

# npic

NATIONAL  
PESTICIDE ● INFORMATION  
CENTER

-2022-

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 2022 Annual Report covers the period of February 15, 2022 - February 14, 2023.

#### 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:



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Cooperative Agreement #X8-83947901  
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# NPIC 2022 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 fourth 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, 2022, and ended February 14, 2023.  
This period will be referenced as "2022" 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 26 organizations this grant year to provide outreach and expert risk communication instruction to the public, medical professionals, agricultural growers, and educators:
  - NPIC presented at a Washington State University pesticide applicator recertification course about disinfectant safety.
  - NPIC worked with the Community Outreach Coordinator of the Oregon Poison Center to translate NPIC's new infographic, Disinfectant Wipes are Different, into **Spanish**.
  - NPIC presented to extension educators and research professionals about NPIC services and use of Integrated Pest Management (IPM) for risk reduction at the IPM Research and Extension Summit hosted by the Oregon IPM Center.
  - NPIC co-hosted a Facebook live event with the American Association of Poison Control Centers (AAPCC), Washington Poison Center, and Virginia Poison Center about disinfectant wipe safety titled "**Tox Talks: Wiping Away Poisoning from Pesticides.**"
  - NPIC and AAPCC created a series of eight FAQ videos about disinfectant wipe safety titled "**Tox Talks: Wiping Away Poisoning from Pesticides.**"
  - NPIC presented on disinfectant safety concerns at an Ignite session with the Children's Environmental Health Research Colloquium at Oregon State University (OSU).
  - NPIC reviewed pesticide safety and IPM content written for OSU's Solve Pest Problems website.
  - NPIC presented about safe pesticide use around water at the Stanislaus County Farm Bureau pesticide applicator recertification course.
  - NPIC delivered a webinar on disinfectant safety for the University of California IPM Urban & Community webinar series. The webinar was also recorded and posted on the program's YouTube page.
  - NPIC presented on the lessons learned from a disinfectant safety outreach campaign at the EPA Region 10 Director's meeting.
  - The Southern IPM Center continued to use NPIC's Product Research Online (NPRO) application programming interface to integrate product searching capabilities on their website.

# 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 about risk communication to the following organizations:
  - Cornell Cooperative Extension Master Gardeners
  - Cornell University Pesticide Safety Education Program (PSEP)
  - EPA Region 10 Inspector Training in Boise, ID
  - Hawaii Department of Agriculture
  - Intertribal Council of Arizona, National Integrated Pest Management Training for Tribal Communities
  - Pesticide Regulatory Education Program (PREP)
    - Comprehensive Combo course in Fort Collins, CO
    - Structural and Public Health course for state and tribal regulators
    - Risk Communication workshop, a 4-day risk communication series for state and tribal regulators in Portland, OR
  - Portland (OR) Parks and Recreation pesticide applicator recertification course
  - Tribal Pesticide Programs Council (TPPC), a 2-part series workshop for tribal regulators and other employees who work with pesticides

## 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 2,165 relevant articles, documents, and websites.
- NPIC updated 14 active ingredient (AI) files and created six new AI files. NPIC also added 968 new documents to AI files.

### New/Updated AI files

- (E)-5-decenol
- (Z)-6-heneicosen-11-one
- (Z)-11-hexadecenal
- 3,13-octadecadien-1-ol (E & Z isomers)
- 8-dodecanyl acetates (E & Z isomers)
- 9-dodecanyl acetates (E & Z isomers)
- 9-tricosene (E & Z isomers)
- 11-tetradecenyl (E & Z isomers)
- Broflanilide (new)
- Chlorhexidine

### New/Updated AI files

- Disparlure
- Hexadecadienol acetates
- Myristyl alcohol
- N-tetradecyl acetate
- Picarbutrazox (new)
- TAED (new)
- Tetraniliprole (new)
- Trichoderma asperellum (new)
- Trichoderma gamsii (new)
- Tridecenyl acetates

- NPIC staff members attended 29 events for continuing education (CE) this grant year, including including 16 webinars, five events hosted by Oregon State University, four conferences or workshops hosted by other organizations, and four in-house speakers.
- NPIC tracked certain elements to quantify risk-reduction activities. In conversations with callers, pesticide specialists discussed following the label 1,723 times, ways to minimize exposure 1,317 times, IPM concepts 405 times, and environmental protection (including pollinator protection) 90 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 155 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 at four Quarterly Coordination Meetings. Follow-up discussions included active ingredients with a high proportion of incidents relative to all inquiry types: cypermethrin, drift in agricultural areas adjacent to residential communities, hazard vs. risk assessment for glyphosate, misuse of disinfectants, popular active ingredients of interest: ADBAC & DDAC, glyphosate, and dicamba, results from a public service announcement advertising campaign with EPA Region 10 about disinfectant safety for workers in high-risk industries, rodenticide concerns from Spanish language emailers, Seresto collar concerns and incidents, and the death of an inmate possibly related to “Waspings”.
- NPIC shared 90 noteworthy cases with the Project Officer during the 2022 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 2022 grant year period.
- Veterinary professionals submitted five incident reports using NPIC’s Veterinary Incident Reporting Portal (VIRP). Fifteen (15) incident reports were submitted using NPIC’s Ecological Incident Reporting Portal (Eco-Portal).
- NPIC provided 20 special reports about incidents and inquiries upon request, including 12 reports for the EPA and eight reports for other state agencies. Reports were provided within 10 business days. Some examples include:
  - Chlorothalonil incidents — U.S. EPA Office of Pesticide Programs
  - Seresto collar incident cases — U.S. EPA Office of Chemical Safety and Pollution Prevention
  - Disinfectants used as cleaning agents — U.S. EPA OPP Antimicrobial Division
  - Incidents involving professional applicators in Oregon — Oregon Health Authority
  - Nonresidential incidents in Midwestern states — U.S. Fish and Wildlife Service
  - Human exposures in Wisconsin — 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. NPIC and AAPCC collaborated on several projects, including a Facebook Live event and a series of eight disinfectant safety videos titled “**ToxTalks: Wiping Away Poisoning from Pesticides.**”
- 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.

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

- NPIC created/updated 13 new web pages this year titled:
  - **A guide to using NPIC’s Herbicide Properties Tool**
  - Quaternary Ammonium Compounds (ADBAC/DDAC) **main page** and **fact sheet**
  - **Pesticide Safety for Youth in Agriculture**
  - **Pesticides in Schools**
  - **Raticidas (Rodenticidas)** (Rodenticides)
  - **State Contacts for Housing and Urban Development**
  - **Tox Talks: Wiping Away Poisoning from Pesticides**
  - **Bacillus thuringiensis (Bt)**
  - **Contacts for Pesticide Applicators and Workers**
  - **Disinfectants and COVID-19 Resources**
  - **Pentachlorophenol Wood Preservatives**
  - **Specific Chemical Information**

# DELIVERING OBJECTIVES

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

- NPIC developed three new infographics, titled:
  - Pesticide Toxicity - What's the Signal Word? ([PDF](#) | [PNG](#))
  - Las toallitas desinfectantes son diferentes ([PDF](#) | [PNG](#))
  - Seguridad del cebo/carnadas para roedores ([PDF](#) | [PNG](#))
- NPIC developed/updated two fact sheets titled:
  - [Bacillus thuringiensis \(Bt\)](#) (updated)
  - [Quaternary Ammonium Compounds \(ADBAC/DDAC\)](#)
- 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 227 posts, averaging 4 per week.
- NPIC presented one new webinar in collaboration with AAPCC this quarter titled "[Tox Talks: Wiping Away Poisonings from Pesticides](#)."
- NPIC reviewed 100% of its web content this grant year and removed or replaced 171 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. In 2022, NPIC created, updated, and/or verified 361 contacts for:
  - Housing and Urban Development (58 new)
  - Pesticide Safety Education Program (PSEP) Coordinators (57)
  - PSEP Tribal Coordinators (57 new)
  - Soil and Water Districts (57)
  - State Health Agencies (57)
  - State Environmental Agencies (75)
- 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), including a new [guide to using NPIC's Herbicide Properties Tool](#).
- NPIC coordinated and communicated with Office of Pesticide Programs (OPP) frequently throughout the year:
  - NPIC and EPA OPP Communication Services Branch coordinated social media post topics and amplified each other's messaging for National Pesticide Safety Education Month.
  - Personnel from EPA OPP and EPA Region 9 provided feedback of the Spanish translation for NPIC's new infographic, Disinfectant Wipes are Different. The Spanish version, [Las toallitas desinfectantes son diferentes](#), was created and posted during this grant year.
  - NPIC spread awareness about National Farmworker Women's Health week after discussion with the EPA Project Officer.
  - OPP provided a courtesy review of NPIC's revised [Bt fact sheet](#).
  - NPIC discussed risk communication with regulators at EPA Region 9.
  - NPIC discussed pesticide misinformation and related topics for an upcoming webinar by OPP Biopesticides and Pollution Prevention Division (BPPD).
  - NPIC met with OPP Antimicrobials Division to discuss disinfectant safety concerns in detention facilities including potential NPIC contributions.
  - NPIC met with the EPA Project Officer to discuss leadership transition within NPIC personnel.
  - NPIC asked for feedback from the Antimicrobials Division on a new [Quaternary Ammonium Compounds \(ADBAC/DDAC\) Fact Sheet](#).

# 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 98% 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 1,076 reported incidents involving humans or animals, NPIC specialists were able to capture the symptom/scenario information in 88% of cases.
- NPIC specialists were able to collect product information for 88% of reported incidents.
- NPIC specialists were able to document the location for 87% of reported pesticide incidents.
- Among the 1,076 reported incidents involving humans or animals, NPIC specialists were able to capture the exposure route in 79% 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 (652 times). Signs or symptoms were categorized as minor, moderate, major, or death 246 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 (425 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 four 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 Customer Satisfaction Survey was conducted by the OSU Survey Research Center. Survey respondents were provided an option of the survey via website link, email, or mail.
- NPIC comprehensively evaluated each staff member in Q4, including quantified measures of data collection skills (see Objective 5), referral appropriateness, customer service skills, and continuing education measures.
- Key personnel from NPIC held a virtual site visit with the EPA Project Officer and various OPP divisions on October 3, 2022. A followup meeting was held on November 15, 2022 with the Health Effects Division. Topics of focus included:
  - Drift in agricultural areas adjacent to residential communities
  - Hazard vs. risk assessment for glyphosate
  - Misuse of disinfectants
  - Rodenticide concerns from Spanish language emailers
  - Seresto collar concerns and incidents



## Trends in NPIC Data

- During this period, NPIC received 6,868 inquiries.
- About 85% of the total inquiries were addressed over the telephone.
- About 19% of NPIC inquiries in 2022 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 21.
- No human deaths and 54 animal deaths were reported to NPIC. See pages 35 and 37.
- The following active ingredients were involved in the most incident reports: naphthalene, paradichlorobenzene, boric acid, 2,4-D, and bifenthrin. See page 30.
- There were 1,731 entities involved in incidents reported to NPIC during this period, 47% were human, 25% were animals, and 28% were environmental nontarget entities. See page 34.
- Among the 478 humans with known age, 14% were children (ages 4 and under), and 27% were seniors (ages 65 and over). See page 36.
- Questions related to health/risk (2,036) and pest control (1,030) were most common. See page 25.
- The NPIC website received 4,838,177 page views during this period. There were more than 3.3 million “new” visitors with 418,175 visits lasting longer than 15 minutes. See pages 22 and 23.

## 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 222 inquiries in Spanish, three in Portuguese, two in American Sign Language, one in Bengali, and one in Oromo.

## Noteworthy Inquiries

**Bed Bugs** – NPIC received 249 inquiries related to bed bugs this year. About 10% of these (24) 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 107 questions about bees or reports of bee deaths. The majority of bee calls were informational only (90%). 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 385 inquiries about mothballs, flakes, and bars. Of these, 201 (52%) were incidents. Many reports involved off-label use of mothballs to repel animals or insects in and around the home.

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## 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, 2023, 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, seven SOPs were updated.

