List of Topics

- Purpose of Evidence Collection
- Sampling Plans
- Communication Protocol
- Sample Types, Units, and Patterns
- Sampling Equipment
- Sample Site
- Sampling Procedures
- Sampling Technique Outsourcing
- Sample Preservation, Storage, and Shipping
- Sample Analysis Report
Purpose of Evidence Collection

- To provide physical evidence in order to:
  - Prove or disprove violation(s)
  - Assess the nature and degree of exposure or damage
  - Assist with mitigation strategies
  - Guide enforcement response
What is Evidence?

• Anything you rely on to make a determination of compliance or to establish a violation

• Examples
  • Samples: Foliage, Chemical, Clothing, Soil, Water, Air
  • Interviews, Oral Statements, Direct Quotes
  • Documents, Writings, Photographs, Diagrams
  • Electronic Data, Video

Definition from California Evidence Code

“Testimony, writings, material, objects or other things presented to the senses that are offered to prove the existence and non-existence of facts”
DPR’s Guidance on Evidence Collection

- Pesticide Use Enforcement Program Standards Compendium, Volume 5
- Investigation Procedures
  - Chapter III-Evidence Collection

http://www.cdpr.ca.gov/docs/enforce/compend/vol_5/investprc.htm
Purpose of DPR’s Evidence Collection Procedures

• To create a solid foundation for pesticide use enforcement for:
  • Administrative Civil Penalties
  • Other violations
• To ensure fairness through statewide consistency in pesticide use enforcement
• To instruct on how to uniformly collect evidence admissible in a court of law
  • Defensibility at hearing or trial
Authority to Investigate Pesticide Episodes (Includes Sampling)

- California Food and Agriculture Code (FAC)
  - FAC § 11456(b). Authority to Enter
- California Code of Regulations, Title 3 (3CCR)
  - 3CCR § 6140. Inspection Authority
- California Business and Professions Code (B&PC)
  - B&PC § 8616.5. Structural Inspections and Investigations
- California Government Code
  - Government Code § 11180 and 11181. Inspection Warrants
Legal Framework

- Both the US and the California Constitutions prohibit “unreasonable” searches and seizures by the government
- This restricts how the government obtains information and conducts inspections
- Constitution supersedes laws, regulations and permits

4th Amendment to the US Constitution

“The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”
Significance of Your Statutory Authority

- Useful in obtaining consent to conduct investigative inspection and evidence collection
- Relevant when obtaining an inspection warrant if consent is denied
- Document all facts supporting “reasonableness” during inspection

*Note: Safety First
Do not put yourself in a dangerous situation. If consent to conduct your investigation/inspection/sampling is denied. Do not enter into an argument with the responsible party. Contact your supervisor and your DPR Enforcement Branch Liaison (EBL) and immediately and begin the process of obtaining an Inspection Warrant.
Formulate a Sampling Plan

Planning ahead is important for a number of reasons, including:

• Ensuring that samples collected result in legally defensible evidence needed, and all samples are relevant to the investigation

• Avoiding critical delays in collection, such as ensuring all equipment is on-site for proper preparation and transport and storage of samples

• Arranging for any sample transport between staff when necessary
Sampling Plan

Organize sampling activities by dividing your tasks into 3 categories

1. Activities before sampling
   • Collect documents, office paperwork & equipment preparation

2. Activities during sampling
   • Field activities

3. Activities after sampling
   • Tasks needing to be done at the office after returning from the field
Sampling Plan

*Should include:*

- Number of samples to be included
- Samples: Types/ Units/ Patterns
- Location(s)
- Safety precautions (personal protective equipment)
- Quality assurance requirements
- Chain of custody
- Storage
- Preservation requirements such as Ice, etc.
Sampling Plan

