

Aerial Fungi Project - Assignable Assets (AA)

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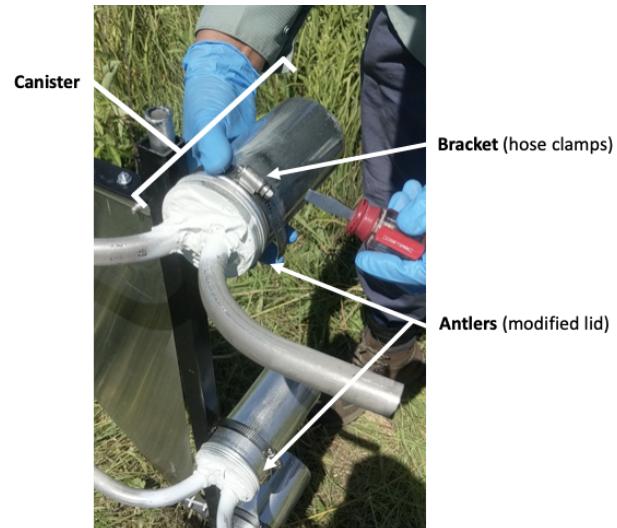
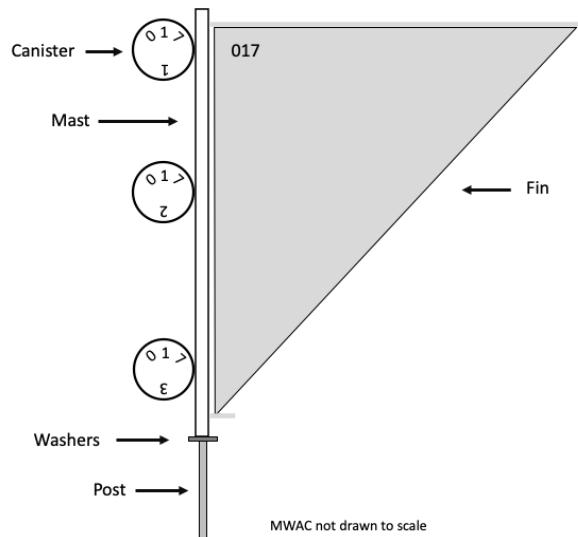
Standard Operating Procedure (SOP) for Spring Reset of MWAC Dust Collectors

1. Project Background:

The purpose of this project is to assess the mycorrhizal fungal community present in the air at all core terrestrial NEON sites and to determine the eco-climatic predictors of aerial dispersal. Five MWAC dust collectors are installed at a single plot at each of the 20 core sites.

2. MWAC Dust Collector Anatomy

The MWAC (Modified Wilson and Cooke) dust collector passively collects air particles using collection chambers that are mounted on a mast with a wind vane that orients the sampler inlet to face the wind. Each **mast** is mounted onto a steel **post** and held in place by **washers** that allow free rotation in the wind. Each **mast** holds 3 sampling **canisters** mounted with **hose clamps** to assess the decline in particle transport with height. Each canister lid is fitted with two **tubes** (e.g. **antlers**); air flows into the longer tube and exits the shorter tube, depositing solid particles into the canister.



3. In order for the MWAC to function properly:

- The antlers must be positioned so that the tubes are horizontal to the ground.
- The antlers must be positioned so that the longer intake tube is upwind.
- The mast must rotate freely and not be obstructed by vegetation.

4. Materials Required for Sample Collection:

Basic supplies:

- GPS to locate MWACs (optional)
- Metric tape measure or meter stick
- Flathead screwdriver (the thicker the tip, the better)
- ~5 alcohol wipes
- Checklist (emailed)
- Pruners/grass clippers for clearing vegetation
- Nitrile gloves

5. Sample Collection Steps

NOTE: The purpose of the ‘spring reset’ is to make sure the MWAC dust collectors are working, and to sterilize the dust collection canisters. No samples will be taken at this time.

