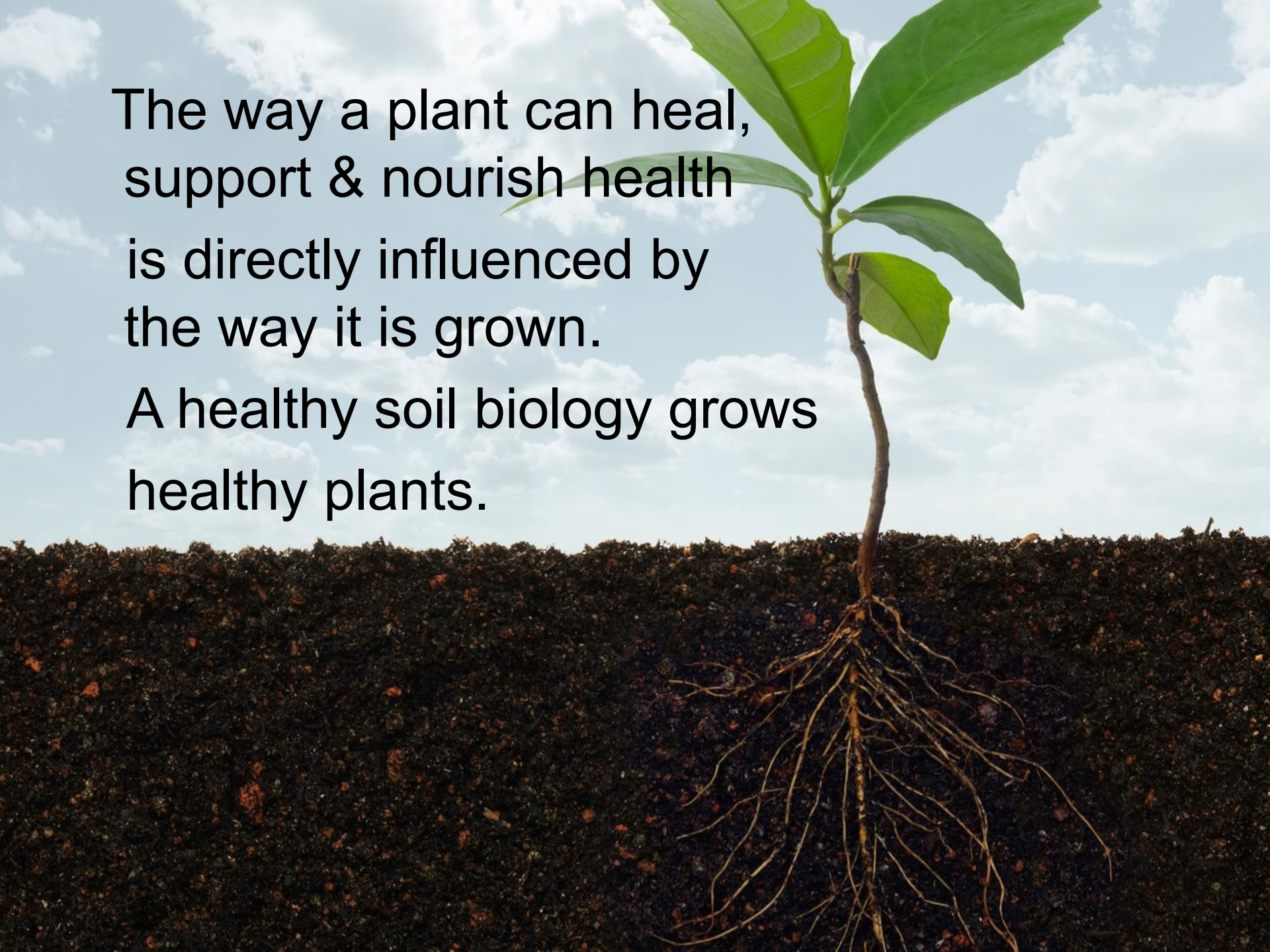