*For Agricultural Use Sites:*

1. Review any Pesticide Use Reports (PUR) info for the site and adjacent areas
2. Obtain Notice of Intent (NOI) to apply Restricted Materials
3. Obtain completion notices (for applications by pest control businesses)
4. Obtain a copy of the Restricted Materials Permit
5. Evaluate accessibility issues
   - Road or field conditions, hours of operation
   - Will you be entering private property
6. Prior to contacting DPR, discuss your plan & coordinate information with your pesticide enforcement Deputy/supervisor
7. Review permit maps
Communication with your Enforcement Branch Liaison (EBL)

- Discuss sampling plan with EBL for approval
- Avoid delays – Laboratory notice (CDFA)
- Develop/Refine a sampling plan
  - The number of Samples
  - Sample: Types/Units/Patterns
  - Pesticide(s) being analyzed
  - Circumstances for sampling (illness, damage, etc...)
- Improve tracking (between EBL and CDFA lab)
- Prevent unnecessary sampling
Sample Types

Used to Determine

**Total Residue**
the presence of pesticides and the amount detected (ppm)

**Dislodgeable Foliage**
the presence of pesticides and the amount detected (ug/cm²)
Sample Types

*Used to Detect*

- **Surface or Swab**
  - Pesticide contamination on surfaces (ug/cm²)

- **Volume Samples**
  - Pesticides in air and water (ug/m³ or ug/l)
Sample Units

There are four different kinds of sample units:

- Single
- Duplicate
- Composite
- Split
Sample Units:
Single Sample

- A single sample provides separate results for an individual sample site.
  - i.e. spray tank mix sample or container
Sample Units: Duplicate Samples

- Duplicate samples are collected and provided when requested by an affected party.
- Collect duplicate samples (two or more) in the same manner as a single or a composite sample from the same site.
Sample Units: Composite Sample

- Determine whether or not an area (field, crop, etc.) is contaminated or to identify specific chemicals on the site.

- Consists of two or more subsamples of equal size that are combined to represent a field or site sample.

Composite samples are collected following the gradient sampling plan.
Sample Units: Split Samples

• Split samples are created by dividing one sample into two equal and identical portions for the purpose of repeating or verifying tests.

• Collect twice as much material for a sample that will be split as for a single sample.
Field Sample Patterns

Two Types

• Grid Samples
  • Establishes the distribution of a pesticide residue at the episode site.

• Gradient Samples
  • Establishes pesticide drift; collect five or nine samples in a gradient pattern at an approximately equal distances apart.

*Note:
When sampling, always sample the area of least contamination first, and then work towards the treatment area.
Sampling Patterns: Grids

- Used to determine the source or sources of pesticide contamination
- Used to isolate the treated area of a misapplication or tank contamination
Sampling Patterns: Gradient

- Used to determine the source or sources of pesticide contamination
- Used to isolate the treated area of a misapplication or tank contamination
- Take the first sample from the area that is suspected to have the least contamination then work towards the treatment area
Sampling Equipment
Create a Checklist

• Use a checklist to assemble the necessary field sampling equipment
  • Office supplies and forms
  • Instruments and tools
  • Personal Protective Equipment
  • Containers
  • Collection supplies

• Do you need special equipment? Where can you procure it?
Supply Checklist:
Office Supplies and Forms

- Sample Analysis Report and Sample Analysis Report Evidence Record (PR-ENF-030)
- Release of clothing form (DPR-071)
- Pens, pencils, permanent markers, and note pad
- Stapler and staples
- Tape
- Templates for swab samples
- Maps, grower files
Supply Checklist: Instruments and Tools

- Shovel, trowel
- Soil probe, disposable core tube
- Knife
- Pruning shears
- Leaf punch
- Measuring tape, land measuring wheel
- Surveyor markers or stakes
- Scale
- Pole with grasping attachment, ladder, and net
- Digital camera, batteries, and memory card
Supply Checklist:
Personal Protective Equipment

- Gloves
  - Chemical Resistant
  - Disposable
- Coveralls
- Respirator
- Eye Protection
- Hard hat
- Rubber boots
- Soap, water, and disposable towels
- Contact information for the nearest emergency medical facility (phone no. and address)
Supply Checklist:
Containers