Environmental & Molecular Toxicology



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# ABOUT US

## Who is NPIC?

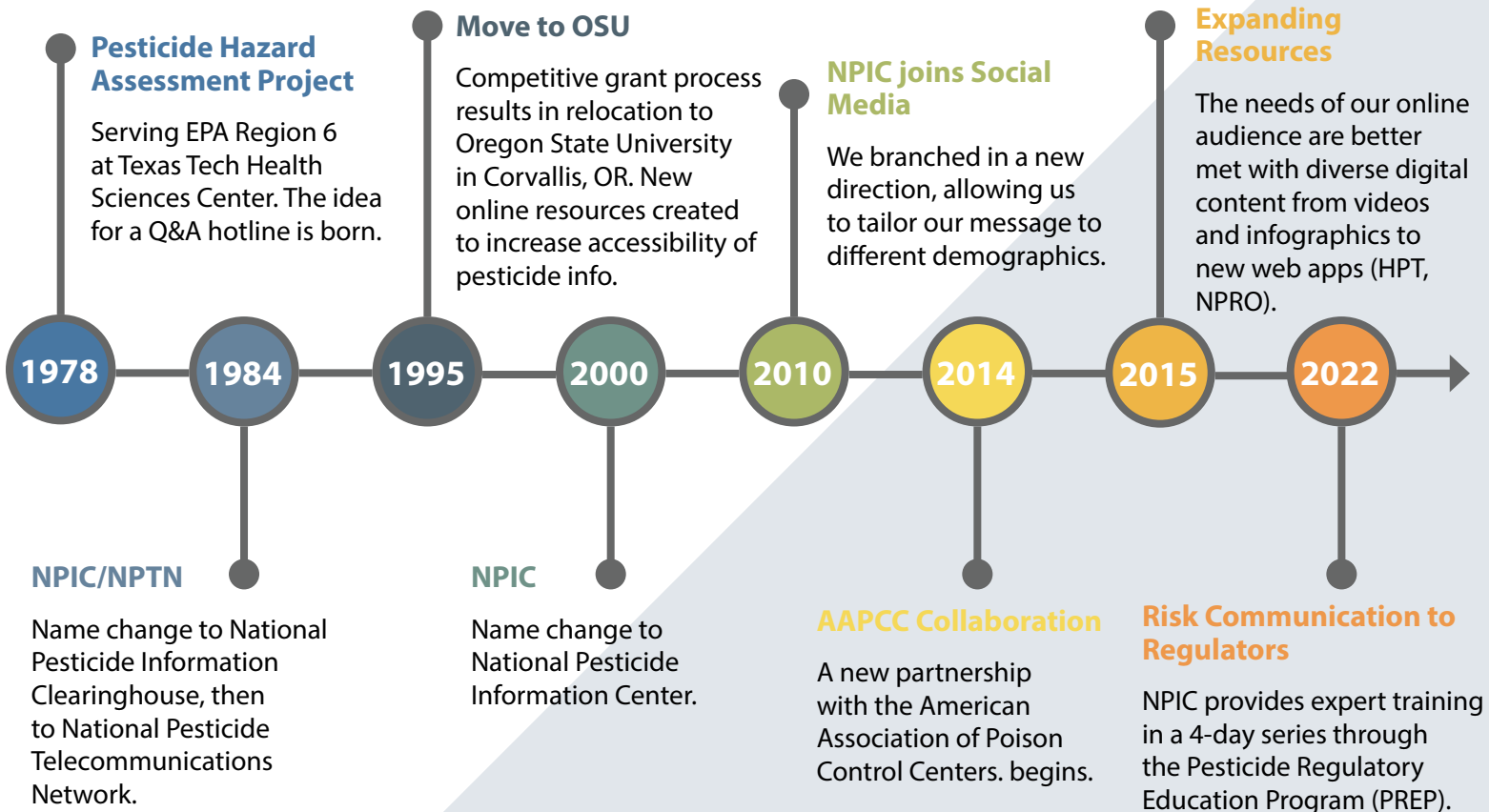
NPIC is a team of well-trained, approachable scientists and talented support staff. We have the knowledge and skill needed to effectively communicate scientific information to anyone who contacts us. If we can't directly answer the question, we'll try to figure out who most likely can.

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 2022, NPIC created or significantly updated 13 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

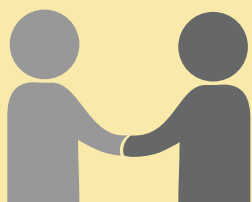
- Pesticide and Local Services (PALS)
- NPIC's Product Research Online (NPRO)
- Herbicide Properties Tool (HPT)

### Web Pages

- Pesticide Safety for Youth in Agriculture
- Pesticides in Schools
- Disinfectants and COVID-19 Resources
- Pentachlorophenol Wood Preservatives
- Specific Chemical Information
- Rodenticides Fact Sheet in Spanish

# COLLABORATIONS : OUTREACH

NPIC teams up with national, state, and local groups to increase awareness about pesticide health and safety across the nation. In 2022, NPIC hosted a 4-day 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

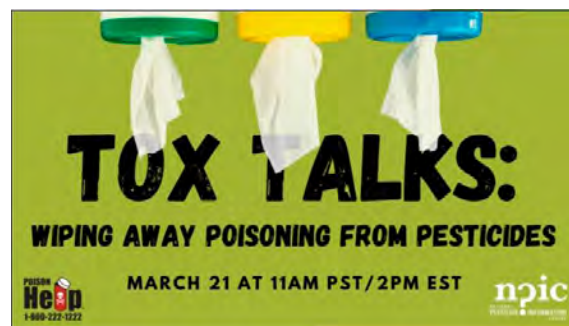
Starting in 2014, NPIC partnered with AAPCC to raise awareness about pesticide poisoning. Our annual outreach materials focus on topics for parents, schools, and the general public.

**2022** ToxTalks: Wiping Away Poisoning from Pesticides

**2021** Partner Chat: a deep dive into disinfectant safety

**2020** Disinfectant Safety Facebook Q&A

**2019** Rodent Bait Safety Infographic



## 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.

**15** Speaking events in 2022, some examples include:



### Professional Webinar

University of California IPM Urban & Community webinar series

### Invited Speaker

Pesticide Applicators Certification & Training conference

### Invited Speaker

National Integrated Pest Management Training for Tribal Communities

# INFOGRAPHICS

## Infographics


We concentrated more of our efforts on visual projects in 2022, including our infographics. Easy to follow, these colorful graphics are perfect for printing or sharing for outreach opportunities.

### PESTICIDE TOXICITY: WHAT'S THE SIGNAL WORD?

The signal word warns you about a product's short-term toxicity before it's diluted. It tells you the pesticide's ability to harm human health. Pesticide labels use three signal words: CAUTION, WARNING, or DANGER. If you are searching for less toxic pesticides, look for CAUTION on the label.

**THERE ARE 3 SIGNAL WORDS:**

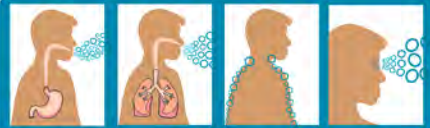
- DANGER** High toxicity
- WARNING** Moderate toxicity
- CAUTION** Low toxicity




Products that are highly toxic by ingestion, skin absorption, or inhalation must also include the word **"POISON"** next to DANGER, with a skull and crossbones symbol.

Always read and follow all label directions.  
EPA requires signal words be printed on the front of labels in capital letters.  
Signal words refer to the entire product, not just the pest-controlling active ingredients.

Can't find the signal word or have other questions about health and safety?  
Call NPIC @ 800-858-7378 from 8am-12pm PT M-F.



Pesticides can poison you if you eat them, breathe them in, or get them on your skin and eyes. Even products that are less toxic, natural, or organic can be hazardous. It depends on how much and where someone is exposed.




- Pesticide Toxicity - What's the Signal Word?
- Las toallitas desinfectantes son diferentes (Disinfectant Wipes are Different)
- Seguridad del cebo/carnadas para roedores (Rodent Bait Safety)

In 2022, we introduced three new infographics

### Seguridad del cebo/carnadas para roedores

A medida que bajan las temperaturas, los roedores buscan lugares donde está caliente y donde pueden obtener alimentos.




#### Métodos de Control

Después de identificar al roedor:

- **Primero utilice los métodos de sanitización, la exclusión, y la captura.** Cuando utiliza el método de exclusión de los roedores, significa sellando grietas y hendiduras. Además, limpie y recorte las plantas alrededor de su casa para limitar el exceso de vegetación. Usando diferentes métodos de control puede ser más efectivo la eliminación de roedores.
- Los roedores pueden con comer los recipientes delgados de plástico y cartón. Mantenga los alimentos en frascos sellados o recipientes de plástico grueso para evitar daños.
- Antes de decidir qué tipo de plan va a utilizar, recuerde utilizar diferentes opciones de control.

**Basura abierta, alpiste derramado y grifos que gotean puede atraer roedores.**



#### Prevención de Envenenamiento

**Consejos para la prevención de intoxicaciones**

- Lea y siga las instrucciones de la etiqueta del producto para el control de roedores.
- Coloque las trampas en lugares donde los niños y las mascotas no puedan tener acceso de ellas. Recuerde usar guantes y ropa protectora cuando usa los productos de raticidas (rodenticidas) para el control de roedores.
- Como último recurso, considere usar una estación de cebo/carnadas. Las estaciones de cebo/carnadas son dispositivos seguros que se utilizan para prevenir el envenenamiento; así como para limitar el acceso de este raticida (rodenticida). Nunca deje el cebo/carnadas sin asegurar desatendido.

**Si tiene preguntas o sospecha que usted u otra persona han estado expuestos al cebo/carnadas, llame inmediatamente a la línea telefónica del Control de Envenenamiento a: 1-800-222-1222.**



**Consejos rápidos de primeros auxilios**

- Si su piel entra en contacto con el cebo, lave bien el área contaminada con agua y jabón
- Si por accidente el cebo/carnadas caen en sus ojos, enjuague bien sus ojos durante 20 minutos.
- Si ingiere el cebo/carnadas, llame inmediatamente a la línea telefónica del Control de Envenenamiento a: 1-800-222-1222

#### Seguridad de limpieza

Consejos de limpieza recomendados por el Centro para el Control y la Prevención de Enfermedades (CDC):

- Use guantes cuando se deshaga de roedores muertos, nidos, o cualquier material de anidación.
- Rocíe las áreas donde encontró roedores muertos o material de anidación con una solución desinfectante. Deje las áreas en remojo durante 5 minutos antes de desecharlos en una bolsa de plástico segura.
- Coloque la bolsa de plástico con material para roedores o anidación en otra bolsa de plástico segura junto con las toallitas o trapos utilizados para desinfectar el área circundante.
- Lávese las manos con jabón y agua.



## P: ¿Debo tratar a las toallitas desinfectantes igual que a otras toallitas?

R: ¡NO! Las toallitas desinfectantes son pesticidas antimicrobianos para superficies, regulados por la EPA. No son toallitas húmedas o toallitas para la piel. Las toallitas con "Información del medicamento" controlan los gérmenes en las personas y están reguladas por la FDA. Es posible que las toallitas que no afirmen controlar gérmenes o virus no estén reguladas por la EPA o la FDA.

### Toallitas Desinfectantes



### Otras Toallitas



Registro de la EPA N° 1-23-4  
Instrucciones de uso

Busque un número de registro de la EPA. Siga las instrucciones cuidadosamente.



Información del medicamento  
No todas las toallitas son iguales. Verifique primero la etiqueta.



Busque el "tiempo de contacto": cuánto tiempo debe estar mojada la superficie para matar los gérmenes.



NO use toallitas desinfectantes en las manos o la piel. Lávese las manos después de usar toallitas en las superficies.



Las toallitas desinfectantes para manos son para las manos y NO son toallitas para bebés.



Las toallitas con "Información del medicamento" son para uso en personas o seres vivos, como toallitas desinfectantes para las manos.



Limpie previamente con agua y jabón para ayudar a que la toallita haga su trabajo. Enjuague después si la etiqueta lo indica.



