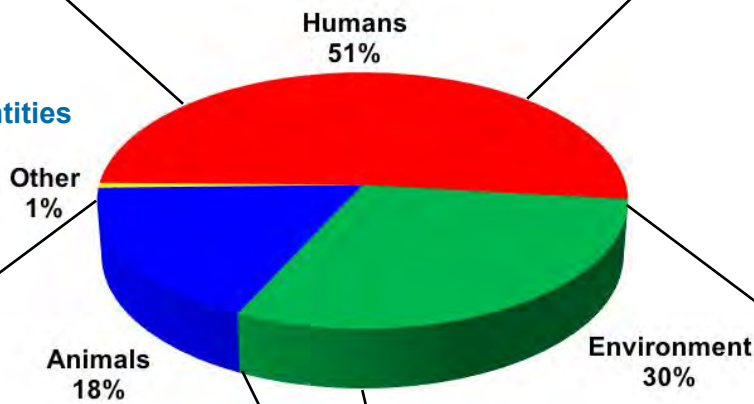
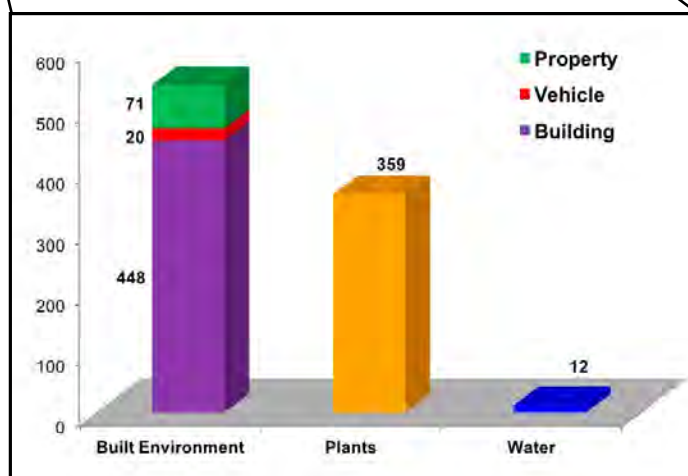


Chart 16. Description of entities



Graph 16.2. Animals



Graph 16.3. Environmental entities

17. Reported Deaths

During this period, one human death with a known active ingredient was reported by email (Table 17.1). A son reported his father's possible exposure to Frontline (active ingredient fipronil) after treating his dog with the spot-on product. The individual's father had recently passed away from ALS and inquired about the link between fipronil exposure and ALS.

Table 17.1. Reported deaths with known active ingredient

Reported Deaths	Total
Human Deaths -	
Male	1
Female	0
Total Human Deaths =	1
Animal Deaths -	
Single Animal	27
Group of Animals	9
Wildlife	4
Total Animal Deaths =	40
Total =	41

Table 17.2 - Active ingredients involved in three or more animal deaths

Active Ingredient ¹	Number of Deaths
METHOPRENE	9
ETHOFENPROX	8
PERMETHRIN	5
PIPERONYL BUTOXIDE	5
BIFENTHRIN	3
CYPERMETHRIN	3

¹ Note that a pesticide product may contain more than one active ingredient.

Of the 535 animal entities involved in pesticide incidents, there were 40 reported deaths where the active ingredients were known. Methoprene, ethofenprox, permethrin, and piperonyl butoxide were the most commonly reported active ingredients in animal deaths (Table 17.2).

18. Entity Age

Table 18 and Graph 18 summarize the ages of people involved in incidents reported to NPIC. Among 1,350 single human entities, NPIC was able to collect the person's age 84.4% of the time. NPIC aims to capture the age for all human entities; occasionally callers decline to provide that information. NPIC was able to collect the person's gender 99% of the time.

Among the 1,139 humans with known age, 11.3% were children ages 4 and under, and 28.1% were seniors (ages 65 and over).

