

# Investigation Instruments: Densiometer

## B. Densiometer

A densiometer is an instrument used for taking measurements of canopy cover as part of the biometry measurements described in the [Biometry Protocol](#). The following includes directions to construct and use the densiometer.

### Required Materials

- 4 cm diameter by 7.5 cm long tube (toilet paper tubes, construction paper, PCV pipe)
- 34 cm of thread or dental floss
- metal nut or washer
- tape

### Construction

1. Gather the required materials for each densiometer.
2. Attach (with tape) two threads at right angles across the diameter of one end of the tube to form a crosshair. Leave a slight end hanging at the bottom of the tape so you can tighten the threads if they loosen.
3. Attach (with tape) an 18 cm piece of thread with a metal nut or washer hanging loosely from it across the diameter of the other end of the tube (opposite the crosshairs).

### Directions for Use

1. Look up through the densiometer, making sure the densiometer is vertical and the metal nut/washer is directly below the intersection of the crosshairs at the top of the tube. See Figure BIO-D-2 and Figure LAND-SS-6. **Note:** Only use the densiometer for looking UP at the canopy cover. Do not use it for looking DOWN at ground cover.

Figure BIO-D-1: Homemade Densiometer

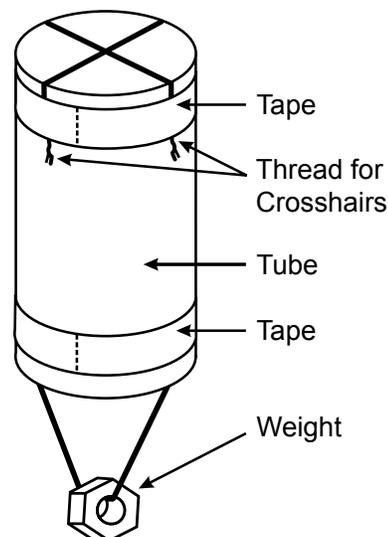
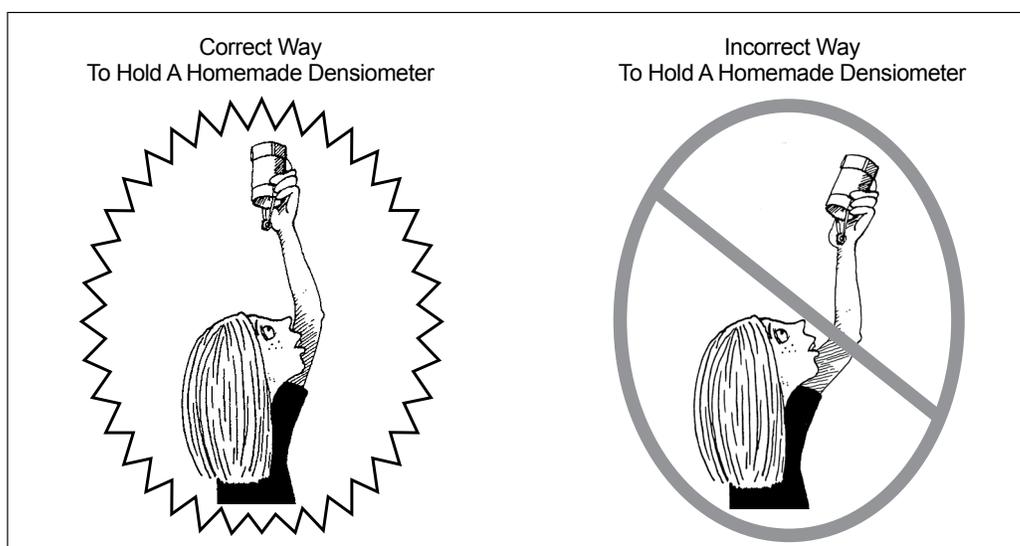


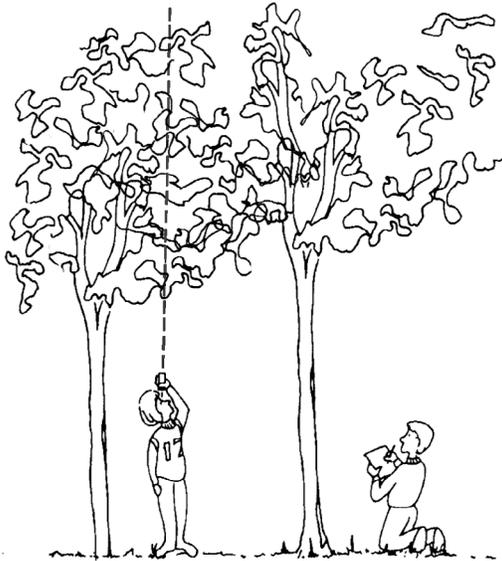
Figure BIO-D-2: Correct and Incorrect Way to Hold a Homemade Densiometer