Las toallitas desinfectantes NO son toallitas para bebés. No permita que los estudiantes de ninguna edad las usen.



Las toallitas húmedas para bebés son para limpiar la piel y no pretenden matar gérmenes.



¿No tienen "Información del medicamento"?  
¿No tienen "Reg. EPA. No."?  
Puede que solo sea un limpiador que no mata los gérmenes.

Si ha estado expuesto, siga los Primeros Auxilios de la etiqueta y llame a su centro local de envenenamiento al 800-222-1222.



¿Tiene preguntas? Llame a NPIC al 800-858-7378, lunes a viernes de 8 a. m. a 12 p. m. (hora del Pacífico) para hablar con un especialista.  
Dirección de correo electrónico: npic@ace.orst.edu



# 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.

Our pesticide chemical (active ingredient) fact sheets answer common questions asked by the public about specific pesticides. They allow people to “dig deeper” for answers.

In 2022, NPIC created/updated two fact sheets:

- *Bacillus thuringiensis (Bt)* (updated)
- Quaternary Ammonium Compounds (ADBAC/DDAC)



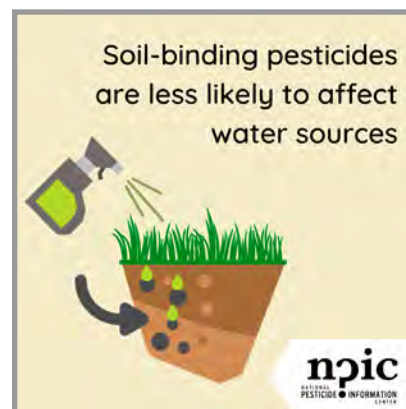
## Social Media

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.



227 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 2022

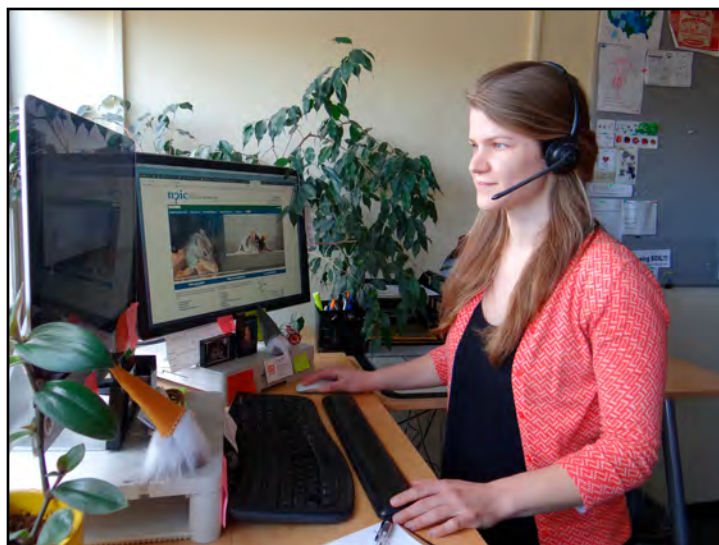
**16** web-based events  
webinars | recorded events

**13** in-person events  
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.

**968** new documents  
added **in 2022**



Documents are uploaded in our searchable collection of Active Ingredient (AI) files for quick reference. The collection now includes more than 19,000 documents in 1,149 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



**6,868** inquiries

### 2022 Inquiry Types

5,359 informational

1,305 pesticide incidents

46% with unknown active ingredient

204 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

# PESTICIDE INQUIRY DATA

The following pages include details about the incidents and inquiries documented by NPIC from February 15, 2022 to February 14, 2023.

## 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 (e.g., child ate a mothball), intended exposures with adverse effects (e.g., illness in pets treated with flea/tick products), spills, and potential misapplications (e.g., a product intended for ornamental plants was applied to vegetables in the home garden.)
- About 3% 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 16. Regardless, NPIC specialists make every effort to collect complete information about scenarios that meet the NPIC incident definition. Approximately 19% 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 26.
- 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 32.
- NPIC makes no claims or guarantees as to the accuracy of the CI or other information presented in its reports, other than that NPIC has done its best to accurately document the information provided to NPIC.
- It is occasionally necessary to collect personally identifiable information (PII) in order to respond to inquiries, for example, by 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

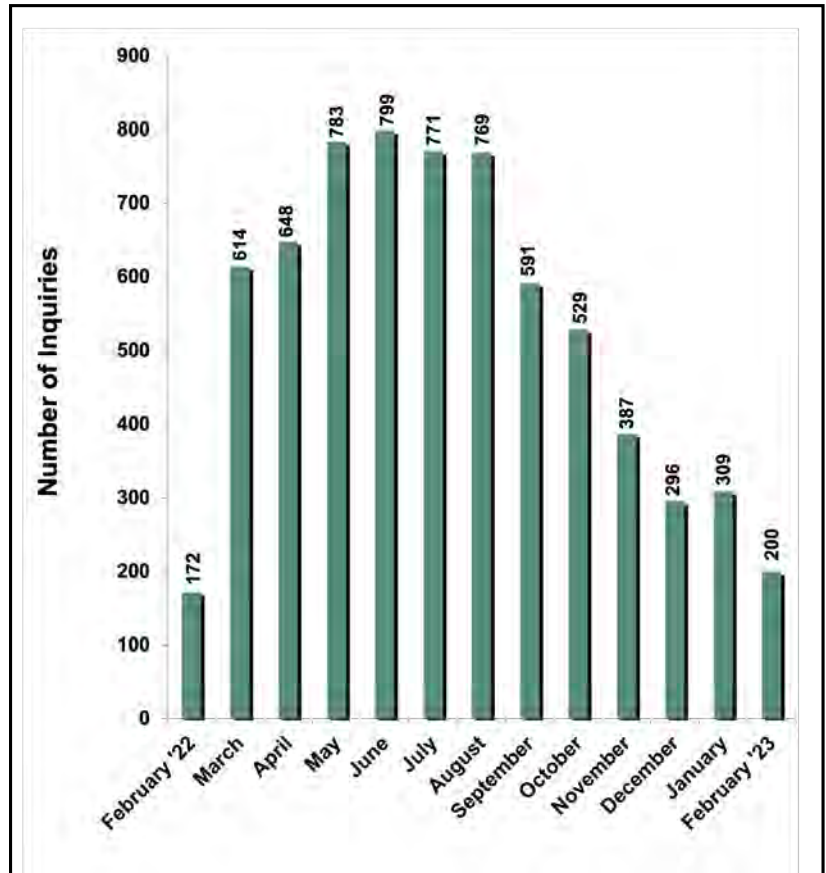
## 1. Monthly Inquiries

NPIC received 6,868 inquiries during this grant year. Graph 1 shows the number of inquiries received for each month. Seventy-one percent (71%) of the inquiries were received between April and October, concurrent with the part of the year when pest pressures are highest.

Table 1. Monthly inquiries

Month	Total
February 2022	172
March	614
April	648
May	783
June	799
July	771
August	769
September	591
October	529
November	387
December	296
January	309
February 2023	200

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.

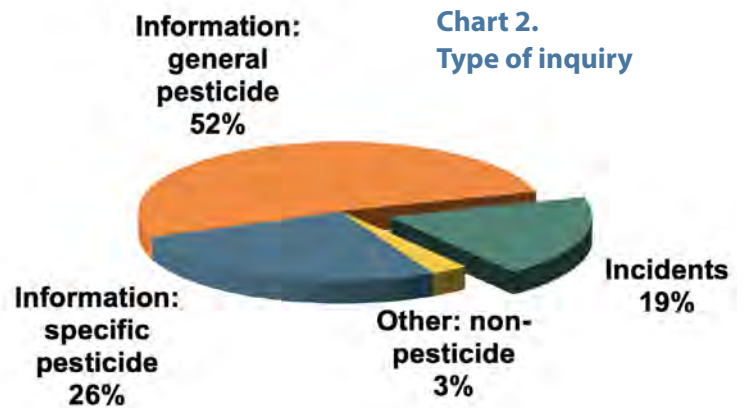
The types of inquiries are summarized in Table 2 and Chart 2.

The majority of inquiries (5,359 or 78%) were informational inquiries about pesticides or related topics. NPIC responded to 3,538 (52%) information inquiries about pesticides in general. NPIC responded to 1,821 (26%) information inquiries relating to specific pesticides or active ingredients.

NPIC documented 1,305 incidents involving pesticides (19%). 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	3538
Information - Specific Pesticide	1821
Incidents	1305
Other (nonpesticide)	204
<b>Total =</b>	<b>6868</b>



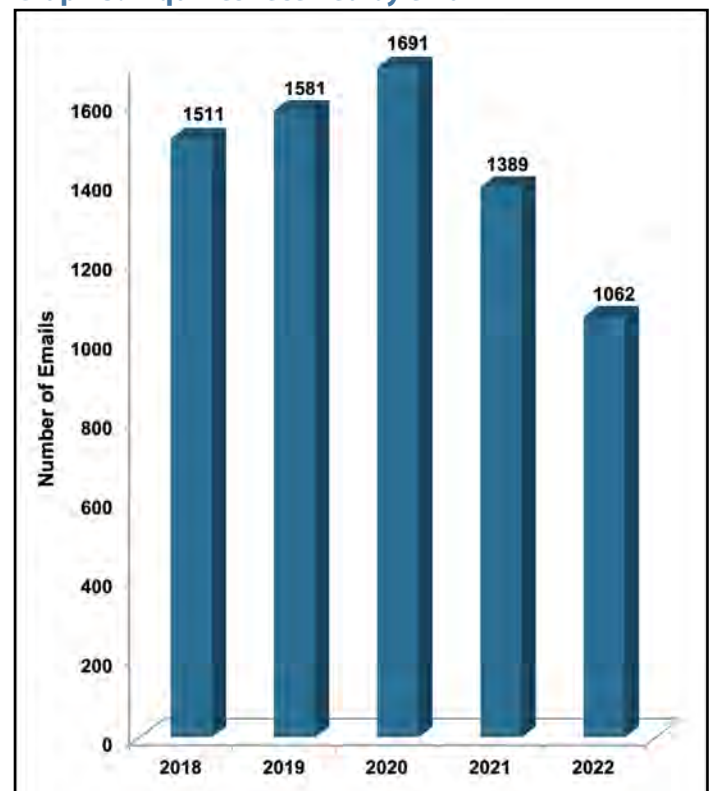
## 3. Origin of Inquiry

Table 3 summarizes the origin of inquiries received by NPIC. About 85% of inquiries were received by telephone.

**Table 3. Origin of inquiry**

Origin of Inquiry	Total
Phone	4870
Email/Web	1062
Voicemail	934
Mail	2
<b>Total =</b>	<b>6868</b>

**Graph 3. Inquiries received by email**



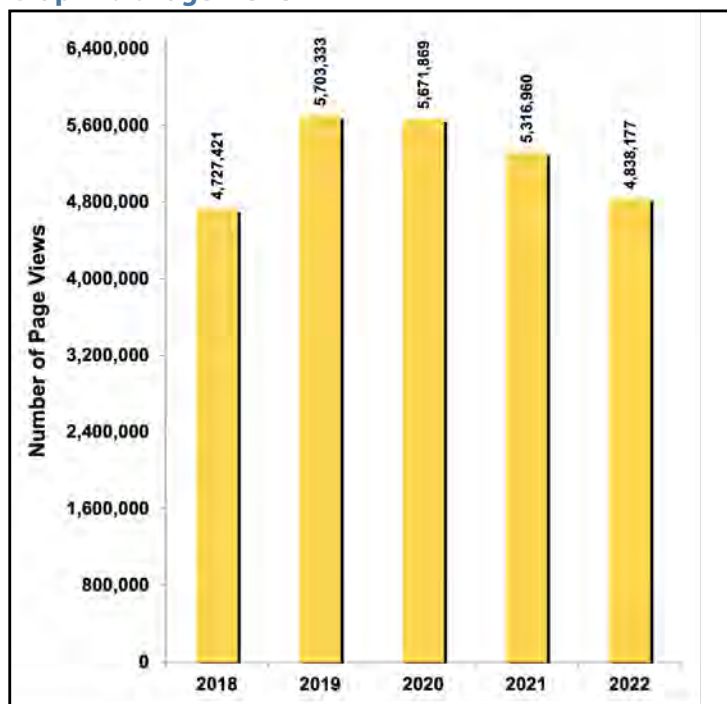
## 4. Website Access

The NPIC website attracted more than 3.3 million “new” visitors viewing 4,838,177 pages during this period.

