Soil Week Australia's School Competition

Topic: "Soil Matters"

Resources

This resource has lots of helpful information that will assist you with your creative entry.

At the end of this resource are some extra websites and videos you may wish to watch.

Soilweek.org.au also has a page devoted to resources. And, also do your own research on the topic.

LOOK OUT for our posts. Soil Week Australia regularly posts on Facebook and Instagram information about healthy soil and its importance to our life

SOIL WEEK AUSTRALIA

Local Food Connect


SOIL WEEK
AUSTRALIA
Soil Week Australia acknowledge the important role of indigenous men and women managing the land, maintaining its healthy for future generations.

Dear teachers and parents

Soil Week Australia – School Competition Invitation

Soil Week Australia is a not-for-profit organisation run entirely by volunteers. We are funded through donations and sponsorships, with a mission to raise awareness about the importance and benefits of healthy soil. We want everyone to fall in love with living, healthy soil! Soil is the foundation of life. Our food, building materials, clothing – and even the well-being of animals, bees, and insects – all depend on it. Healthy soil improves food quality and supports entire ecosystems. When we explore the topic Soil Matters- we begin a journey to understand its importance and how we can look after it.

We invite students of all abilities to enter our school competition!

Entries are welcome from individuals, small groups, or entire classes. Every student who enters will receive a high-quality printed certificate of participation. Winning entries will be awarded a special certificate for their school along with a prize sent by post. We'll also have a number of "Shout Out" prizes, vouchers for students and classes who demonstrate great effort or creativity in their entries.

This resource contains valuable information to help guide your project, though some of the content may be more suitable for older students. We encourage independent research using the key concepts we've provided.
Each week we provide interesting posts on the Competition topic. Follow us on Instagram and Facebook for inspiration and helpful posts for your project! Our website also provides valuable information. Soilweek.org.au

Submission Details:

- Entries must be in **digital format**. Please limit size to 3 minutes for videos. Maximum file size 200-250 MB. Please use the google drive option which will be provided.
- Physical items (e.g., posters or artworks) can be photographed and submitted digitally.
- Clearly include the **school name and student names** with each entry. (Note Many videos do not have name or schools) and we cannot place them
- Email entries to: **soilweek@localfoodconnect.org.au**
  or upload to our **Google Drive**.
- **Entries close: 25 the September 2026**

Your Project

Your Project

At Soil Week Australia, our mission is to raise awareness about the vital importance of healthy soil. We're thrilled you've chosen to explore the fascinating world of soil and why it matters!

You are encouraged to approach this project in any way that inspires you.

Your focus can be on a small, specific aspect of soil or a broader exploration of the topic. Past entries have included creative ideas such as:

- A deck of playing cards illustrating different components of soil
- A school garden project that documented actions taken to enrich the soil, along with the food grown and a shared feast
- A dance about worms
- Poems and other artistic expressions

What we're looking for is a demonstration of **understanding**:

- Why soil matters and why healthy soil matters
- The web of life within the soil
- How soil stays healthy
- What actions make soil healthier or less healthy
- And how this connects to the quality of our food and the health of our environment

We've provided a resource pack to help guide your exploration. ***Please note that not all information will be suitable for every age group***, so we encourage teachers and parents to help tailor the material for their students.

We're excited that you — as a teacher, parent, or mentor — are joining your students on this journey into the wonders of nature. We hope this experience sparks curiosity and leads to a deeper connection with the natural world.

Good luck — and have fun discovering why Soil Matters!

Your project -2

For Senior Students-

To be in the running for a prize, we expect senior students to demonstrate a deeper understanding of the topic. Your project should explore some (or all) of the following key questions:

Soil Matters

Soil isn't just "dirt" — it's a living, breathing ecosystem filled with organisms essential to life on Earth.
•Why is the life in soil so important? What land management techniques look after soil.
•What helps sustain this life, and what threatens or destroys it?
•What does this mean for food and the environment and the future?

Challenging Common Misconceptions

Many people believe soil is just a passive substance to grow plants, needing artificial fertilisers, pesticides, or fungicides to be productive. But soil is far more than sand, silt, or clay. It's a complex web of life, much like ecosystems above ground.
•Why is this "just dirt" view too simplistic?
•What are the dangers of relying too heavily on chemical treatments?

Key Exploration Areas

•What are the **key differences between healthy and unhealthy soil**?
•How are **soil, food, and the environment** interconnected?
•What living organisms and natural processes keep soil healthy?
•What's **one clear indicator** that soil is healthy?
•What does **nutrient-dense food** mean — and how does soil influence that?

Science in Soil

•Explain **photosynthesis** — what it is and why it matters for soil, plants, and all life.
•Why is **composting** important? Why does **organic matter** really matter?

The Role of Carbon

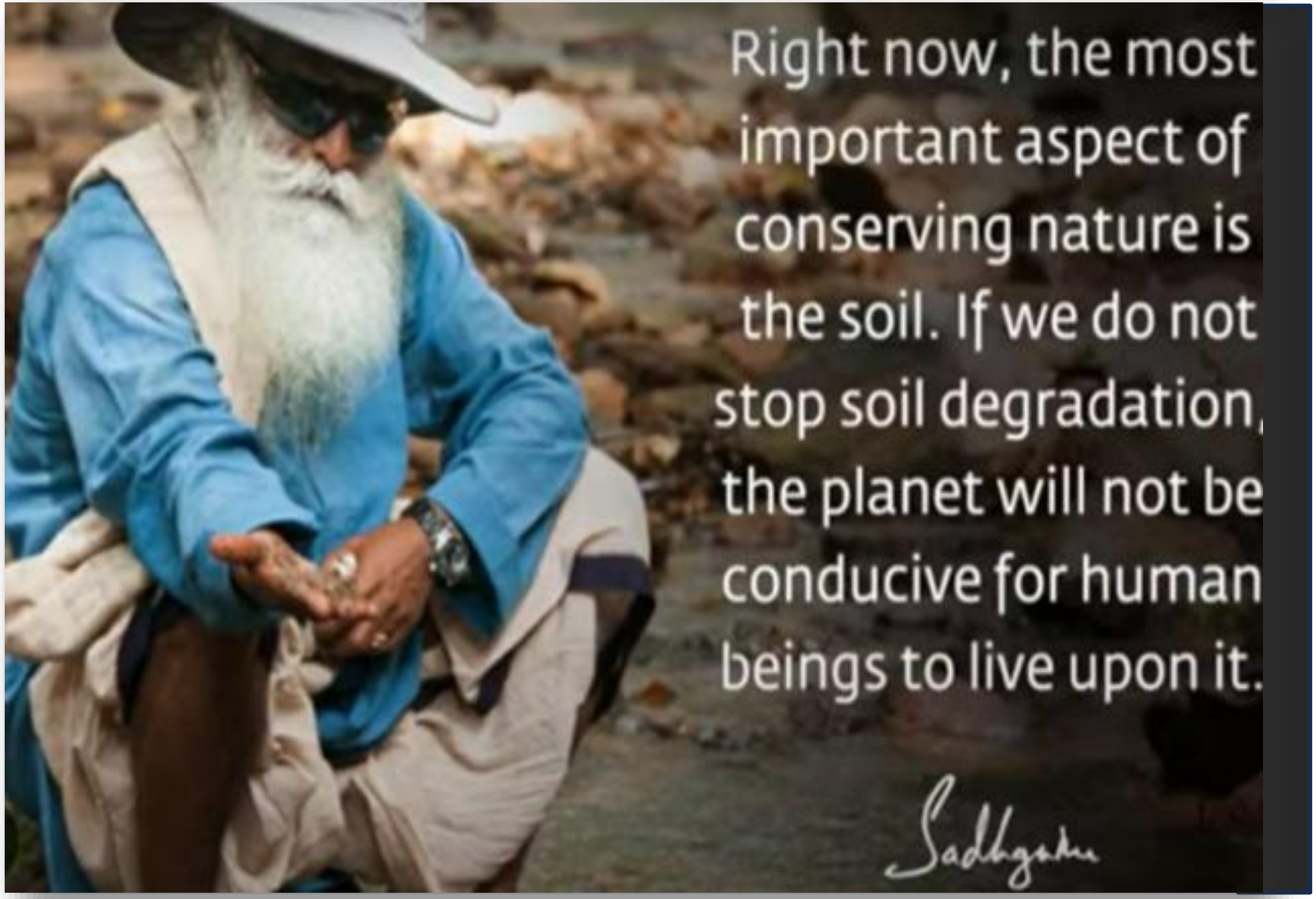
•Explore **carbon in soil**: what it is, its role, and why it's crucial for soil health and climate.

