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NATIONAL
PESTICIDE ● INFORMATION
CENTER

-2020-

Environmental & Molecular Toxicology



**Oregon State
University**

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 US Environmental Protection Agency. The 2020 Annual Report covers the period of February 15, 2020 - February 14, 2021.

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:

US Environmental Protection Agency
Office of Pesticide Programs

Submitted By:



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NPIC 2020 Annual Report

Table of Contents

| | |
|--|----|
| INTRODUCTION / DELIVERING OBJECTIVES..... | 4 |
| SUMMARY | 9 |
| RESOURCES..... | 10 |
| ABOUT US..... | 11 |
| WEBSITE / APPS | 12 |
| INFOGRAPHICS..... | 14 |
| FACT SHEETS / SOCIAL MEDIA..... | 16 |
| NPIC DATA / STAFF | 18 |
| PESTICIDE INQUIRY DATA | 19 |
| 1. Monthly Inquiries | 21 |
| 2. Type of Inquiry..... | 22 |
| 3. Origin of Inquiry..... | 22 |
| 4. Website Access | 23 |
| 5. Type of Inquirer | 25 |
| 6. Type of Question..... | 26 |
| 7. Actions Taken..... | 27 |
| 8. Inquiries by State..... | 28 |
| 9. Top 25 Active Ingredients for All Inquiries | 29 |
| 10. Incident Type | 30 |
| 11. Top 25 Active Ingredients for Incidents | 31 |
| 12. Locations of Exposure or Accident | 32 |
| 13. Environmental Impact | 32 |
| 14. Certainty Index | 33 |
| 15. Severity Index..... | 34 |
| 16. Description of Entities..... | 35 |
| 17. Reported Deaths | 36 |
| 18. Entity Age | 37 |
| 19. Notable Exposures..... | 38 |
| VETERINARY REPORTING | 39 |
| ECOLOGICAL REPORTING..... | 41 |

INTRODUCTION / DELIVERING OBJECTIVES

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 second year of the project period under cooperative agreement #X8-83947901, Oregon State University (OSU) provided information to millions of people by phone, email, social media, data-sharing, mobile web apps, and/or web content.

NPIC supports the U.S. Environmental Protection Agency (U.S. EPA)'s 2018-2022 Strategic Plan Goal 1: Core Mission, and Objective 1.4: "Ensure Safety of Chemicals in the Marketplace," which states: "Effectively implement the Federal Insecticide, Fungicide, and Rodenticide Act to ensure new and existing chemicals and pesticides are reviewed for their potential risks to human health and the environment and actions are taken when necessary." NPIC also supports the mission of the 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, 2020, and ended February 14, 2021.

This period will be referenced as "2020" in this report.

The cooperative agreement between OSU and the U.S. 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. **Serve as a source of factual, unbiased information for diverse audiences including the agricultural and pest control community, healthcare providers, educators, consumers, and the public.**

- NPIC maintained open hours with multilingual capabilities from 8:00am to 12:00pm Pacific Time, Monday-Friday, excluding holidays, with no closures due to technical or staffing issues.
- NPIC responded immediately to 99% of calls received during open hours and when inquiries were received via voicemail, email, and/or social media. Occasionally when call volume is high, people may choose to leave a message.
- NPIC recruited five pesticide specialists this year, retaining five highly qualified pesticide specialists total.
- NPIC collaborated with 21 organizations on 23 collaborative outreach efforts this grant year to provide outreach and expert risk communication instruction to the public, medical professionals, agricultural growers, and educators, including:
 - NPIC and EPA Region 10 identified outreach gaps and developed a fact sheet: **Using Disinfectants to control the COVID-19 virus.**
 - NPIC presented about disinfectants and List N to the National School IPM Work Group.
 - NPIC shared nationwide County Extension contacts with the USDA Agricultural Marketing Service for outreach to growers about COVID-19 federal assistance.
 - NPIC provided additions to a Pesticide Educational Resources Collaborative-med (PERC-med) newsletter highlighting NPIC services.
 - NPIC and the Oregon Department of Agriculture created joint messaging for social media guidance about not using disinfectants on masks and also translation of the **COVID-19 Fact Sheet in Spanish.**
 - NPIC, the American Association of Poison Control Centers, the Oregon Poison Control Center, and the Virginia Poison Center hosted a **Facebook Q&A** about disinfectant health and safety during COVID-19.
 - NPIC presented at the Tribal Environmental Coalition in Oklahoma (TECO) conference: "Using Disinfectants Against COVID-19: List N, Precautions, and Efficacy."
 - NPIC discussed clopyralid soil contamination with Oregon agencies within the Pesticide Analytical Response Center (PARC) and drafted/reviewed health and testing information provided to affected households through the Oregon Department of Agriculture.
 - NPIC reviewed an EPA Region 8 advertisement about the NPIC disinfectant webinar, which was published in July by the Colorado Coalition for School IPM Newsletter.
 - NPIC approved modifications of its disinfectant wipes infographic for the National School IPM Workgroup.
 - NPIC worked with the Pesticide Applicator Certification & Training (PACT) Planning Committee to compile disinfectant safety resources and lists for groups like custodians and other front-line workers.
 - NPIC staff presented about disinfectant safety to the Inter-Tribal Environmental Council.
 - NPIC shared messaging about risks of impregnated masks with the American Association of Poison Control Centers and the National School IPM Workgroup.

DELIVERING OBJECTIVES

1. Serve as a source of factual, unbiased information for diverse audiences including the agricultural and pest control community, healthcare providers, educators, consumers, and the public (continued).

- NPIC presented for state, tribal, and federal regulators at the Compliance and Enforcement Management, Pesticide Regulatory Education Program (PREP) virtual conference.
- NPIC worked with the Florida Department of Agriculture to customize an **NPIC infographic** for Florida residents to search for registered disinfectants in their state.
- NPIC presented about disinfectant safety to a food safety group at the University of Nebraska Extension.
- NPIC and PERC-med provided a webinar for medical professionals, hosted through Oregon Pacific Area Health Education Center of Samaritan Health Services. Topics included disinfectant safety, efficacy, and pesticide exposure reporting.
- NPIC provided risk communication training for pesticide applicators and educators through the Purdue Pest Management Annual Conference.
- NPIC discussed disinfectant safety with pesticide applicators through the Central Oregon Pest Management program hosted by Oregon Pesticide Safety Education Program (PSEP).
- NPIC provided risk communication training for pesticide applicators through the Chemical Applicator program hosted by Oregon PSEP.
- NPIC participated in the EPA Region 10 Director's meeting, sharing inquiry trends and COVID-19 outreach materials with federal and state regulators, as well as state PSEP coordinators.
- NPIC provided assistance to EPA Region 6 by answering questions from the Texas Department of Agriculture regarding product labeling and toxicity categories for abamectin.
- NPIC aided the Oregon Department of Agriculture's citizen advocate by answering questions from a grower regarding dieldrin and other pesticide residue risks to employees.

2. Provide information on a wide variety of pesticide-related subjects including, but not limited to, pesticide products, toxicology, environmental chemistry, safety practices, pesticide regulation, enforcement, risk assessment, risk management, environmental effects, clean-up and disposal, understanding the label, recognition and management of pesticide poisonings, and integrated pest management (IPM).

- In order to stay current, NPIC staff members monitored 21 relevant publications and publication indexing services, including federal register notices (pest), affiliated dockets, newsletters, listervs, and selected journals of relevance.
- NPIC exceeded this year's goal of evaluating 1,000 articles, documents, and websites in order to maintain and expand up-to-date, reputable, immediately accessible and optimized information about pesticide science and regulation. This year NPIC evaluated 2,272 relevant articles, documents, and websites.
- NPIC updated 12 active ingredient (AI) files and created eight new AI files. NPIC also added 687 new documents to AI files.

New AI Files

- (E)-5-Decenol
- Autographa californica
- Chlorohexidine digluconate
- Irgarol
- Lipo-chitooligosaccharide
- N-bromosulfamate salts
- UV Light
- Zinc pyrethione

Updated AI files

- 1-Methyl-cyclopropene
- Acetamiprid
- ADBAC
- Bromadiolone
- Chlorfenapyr
- Clopyralid
- DDAC
- Dichlobenil
- Hydrogen Peroxide
- Imazapyr
- Isopropanol
- Paclobutrazol

- NPIC staff members attended 42 events for continuing education this grant year, including 23 webinars, eight events hosted by Oregon State University, seven meetings, conferences, or workshops hosted by other organizations, three in-house presentations, and one class at Oregon State University.
- NPIC tracked certain elements in order to quantify risk-reduction activities. In conversation with callers, pesticide specialists discussed following the label 2,148 times, ways to minimize exposure 2,059 times, IPM concepts 567 times, and environmental protection (including pollinator protection) 69 times.
- NPIC maintained storage capacity in order to ensure continuous access to NPIC resources by stakeholders, documenting and reporting milestones to inform future efforts for secure, long term data storage and hosting capacity.

DELIVERING OBJECTIVES

3. Address current and emerging pesticide-related issues and provide federal, state, and local resources on the topics in Objective 2.

- NPIC specialists were polled about trends and discussed 100% of cases flagged as “important and interesting” as a team. Specialists discussed 51 cases during the year.
- NPIC discussed potential trends and data with EPA’s Office of Pesticide Programs (OPP), including disinfectants:
 - Dramatic increase in disinfectant related calls in early 2020, including top #1 and #2 active ingredient ranking for ADBAC and DDAC inquiries during Q1.
 - Using disinfectants as a replacement for whole space sprays or air sprays.
 - Spraying masks; follow-up resulted in targeted messaging about infused masks through NPIC and the American Association of Poison Control Centers. Messaging was discussed with staff from the OPP Health Effects Division and Antimicrobials Division (AD).
 - Using disinfectants as hand sanitizer
 - Schools considering electrostatic sprayers for classrooms, busses.
 - School disinfection with products without considering students may be eating at desks (may not be Food Contact Surface products).
 - Confusion about residual activity of “24-hour” sanitizer and disinfectant.
 - Questions about distributors making SARS-CoV-2 claims verbally.
 - Questions about importing, selling, and regulation.
 - NPIC and OPP AD discussed regulations and issues for on-site generation products.
 - NPIC queried informally for inquiries related to disinfectant exposures or illnesses related to ICE detention facilities, as requested by the Office of Enforcement and Compliance Assurance (OECA).
 - NPIC and OPP AD discussed a consumer complaint about eye damage from UV light use and the option to report to Consumer Product Safety Commission (CPSC).
- NPIC shared 49 noteworthy cases with the Project Officer during the 2020 grant year period.
- NPIC compiles summary statistics about inquiries received on a quarterly and annual basis. All quarterly reports were submitted within 30 days of the quarter’s closure, along with this annual report, and a quality assurance report for the 2020 grant year period.
- Veterinary professionals submitted 19 incident reports using NPIC’s Veterinary Incident Reporting Portal (VIRP). Thirty-seven (37) incident reports were submitted using NPIC’s Ecological Incident Reporting Portal (Eco-Portal).
- NPIC fulfilled 19 special reports this year including data requests for:
 - California Department of Pesticide Regulation (2)
 - EPA OPP Health Effects Division (HED) (7)
 - EPA OPP Pesticide Reevaluation Division (PRD) (8)
 - Oregon Department of Agriculture
 - Vermont Agency of Agriculture, Food and Markets
- NPIC promoted the availability of inquiry data to states and tribes through the Association of American Pesticide Control Officials’ State FIFRA Issues Research and Evaluation Group (AAPCO – SFIREG).
- NPIC continued to monitor and improve its working relationship(s) with the American Association of Poison Control Centers (AAPCC) and the Oregon Health & Science University (OHSU), ensuring that baseline expectations were met and/or exceeded. NPIC, AAPCC, the Oregon Poison Control Center, and the Virginia Poison Center hosted a Facebook Q&A about disinfectant health and safety during COVID-19. The content is available on NPIC’s webpage: [Disinfectant safety during the COVID-19 pandemic](#).
- Annually, specialists made timely and appropriate referrals with less than a 3% margin of error. This standard was evaluated as part of annual staff evaluations in Q3.

4. Provide reputable, science-based information in a manner understandable to a lay audience to help people make informed decisions.

- NPIC created/updated 15 new web pages this year titled:
 - Using Disinfectants to Control the COVID-19 Virus ([English](#) | [Spanish](#))
 - [Antimicrobianos](#) (Antimicrobials)
 - [Comprendiendo la selección de pesticidas antimicrobianos](#) (Understanding and Selecting Antimicrobial Pesticides)
 - [Selección del producto antimicrobiano adecuado](#) (Selecting the Right Antimicrobial)
 - [Antimicrobianos para patógenos en sangre y fluidos corporales](#) (Antimicrobials for Pathogens in Blood and Body Fluids)

DELIVERING OBJECTIVES

4. Provide reputable, science-based information in a manner understandable to a lay audience to help people make informed decisions (continued).