1. Locate the first dust collector. Each MWAC dust collector is labeled with a unique three digit number stamped on the metal fin (e.g. “017”). Each canister is labeled with the same number and either a 1, 2, or 3, noting its position at the top, middle, or bottom of the mast. Top=1, Middle = 2, Bottom = 3. See Figure 1. *NOTE: The dust collector may be bent, missing pieces, or otherwise in disarray. How to fix or record this damage is described later.*
2. Remove the first canister by loosening the hose clamp with a flathead screwdriver. Slide the canister out of the loosened hose clamp.
3. Unscrew the antler lid (lid modified with tubes) and dump out any contents of the jar. Additionally, clear any debris that may be inside of the aluminum tubes using a stick, brush, or screwdriver.
4. Wearing gloves, sterilize the inside of the jar and antler lid (lid modified with tubes) with an alcohol wipe. Be sure to sterilize all parts, including the aluminum tubes and epoxy and pay special attention to the difficult to reach inner seal and threads (Figure 2). If you cannot reach the bottom of the canister with your gloved hand, you can use a pen or the back end of a clean screwdriver to properly apply the alcohol wipe. As best as possible, also try to sterilize the inside of the aluminum tubes.
5. When the canister and antler lid are both sterilized, screw the antler lid back onto the canister. Make sure to screw it on very tightly, and check that the threads have not slipped out of place.
6. Slide the canister back into the hose clamp and tighten using a flathead screwdriver. Be sure to position the antlers so that the longer tube is facing upwind or away from the fin. If you cannot tell which tube is the longer tube, you can take a quick peek inside the canister (Figure 2). You may need to make several adjustments to make sure that the tubes are parallel with the ground and that the can is tightly attached. *Note that*

tightening the hose clamp can twist the canisters. Do not unscrew the lid in order to make the tubes parallel, please adjust the whole canister.

7. Repeat for each canister.
8. Use the data sheet to perform checks of the dust collector and canisters. If checks are not met, try the troubleshooting steps below. Note and take photographs of any damage that cannot be fixed.
 - a. **Collector is upright and straight (not bent over)** If the metal post is bent, put your foot at the base of the post and try to carefully bend the collector by leaning into it so that it sits straight up from the ground.
 - b. **Vegetation has been trimmed around base** Trim down any vegetation that could grow to obstruct the MWAC
 - c. **Distance from ground to center of highest canister is ~92 cm (+/- 3 cm)** Height can be adjusted by using a screwdriver to change the position of the small coupling below the washers.
 - d. **Small coupling (just below washers) is tight** Tighten with a screwdriver
 - e. **Jars and lids have been sterilized with an alcohol wipe**
 - f. **Aluminum tubes cleared of insects/debris and sterilized**
 - g. **Aluminum tubes are positioned parallel to the ground**
 - h. **Jars are tight within the hose clamps and the hose clamps are intact**
 - i. **Longer aluminum tube is facing away from the fin**
 - j. **Number on fin matches numbers on jar** Ensure that the three digit canisters numbers match the three digit number on the fin.
 - k. **Top, middle, and bottom jars are labeled 1, 2, and 3 respectively** (Figure 1). If, for some reason, the replacement canister does not have a label stamped into the bottom, please add a label to the bottom of the canister using a permanent marker. If any of the labels appear wrong or inconsistent with our labeling scheme, please note this in the data sheet.
 - l. **Mast can spin freely** Check the bottom of the mast to ensure that nothing is obstructing the spin.
9. Repeat for each of the five MWAC dust collectors at your site.

Thank you for your assistance in this spring reset!! If you have any questions, please feel free to call or email.

Figures

Figure 1. Close up picture of canister labeling scheme. In this example, the canister from MWAC dust collector number 023, in the top position, is shown. Each canister is labeled with the MWAC number and either a 1, 2, or 3, noting its position at the top, middle, or bottom of the mast. Top=1, Middle = 2, Bottom = 3.

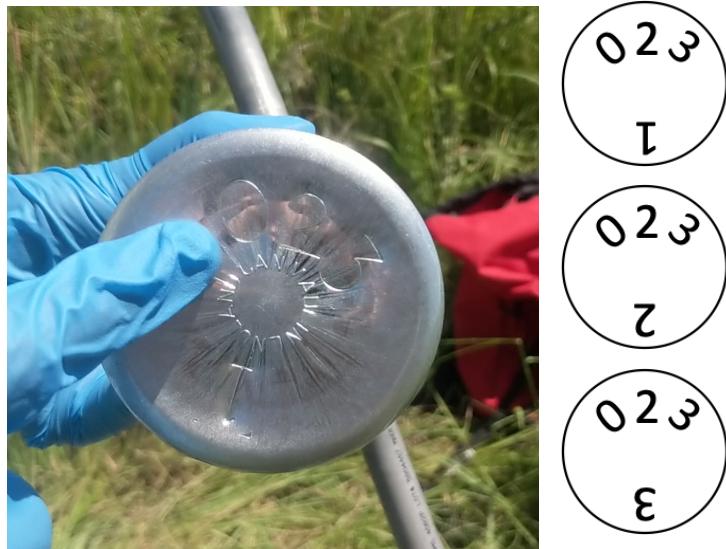


Figure 2. Close-up picture of antler lid from the inside. Note the longer tube on the left, which should be oriented to point upwind, away from the fin.