Graph 18. Age of people involved in reported incidents

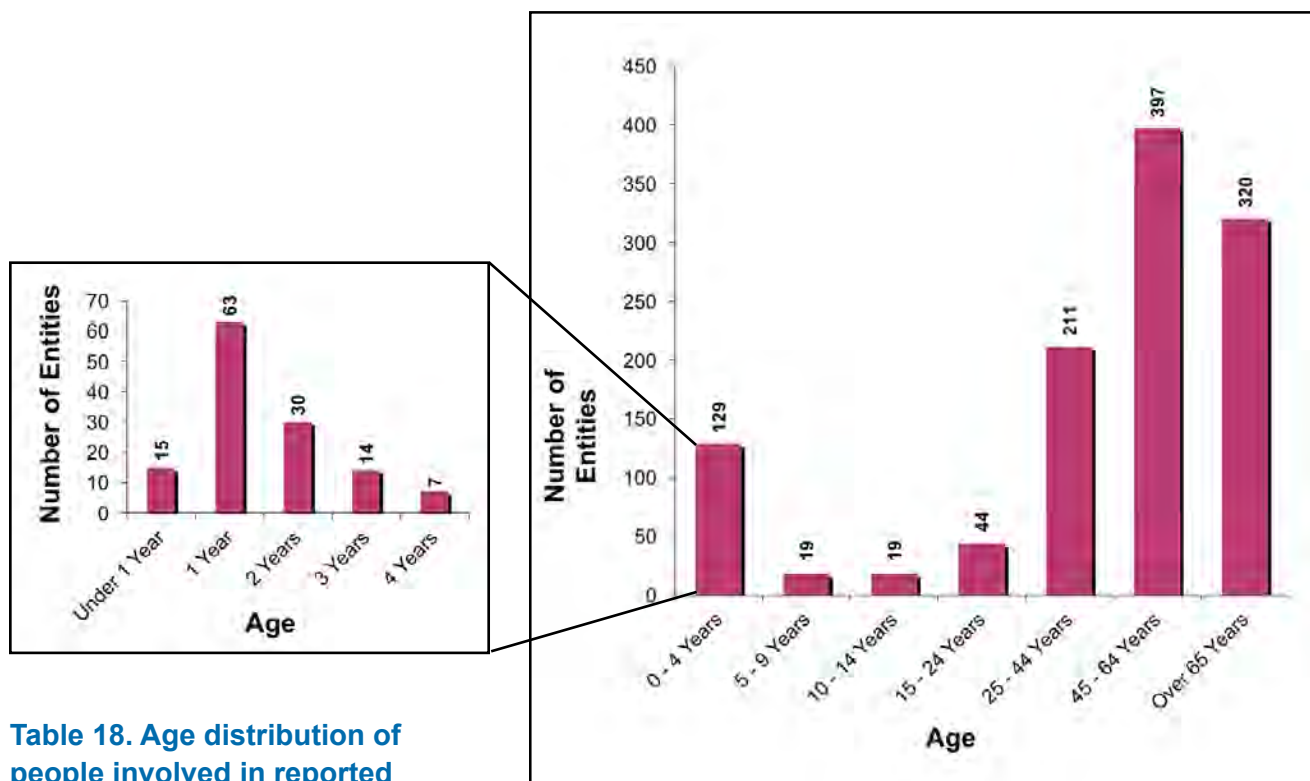


Table 18. Age distribution of people involved in reported incidents

Age Category	Total
Under 1 Year	15
1 Year	63
2 Years	30
3 Years	14
4 Years	7
Total (0 - 4 Years) =	129
5 - 9 Years	19
10 - 14 Years	19
15 - 24 Years	44
25 - 44 Years	211
45 - 64 Years	397
Over 65 years	320

NOTABLE EXPOSURES

19. Notable Exposures

There were 3,019 entities potentially exposed to pesticides in 1,903 reported incidents.

Figure 19.1

Entities potentially exposed to pesticides in 1,903 incidents reported to NPIC.

