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NATIONAL
PESTICIDE ● INFORMATION
CENTER

-2021-

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 2021 Annual Report covers the period of February 15, 2021 - February 14, 2022.

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 consistency 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:



Jeff Jenkins, Ph.D.
Project Director

Cooperative Agreement #X8-83947901
Environmental and Molecular Toxicology
Oregon State University
310 Weniger Hall
Corvallis, OR 97331-6502
800-858-7378
npic.orst.edu

NPIC 2021 Annual Report

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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 third 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, 2021, and ended February 14, 2022.
This period will be referenced as "2021" 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 one pesticide specialist this year, retaining six highly qualified pesticide specialists total.
- NPIC collaborated with 23 organizations this grant year to provide outreach and expert risk communication instruction to the public, medical professionals, agricultural growers, and educators:
 - NPIC discussed communication and outreach between NPIC and tribes with EPA Region 10.
 - NPIC participated in the Oregon Department of Agriculture's Pesticide Analytical and Response Center follow-up meeting about clopyralid-contaminated compost issues from 2020, helping to identify resources for affected citizens.
 - NPIC discussed disinfectant trends with various state agencies at the Oregon Pesticide Symposium in April 2021.
 - NPIC participated in a meeting of the Association of Structural Pest Control Regulatory Officials (ASPCRO), Structural Remediation Committee (SRC), to discuss contributing materials for a new pesticide cleanup resources tool, RemediaPedia.
 - NPIC and the Washington Department of Health created an [infographic about bleach safety](#) for early childcare centers.
 - NPIC discussed NPIC services with the Tribal Pesticide Program Council (TPPC).
 - NPIC participated in a board meeting with the Oregon Department of Agriculture's Pesticide Analytical and Response Center (PARC) to discuss current events and incidents in Oregon.
 - NPIC staff presented virtually about risk communication and debunking misinformation at the Public Health Pesticide Regulatory Education Program (PREP) course.
 - NPIC discussed NPIC services with inspectors of the Wisconsin Department of Agriculture, Trade, and Consumer Protection.
 - NPIC presented for state, Tribal, and federal regulators at the Compliance and Enforcement Management PREP virtual conference.
 - NPIC presented at the national SFIREG meeting to explain NPIC services, data collection, and noteworthy cases.
 - Pesticide Educational Resources Collaborative (PERC) promoted NPIC services and where to report pesticide exposures during the Pesticides and Public Health PREP course.
 - NPIC staff presented at the Pesticide Applicators Certification & Training (PACT) conference in Denver, CO, discussing risk communication for state, federal, tribal, and territory officials.

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 worked with the Virginia Department of Agriculture and Consumer Services, to approve the use of NPIC images and written content in a brochure about mothball risks and proper use.
- NPIC and the American Association of Poison Control Centers hosted a Facebook Live event about disinfectant risks and best practices titled, "**Partner Chat: Deep Dive on Disinfectants.**"
- NPIC presented at the EPA Regional Division Directors meeting about NPIC services, data collection, and noteworthy case reporting.
- NPIC staff presented virtually about risk communication and debunking misinformation at the Pesticides and Water Quality PREP course.
- NPIC worked with an Oregon Poison Center's Community Outreach Educator to translate an existing NPIC **infographic about PPE** into Spanish for use in a poison center outreach campaign.
- NPIC shared disinfectant safety webinar slides with EPA Region 8 for use at the Wyoming Pesticides Education Conference.
- NPIC discussed its services, data collection, and noteworthy cases at the Region 10 Directors Meeting.
- NPIC led a risk communication workshop at the Pesticide Applicator Continuing Education Short Course for the Arizona-New Mexico Chapter of the American Fisheries Society.
- NPIC cohosted a webinar with the Pesticide Educational Resources Collaborative – Medical (PERC-med) titled **Disinfectants: What clinicians need to know to reduce risk.** The webinar was hosted by the Oregon Pacific Area Health Education Center.
- NPIC worked with the American Association of Poison Control Centers, the Oregon Poison Center, the Washington Poison Center, and the Virginia Poison Center to spread awareness of NPIC's new infographic titled **Disinfectant Wipes are Different.**
- NPIC was interviewed in the February 2022 issue of **Dermatology World** to reach out to medical professionals about pesticide risks in bedbug control. The interview highlighted a 2021 NPIC publication: **Pesticides Misused for Bed Bug Control: Comparing Professional and Nonprofessional Applications Reported to the National Pesticide Information Center, 2013–2017.**

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 23 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 1,908 relevant articles, documents, and websites.
- NPIC updated 17 active ingredient (AI) files and created three new AI files. NPIC also added 355 new documents to AI files.

New/Updated AI files

- Acetic Acid
- Brodifacoum
- Calcium Acetate (new)
- Calcium Hypochlorite
- Chlorantraniliprole
- Citric Acid
- Dithiopyr
- Esfenvalerate
- Fenoxaprop-p-ethyl
- Flumethrin

New/Updated AI files

- Fluroxypyr
- Inpyrfluxam (new)
- Naphthalene acetic acid
- Paraquat Dichloride
- Polihexanide
- Prallethrin
- Prodiamine
- Sulfentrazone
- Sodium Hypochlorite
- Tiafenacil (new)

DELIVERING OBJECTIVES

- NPIC staff members attended 34 events for continuing education (CE) this grant year, including 19 webinars, eight conferences/workshops hosted by other organizations, six events hosted by Oregon State University, and one in-house presentation.
- NPIC tracked certain elements to quantify risk-reduction activities. In conversations with callers, pesticide specialists discussed following the label 1,962 times, ways to minimize exposure 1,733 times, IPM concepts 498 times, and environmental protection (including pollinator protection) 82 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.

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 154 cases during the year.
- NPIC discussed potential trends and data with EPA’s Office of Pesticide Programs (OPP):
 - NPIC and OPP discussed data trends and deliverables for Q4 (GY2) and Q1-Q3 (GY3) at two Quarterly Coordination Meetings. Follow-up discussions included sharing NPIC’s upcoming ADBAC/DDAC fact sheet with specific OPP Antimicrobial Division personnel, ozonated water incidents, and an infographic about comparing pesticide wipes with non-pesticide wipes.
- NPIC shared 100 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 2021 grant year period.
- Veterinary professionals submitted 15 incident reports using NPIC’s Veterinary Incident Reporting Portal (VIRP). Thirty-seven (73) incident reports were submitted using NPIC’s Ecological Incident Reporting Portal (Eco-Portal).
- NPIC fulfilled 18 special reports this year including data requests for:
 - EPA Office of Pesticide Programs (OPP)
 - EPA Office of Chemical Safety and Pollution Prevention (OCSPP) Communications Branch
 - EPA OPP Environmental Fate and Effects Division (EFED)
 - EPA OPP Health Effects Division (HED) (3)
 - EPA OPP Pesticide Reevaluation Division (PRD) (4)
 - Maine Department of Agriculture, Conservation, and Forestry (2)
 - Michigan Department of Agriculture and Rural Development
 - Oregon Department of Agriculture (2)
 - Pennsylvania Department of Agriculture, Bureau of Plant Industry (2)
 - Wisconsin Department of Agriculture, Trade, and Consumer Protection
- 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.
- 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 11 new web pages this year titled:
 - [A deep dive about disinfectant safety](#) (short FAQ videos)
 - [Caterpillars](#)
 - Chlorantraniliprole [main page](#) and [fact sheet](#)
 - Disinfectant Safety for Workers During COVID-19 ([English](#) | [Spanish](#))
 - FAQ: [Can I use compost contaminated with clopyralid or other herbicides?](#)
 - FAQ: [Can pesticides cause cancer?](#)
 - [Pesticide Hazard vs. Risk Fact Sheet](#)
 - [Resources for Small Farms](#)
 - [Urban Agriculture](#)

DELIVERING OBJECTIVES

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

- NPIC also significantly updated 15 web pages including **Videos by NPIC** and “**Local Contacts**” in each state:
 - **County Extension**
 - **EPA Regions**
 - **Household and Hazardous Waste (HHW)**
 - **Master Gardeners**
 - **Mosquito/Vector Control Districts**
 - **Occupational Safety and Health (OSHA)**
 - **Pesticide Safety Education Programs (PSEP)**
 - **Soil and Water Conservation Districts**
 - **State Environmental Agencies**
 - **State Health Departments**
 - **State Pesticide Regulatory Agencies**
 - **University Extension**
 - **Worker Protection (WPS)**
- NPIC developed four new infographics, titled:
 - **Disinfectant Wipes are Different (PDF | PNG)**
 - **Pesticide Movement in the Environment (PDF | PNG)**
 - **Using Bleach at Child Care Sites (PDF | PNG)**
 - **Evite exponerse a los pesticidas con ropa protectora (PDF | PNG)** (Avoid Pesticide Exposure with Protective Clothing). This infographic was translated into Spanish in collaboration with Oregon Health & Sciences University (OHSU).
- NPIC developed two new fact sheets titled:
 - **Chlorantraniliprole**
 - **Pesticide Hazard vs. Risk**
- NPIC and AAPCC developed 11 topic-based video clips about disinfectant safety from the Partner Chat webinar:
 - **What if a baby or toddler licks disinfectants or hand sanitizer from their hands?**
 - **How often is it necessary to disinfect “high touch” surfaces?**
 - **Can kids help with cleaning and disinfecting a home or classroom?**
 - **What are some general tips that parents, caregivers, and teachers can use while disinfecting?**
 - **What’s the right way to go about sanitizing and disinfecting before and after preparing food?**
 - **Should people put bleach in their soapy dish water?**
 - **A website or a friend recommended a new recipe for disinfecting. What are the risks if I try DIY?**
 - **Why is it important to avoid mixing disinfectants and household chemicals?**
 - **Why shouldn’t you spray disinfectant into the air to fight airborne illnesses?**
 - **What’s the proper way to disinfect a home? Should people wash their hands right after disinfecting?**
 - **Disinfectants, sanitizers and antiseptics...what’s the difference between all three**
- NPIC completed formalizing procedures for selecting references in NPIC fact sheets. An overview of these 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 199 posts, averaging 4 per week.
- NPIC developed and delivered two new webinars:
 - “**Partner Chat: Deep Dive on Disinfectant Precautions**,” in collaboration with the American Association of Poison Control Centers (AAPCC)
 - In collaboration with the Pesticide Educational Resources Collaborative – Medical (PERC-med) titled, “**Disinfectants: What Clinicians Need to Know to Reduce Risk**”. The webinar was hosted by the Oregon Pacific Area Health Education Center.
- NPIC conducted an in-depth review and retooling of the process used to identify and replace external broken links on our website. This grant year, NPIC removed or replaced 509 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 763 contacts, including:
 - EPA Regional Offices (including new school IPM and tribal contacts)
 - Occupational Safety and Health Administration (OSHA)
 - State Pesticide Regulatory Agencies
 - State/University Extension & Publications
 - Vector Control Districts (including new additional contacts)
 - Worker Protection Standard (WPS) State Offices