Use your creativity and critical thinking — we welcome projects in any format that clearly demonstrate thoughtful research and a strong understanding of soil as a living system.

Good luck! We can't wait to see what you discover.

Resources

- This resource pack is designed to be a starting point for your exploration of soil — not just as “dirt,” but as a living, dynamic foundation of life on Earth. We have provided snippets of information on soil. Use the information provided as a springboard for your own questions and ideas.
- Soil supports the food we eat, stores carbon, filters water, sustains biodiversity, and connects human activity to the health of the planet. It is shaped by climate, organisms, time, and geology, yet it is also shaped by us. Think creatively about why something beneath our feet might be so essential to our future?
- Make sure you distinguish between healthy soil and dirt and how soil becomes dirt.
- Let this pack help you investigate not only how soil functions, but why it truly matters.



Yogi, Visionary, and Environmental Advocate – Sadhguru

Sadhguru has been honored with three Presidential awards in recognition of his significant contributions to environmental conservation.
Over the years, he has spearheaded major ecological movements, including the global **Save Soil** campaign. Through these initiatives, Sadhguru has inspired positive change for millions, especially by promoting natural farming practices that have improved the lives of farmers across India.
The **Save Soil** website offers a wealth of resources for learning and engagement:
🌱
https://consciousplanet.org/en/save-soil/soil

Soil

Soil covers the earth's surface and is formed by the weathering or rocks over millions of years.

There are three main categories of soil, – sand, silt, and clay. Sand particles are the largest and clay particles the smallest. Most soils are a combination of the three.

Soil is made up mainly of mineral particles, organic materials, air, water, microorganisms and fungi all working together. It's the life in the soil and chemical processes that make soil so important to our food and environment

There are lots of nutrients in the soil but if we want to grow crops and food it is important to look after the soil, ensure the microorganism and fungi can do their job and replace the nutrients.

Fun fact: a handful of healthy soil can contain more living organisms than human beings that have ever lived on earth.

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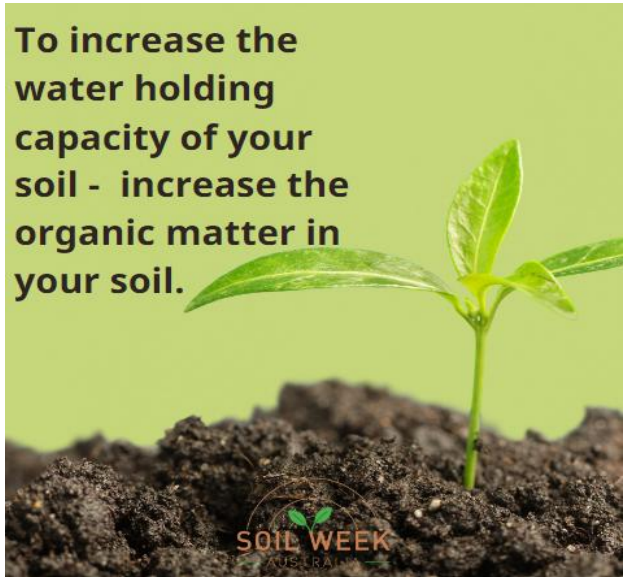
Can you pick which soil is healthy?



Unhealthy soil
Has no structure. It does not stick together, cannot absorb rain and cannot hold water. It is too compacted with no air or water for the microorganisms to survive. Food can only grow in it with chemical fertilisers and pesticides. It usually has lots of weeds.

Healthy Soil
Has strong structure and can stick together. It absorbs water and has lots of microorganisms (life) and organic matter in it (from decomposed plant and animal material) and worms and microorganisms like to live there. The organic matter provides good structure for the microorganisms to work and play! Healthy soil allows plants and food to grow big and strong without chemical fertilisers and pesticides.

The Soil Food Web

Dr. Elaine Ingham was the first to present the concept of the Soil Food Web.

The Soil Food Web is the combination of organic matter and the community of organisms that decompose the organic matter in the soil, and provide nutrients to the plants Each of the types of organisms have a role and decompose leaves and roots and animal manure and animals that have died and even each other. Just like the food chain above the ground.

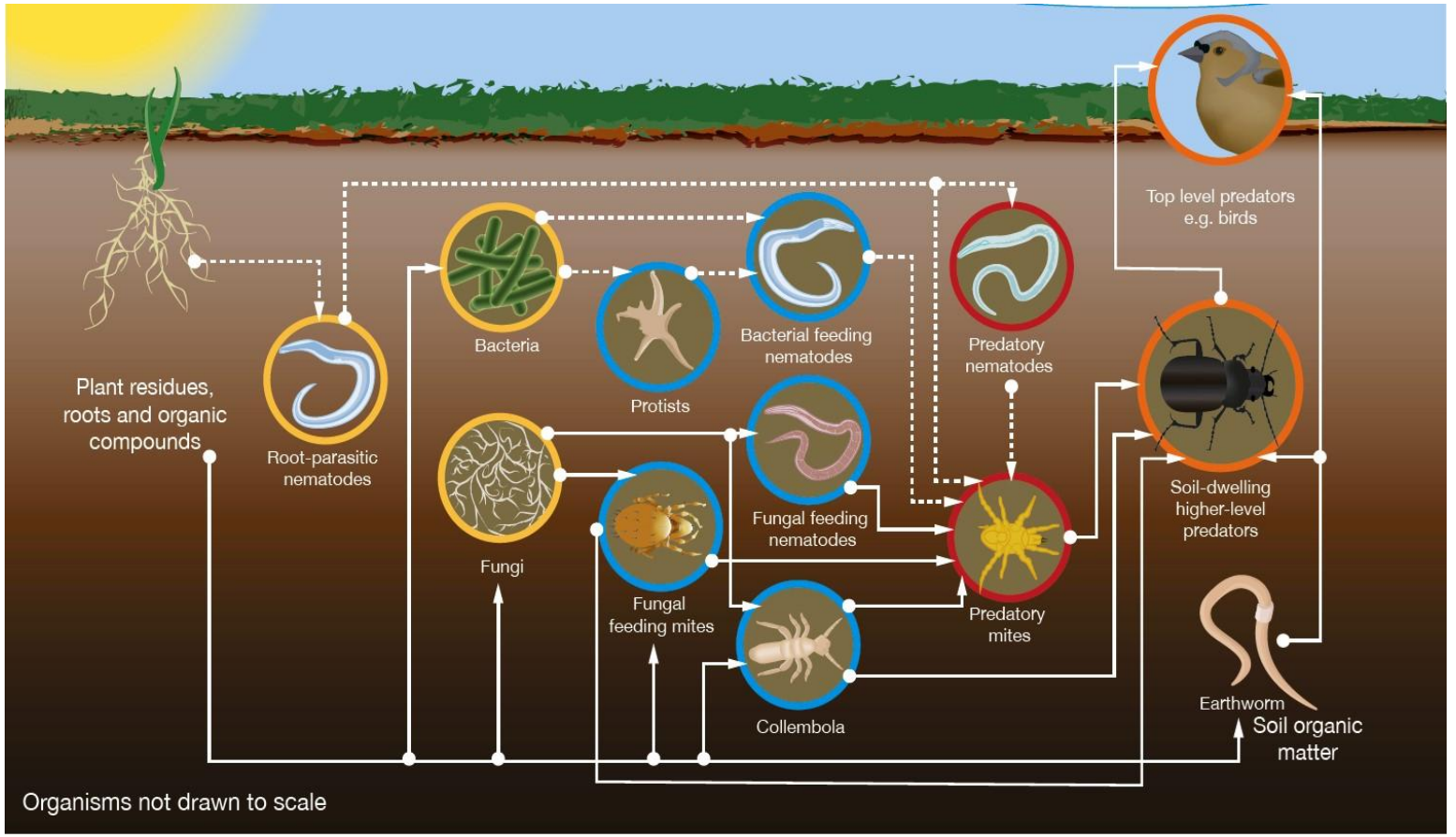
Here are some videos and websites for more information.

