Understanding a Compost Test Report

(Special Products Test Report)

Compost adds valuable organic matter and nutrients to the soil. It has the added benefit of turning organic waste, such as manure and crop debris, into something that's reusable. By testing your compost, you can match the nutrients in the compost with the nutritional needs of your crop.

A compost test measures the amount of nitrogen, phosphorus, potassium, and several micronutrients to determine its fertilizing value. Nutrients in the compost can be matched to the requirements of a specific crop. Additional nutrient sources, can be applied to balance what is lacking in compost.

TIP

Samples 'as received'
Test results are reported as received, or on a wet-basis rather than a dry-basis.

Laboratory Services reports test results 'as received' by the lab, or on a wet-basis, because that's the way manure is usually spread. The compost analysis also measures the % dry matter and the pH level.

The compost test is divided into two sections, as shown on the Special Products Test Report.

- Information on client and sample identification
- Results of the compost test

Client and Sample Identification

Client number

This is assigned to the producer the first time samples are taken to Laboratory Services. The client number remains the same for future samples.

Accession number

This is the unique identifier assigned by Laboratory Services to a single sample or a set of samples.

Samples reported

This is the date Laboratory Services produced the soil test report.

Samples received

This is the date Laboratory Services receives the samples for analysis.

Lab number

This is assigned by Laboratory Services to an individual sample for tracking and keeping records.

Type

This identifies the sample type as manure, compost, or other organic material.

Sample ID

This is assigned to the sample by the client. It's often a name or a number.

Compost Test Results

DM – dry matter (%)

Dry matter (DM) is the dry weight of the compost after the water has been removed. Laboratory Services reports it as the percentage of solids in the compost. Ideally the DM content should start at 40–50 per cent and finish at about 70 per cent.

pH

The pH of compost varies, depending on the feedstock used.

- The pH scales ranges from 0 to 14, where 7 is neutral, below 7 is acidic, and above 7 is alkaline or basic.
- Each whole unit (1.0) is a ten-fold difference in the level of acidity. For example, pH 5.5 is ten times more acidic than pH 6.5.

N – nitrogen (%)

Nitrogen is reported as total nitrogen. This includes both the immediately available inorganic Ammonium–N (NH4+) and the slowly released organic nitrogen (NO3-N).

Nitrogen facts

- The amount of each type of nitrogen can be very different, depending on what organic materials were used to make the compost.
- The amount of nitrogen can vary depending on whether the compost is mature or immature. A mature compost has finished its decaying process, and an immature compost is still decaying.
- A well-cured compost can release up to 15–20 per cent of organic nitrogen each year. Composts can actually make nitrogen less available for plant growth by tying up nitrogen.

Phosphorus (%)

Phosphorus is reported as total phosphorus, which includes forms that are available and unavailable to plants.

TIP

To convert phosphorus to its oxide available form of phosphate (P_2O_5), multiply by 2.29 to get the total P_2O_5%. The compost report also provides this information.

Phosphorus facts

- Phosphorus is important for seed germination and root development. Fields with low phosphorus levels may not have well-developed root systems, leading to heavily-stressed plants during droughts. These fields will require re-seeding more often.
- It's important for vegetable, fruit, and grain maturity and quality.
- It improves nitrogen absorption by the crop.
- Research shows that it takes 3.5 kg of phosphorus, added through nutrients or removed during harvest, to change the level in a soil test by 1.0 kg/ha.

P_2O_5 – (%)

Phosphorus has to be converted to phosphate (P_2O_5) to determine the phosphorus available to the plant. Commercial fertilizers report the phosphorus amount in its oxide form, phosphate (P_2O_5).

TIP

Multiply P_2O_5% by 10 to convert to per tonne of compost (kg/tonne).

K – potassium (%)
Potassium is reported as total potassium, which includes forms that are available and unavailable to plants.

TIP

To convert potassium (K_2O), multiply potassium % by 1.2 to get the total K_2O_5%. The manure report also provides this number.

Potassium facts

- Potassium is important for legumes. Nodules on legume roots are filled with bacteria that fix, or convert, nitrogen into a form that's usable by the plant. When legumes are grown on low-potassium soils, the bacteria can't fix as much nitrogen for the plant.
- Potassium is important for disease resistance and affects the taste and color of fruit and vegetables.
- Research shows that it takes 4.0 kg of phosphorus, added through nutrients or removed during harvest, to change the soil test level by 1.0 kg/ha.
- Levels of potassium in soil can decrease much more quickly than levels of phosphorus because crops remove significantly more potassium during harvest.