Total = 3,019 entities

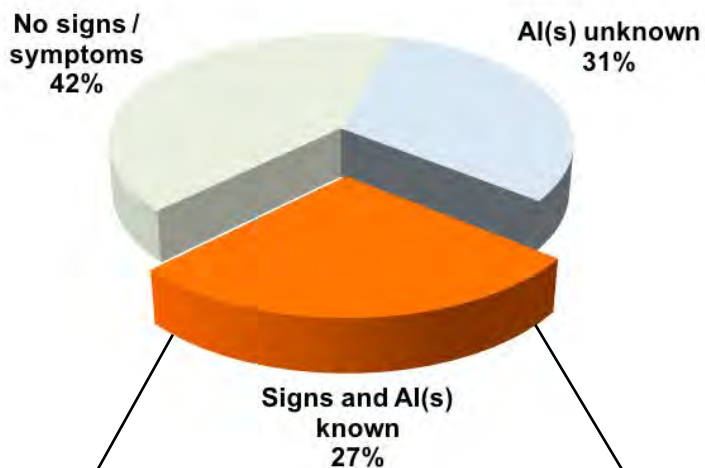


Figure 19.2

Entities potentially exposed to a known pesticide with reported signs/symptoms.

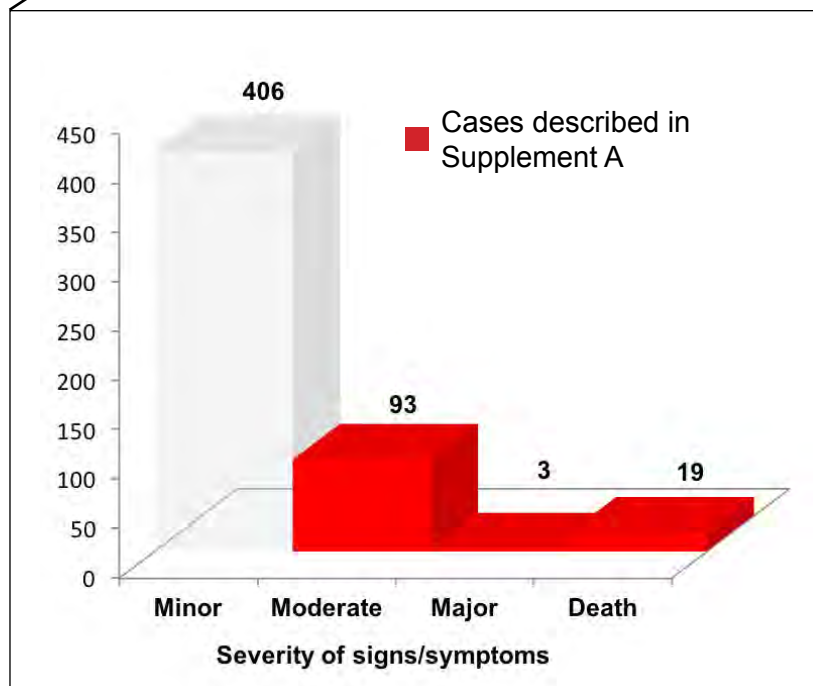
Total = 820 entities



Figure 19.3

Entities potentially exposed to a known pesticide with reported signs/symptoms that were consistent with reports in the literature for that pesticide.

Total = 521 entities



A supplemental report describes the 115 entities represented by the red bars in Figure 19.3.

VETERINARY REPORTING

NPIC developed a web-based portal for veterinarians to report adverse reactions to pesticides among animals. NPIC does not verify or conduct quality assurance of the information submitted into the VIRP.

Veterinarians submitted 31 incident reports to the VIRP involving 37 animals (32 dogs and 5 cats). All VIRP reports are forwarded to EPA quarterly, in their entirety.

Table 20.1 and Chart 20.1 summarize the formulation of products that were involved in the incidents reported by veterinarians. Over half of the products were pelleted products (42%) and liquid spot-on treatments for pets (25%). About 8% were other liquids, not intended for spot-on application.