www.soilfoodweb.com

www.youtube.com/watch?v=uAMniWJm2vo

www.juniorlandcare.org.au

www.thekidshouldseethis.com

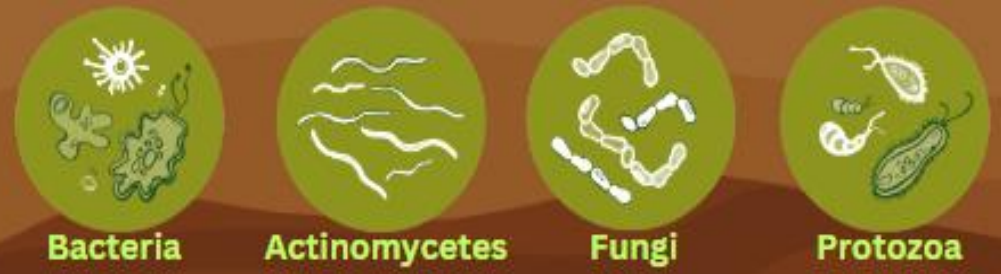


Critters in the soil


Life in the Soil-
59 % of all life lives underground !
Viruses
Fungi
Protozoa
Nematodes
Bacteria
Ants
Algae
Time to show the invisible some respect!
springtails

Critters in Our Soil

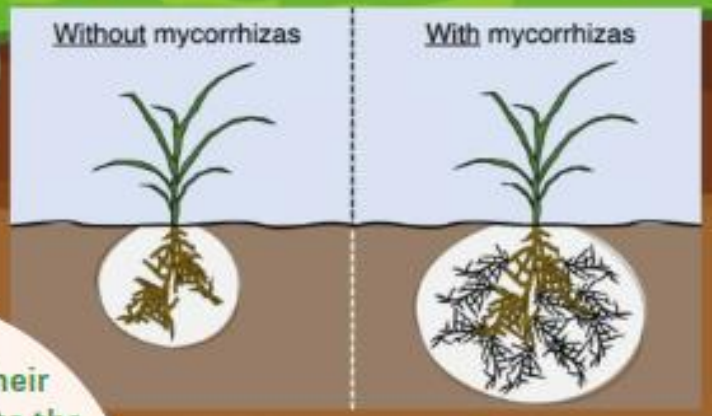
Worms are the big guys in the soil. However, there are lots of little ones we cannot see. They are part of the soil food web. They are what give the soil life, which is necessary to grow plants, the backbone of our existence.



Bacteria Actinomycetes Fungi Protozoa

Fungi

An important soil fungi is the Mycorrhizal fungi , that form symbiotic associations with the roots of most plants



The fungi extend their mycelial networks into the soil, enhancing a plant's ability to absorb water and nutrients like phosphorus and nitrogen. In return, the plant provides the fungi with sugars produced through photosynthesis.

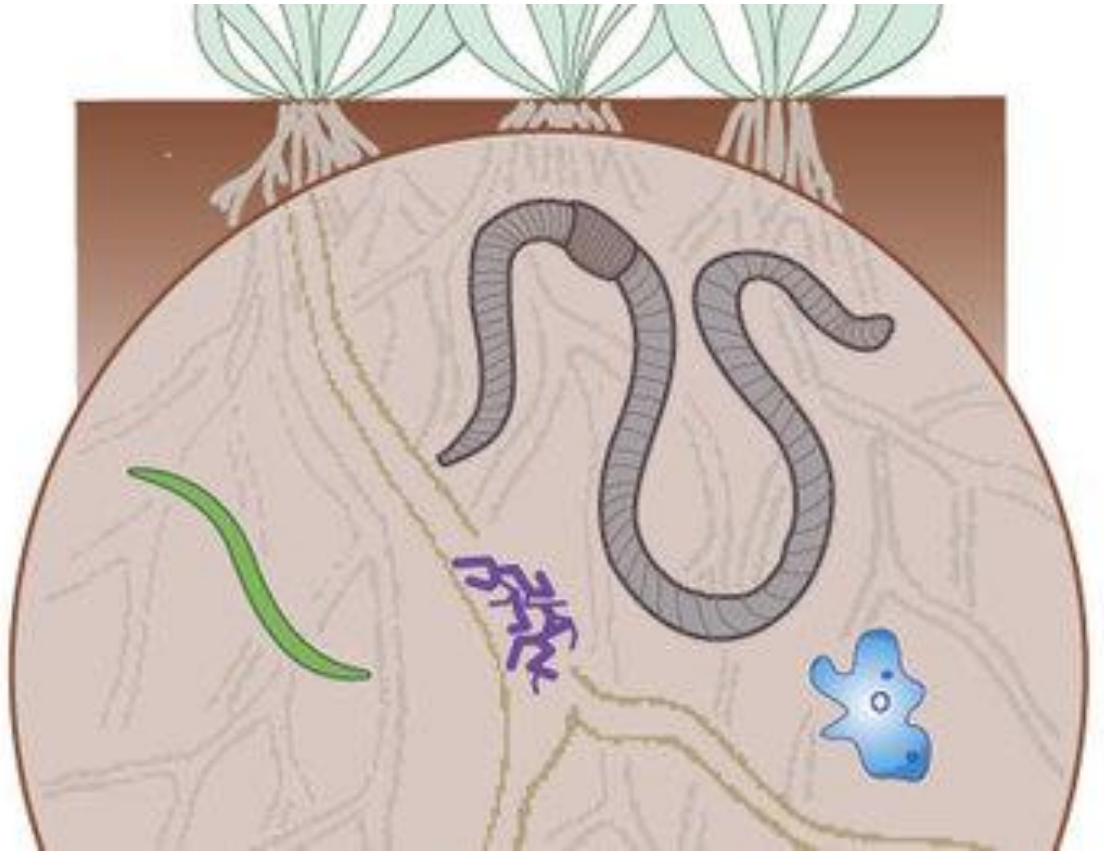
This is fungi

The Life in the Soil

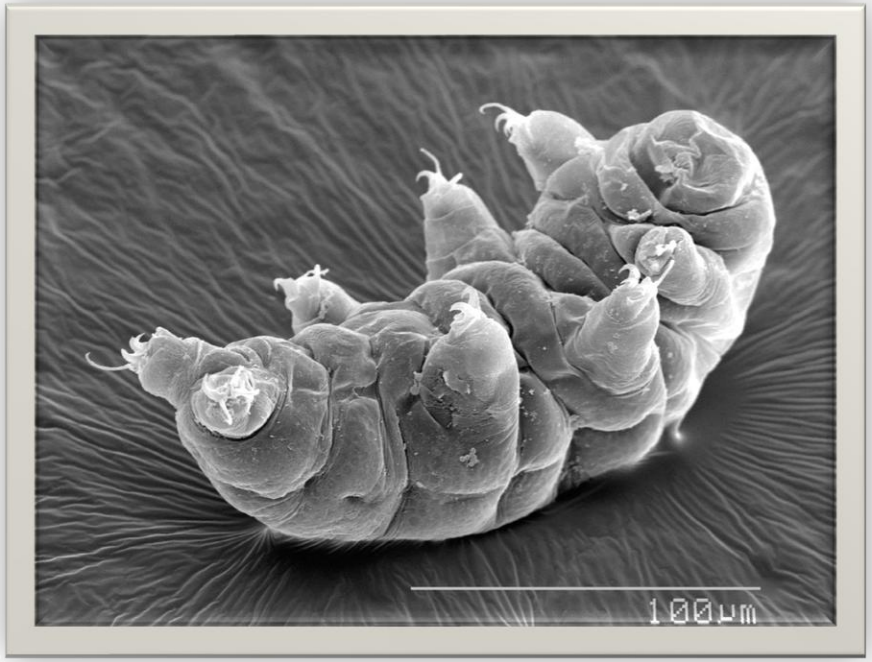
More than half of the earth's species live in the soil