Most page views originated from queries on popular search sites (72%). Others were connected with NPIC from a bookmark (25%) or direct link (i.e., shared via email). The most popular search phrases used to reach NPIC were “neem oil”, “glyphosate”, and “boric acid.”

Visits to the website varied greatly in duration, with 418,175 visits lasting longer than 15 minutes. The average visit duration was approximately 50 seconds.

Graph 4.1. Page views



The most popular pages viewed were:

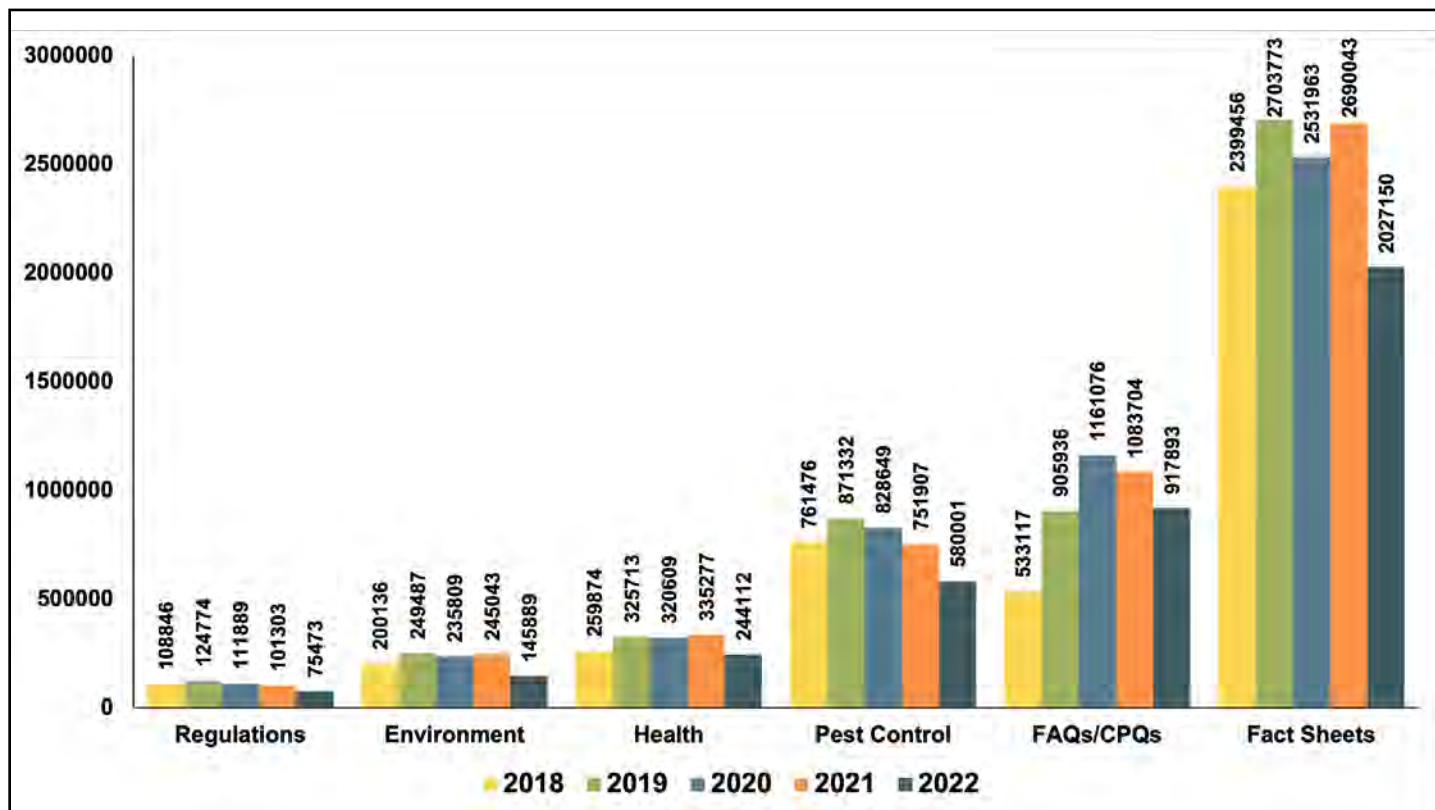
- Diatomaceous earth general fact sheet (157,925)
- ¿Por qué tengo cucarachas en mi casa? (Why do I have cockroaches in my home?) (153,081)
- Neem oil general fact sheet (126,101)
- Glyphosate general fact sheet (124,905)
- Why do I have cockroaches in my home? (107,542)

Table 4. Selected page views

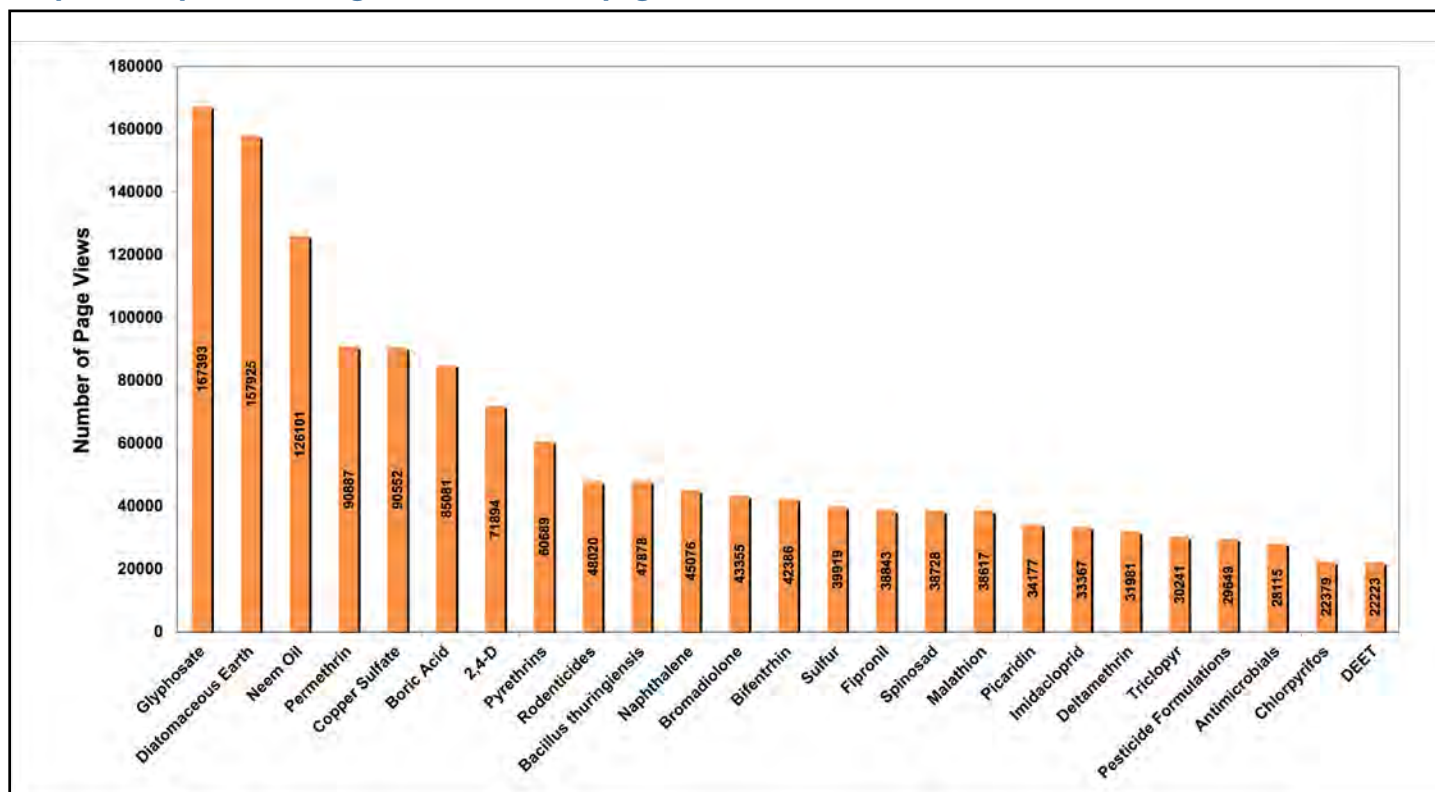
Page Accessed	English page views	Spanish page views
Fact Sheets	2,001,030	26,120
FAQs/CPQs	324,817	593,076
Pest Control	266,078	313,923
Health and Safety	112,009	132,103
Environment	88,679	57,210
Regulations	67,383	8,090

# NPIC WEBSITE

Graph 4.2. Category of web pages viewed by year



Graph 4.3. Top 25 active ingredient fact sheet pages viewed



# TYPE OF INQUIRER

## 5. Type of Inquirer

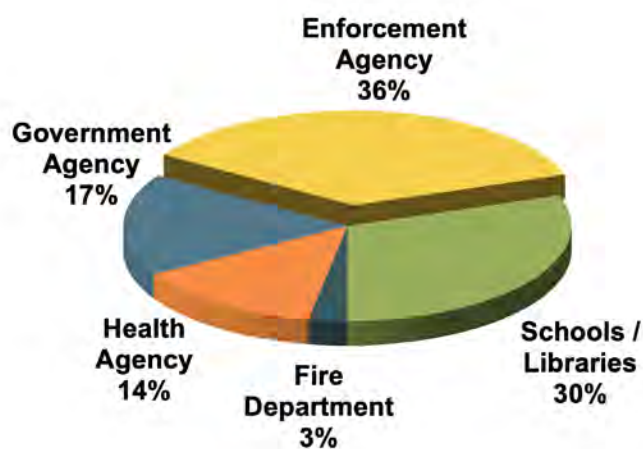
Table 5 summarizes the profession/occupation of individuals contacting NPIC. The majority of inquiries to NPIC are from the public. Of the 6,868 inquiries received, there were 6,187 (90%) from the public, 109 from federal, state, local government agencies, or schools, 104 from pesticide manufacturers, and 58 from human and animal medical personnel.

Chart 5 summarizes the 109 governmental entities that contacted NPIC during the grant year. Health agencies include health departments and WIC personnel. Government agencies include city, county, and other government entities without enforcement roles. Enforcement agencies include the U.S. EPA, state pesticide regulatory agencies, and police, among others.

**Table 5. Type of inquirer**

Type of Inquirer	Total
<b>General Public</b>	<b>6187</b>
<b>Federal/State/Local Agencies</b>	
Enforcement Agency	39
Schools / Libraries	33
Government Agency	19
Health Agency	15
Fire Departments	3
<b>Medical Personnel</b>	
Human Medical	41
Animal / Vet / Clinic	17
<b>Agencies or Organizations</b>	
Pesticide Mfg / Mktg Co	104
Farm/Fertilizer	62
Pest Control	59
Info Service - Unions	30
Labs/Consulting	25
Media/Authors	21
Environmental Orgs	19
Retail Store/Nursery	17
Beekeeper	13
Lawyers/Insurance	13
Master Gardener	11
Migrant Ag Worker	1
Non-migrant Ag Worker	1
Other	138
<b>Grant Year Total =</b>	<b>6868</b>

**Chart 5. Inquiries from federal / state / local agencies**





# TYPE OF QUESTION

## 6. Type of Question

The questions received at NPIC are most often related to health (e.g., effects to humans and animals, risk, etc.), pest control (e.g., how to control a pest, pest habits, etc.), and application (e.g., methods, label clarity, etc.). "Other" questions (855) include all wrong numbers and people seeking their pest control companies, among others.

Questions about how to follow pesticide label directions are coded as "application" (810). Questions about regulations (673) range from "How do I get a new product registered?" to "Can the authorities make my neighbor stop spraying?"