Table 20.2 and Chart 20.2 summarize the pesticide types that were involved in the incidents reported by veterinarians. About half (46%) of the products were insecticides and 30% were rodenticides.

Table 20.1. Product formulations as reported in VIRP

Formulation	Number of Products
	2016
Pellet	15
Spot-on	9
Other	6
Liquid	3
Powder	2
Aerosol	1
Total =	36

Chart 20.1. Product formulations reported in VIRP

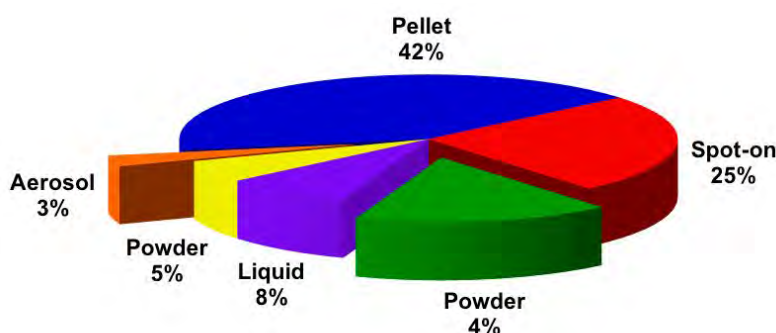
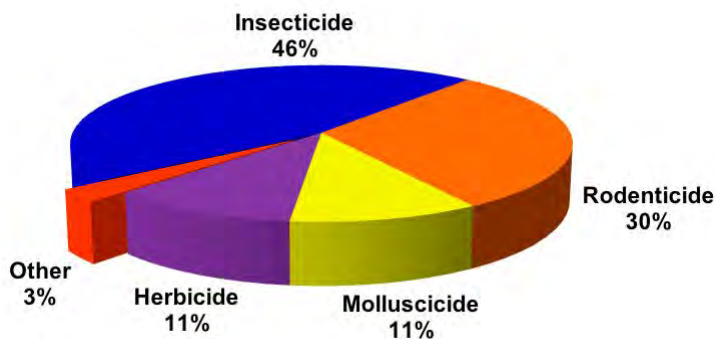


Table 20.2. Product types as reported in VIRP

Type	Number of Products
	2016
Insecticide	17
Rodenticide	11
Molluscicide	4
Herbicide	4
Other	1
Total =	37

Chart 20.2. Product types reported in VIRP



VETERINARY REPORTING

Table 20.3 and Chart 20.3 show the types of animal symptoms reported to VIRP. Symptoms are classified as dermatological (irritant, sloughing, ulcer), gastrointestinal (diarrhea, vomiting), neurological (depression, excited state, seizures, tremors), none, or other. Multiple symptoms may be reported for each animal. Of the reported symptoms, 28% were classified as neurological. Twenty-two percent (22%) were classified as gastrointestinal, 13% as dermatological, 15% as none, and 13% as other.

Table 20.4 and Chart 20.4 summarize the outcomes associated with each animal incident reported in the VIRP. Multiple animals may be involved in each VIRP report; thus totals reflect the number of animals, as opposed to the number of reports.

Of the total number of animals involved in VIRP incident reports, 60% of the cases were ongoing. The affected animals had recovered at the time of the report, in 27% of cases. Five percent (5%) of the animals experienced continuing illness and 5% resulted in the death of the animal.