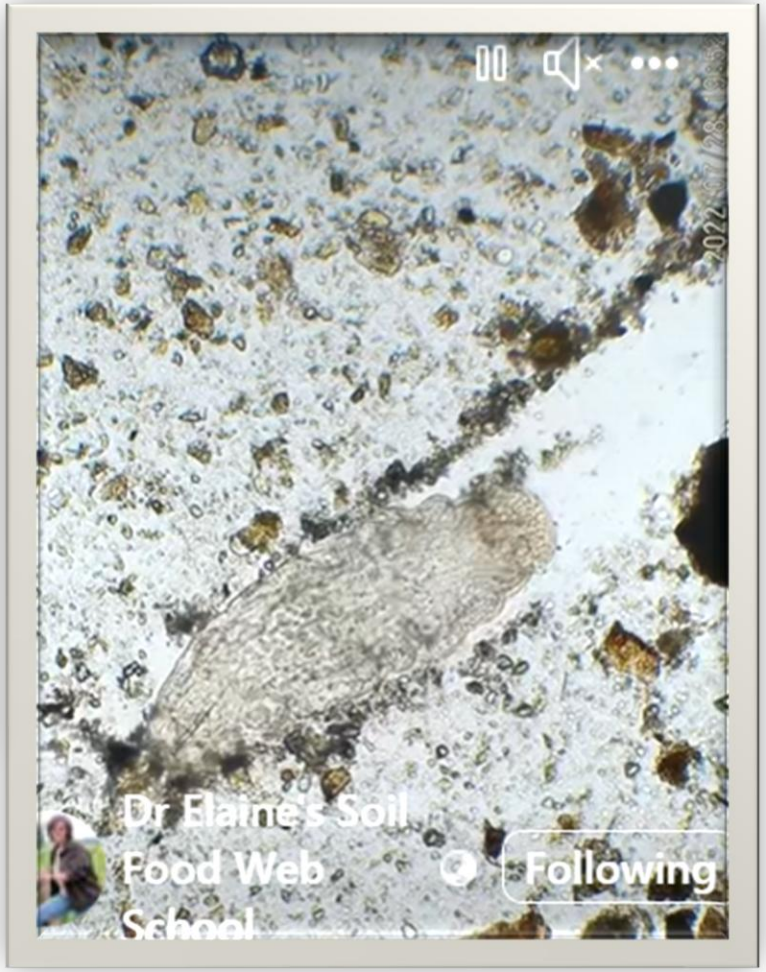
A recent study has found that soil is home to 59% of all life on Earth, from an insect feeding on the soil surface to a tiny microbe nestled in a soil pore. ***This discovery crowns soil as the most biodiverse habitat on the planet***

While we can see worms and a few other organisms, there is much much more life in the soil. It is just too small to see and its only with the invention of very very strong microscopes have we been able to discover the amazing diversity of organisms that live in the soil. And, yet at this time, we have only discovered less than 90% of the microorganisms living in the soil.



Strange Life in the soil- Tardigardes- magnified with a special microscope. —





Most tardigrades eat algae and flowering plants, piercing plant cells and sucking out their contents though their tube-shaped mouths. They are also called Water Bears

Life in the Soil- Microarthropod- magnified many thousands of times

These are just some of the organisms in the soil. Some you can just see, others you need strong microscopes. These are micro- arthropods. They love to eat bacteria and fungi.

Organic Matter Really Matters!

- Organic matter- consists of anything that was once living (remember: all living things are made of carbon) such as plant and animal matter (even a woolen jumper or cotton undies have carbon in them!)
- Soil Microorganisms (such as bacteria, protozoa, nematodes, fungi and algae) love to eat organic matter, and are an essential part of the decomposing process.
- The microorganisms eat the organic matter (and each other!) and the worms eat the microorganisms and fungi, then the worm's poo and this makes beautiful dark compost. This compost is full of nutrients that plants use to grow and produce food. Yum Yum!

Is your soil healthy- ?

Do you have any microorganisms?
Yes they are way too small to see but can you find some worms in your soil?
If you can find worms in your soil there will also be other microorganisms working hard.
This means you have healthy soil!

2. Inspect your fruit and veggies
Healthy soil will produce good quality fruit and veggies.
Good quality food will:
-**Look good:** bright and vibrant
-**Taste good**: sweet and juicy
-**Feel good**: firm not floppy
-**Smell good:** fresh and ripe
-**Sounds good:** "eat me!"

Is your soil healthy ?- an experiment

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3. Bury your undies! (nope we're not joking!)

Bury your undies to test how healthy your soil is!

(No we're not joking!) 🤭

THE LOW DOWN:

Healthy soil has microorganisms which you can't see, but they LOVE to eat anything made of carbon.

All living things are made of carbon, including natural fibres such as cotton, silk, bamboo and linen.

The carbon is a source of energy for the microorganisms, so healthy soil = carbon rich soil

The Undie Experiment:

INSTRUCTIONS:

1. The undies must be cotton or a natural fibre (linen, bamboo or silk)
2. Bury the undies so they are completely covered in soil (at home, at school or both!)
3. Leave them in the soil for at least 6 weeks

RESULTS:

If you only have elastic left, your soil is nice and healthy as the microorganisms in your soil have gobbled them up!
If your undies still look like a pair of undies there is very little life in your soil, sorry but your soil is not very healthy :(

'Soil Your Undies Challenge' was originally created by the USDA Natural Resources Conservation Service.

How did you go?

DID YOU BURY YOUR UNDIES?

Make sure you take photos and tag @soilweekaustralia OR email them to soilweekaustralia@gmail.com for a shout out and to be featured on our page!

For more information visit:
https://www.unediscoveryvoyager.org.au/2020/10/18/soil-your-undies

By sending in your photos you are consenting for your photos to be featured on Soil Week Australia's social media pages.

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Is your Soil Healthy- an experiment 2

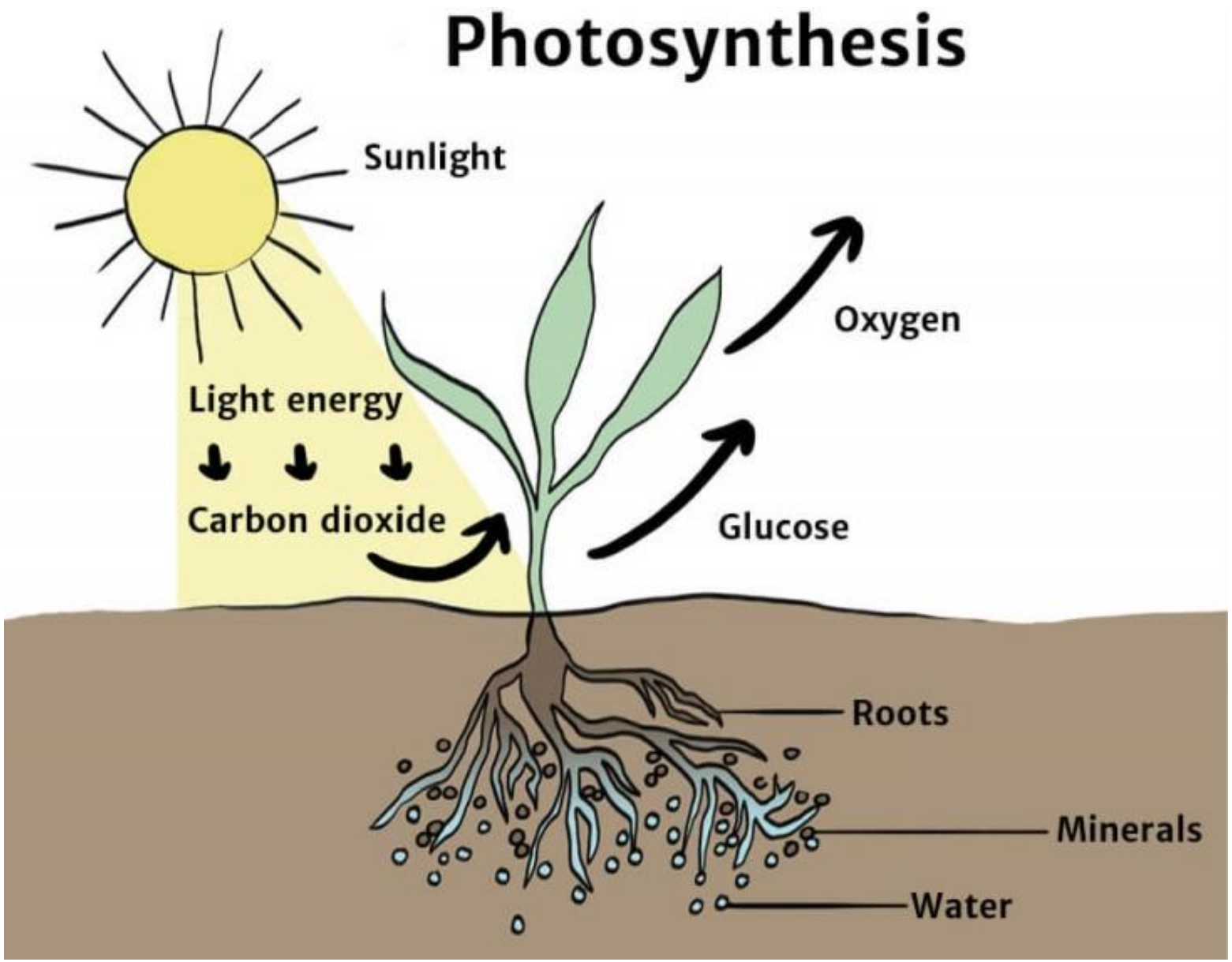
- Ray Archuleta- World expert on soil to farmers.