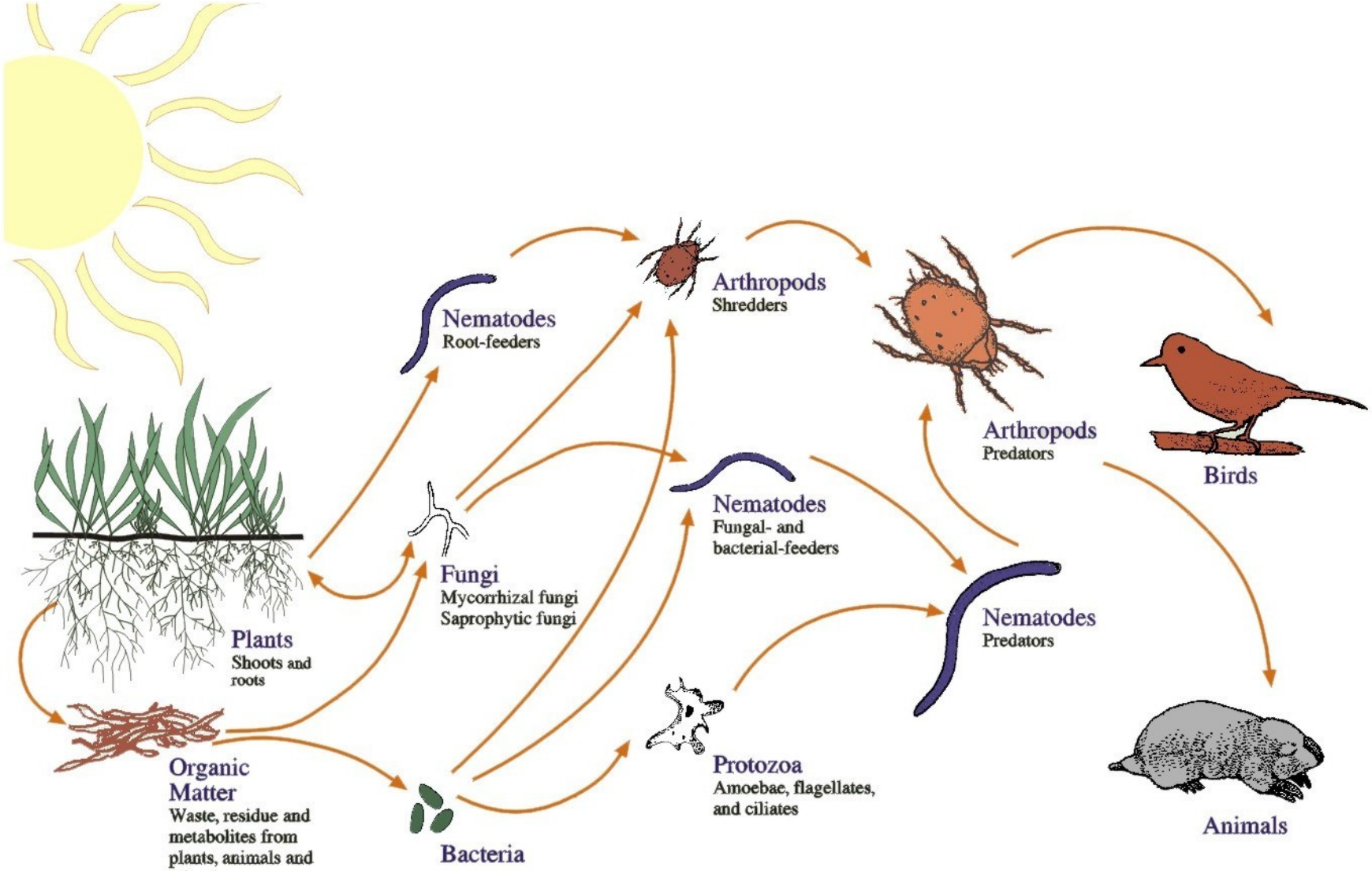

