



gardenroots

The "Gold Country", CA Garden Project

INSTRUCTION MANUAL

This manual provides step-by-step instructions on how to collect water, soil, plant, and dust samples from your garden for analysis by University of Arizona laboratories.

What is Citizen Science?

Citizen Science can be defined as intentional collaborations in which members of the public engage in the process of research to generate new science-based knowledge.

This is a partnership between the University of Arizona's Integrated Environmental Science and Health Risk Laboratory, Sierra Springs Institute, and University of CA - San Francisco.



Important points

- Follow the instructions.
- Label everything!
- Be careful during collection.
- If something happens that might compromise the sample (for example if you drop the sampling wipe) it's not a big deal, just be sure to let us know!
- Be sure to document anything out of the ordinary that happens to the sample during and/or after collection on the provided sample journal (pages 10-21). You will be submitting your Sampling Journal with your samples!
- Once collected, UA scientists will be analyzing the samples you collect.
- Please place all waste (gloves, packaging, etc.) into the provided waste bag and drop off with your sample.
- Once you complete sampling, store the samples in the provided sample return bag.

A. Water Sampling



Gather Materials

Before you start collecting your sample, you will need the following items:

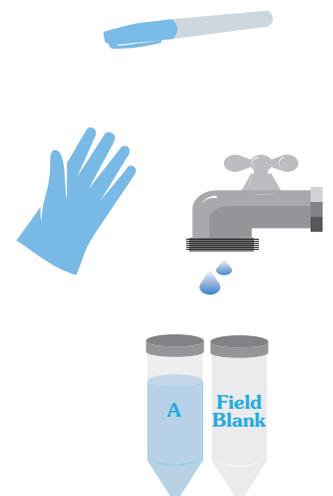
1. Gloves (1 Pair)
2. Empty 50 ml sample tubes (2)
3. Field Blank water tube (1)
4. Sample Labels (2)
5. Sampling Journal

Important Points

- You will collect 2 samples 1 from your water source, and another field blank sample.
- Wear gloves
- Do not freeze the samples

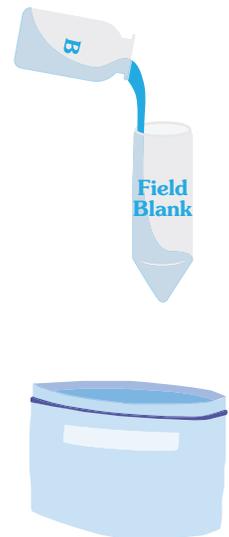
How to Collect a Water Sample:

1. Fill out two labels, one will be for the collected water sample (empty 50 ml plastic tube pre-labeled "A") and the other is for the "Field Blank" (empty 50 ml plastic tube pre-labeled "Field Blank") with all the information requested. Put label on tubes.
2. Put on a pair of fresh gloves.
3. Turn on the water and allow the water to flow for 3 minutes.
4. Slow the flow to a small trickle and carefully fill the empty 50 ml sample tube labeled "A" until water overflows.
5. Label this sample with the "water - collected sample" label.



How to Collect a Blank Water Sample:

1. Standing in the same place near your water source, remove the cap on the tube labeled “B”.
2. Carefully open the tube labeled “Field Blank”.
3. Carefully pour the nanopure water from the “B” tube into the “Field Blank” tube.
4. Once full, quickly cap the tube, tightly seal, and turn the tube upside down to ensure that no leakage will occur.
5. Label this sample with the “water – blank sample” label.
6. Finally, place the 2 water sample tubes into the Ziploc bag they came in, seal, and store in a refrigerator (do NOT freeze). Place the now empty “B” tube into the waste container.



