

Date:
July 2009

Compost Moisture

“ It is neat to see that the moisture content directly relates to how far along the composting process a pile may get, it is almost like making haylage.”

*~Pat Burton, Aug.
Friendly Forage Field Day*

Introduction

Moisture is an important factor in the composting process. The bacteria and microorganisms that convert the manure into a humus-like substance can only consume nutrients that are dissolved in water. These ‘bugs’ also need oxygen though, so if there is too much moisture in the compost, all of the air spaces fill with water. This causes an anaerobic environment and odour problems.

The optimum moisture content of a pile is between 50 and 60%. There are a few different ways to test the moisture content of a compost pile, from a high-tech moisture probe to a simple and easy ‘squeeze test’.

Moisture Testing Methods

We tested out three different methods of measuring the moisture content of a compost pile:

1. The tried and true **‘oven-dry’ method**. A sample is collected in a small tin, sealed, and then brought back to a lab where it is weighed and placed in a 70-80°C oven for 3 days. The samples are then re-weighed and the moisture content is determined by the weight difference caused by the evaporated water.
2. A **high moisture silage meter**. We ran a few test runs against the oven dry method to see if we could use a silage bale moisture meter for on-site, immediate results.
3. The **squeeze test**. This is the easiest way to get a rough idea of the moisture content in compost. Exactly as it sounds, you squeeze a sample of compost and determine the moisture content by what type of ball it forms and how much water drips out.

Location: Hogbergs’ Ranch

Manure Type: Cattle manure mixed with straw bedding



Moisture tins filled with compost samples sitting in a drying oven in Sandy’s field lab.

Contacts:

Rick Kantz
(250) 785-1135

Glenn Hogberg
(250) 782-0895

Sandra Burton
(250) 789-6885

Julie Robinson
(250) 787-3241

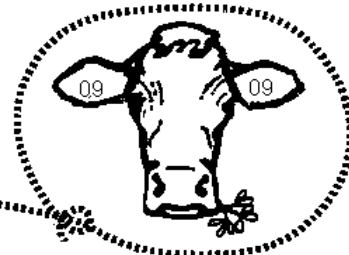
**Published by
P.R.F.A. of BC:**

For more Forage Facts
visit:



2009 summer student Megan Harwood digging in to a newly-made compost pile to obtain some moisture samples.

**Peace River Forage Association
of British Columbia**



Oven Drying Samples

This is the most accurate method for determining the moisture content of a sample of compost. We took several samples with a soil auger to get the best representation of the piles. The formula for this method after you have the wet and dry weights is:

$$\text{Moisture content} = \frac{\text{wet wt.} - \text{dry wt.}}{\text{wet wt.}} \times 100\%$$

It is important that the samples go in the oven until their weight remains constant (3 to 4 days) at a temperature below 80°C. Any hotter and the organic material could catch fire!

Silage Moisture Meter

This meter was user-friendly and gave very fast results. However, after comparing the readouts from the moisture meter to the oven dried samples, the meter was inconsistently between 10 and 30% off. The difference was likely due to the variability and low density of the composting material. Silage bales are typically much more dense and uniform than a compost pile, and so would be much better represented by this probe.

We are still hopeful that there is a moisture probe out there that would be useful for measuring the moisture content of compost...keep your eyes open!

Moisture Wrap-up

As long as there is proper aeration and nutrients, manure will compost (slowly) below 50% moisture, but will stop completely below 15%.

When the moisture content is too high, the compost pile should be turned to loosen the material and add oxygen. Chances are the compost will have an odour if it is too wet because there was not enough air in the pile.

If the pile is too dry, or the temperature goes above 70°C, water may need to be added. It is recommended to do this while turning the compost pile.

Squeeze Test

This test is designed to give you a ballpark idea of the moisture content of a compost pile.

If you squeeze a sample of compost the size of a golf ball in your hand, it should glisten and form small droplets. There is too much moisture if water drips from the sample, and if the material does not form a ball in your hand, it is too dry.



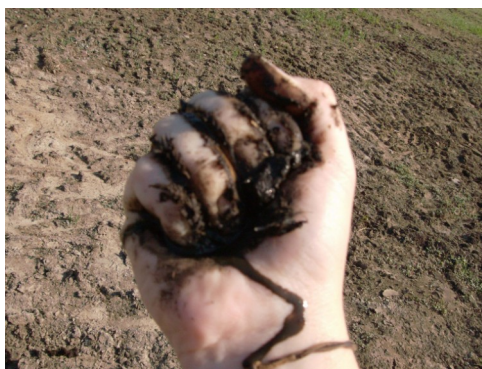
Too Dry

**Less than
50%**



Just Right

50 to 60%



Too Wet

**More than
60%**

Compiled by: Megan Harwood, Courtney Thompson & Sandra Burton in July 2009.

Compost, Compost Tea, & Manuring Project Funded in 2009 by:

Peace River Agriculture Development Fund

With Contributions from: Bickford Farms, Glenn Hogberg, & Douglas Lake Equipment

Forage Facts Funded by: all the donators and supporters

at the Forage Goods & Services Auction on Feb 16, 2008.