

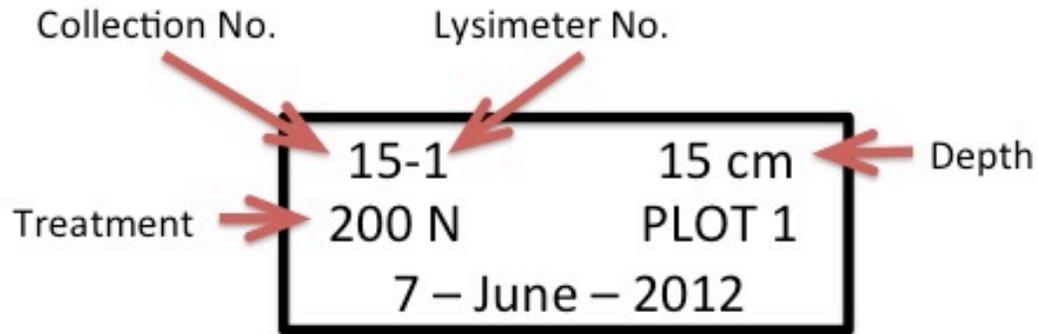
## Measure Nitrate on Horiba Nitrate Meter

### Materials

- Horiba Nitrate Meter and kit
  - o Nitrate meter
  - o Rinse Bottle
  - o Transfer Pipettes
  - o 50mL beaker
  - o Low Standard: 30 ppm  $\text{NO}_3^-$  (6.8 mg  $\text{NO}_3^-$ -N/L)
  - o High Standard: 300 ppm  $\text{NO}_3^-$  (68 mg  $\text{NO}_3^-$ -N/L)
- Deionized water (DIW)
- Pencil
- Lab Notebook

### Procedure

1. Press the center button to turn on the Horiba.
2. Check the units and set to mg  $\text{NO}_3^-$ -N/L if necessary (see instructions below)
3. Rinse with DIW and blow remaining drops of water off the electrode.
4. Add enough **Low** Standard to cover the entire electrode, and close the lid.
5. Hold down the CAL button until the meter reads 6.8. Wait for the blinking to stop.
6. Pour out the standard. Rinse with DIW and blow remaining drops of water off the electrode.
7. Add enough **High** Standard to cover the entire electrode, and close the lid.
8. Hold down the CAL button until the meter reads 68. Wait for the blinking to stop.
9. Pour out the standard. Rinse with DIW and blow remaining drops of water off the electrode.
10. Shake to mix the water sample. Use the small pipette to add the sample to cover the electrode.
11. Close the lid and press the measure button once (hold for 1 sec). Wait for the ☺ icon to appear.
12. Press the measure button once more (hold for 1 sec) and wait for the “MEAS” to stop blinking. **Note:** The value will still blink if it is below 6.8 mg  $\text{NO}_3^-$ -N/L, to indicate that it is reading below the standard range.
13. Record the value in the Lab notebook
14. Pour out the sample. Blow remaining drops of water off of the electrode.
15. Run each sample three times if there is enough sample. **Note:** Record volume as **High** (more than 20mL), **Med** (less than 20mL, but greater than 10mL), or **Low** (less than 10mL).
16. Pour out the sample. Rinse with DIW and blow remaining drops of water off the electrode.
17. Run samples in sets of **six**. Calibrate the meter every six samples.
18. When all samples have been analyzed, add a small pinch of thymol, cap, and shake the sample to mix.
19. Write on a small label or lab tape the information in the figure below. Note that the sample ID contains the collection and the lysimeter number (see the data sheet “Nitrate.xls” for all the information).



-----

### Samples with soil particles

1. Carefully remove the solid lid from the Horiba.
2. Trying to touch the membrane filters as little as possible, carefully place a filter directly over the electrode.
3. Snap on the filter holder where the solid lid was.
4. Use a transfer pipette to add the sample.
5. Place the solid lid over the filter holder to block out the light.
6. Measure sample as described above.
7. You can re-use for the three replicates of the sample.
8. After you have finished reading the dirty sample, remove the filter holder, rinse the filter off of the electrode and replace the solid lid.

## **TROUBLESHOOTING:**

### Calibration Failure

1. If the calibration fails, you can try to calibrate using only the high standard solution. This is less accurate, but can work if the electrode is burning out.
2. Another option is to turn off the Horiba for about 1 hour and then try to calibrate again.

### Changing the Units

1. Press and hold the "Meas" button for 5 seconds until the screen changes to the special setting modes.
2. Press the "Meas" button to select the desired unit.
3. Select mg NO<sub>3</sub><sup>-</sup>-N/L

### Changing the Calibration from 1-Cal to 2-Cal

1. Press and hold the "Meas" button for 5 seconds until the screen changes to the special setting modes.
2. Press and hold the "Cal" button until the CAL icon and the number 3 appears.
3. Press the "Meas" button once to display the number of calibrations. When one calibration is set, the number 1 appears,
4. Press the "Cal" button to switch the display to the number 2.
5. Press the "Meas" button to return to the measurement mode.