

COMPOST QUALITY TEST



This factsheet contains complementary information to the Best4Soil video on Compost quality tests.
<https://best4soil.eu/videos/8/en>

INTRODUCTION

Compost is a natural product, and therefore the final composition and characteristics of each compost is different. Depending on the preliminary feedstock, composting process and the maturity / stability of a compost, its characteristics and therefore quality can vary greatly. For the correct and optimal application of a compost, it is therefore most important to determine the quality of the compost before its application. In the Best4Soil video on compost quality, a series of simple chemical and biological tests to measure this quality are presented.

QUALITY TESTS AND THEIR INTERPRETATION

Three chemical tests (the determination of the pH, the salinity and three forms of mineral nitrogen) and two biological tests (the open and the closed cress tests) (fig. 1) are presented in the video. You will find the values needed for the interpretation of these tests in the table below (according to the Swiss directive 2010 for the compost and digestate quality).

PARAMETER	COMPOST GENERAL USE	COMPOST HORTICULTURAL USE OPEN FIELD	COMPOST HORTICULTURAL USE GREEN HOUSE
pH-value *		< 7.8	< 7.5
Salt content [g KCl _{eq} /kg DM]**		<20	<10
Ammonium (N-NH ₄) *	< 600 mg/kg DM	< 200 mg/kg DM	< 40 mg/kg DM
Nitrate (N-NO ₃) *		> 80 mg/kg DM	> 160 mg/kg DM
Nitrite (N-NO ₂) *		< 20 mg/kg DM	< 10 mg/kg DM
N _{min} (mineral nitrogen) *	> 60 mg/kg DM	> 100 mg/kg DM	> 160 mg/kg DM
Ratio N-NO ₃ /N _{min}		> 0.4	> 0.8
Open cress test (7 days after sowing)		> 50% of reference substrate	> 75% of reference substrate
Closed cress test (7 days after sowing)		> 25% of reference substrate	> 50% of reference substrate
Dry matter (DM)		> 50%	> 55%

* Extract of 50 g compost in 500 ml 0.01 M CaCl₂ solution, shaking for 1 h. N-NH₄ = (NH₄ in extract (in mg/liter) / DM (in % FM))* 776.5); N-NO₂ = (NO₂ in extract (in mg/liter) / DM (in % FM))* 304.4); N-NO₃ = (NO₃ in extract (in mg/liter) / DM (in % FM))* 225.9)

** Extract of 50 g compost in 500 ml H₂O, shaking for 1 h. Salt content [g KCl_{eq}/kg DM] = EC value from extract (in mS) * 583.41 / DM (in % FM)

For the determination of the dry matter (DM) of the compost, dry a sample at 105°C for one day.

Other important quality parameters are the content of other mineral nutrients such as P_2O_5 , K_2O , Mg and Ca, and the carbon content of the compost. Analysis of these parameters are more complicated and therefore a sample has to be analyzed by a specialized laboratory. In general, laboratories which analyze soil can also analyze compost. For the interpretation of these results, national guidelines have to be consulted. Often, but not always, the interpretation is integrated in the analysis report of the laboratory.

COMPOST MOISTURE

A compost has to be humid to allow the microorganisms to be active. If the compost is too dry, no microbial activity is possible and the transformation (composting) process of the compost is stopped. If the compost is too wet, undesired microbial processes under anaerobic (= absence of oxygen) conditions will occur and the compost will possibly have a bad smell and contain phytotoxic acids.

A simple test to control the moisture content of a compost is the 'fist test'. You take a handful of compost, squeeze it firmly and then open the fist. If the compost is too dry, the compost will then fall apart (fig. 2). If the moisture content is normal, then compost stays together (fig. 3). In case the compost is too wet, then water will run out of your fist when you squeeze the compost (fig. 4). Depending on the situation, you can take the needed measures, such as adding water to the compost or cover the compost.



Fig. 1: Closed and open cross test, 7 days after sowing, ready for evaluation.



Fig. 2: Fist test: Compost is too dry.



Fig. 3: Fist test: Compost has the right moisture content.



Fig. 4: Fist test: Compost is too wet.