- Bags
  - Clean, unused paper (double-strength)
  - Plastic, various sizes
- Jars
  - Glass, new or clean, various sizes
  - Teflon® lined lids and or foil to seal the lid
- Labels
- Ice Chest
Supply Checklist:
Collection Supplies

- Isopropyl alcohol
- Distilled water
- “3-in-1 oil”
- Sterile pads, Sharkskin paper
- Blue ice
- Paper towels
Sample Site Evaluation

• A) Evaluate the site...to provide a better picture of what happened. (Do not contaminate yourself or your equipment while on site!)

• B) Site Diagrams: What information do you need to include in the diagram?
  • Start with a “rough” map of the site
  • Fill in details as you investigate, for the site and the surrounding adjacent area
The Initial “Rough” Map

• Draw the “Rough Map” while at the site.

• Don’t do it by memory after leaving the site to avoid loss of key details.
Sample Site Evaluation

What must be included in the site map?

- Degree and extent of damage
- Surrounding crops/fields
- Roads
- Buildings
- Waterways
- Location (Section/Township/Range)
- Which direction is “North”
- Scale (feet? Miles?)
- Sample numbers with corresponding locations
Sample Site Evaluation

What to include in the site map? (if available)

- Wind direction and speed
- Application pattern(s)
- Application direction
- Row orientation
- Location of workers or witnesses
- Site/direction of photos taken
- Entry points, gates, fences
The “Final” Site Map

The sampling map is evidence that must be included in your investigation report.
Sampling Procedures

Different sample types

- Foliage
  - Whole Leaf
  - Dislodgeable
- Surface (Swab)
- Clothing
- Soil
- Water

- Sediment
- Honeybee, Animal, Bird and Fish
- Commodity
  - Field
  - Packed
- Tank Mix
Sampling Procedures

• Before entering a treated area, determine:
  • What was sprayed
  • If any reentry restrictions are in effect
  • What PPE is needed

• When sampling:
  • Use the required PPE
  • Use new disposable gloves **for each sample**
  • Decontaminate tools **between each sample**
Sampling Procedures

• Collect a minimum of one pound of material per chemical or screen for laboratory analysis
  • Exceptions: swab or dislodgeable samples
• Measure and record the sample area in your notes
• ID each sample immediately after collecting
Foliage Samples

- Two types
  - Foliage – Whole leaf
  - Dislodgeable Foliar – Leaf punch
- Both types be collected in a grid or a gradient pattern
Foliage Samples

Whole leaf

- 1 pound of foliage per active ingredient
- 1 set of clean/new gloves per sample
- Assign a unique identification number to the sample package and date
- Record sampling location and area
- Sample mature leaves
Surface Swab Samples

- Surface swab samples are used to establish:
  - Pesticide drift
  - Pesticide contamination

- Where to take surface swab samples:
  - Can be taken indoors or outdoors
  - Smooth surfaces (windows, seats, etc.)
  - Uneven surfaces (carpet, furniture, walkways, etc.)
Surface Swab Samples

Control Swab

• The control swab sample must always accompany the swab samples

• Take the control sample **before** entering the episode location AND wear gloves

• Mark control sample with a sample number
Surface Swab Samples

Solvent Type

• **Isopropyl Alcohol** is the typical solvent for most samples
• **Distilled Water** for water soluble pesticides
  • e.g. Glyphosate and Paraquat
• Indicate solvent type on Sample Analysis form

*Note: Do not contaminate the solvent by placing the swabbing material on the mouth of the solvent bottle. Pour the solvent over the sampling swab without touching the bottle.*
Surface Swab Samples

Area Size

• Area size:
  • As a general rule – 20 cm x 25 cm (or 500 cm²)
  • If sample area is different then 500 cm², indicate it on the sample analysis form.
• Prepare ahead of time several same sized disposable templates to delimit the area to be sampled
Clothing Samples