DELIVERING OBJECTIVES

- NPIC ensured continuous access to NPIC apps by stakeholders, maintaining software applications, tools, and mobile apps. A university-wide power outage from ice storms caused discontinuation of three web apps that were slated for retirement: Mobile Access to Pesticides & Labels (MAPL), Insect Repellent Locator (IRL), and Pesticide Education & Search Tool (PEST). Newer apps or web pages on NPIC/EPA websites already included the content from these older web apps. This outage did not affect newer web apps such as NPIC's Product Research Online (NPRO) or the Herbicide Properties Tool (HPT). The affected apps were officially removed and redirected to the newer apps or web content
- NPIC updated the **Herbicide Properties Tool** (HPT) to provide citations when HPT data originated from the Herbicide Handbook (Weed Science Society of America, 2014). Due to copyright restrictions, NPIC is unable to link directly to a digital version of the data.
- NPIC coordinated and communicated with Office of Pesticide Programs (OPP) frequently throughout the year:
 - OPP discussed a trend of concern about ivermectin ingestion for control of COVID and asked NPIC about similar reports.
 - OPP requested NPIC reports of adverse events related to devices; there were none.
 - NPIC alerted the EPA Project Officer of a call trend related to Seresto collars after an article in USA Today about Seresto incidents.
 - NPIC reported a product to the EPA Project Officer that was potentially mislabeled. The product was a hand and surface wipe "ProClean Disinfecting 75% Alcohol Wipes 50 Wipes - 4 Pack."
 - NPIC attended an incident work group meeting with OPP and PMRA Canada to discuss Seresto collars.
 - NPIC discussed CCA-treated utility pole coatings and volatility with OPP Antimicrobials Division (AD).
 - NPIC discussed Seresto inquiries with the EPA Project Officer and Shanna Recore, OPP Health Effects Division (HED).
 - NPIC discussed the NPIC Consistency Index (formerly "Certainty Index") with Nicholas Mastrota, OPP Environmental Fate and Effects Division (EFED), regarding use in Seresto noteworthy cases sent to EPA.
 - NPIC discussed sodium nitrite with OPP after reports of incidents and deaths through the Oregon Health Authority and Oregon Department of Agriculture.
 - NPIC assisted OPP AD in responding to a caller with questions about her husband's exposure to CCA and other treated wood during his work as a firefighter.
 - NPIC discussed Noteworthy Case reporting criteria with the EPA Project Officer, highlighting the need for messaging to EPA Regional offices about NPIC services and case reporting policies.
 - At the virtual site visit in August 2021, NPIC staff discussed several topics and proposed new projects with various OPP offices (see Objective 6).
 - NPIC and the OCSPP Communications Branch discussed scheduling regular NPIC data requests and collaborating on social media outreach.
 - NPIC created website and social media messaging about risks of veterinary ivermectin use for humans, coordinating with the OCSPP Communications Branch and the American Association of Poison Control Centers (AAPCC).
 - NPIC notified the EPA Project Officer, the OCSPP Communications Branch, and Office of Pollution Prevention and Toxics about a potential TikTok trend of ingesting glyphosate for COVID. NPIC followed up with website and social media outreach.
 - NPIC met with EPA personnel about creating outreach about indoor air quality and ozone generating devices.
 - NPIC discussed NPIC services and concern about misleading label statements with EPA Label Review Managers.
 - As a result of a collaboration with EPA Region 10 to spread awareness about disinfectant risks, NPIC conducted targeted disinfectant risk advertising to teachers, workers, and other high-risk user groups nationwide. The online advertising reached over 1 million impressions (also referred to as view-throughs or displays).
 - NPIC provided feedback to EPA Region 5 about the impact and usefulness of EPA research pesticide sampling and decontamination research projects.
 - NPIC discussed its Consistency Index (formerly "Certainty Index") and Seresto collar incidents with the Environmental Fate and Effects Division of OPP.
 - NPIC discussed a high-priority product, AC-5 Red cleaner, with Elizabeth Evans and the SENSOR group researching recent incidents.
 - NPIC and the EPA Project Officer discussed how more callers may be finding NPIC through state pesticide agencies.
 - NPIC and the EPA Project Officer discussed plans for an NPIC presentation about risk and disinfectant safety for EPA student interns.
 - NPIC and the OCSPP Communications Branch amplified social media messaging for National Pesticide Safety Education Month by sharing and coordinating content themes.
 - NPIC and Diane Isbell, OPP Antimicrobials Division, discussed an in-depth courtesy review of the future NPIC fact sheet about disinfectant ingredients ADBAC/DDAC fact sheet.
 - EPA Office of Pollution Prevention and Toxics discussed risks of ozonated water devices with NPIC, citing the statement titled Communication to State FIFRA Issues Research and Evaluation Group (SFIREG) from EPA Regarding Use of Ozonated Water Devices.
 - NPIC and the EPA Project Officer discussed recommendations for NPIC in the December 2021 **Farm, Ranch, and Rural Communities (FRR) Advisory Committee Recommendations to U.S. Environmental Protection Agency**.
 - NPIC and OPP discussed potential updates to NPIC's Chlorantraniliprole fact sheet, via courtesy review by OPP.
 - The January 2022 QCM with EPA led to discussions about an outreach piece describing the differences between pesticide and non-pesticide wipes. NPIC worked with EPA Region 9 to identify needs. Through this collaboration, NPIC created the infographic **Disinfectant Wipes are Different**.

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 1,215 reported incidents involving humans or animals, NPIC specialists were able to capture the symptom/scenario information in 91% of cases.
- NPIC specialists were able to collect product information for 91% of reported incidents.
- NPIC specialists were able to document the location for 87% of reported pesticide incidents.
- Among the 1,215 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 (consistency index). NPIC assigned a severity index 100% of the time when signs/symptoms were known (1,270 times). Signs or symptoms were categorized as minor, moderate, major, or death 759 times. NPIC assigned a consistency index 100% of the time when signs/symptoms were described, and they could be compared to published reports about the active ingredient(s) involved (534 times).
- NPIC produced internally routed human and animal incident reports in coordination with Dr. Berman (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 one highly qualified pesticide specialist this year. 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. This grant year a secret shopper evaluation was conducted. NPIC specialists were evaluated on 19 customer service metrics, including efficiency, effective communication, and their ability to meet customers' needs.
- 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 GY2 data trends during a virtual site visit with the EPA Project Officer and various OPP divisions in August 2021. Topics and follow-up conversations included discussions with:
 - Antimicrobials Division to review a new NPIC page about workers and disinfectants.
 - Antimicrobials Division about ozone generators and monitoring protocols for schools and indoor air quality.
 - Antimicrobials Division about sharing NPIC outreach materials with the Department of Education.
 - Antimicrobials Division about using synonyms for ADBAC and DDAC on labels, health risks of impregnated materials, air sanitizers, sealed vs. unsealed granite for use sites, and improper sale of mattresses impregnated with diatomaceous earth as FIFRA exempt "treated articles."
 - Registration Division, Pesticide Reregistration Division, and Incident Screening Team about how to get NPIC on more pesticide labels and improve NPIC visibility.
 - Office of Enforcement and Compliance about responding to Amazon seller questions.
 - OCSPP Communications Branch about Roundup product diversification to 10+ active ingredients.
 - OCSPP Communications Branch about social media sharing and future collaborations.
 - EPA Region 10 about neighbor notification and other frequently asked questions related to forestry applications.

Trends in NPIC Data

- During this period, NPIC received 8,208 inquiries.
- About 72% of the total inquiries were addressed over the telephone.
- About 18% of NPIC inquiries in 2021 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 23.
- One human death and 47 animal deaths were reported to NPIC. See pages 35 and 37.
- The following active ingredients were involved in the most incident reports: boric acid (173), naphthalene (119), imidacloprid (78), ADBAC (69), DDAC (63), and bifenthrin (63). See page 30.
- There were 1,950 entities involved in incidents reported to NPIC: 50% were human, 22% were animals, and 28% were structural or environmental. See page 36.
- Among the 701 single humans in incidents for which the age was captured, 13% were children (ages 4 and under), and 29% were seniors (ages 65 and over). About 43% of all people reported no symptoms. See page 38.
- Questions related to health/risk (2,919) and pest control (1,123) were most common. See page 27.
- The NPIC website received 7,557,851 page views during this period. There were more than 4.2 million unique visitors, and 144,912 visitors stayed for more than 15 minutes. See pages 24 and 25.

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 284 inquiries in Spanish, seven in Russian, three in French, two in Arabic, one in Hindi, one in Indonesian, one in Italian, one in Swedish, and one in Tagalog.

Noteworthy Inquiries

Bed Bugs – NPIC received 266 inquiries related to bed bugs this year. About 15% of these (40) 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 131 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.

Mothball Products – NPIC received 466 inquiries about mothballs, flakes, and bars. Of these, 257 (55%) were incidents. Many reports involved off-label use of mothballs to repel animals or insects in and around the home.

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 1,140 active ingredients. This collection has been scanned/saved and indexed for desktop access, using software developed by NPIC.

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 and two co-investigators. Six Pesticide Specialists were retained this year. As of February 14, 2021, NPIC staff included six 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, eight SOPs were updated.

Environmental & Molecular Toxicology



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ABOUT US

Who is NPIC?

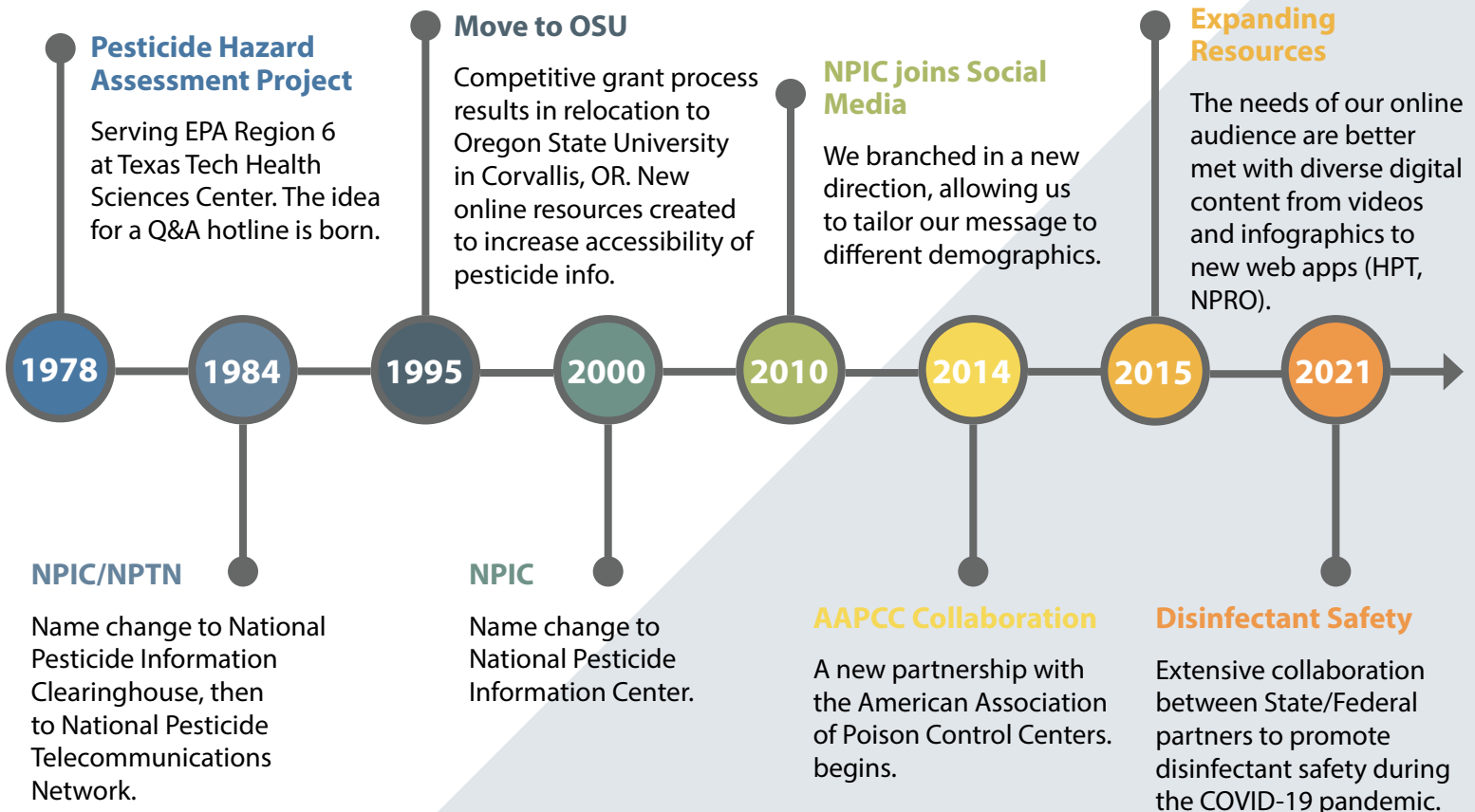
NPIC is a team of well-trained, approachable scientists and talented support staff. We have the knowledge and skill needed to effectively communicate scientific information to anyone who contacts us. If we can't directly answer the question, we'll try to figure out who most likely can.

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 2021, NPIC created or significantly updated 26 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

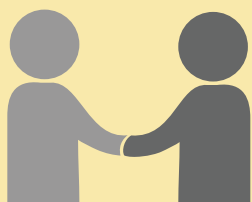
- Pesticide and Local Services (PALS)
- NPIC's Product Research Online (NPRO)
- Herbicide Properties Tool (HPT)

Web Pages

- A deep dive about disinfectant safety
- Caterpillars
- Disinfectant safety for workers during COVID-19
- Pesticide Hazard vs. Risk
- Resources for Small Farms
- Urban Agriculture

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.

Lawn and Garden
2018 Safety Brochure

Disinfectant Safety
2020 Facebook Q&A

Rodent Bait Safety
2019 Infographic

Partner Chat: a deep
2021 dive into
disinfectant safety

Q: I ran out of hand sanitizer, why can't I wipe my children's hands with disinfectant wipes?

A: Do not use disinfectants on people, only use on surfaces listed on the label. They are not designed to be effective on skin and can increase health risks if used that way. Children can be especially sensitive to pesticides, including disinfectants. Always follow the label for how and where to use disinfectants. Wash your hands after every use.