- Youtube
- Ray Archuleta
- Experiment on whether soil is healthy

- https://www.facebook.com/reel/1802253447235908

- Raythesoilguy@life.com

The power of sunlight



Photosynthesis is the process where carbon dioxide is drawn from the air and used by plants to help them grow.

Plants use sunlight, carbon dioxide (CO_2) from the air and water vapour from the land and create carbohydrates and oxygen. Just like you need carbohydrates from food to move and grow, plants need carbohydrates for energy too! They also send approx. 30% of the carbohydrates down their roots to feed the microorganisms and fungi in the soil below. These microorganisms then find other nutrients and water for the plant. **It's a symbiotic relationship (they both need each other to survive)**. As the microorganisms break down the organic matter and then die, humus is formed and the soil structure improves, making nutrients available to plants.

It's a team effort – photosynthesis

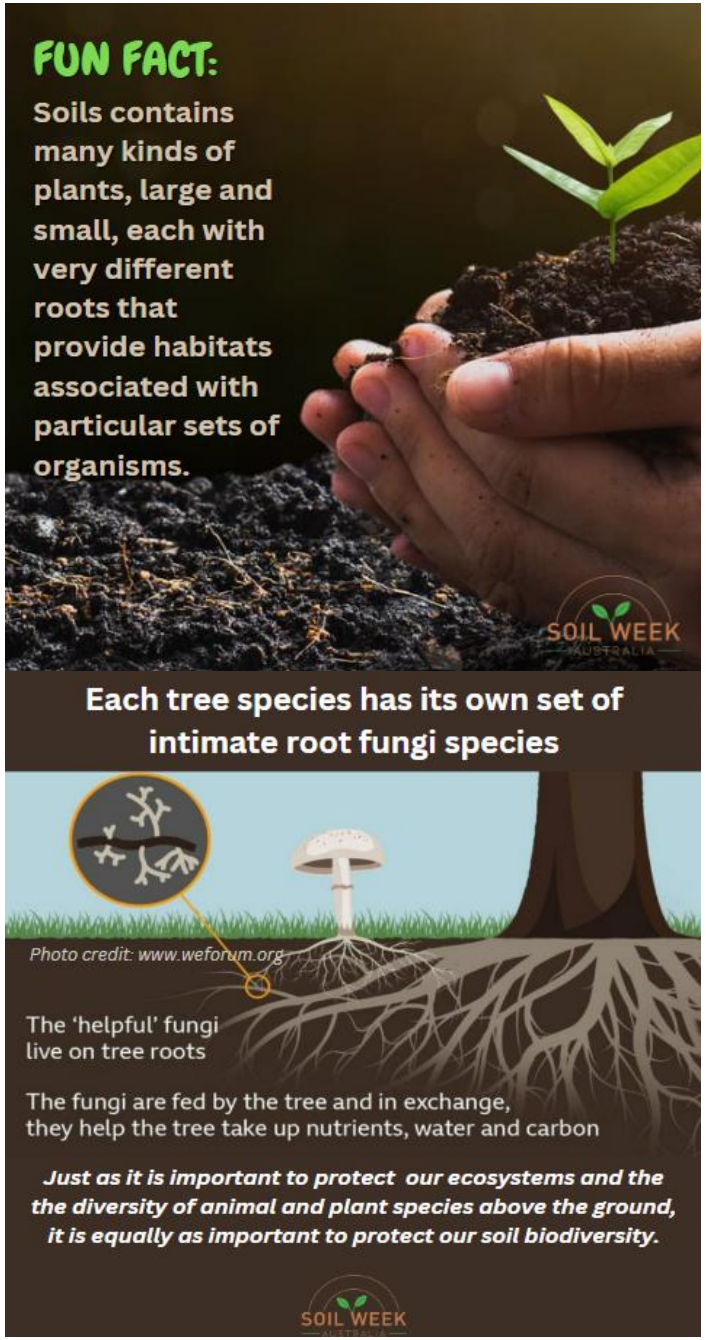
and energy for the life in the soil

What do microorganisms and fungi in the soil eat? - sugar. (*Good sugars, not the sugars you find in lollipops and fizzy drinks*). Plants and life in the soil have an arrangement to look after each other.

Through a process called photosynthesis plants make carbohydrates (sugars) and send some down the roots to the microorganisms who then give the plants the minerals and water they need.

The microorganisms and fungi also protect the plants against pests and nasty diseases.
Plants can't move around to find food themselves so they make friends with the fungi and microorganisms who can get it for them.

Now that's a great friend!



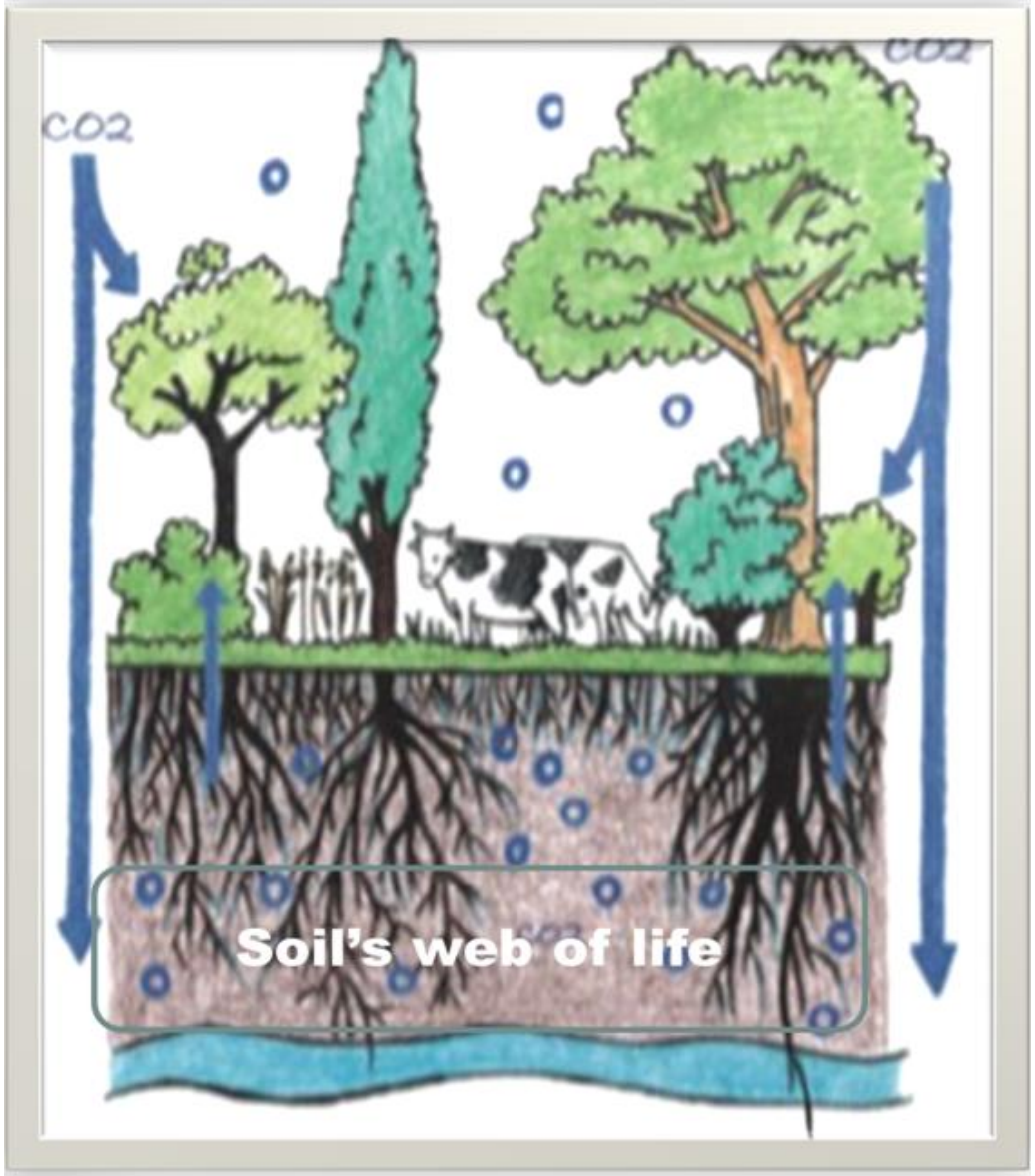
How we treat the soil makes a big impact

Healthy soil has lots of different microorganisms, worms, plants and trees in it. This reduces the need for synthetic fertilisers and pesticides. This results in food grown with less chemicals and environmental impacts.