- Disinfectants and COVID-19 Resources ([English](#) | [Spanish](#))
- FAQ: Disinfectant safety during the COVID-19 pandemic ([English](#) | [Spanish](#))
- FAQ: [Outdoor Pesticide Treatments](#)
- [Videos relacionados con pesticidas](#) (Pesticide-related videos)
- [Kissing Bugs](#)
- [Houseplant IPM](#)
- [Bed Bugs and DDT](#) Fact Sheet
- NPIC developed three new infographics, titled:
 - Using Disinfectants and Wipes Against COVID-19 ([English](#) | [Spanish](#))
 - [Bacillus Thuringiensis \(Bt\) Strains](#)
- NPIC developed four new fact sheets titled:
 - [Antimicrobianos](#) (Antimicrobials)
 - Using Disinfectants to Control the COVID-19 Virus ([English](#) | [Spanish](#))
 - [Bed Bugs and DDT](#) Fact Sheet
- NPIC developed and posted a new Spanish video titled:
 - [Reducción de la exposición a desinfectantes en el lugar de trabajo](#) (Reducing Disinfectant Exposures in the Workplace)
- NPIC continued to formalize procedures for selecting references in fact sheets during Year 2, using scoping work from Year 1 to inform ongoing plans. An overview of procedures is provided in "[Writing NPIC Fact Sheets](#)".
- NPIC posts new items in social media venues (Facebook and Twitter) promoting safe use practices, IPM, and pesticide label comprehension. This grant year NPIC uploaded 206 posts, averaging 4 per week.
- NPIC developed and delivered two new webinars this grant year titled "[Disinfectant safety during the COVID-19 pandemic](#)" and "[Disinfectant Safety for Medical Professionals](#)".
- NPIC conducted an in-depth review of current procedures to identify and replace external broken links on our website. New software was implemented to better achieve annual objectives. NPIC removed or replaced 693 broken links.
- In order to provide the best referrals when appropriate, NPIC actively verifies/updates contact lists (i.e., county extension, vector control, manufacturers) on a routine basis. This grant year, NPIC updated 4,244 contacts, including:
 - County Extension
 - Household and Hazardous Waste
 - State Environmental Agencies
 - Vector Control
- NPIC ensured continuous access to NPIC web apps by stakeholders, maintaining and expanding software applications, tools, and mobile apps. The [Herbicide Properties Tool](#) (HPT) was updated with new guidance directing users to additional information on NPIC's website and comprehensive fact sheets, when available for herbicide active ingredients.
- NPIC coordinated and communicated with OPP frequently throughout the year including:
 - NPIC discussed registrant guidance with OPP's Antimicrobial Division (AD), clarifying SARS-CoV-2 product labeling and advertisement claims. We also discussed residual claims for List N disinfectant products to incorporate into NPIC outreach materials.
 - NPIC discussed outreach material needs with the EPA Project Officer, related to COVID-19 and disinfectants.
 - NPIC discussed suggested changes to NPIC pages about disinfectants, offered by OPP FEAD.
 - NPIC discussed plans for outreach materials to school administrators with OPP and EPA Region 5.
 - NPIC hosted a webinar "[Disinfectant safety during the COVID-19 pandemic](#)"; coordinating with the EPA Project Officer to advertise the webinar to EPA and other regulatory personnel.
 - OPP's Health Effects Division and NPIC discussed ways to increase messaging related to infused masks. NPIC used this information to create targeted social media outreach and to communicate with the American Association of Poison Control Centers to create their own messaging. Messaging was also shared with the National School IPM Workgroup
 - Discussions with the Project Officer and the Office of Enforcement and Compliance Assurance to discuss best resources for registrants/distributors and Amazon retailers regarding pesticide devices and product registration.
 - Discussions with Toxic Substances Control Act (TSCA) contacts about NPIC services and referrals.
 - Discussions about bleach dilution guidance from CDC with OPP's Health Effects Division.
 - Discussions with OPP's Health Effects Division about outreach messaging regarding ivermectin use against COVID-19.
 - Discussions with OPP's Health Effects Division about outreach messaging related to wasping (form of substance abuse using insecticides).

DELIVERING OBJECTIVES

5. Collect and disseminate quality pesticide incident data via a rigorous and well-defined data collection system.

- NPIC specialists were able to document demographic information for 99% of human incidents, including age and/or gender. Callers occasionally decline to provide personal information such as age.
- “Incident information” includes information such as symptoms, time to onset of symptoms, and circumstances surrounding reported exposures. Among 1,319 reported incidents involving humans or animals, NPIC specialists were able to capture the symptom/scenario information in 92% of cases.
- NPIC specialists were able to collect product information for 92% of reported incidents.
- NPIC specialists were able to document the location for 90% of reported pesticide incidents.
- Among the 1,319 reported incidents involving humans or animals, NPIC specialists were able to capture the exposure route in 78% of cases.
- NPIC used standard operating procedures and rigorous quality control to classify reported signs/symptoms in terms of severity (severity index) and in terms of their relationship to the reported exposures (certainty index). NPIC assigned a severity index 100% of the time when signs/symptoms were described (1,395 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 (576 times).
- NPIC responds to user feedback by updating/improving the Eco-Portal. While no improvements or updates were suggested during the site visit with OPP, NPIC and OPP discussed sharing Eco-Portal data with additional personnel within the Environmental Fate and Effects division. No suggestions for the VIRP were received from users.
- NPIC produced internally routed human and animal incident reports in coordination with the OHSU), highlighting any changes in coding that were made in the QA process. Additionally, 100% of records were evaluated using automated QA protocols and all cases with symptoms were manually inspected/verified.
- The QA/QC facilitator led eight training exercise(s) during staff meetings to facilitate consistency in data quality.
- Log Assessment Reviews (LARs) were conducted as part of regularly scheduled annual staff evaluations (see Objective 6), including quantifiable measures of data completeness and coding consistency. Deliverable upon hiring new staff, formally graded LARs were completed for three new specialists, twice, in order to establish consistent habits in coding and data entry, including timely and appropriate referrals with less than 5% margin of error.

6. Provide exceptional customer service by integrating professionalism, teamwork, integrity, accountability, and a strong commitment to the public, as well as to the professional and medical communities.

- NPIC recruited and hired four highly qualified pesticide specialists this year, in addition to hiring a highly skilled former Pesticide Specialist. All training materials were updated, including the NPIC training manual, “stop points,” exercises, and mentored practice scenarios. All NPIC staff participated in training and mentoring new hires.
- Annually, NPIC completes one evaluation event through 3rd-party assessment of NPIC services or by conducting website usability testing. NPIC conducted virtual website usability testing with participants from across the country. Their feedback and use patterns were recorded anonymously and used to identify potential areas for improvement. Feedback will be incorporated as the NPIC website undergoes updates. A report of the website usability testing results was sent to the Project Officer in Q4.
- NPIC comprehensively evaluated each staff member in Q3, including quantified measures of data collection skills (see Objective 5), referral appropriateness, customer service skills, and continuing education measures.
- NPIC presented GY1 data trends during a virtual site visit with various Office of Pesticide Program (OPP) divisions in October and November 2020. Follow-up conversations with OPP staff highlighted device resources for the public and manufacturers, resources for Amazon sellers flagged for inappropriate pesticide sales, interest in Dicamba incidents, interest in pollinator incidents, NPIC email operations, and a data request for Seresto collar incidents.

Trends in NPIC Data

- During this period, NPIC received 10,113 inquiries.
- About 83% of the total inquiries were addressed over the telephone.
- About 16% of NPIC inquiries in 2020 were incidents. A pesticide incident is defined as: 1) any unintended exposure to humans or animals, 2) an exposure with an adverse effect, 3) a spill, and/or 4) a misapplication. See page 22.
- One human death and 34 animal deaths were reported to NPIC. See pages 32 and 34.
- The following active ingredients were involved in the most incident reports: boric acid (182), naphthalene (130), ADBAC (90), DDAC (84), and bifenthrin (77). See page 29.
- There were 2,160 entities involved in incidents reported to NPIC: 49% were human, 21% were animals, and 29% were structural or environmental. See page 35.
- Among the 792 single humans in incidents for which the age was captured, 11% were children (ages 4 and under), and 29% were seniors (ages 65 and over). About 34% of all people reported no symptoms. See page 37.
- Questions related to health/risk (3,029) and pest control (1,539) were most common. See page 26.
- The NPIC website received 7,606,574 page views during this period. There were more than 4.1 million unique visitors, and 157,385 visitors stayed for more than 15 minutes. See pages 23 and 24.

Foreign Language Capabilities

Under an agreement with LanguageLine Solutions, NPIC is capable of responding to inquiries in more than 240 languages. Translation services are provided immediately during calls, at no cost to NPIC customers, and language identification is available through this service.

NPIC responded to 291 inquiries in Spanish, three in Hindi, two in French, one in Afrikaans, one in American Sign Language, and one in Portuguese.

Noteworthy Inquiries

Mothball Products – NPIC received 497 inquiries about mothballs, flakes, and bars. Of these, 275 (55%) were incidents. Many reports involved off-label use of mothballs to repel animals or insects in and around the home.

Bed Bugs – NPIC received 281 inquiries related to bed bugs this year. About 12% of these (34) were pesticide incidents. Many of these inquiries were related to the difficulty of pest control and the potential health effects of pesticides.

Bees – NPIC received 122 questions about bees or reports of bee deaths. The majority of bee calls were informational only (88%). NPIC Specialists have experience discussing pollinator protection, including ways to prevent pesticide exposure for beneficial insects and how to compare pesticide products for bee toxicity. NPIC immediately notifies the EPA Project Officer when bee deaths are reported.

Resources & Facilities

NPIC maintains an extensive collection of hard copy and electronic information. NPIC specialists have access to the full resources of OSU's Valley Library, which includes electronic access to thousands 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 more than 1,130 active ingredients. This collection has been scanned/saved 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 at OSU. Allocated spaces include five rooms, six individual offices, and a storage unit.

Funding & Compliance

Funding for NPIC is provided by the U.S. Environmental Protection Agency and Oregon State University.

Throughout the reporting period, NPIC has complied with the requirements of the U.S. 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 U.S. EPA Guidelines regarding procurement requirements stipulated in 40 CFR Part 33. NPIC has complied with all requirements specified by the U.S. EPA as part of the funding authorization of this project.

Personnel Update

The NPIC Executive Committee includes the director, Dr. Jeff Jenkins, as well as two co-investigators: Kaci Buhl, MS; and Dr. Fred Berman, DVM. Dr. Jenkins and Ms. Buhl hold faculty appointments at OSU, while Dr. Berman, DVM, serves NPIC through a subaward with the Oregon Health & Science University.

Five Pesticide Specialists were retained this year. As of February 14, 2020, NPIC staff included five Pesticide Specialists, three supporting staff members, and the Executive Committee.

Standard Operating Procedures

NPIC staff use a variety of SOPs and policies to guide their work and some decision making. This year, 16 SOPs were updated. In addition, two policies were updated instructing staff about scheduling and personnel matters.

Environmental & Molecular Toxicology



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ABOUT US

Who is NPIC?

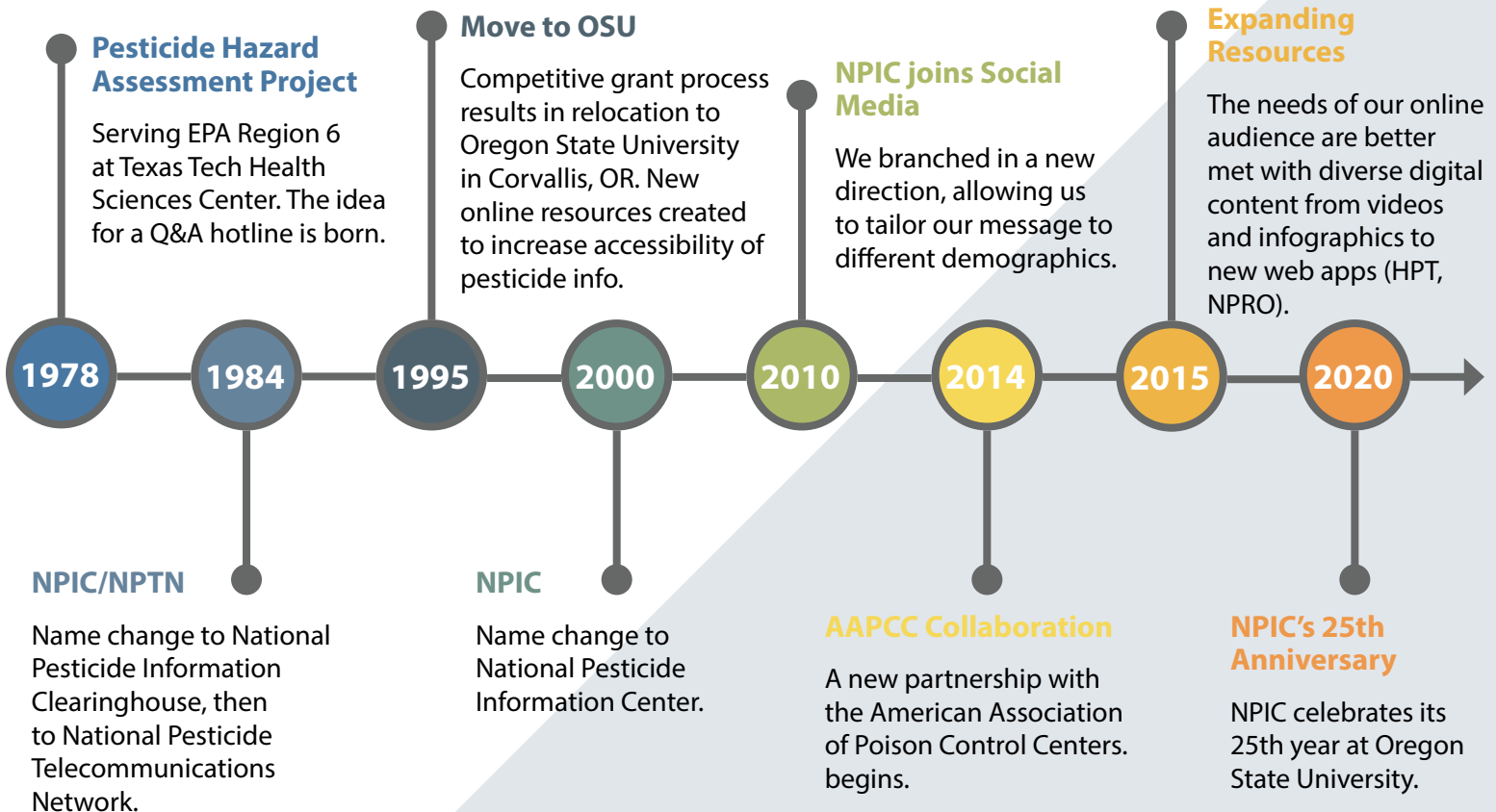
NPIC is a team of well-trained, approachable scientists and talented support staff. We have the knowledge and skill needed to effectively communicate scientific information to anyone who contacts us. If we can't directly answer the question, we'll try to figure out who most likely can.

Our number one goal is to provide objective, science-based information about pesticides and related topics to enable people to make informed decisions about pesticides and their use.

