

README FILE FOR SGS-LTER: Root Harvest

This data package was produced by researchers working on the Shortgrass Steppe Long Term Ecological Research Project. This project was supported by National Science Foundation from 1982-2014. This data package includes one or more tab-delimited data tables, tab-delimited files (named _var) that denote header definitions and data types for each column, and detailed metadata within an Ecological Metadata Language document (i.e. XML). Example image files of plots, digital datasheets, or schematics of the experimental design may also be included when applicable.

Background information on the SGS-LTER project is contained in related series of objects within the Digital Collections of Colorado and the Colorado State University archives. Together data packages and other background information, including items such as images, proposals, and reports contribute to a comprehensive SGS-LTER collection.

The data tables and associated EML documents represent components of a PASTA (Provenance Aware Synthesis and Tracking Architecture) congruent LTER data package, which may be discovered and accessed through secondary repositories serving specific ecosystem science domains (e.g. LTER Network Information System, DataONE, or The Knowledge Network for BioComplexity).

The following information and protocol was obtained from the SGS-LTER Field Crew Manual:

Root Harvest

Principal Investigator(s): William Lauenroth

Study Objectives: to assess belowground productivity

What to know before you start sampling:

- ✓ Only core where you are told to core!!
- ✓ It is very important that you use the correct core with the correct diameter for this sampling. The correct core size diameter is 6.65 cm.
- ✓ It is very important that you use the correct smaller size sieve for the root washing as well. The correct smaller size sieve is 500 micrometers.

Study Area Location and Design: These samples are taken south of the C14 plots approximately five yards from the outside perimeter of the C14 plots. (Until 2000 they were taken to the North of the C14 plots). This sampling is performed the 15th of April – September each year. Root washing is performed at the root washing station outside the field station.

Sampling Protocol:

Equipment:

Pin flags (40)
Clippers
Short Corers (20 cm)
Sledge Hammers
Jack with Chain and Bolt
Forty Medium Sized Paper Bags (pre-labeled 1-1 through 8-5)
Wheel Barrow or bucket and shovel

South of C14 plots approximately 5 yards randomly place five pin flags in line with existing C14 so there are a total of 8 plots with 5 pin flags in each.

At each pin flag, score the soil with a soil corer. Clip out the blue grama crowns and above ground vegetation. Leave all roots in place. Core the root sample; 20 cm depth, and put it in the correct bag. Place samples in garage drying oven at 55 degrees centigrade for 3 days. Then root wash.

Fill in the holes left from the core with soil from the near by soil pit. Fill the hole neatly, so the soil is level with the existing ground level.

Root Washing Protocol:

Equipment: metal pans with spouts, 500-micrometer sieve, larger opening sieve, water hose, and sprayers at root washing station, coin envelopes, and a sharpie.

Procedure:

1. Place larger sized sieve on top of bars running across the metal pail.
2. Place 500 micrometer sieve on table beneath pail spout and place an object (tent stakes work well) beneath this sieve to allow water to run out.
3. Take a paper bag with a soil sample and copy information (i.e. study, location, data, etc.) onto a coin envelope.
4. Carefully dump soil into large (> 500 micrometers) sieve.
5. Take sprayer connection and gently wash soil through large sieve. While washing, place one hand in between large sieve and pail spout to prevent rocks from flowing into the 500-micrometer sieve.
6. When all the soil has been washed off, take the roots in the large sieve (while being careful not to grab any rocks) and place them in the coin envelope.
7. To collect remaining roots, carefully pour water in pail through 500-micrometer sieve (roots should float to the top and rocks and soil should sink to the bottom of the pail). Pour off water just until soil/rocks start to flow out. It works well to pour water near one side of the sieve so the roots collect in one spot. You may use the sprayer to spray roots to one edge of the sieve, but do so gently.
8. Grab roots in 500-micrometer sieve, wring out the water, and place in coin envelope.
9. Take the sprayer and agitate the soil in bottom of the pail. After allowing the soil/rocks to settle again to the bottom of the pail, pour off water and roots through the 500-micrometer sieve. Repeat this 3 times, or until it appears that all of the roots have been collected.
10. Clean any soil/rocks out of the pail and wash out any roots stuck in the sieves before processing the next sample.

QAQC Instructions: It is very important that you use the correct core with the correct diameter (6.65 cm) for this sampling. Make sure that all samples have been taken before leaving the site. When root washing make sure that you are using the correct smaller size sieve (500 micrometers) and that all envelopes are labeled correctly. Be sure both soil core samples and root samples are stored in the drying oven at 55 degrees C when they not out being processed.