Connecting
Soil & Human Health

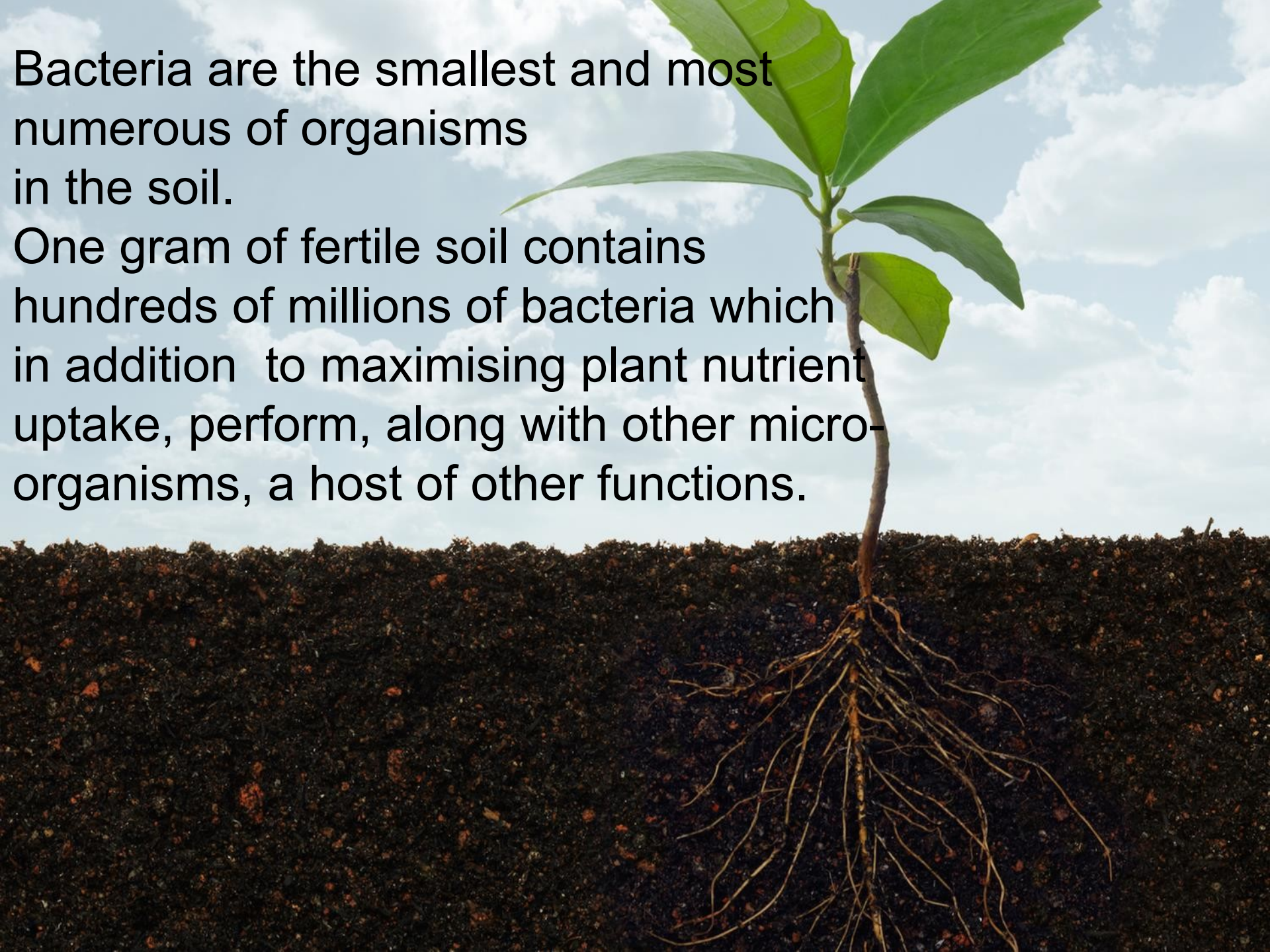

The way a plant can heal,
support & nourish health
is directly influenced by
the way it is grown.
A healthy soil biology grows
healthy plants.

Most of our food comes from the soil. Modern industrial agriculture through the use of chemical fertilisers, fungicides, herbicides, pesticides, failure to add sufficient organic matter and heavy tillage devastates soil micro-organisms. Bio-dynamic, organic, natural & regenerative farming systems cultivate & feed the life in soils supporting the natural ecosystem often called the soil-food web.

The Soil Food Web

During photosynthesis plants combine CO_2 from the atmosphere and sunlight to produce simple sugars and carbohydrates. These sugars are then fed via plant roots to fungi and bacteria so that they flourish & increase their number. These micro-organisms decompose organic matter and absorb nutrients into their body. Predatory micro-organisms, nematodes & protozoa, then consume the bacteria and fungi the waste left behind by these predators releases nutrients in a plant available form.