We reliably create accessible, up-to-date, factual materials to communicate complex pesticide information to both the public and professionals.



NPIC: A History



WEBSITE : APPS



Website

The NPIC website, available in both English and Spanish, is the culmination of years of work from every member on our team. We conducted website usability testing to help us better understand how people find information on our site and will guide future updates.

To refresh the look of our website, we've added more pictures and created new ways to find information, like adding topic tabs to improve navigability of our FAQs and pest-related pages.

Web Apps

We've developed web apps for the public and professionals. Available on any browser, apps are mobile- and desktop-compatible for easy access wherever you might be. Because they are web-based, you always get the most up-to-date information. Apps range from NPIC's Product Research Online (NPRO) to find product information, to our Herbicide Properties Tool. This tool helps professionals select low-impact herbicides for targeted plant eradication in the field.



In 2020, NPIC created or significantly updated 15 web pages in English and Spanish. Selected examples are listed below.

Web Topics

- Human/animal health and safety
- Environmental protection
- Food safety
- Integrated Pest Management
- How to report pesticide incidents
- Safe use practices
- Local pesticide-related contacts

Web Apps

- Pesticide and Local Services (PALS)
- NPIC's Product Research Online (NPRO)
- Herbicide Properties Tool (HPT)

Web Pages

- Disinfectants and COVID-19 Resources
- Using Disinfectants to Control the COVID-19 Virus
- Disinfectant safety during the COVID-19 pandemic
- Kissing Bugs
- Houseplant IPM
- Bed Bugs and DDT
- Outdoor Pesticide Treatments

COLLABORATIONS : OUTREACH

NPIC teams up with national, state, and local groups to increase awareness about pesticide health and safety across the nation. In 2020, NPIC hosted a risk communication workshop for regulators with the Pesticide Regulatory Education Program (PREP).



Our reach has continued to grow through a collaboration with the American Association of Poison Control Centers (AAPCC). Together, we work to raise awareness about pesticide poison prevention and best use practices, through social media and annual publications.

American Association of Poison Control Centers

Starting in 2014, NPIC partnered with AAPCC to raise awareness about pesticide poisoning. Our annual outreach materials focus on topics for parents, schools, and the general public.


Back-to-School
2017 poison
prevention webpage

Rodent Bait Safety
2019 Infographic


Lawn and Garden
2018 Safety Brochure

Disinfectant Safety
2020 Facebook Q&A


Q: What are the differences between sanitizers, disinfectants, and antiseptics?




Disinfectants kill viruses and bacteria on surfaces and are stronger than sanitizers. Sanitizers only make claims to kill bacteria on surfaces, not viruses. Disinfectants and sanitizers can only be used on surfaces, not on people. Antiseptics like hand sanitizers are used on people, not surfaces, to kill bacteria and viruses.



Cleaners




Sanitizers / Antiseptics




Disinfectants

Q: What is contact time?

A:



Contact time is the time a surface must stay visibly wet with the disinfectant to be effective against the virus. Contact time changes between products, so always follow the label closely. You may also need to pre-clean surfaces or wipe down with water after you are finished. All of these instructions are important for the disinfectant to work correctly. Follow the label closely!



NPIC Presentations

NPIC has **more than 25 years** of experience engaging the public in science-based conversations. We're excited to share our pesticide and science communication expertise at public and professional events.

14 Speaking events in 2020, including:



Professional Webinar

Disinfectant safety during the COVID-19 pandemic

Invited Speaker

Tribal Environmental Coalition in Oklahoma (TECO)

Invited Speaker

Oregon Pacific Area Health Education Center of Samaritan Health Services

INFOGRAPHICS

Infographics

We concentrated more of our efforts on visual projects in 2020, including our infographics. Easy to follow, these colorful graphics are perfect for printing or sharing for outreach opportunities.

Bacillus Thuringiensis (Bt) Strains

Bt is a bacterium that lives in the soil. Bt can be applied as a spray, dust, granules, or pellets for insect control. It can also be genetically engineered into plants to protect them from insects. Some Bt products are approved for use in organic agriculture.

Bt makes a protein, called cryprotein

These proteins need to be activated to be toxic

Insect-specific gut conditions activate these proteins

When eaten, some proteins are toxic to certain immature insects (larvae), but not others

There are different types of Bt, and these different strains produce different proteins.

The need for specific gut conditions and enzymes allows Bt Proteins to target one kind of insect over another.

Bt does not activate in the acidic stomach of humans and wildlife.

Mosquitoes
Flies & Gnats

Bt israelensis

Humans

No strain

Caterpillars
Butterflies
Moths

Bt aizawai
Bt kurstaki

Wildlife

No strain

Beetles

Bt san diego
Bt tenebrionis

800-858-7378
M-F 8am-12pm PST
npic@ace.orst.edu

If you have questions about this or other pesticide topics, contact NPIC.

In 2020, we introduced three new infographics titled:

- Using Disinfectants and Wipes Against COVID-19 (English | Spanish)
- *Bacillus Thuringiensis* (Bt) Strains

USING DISINFECTANTS AND WIPES AGAINST COVID-19

WHAT ARE THEY?

Disinfectants kill viruses, bacteria, and fungi on surfaces. Products on EPA's "List N" are expected to control COVID-19. To see if your product is on List N, look for the EPA Registration Number on your label. If you have questions, call NPIC M-F 8am-12pm PT at 800-858-7378.

HOW DO I USE THEM?



Disinfectants may not work on unlisted surfaces. Follow your label carefully.



Follow the contact time (how long the surface must stay wet).



Pre-clean surfaces with soap and water first.

CAN I USE THEM ANYWHERE?

Do not use wipes on food. Only use on food contact surfaces if the label says so.

Check for rinsing instructions on the label.

Do not let children (under age 18) use disinfectant wipes.

Do not use them to clean hands.

Do not use as baby wipes.



HOW DO I MINIMIZE RISK?



Never mix cleaning products. Leave them in their original container.



Wear protective gear like gloves, masks, and eyewear. Do not reuse disposable gear if contaminated with disinfectant.



Wash hands after use.



Always follow the label, including listed surfaces and contact times.



Store out of reach of kids.



Open windows and use fans to ventilate. Step away from odors if they become too strong.

FACT SHEETS | SOCIAL MEDIA

Fact Sheets

As part of our mission to encourage informed decision making, NPIC publishes scientific information in the form of fact sheets. These summarize information about pesticides and related topics like “Is it Safe?”, “What’s my Risk?”, “Antimicrobials”, and “Pesticide Binding Affinity.”

Our chemical (active ingredient) fact sheets answer common questions asked by the public about specific pesticides. They allow people to “dig deeper” for answers. In 2020, NPIC created four new fact sheets:

- Antimicrobials (Antimicrobials)
- Bed Bugs and DDT
- Using Disinfectants to Control the COVID-19 Virus (English | Spanish)



Social Media

At NPIC, we understand that we have to meet people on familiar ground. By staying active on various social media platforms, NPIC is able to further expand our reach to make science-based pesticide information available.

We try to keep our followers in the loop about seasonal pest and pesticide issues, health and safety topics, and the latest resources from NPIC and other reputable organizations.



206 posts this year



CONTINUING ED : AI FILES

Continuing Education

Our Pesticide Specialists and staff make it a priority to keep up with current events, regulatory decisions, and relevant findings in science research. Each year, we devote up to 25% of our time to NPIC's Continuing Education program.

We attend a diverse array of educational events, including webinars, regional professional conferences, expert speaker seminars, and guest lectures. Specialists also regularly monitor scientific journals, daily news articles, social media, and other relevant publications.

In 2020

23 web-based events

webinars | recorded events

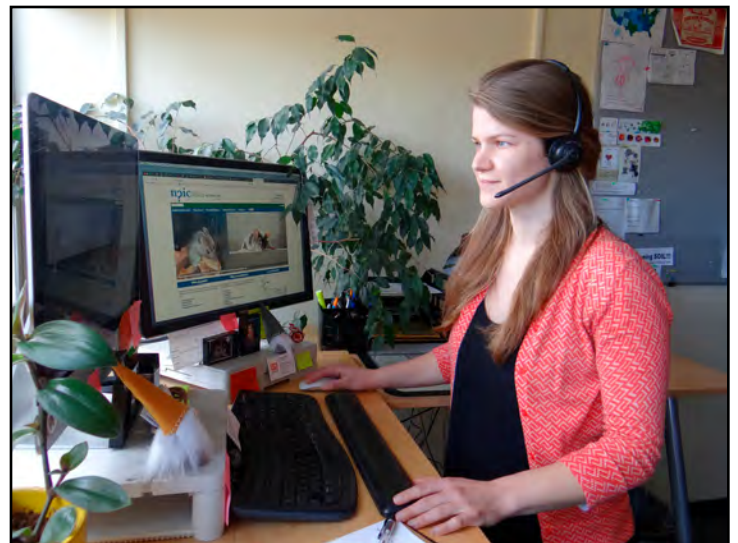
in-person events **19**

seminars | invited speakers

Active Ingredient Files

We answer questions as we get them, with limited time for research. To do this, our team needs to have the best resources at our fingertips. We continually monitor and evaluate a wide variety of peer-reviewed sources for the latest research on toxicology, regulatory information, ecological impacts, and pest management science.

687 new documents
added in **2020**



Documents are uploaded in our searchable collection of Active Ingredient (AI) files for quick reference. The collection now includes more than 18,000 documents in 1,137 AI files. All of these documents are available for Specialists during pesticide conversations.

We invested more than four hours per week monitoring Federal Register Notices, affiliated dockets, newsletters, and selected journals of relevance.

NPIC DATA : STAFF

NPIC's Pesticide Inquiry Database (PID)

When our Specialists get questions over the phone, through email, social media, or other methods, we collect certain pieces of information about the inquiry. We don't collect personally identifiable information, but we do ask questions to paint a better picture of each unique situation. This helps us tailor our resources to each person, making the conversation valuable to individuals, and our data valuable to other organizations, including:

- Pesticide Regulators and Policy Makers
 - EPA
 - Federal, State, and Tribal Agencies
- Researchers
- Universities



10,113 inquiries

2020 Inquiry Types

8,305 informational

1,623 pesticide incidents

27% with unknown active ingredient

185 other (not pesticide related)



Staff Training & Experience

Our team of highly qualified Pesticide Specialists has nearly 30 years of combined experience answering questions at NPIC.

Thanks to our rigorous training program, people can be confident they are speaking with an experienced Specialist. The training process exposes new team members to a variety of topics, scenarios, and challenges.

During training, we take an "all hands on deck" approach, where every team member is invested in training new Specialists.

Our Pesticide Specialists have unique scientific backgrounds, from pollinator health to toxicology, soil, and environmental science. This scientific diversity strengthens our ability to answer diverse questions about pesticides and related topics.

chemistry biology soil science
environmental science botany
anthropology geoscience
food science & technology
microbiology zoology

Introduction to Inquiry Data

Pesticide specialists create a record for every inquiry, which is entered into the NPIC Pesticide Inquiry Database (PID). PID is a relational database, designed and built by NPIC. Custom reports may be available based on many of the 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 (public, government, 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 (web, referrals, 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 (inside the home, outside the home, 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 emergency medical events.

- A timeline 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 for the identified active ingredients, in the context of the reported pesticide exposure. 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. Berman, DVM, 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, 2020 to February 14, 2021.

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 through 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., a product intended for ornamental plants was applied to vegetables in the home garden.)
- About 1% of the time, callers' main purpose for contacting NPIC was to report a pesticide incident. More often, they contacted NPIC to obtain technical information. See page 26. Regardless, NPIC specialists make every effort to collect complete information about scenarios that meet the NPIC incident definition. Approximately 16% 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, provided to the inquirer. See page 27.
- NPIC qualifies the information received by assigning a certainty index (CI). The CI is an estimate by NPIC as to the likelihood that the reported signs and symptoms were consistent or inconsistent with published reports/materials for the identified active ingredients, in the context of the reported pesticide exposure. See page 33.
- 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 voicemail, 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 agriculture and environmental protection agencies. Other entities with interest in special reports should contact NPIC to inquire about the procedure and possible costs.

MONTHLY INQUIRIES

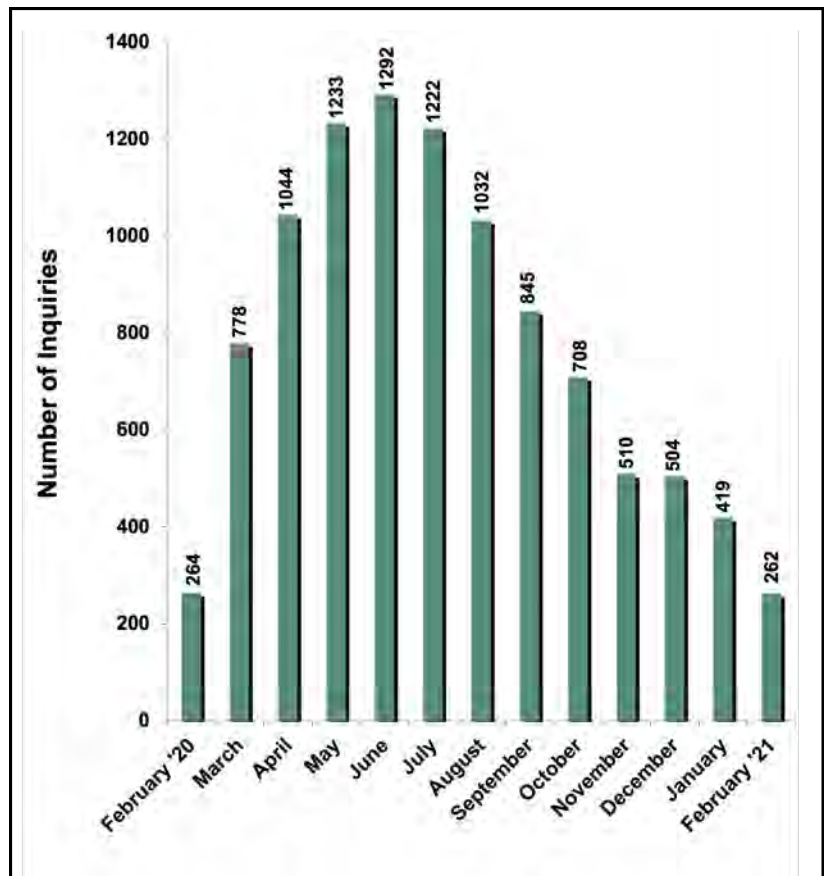
1. Monthly Inquiries

NPIC received 10,113 inquiries during this grant year. Graph 1 shows the number of inquiries received for each month. Seventy-three percent (73%) 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 2020 | 264 |
| March | 778 |
| April | 1044 |
| May | 1233 |
| June | 1292 |
| July | 1222 |
| August | 1032 |
| September | 845 |
| October | 708 |
| November | 510 |
| December | 504 |
| January | 419 |
| February 2021 | 262 |

Graph 1. Monthly inquiries



TYPE OF INQUIRY / ORIGIN OF INQUIRY

2. Type of Inquiry

NPIC classifies inquiries as information, incident, or other (not pesticide related) 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.