B. Garden and Yard Soil Sampling



Gather Materials

Before you start collecting your sample, you will need the following items:

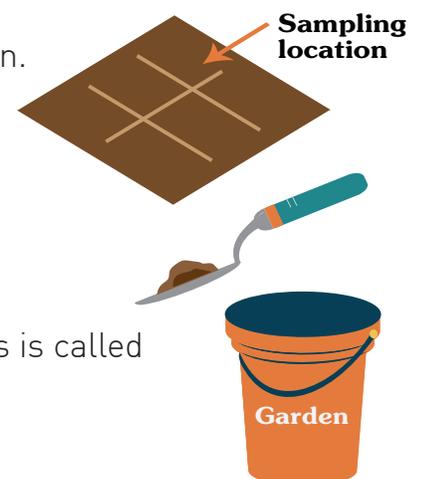
1. Gloves (1 Pair)
2. Trowel
3. Buckets (2)
4. Brown Paper Bags (2)
5. Sample Labels (2)
6. Sampling Journal

Important Points

- **Do not collect saturated (wet/soaked) soil samples! Please avoid watering the soil (and garden) before collecting your soil sample. A super wet soil sample is problematic for shipping and sample preparation.**

How to Collect a Garden Sample:

1. Select 6 spots to sample in your garden in a rough grid-like pattern.
2. Using the hand trowel provided, loosen the top 6 inches (the approximate length of the hand trowel blade) of each of the 6 soil spots.
3. At each of the 6 spots, take one full scoop of soil and place it into a 2-gallon bucket.
4. Mix the six soil samples thoroughly inside the bucket. This process is called sample bulking” or “bulk soil sampling”.



5. Repeat steps 1-5 from above to now collect **unamended yard** soil samples using the other 2-gallon bucket.
6. Fill a brown paper bag with the bulked soil sample to the line drawn on the outside of the bag.
7. Label the paper bag containing the sample with the information requested and place into a 1 gallon Ziploc bag.
8. Repeat steps 1-5 from above to now collect unamended yard soil samples using the other 2-gallon bucket.



D. Dust Sampling



Gather Materials

Before you start collecting your sample, you will need the following items:

- | | |
|---|-------------------------------|
| 1. 2 pairs of Gloves
(1 for indoor sampling and
1 for outdoor sampling) | 4. Dust Collection Frames (2) |
| 2. 50 ml tube (6) | 5. Tape (1) |
| 3. Ghost Wipes (6) + 1 Extra | 6. Sharpie Marker (1) |
| | 7. Sample Labels (6) |
| | 8. Sampling Journal |

Choose and Prepare the Sampling Area - Important Points when Selecting and Preparing the Sampling Area:

- Do not clean the sample area before taking a dust sample.
- Ensure that the sampling area is a hard and flat surface.
- You will be taking 3 samples, two indoors and one outdoors.
- Use a different dust collection frame for the indoor floor and outdoor sampling locations.

Prepare the Sample Tubes:

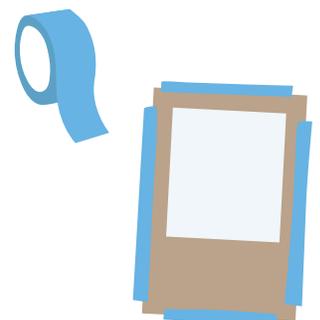
Fill out the labels for the 3-50 ml tubes, one for the indoor – floor sample, one for the indoor – windowsill sample, and one for the outdoor sample.



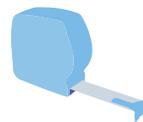
Indoor Samples

FLOOR SAMPLE

1. Select an area on the floor of your house with a hard and flat surface where you can sample using the dust collection frame. Do NOT pick a room that is an entryway to the house.
2. Place frame around the sampling area and tape securely in place. Do not place tape inside the frame.



- **If you can't find an area as described in Step 1**, find another sampling location to the best of your ability, like the top of a bookshelf or a dresser to sample and follow Step 2. If you cannot fit the frame in the area, please tape off an area approximately the same size of the dust collection frame. Use a tape measure to record the size of the sampled area in centimeters and record this in the sample log sheet.



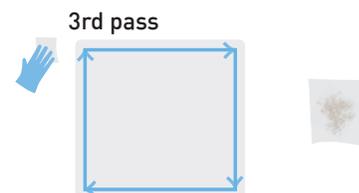
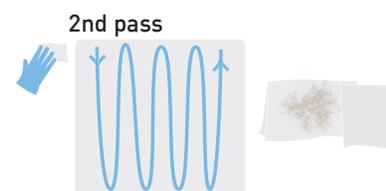
3. Email or text a picture of the sampled area with your sample to diegoHuerta@email.arizona.edu or (520) 314-1533 **along with your participant number**. Only if you can't email or text the picture, draw out the area in your sampling journal with the exact dimensions in centimeters.