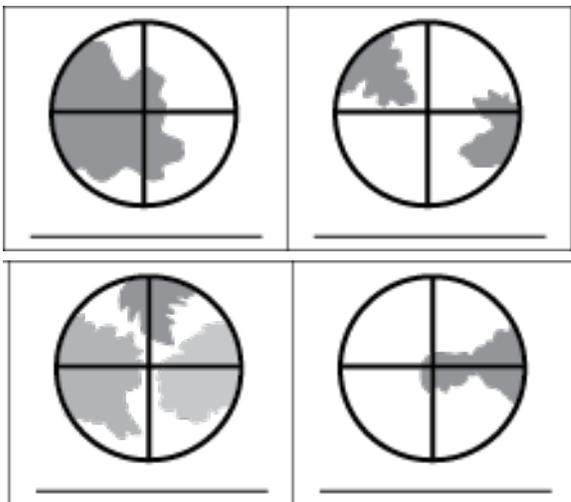
Modified from TEREZA, Association for Environmental Education, Czech Republic (1996).

- If you see vegetation, twigs, or branches **touching the crosshair intersection**, you would call this “T” meaning that there is tree canopy or “SB” meaning that there is shrub canopy.
- If you **do not** see vegetation, twigs, or branches **touch the crosshair intersection**, you would call this minus “-” meaning that you saw the sky above the intersection of the crosshairs.

Figure BIO-D-3: Using a Homemade Densiometer in Multi-Story Canopy



Below are several examples of what you might see when looking up through a densiometer. Label each diagram with a “T” or minus “-”.



### Frequently Asked Questions



#### 1. What should we do if there is a multi-storied canopy?

If there is a multi-story canopy, try to identify the highest level of the canopy without changing your position. If the vegetation touches the intersection of the crosshairs, mark a “T” or an “SB”. See BIO-SS-6.

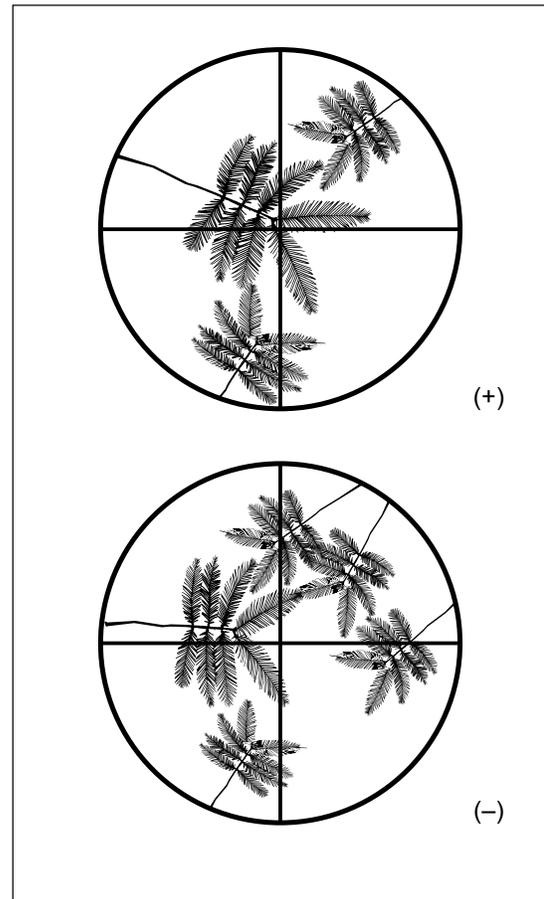
#### 2. What if the entire circle I see through the densiometer is full of vegetation, but there is no vegetation at the crosshairs?

This is a sampling question. The Land Cover/Biology Team has chosen the intersection of the crosshairs as the sample. Therefore, this would be a (-).

#### 3. What if we can't get to our site during peak vegetation (full leaf-on) conditions?

If you cannot get to your site during peak growth (leaf-on), measure your site during the leaf-off period and try your best to get the peak growth (leaf-on) data, when you can.

Figure BIO-D-4: Densiometer Sampling



Answers to densiometer examples:  
First row: +, -, -, +  
Second row: -, -, +, +