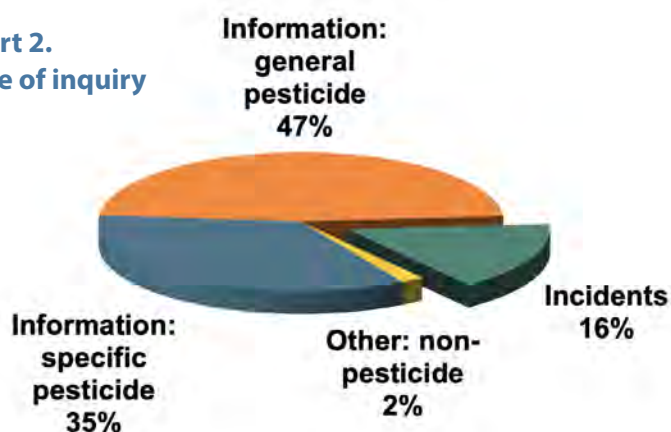
The majority of inquiries (8,305 or 82%) were informational inquiries about pesticides or related topics (Chart 2). NPIC responded to 4,791 (47%) information inquiries about pesticides in general. NPIC responded to 3,514 (35%) information inquiries relating to specific pesticides or active ingredients.

NPIC documented 1,623 incidents involving pesticides (16%). Pesticide specialists routinely provided 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 | 4791 |
| Information - Specific Pesticide | 3514 |
| Incidents | 1623 |
| Other (nonpesticide) | 185 |
| Total = | 10113 |

Chart 2. Type of inquiry



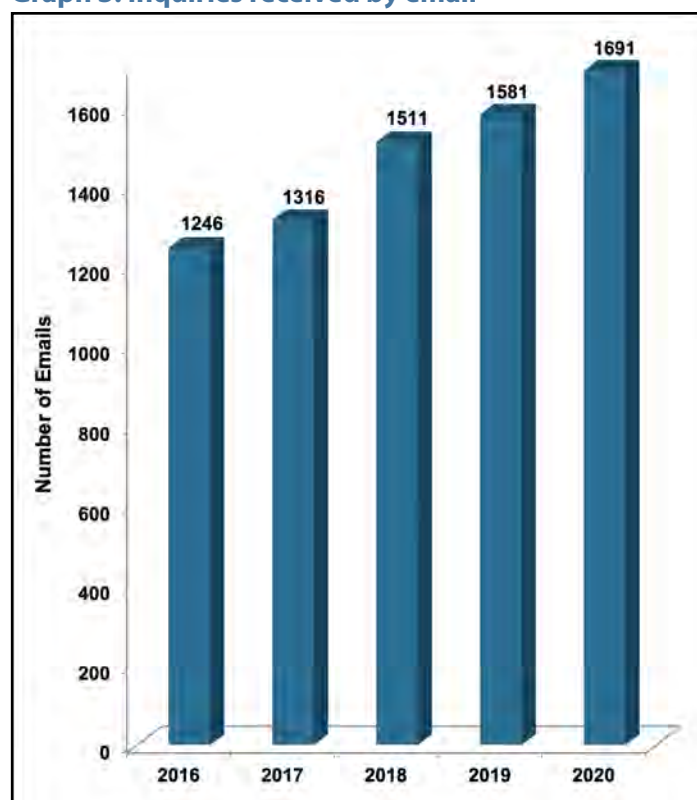
3. Origin of Inquiry

Table 3 summarizes the origin of inquiries received by NPIC. About 83% of inquiries were received by telephone.

Table 3. Origin of inquiry

| Origin of Inquiry | Total |
|-------------------|--------------|
| Phone | 6915 |
| Email/Web | 1691 |
| Voicemail | 1507 |
| Total = | 10113 |

Graph 3. Inquiries received by email



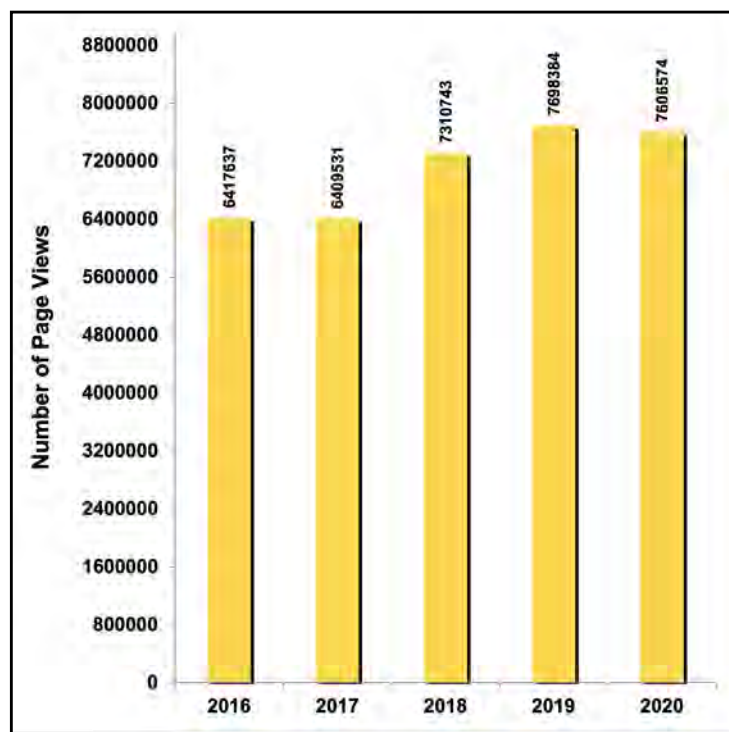
4. Website Access

The NPIC website attracted more than 4.1 million unique visitors viewing 7,606,574 pages during this period.

Most page views originated from queries on popular search sites (57.2%). Others were connected with NPIC from a bookmark (38.1%) or direct link (i.e., shared via email). The most popular search phrases used to reach NPIC were “roach,” “neem oil,” and “DDT.”

Visits to the website varied greatly in duration, with 157,385 visits lasting longer than 15 minutes. The average visit duration was approximately 1 1/2 minutes.

Graph 4.1. Page views



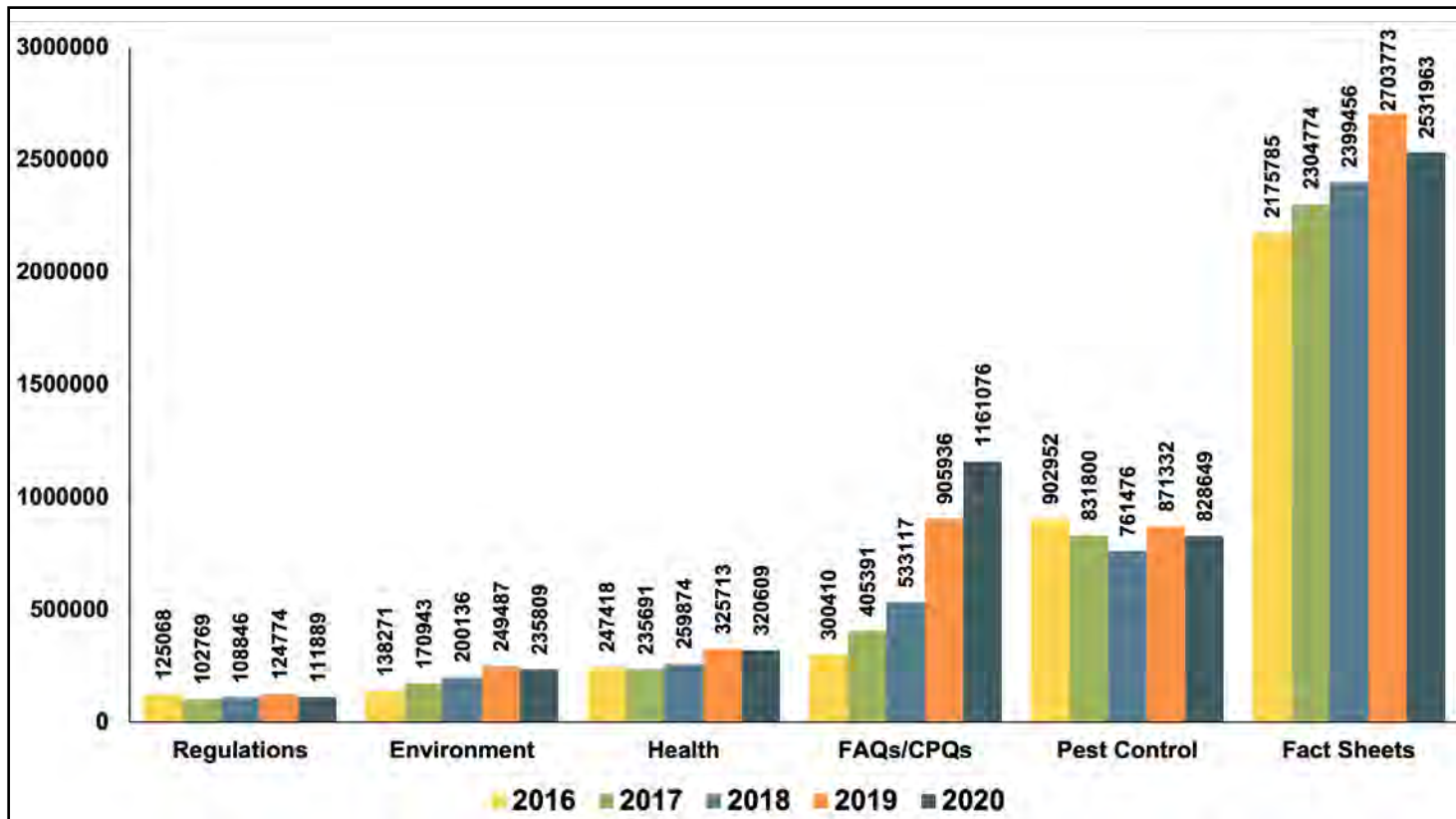
The most popular pages viewed were NPRO (475,684 views), the NPIC home page (358,120 views), the neem oil general fact sheet (244,257 views), Disinfectants and COVID-19 resources (220,711), and the diatomaceous earth general fact sheet (211,503 views).

Table 4. Selected page views

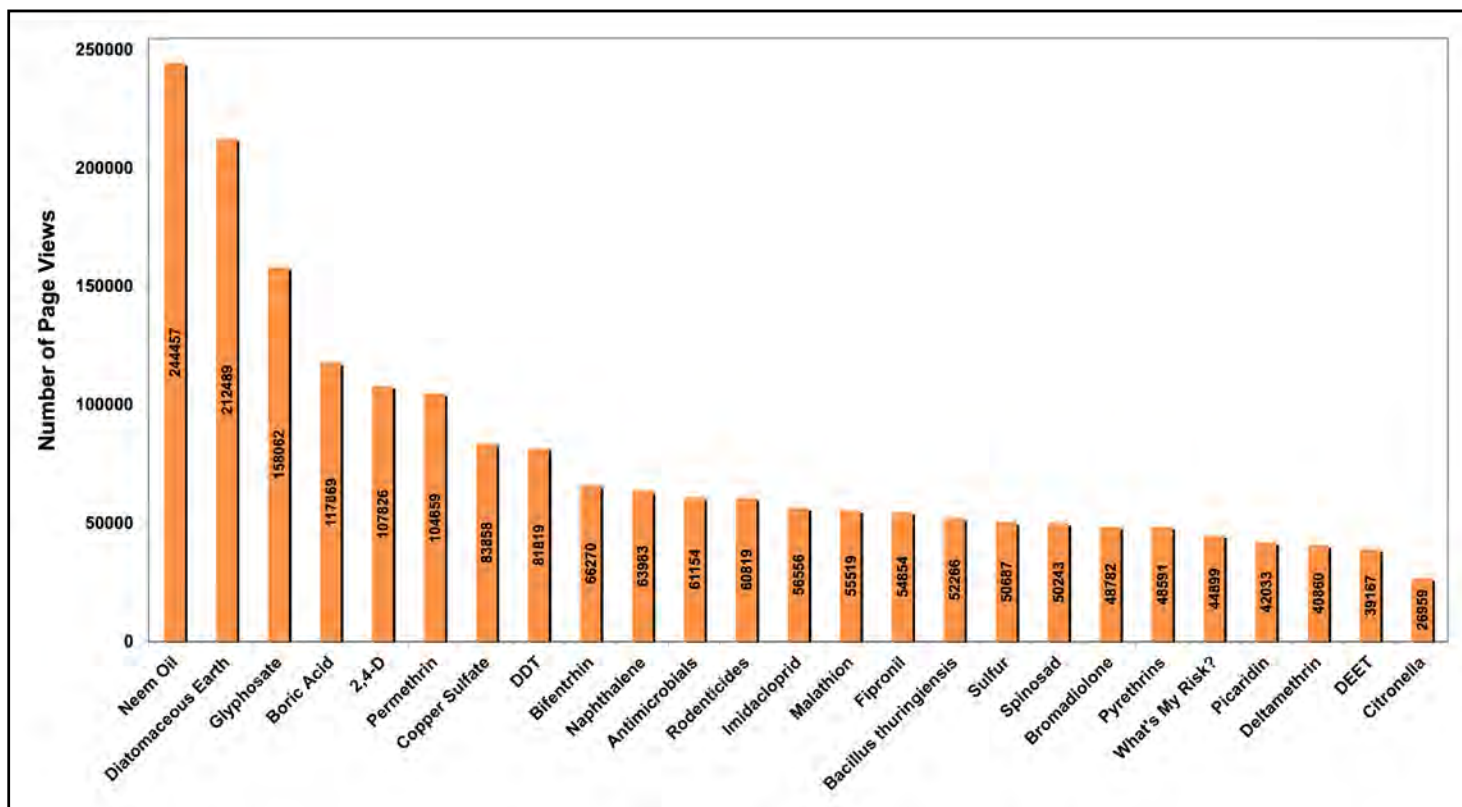
| Page Accessed | English page views | Number of pages available | Spanish page views | Number of pages available |
|-------------------|--------------------|---------------------------|--------------------|---------------------------|
| Fact Sheets | 2,487,162 | 261 | 44,801 | 11 |
| FAQs/CPQs | 510,807 | 121 | 650,269 | 95 |
| Pest Control | 501,687 | 68 | 326,962 | 37 |
| Health and Safety | 197,900 | 33 | 122,709 | 21 |
| Environment | 159,340 | 30 | 76,469 | 7 |
| Regulations | 101,287 | 27 | 10,602 | 7 |