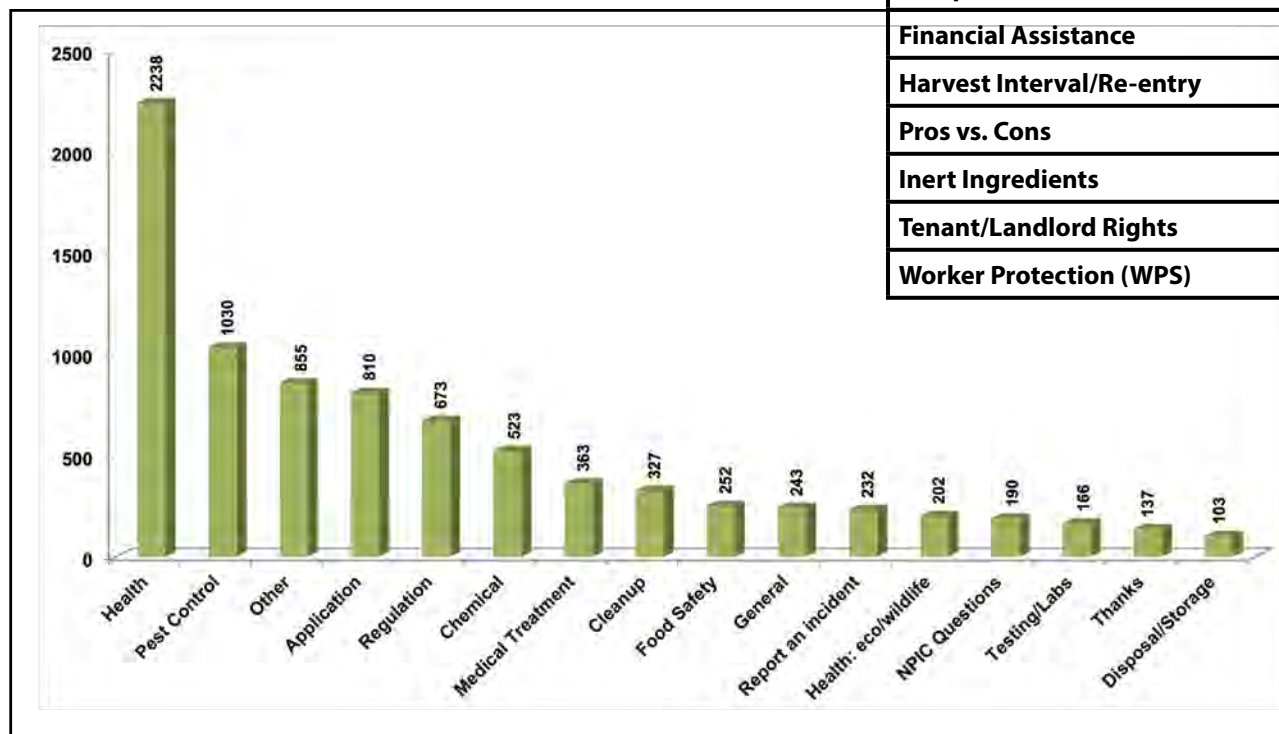
People contacted NPIC to report a pesticide incident 232 times. In these cases, NPIC provided people with appropriate local referrals for enforcement, as needed.

Inquiries may involve more than one type of question. Inquirers asked 8,538 questions during this grant year in the course of 6,868 inquiries.

**Table 6. Type of question**

Type of Question	Total
Health: human/domestic	2036
Pest Control	1030
Other	855
Application	810
Regulation	673
Chemical	523
Medical Treatment	363
Cleanup	327
Food Safety	252
General	243
Report an incident	232
Health: eco/wildlife	202
NPIC Questions	190
Testing/Labs	166
Thanks	137
Disposal/Storage	103
Just Wants Another Contact	93
Where to Buy a Product	91
Complaints	71
Financial Assistance	41
Harvest Interval/Re-entry	31
Pros vs. Cons	25
Inert Ingredients	23
Tenant/Landlord Rights	18
Worker Protection (WPS)	3

**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 (5,746) were answered by providing information over the phone. Information was also sent via email in 1,118 cases. Upon request, NPIC brochures were mailed to people 11 times during this grant year.

Table 7.1. Primary action taken

Primary Action Taken	Number of Inquiries
	2022
Verbal Info	5746
Emailed Info	1118
Handled Inquiry in Spanish	169
Transferred to EC / PC	116
Interpreted via Language Line Svs	50
Transferred to Specialist / Voicemail	33
Mailed Info	24
Sent NPIC Outreach Material(s)	11

### Risk reduction actions:

NPIC keeps track of certain conversation topics aimed at reducing pesticide risk. Specialists documented 3,535 risk reduction actions, detailed in Table 7.2.

Table 7.2. Risk reduction actions

Risk Reduction Action Taken	Number of Inquiries
	2022
Discussed Following the Label	1723
Discussed Ways to Minimize Exp.	1317
Discussed IPM Concepts	405
Discussed Environmental Protection	90

### 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

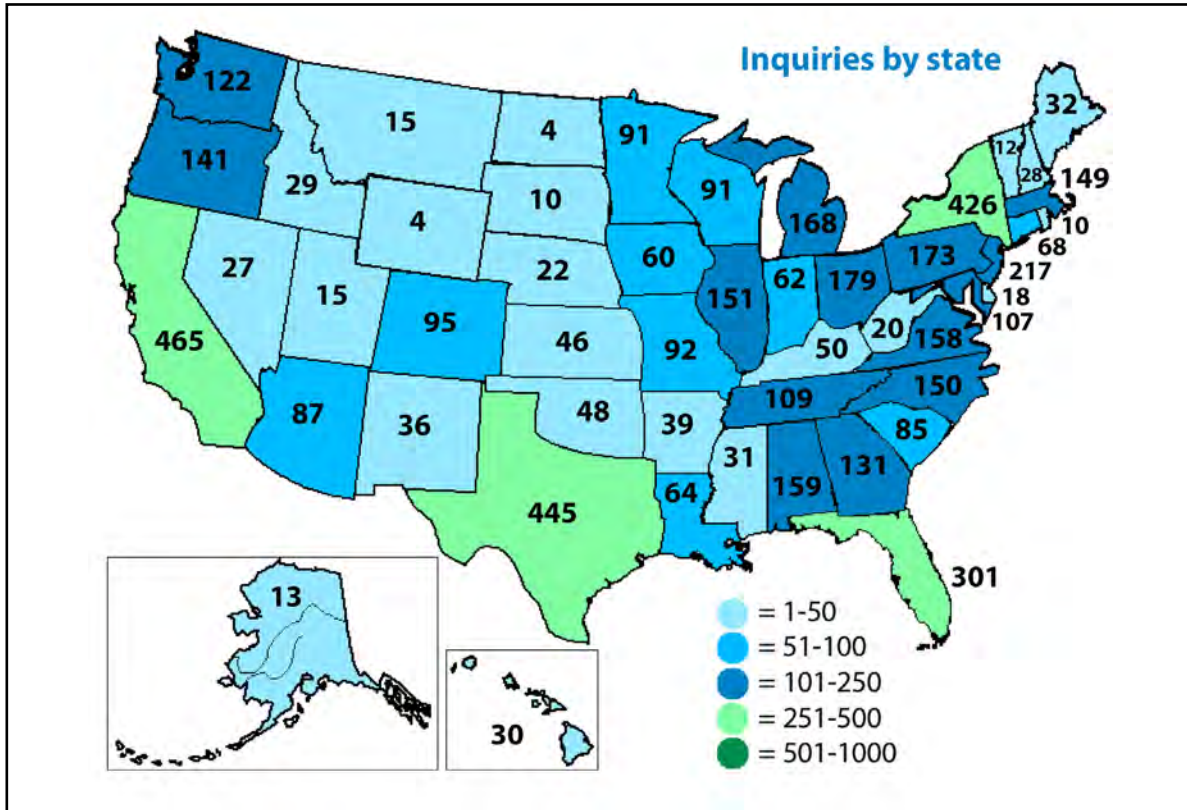
Organization Name	Number of Inquiries
	2022
Manufacturer / Distributor Contact	1225
NPIC Website	1102
County Extension Contact	954
State Lead Contact	586
Other Org. Contact	406
Poison Control Contact	382
EPA Website	188
Animal Poison Contact	177
Dept of Health Contact	142
EPA HQ / OPP Contact	137
Other State Agency Contact	136
Hazardous Waste Contact	106
EPA Region Contact	82
Other Fed Agency Contact	45
OSHA Contact	8

# INQUIRIES BY STATE

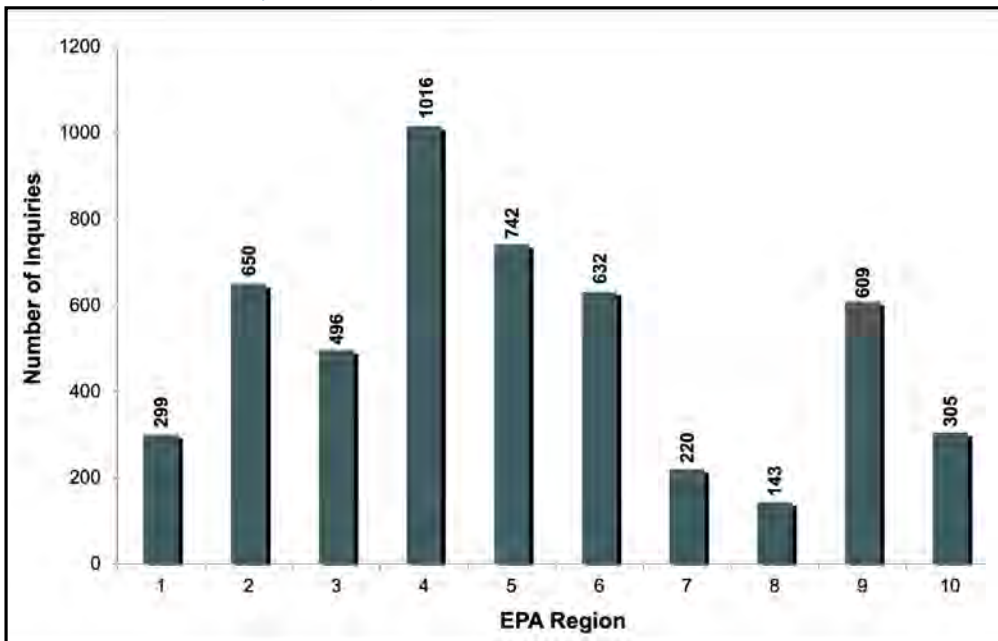
## 8. Inquiries by State

The map below shows the number of inquiries received by NPIC from each state. The largest number of inquiries came from California (465), Texas (445), New York (426), and Florida (301). In addition to the states, NPIC received inquiries from the Virgin Islands (2) Puerto Rico (5), District of Columbia (20), Canada (10), and other countries (140). Sometimes a state cannot be identified during the inquiry.

Graph 8 summarizes inquiries by EPA region.



