Sampling and Analysis of Organic Commodities for the Determination of the Presence or Absence of Pesticide Residues

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Sampling for Analytical Testing

• The reliability and relevance of any analytical test is totally dependent upon the integrity and representation of the sample tested.
• A laboratory can perform the most accurate, precise, and defendable analysis of a sample, but if the sample is not relevant or defendable, the analysis is worthless.
• Reliable laboratory results begin with and depend directly upon the quality and timing of sample collection.

It is imperative that Certifiers follow their standard operating procedures for sampling; otherwise ALL results may be considered suspect.
Communication is a key ingredient in a successful sampling program

The laboratory needs notification of sample collection prior to sample shipment in order to be ready to receive and process the sample.

Sample Collectors Shall Notify:

Certifier

• When scheduled samples are collected and shipped.
• When problems arise with sampling.
• Any other sampling-related problems.

Lab

• When scheduled samples are collected and shipped.
Diagram of Communications

- Sample Collector
- Certifier
- Laboratory
Certifier Should Notify:
Laboratory
- When sampling is planned or scheduled in advance to assist in laboratory preparation.

Laboratories Should Notify:
Certifiers
- Rotten, spoiled, or damaged samples
- Samples did not arrive
- Insufficient sample weights or numbers
- Missing sample form
- Any other sample receipt problems

Lab requests resample
Use of Field Notebooks

Field Notebooks are used by the collector for reference and documentation.

Collectors should have sampling information in a notebook that includes:

1. Site information
2. Certifier or NOP sampling SOPs
3. Blank sampling forms
4. Packaging and shipping instructions
5. Certifier, Laboratory, and NOP Contact Information
Preparation for Sample Collection

Pre-frozen cold packs
Styrofoam cooler (with lid) fitted conformably inside cardboard box

OR, thick bubble wrap to conform to inside of sturdy cardboard box
Several ice packs placed inside box to pre-cool container
Checklist prior to sampling

- Insulated container with ice packs
- Field notebook with blank sampling forms
- Markers, pens, pencils
- Sample bags
- Gloves (optional)
- Tamper-proofing tape
- Sample identification stickers & envelopes
- Knife or scissors
- Laptop computer or PDA Portable scale (optional)
- Packing materials, tape, & shipping labels.
Timing of Sample Collection

- Attempt to call the sample collection site ahead of time to assure product availability and accessibility.
- Samples collected on Mon. – Thursday only with overnight shipment.
- Samples shipped the same day as collection, for arrival at labs the next day.
- Labs are notified the same day samples are collected for preparedness.
- Labs notify Certifier if samples do not arrive at laboratory.
Samples selected that are NOT damaged, overripe, or wilted

Plastic bags should be used for samples
Bags should NOT be overstuffed
Target Sample Weights:

3 lbs—small produce

5 lbs—large produce

A minimum of two units for large commodities are required --- to obtain representative samples
Non-perishable products like processed foods, grains, dried fruit, spices, etc. can be collected in the finished container and shipped without being cooled. These types of samples may also be shipped ground instead of overnight to save on shipping costs.
Fiber samples (cotton, wool, etc.) may also be handled like non-perishable food products.

Non-edible plant parts (leaves, stems, blossoms, etc.) can be collected, handled and shipped in the same manner as perishable fruits and vegetables.

Soil and water should be shipped overnight but do not require cooling. Water samples should be collected in screw top plastic bottles of 1 liter size or larger. Soil samples should be collected into plastic bottles or plastic bags and should be approximately 1000 grams or larger.
1. Sample Documentation

Each sample shall be identified by the following information on the sample form - PLEASE WRITE LEGIBLY:

- **Certified operation name and mailing address (city/state/zip/country).**
- **Identification of sampling site (may include site maps or field).**
- **Grower and handler information (both grower and handler should have identification included if the sample is not collected at the farm).**
- **Sample identification, including commodity information, variety, brand name and lot number (if applicable), or other identification.**
- **Certifier name.**
- **Collector's name & signature.**
- **Date collected and date shipped.**
- **Name of Lab samples are shipped to for analysis.**

Note: The certified operation must also receive documentation (i.e. a receipt) when a sample is obtained for analysis.
Tamper-proofing and chain-of-custody

- Write sample ID on the sample bag either directly or with a sticker.
- Place the sample into the plastic bag and place tamper proof tape around the knot for chain-of-custody protection.
- Place sampling form in an envelope and place the envelope on top of the insulated container and under the cardboard box lid.

Sample info on the bag and tape placed around knot in bag that is initialed and dated.
Frozen cold packs are placed around all sides, top, & bottom of bagged samples

Plenty of paper is used for cushioning & insulation
Box is securely taped

And properly labeled and shipped for overnight delivery
Collectors can reuse boxes to save on costs by placing a return request inside box.
Samples Should Arrive at $<15^\circ C$ ($<60^\circ F$)

Ideal Temperature is $4-7^\circ C$ ($39-45^\circ F$)
Laboratory Requirements

Upon arrival at the laboratory, the following information shall be recorded by the laboratory on the sampling form:

– Date received.
– Name or initials of person receiving the sample.
– Explanation for what happened to a sample that is not analyzed (e.g., chain of custody breached, rotten sample, sample miscoded).
– Internal Sample ID: The laboratory shall generate an internal Sample ID for chain-of-custody.

Sample Login-

• The Lab shall login the sample information on the sample form to record the receipt and utilize the information when reporting results.
• A unique laboratory identification shall be assigned to each sample at login.
• Samples are then transferred to temporary storage prior to preparation for analytical testing.
Sample Prep

• Samples are homogenized in a large, high speed food processor.
• Some commodity types (e.g. high fat or dry samples) require the addition of dry ice to the homogenization step.
• Samples are stored at -20 ºC prior to analysis.
Reporting of results

- Reports of sample results are generated and e-mailed to the certifier.
- A lab may also provide results in a spreadsheet or other format for easier viewing and uploading to client databases.
- Laboratories are required to maintain confidentiality of results with the client. If you pay for the testing, you own the results and they are your property.
- The NOP has additional requirements for the availability of sample results under 205.670 of the regulations.
For more information concerning pesticide residue testing services, please contact:

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QUESTIONS?