NPIC WEBSITE

Graph 4.2. Top 6 web pages viewed by topic



Graph 4.3. Top 25 active ingredient fact sheet pages viewed



TYPE OF INQUIRER

5. Type of Inquirer

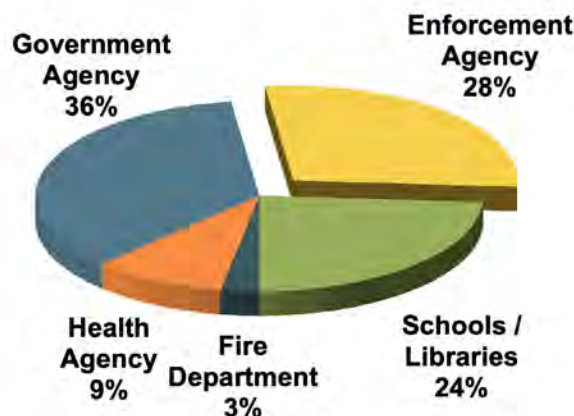
Table 5 summarizes the profession/occupation of individuals contacting NPIC. The majority of inquiries to NPIC are from the public. Of the 10,113 inquiries received, there were 8,781 (86.8%) from the public, 546 (5.4%) from pesticide manufacturers, 146 (1.4%) from federal, state, local government agencies, or schools, and 81 (0.8%) from human and animal medical personnel.

Chart 5 summarizes the 146 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 US EPA, state pesticide regulatory agencies, and police, among others.

Table 5. Type of inquirer

| Type of Inquirer | Total |
|-------------------------------------|--------------|
| General Public | 8781 |
| Federal/State/Local Agencies | |
| Government Agency | 52 |
| Enforcement Agency | 41 |
| Schools / Libraries | 35 |
| Health Agency | 14 |
| Fire Departments | 4 |
| Medical Personnel | |
| Human Medical | 59 |
| Animal / Vet / Clinic | 22 |
| Other | |
| Pesticide Mfg / Mktg Co | 546 |
| Pest Control | 92 |
| Labs / Consulting | 75 |
| Farm | 61 |
| Media | 28 |
| Info Service / Unions | 27 |
| Retail Store / Nursery | 17 |
| Master Gardener | 14 |
| Beekeepers | 9 |
| Environmental Orgs | 9 |
| Nonmigrant Ag Worker | 7 |
| Lawyer / Insurance | 5 |
| Vector Control | 4 |
| Migrant Ag Worker | 2 |
| Other | 209 |
| Grant Year Total = | 10113 |

Chart 5. Inquiries from federal / state / local agencies (Total: 146)



TYPE OF QUESTION

6. Type of Question

The questions received at NPIC are most often related to health (e.g., effects, risk, etc.), pest control (e.g., how to control a pest, pest habits, etc.), and application (e.g., methods, label clarity, etc.). "Other" questions (1,176) include all wrong numbers and people seeking their pest control companies, among others.

Questions about how to follow pesticide label directions were coded as "application" questions (1,454). Questions about regulations (1,271) range from "How do I get a new product registered?" to "Can the authorities make my neighbor stop spraying?"

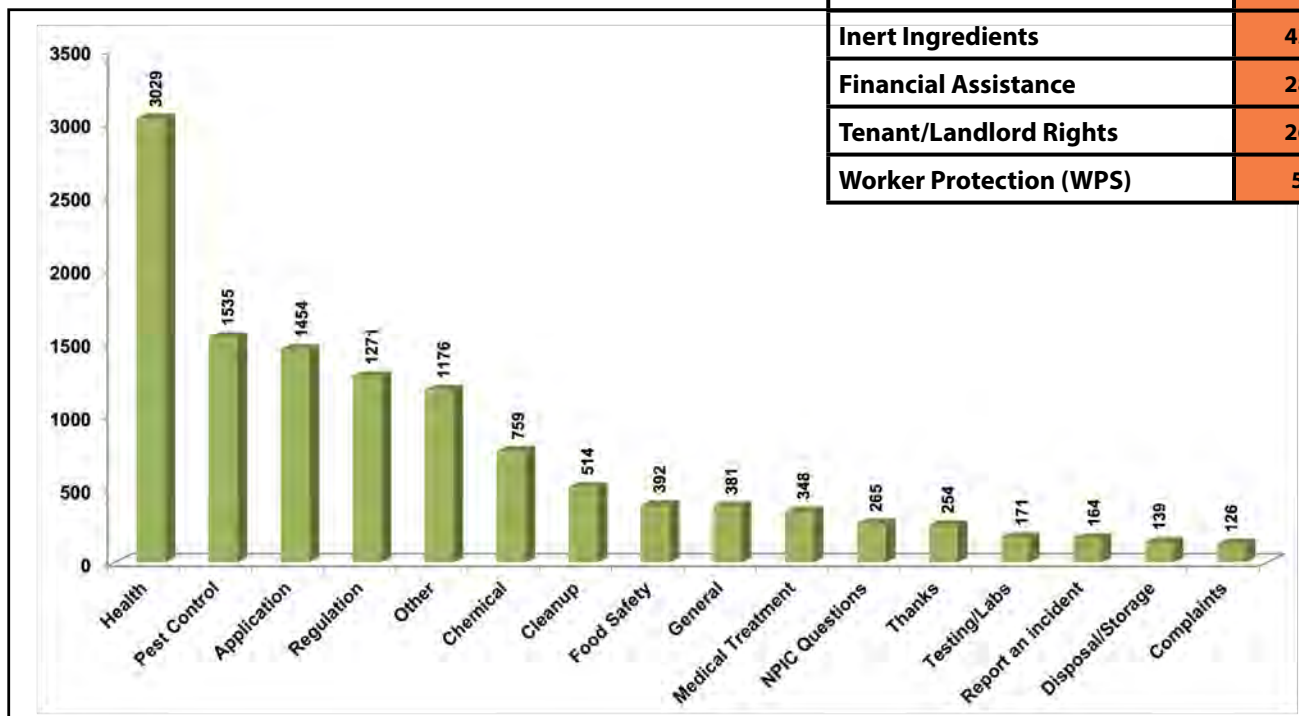
People contacted NPIC in order to report a pesticide incident 164 times. In these cases, NPIC provides people with appropriate local referrals for enforcement, as needed.

Inquiries may involve more than one type of question. Inquirers asked 12,451 questions during this grant year in the course of 10,113 inquiries.

Table 6. Type of question

| Type of Question | Total |
|----------------------------|-------|
| Health: human/domestic | 2780 |
| Pest Control | 1535 |
| Application | 1454 |
| Regulation | 1271 |
| Other | 1176 |
| Chemical | 759 |
| Cleanup | 514 |
| Food Safety | 392 |
| General | 381 |
| Medical Treatment | 348 |
| NPIC Questions | 265 |
| Thanks | 254 |
| Health: eco/wildlife | 249 |
| Testing/Labs | 171 |
| Report an incident | 164 |
| Where to Buy a Product | 153 |
| Disposal/Storage | 139 |
| Complaints | 126 |
| Just Wants Another Contact | 95 |
| Harvest Interval/Re-entry | 71 |
| Pros vs. Cons | 52 |
| Inert Ingredients | 43 |
| Financial Assistance | 28 |
| Tenant/Landlord Rights | 26 |
| Worker Protection (WPS) | 5 |

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 (8,369) were answered by providing information over the phone. Information was also sent via email in 1,640 cases. Upon request, NPIC brochures and other materials were mailed to people eight times in this period.

Table 7.1. Primary action taken

| Primary Action Taken | Number of Inquiries |
|---------------------------------------|---------------------|
| | 2020 |
| Verbal Info | 8369 |
| Emailed Info | 1640 |
| Handled Inquiry in Spanish | 189 |
| Interpreted via Language Line Svcs | 52 |
| Transferred to Specialist / Voicemail | 34 |
| Transferred to EC / PC | 30 |
| Sent NPIC Outreach Material(s) | 5 |
| Mailed Info | 3 |

Risk reduction actions:

NPIC keeps track of certain conversation topics aimed at reducing pesticide risk. Specialists documented 4,843 risk reduction actions, detailed in Table 7.2.

Table 7.2. Risk reduction actions

| Risk Reduction Action Taken | Number of Inquiries |
|-------------------------------------|---------------------|
| | 2020 |
| Discussed Following the Label | 2148 |
| Discussed Ways to Minimize Exposure | 2059 |
| Discussed IPM Concepts | 567 |
| Discussed Environmental Protection | 69 |

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. Examples include “manufacturer/distributor” for detailed application instructions and product complaints, “county extension” for pest control advice, and “state pesticide regulatory agencies” for enforcement.

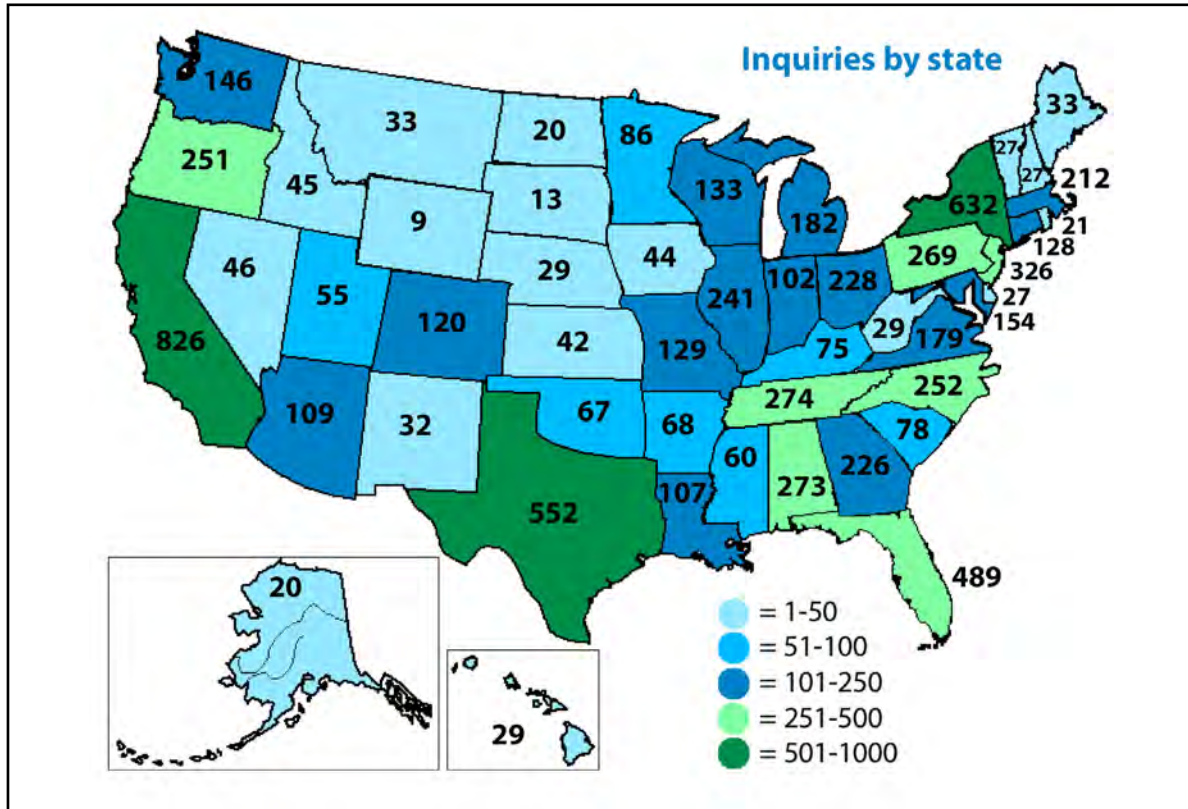
Table 7.3. Referrals to other organizations

| Organization Name | Number of Inquiries |
|------------------------------------|---------------------|
| | 2020 |
| Manufacturer / Distributor Contact | 2018 |
| NPIC Website | 1408 |
| County Extension Contact | 861 |
| State Lead Contact | 825 |
| EPA Website | 589 |
| EPA HQ / OPP Contact | 483 |
| Other Organization Contact | 477 |
| Poison Control Contact | 325 |
| EPA Region Contact | 242 |
| Hazardous Waste Contact | 121 |
| Department of Health Contact | 121 |
| Other State Agency Contact | 105 |
| Animal Poison Contact | 100 |
| Other Federal Agency Contact | 44 |
| OSHA Contact | 12 |

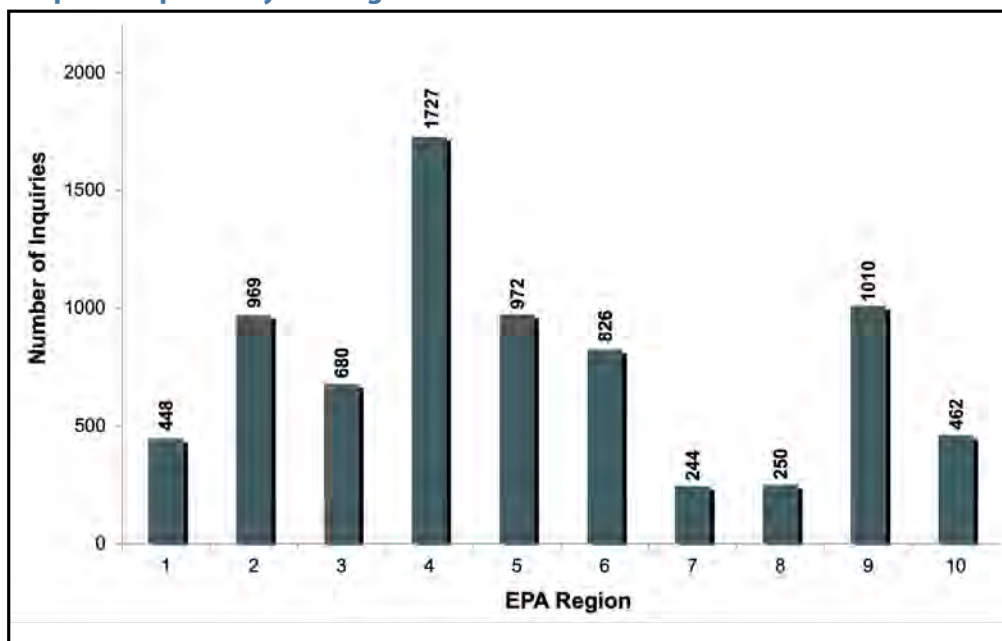
INQUIRIES BY STATE

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, Texas, New York, and Florida. In addition to the states, NPIC received inquiries from Puerto Rico (11), District of Columbia (22), Canada (101), and other countries (251). Sometimes a state cannot be identified during the inquiry.



