

# Earthworms: Silent superheroes

## Practical Guide

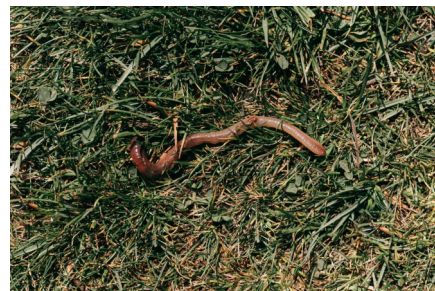


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Earthworms play a major role in soil fertility and are a sign of a healthy well-functioning soil. Earthworms contribute in many ways to soil health and improve grassland production. This guide explains why they are important and how you can assess the abundance of earthworms in your soil.

### Earthworms - why are they important for soil health?

- Through their biological activity, earthworms create tunnels within the soil profile, which aerate and increase the porosity of the soil and contribute to the formation of soil structure
  - This improved loose soil structure leads to better drainage and water holding capacity of the soils
- Earthworms spread and feed on (decomposed) organic matter; this includes decaying leaves, roots and animal manure
- Earthworms break these down into smaller components and thus allowing bacteria and fungi to feed and release nutrients to the soil
- This and the movement within the soil profile increases soil fertility and therefore improves plant productivity

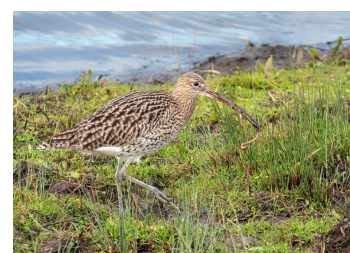


### How many Earth worms are abundant in a healthy soil?

- Variety is more important rather than number of earthworms occurring in the soil
- The abundance of earthworms depends on several factors, such as
  - Habitat type, soil type, pH, waterlogging, compaction, tillage and organic matter management
  - For example: recent research proves that liming has a positive effect on earthworm abundance, while tillage and compaction can have detrimental effects

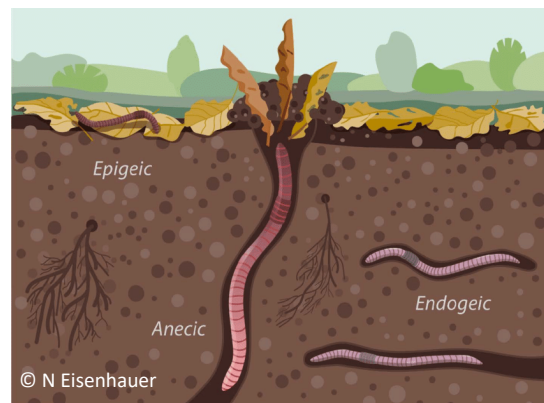


Earthworms also play an important role for biodiversity as they are a food source for farmland birds



## Types of earthworms

- There are three main types of earthworms (see table) & the presence of all three types of earthworms has many benefits to soil health
- The most common earthworm type in arable soils is the topsoil earthworm; in grassland soils it is the deep-burrowing earthworm
- All three types benefit from good organic matter management, such as manure application and straw



Dung & litter-dwelling earthworms (Epigeic)	Topsoil earthworms (Endogeic)	Deep-burrowing earthworms (Anecic)
<ul style="list-style-type: none"> <li>• Small size (&lt;8 cm)</li> <li>• Dark red-headed</li> <li>• Sensitive to tillage</li> <li>• Important for carbon cycling</li> <li>• Prey for native birds</li> </ul>	<ul style="list-style-type: none"> <li>• Small to medium size</li> <li>• Pale-coloured &amp; green</li> <li>• Contributes to soil aggregation &amp; nutrient mobilisation for plants</li> </ul>	<ul style="list-style-type: none"> <li>• Large size (&gt;8 cm)</li> <li>• Dark red or black-headed</li> <li>• Sensitive to tillage</li> <li>• Makes deep vertical tunnels, up to 2m</li> <li>• Improves aeration, water infiltration &amp; root development</li> </ul>

## Assessing earthworm population in just 60 minutes

- Spring and autumn are the best times to count earthworms, especially after warm, wet conditions.
- Tools: Spade, small pot, bottle of water, mat & a record sheet
- Procedure: Dig 10 soil pits per field following a standard W-shape field sampling pattern.
  1. Dig a soil pit (20cm x 20cm x 20cm) and place it on the mat.
  2. Hand-sort the soil, finding and placing each whole earthworm in the pot. Count & record the total numbers of earthworms.
  3. Separate earthworms into adults & juveniles. Count & record the number of each type of adult earthworm, then return to soil pit.
  4. A minimum of 1 earthworm per pit and a variety of types across the field are indicators of a healthy, fertile soil

Adult earthworms have a clearly developed saddle (reproductive ring) and juveniles do not.



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## Summary

Earthworms are the silent superheroes of our soils and it is important to know how they contribute to our soil health and what we can do to promote their abundance, such as organic matter management, liming and relieving compaction.

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