Nematodes
Root-feeders
Arthropods
Shredders
Arthropods
Predators
Birds
Plants
Shoots and
roots
Fungi
Mycorrhizal fungi
Saprophytic fungi
Nematodes
Fungal- and
bacterial-feeders
Nematodes
Predators
Organic
Matter
Waste, residue and
metabolites from
plants, animals and
microbes.
Bacteria
Protozoa
Amoebae, flagellates,
and ciliates
Animals


Bacteria are the smallest and most numerous of organisms
in the soil.
One gram of fertile soil contains hundreds of millions of bacteria which in addition to maximising plant nutrient uptake, perform, along with other micro-organisms, a host of other functions.

Protect plants from pathogens

bacteria produce compounds to fight off pathogens and disease

Phosphorous

microbes convert phosphorous in soils into the ionic form phosphate that plants take up

Create soil stability

micro-organisms through the formation of micro-aggregates create soil stability. Stable aggregates h protect organic matter, improving soil structure, water holding capacity, and drought resistance.

they play a critical role in the capture, filter, and storage of water

Soil is a major store of carbon

Organic farming is based on taking care of the soil, nourishing the soil with composts, manure and regular rotations, and keeping it covered with different crops throughout the year. This helps build 'soil organic carbon', and as a result, long term studies have shown comparing organic and non organic farming systems that soils in organic farms store more carbon. Organic farming would substantially reduce GHG emissions and make agriculture more resilient to the effects of climate change.

Natural farming methods reduces nitrogen pollution

Nitrogen is an element essential for all life on earth and vital in food and farming. But when used in excess it becomes a dangerous pollutant in the iir rivers and sea.

A fundamental principle of natural, organic and bio-dynamic farming is to feed the soil which in turn feeds plants and crops

Reviews of multiple studies show that organic food grown in well aerated soil, rich in humus and teeming with microbial life has significantly greater levels of vitamin C, iron, magnesium, and phosphorus than non-organic varieties of the same foods and provide greater levels of a number of important antioxidant phytochemicals (anthocyanins, flavonoids, and carotenoids)https://pubmed.ncbi.nlm.nih.gov/20359265/

Up until recently eating raw fruit and vegetables from the fields or garden was common place and ingesting soil based organisms with the food we ate would have been the norm simply because of the way we grew, harvested and prepared our food.

Today particularly for those living in urbanised societies, unable to grow food, contact with soil is lost along with the benefits connection brings.

Exposure to soil based organisms strengthen the immune system.
The loss of contact with beneficial bacteria in the natural environment may have negative consequences on human health. 1
This is supported by the ‘hygiene hypotheses’ which suggests that environments with rich microbial diversity protect against allergies and autoimmune disorders. 2.3

1.https://www.frontiersin.org/articles/10.3389/fmicb.2017.01935/full
2.Natural immunity https://pubmed.ncbi.nlm.nih.gov/21979814/
3.Hygiene hypothsis https://pubmed.ncbi.nlm.nih.gov/19120493/

Recently a field of science and enquiry has emerged exploring the link between the microbiomes within soils and the human gut.

A scientific study* undertaken at the University of Natural Resources and Life Sciences in Vienna found that the microbiota in our environment influence the human intestine microbiome, via direct contact with soil as well as via food quality

* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6780873/

Whilst the exact way soil and the environment shape the human gut microbiome has yet to be fully understood, researchers in Vienna conclude that connection with and food from healthy soil is crucial to the health of our gut microbiome. Depletion of microbial richness in our soils claim the researchers has had a serious and deleterious effect on our own health

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6780873/

Comparative analysis of the gut microbiome of hunter-gatherers with that of westernised industrial populations is also beginning to yield important insights. The microbial diversity in industrial groups is far below that of the Hadza, as well as those of other rural farming communities in Burkina Faso, Malawi and South Africa

https://www.scientificamerican.com/article/hunter-gatherers-have-diverse-gut-microbes/

Locally grown fruit and vegetables contain more nutrients

Eating locally means you'll be eating in season

Buying local foods builds more connected communities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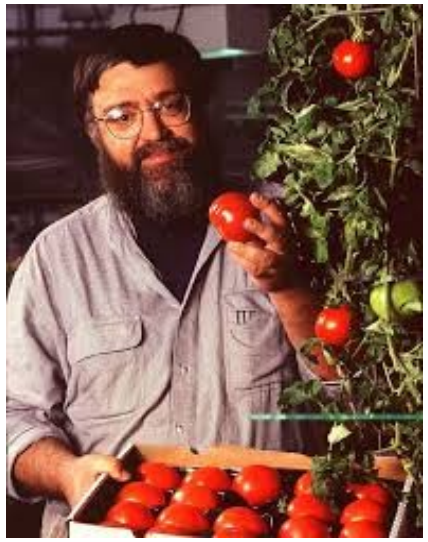