- Positive results on clothing samples:
  - Are evidence that a pesticide exposure occurred and possibly the extent of the exposure.
  - Are not an indication of a health hazard

- Be selective when sampling clothing
  - From “contaminated” individuals only
  - Will part or all of clothing test positive for pesticide residue?
  - Has clothing been washed or hosed off?
  - Will resulting data be useful in the investigation?
Clothing Samples

*Before deciding to collect clothing, interview the person for key detailed information such as:*

- Was the contaminated individual in any pesticide treated areas other than the site where this incident occurred?
- If so, were the other sites treated with the same pesticide(s) or different ones?
- Avoid collecting clothing that seldom or never gets washed, because of the risk of non-related contamination (lab results would have little value)
  - Dirty ball caps, and leather jackets
Clothing Samples

• Coordinate with your EBL and DPR’s Worker Health and Safety Branch for clothing samples collected for exposure assessment purposes

• Inform the person that clothing **will not** be returned before filling out the clothing release form and requesting person’s signature

• Collect and bag the clothing away from the treated/contaminated area

*Note: Make sure to fill out and get the owner’s signature on the Clothing Release Form (# DPR-071) before taking possession of the clothing!
Clothing Samples

• Each piece of clothing is to be placed in a separate paper bag to prevent cross contamination.
  • Clean unused paper bag
  • Sealed in a plastic bag for shipment

• If affected area on clothing is known, investigator should document it on the Sample Analysis form.
  • For example: “upper front area of shirt”

• Clothing samples must be chilled promptly upon collection by the sample collector/investigator
Soil Samples

- A. Surface Soil Sampling
- B. Soil Samples at a Known Depth
- C. Soil Sampling (Known Depth, Furrowed Field)
Water Samples

• Surface Water
  • Follow the guidelines in DPR’S Pesticide Enforcement Compendium Vol. 5 pages 45-46

• Ground Water
  • Determine the appropriate local, state, or federal agency for follow-up
Sediment Samples

• Pesticide residues can accumulate in the bottom sediment of lakes and streams, but generally sediment samples are of limited value and other sampling types are preferred.
Honeybee, Animal, Bird, and Fish Samples

- Collect and chill samples of dead honeybees, animals, birds, and fish immediately, if possible
- Freeze samples upon return to office to avoid smell
- Ship or deliver the samples to the lab ASAP
- If fish or other wildlife are involved, contact the Dept. of Fish and Wildlife
  - Joint jurisdiction incident

Collect ½ lb. of fresh dead bees or honey and minimum 1 oz. of pollen

Contact the Dept. of Fish and Wildlife
Commodity Samples
Residue Sampling Program

Commodity samples are taken to determine if pesticide residues are in excess of the EPA food tolerance

- If DPR’s residue sampling program detects a commodity has a residue level determined to be either
  - No Tolerance Established (NTE) or
  - Over Tolerance (OT) by the USEPA 40 CFR then:
- DPR handles the investigation and follow-up for the commodity in
  - retail and/or wholesale settings (the channels of trade)
Commodity Samples
Residue Sampling Program

• If DPR’s residue sampling program detects a commodity with No Tolerance Established (NTE) or Over Tolerance (OT) then:
  • CAC handles commodity in agricultural setting.
  • Grower may collect samples and submit to an accredited lab, with CAC overseeing sampling.
Commodity Samples

**Field Sampling**

Do not wash, clean, or remove leaves

**Packed Sampling**

<table>
<thead>
<tr>
<th>Number of Containers in the Lot</th>
<th>Number of Containers to Sample From</th>
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</thead>
<tbody>
<tr>
<td>1 – 5</td>
<td>All</td>
</tr>
<tr>
<td>6 – 100</td>
<td>5</td>
</tr>
<tr>
<td>Over 101</td>
<td>10</td>
</tr>
</tbody>
</table>
Tank Mix Samples