Graph 8. Inquiries by EPA region



Graph 8 summarizes inquiries by EPA region.

The top 5 regions with a known state were:

- Region 4 (22.8%)
- Region 9 (13.3%)
- Region 5 (12.8%)
- Region 2 (12.8%)
- Region 6 (10.9%)

TOP 25 AIs FOR ALL INQUIRIES

9. Top 25 Active Ingredients for All Inquiries

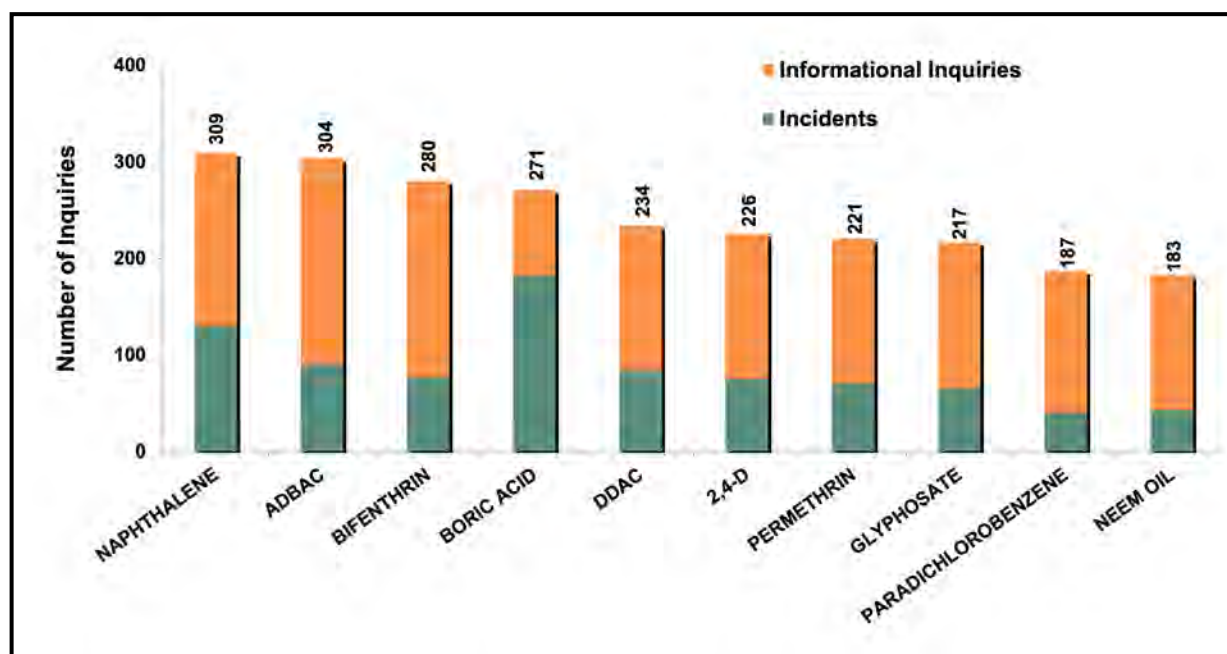
When inquiries to NPIC involve discussion of a specific product or active ingredient, specialists record the product and the active ingredient in the PID. Naphthalene was discussed in more inquiries than any other single active ingredient this year (Table 9, Graph 9). Of the 309 inquiries involving naphthalene, 130 (42.1%) were incidents. Note that an inquiry may involve discussion of several active ingredients.

Graph 9 illustrates the number of informational and incident inquiries for the top active ingredients discussed during the grant year.

Table 9. Top 25 active ingredients for all inquiries

| Active Ingredient | Total Inquiries | Incident Inquiries | Information Inquiries |
|--------------------|-----------------|--------------------|-----------------------|
| NAPHTHALENE | 309 | 130 | 179 |
| ADBAC | 304 | 90 | 214 |
| BIFENTHRIN | 280 | 77 | 203 |
| BORIC ACID | 271 | 182 | 89 |
| DDAC | 234 | 84 | 150 |
| 2,4-D | 226 | 75 | 151 |
| PERMETHRIN | 221 | 71 | 150 |
| GLYPHOSATE | 217 | 65 | 152 |
| PARADICHLOROBEZENE | 187 | 40 | 147 |
| NEEM OIL | 183 | 43 | 140 |
| SILICON DIOXIDE | 132 | 32 | 100 |
| PYRETHRINS | 123 | 33 | 90 |
| DICAMBA | 121 | 40 | 81 |
| IMIDACLOPRID | 117 | 45 | 72 |
| PIPERONYL BUTOXIDE | 113 | 40 | 73 |
| FIPRONIL | 105 | 28 | 77 |
| MALATHION | 98 | 37 | 61 |
| CYPERMETHRIN | 92 | 43 | 49 |
| TRICLOPYR | 90 | 25 | 65 |
| DELTAMETHRIN | 88 | 31 | 57 |
| PYRIPROXYFEN | 72 | 33 | 39 |
| LAMBDA-CYHALOTHRIN | 67 | 28 | 39 |
| MECOPROP | 66 | 17 | 49 |
| SULFUR | 65 | 18 | 47 |
| CARBARYL | 65 | 15 | 50 |

Graph 9. Top 10 pesticide active ingredients for all inquiries



INCIDENT TYPE

10. Incident Type

An incident may involve a spill, misapplication, exposure, adverse effects, or any combination of these events.

There were 1,823 pesticide exposures and 753 accidents. Charts 10.1 and 10.2 provide further details. Among reported exposures, inhalation was the most common route of exposure (32.4%), followed by dermal contact (23.5%) and ingestion (17.0%). When a specific exposure route could not be identified, specialists documented an "Unknown" exposure route (11.7%).

Indoor spills (75) were reported more often than outdoor spills (29). Among reported misapplications (452), 83.0% were misapplications by the homeowner or resident. Misapplications by homeowners decreased between 2019 (412) and 2020 (375). The number of incidents involving drift decreased from 2019 (98) to 2020 (72).

Chart 10.1. Pesticide exposures (Total: 1,823)



Chart 10.2. Pesticide accidents (Total: 753)



Table 10. Incident Type

| Type of Incident | Total |
|---------------------|-------------|
| Exposures | |
| Inhalation | 591 |
| Dermal | 429 |
| Ingestion | 310 |
| Unknown | 214 |
| Exposure Possible | 211 |
| Ocular | 39 |
| Workplace | 17 |
| Occupational | 12 |
| Accidents | |
| Misapp. - Homeowner | 375 |
| Plant Damage | 122 |
| Spill - Indoor | 75 |
| Drift | 72 |
| Misapp. - Other | 35 |
| Spill - Outdoor | 29 |
| Misapp. - PCO | 28 |
| Misapp. - Unknown | 14 |
| Other | 2 |
| Fire | 1 |
| Total = | 2576 |

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. Both are commonly found in mothballs and similar products.

In Table 11, the top three active ingredients for human and animal exposures are highlighted below. Naphthalene, paradichlorobenzene, and ADBAC were involved in the highest number of exposures for human incidents. The top three active ingredients with the highest number of exposures involving animals were boric acid, naphthalene, and iron phosphate.

Table 11. Top 25 active ingredients for incidents reported to NPIC¹

| Active Ingredient | Human Exposures | Animal Exposures | Other Accidents |
|---------------------|-----------------|------------------|-----------------|
| NAPHTHALENE | 229 | 30 | 242 |
| PARADICHLOROBENZENE | 179 | 23 | 206 |
| BORIC ACID | 51 | 119 | 18 |
| ADBAC | 69 | 5 | 21 |
| 2,4-D | 41 | 10 | 34 |
| BIFENTHRIN | 48 | 18 | 18 |
| PERMETHRIN | 39 | 20 | 16 |
| DDAC | 60 | 5 | 20 |
| GLYPHOSATE | 32 | 16 | 18 |
| IMIDACLOPRID | 25 | 19 | 8 |
| DICAMBA | 24 | 4 | 17 |
| IRON PHOSPHATE | 2 | 27 | 1 |
| PIPERONYL BUTOXIDE | 26 | 8 | 11 |
| BROMETHALIN | 3 | 21 | 4 |
| CYPERMETHRIN | 34 | 2 | 10 |
| MALATHION | 20 | 1 | 18 |
| CAPSAICIN | 22 | 5 | 10 |
| NEEM OIL | 36 | 4 | 3 |
| BROMADIOLONE | 4 | 19 | 4 |
| DELTAMETHRIN | 24 | 6 | 8 |
| FIPRONIL | 8 | 13 | 10 |
| PYRIPROXYFEN | 20 | 11 | 3 |
| PYRETHRINS | 23 | 6 | 7 |
| SILICON DIOXIDE | 22 | 10 | 2 |
| LAMBDA-CYHALOTHRIN | 18 | 6 | 5 |

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 an exposure or accident. Of the 2,315 locations where exposures or accidents were documented, 88.2% occurred in the home or yard, 3.0% occurred in an agricultural setting, and 2.4% occurred at the intersection of home and agricultural property. Table 12 identifies the number of exposures or accidents reported to NPIC in a variety of other locations.

Based on inquiries, NPIC saw a decrease in incidents occurring at natural (e.g., ponds, lakes, streams) and treated water locations in 2020 (13) compared to 2019 (23).

Table 12. Location of exposure/accident

| Location | Total |
|-----------------------|-------------|
| Home - Inside | 1176 |
| Home - Outside | 865 |
| Agricultural | 69 |
| Ag/urban interface | 55 |
| Vehicle | 38 |
| Other | 29 |
| Health Care Facility | 19 |
| Park/Golf Course | 13 |
| Office Building | 12 |
| Pond/Lake/ Stream | 11 |
| Roadside/Right-of-Way | 10 |
| Industrially Related | 6 |
| School/Day Care | 5 |
| Nursery/Greenhouse | 3 |
| Retail Store | 2 |
| Treated Water | 2 |
| Total = | 2315 |

13. Environmental Impact

Table 13 presents the type of incidents reported for each kind of environmental or built entity. The most common environmental incidents reported to NPIC involve pesticide misapplications to buildings by residents (152).

Table 13. Reported environmental impacts

| | Drift | Fire | Misapplication: Resident | Misapplication: Other | Misapplication: PCO | Misapplication: Unknown | Other | Plant Damage | Spill: Indoor | Spill: Outdoor |
|------------------------|-------|------|--------------------------|-----------------------|---------------------|-------------------------|-------|--------------|---------------|----------------|
| Agricultural Crop | 6 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 0 | 0 |
| Building - Home/Office | 7 | 0 | 152 | 19 | 17 | 9 | 0 | 0 | 50 | 4 |
| Home Garden | 23 | 0 | 68 | 2 | 6 | 0 | 0 | 54 | 0 | 1 |
| Home Lawn | 2 | 0 | 57 | 4 | 0 | 2 | 0 | 9 | 0 | 5 |
| Natural Water | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Property | 6 | 1 | 30 | 2 | 3 | 0 | 0 | 0 | 16 | 4 |
| Soil/Plants/Trees | 18 | 0 | 26 | 3 | 0 | 2 | 0 | 45 | 0 | 7 |
| Treated Water | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Vehicle | 3 | 0 | 10 | 4 | 0 | 0 | 0 | 0 | 6 | 1 |
| Other ¹ | 1 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |

¹“Other” refers to miscellaneous items not included in previous categories (i.e., sidewalk, food).

CERTAINTY INDEX

14. Certainty Index

Table 14 and Graphs 14.1 and 14.2 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 (1,516), 20.4% of the cases were assigned a certainty index of “consistent,” 17.6% were assigned an index of “inconsistent,” and 62.0% 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 a quality assurance specialist. Dr. Berman, DVM, 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 for the identified active ingredients, in the context of the reported pesticide exposure.