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 2021, including:



Professional Webinar

Disinfectants: What clinicians need to know to reduce risk

Invited Speaker

Pesticide Applicators Certification & Training conference

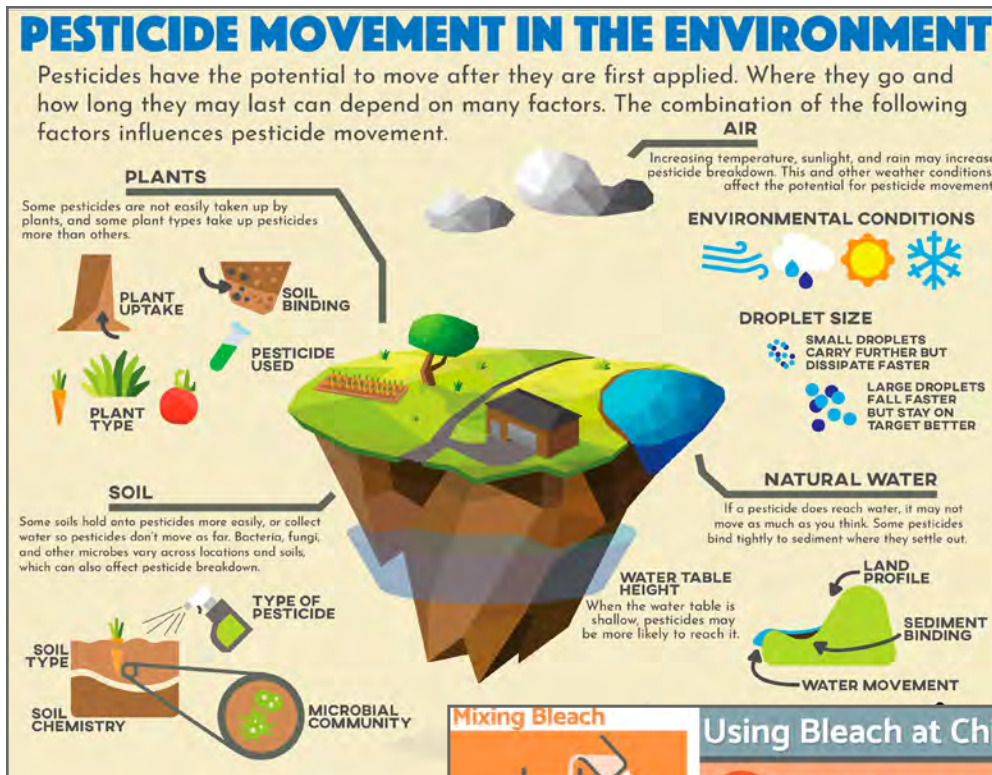
Invited Speaker

Public Health Pesticide Regulatory Education Program

INFOGRAPHICS

Infographics

We concentrated more of our efforts on stunning visual projects in 2021, including our infographics. Easy to follow, these colorful graphics are perfect for printing or sharing for outreach opportunities.



In 2021, we introduced four new infographics

- Disinfectant Wipes are Different
- Pesticide Movement in the Environment
- Using Bleach at Child Care Sites
- Evite exponerse a los pesticidas con ropa protectora (Avoid Pesticide Exposure with Protective Clothing)

Mixing Bleach

Step 1: Add water first, then bleach. Prevent spills when filling containers. Dilute fresh bleach each day.

Step 2: Prevent spills when filling containers. Dilute fresh bleach each day.

Bleach is sold in different concentrations. This will change how you dilute it.

When mixing and applying:

- Mix next to eyewash stations
- Wear gloves
- Use Safety glasses
- Wear clothes that cover and shoes with socks

Using Bleach at Child Care Sites

Contact Time: Bleach stays on surfaces for less time when sanitizing and more time when disinfecting. Check the label first.

- Do not wash food with bleach
- Do not drink, breathe in, or spray on skin
- Do not mix bleach and ammonia
- Avoid using scented bleach

Bleach is not for routine cleaning. It is a pesticide that controls bacterial and viruses. Every pesticide, including bleach, can have health risks.

Eye Wash Station

Weaker bleach sanitizes:

- food contact surfaces
- items that touch the mouth
- floor and sleeping areas

Stronger bleach disinfects:

- surfaces with body fluids
- when someone is sick

Child Safety

- Keep kids away while mixing and using bleach.
- Never let children under 18 use bleach.
- Store out of reach of children.

Using Bleach

- Use on hard surfaces.
- Wash surfaces with soap and water before using bleach.
- Open windows or use fans to ventilate.
- Wipe surfaces with clean water after use.

Bleach isn't the only option. Other products might work in your situation. Check the label for proper use. Ask your Department of Health: <http://npic.orst.edu/shemic.html>

For questions about risk and the use of bleach or disinfectants, call:

npic
NATIONAL PESTICIDE INFORMATION CENTER
800-858-7278
8am-12pm PST

Office of Environmental Health and Safety
Washington State Department of Health
360-236-3330

DISINFECTANT WIPES ARE DIFFERENT

Q: Should I treat disinfectant wipes the same as other wipes?

A: NO! Disinfecting wipes are antimicrobial pesticides for surfaces, regulated by the EPA. They are not baby wipes or skin wipes. Wipes with "Drug Facts" control germs on people and are regulated by the FDA. Wipes that don't claim to control germs or viruses might not be regulated by EPA or FDA.

Disinfectant Wipes



**EPA Reg.
No. 1-23-4**
Directions
For Use

Look for an EPA
Registration
Number. Follow
directions
carefully.



Look for "contact
time": how long the
surface must be wet
to kill germs.



Do NOT use disinfectant
wipes on hands or skin.
Wash hands after using
wipes on surfaces.



Preclean with soap and
water to help the wipe
do its job. Rinse after
if the label says to.



Disinfectant wipes are
NOT baby wipes.
Do not let students
of any age use them.

Other Wipes



Other wipes are
not all the same.
Check the label
first.



Hand sanitizing
wipes are for
hands, and are
NOT baby wipes.



Wipes with "Drug Facts"
are for use on people
or living things, like
hand sanitizing wipes.



Baby wipes are
for cleaning skin
and do not claim
to kill germs.



No "Drug Facts"?
No "EPA Reg. No."?
It may just be a cleaner
that doesn't kill germs.

If exposed, follow
the label's First Aid
and call your local
poison center
at 800-222-1222.



Questions? Call NPIC
at 800-858-7378 M-F
8am-12pm PT to talk
to a trained specialist.
Email us:
npic@ace.orst.edu.



FACT SHEETS : FAQs : 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. Our chemical (active ingredient) fact sheets answer common questions asked by the public about pesticides. They allow people to “dig deeper” for answers. In 2021, NPIC created two new fact sheets:

- **Chlorantraniliprole**
- **Pesticide Hazard vs. Risk**



Frequently Asked Questions

Current FAQ topics include questions about pesticide risk to people, animals, and the environment based on real questions received by our team. Answers to FAQ topics can be complicated and situation-specific. We aim to provide brief, yet well-rounded, answers. NPIC developed two new FAQs this year.

Can I use compost contaminated with clopyralid or other herbicides?

Can pesticides cause cancer?

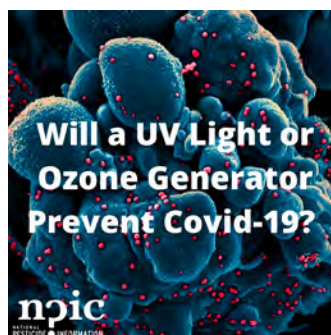


206 posts this year

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.



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 2021

19 web-based events

webinars | recorded events

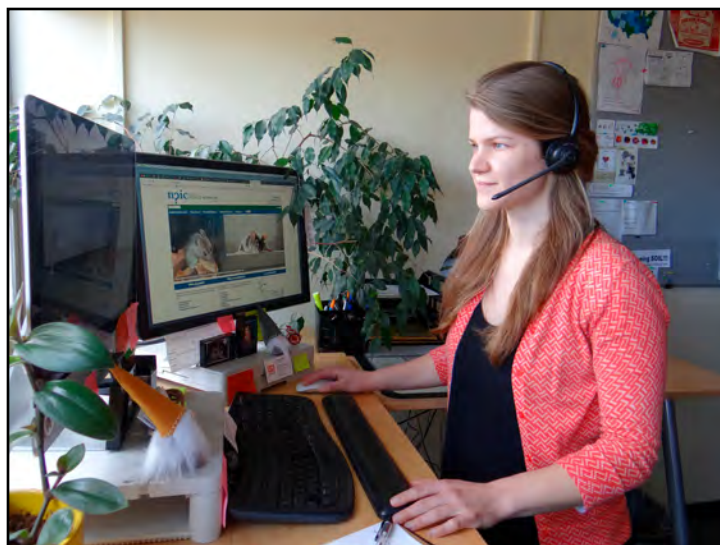
in-person events **15**

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.

355 new documents
added in **2021**



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 1,143 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



8,208 inquiries

2021 Inquiry Types

6,568 informational

1,484 pesticide incidents

27% with unknown active ingredient

156 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, 2021 to February 14, 2022.

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 27. 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 28.
- NPIC qualifies the information received by assigning a consistency 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 34.
- 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

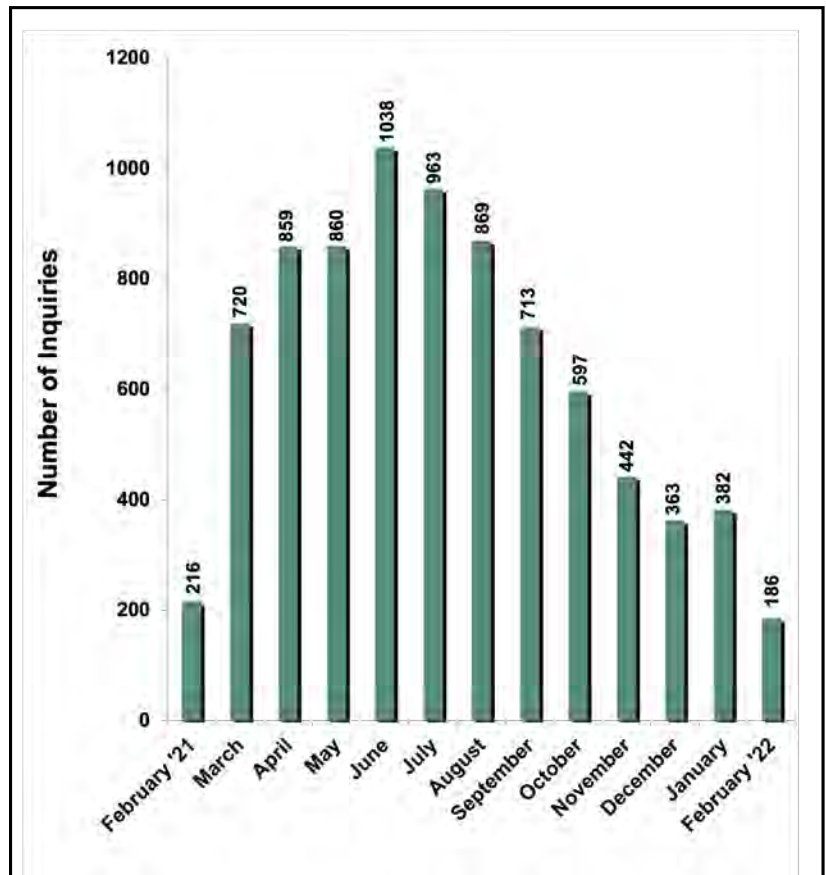
1. Monthly Inquiries

NPIC received 8,208 inquiries during this grant year. Graph 1 shows the number of inquiries received for each month. Seventy-two percent (72%) 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 2021	216
March	720
April	859
May	860
June	1038
July	963
August	869
September	713
October	597
November	442
December	363
January	382
February 2022	186

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.

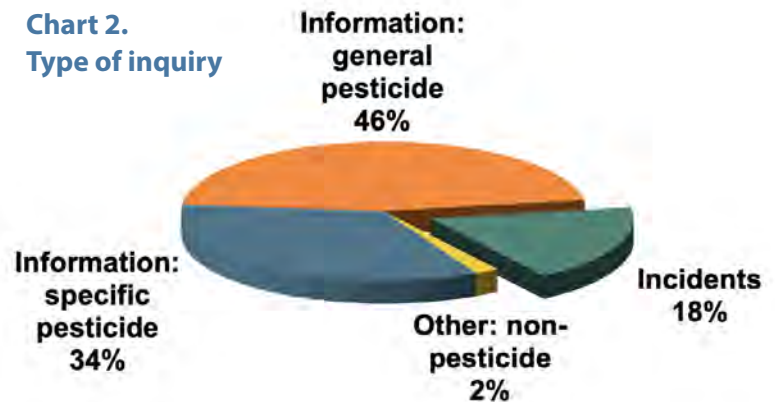
The majority of inquiries (6,568 or 80%) were informational inquiries about pesticides or related topics (Chart 2). NPIC responded to 3,784 (46%) information inquiries about pesticides in general. NPIC responded to 2,784 (34%) information inquiries relating to specific pesticides or active ingredients.