- Lab analysis of tank mix samples identifies the active ingredient and any possible contaminants in the tank mixture, but not “inert” materials.
- If the tank mix ingredients are unknown, assume they are highly hazardous & wear maximum PPE.
- DO NOT allow the tank mix solution to come in contact with plastic or rubber materials because it may affect the lab results.
- Some pesticides also cannot contact metal because they will react to form other compounds.
Tank Mix Samples

• Promptly chill samples to avoid degradation of the pesticide ingredients
• Transport samples in an ice chest with “blue ice”
• To avoid cross-contamination, DO NOT store or ship tank mix samples with or near other sample types (foliage, soil, etc.)
• Ship to lab by the fastest means available
• Write “CDFA Formulations Laboratory Only” on the Sample Analysis Report.
Outsourced Sampling Techniques

- **Air Samples** – due to complexity contact your EBL to coordinate with DPR’s Environmental Monitoring branch to take samples

- **Feed, Milk & Dairy Foods and Egg Samples** – follow sampling protocol of the US FDA’s Investigations Operations Manual

- **Pesticide Formulations Samples** – Contact your EBL, generally DPR staff collect these samples
Sample Storage, Preservation & Transport

Note* only use direct delivery courier services
Sample Packing

- Place glass jars in plastic bags
- All other samples, place in paper bag before placing in plastic bag
- Stabilize samples in shipping container with crumpled newspaper or Styrofoam

Mark cooler and “blue ice” with your address in indelible ink so they may be returned to the appropriate regional office or CAC office
Sample Packing

Keep samples chilled with Blue Ice

Include Sample Analysis Report in a separate bag

Use an insulated container

Seal shipping container
Sample Analysis Report Form

**REMINDERS - 1**

Get current version from DPR website

Fill in ALL Fields:
- Entry
- None
- N/A

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<table>
<thead>
<tr>
<th>Important</th>
<th>For Laboratory Use Only</th>
<th>Laboratory Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use only one analysis report form per sample.</td>
<td>□ ANAHEIM</td>
<td>□ SACRAMENTO</td>
</tr>
<tr>
<td>2. Complete chain of evidence record on reverse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Use black ink and print legibly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The original will be returned to you.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**A. Sample Analysis Requester**

<table>
<thead>
<tr>
<th>Agency Name (Complete name)</th>
<th>Telephone Number</th>
<th>Fax Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**B. Sample Source**

<table>
<thead>
<tr>
<th>Property/Operator/Complainant Name</th>
<th>Operator Identification or Permit No.</th>
<th>Telephone Number</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

**C. Sample Information**

<table>
<thead>
<tr>
<th>Sample Consists Of:</th>
<th>Structural-Related</th>
<th>Basis for Sample (Check one box only)</th>
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<tbody>
<tr>
<td>Commodity (Acre, if applicable)</td>
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<td>□ Health Hazard</td>
</tr>
<tr>
<td>Sample Identification Marking</td>
<td></td>
<td>□ Animal Illness/Beel Loss</td>
</tr>
<tr>
<td>Description of Problem</td>
<td></td>
<td>□ Plant Symptoms</td>
</tr>
</tbody>
</table>

Sample ID number *(must match the sample container and the map)*
REMINDERS - 2

Sample taken as a “blank” for a 0 reading

Specify Active Ingredient if known. Screen does not include glyphosate, other common pesticides.
Contact EBL for sample priority # designation

Indicate surface area and solvent type
Sample Analysis Report Form

REMINDEERS - 4

Maintain & record chain of custody to ensure the integrity of your sample and investigation.
Summary

• Identification of what was treated/drifted upon
• Accurate sample map & sampling plan with photos
• Appropriate distance between samples taken
• Appropriate area for the collection of each sample
• Identify each sample with a unique ID number
• One set of gloves per sample! (Prevents contamination, the lab easily detects to PPB)
• Proper equipment & tools
• Prompt chilling of collected samples
• Prompt filling out of sampling forms
• Maintain chain of custody