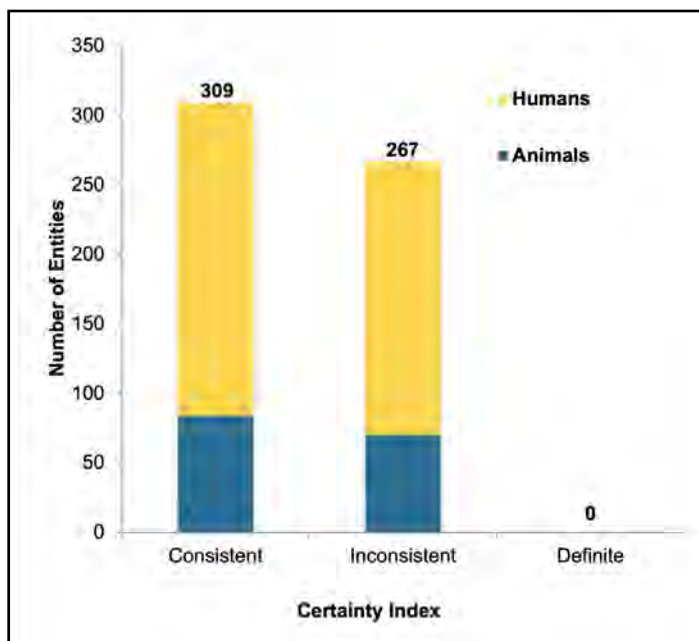
The certainty index is “**unclassifiable**” when one or more of the following criteria apply:

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

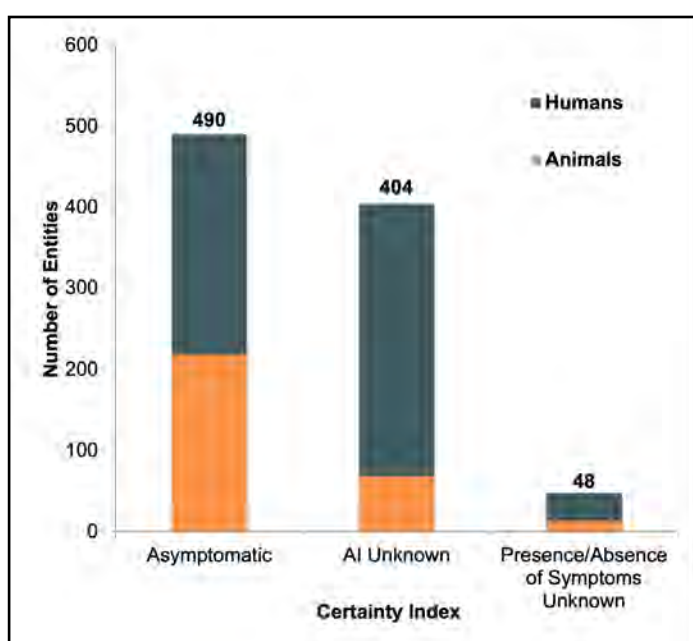
Table 14. Incident inquiries by certainty index (CI)

| 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 | 640 | 300 | 644 | 1584 | 227 | 323 | 83 | 6 |
| Definite | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consistent | 225 | 84 | 0 | 309 | 79 | 128 | 18 | 1 |
| Inconsistent | 197 | 70 | 0 | 267 | 67 | 121 | 9 | 0 |

Graph 14.1. Certainty index for incidents



Graph 14.2. Unclassifiable CI categories



SEVERITY INDEX

15. Severity Index

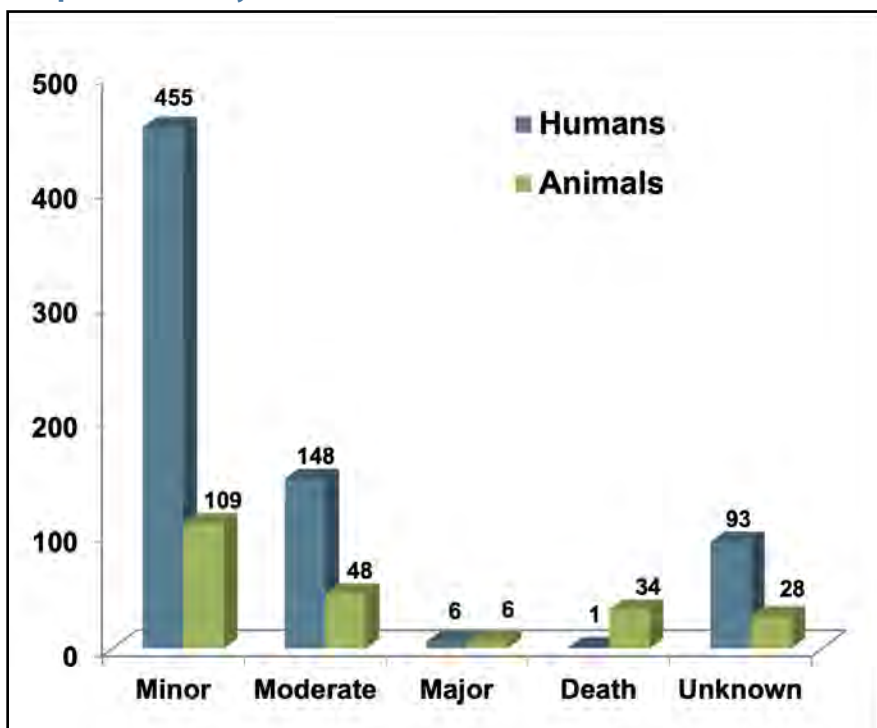
Table and Graph 15 summarize the severity of symptoms for all human and animal incidents reported to NPIC.

For all human pesticide incidents with reported exposures, 42.8% had minor symptoms, 13.9% had moderate symptoms, 0.6% had major symptoms, and 0.1% reported a death. Symptoms were unknown in 8.8% of human incidents. In 33.8% 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 | 455 | 109 | 564 | 143 | 279 | 33 | 0 |
| Moderate | 148 | 48 | 196 | 54 | 82 | 11 | 1 |
| Major | 6 | 6 | 12 | 2 | 4 | 0 | 0 |
| Death | 1 | 34 | 35 | 0 | 1 | 0 | 0 |
| Unknown | 93 | 28 | 121 | 34 | 40 | 13 | 6 |
| Asymptomatic | 359 | 229 | 588 | 140 | 166 | 53 | 0 |

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 2,160 entities involved in incidents reported to NPIC during this period, 49.2% were human, 21.0% were animals, and 29.4% were environmental nontarget entities. Other entities (9, 0.4%) are miscellaneous items (i.e., sidewalk, food). Pesticide incidents may involve multiple entities.

Graph 16.1. Humans

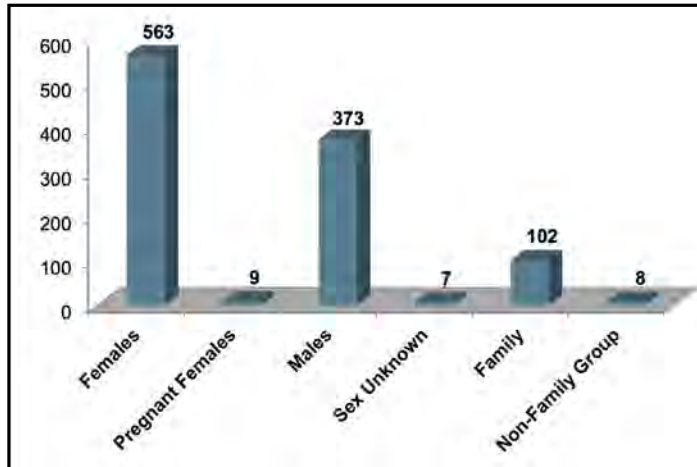
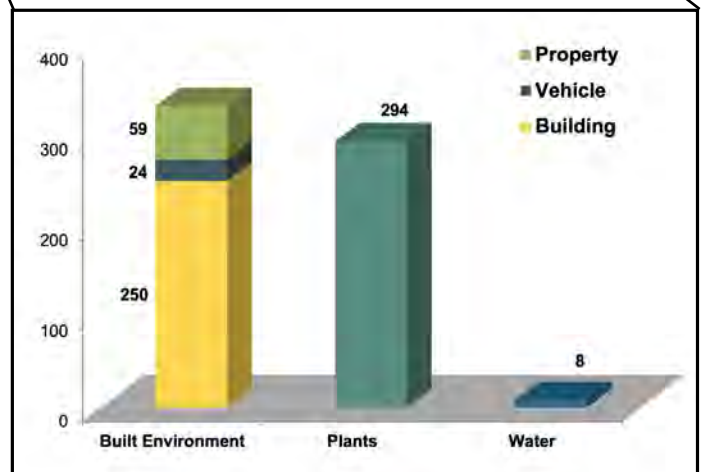
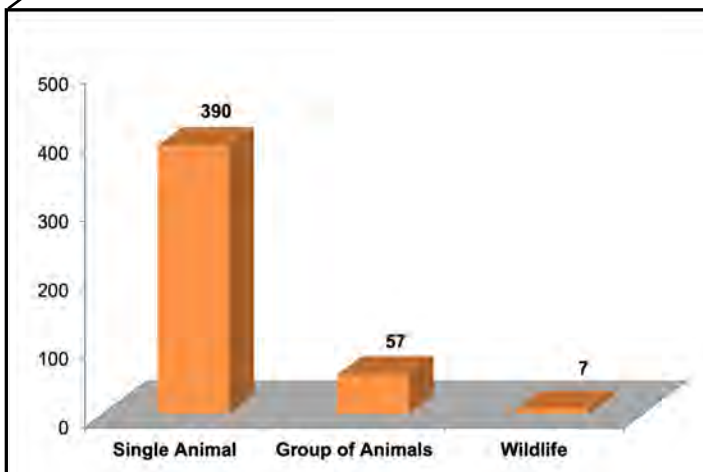
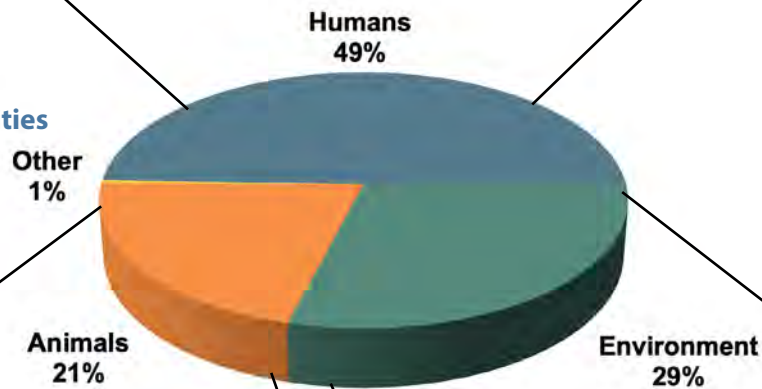


Chart 16. Description of entities



Graph 16.2. Animals

Graph 16.3. Environmental entities

DEATHS WITH KNOWN ACTIVE INGREDIENT

17. Reported Deaths

Of the 454 animal entities involved in pesticide incidents, 34 deaths were reported. Of those, there were 25 animal deaths where the active ingredients were known (Table 17.1).

Table 17.2 describes reported deaths with known active ingredient(s) where signs and/or symptoms were consistent with literature, in the context of the reported exposure scenario.

A woman's death was reported to NPIC as a suspected poisoning after a hair sample tested positive for an unknown rodenticide. The caller did not have information about the exposure timeline or scenario, testing results, product information, or other details.

Table 17.1. Reported deaths with known active ingredient

| Reported Deaths | Total |
|----------------------|-----------|
| Animal Deaths | |
| Single Animal | 14 |
| Group of Animals | 7 |
| Wildlife | 4 |
| Total = | 25 |

Table 17.2. Reported animal deaths with compatible signs/symptoms in severity

| PESTICIDE PRODUCT | ACTIVE INGREDIENT | INCIDENT TYPE | ENTITY | CERTAINTY INDEX | STATE |
|----------------------|---------------------------------|---------------------|------------------|-----------------|-------|
| N/A | BROMADIOLONE | Exposure: Possible | Wildlife | Consistent | CT |
| TALSTAR | BIFENTHRIN | Exposure: Possible | Group of Animals | Consistent | WI |
| MERIT | IMIDACLOPRID | Exposure: Possible | Group of Animals | Consistent | MD |
| N/A | STRYCHNINE | Exposure: Possible | Group of Animals | Consistent | MT |
| MARTIN'S GOPHER BAIT | STRYCHNINE | Exposure: Ingestion | Single Animal | Consistent | TX |
| AQUA-RESLIN | PIPERONYL BUTOXIDE PERMETHRIN | Exposure: Possible | Group of Animals | Consistent | SD |

18. Entity Age

Table 18 and Graph 18 summarize the ages of people involved in incidents reported to NPIC. Among 952 single human entities, NPIC was able to collect the person's age 83.2% of the time. NPIC aims to capture the age for all human entities; occasionally callers decline to provide that information.

Among the 792 humans with known age, 10.5% were children (ages 4 and under), and 28.8% were seniors (ages 65 and over).

