

3. Worm Count Test

Measure Your Soil Organic Matter

Worms are the poster child of healthy soil. They are the most efficient and hardworking invertebrates in the soil ecosystem for decomposing dead plants and animals and producing castings rich in organic matter. Worms happily dwell, burrow, and reproduce in soils with adequate moisture and organic matter. The Worm Count provides a very reliable method of measuring the levels of organic matter in your soil.

What role do worms play in soil?

Healthy soil is home to many species of worms, including surface dwelling red wigglers, shallow burrowing night crawlers and deep burrowing earthworms. Worms are efficient decomposers of plant residue, fallen leaves, broken down mulches, and dead plant roots. Worm's stomachs are lined with beneficial bacteria that envelop the castings left behind by worms. Worm castings are rich in organic matter and quite nutrient dense, especially in nitrogen. Worms naturally aerate the soil as they move up, down and across your soil's profile. While consuming dead plant and animal matter, worms receive much of their nutrition from digesting the bacteria and fungi that exist in the soil and on the decomposing residue – this makes the presence of worms in your soil an excellent indicator of beneficial bacteria and fungi populations that are also important decomposers in your soil ecosystem. Worms are acutely aware of soil moisture through their sensitive skin and rely on adequate soil moisture, and will quickly migrate away from overly dry or compacted soils.



How do I attract worms into my garden?

Many factors contribute to the presence of worms in your soil. Ask yourself, is your garden soil a good habitat for worms? While moisture and organic matter attract worms to your soil, soil compaction and synthetic pesticides and herbicides will keep them out. Worms consume organic nitrogen, not inorganic nitrogen, and so synthetic fertilizers will not attract worms. Worms are rapid reproducers and respond quickly to improved soil conditions. If your garden does not seem to house many worms, the best way to attract these beneficial creatures is by topdressing with compost and spreading a layer of mulch on the soil surface. Compost is a desired food source for worms rich in organic matter and beneficial bacteria and fungi, and mulch protects worms by keeping soil moist, providing cover for worm burrows, and hiding worms from above-ground predators. Finding worm cocoons, tiny yellow and red colored eggs the size of a grain, is an excellent sign that worms are in your soil to stay!

How is the significance of what I find in the Worm Count?

The Worm Count is an actual field test used by farmers across the country and a recommended practice by the Natural Resources Conservation Service (NRCS). The number of worms in your soil directly indicates the amount of organic matter currently in your soil. Your findings may be variable, so consider it as a barometer check for current conditions in your soil!

Worm Count

What is the objective?

By collecting and counting worms from a cubic foot of soil, you get an indicator of the amount of organic matter in your soil and fertility of your soil.

What materials do I need?

- shovel
- small container
- small tarp or piece of cardboard
- 12 inch ruler.

Activity Guide

1. Check your soil's moisture. This activity is ideally done when the soil is moist, as worms will quickly migrate away from dry soils. If the soil feels moist to the touch, continue to step 2. If the soil is dry, you have two choices: deeply water your soil and do activity in a few hours or the next day, or continue activity and expect to find reduced number of worms.
2. Map out a 12x12 inch square surface area on the soil's surface in a location near the center of your garden. Worms tend to congregate near plant root zones, so choose a space within a few feet of plants and dig carefully to avoid damaging plant roots.
3. Within your 12x12 inch square, dig out soil to a depth of 12 inches, and place the soil on a tarp. This will provide you one cubic foot of soil.
4. On the tarp, dig through the soil and collect as many worms as you find. Place the worms into the container, making sure to keep the container shaded, moist, and covered with a little soil to keep the worms comfortable. Replace the soil into the hole as you collect worms.
5. Count the total number of worms, and compare your number to the table below. Note: the table below is based on recommended numbers provided by the NRCS for on-farm field trials. Your soil conditions may certainly differ from a farm site!



Number of worms	Level of Organic Matter
31+ worms	Very high
16-30 worms	High
6-15 worms	Medium
1-5 worms	Low
0 worms	Very low

6. Reflect on your findings. If you only found a few worms, what soil conditions could be responsible? Possible reasons could be low organic matter, low plant residue such as leaves or mulches, excessive pesticides or fertilizers, excessive tilling, and poor aeration/high compaction. Suggestions for attracting more worms include topdressing with compost and mulch, no tilling, planting more plants, and watering your garden less frequently but more deeply.
7. Consider doing the Worm Count again after you improve soil conditions to track increases to your worm population!