Some agriculture practices damage the soil.
Ploughing destroys the soil structure. It kills the fungi in the soil and releases carbon from the soil (remember, carbon in the soil is good!). Pesticides and fungicides kills the good bugs as well as the bad bugs in the soil. Fertilisers act as fake food to plants. It is needed if there isn't much organic matter (nutrients) in the soil for the plants to eat.
Overuse of fertilisers can run off the land and damage waterways and cause environmental problems such as blue green algae in our lakes, which kills our fish.

If we look after our soil it can keep producing good quality, healthy food and a great environment for our wildlife.

Great ways to build soil health



1. Limit disturbance - mixing up the soil kills the fungi and the bacteria.

2. Keep the ground covered in plants. The life in the soil needs the sugars for energy, and they get that sugar from plants.

3. Lots of different plants above the ground means lots of different microorganisms below the ground.

4. Keep living roots in the soil. The microorganisms love to feed on old tree and plant roots.

5. Limit chemical fertilisers, pesticides - they kill the good guys (microorganisms and fungi)

Home gardening

Creating Black Gold

Your plants, fruits and veggies will love you for adding this dark nutrient rich food to the soil. Compost!
Compost and vermicast (worm poop!) adds structure to the soil, provides nutrients to the plants and your soil retains more water. This then leads to less need for synthetic fertilisers. Humus is 46% carbon, better to have carbon in the soil (where there is not enough of it) than in the air, where there is too much of it.

Healthy soil produces healthy plants which are resilient against pests and disease.

Compost
There are lots of different ways to make compost. Essentially the process mimics what nature does, it just speeds it up.

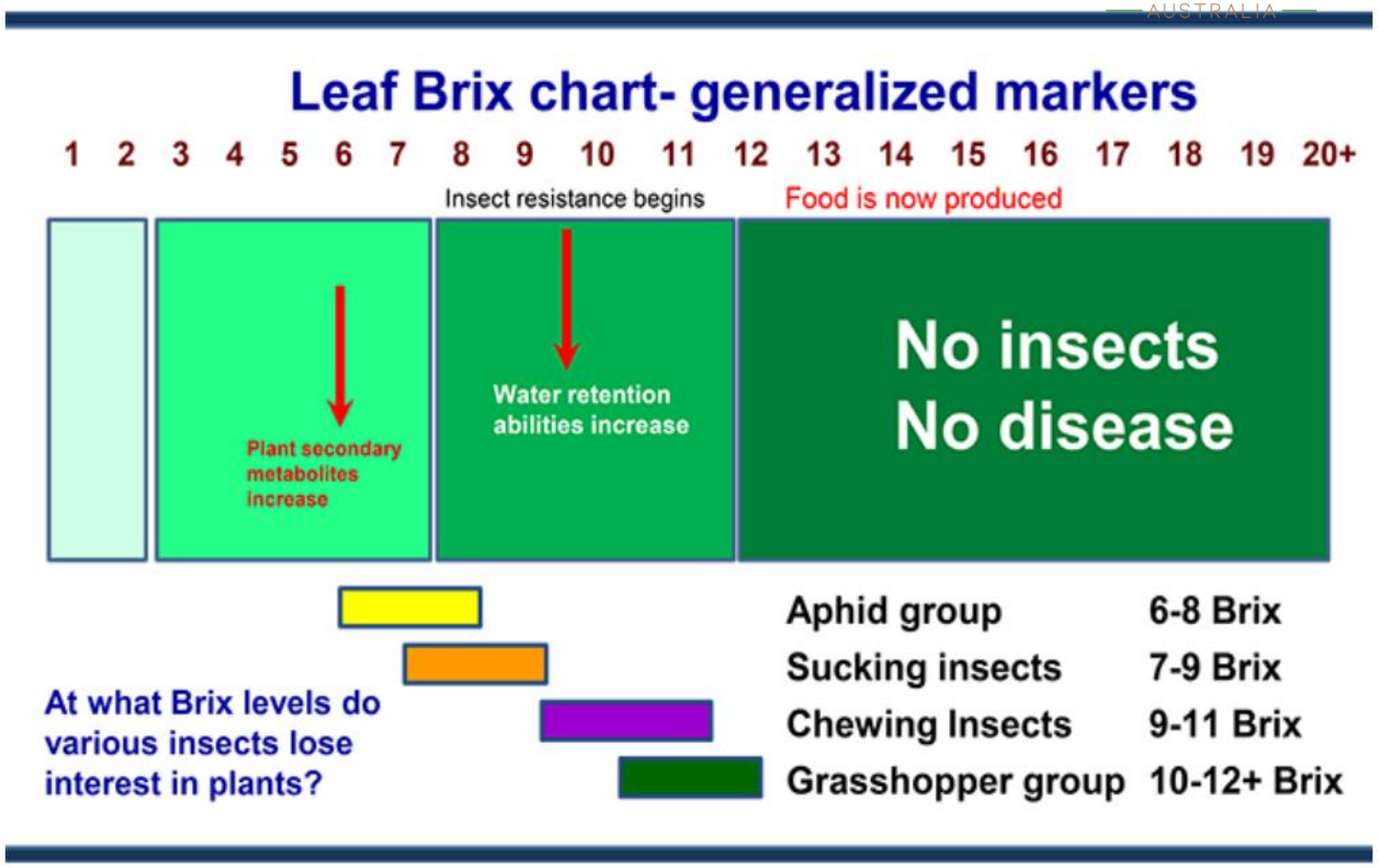
Recipe
Add 1/3 brown matter (such as Autumn leaves, sawdust, cardboard, small twigs) 1/3 green matter (green leaves, lawn clippings, coffee grounds) 1/3 manure (yep, you guessed it, poop!) Arrange the matter in layers in any container, wet thoroughly and mix regularly (weekly). The microorganisms love this mixture and will chomp it all up. The worms then come along to eat up the mixture and the microorganisms. It gets quite hot in the compost as the millions of microorganisms get to work. After a few months you will have lovely black gold, full of nutrients. Add this to your soil and your plants will love you.

Healthy Plants

Healthy food tastes better!
Fruits and seeds on plants are nature's way of reproducing themselves.

Did you know that fruit tastes so good because it is high in natural plant sugar. Fruits and vegetables that have a high sugar level are also high in essential vitamins and minerals, making them a more nutritious option. The level of sugars and minerals in plants is measured in Brix. The higher the Brix, the healthier the plant is. Farmers can use this cool tool to measure how healthy their plants are.

Fun fact: *The healthier a plant/crop is the less likely pests and diseases will attack it! This means more healthy food on our plates!*



https://joegardener.com/podcast/understanding-brix-how-it-affects-plants-pests/

Agriculture/Farming

Healthy soil reduces the need for farmers to use synthetic fertilisers and pesticides.

Long term sustainability

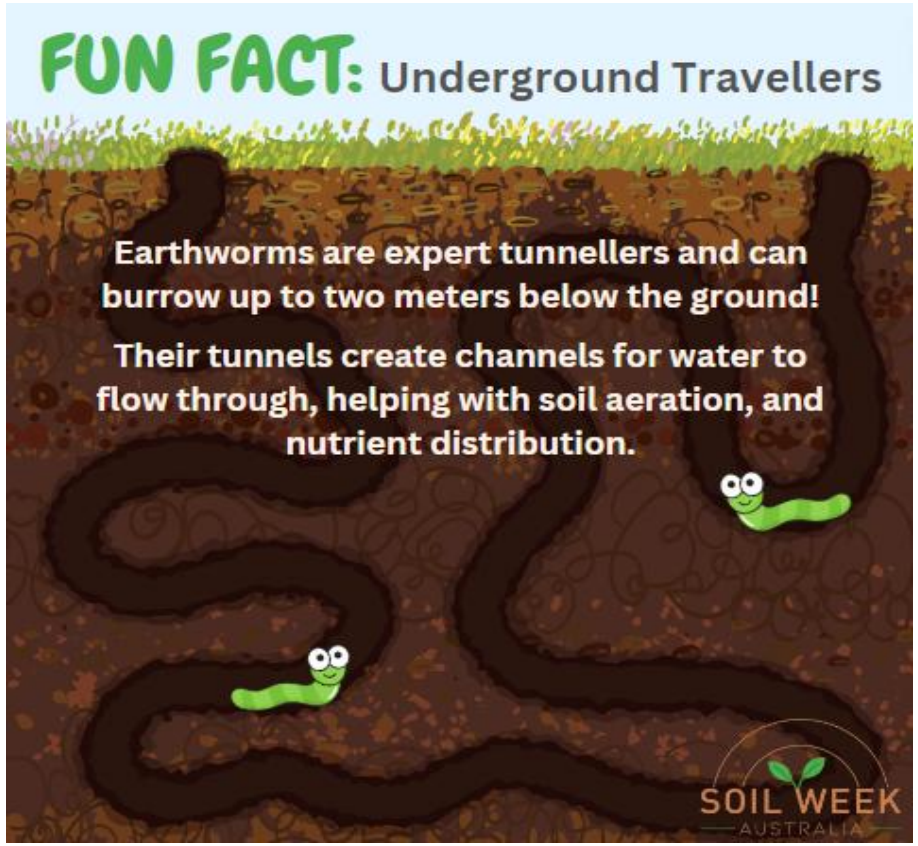
If farmers look after their soil, it will keep producing good quality food for longer.