**Graph 8. Inquiries by EPA region**



The top 5 regions with a known state were:

- Region 4 (14.8%)
- Region 5 (10.8%)
- Region 2 (9.5%)
- Region 6 (9.2%)
- Region 9 (8.9%)

# TOP 25 AIs FOR ALL INQUIRIES

## 9. Top 25 Active Ingredients for All Inquiries

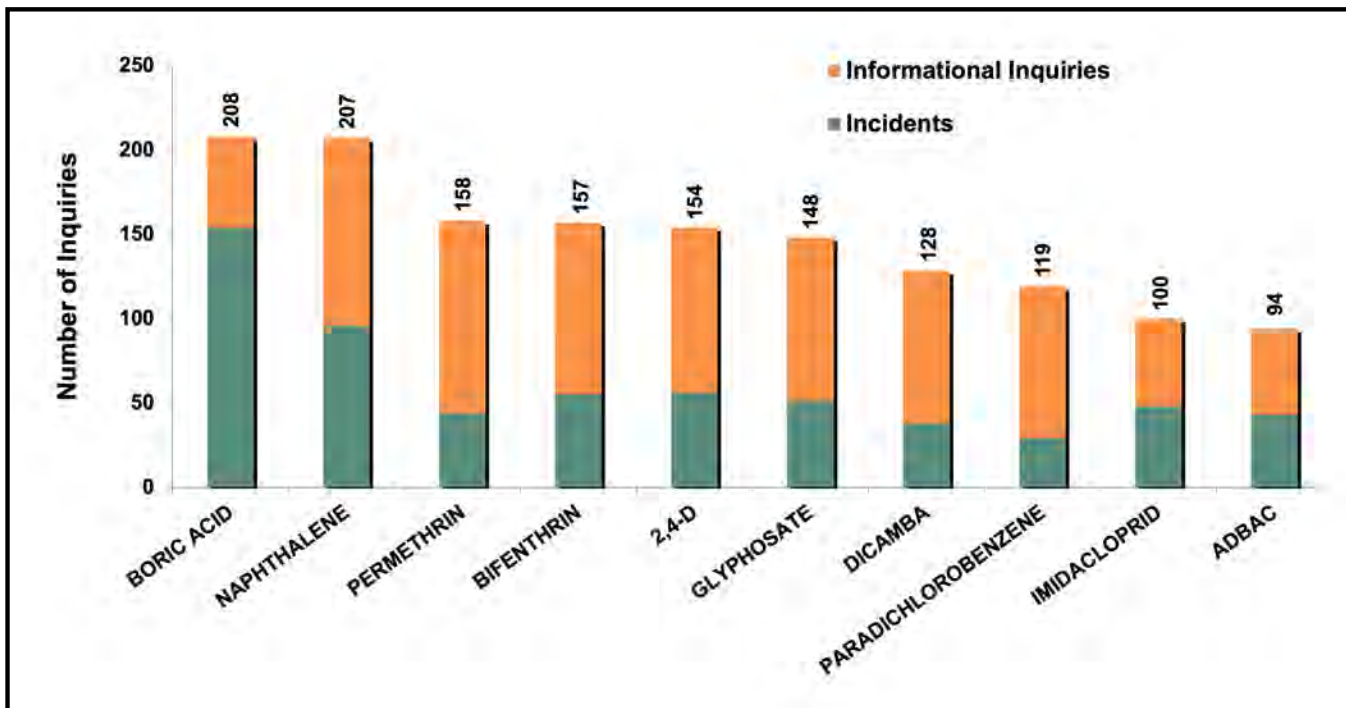
When inquiries to NPIC involve discussion of a specific product or active ingredient, specialists record the product and the active ingredient in the PID. Boric acid was discussed in more inquiries than any other single active ingredient this year (Table 9, Graph 9). Of the 208 inquiries involving boric acid, 154 (74%) 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
BORIC ACID	208	154	54
NAPHTHALENE	207	96	111
PERMETHRIN	158	44	114
BIFENTHRIN	157	55	102
2,4-D	154	56	98
GLYPHOSATE	148	51	97
DICAMBA	128	38	90
PARADICHLOROBENZENE	119	29	90
IMIDACLOPRID	100	48	52
ADBAC	94	43	51
NEEM OIL	91	31	60
PIPERONYL BUTOXIDE	89	32	57
DDAC	85	39	46
SILICON DIOXIDE	85	34	51
DELTA METHRIN	79	34	45
MECOPROP	74	26	48
PYRETHRINS	73	21	52
LAMBDA-CYHALOTHRIN	66	31	35
CYPERMETHRIN	62	35	27
FIPRONIL	62	19	43
BACILLUS THURINGIENSIS	62	13	49
CAPSAICIN	56	33	23
IMAZAPYR	52	15	37
SULFUR	51	21	30
TRICLOPYR	49	10	39

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.

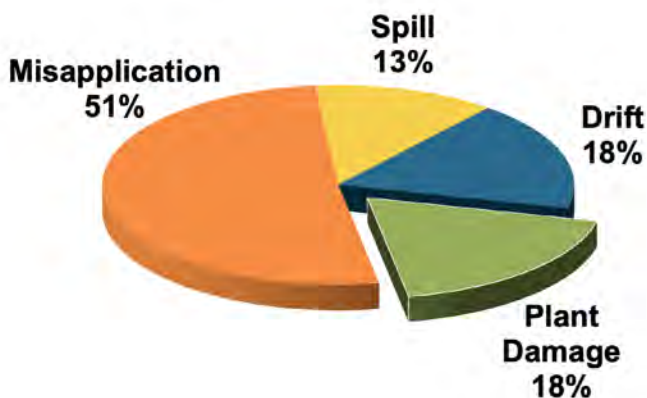
There were 1,482 pesticide exposures and 647 accidents. Charts 10.1 and 10.2 provide further details. Among reported exposures, inhalation was the most common route of exposure (31%), followed by dermal contact (20%) and ingestion (19%). When a specific exposure route could not be identified, specialists documented an “unknown” exposure route (12%). When an exposure occurred but could not be verified (e.g., a pet is found next to an open container), specialists documented “possible” exposure.

Indoor spills (58) were reported more often than outdoor spills (23). Among reported misapplications (330), 74% were misapplications by the homeowner or resident.

**Chart 10.1. Pesticide exposures (Total: 1,482)**



**Chart 10.2. Pesticide accidents (Total: 647)**



**Table 10. Incident Type**

Type of Incident	Total
<b>Exposures</b>	
Inhalation	466
Dermal	302
Ingestion	279
Unknown	171
Exposure Possible	192
Ocular	32
Occupational	23
Workplace	17
<b>Accidents</b>	
Misapp - Homeowner	244
Plant Damage	121
Drift	115
Spill - Indoor	58
Misapp - PCO	48
Misapp - Other	34
Spill - Outdoor	23
Misapp - Unknown	4
Other	1
<b>Total =</b>	<b>2130</b>

# 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, naphthalene, and imidacloprid.

**Table 11. Top 25 active ingredients for incidents reported to NPIC<sup>1</sup>**

Active Ingredient	Human Exposures	Animal Exposures	Other Accidents
NAPHTHALENE	169	31	164
PARADICHLOROENZENE	126	25	144
BORIC ACID	54	93	9
2,4-D	29	9	28
BIFENTHRIN	26	12	25
GLYPHOSATE	21	10	26
IMIDACLOPRID	13	30	9
DICAMBA	20	5	23
ABAMECTIN	1	29	3
PERMETHRIN	29	4	11
ADBAC	34	3	7
DDAC	30	3	7
SILICON DIOXIDE	15	17	5
CAPSAICIN	26	4	3
LAMBDA-CYHALOTHRIN	18	6	14
DELTAMETHRIN	26	6	4
CYPERMETHRIN	19	4	13
BROMETHALIN	0	20	4
FLUMETHRIN	2	24	0
PIPERONYL BUTOXIDE	22	2	8
IRON PHOSPHATE	1	21	0
NEEM OIL	29	3	0
MECOPROP	16	5	7
BROMADIOLONE	1	13	2
FIPRONIL	8	6	5

<sup>1</sup> 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 1,877 locations where exposures or accidents were documented, 76% occurred in the home or yard, 8% occurred at the intersection of home and agricultural property, and 5% 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 an increase in incidents occurring at natural (e.g., ponds, lakes, streams) and treated water locations in 2022 (33) compared to 2021 (14).

**Table 12. Location of exposure/accident**

Location	Total
Home - Inside	841
Home - Outside	589
Ag/urban interface	158
Agricultural	92
Vehicle	46
Pond/Lake/Stream	31
Other	25
School/Day Care	22
Office Building	16
Roadside/Right-of-Way	15
Health Care Facility	12
Park/Golf Course	8
Retail Store	8
Industrially Related	7
Food Service/Restaurant	3
Nursery/Greenhouse	2
Treated Water	2
<b>Total =</b>	<b>1877</b>

## 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 (99).

**Table 13. Reported environmental impacts**

	Drift	Misapplication: Resident	Misapplication: Other	Misapplication: PCO	Misapplication: Unknown	Plant Damage	Spill: Indoor	Spill: Outdoor
Agricultural Crop	22	5	2	1	0	15	0	0
Building - Home/Office	0	99	19	16	2	0	38	6
Home Garden	56	33	4	23	0	58	0	1
Home Lawn	4	42	0	1	1	13	0	3
Natural Water	0	2	1	0	0	0	0	2
Other <sup>1</sup>	0	1	0	0	0	0	0	2
Property	3	18	2	6	0	0	9	2
Soil/Plants/Trees	22	32	4	1	0	35	0	4
Treated Water	3	3	0	0	0	0	0	1
Vehicle	1	4	2	0	0	0	10	2

<sup>1</sup> "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 (1,674), 15% of the cases were assigned a consistency index of “consistent,” 11% were assigned an index of “inconsistent,” and 74% 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.

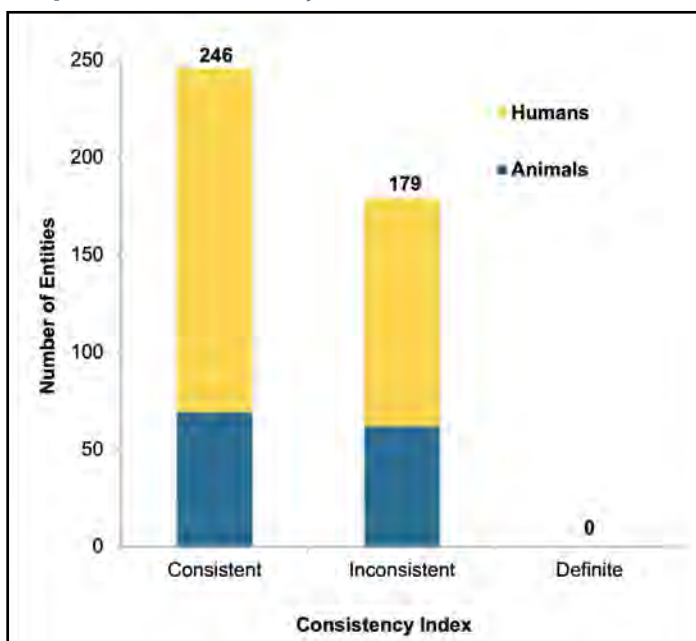
The consistency index is “**unclassifiable**” when one or more of the following criteria apply:

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

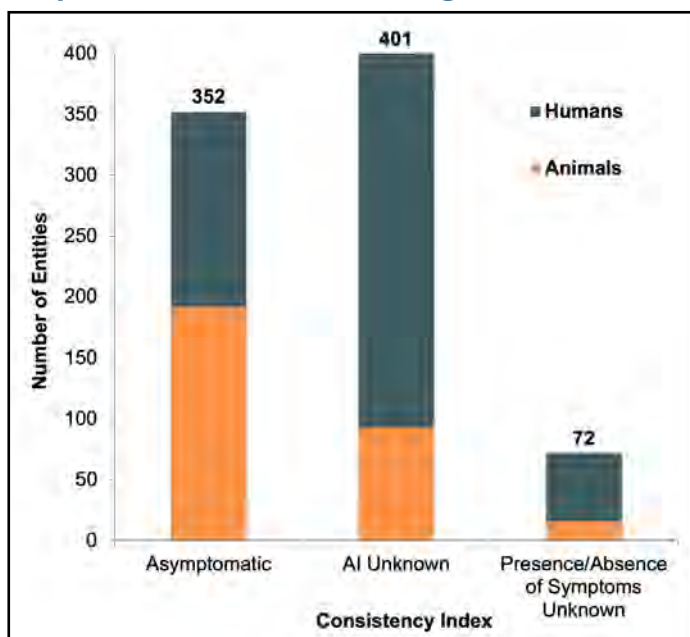
**Table 14. Incident inquiries by consistency index (CI)**

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	526	301	479	1306	171	254	85	16
Definite	0	0	0	0	0	0	0	0
Consistent	177	69	0	246	72	90	15	0
Inconsistent	117	62	0	179	40	68	9	0