Table 20.3. Animal symptoms as reported in VIRP

Symptom	Number of Animals
	2016
Dermatological: Irritant	6
Dermatological: Ulcer	2
Dermatological Total	8
Gastrointestinal: Vomiting	8
Gastrointestinal: Diarrhea	5
Gastrointestinal total	13
Neurological: Depression	11
Neurological: Tremor	7
Neurological: Seizure	2
Neurological: Excited	2
Neurological Total	22
None	9
Other	8
Total =	60

Chart 20.3. Animal symptoms as reported in VIRP

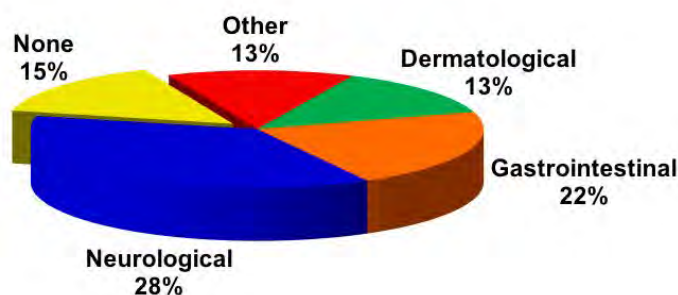
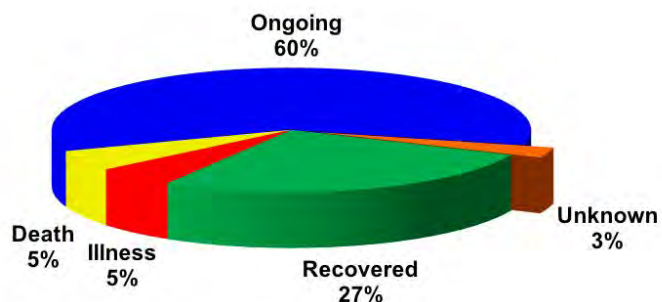


Table 20.4. Incident outcomes as reported in VIRP

Outcome	Number of Animals
	2016
Ongoing	22
Recovered	10
Illness	2
Death	2
Unknown	1
Total:	37

Chart 20.4. Incident outcomes as reported in VIRP



ECOLOGICAL REPORTING

In 2009, NPIC developed a web-based portal to facilitate reporting of ecological incidents. It was designed by the U.S. EPA Office of Pesticide Programs (OPP), built and hosted by Oregon State University.

NPIC does not verify reports through independent investigation, nor does NPIC conduct quality assurance of the information submitted into the Eco-portal. NPIC provides each report, as submitted, to OPP quarterly, in their entirety. More recently, NPIC developed programming to make that delivery automatic and immediate.

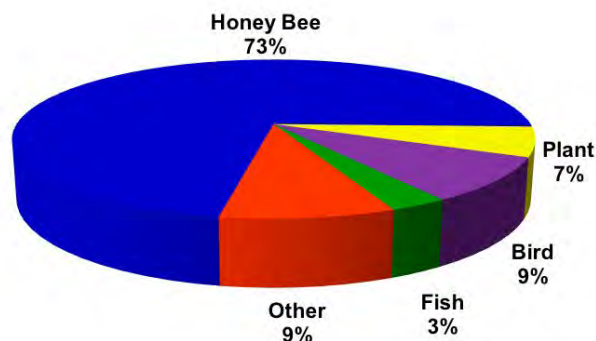
Table 21.1 Entities involved in the Eco-reports

Entity	Number of Reports
Honey Bee	24
Plant	2
Bird	3
Fish	1
Other	3

Table 21.2 Active ingredients involved in the Eco-reports

Active Ingredient	Quantity
UNKNOWN	5
CLOTHIANIDIN	2
IPCONAZOLE	2
METALAXYL	2
TRIFLOXYSTROBIN	2
BIFENTHRIN	2
CHLORPYRIFOS	1
AMITRAZ	1
FIPRONIL	1
TRICLOPYR	1
2,4-D, 2-ETHYLHEXYL ESTER	1
METHOMYL	1
DIFETHIALONE	1
BRODIFACOU	1
BROMADIOLONE	1

Chart 21.1 Entities involved in the Eco-reports



Environmental & Molecular Toxicology
Cooperative Agreement #X8-83458501
Oregon State University
310 Weniger Hall
Corvallis, OR 97331-6502
npic.orst.edu