4. Now, you are ready to take a ghost wipe sample and a field blank sample, see the next section.

How to take a Ghost Wipe Sample:

1. Put on a pair of clean gloves. Use the same pair for both indoor samples.
2. Open and completely unfold a dust wipe.
3. Press the completely unfolded wipe down firmly at the top of the inside of the frame and wipe as shown in the figures on the right.
 - On the first pass, using a "S" shaped motion move the wipe from the top of the frame to the bottom. Then fold the wipe in half with the dirty side in.
 - On the second pass, using the same "S" shaped motion, move the wipe from one side of the frame to the other. Fold the wipe in half, again with the dirty side in.
 - On the third pass, move the wipe along the inside perimeter of the frame in a square.
4. Carefully fold the wipe until it is small enough to fit into the 50 ml vial.
5. Place the wipe in the tube and screw the lid on tightly.
6. Did anything occur during sampling that we need to know and you need to remember? Be sure to document your observations in the sampling journal!



Collecting a Sample Blank:

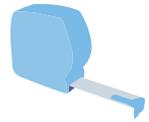
7. In the same place you collected your dust sample, remove a ghost wipe from its packaging.
8. Fold the wipe in half until it is small enough to place in the provided blank 50 ml vial and screw the lid on tightly.



Indoor Samples (cont'd)

WINDOWSILL SAMPLE

1. Select a windowsill in your house to sample. In your sample log sheets, write down the exact window location in your home and the direction the window faces. You will **not** use a sampling frame for this sample.
 - If there is no such area available, find a sampling location to the best of your ability, such as the top of a bookshelf or a dresser to sample.
2. Use a tape measure to record the size of the sampled area in centimeters and record this in the sampling journal.
3. Email or text a picture of the sampled area **from a “bird’s eye” view** to diegohuerta@email.arizona.edu or (520) 314-1533 **along with your participant number**. Only if you can’t email or text the picture, draw out the area in your Sample Log sheets with the exact dimensions in centimeters.
4. Now, you are ready to take a ghost wipe sample. You will wipe the entire windowsill. Complete steps 1-6 on page 5.
5. Now, collect a blank sample in the same location. Complete steps 1-2 on page 5.
6. Did anything occur during sampling that we need to know and you need to remember? Be sure to document your observations in the provided sampling journal.

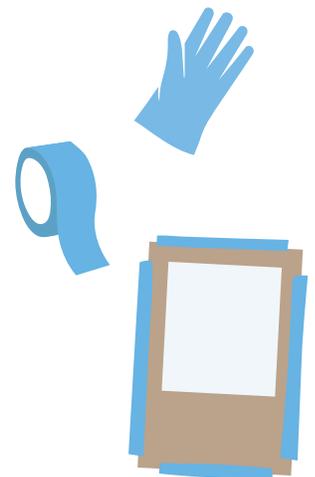


Outdoor Samples

1. Put on a new pair of gloves.
2. Retrieve the other, unused dust collection frame.

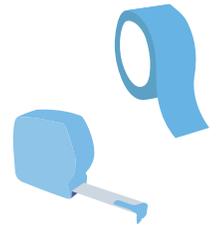
If you have a porch:

- a. Find a hard and flat surface where you can put the dust collection frame near a porch railing or the edge of the porch.
- b. Tape the dust collection frame in place, making sure not to put tape inside the framed area.
- c. Now, you are ready to take a ghost wipe sample. Complete steps 1-6 on page 5.



If you do not have a porch:

- a. Find a location outside with a hard and flat surface where you can put the dust collection frame.
 - If no location is available, find a sampling location to the best of your ability, such as a railing, to sample.
 - If you cannot fit the frame in the area, please tape off an area approximately the same size of the dust collection frame. Use a tape measure to record the size of the sampled area in centimeters and record this in the sample log sheet.
- b. If you have to tape off an area, please text or email a picture of the sampled area with your sample to diegohuerta@email.arizona.edu or (520) 314-1533 **along with your participant number**. Only if you can't text or email the picture, draw out the area in your sampling journal with the exact dimensions in centimeters
- c. Now, you are ready to take a ghost wipe sample. Complete steps 1-6 on page 5.
- d. Now, collect a blank sample in the same location. Complete steps 1-2 on page 5.