**Graph 14.1. Consistency index for incidents**



**Graph 14.2. Unclassifiable CI categories**





# SEVERITY INDEX

## 15. Severity Index

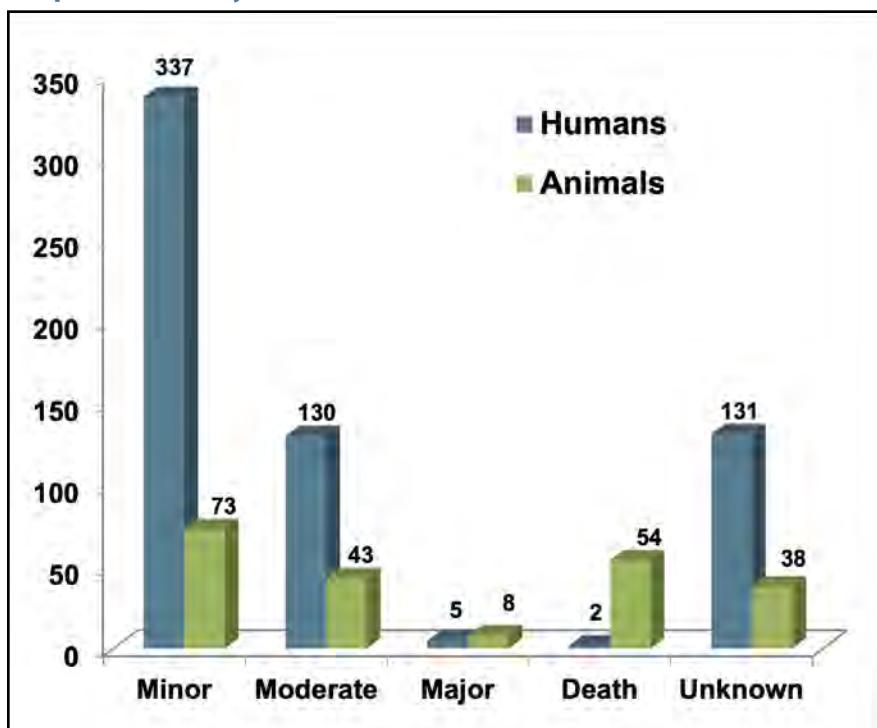
Table and Graph 15 summarize the severity of symptoms for all human and animal incidents reported to NPIC.

For all human pesticide incidents with reported exposures, 41% had minor symptoms, 16% had moderate symptoms, and 1% had major symptoms. Symptoms were unknown in 16% of human incidents. In 26% 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	337	73	410	108	196	32	1
Moderate	130	43	173	54	65	10	1
Major	5	8	13	3	2	0	0
Death	2	54	56	1	1	0	0
Unknown	131	38	169	35	58	29	9
Asymptomatic	213	216	429	82	88	38	5

**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 1,731 entities involved in incidents reported to NPIC during this period, 47% were human, 25% were animals, and 28% were environmental nontarget entities. Other entities (3, 0.2%) are miscellaneous items (e.g., sidewalk, food). Pesticide incidents may involve multiple entities.

Graph 16.1. Humans

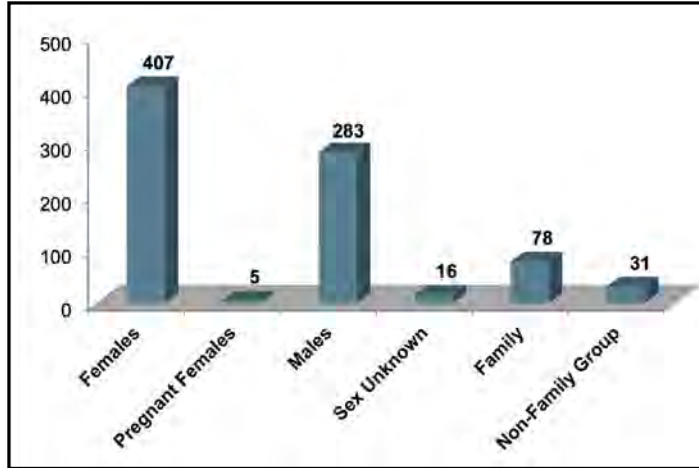
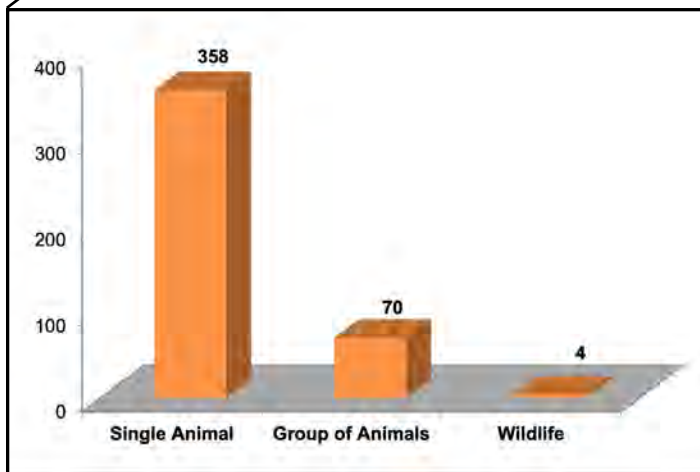
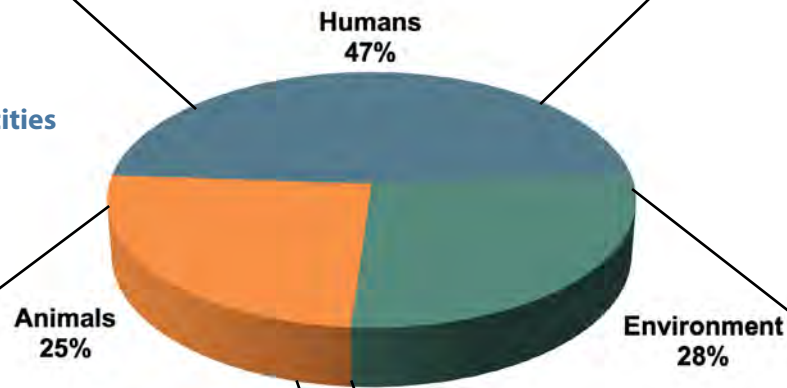
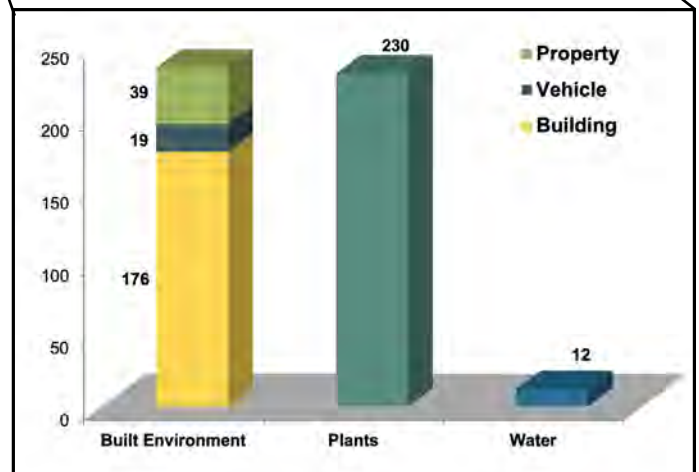


Chart 16. Description of entities



Graph 16.2. Animals



Graph 16.3. Environmental entities

# DEATHS WITH KNOWN ACTIVE INGREDIENT

## 17. Reported Deaths

Of the 432 animal entities involved in pesticide incidents, 54 deaths were reported. Of those, there were 38 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
<b>Animal Deaths</b>	
Single Animal	20
Group of Animals	16
Wildlife	2
<b>Total =</b>	<b>38</b>

**Table 17.2. Reported animal deaths with compatible signs/symptoms**

PESTICIDE PRODUCT	ACTIVE INGREDIENT	INCIDENT TYPE	ENTITY	STATE
TRIVAPRO   WILLOWOOD LAMBDA-CY 1 EC	BENZOVIINDIFLUPYR   PROPICONAZOLE   AZOXYSTROBIN   LAMBDA-CYHALOTHRIN	Exposure: Possible	Wildlife	868
TRIVAPRO   WILLOWOOD LAMBDA-CY 1 EC	BENZOVIINDIFLUPYR   PROPICONAZOLE   AZOXYSTROBIN   LAMBDA-CYHALOTHRIN	Exposure: Possible	Group of Animals	868
N/A	COPPER SULFATE	Exposure: Ingestion   Exposure: Inhalation   Exposure: Dermal	Group of Animals	873
N/A	COPPER SULFATE	Exposure: Ingestion   Exposure: Inhalation   Exposure: Dermal	Group of Animals	873
N/A	STRYCHNINE	Exposure: Unknown	Single Animal	1794
N/A	COPPER SULFATE	Exposure: Ingestion   Exposure: Inhalation   Exposure: Dermal	Wildlife	2529
ALPINE WATER SOLUBLE GRANULES	DINOTEFURAN	Exposure: Possible	Group of Animals	2686
CREOSOTE	CREOSOTE	Exposure: Ingestion   Exposure: Dermal	Group of Animals	2857
LAWN SCAPE FALL WEED & FEED	2,4-D   MECOPROP	Exposure: Possible	Single Animal	3047
K9 ADVANTIX	PERMETHRIN   PYRIPROXYFEN   IMIDACLOPRID	Exposure: Dermal	Single Animal	3174
COPPER SULFATE CRYSTALS	COPPER SULFATE	Exposure: Ingestion   Exposure: Inhalation   Exposure: Ocular   Exposure: Dermal	Group of Animals	3236
SIMAZINE 90DF	SIMAZINE	Exposure: Ingestion   Exposure: Inhalation   Exposure: Dermal	Group of Animals	3659
SERESTO COLLAR	FLUMETHRIN   IMIDACLOPRID	Exposure: Dermal	Single Animal	4023
SENTRY FIPOGUARD	FIPRONIL	Exposure: Dermal	Single Animal	4792
N/A	DELTAMETHRIN	Exposure: Possible	Group of Animals	4938
SERESTO	FLUMETHRIN   IMIDACLOPRID	Exposure: Dermal	Single Animal	5133
SERESTO	FLUMETHRIN   IMIDACLOPRID	Exposure: Dermal	Single Animal	5133
N/A	DIPHACINONE	Exposure: Possible	Single Animal	6066
LESCO THREE-WAY SELECTIVE HERBICIDE   BARRICADE 65WG HERBICIDE   INDAZIFLAM 74SC	2,4-D   DICAMBA   MECOPROP   INDAZIFLAM   PRODIAMINE	Exposure: Possible	Group of Animals	6256
SERESTO COLLAR	FLUMETHRIN   IMIDACLOPRID	Exposure: Dermal	Single Animal	6620