Graph 18. Age of people involved in reported incidents

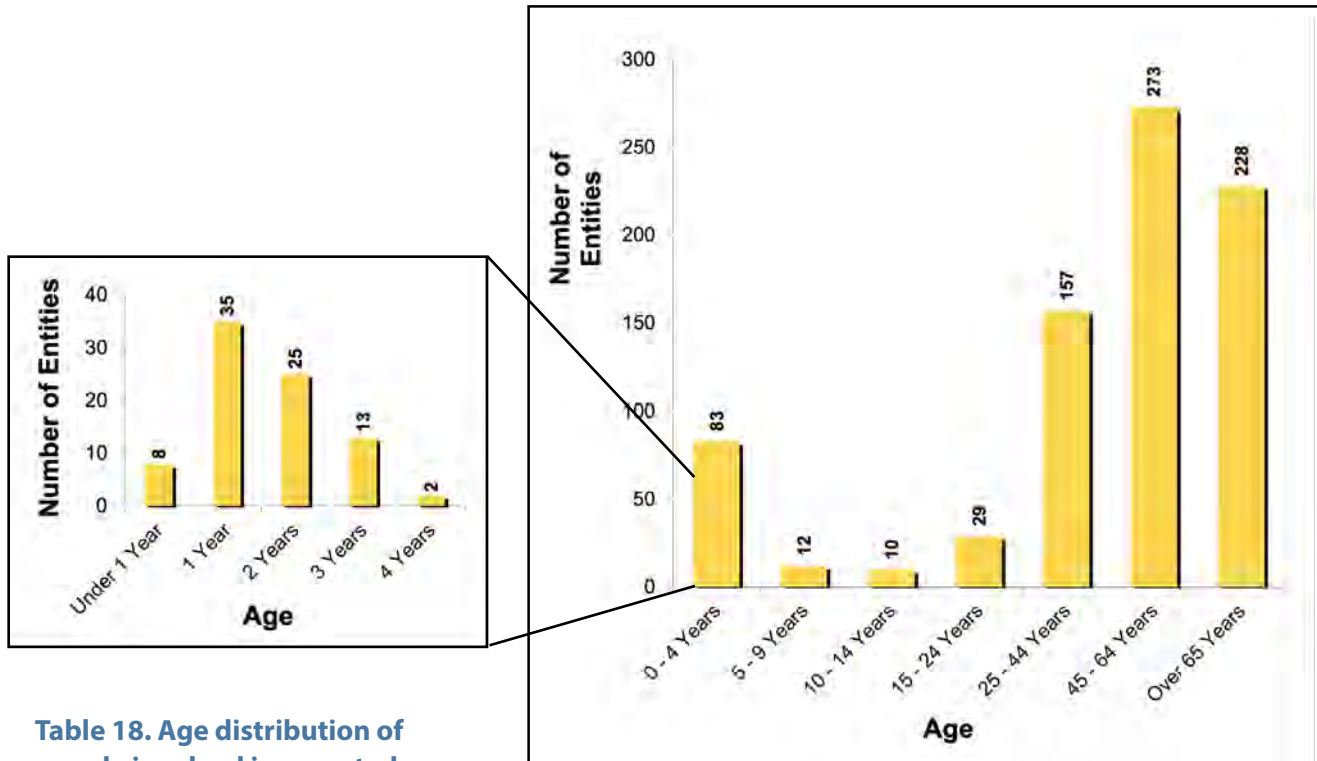


Table 18. Age distribution of people involved in reported incidents

| Age Category | Total |
|------------------------------|-----------|
| Under 1 Year | 8 |
| 1 Year | 35 |
| 2 Years | 25 |
| 3 Years | 13 |
| 4 Years | 2 |
| Total (0 - 4 Years) = | 83 |
| 5 - 9 Years | 12 |
| 10 - 14 Years | 10 |
| 15 - 24 Years | 29 |
| 25 - 44 Years | 157 |
| 45 - 64 Years | 273 |
| Over 65 years | 228 |

NOTABLE EXPOSURES

19. Notable Exposures

There were 2,160 entities potentially exposed to pesticides in 1,623 reported incidents.

Figure 19.1

There were 1,623 pesticide incidents reported, involving 2,160 exposed entities (people, animals, buildings, plants, soil, and water).

Total = 2,160 entities

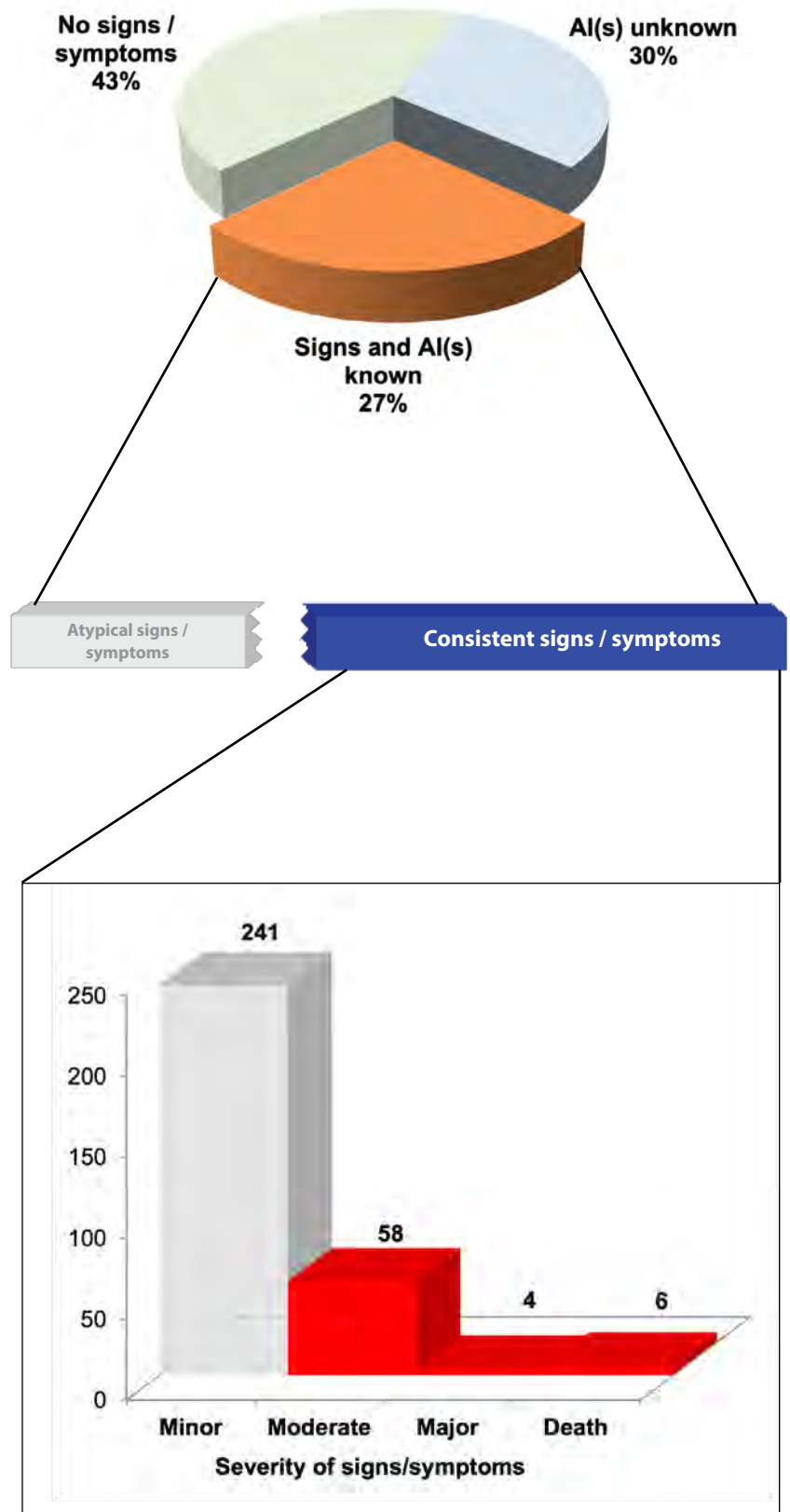


Figure 19.2

Human and animal entities potentially exposed to a known pesticide, with reported signs/symptoms.

Total = 576 entities

Figure 19.3

Human and animal entities potentially exposed to a known pesticide with reported signs/symptoms that were **consistent** with reports in the literature for that pesticide.

Total = 309 entities

Signs and symptoms are compared to the open literature, including fact sheets, case reports, textbooks, and articles. Furthermore, the timing of onset and duration are considered.

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 Veterinary Incident Reporting Portal (VIRP).

Veterinarians submitted 19 incident reports to the VIRP involving 19 animals (16 canine, 2 feline, and 1 other). 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. About a third of incidents were pellet products (35%).

Table 20.2 and Chart 20.2 summarize the pesticide types that were involved in the incidents reported by veterinarians. More than half of the products reported in incidents were insecticides (53%).

Table 20.1. Product formulations as reported in VIRP

| Known Formulations | Number of Products |
|--------------------|--------------------|
| | 2020 |
| Pellet | 6 |
| Other | 5 |
| Liquid | 2 |
| Powder | 2 |
| Spot-on | 2 |
| Unknown | 2 |
| Total = | 19 |

Chart 20.1. Product formulations reported in VIRP

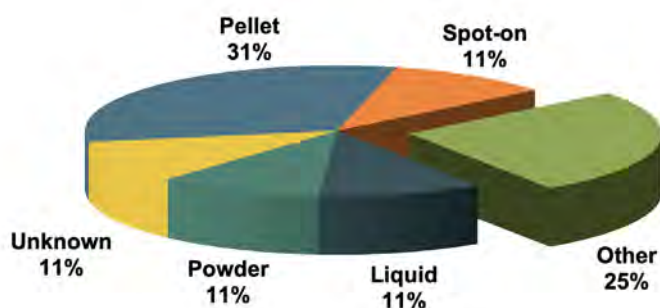
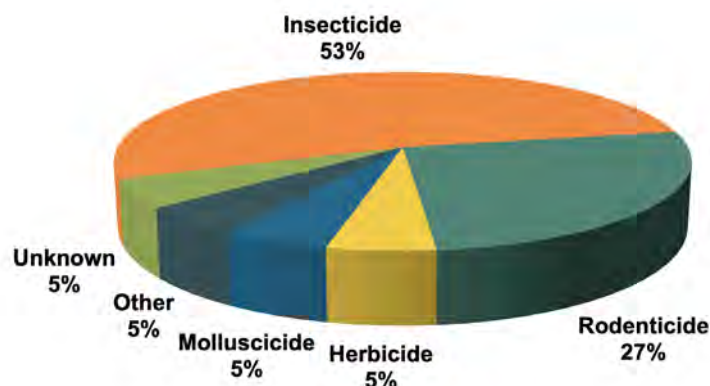


Table 20.2. Product types as reported in VIRP

| Product Type | Number of Products |
|----------------|--------------------|
| | 2020 |
| Insecticide | 10 |
| Rodenticide | 5 |
| Herbicide | 1 |
| Molluscicide | 1 |
| Other | 1 |
| Unknown | 1 |
| Total = | 19 |

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 the VIRP. Symptoms are classified as dermatological (e.g., irritant, sloughing, ulcer), gastrointestinal (e.g., diarrhea, vomiting), neurological (e.g., depression, excited state, seizures, tremors), none, or other. Multiple symptoms may be reported for each animal. Of the reported symptoms, 39% were classified as neurological, 32% were classified as gastrointestinal, 13% were classified as other, 10% were classified as none, and 6% were classified as dermatological.

Table 20.3. Animal symptoms as reported in VIRP

| Symptom | Number of Animals |
|-------------------------------|-------------------|
| | 2020 |
| Dermatological: Irritant | 1 |
| Dermatological: Ulcer | 1 |
| Dermatological: Sloughing | 0 |
| Dermatological Total | 2 |
| Gastrointestinal: Vomiting | 6 |
| Gastrointestinal: Diarrhea | 4 |
| Gastrointestinal Total | 10 |
| Neurological: Seizure | 5 |
| Neurological: Tremor | 4 |
| Neurological: Depression | 2 |
| Neurological: Excited | 1 |
| Neurological Total | 12 |
| Other | 4 |
| None | 3 |
| Total = | 31 |

Chart 20.3. Animal symptoms as reported in VIRP

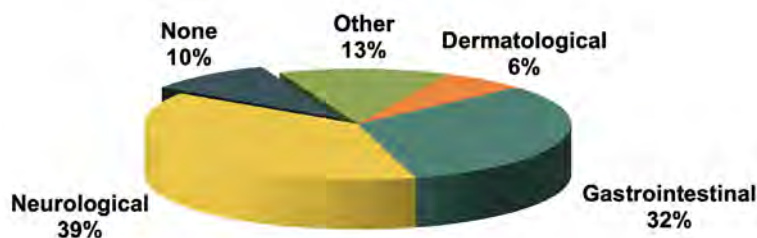


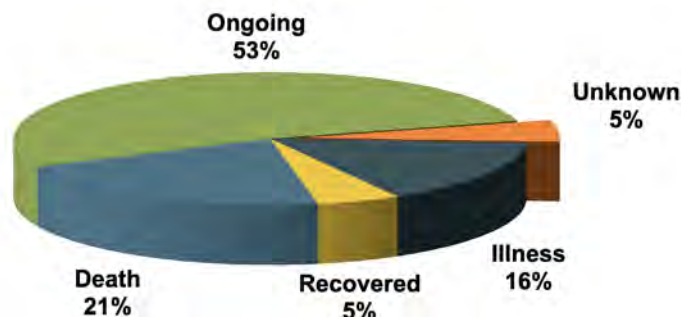
Table 20.4 and Chart 20.4 summarize the outcomes associated with each animal incident reported in the VIRP. Multiple animals may be involved in each VIRP report. Thus, totals reflect the number of animals, as opposed to the number of reports.

Of the total number of animals involved in VIRP incident reports, 53% of the cases were ongoing. The affected animals had recovered at the time of the report in 5% of cases. Twenty-one percent (21%) of the outcomes reported an animal death.

Table 20.4. Incident outcomes as reported in VIRP

| Outcome | Number of Animals |
|---------------|-------------------|
| | 2020 |
| Ongoing | 10 |
| Death | 4 |
| Illness | 3 |
| Recovered | 1 |
| Unknown | 1 |
| Total: | 19 |

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 US 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, without modification, to OPP quarterly, in their entirety. More recently, NPIC developed programming to make that delivery automatic and immediate.

Reports submitted to the Eco-portal in 2020 involved possible exposures to bees (29), plants (2), fish (2), insects (1), reptiles (1), mammals (1), and birds (1). Table 21.1 summarizes the active ingredients involved in the 37 reports submitted to the Eco-portal.

Table 21.1. Active ingredients involved in the Eco-reports

| Active Ingredient | Quantity |
|--------------------------|-----------------|
| UNKNOWN | 38 |
| CLOTHIANIDIN | 2 |
| METALAXYL | 2 |
| PROTHIONCONAZOLE | 2 |
| TRIFLOXYSTROBIN | 2 |
| FLUOXASTROBIN | 2 |
| IPCONAZOLE | 2 |
| CARBENDAZIM | 1 |
| MALATHION | 1 |
| BIFENTHRIN | 1 |
| GLYPHOSATE | 1 |
| PERMETHRIN | 1 |
| PROPYLENE GLYCOL | 1 |



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