C. Collecting Plant Samples



ONLY COLLECT PLANT SAMPLES THE DAY YOU DROP OFF ALL OF YOUR SAMPLES!

You will need to select your sample drop off time. See sample drop off instructions on the page 9.

Gather Materials

Before you start collecting your sample, you will need the following items:

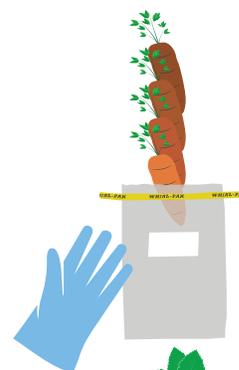
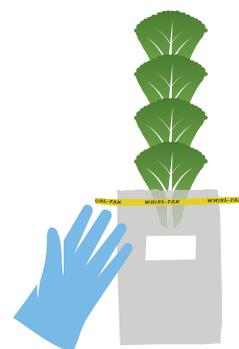
1. Gloves (1 pair)
2. Whirlpack Bags (number varies)
3. Sharpie Marker (1)
4. Sample labels (3)
5. Sampling Journal

Important Points

- Please only collect your plant samples the day you submit all your samples to make sure the samples arrive at the University of Arizona in good condition for analysis.
- Only collect plants that you eat.
- Do not water plants or wash plants before collecting, wet plants will spoil faster during transport.

How to take a Plant Sample:

1. Select up to 3 edible plants you want to sample. Be sure to select plants you commonly grow in your garden and eat! You will collect 4 replicates (4 samples of the same plant) and have a total of 12 plant samples.
 - If you do not have edible plants that you have grown yourself, feel free to submit edible plants from local farms, or from the store. Be sure to pick edible plants that you commonly eat!
2. Only collect the edible part of the plant and submit the entire piece (do not cut).
3. Fill out a label for each plant type with the information requested and place the label on the whirl-pak bag.
 - If you are submitting any plants that did not come from your garden, let us know! Use the sampling journal and write out:
 - Name of the edible plant
 - Origin – Where did you get/purchase the edible plant – (farmers market, store, etc.)? Be as specific as possible, list the exact name of the store or farmer’s market and address.
 - Time - When did you purchase the edible plant? (Month, Day, Year)
4. With gloves on, collect four samples of the same plant and place them in the whirl-pak bags.
 - Open a sterile Whirl-pak bag by removing the plastic strip at the top, then pulling the white tabs apart from one another.
 - Place as many samples of the same plant as you can comfortably fit in the bag. You may have to split samples between multiple bags, or you may be able to fit all 4 samples from one plant in the same bag.
 - To prevent cross contamination of samples, do not place samples of different plants in the same bag.
5. Remove all air from bag before sealing. Close the bag tightly by rolling the top all of the way down and thoroughly wrapping the wires around the top (like a coffee bag).
6. Do steps 3 through 6 for all four plant samples.
7. Keep plant samples refrigerated before sample drop off.



Checklist

Be sure all your samples are labeled!

1. 1 water sample and 1 water field blank sample in 50 mil vials
2. Yard soil sample (paper bag in 1-gallon Ziploc bag)
3. Garden soil sample (paper bag in 1-gallon Ziploc bag)
4. 2 dust samples and 2 dust sample blanks in 50 mil vials
5. 12 plant samples in __ whirl pak bags
6. Sampling Journal

Please place all samples and your sampling journal into the “Sample Return Bag” and drop this bag off at the designated drop off location.

Sample Drop-off

Please select the drop off location nearest you!

Sampling Journal:

Tear off these pages to submit with your samples.

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Gardenroots Contacts

Project Director

- Monica Ramirez-Andreotta, PhD
mdramire@email.arizona.edu
(520)-621-0091

Sample Drop-Off/Pick-Up Concerns or Questions:

- Taylor Schobel
taylor@sierrastreamsinstitute.org
(630)-664-6064

Resources - University of Arizona:

- Department of Environmental Science
<https://environmentalscience.cals.arizona.edu>
- Gardenroots: A Citizen Science Garden Project
<https://gardenroots.arizona.edu/>