Water infiltration

We want the water to go deep into the soil and not just run off the top. Water infiltration measures how quickly water goes through the surface of the soil. It is influenced by soil texture, structure and compaction. High infiltration rates (such as rain on the soil being absorbed quickly), indicates good structure and aeration. While in some circumstances rain just runs off the soil or land and is not being absorbed.
It is important for farmers to have good infiltration rates so that whenever it rain the water is absorbed and does not run off. For farmers living in areas of low rainfall they need to keep as much rain as they can.

Soil Compaction

Soil compaction is when the soil is too compact and has no air in it. It is very hard and difficult to dig through. It's not ideal because it makes it hard for plant and tree roots to grow through the soil to reach nutrients and water. Compaction occurs when there is little life in the soil and through some farming practices (such as tractor wheels compressing the soil). Compaction causes rain to run off the top of the soil and doesn't get absorbed, which can create flooding. If it is too hot and there isn't much rain, the compacted soil is too dry and just blows away. If this happens farmers need to use synthetic products to grow their crops.



Did You Know

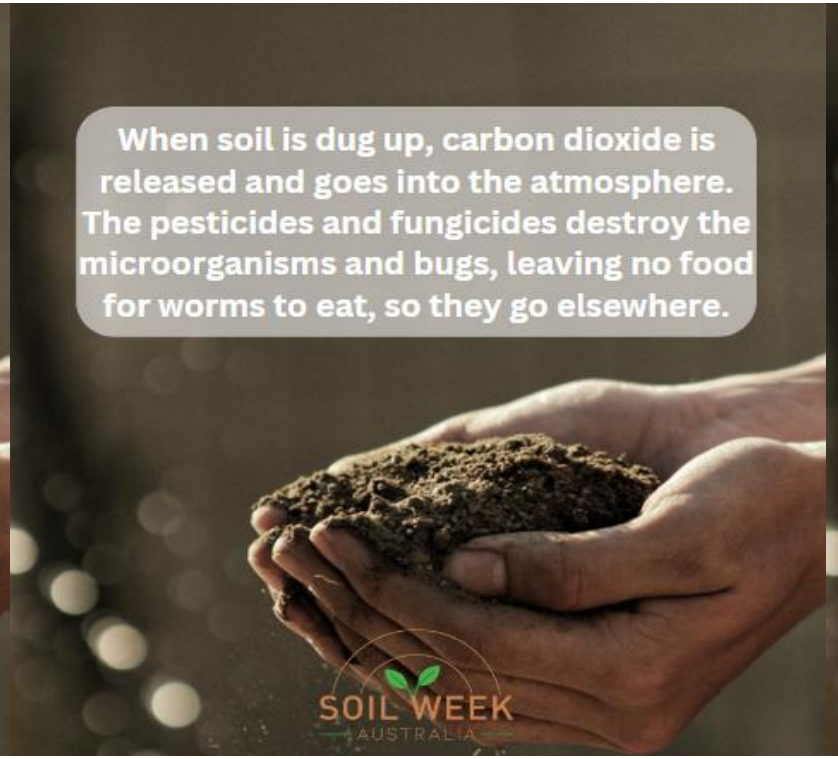
Nature Clean Up team

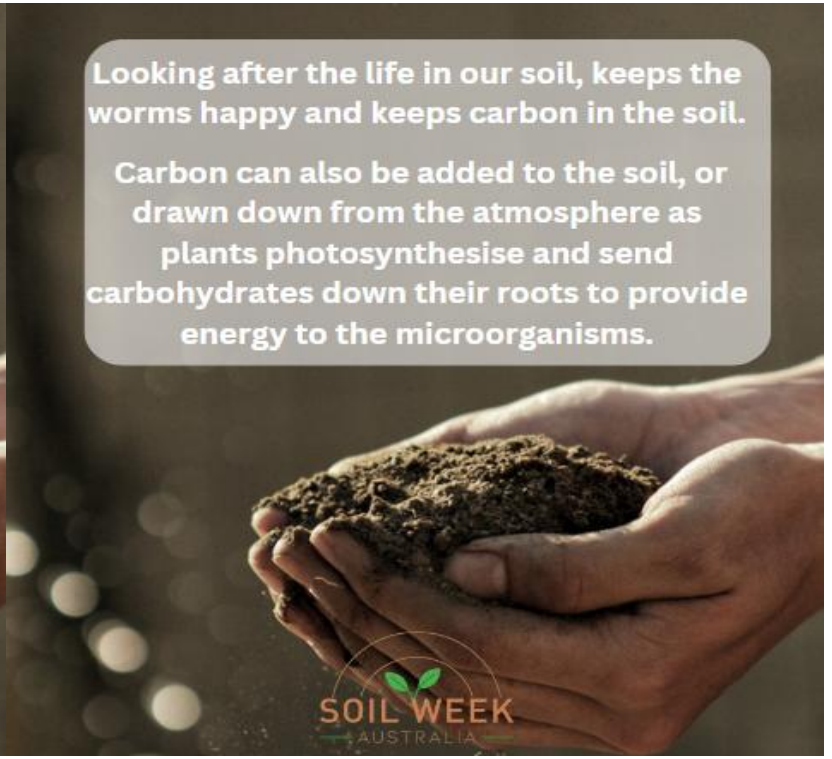
Pests and disease are natures clean up team. If plants are sick or unhealthy, pests and diseases will attack it and get rid of it.

Pests and diseases will generally not attack healthy plants.

In fact, aphids (also known as the Green Fly) can only digest unhealthy plants. Healthy plants have complex sugars that the aphid cannot digest.