NPIC documented 1,484 incidents involving pesticides (18%). 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	3784
Information - Specific Pesticide	2784
Incidents	1484
Other (nonpesticide)	156
Total =	8208

Chart 2. Type of inquiry



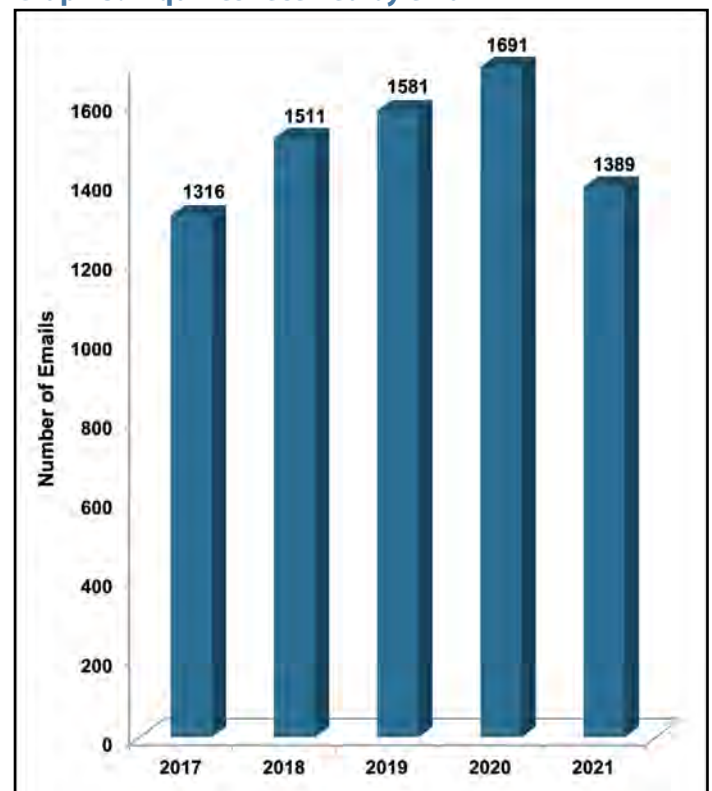
3. Origin of Inquiry

Table 3 summarizes the origin of inquiries received by NPIC. About 71% of inquiries were received by telephone.

Table 3. Origin of inquiry

Origin of Inquiry	Total
Phone	5822
Email/Web	1389
Voicemail	997
Total =	8208

Graph 3. Inquiries received by email



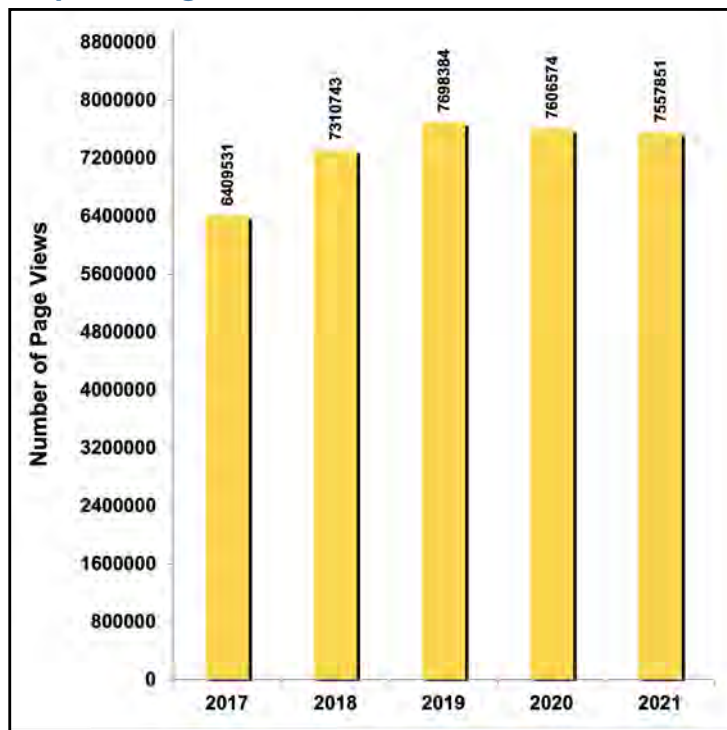
4. Website Access

The NPIC website attracted more than 4.2 million unique visitors viewing 7,557,851 pages during this period.

Most page views originated from queries on popular search sites (57%). Others were connected with NPIC from a bookmark (38%) or direct link (i.e., shared via email). The most popular search phrases used to reach NPIC were “DDT,” “malathion,” and “antimicrobial.”

Visits to the website varied greatly in duration, with 144,912 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:

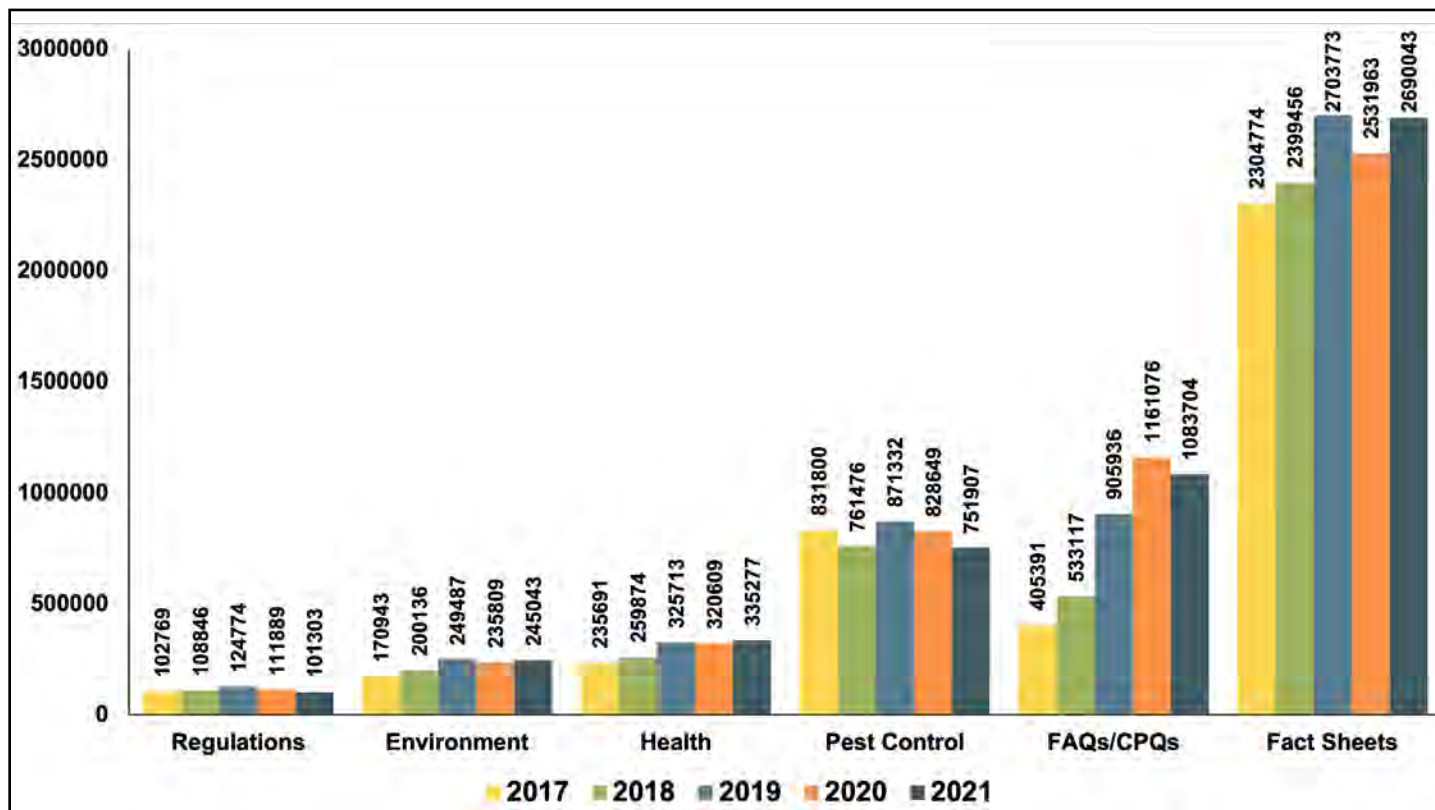
- NPIC home page (407,638)
- Diatomaceous earth general fact sheet (283,538)
- Neem oil general fact sheet (213,864)
- ¿Por qué tengo cucarachas en mi casa? (Why do I have cockroaches in my home?) (166,329)
- NPRO (150,462).

Table 4. Selected page views

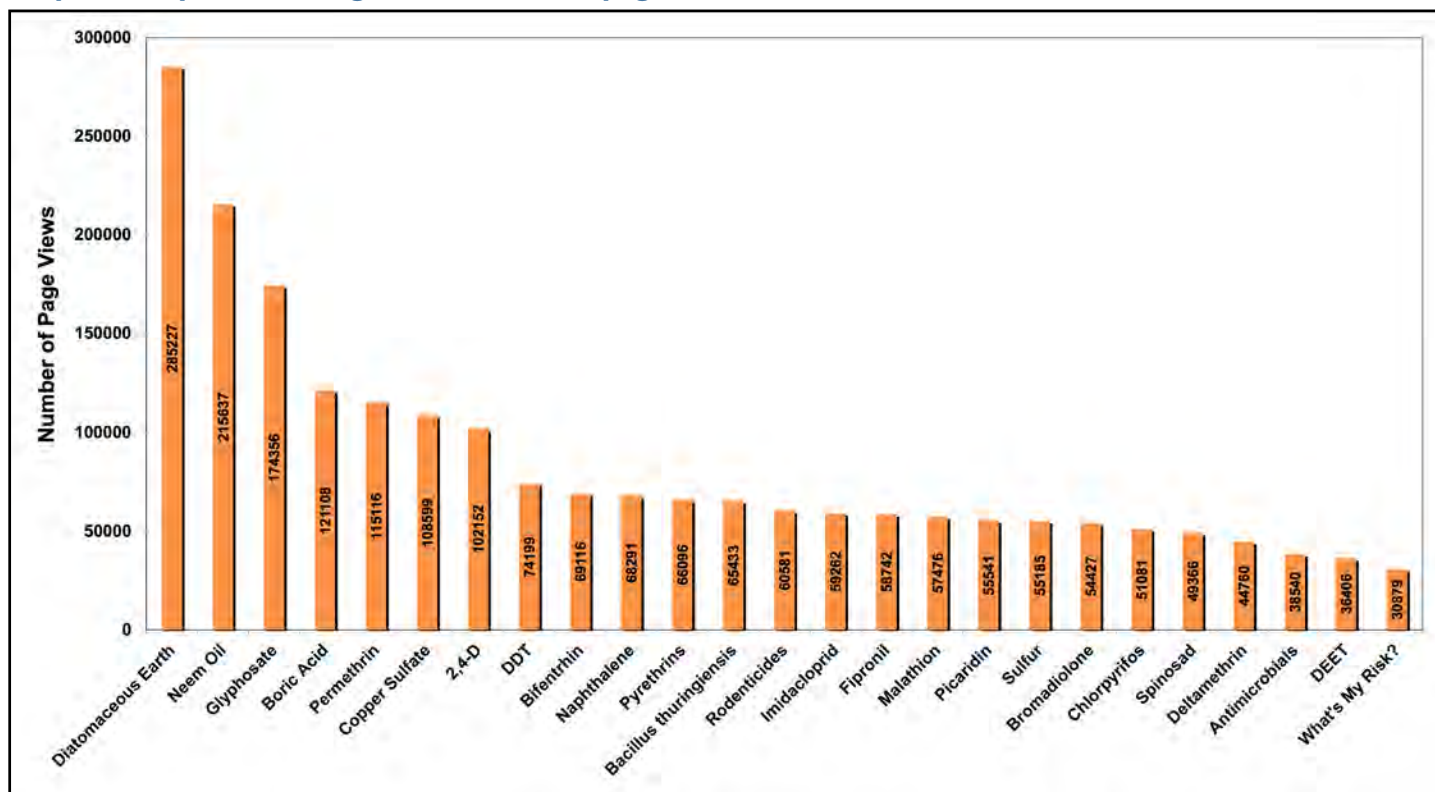
Page Accessed	English page views	Spanish page views
Fact Sheets	2,656,566	33,477
FAQs/CPQs	385,727	697,977
Pest Control	413,527	338,380
Health and Safety	197,370	137,907
Environment	165,710	79,333
Regulations	91,935	9,368

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 8,208 inquiries received, there were 7,291 (89%) from the public, 269 (3%) from pesticide manufacturers, 120 (1%) from federal, state, local government agencies, or schools, and 67 (1%) from human and animal medical personnel.