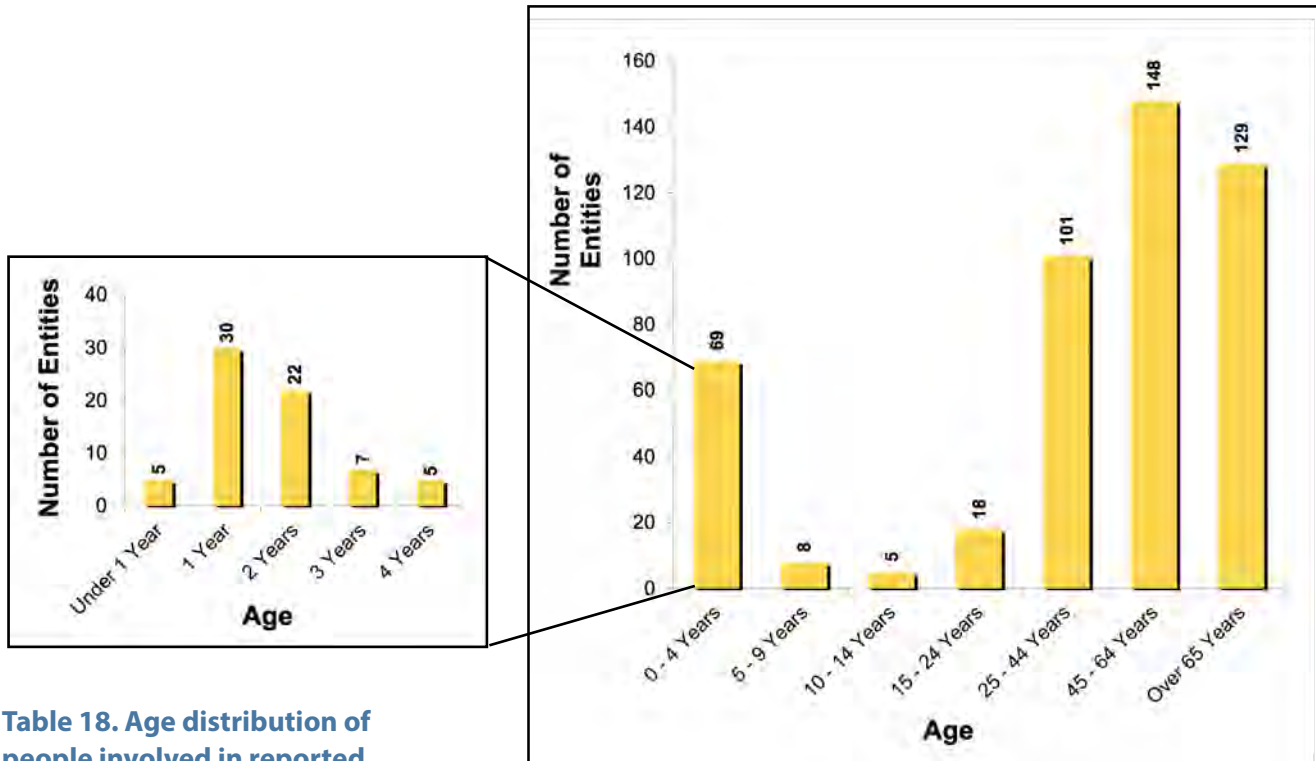
# ENTITY AGE

## 18. Entity Age

Table 18 and Graph 18 summarize the ages of people involved in incidents reported to NPIC. Among 711 single human entities, NPIC was able to collect the person's age 67% of the time. NPIC aims to capture the age for all human entities; occasionally callers decline to provide that information.

Among the 478 humans with known age, 14% were children (ages 4 and under), and 27% 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	5
1 year	30
2 years	22
3 years	7
4 years	5
<b>Total (0 - 4 years) =</b>	<b>69</b>
5 - 9 years	8
10 - 14 years	5
15 - 24 years	18
25 - 44 years	101
45 - 64 years	148
Over 65 years	129

# NOTABLE EXPOSURES

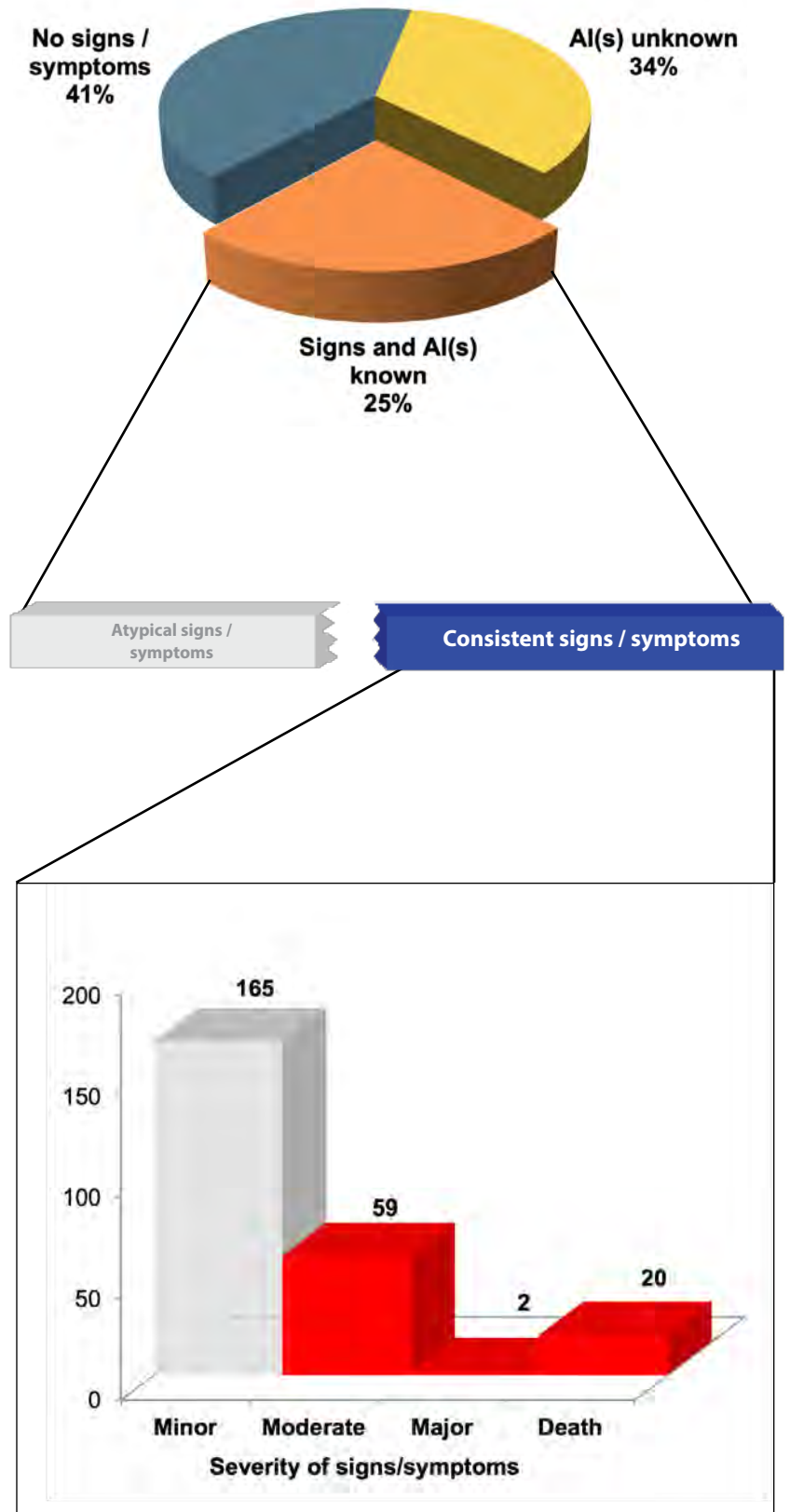
## 19. Notable Exposures

There were 1,731 entities potentially exposed to pesticides in 1,305 reported incidents.

### Figure 19.1

There were 1,305 pesticide incidents reported, involving 1,731 exposed entities (people, animals, buildings, plants, soil, and water).

**Total = 1,731 entities**



### Figure 19.2

Human and animal entities potentially exposed to a known pesticide, with reported signs/symptoms (246 consistent and 179 atypical).

**Total = 425 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 = 246 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.

## 20. Veterinary Incident Report Portal

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 five incident reports to the VIRP involving five animals (4 canine and 1 feline). All VIRP reports are forwarded to EPA quarterly, in their entirety.

Of the three reports with a known product type, all were insecticide products (two spot-on and one liquid).

Symptoms reported to the VIRP 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, 67% were classified as neurological, 22% were classified as gastrointestinal, and 11% were classified as other.

Incident outcomes as reported may involve multiple animals in each VIRP report. Thus, totals reflect the number of animals, as opposed to the number of reports. Of the total number of animals (5) involved in VIRP incident reports, 60% of the cases were ongoing. The affected animals had recovered at the time of the report in 40% of cases. There were no reported animal deaths.

## 21. Ecological Incident Reporting

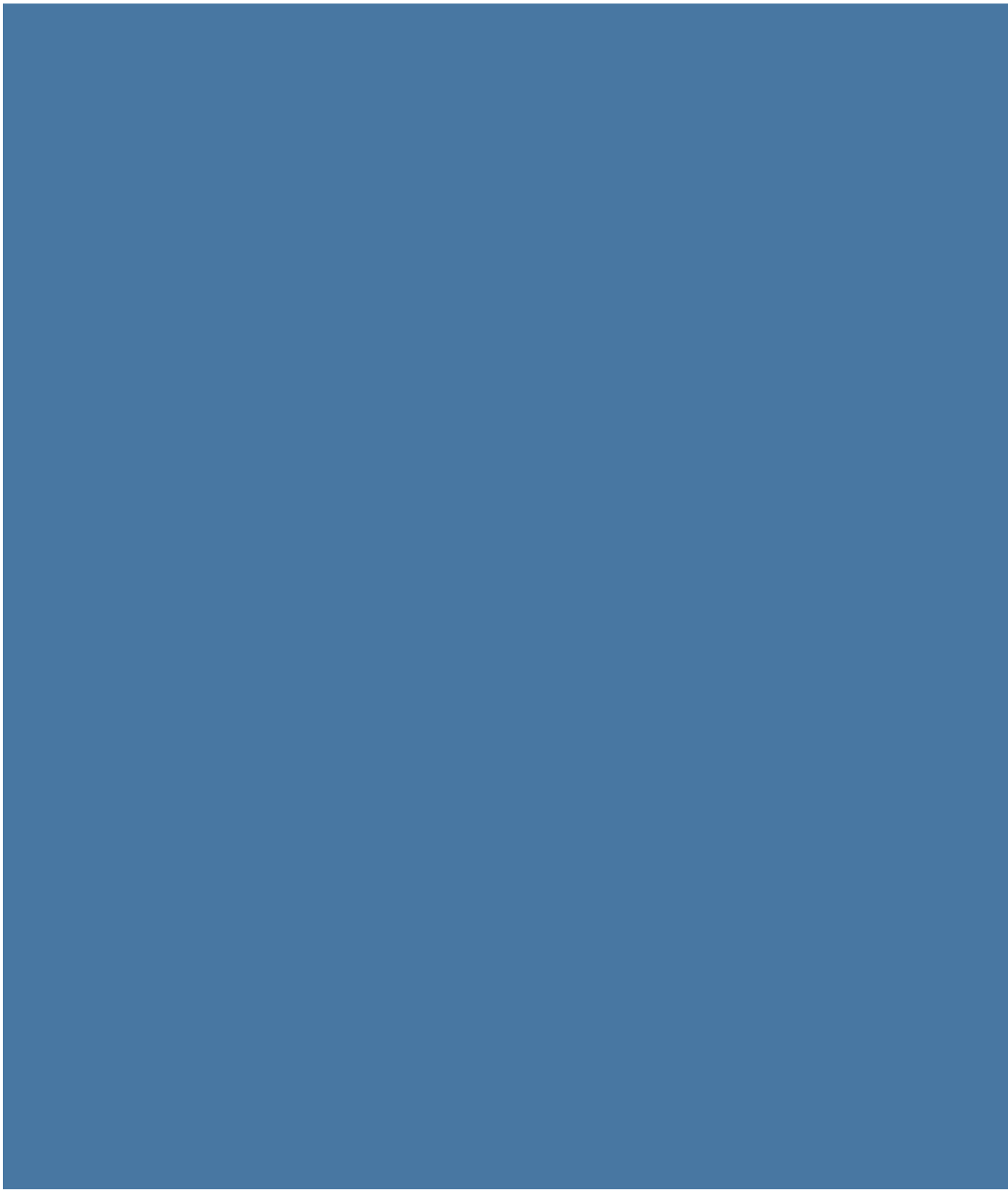
In 2009, NPIC developed a web-based portal to facilitate reporting of ecological incidents. It was designed by the U.S. EPA Office of Pesticide Programs (OPP), then built and hosted by Oregon State University.

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. More recently, NPIC developed programming to make that delivery automatic and immediate.

Reports submitted to the Eco-portal in 2022 involved possible exposures to bees (10), birds (2), fish (2), and plants (1). Table 21.1 summarizes the active ingredients involved in the eight reports submitted to the Eco-portal.

**Table 21.1. Active ingredients involved in the Eco-reports**

Active Ingredient	Quantity
UNKNOWN OR N/A	16
2,4-D	1
ACETOCHLOR	1
ATRAZINE	1
GLYPHOSATE	1
MESOTRIONE	1
PRALLETHRIN	1



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