

Improving our soils to improve our food



AIMS

To highlight the importance of soil quality in producing food and providing other ecosystem services;

To promote the important role that farmers play as stewards of soil;

To showcase the ways in which farmers care for their soils and how this improves the sustainability of food production.

TIP

Don't forget to display the two posters provided alongside the activities.



Rhizotron Grow Tanks

1-2 months ahead

Create viewing tanks where different root systems can be observed to show the importance of roots for holding the soil together, creating air spaces, reducing soil compaction, and helping plants access nutrients and water.

OPTION 1



Cut the tops off two 2l drinks bottles and place a 500ml bottle inside each to reduce the volume.

OPTION 2



Drive two 4"x4" posts into the ground where you will display the tank. Attach clear perspex sheets in parallel between the posts to form a channel.

FILL THE TANK

Fill the base of large tanks with vermiculite, gravel or shredded cardboard for drainage. Fill with a mix of soil or compost and sand or vermiculite. Sow seed that is relevant to your farm and include some different root types.



TIP

Fast-growing root and legume crops provide the most interest e.g. fodder radish and red clover

Earthworm farm

2 weeks -
1 month
ahead

Display the important work earthworms do to break down dead matter and move it through the soil.

MAKE A TANK

Use one of the same set-ups as for the rhizotron tanks. If using the 2 bottles method, pierce small holes in the inner bottle to improve ventilation.

ADD THE WORMS

Add as many worms as you can dig up on the farm or buy worms for "vermicomposting" online. Take a "before" photo showing the distinct layers and display this at your event. Black out the sides and keep the soil moist but not soggy.

FILL THE TANK

Instead of just adding soil, make visible layers of beige and brown by alternately adding sand, sawdust or shredded newspaper for the beige and soil or compost for the brown.

TIP

Compost will make the brown layer darker. Add a layer of grass clippings on top to hold in moisture.

Post photos of your changing worm farm to advertise your event in advance



Soil Compaction Experiment

1 week
ahead

Show how damaging soil compaction can be for drainage and highlight how this makes soil management important for flood defence and water conservation as well as for food production.

IN ADVANCE

Cut the bottoms off two 2l drinks bottles. Turn upside down. Use a measuring jug to fill with equal volumes of soil. Label one bottle "COMPACTED" and press down the soil. Label the other bottle "NOT COMPACTED".



TIP

Prepare lots of bottles as the experiment will get messy after being used a few times!

ON THE DAY

An adult can hold up the two bottles. Provide a measuring jug or watering can and allow children to pour equal volumes of water into the two bottles. You can use a phone to time the drainage or just observe. Provide a container to catch the water in.

Healthy soil acts like a sponge to soak up water but compacted soil doesn't so water will pool at the surface or run down the sides of the container.

EXAMPLES & ALTERNATIVES

TIP

Use whatever materials you have available - the bigger the better but make sure everything's secure.

ROOT GROWTH



Pea roots after 2 weeks

Instead of 2l drinks bottles, use any clear plastic tub, bucket, container or tube. Alternatively construct a tank from transparent plastic roofing sheets.

If you don't have much space you can make mini-tanks for root viewing - just use old clear plastic CD cases. Keep the hinge at the top and tape up the bottom edge.

MINI-TANKS



WORM FARM



Field worms after 1 month

For advice or further information on setting up the activities, please email Lizzy ...

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LINKING ENVIRONMENT AND FARMING



P3

Plant Production and Protection

TALKING POINTS



What management practices do you use on the farm to avoid soil compaction? Explain to the public how these not only help you produce better food but can help prevent flooding and conserve water.

What are the other benefits of these management practices for the soil, for wildlife and for your business?

What different types of crops do you grow? How do you choose which to grow and what orders to rotate them in? How does this affect the health of the soil?

MANAGEMENT EXAMPLES



Carefully managed crop rotations;

Including legumes and deep rooted plants;

Leaving crop residues and planting cover crops;

Reduced tillage and machinery usage;

Carefully managed grazing regimes.



USEFUL FACTS

The UK has 27 species of earthworm. They are grouped into 4 types depending on where in the soil they live, what they eat, and what type of burrows they make.

About a third of the world's soil is degraded. Soil compaction is one contributing factor.

Decomposed plant and animal matter (organic matter) in the soil can hold 20 times its weight in water.

Currently, there is no international legal agreement to protect soils even though 95% of our food supply depends on them.

WEBSITES FOR HELP & MORE INFO

Our Soil Secret Agents website: www.sheffield.ac.uk/ssa

FAO 2015 International Year of Soils infographics: www.fao.org/soils-2015/resources/infographics

Timelapse worm farm video: www.youtube.com/watch?v=n9Mnf9ysNSs

Earthworm Society of Britain: www.earthwormsoc.org.uk/earthworm-information



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