K_20 (%)
Potassium has to be converted to potassium oxide (K_2O) to determine the potassium available to the plant. Commercial fertilizers report the potassium amount in its oxide form, K_2O.

TIP

Multiply K_2O% by 10 to convert to K_2O_5 per tonne of compost (kg/tonne).

Ca – calcium (%)
Calcium is reported as the percentage by weight of calcium found in the compost.

TIP

Calculating calcium (Ca) by weight in compost
– Multiply the Ca (%) by 10 to determine total amount in kilograms per tonne (t) of compost.
Ca (%) = total Ca (kg/t)

Calcium facts

- Calcium is important for cell nutrition.
- It helps plants respond better to environmental and disease stresses.
- It improves uptake and use of other nutrients within the plant.

Mg – magnesium (%)
Laboratory Services reports magnesium as the percentage by weight of magnesium in the manure. Soils in Nova Scotia typically have medium to high levels of magnesium.

TIP

Calculating magnesium (Mg) and socium (Na) by weight in compost
Multiply the Mg or Na(%) by 10 to determine total amount in kilograms per tonne (t) of compost.
Mg (%) x 10 = total Mg (kg/t) Na (%) x 10 = total Na (kg/t)

Magnesium facts

- Magnesium is important for plant photosynthesis.
- It helps legume nodules fix nitrogen.
- It helps move phosphorus within the plant.
- It helps prevent livestock disorders such as grass tetany and milk fever in cattle.

Na – sodium (%)

Laboratory Services reports sodium as its percentage by weight found in the compost. Sodium isn't an important plant nutrient but can cause harm at high levels.

Fe – iron (ppm)

This is the level of available iron found in the compost. Laboratory Services reports it in parts per million (ppm), which is equal to one gram per tonne (g/t).

Iron facts

- Iron is important for crops that prefer acid soils such as blueberries, strawberries, grain, soybeans, and cole crops such as cabbage and broccoli.
- It's an important part of nitrogen-fixing in legume crops.

Mn – manganese (ppm)

This is the level of available manganese found in the compost. Laboratory Services reports it in parts per million (ppm), which is equal to one gram per tonne (g/t).

Manganese facts

- Manganese increases seed germination rates and reduces time to harvest because it increases phosphorus and calcium availability to the crop.
- A manganese deficiency can be a problem for soybeans if the field has a high pH, heavy clays in the soil, and low soil Mn levels.
- Crops that have a high response to manganese are beans, cereals, soybeans, and vegetables.

Cu – copper (ppm)

This is the level of available copper found in the compost. Laboratory Services reports it in parts per million (ppm), which is equal to one gram per tonne (g/t).

Copper is an important nutrient for all animals except sheep, where it is toxic even at low levels.

Copper facts

- High pH levels and high levels of phosphorus, zinc, and iron will decrease copper uptake in plants.
- Crops that respond highly to copper are alfalfa, grain, lettuce, onions, beets, spinach, blueberries, watermelons, and tomatoes.
- Some animal manures have high levels of copper from copper foot baths.
- Toxic affects from applying too much copper can last for years.

Zn – zinc (ppm)

This is the level of available zinc found in the compost. Laboratory Services reports it in parts per million (ppm), which is equal to one gram per tonne (g/t).

Zinc is important for root development. It can be tied up and unavailable to the crop when soil levels of phosphorus are over 1000 kg/ha.

Zinc fact

- Zinc affects the rate of maturation of both seed and stalks.
- Crops that respond highly to zinc are corn, beans, onions, and spinach.

B – boron (ppm)

This is the level of available boron found in the compost. Laboratory Services reports it in parts per million (ppm), which is equal to one gram per tonne (g/t).

In sensitive crops, boron is important in reducing nutritional disorders that affect marketability. Boron moves easily in the soil (leaches) so fields with low boron levels should receive annual applications when growing sensitive crops. Most fields in Nova Scotia have low levels of boron.

Boron facts

- Plant tissue tests can be a better indicator of boron levels than a soil test.
- Boron is most available to crops when soil has a pH of 5 to 7.
- If levels are too low, below 0.5 ppm, sensitive crops should respond if you apply 1.1 to 2.2 kg/ha.
- Vegetables are sensitive to boron, especially root and cole crops. At levels below 0.7, many vegetables need between 1.1 to 3.3 kg/ha of boron.
- Alfalfa grows and survives longer with higher levels between 1-3 ppm.
- Clovers grow best between 0.5-2.0 ppm.
- Grain, corn, and grass grow best between 0.5-1.5 ppm.