Chart 5 summarizes the 120 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.

Chart 5. Inquiries from federal / state / local agencies (Total: 120)

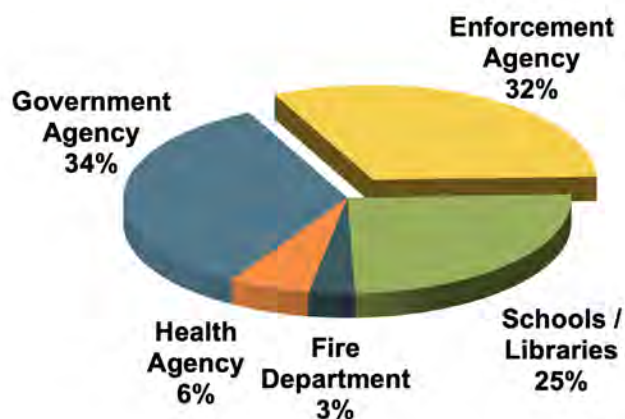


Table 5. Type of inquirer

Type of Inquirer	Total
General Public	7291
Federal/State/Local Agencies	
Government Agency	41
Enforcement Agency	38
Schools / Libraries	30
Health Agency	7
Fire Departments	4
Medical Personnel	
Human Medical	38
Animal / Vet / Clinic	29
Other	
Pesticide Mfg / Mktg Co	269
Pest Control	81
Farm	69
Labs / Consulting	32
Info Service / Unions	29
Retail Store / Nursery	23
Media	20
Master Gardener	16
Nonmigrant Ag Worker	12
Lawyer / Insurance	8
Beekeeper	7
Environmental Orgs	7
Vector Control	3
Migrant Ag Worker	2
Other	152
Grant Year Total =	8208

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 (849) 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" (972). Questions about regulations (927) range from "How do I get a new product registered?" to "Can the authorities make my neighbor stop spraying?"

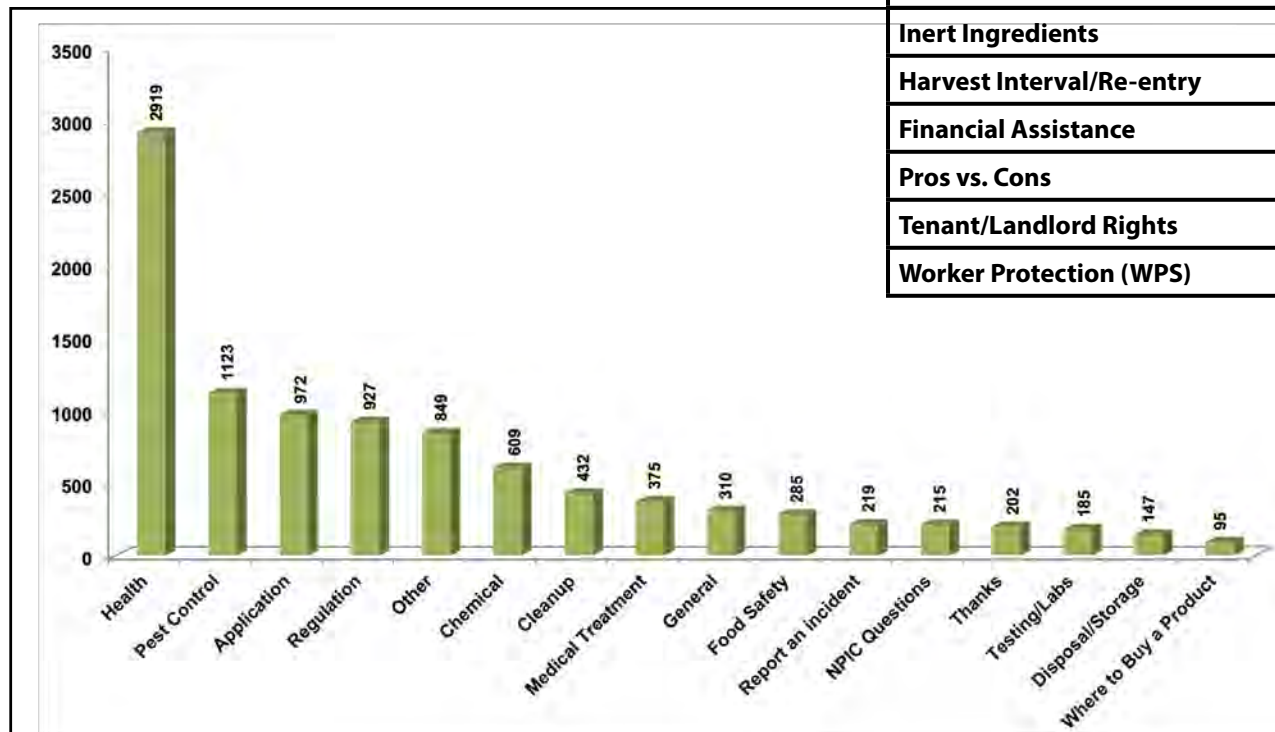
People contacted NPIC in order to report a pesticide incident 219 times. In these cases, NPIC provides people with appropriate local referrals for enforcement, as needed.

Inquiries may involve more than one type of question. Inquirers asked 10,203 questions during this grant year in the course of 8,208 inquiries.

Table 6. Type of question

Type of Question	Total
Health: human/domestic	2692
Pest Control	1123
Application	972
Regulation	927
Other	849
Chemical	609
Cleanup	432
Medical Treatment	375
General	310
Food Safety	285
Health: eco/wildlife	227
Report an incident	219
NPIC Questions	215
Thanks	202
Testing/Labs	185
Disposal/Storage	147
Where to Buy a Product	95
Just Wants Another Contact	91
Complaints	86
Inert Ingredients	44
Harvest Interval/Re-entry	36
Financial Assistance	34
Pros vs. Cons	31
Tenant/Landlord Rights	9
Worker Protection (WPS)	8

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 (6,784) were answered by providing information over the phone. Information was also sent via email in 1,426 cases. Upon request, NPIC brochures and other materials were mailed to people seven times during grant this period.

Table 7.1. Primary action taken

Primary Action Taken	Number of Inquiries
	2021
Verbal Info	6784
Emailed Info	1426
Handled Inquiry in Spanish	138
Interpreted via Language Line Services	109
Transferred to EC / PC	92
Transferred to Specialist / Voicemail	38
Mailed Info	10
Sent NPIC Outreach Material(s)	7

Risk reduction actions:

NPIC keeps track of certain conversation topics aimed at reducing pesticide risk. Specialists documented 4,275 risk reduction actions, detailed in Table 7.2.

Table 7.2. Risk reduction actions

Risk Reduction Action Taken	Number of Inquiries
	2021
Discussed Following the Label	1962
Discussed Ways to Minimize Exposure	1733
Discussed IPM Concepts	498
Discussed Environmental Protection	82

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.

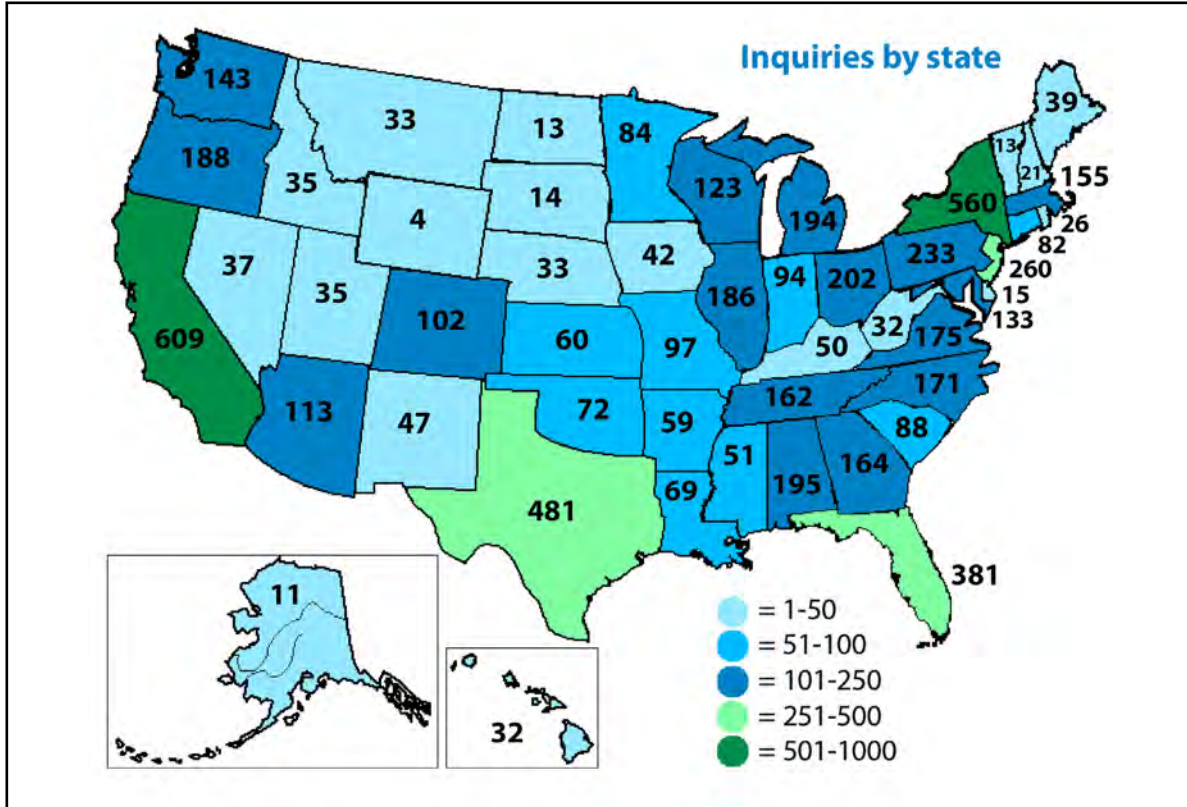
Table 7.3. Referrals to other organizations

Organization Name	Number of Inquiries
	2021
Manufacturer / Distributor Contact	1588
NPIC Website	1270
County Extension Contact	960
State Lead Contact	830
Other Organization Contact	558
Poison Control Contact	454
EPA Website	346
EPA HQ / OPP Contact	310
EPA Region Contact	175
Hazardous Waste Contact	148
Department of Health Contact	141
Other State Agency Contact	131
Animal Poison Contact	120
Other Fed Agency Contact	63
OSHA Contact	16

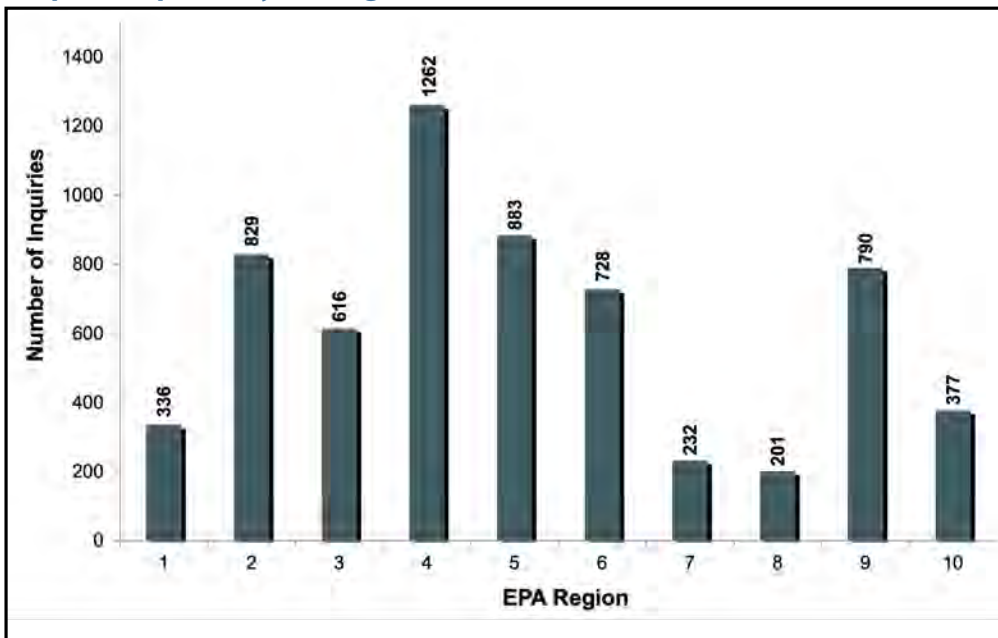
INQUIRIES BY STATE

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, Florida, New York, and Texas. In addition to the states, NPIC received inquiries from Armed Forces Europe (1), Puerto Rico (9), District of Columbia (28), Canada (40), and other countries (243). 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 (15.4%)
- Region 5 (10.8%)
- Region 2 (10.1%)
- Region 9 (9.6%)
- Region 6 (8.9%)