Carbon in the soil is good



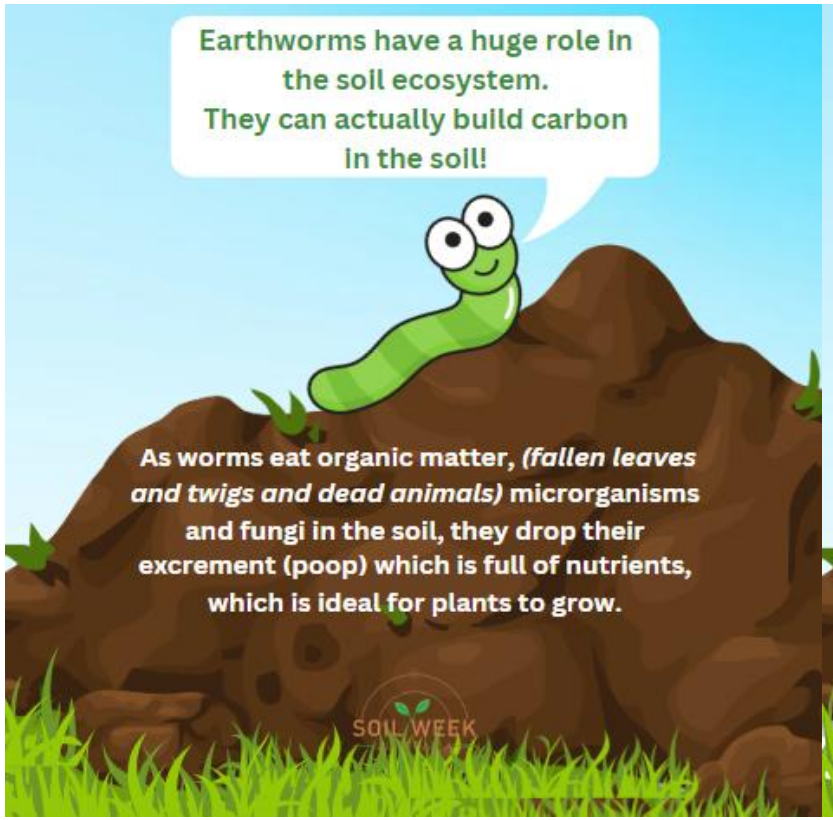


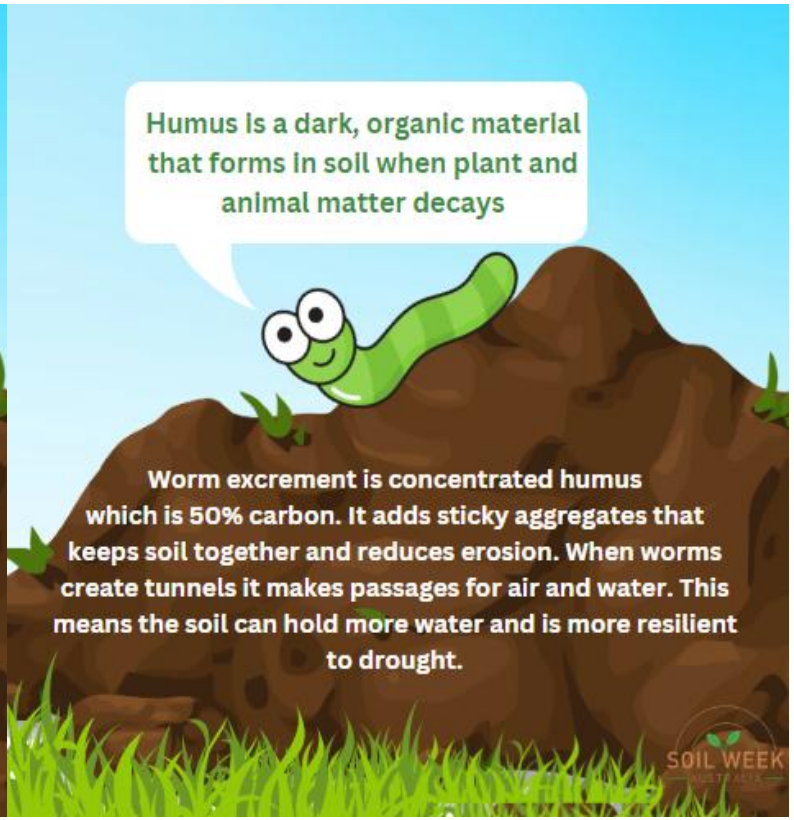
Carbon in the soil is good-2

Carbon is a primary component of all known life on Earth. Humans are made of carbon as well as all animals, trees and plants. Everything that has ever lived is made of carbon.

Carbon is stored in the humus of our soil.
(no not the delicious chickpea dip but the dark, organic material that forms in soil when plant and animal matter decays).

Too much carbon dioxide in the air is not good contributes to climate change.
Through photosynthesis carbon dioxide can be transformed into carbon and sent down into the soil through plants. This improves the structure of the soil and can reduce the carbon in our atmosphere.





Plants and our food

The food we eat contains proteins, minerals and vitamins. The soil our food grows in provides the nutrients for the plants to grow. Soil with lots of microorganisms, fungi and nutrients produces food that has more vitamins, minerals and phytonutrients than food grown in poor soil with chemical fertilisers. nutrient dense food. This food is much better for us to eat.

If the soil has no life in it, then it needs chemical fertilisers and pesticides. Too much of these are not good for our health.

The plants still grow but they are weak and less nutritious.

Which celery would you prefer to eat?

Remember:

*Healthy soil is carbon rich, has good structure and holds water to provide nutrients to plants.

*Healthy soil has lots of life in it (microorganisms, fungi and worms)

*It is a symbiotic relationship between plants and the microorganisms

*Healthy soil = healthy plants = healthy food

*How we treat the soil abd its life matters. Looking after our soil will enable the soil to do what nature wanted it to do. Store water and nutrients and grow healthy plants that we can eat. And the animals are looked after too.

Agriculture/Farming

Healthy soil reduces the need for farmers to use synthetic fertilisers and pesticides.

Long term sustainability

If farmers look after their soil, it will keep producing good quality food for longer.

Water infiltration

We want the water to go deep into the soil and not just run off the top. Water infiltration measures how quickly water goes through the surface of the soil. It is influenced by soil texture, structure and compaction. High infiltration rates (such as rain on the soil being absorbed quickly), indicates good structure and aeration. While in some circumstances rain just runs off the soil or land and is not being absorbed.
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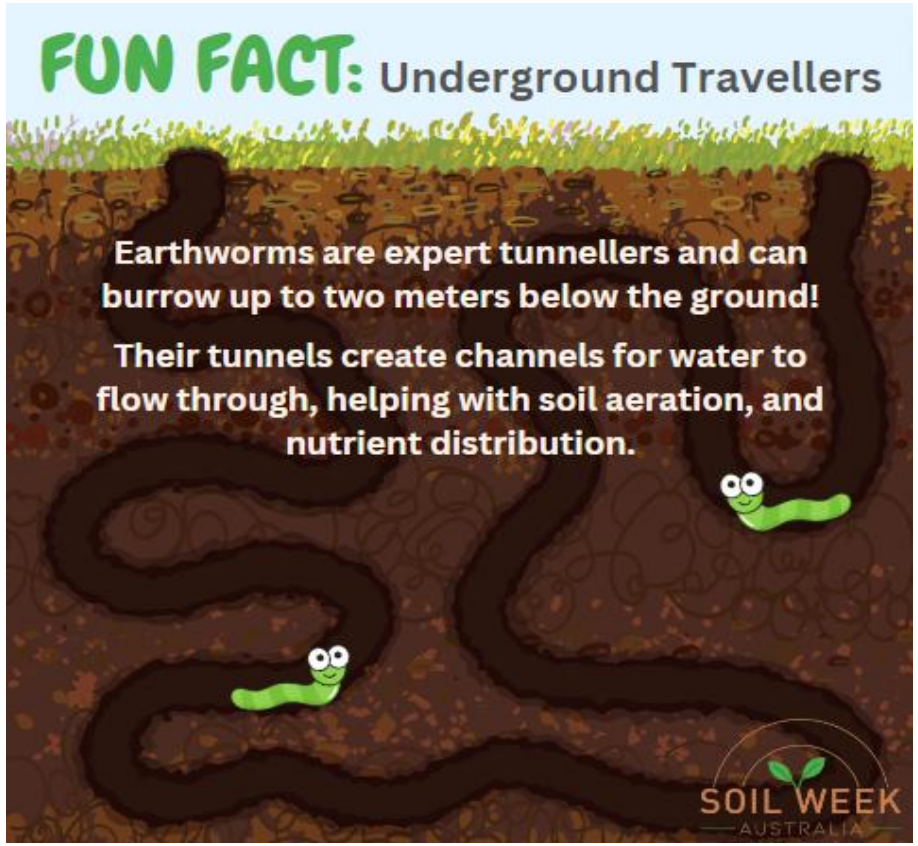

Soil Compaction

Soil compaction is when the soil is too compact and has no air in it. It is very hard and difficult to dig through. It's not ideal because it makes it hard for plant and tree roots to grow through the soil to reach nutrients and water. Compaction occurs when there is little life in the soil and through some farming practices (such as tractor wheels compressing the soil). Compaction causes rain to run off the top of the soil and doesn't get absorbed, which can create flooding. If it is too hot and there isn't much rain, the compacted soil is too dry and just blows away. If this happens farmers need to use synthetic products to grow their crops.

Resources

https://soilweekaustralia.com.au/resources/
The United Nations Food and Agriculture Organisation (FAO) has a wealth of information on healthy soil.
https://www.fao.org/world-soil-day/campaign-materials/en/
https://rodaleinstitute.org/why-organic/organic-farming-practices/soil-health/
https://www.fao.org/americas/events/event-detail/celebration-of-world-soil-day/en
https://soilhealthinstitute.org/contact/ US based but good information
https://consciousplanet.org/en/save-soil. Oriented towards older students
https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soils/
https://farmersfootprint.org.au/
https://soilsforlife.org.au/soils-in-schools/
https://megconnolly.com/2023/04/21/regenerative-agriculture/
A great series of short videos by Elaine Engham, each less than 5 min on soil and carbon .
https://www.youtube.com/channel/UCSAU5ludwNyqMHBaR1ZfheQ

Books

- "The Good Garden: How One Family Went from Hunger to Having Enough" by Katie Smith Milway and illustrated by Sylvie Daigneault. This book tells the story of a Honduran boy named María Luz and his family who learn sustainable farming practices.
- "Compost Stew: An A to Z Recipe for the Earth" by Mary McKenna Siddals and illustrated by Ashley Wolff. This book introduces children to the concept of composting and its importance in creating healthy soil.
- Life Rocks- big Book Series- The SOIL Book. A great book for primary students. Beautifully illustrated.