TOP 25 AIs FOR ALL INQUIRIES

9. Top 25 Active Ingredients for All Inquiries

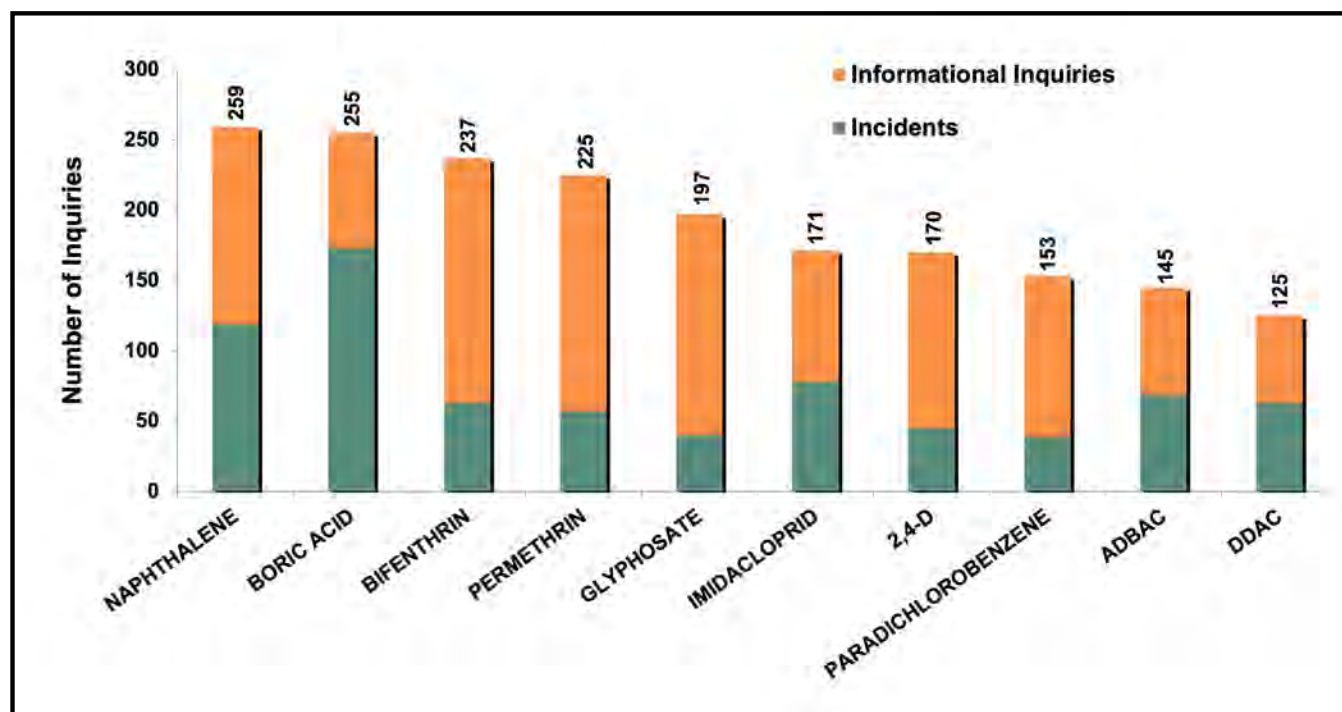
When inquiries to NPIC involve discussion of a specific product or active ingredient, specialists record the product and the active ingredient in the PID. Naphthalene was discussed in more inquiries than any other single active ingredient this year (Table 9, Graph 9). Of the 259 inquiries involving naphthalene, 119 (46%) 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	259	119	140
BORIC ACID	255	173	82
BIFENTHRIN	237	63	174
PERMETHRIN	225	57	168
GLYPHOSATE	197	40	157
IMIDACLOPRID	171	78	93
2,4-D	170	45	125
PARADICHLOROENZENE	153	39	114
ADBAC	145	69	76
DDAC	125	63	62
DICAMBA	125	34	91
NEEM OIL	122	34	88
PIPERONYL BUTOXIDE	110	37	73
PYRETHRINS	107	30	77
MALATHION	106	45	61
SILICON DIOXIDE	95	23	72
DELTAMETHRIN	93	36	57
CYPERMETHRIN	90	48	42
FIPRONIL	86	25	61
TRICLOPYR	82	24	58
MECOPROP	78	21	57
LAMBDA-CYHALOTHRIN	74	32	42
BACILLUS THURINGIENSIS	64	17	47
CARBARYL	62	17	45
SULFUR	59	24	35

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 1,652 pesticide exposures and 658 accidents. Charts 10.1 and 10.2 provide further details. Among reported exposures, inhalation was the most common route of exposure (30%), followed by dermal contact (24%) and ingestion (17%). When a specific exposure route could not be identified, specialists documented an "Unknown" exposure route (12%).

Indoor spills (76) were reported more often than outdoor spills (17). Among reported misapplications (422), 77% were misapplications by the homeowner or resident.

Chart 10.1. Pesticide exposures (Total: 1,652)



Chart 10.2. Pesticide accidents (Total: 658)

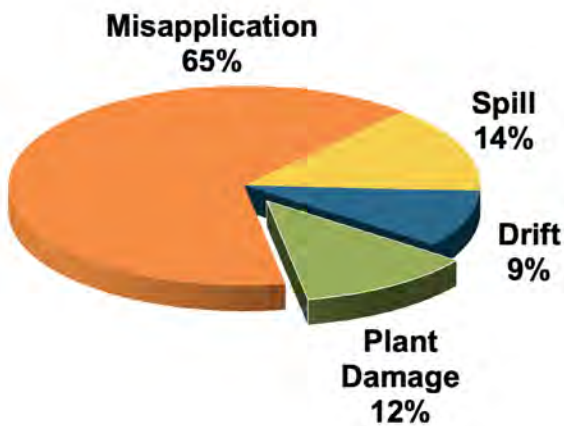


Table 10. Incident Type

Type of Incident	Total
Exposures	
Inhalation	493
Dermal	397
Ingestion	279
Unknown	200
Exposure Possible	198
Ocular	45
Workplace	27
Occupational	13
Accidents	
Misapp - Homeowner	324
Plant Damage	79
Spill - Indoor	76
Drift	61
Misapp - Other	43
Misapp - PCO	39
Spill - Outdoor	17
Misapp - Unknown	16
Other	3
Total =	2310

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 boric acid 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, imidacloprid, and iron phosphate.

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

Active Ingredient	Human Exposures	Animal Exposures	Other Accidents
NAPHTHALENE	194	20	227
PARADICHLOROENZENE	158	13	189
BORIC ACID	62	104	12
IMIDACLOPRID	31	37	16
BIFENTHRIN	32	15	20
ADBAC	56	4	14
PERMETHRIN	33	12	17
2,4-D	28	10	20
DDAC	49	4	13
GLYPHOSATE	28	4	18
IRON PHOSPHATE	1	30	0
CYPERMETHRIN	31	4	14
FLUMETHRIN	4	29	0
MALATHION	28	1	17
BROMETHALIN	3	21	5
PIPERONYL BUTOXIDE	25	5	11
DICAMBA	20	9	7
DELTAMETHRIN	29	5	7
LAMBDA-CYHALOTHRIN	23	6	7
PYRETHRINS	26	2	9
NEEM OIL	30	1	4
ABAMECTIN	4	16	2
FIPRONIL	10	9	7
BROMADIOLONE	4	15	5
TRICLOPYR	12	6	7

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 2,075 locations where exposures or accidents were documented, 81% occurred in the home or yard, 5% occurred at the intersection of home and agricultural property, and 3% occurred in an agricultural setting. Table 12 identifies the number of exposures or accidents reported to NPIC in a variety of other locations.

Based on inquiries, NPIC saw a slight increase in incidents occurring at natural (e.g., ponds, lakes, streams) and treated water locations in 2021 (14) compared to 2020 (13).

Table 12. Location of exposure/accident

Location	Total
Home - Inside	968
Home - Outside	720
Ag/urban interface	111
Agricultural	66
Vehicle	35
School/Day Care	31
Other	26
Office Building	23
Roadside/Right-of-Way	21
Park/Golf Course	18
Retail Store	16
Pond/Lake/Stream	9
Health Care Facility	8
Industrially Related	8
Nursery/Greenhouse	6
Treated Water	5
Food Service/Restaurant	4
Total =	2075

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 (137).

Table 13. Reported environmental impacts

	Drift	Misapplication: Resident	Misapplication: Other	Misapplication: PCO	Misapplication: Unknown	Other	Plant Damage	Spill: Indoor	Spill: Outdoor
Agricultural Crop	8	0	0	2	0	0	8	0	0
Building - Home/Office	4	137	30	16	9	0	0	53	4
Home Garden	21	51	0	10	1	0	35	0	0
Home Lawn	0	35	3	2	1	1	5	0	2
Natural Water	0	0	0	1	1	0	0	0	1
Other ¹	0	5	1	0	0	0	0	0	3
Property	3	20	1	3	1	0	0	14	1
Soil/Plants/Trees	21	44	3	3	3	0	31	0	4
Treated Water	0	1	1	0	0	2	0	0	2
Vehicle	4	2	3	0	0	0	0	8	0

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

CONSISTENCY INDEX

14. Consistency Index

Table 14 and Graphs 14.1 and 14.2 summarize the consistency 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 (1,342), 14% of the cases were assigned a consistency index of “consistent,” 14% were assigned an index of “inconsistent,” and 72% 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 consistency index assignment for “definite” is rarely assigned.

All consistency index assignments are reviewed by a quality assurance specialist. Dr. Berman, DVM, provides additional consultation for human and animal incidents.

What is the Consistency Index?

The consistency 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.

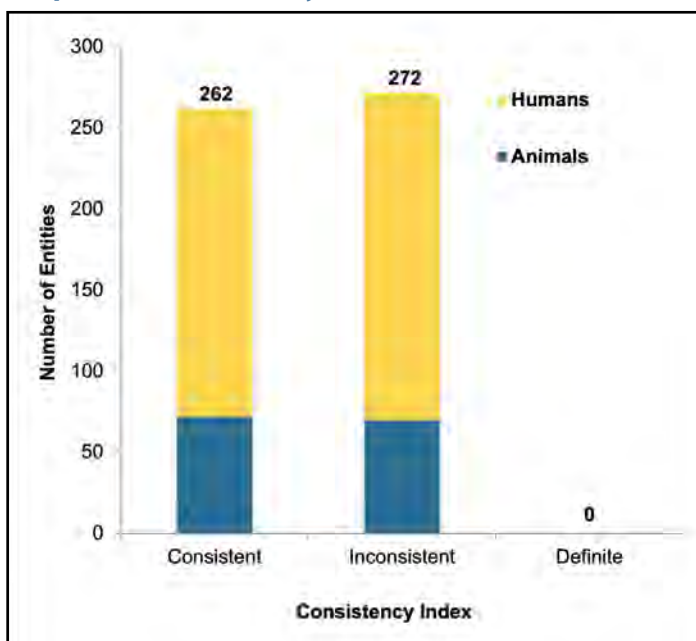
The consistency index is “**unclassifiable**” when one or more of the following criteria apply:

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

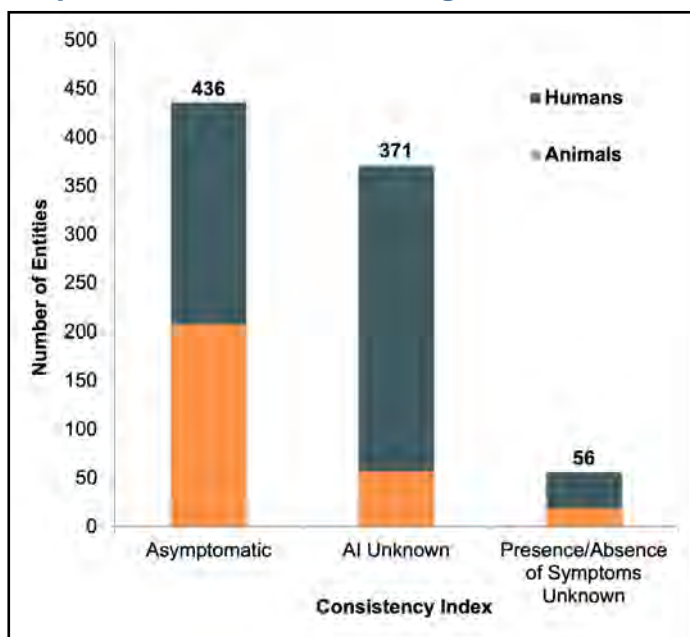
Table 14. Incident inquiries by consistency index (CI)

CI for All Categories of Entities					Breakdown of Human-Entity Incident Inquiries			
Consistency Index (CI)	Humans	Animals	Other	Total	Male	Female	Groups	Gender Not Stated
Unclassifiable	523	285	549	1357	180	314	70	13
Definite	0	0	0	0	0	0	0	0
Consistent	190	72	0	262	72	104	9	2
Inconsistent	202	70	0	272	73	123	4	0

Graph 14.1. Consistency index for incidents



Graph 14.2. Unclassifiable CI categories



SEVERITY INDEX

15. Severity Index

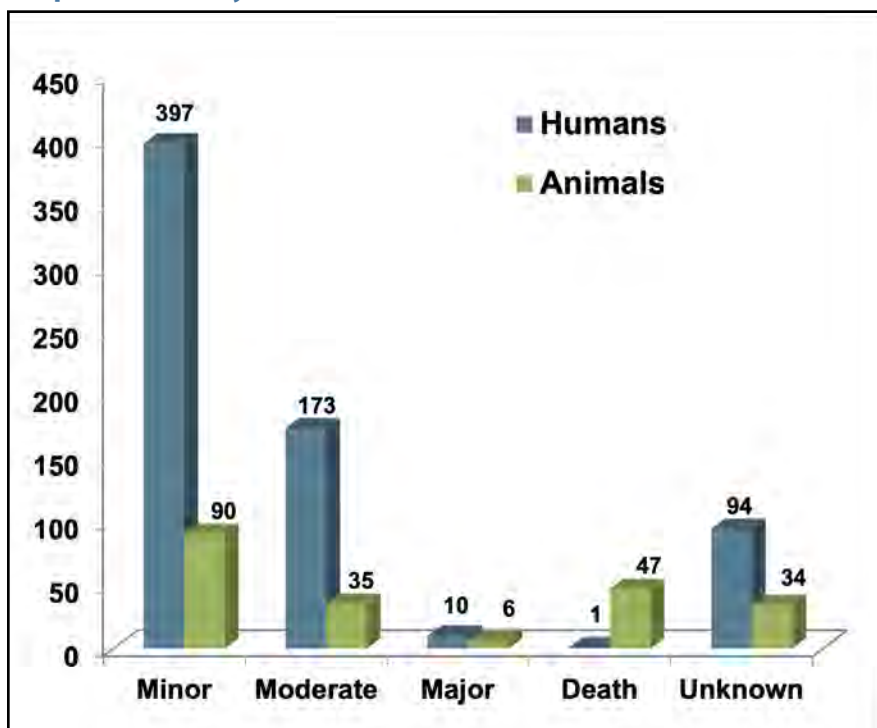
Table and Graph 15 summarize the severity of symptoms for all human and animal incidents reported to NPIC.

For all human pesticide incidents with reported exposures, 41% had minor symptoms, 18% had moderate symptoms, and 1% had major symptoms. Symptoms were unknown in 10% of human incidents. In 31% 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	397	90	487	127	244	24	2
Moderate	173	35	208	69	98	6	0
Major	10	6	16	4	5	0	1
Death	1	47	48	0	0	0	1
Unknown	94	34	128	30	37	17	10
Asymptomatic	297	214	511	95	166	35	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 1,950 entities involved in incidents reported to NPIC during this period, 50% were human, 22% were animals, and 28% were environmental nontarget entities. Other entities (8, 0.4%) are miscellaneous items (e.g., sidewalk, food). Pesticide incidents may involve multiple entities.

Graph 16.1. Humans

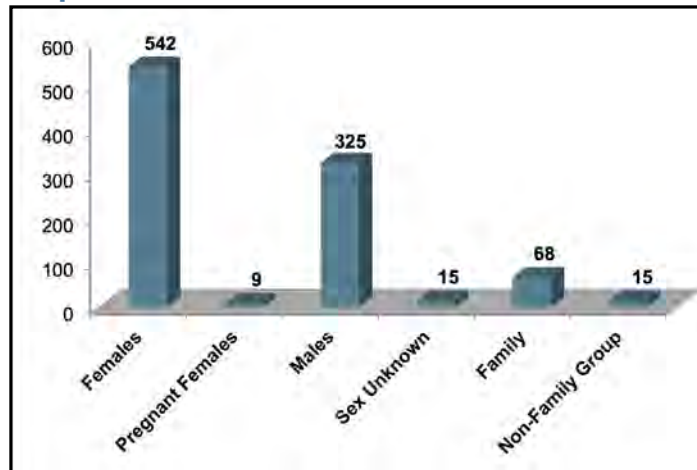
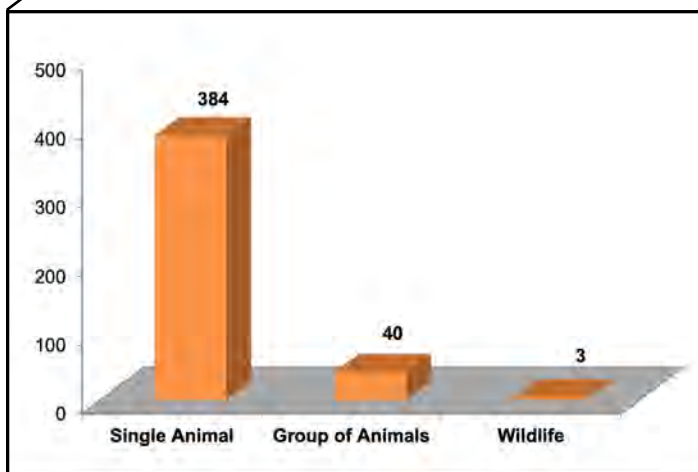
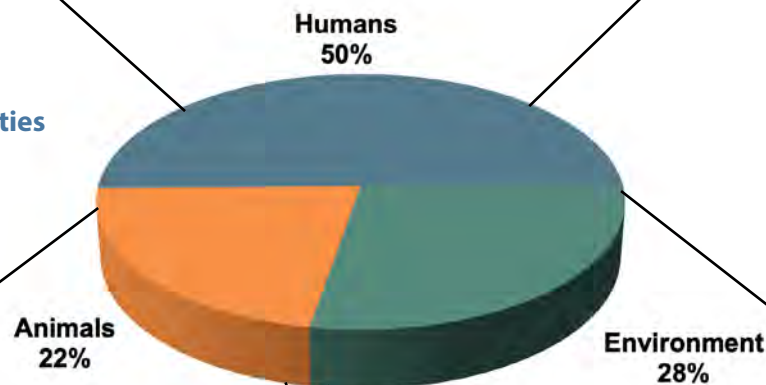
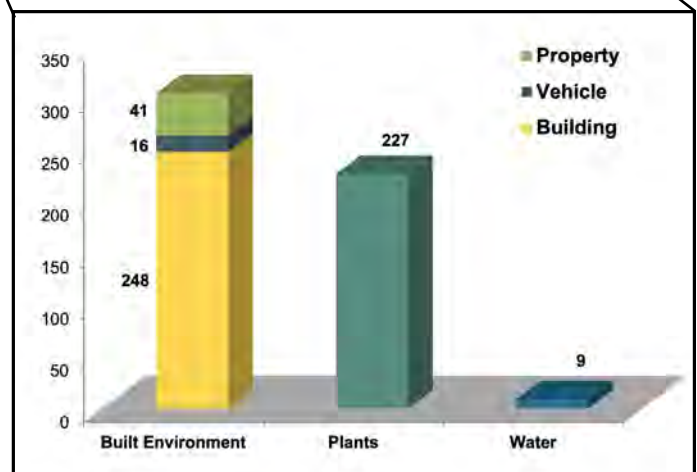


Chart 16. Description of entities



Graph 16.2. Animals



Graph 16.3. Environmental entities

DEATHS WITH KNOWN ACTIVE INGREDIENT

17. Reported Deaths

Of the 427 animal entities involved in pesticide incidents, 47 deaths were reported. Of those, there were 37 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.

Table 17.1. Reported deaths with known active ingredient

Reported Deaths	Total
Animal Deaths	
Single Animal	26
Group of Animals	8
Wildlife	3
Total =	37

A human death was reported to NPIC by email correspondence. Few details were available, and no follow-up information could be obtained. The death of an adult relative was reported after ingestion of an unknown rodenticide. The subsequent autopsy reported "suffocation". Additional details of the product and incident were not available.

An investigator from a coroner's office asked about testing for pyrethroids after the death of an inmate four months prior. The inmate reportedly soaked paper with an unknown bug spray that was then burned then inhaled. This report was considered "information only" as the investigator did not have sufficient knowledge about the scenario and was unable to provide essential information. This report was provided to the EPA Project Officer. This report did not qualify for inclusion in the NPIC dataset and statistics.

Table 17.2. Reported animal deaths with compatible signs/symptoms

PESTICIDE PRODUCT	ACTIVE INGREDIENT	INCIDENT TYPE	ENTITY	CONSISTENCY INDEX	STATE
STEELCOAT PLUS FOR DOGS	FIPRONIL METHOPRENE	Exposure: Dermal	Single Animal	Consistent	WA
MLB MAX PRO	BIFENTHRIN	Exposure: Possible	Wildlife	Consistent	CA
KONTROL 30-30 CONCENTRATE	PERMETHRIN PIPERONYL BUTOXIDE	Exposure: Possible	Group of Animals	Consistent	TX
LAMCAP	LAMBDA-CYHALOTHRIN	Exposure: Dermal	Group of Animals	Consistent	OH
DREXEL CHLORPYRIFOS 15G	CHLORPYRIFOS	Exposure: Possible	Group of Animals	Consistent	CA
N/A	BORIC ACID	Exposure: Ingestion	Single Animal	Consistent	TN
N/A	ZINC PHOSPHIDE	Exposure: Ingestion	Group of Animals	Consistent	FN
N/A	ZINC PHOSPHIDE	Exposure: Possible	Group of Animals	Consistent	FN
ETOXAZOLE ENTRUST TETRASAN	ETOXAZOLE SPINOSAD	Exposure: Possible	Group of Animals	Consistent	CA
CONTRAC ALL-WEATHER BLOX	BROMADIOLONE	Exposure: Possible	Single Animal	Consistent	TX
SILENCE	LAMBDA-CYHALOTHRIN	Exposure: Possible	Group of Animals	Consistent	WI
MGK FORMULA 2964	PIPERONYL BUTOXIDE ESFENVALERATE PRALLETHRIN	Exposure: Possible	Single Animal	Consistent	OR
BONIDE MOLETOX II	ZINC PHOSPHIDE	Exposure: Possible	Wildlife	Consistent	WI

ENTITY AGE

18. Entity Age

Table 18 and Graph 18 summarize the ages of people involved in incidents reported to NPIC. Among 891 single human entities, NPIC was able to collect the person's age 79% of the time. NPIC aims to capture the age for all human entities; occasionally callers decline to provide that information.

Among the 701 humans with known age, 13% were children (ages 4 and under), and 29% were seniors (ages 65 and over).

Graph 18. Age of people involved in reported incidents

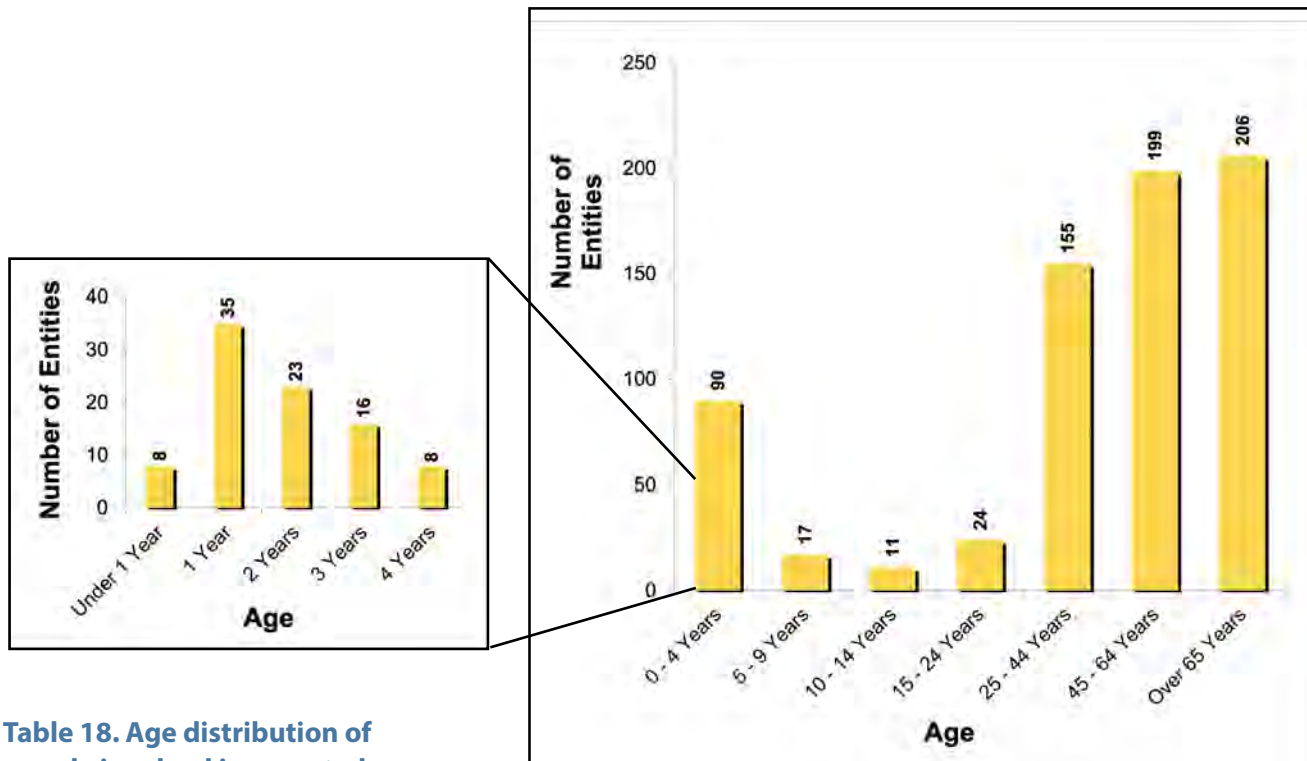


Table 18. Age distribution of people involved in reported incidents

Age Category	Total
Under 1 year	8
1 year	35
2 years	23
3 years	16
4 years	8
Total (0 - 4 years) =	90
5 - 9 years	17
10 - 14 years	11
15 - 24 years	24
25 - 44 years	155
45 - 64 years	199
Over 65 years	206

NOTABLE EXPOSURES

19. Notable Exposures

There were 1,950 entities potentially exposed to pesticides in 1,484 reported incidents.

Figure 19.1

There were 1,484 pesticide incidents reported, involving 1,950 exposed entities (people, animals, buildings, plants, soil, and water).

Total = 1,950 entities

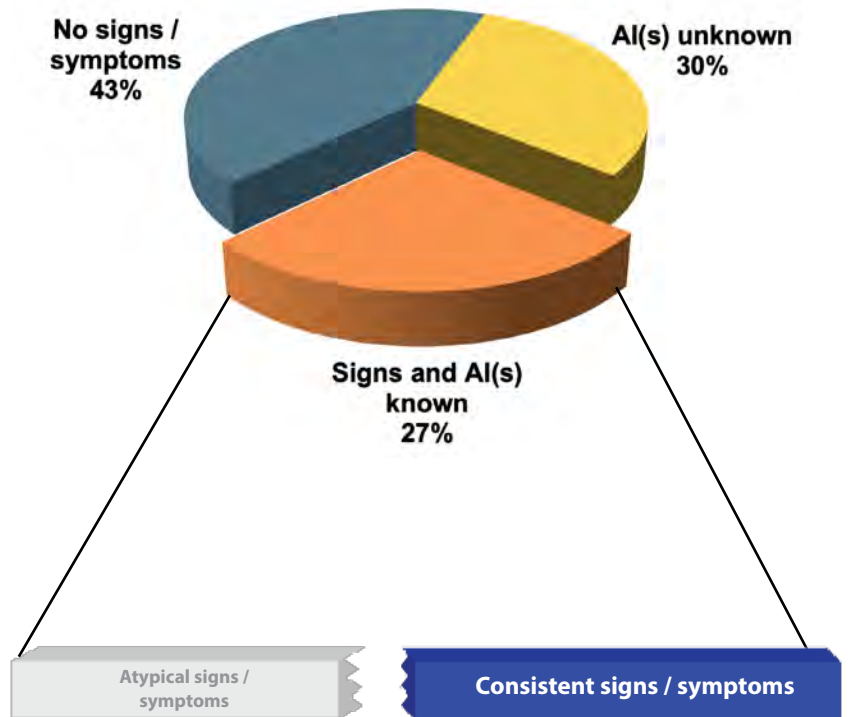


Figure 19.2

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

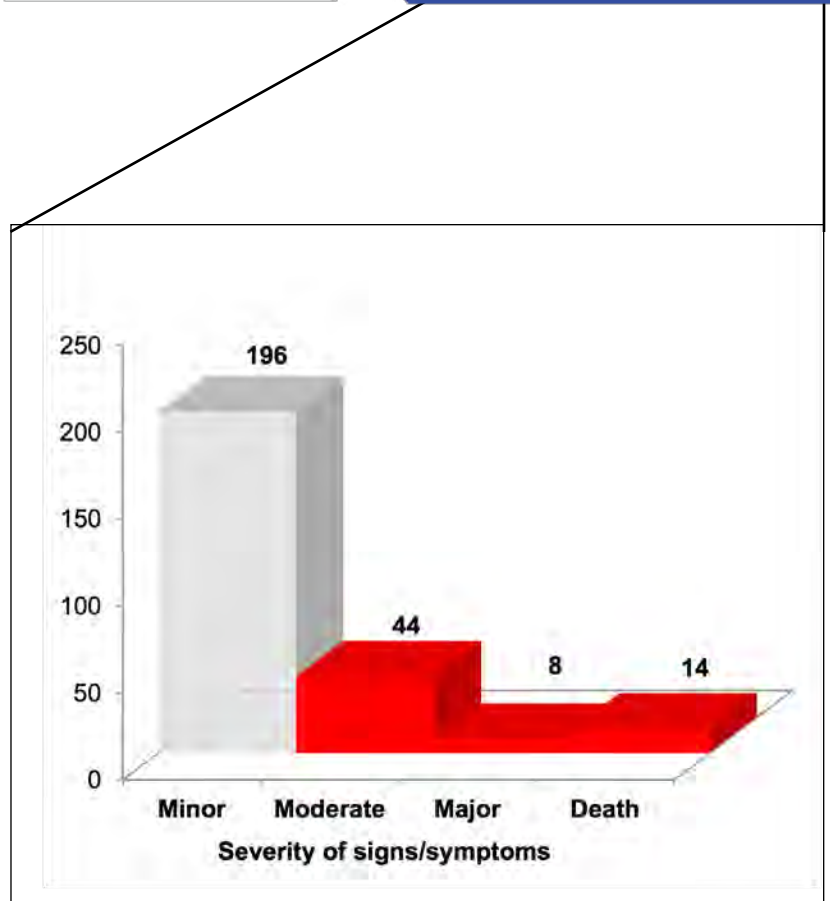
Total = 534 entities

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 = 262 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 15 incident reports to the VIRP involving 15 animals (12 canine and 3 feline). 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 spot-on products (31%).

Table 20.2 and Chart 20.2 summarize the pesticide types that were involved in the incidents reported by veterinarians. Most of the products reported in incidents were insecticides (72%).

Table 20.1. Product formulations as reported in VIRP

Known Formulations	Number of Products
	2021
Spot-on	4
Other	4
Liquid	2
Pellet	2
Shampoo	1

Chart 20.1. Product formulations reported in VIRP

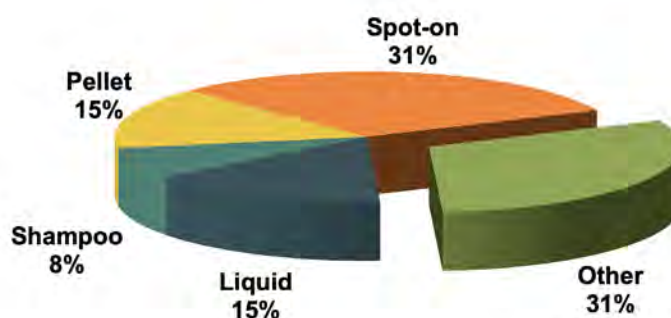
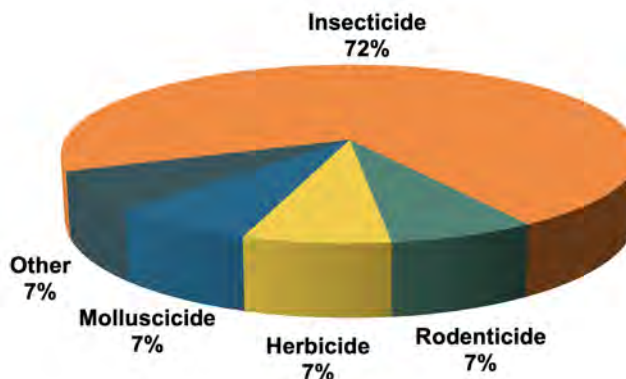


Table 20.2. Product types as reported in VIRP

Product Type	Number of Products
	2021
Insecticide	10
Rodenticide	1
Herbicide	1
Molluscicide	1
Other	1

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, 48% were classified as neurological, 15% were classified as gastrointestinal, 15% were classified as none, 11% were classified as dermatological, and 11% were classified as other.

Table 20.3. Animal symptoms as reported in VIRP

Symptom	Number of Animals
	2021
Dermatological: Irritant	2
Dermatological: Ulcer	1
Dermatological: Sloughing	0
Dermatological total	3
Gastrointestinal: Vomiting	2
Gastrointestinal: Diarrhea	2
Gastrointestinal total	4
Neurological: Tremor	6
Neurological: Excited	3
Neurological: Depression	2
Neurological: Seizure	2
Neurological total	13
None	4
Other	3

Chart 20.3. Animal symptoms as reported in VIRP

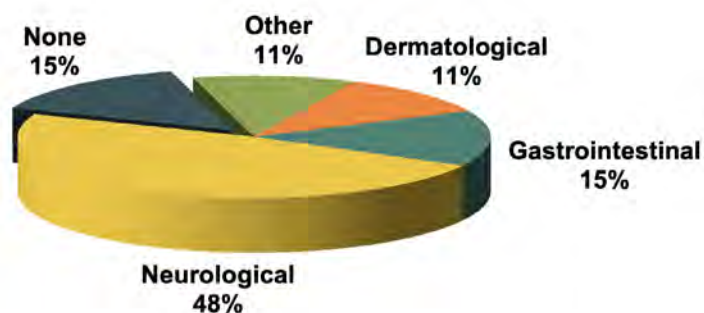


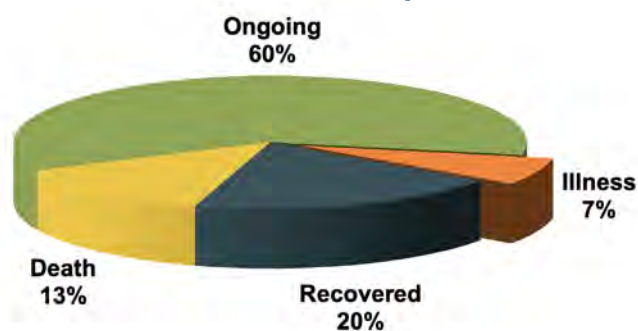
Table 20.4 and Chart 20.4 summarize the outcomes associated with each animal incident reported in the VIRP. Multiple animals may be involved in each VIRP report. Thus, totals reflect the number of animals, as opposed to the number of reports.

Of the total number of animals involved in VIRP incident reports, 60% of the cases were ongoing. The affected animals had recovered at the time of the report in 20% of cases. Thirteen percent (13%) of the outcomes reported an animal death.

Table 20.4. Incident outcomes as reported in VIRP

Outcome	Number of Animals
	2021
Ongoing	9
Recovered	3
Death	2
Illness	1

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 2021 involved possible exposures to mammals (36), bees (31), birds (3), reptiles (2), and fish (1). Table 21.1 summarizes the active ingredients involved in the 73 reports submitted to the Eco-portal.

Table 21.1. Active ingredients involved in the Eco-reports

Active Ingredient	Quantity
BRODIFACOUM	36
UNKNOWN	27
BROMADIOLONE	12
ANTICOAGULANT	3
ATRAZINE	2
PERMETHRIN	2
PHENOTHRIN	2
TETRAMETHRIN	2
2,4-D	1
BIFENTHRIN	1
BOSCALID	1
DIPHACINONE	1
FLUOPYRAM	1
GERANIOL	1
METOLACHLOR	1
NAPHTHALENE	1
NOVALURON	1
PARADICHLOROBENZENE	1
PEPPERMINT OIL	1
PRALLETHRIN	1
PYRETHRIN	1
ROSEMARY OIL	1
THYMOL	1

**Cooperative Agreement #X8-83947901
Environmental & Molecular Toxicology
Oregon State University
310 Weniger Hall
Corvallis, OR 97331-6502
npic.orst.edu**