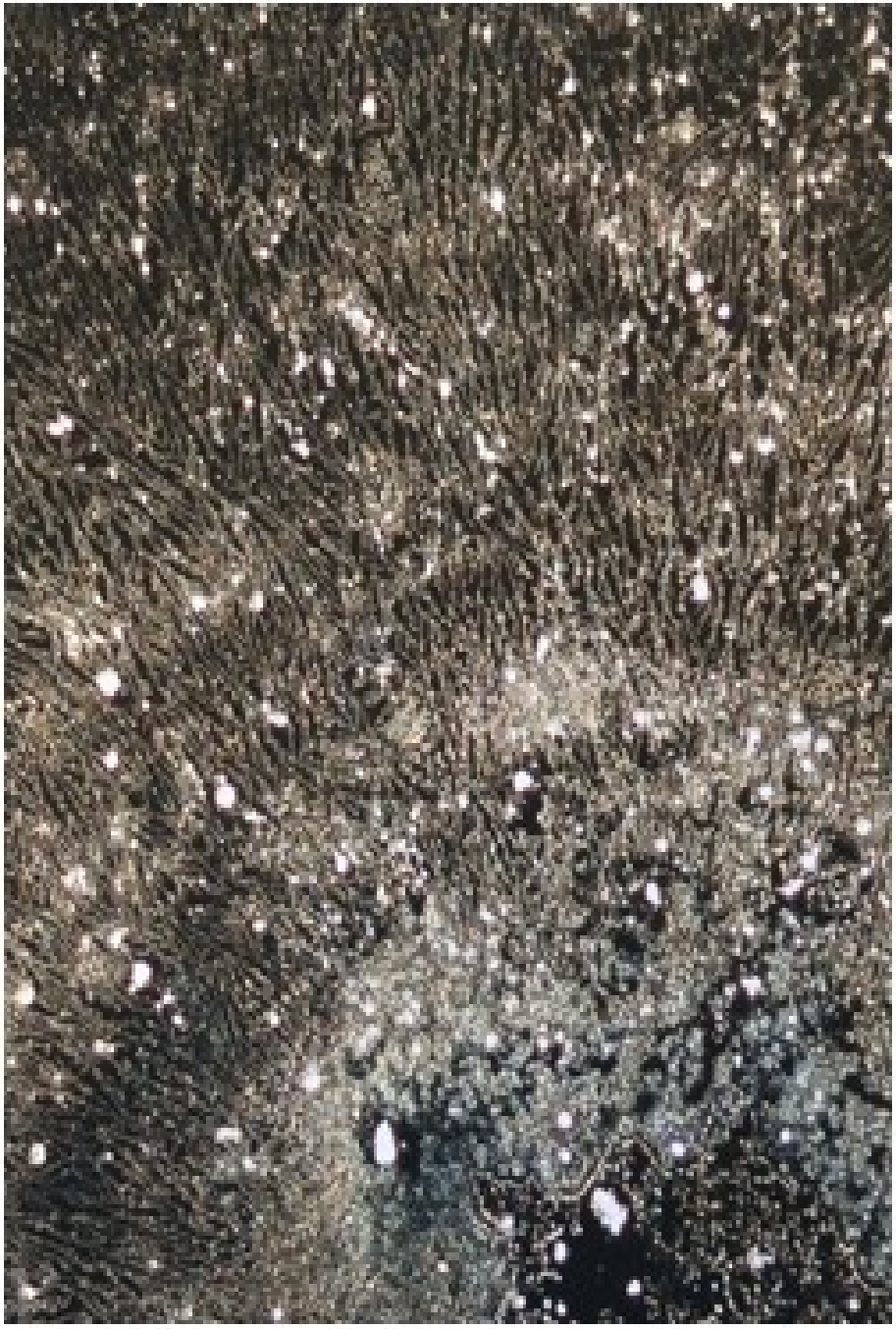

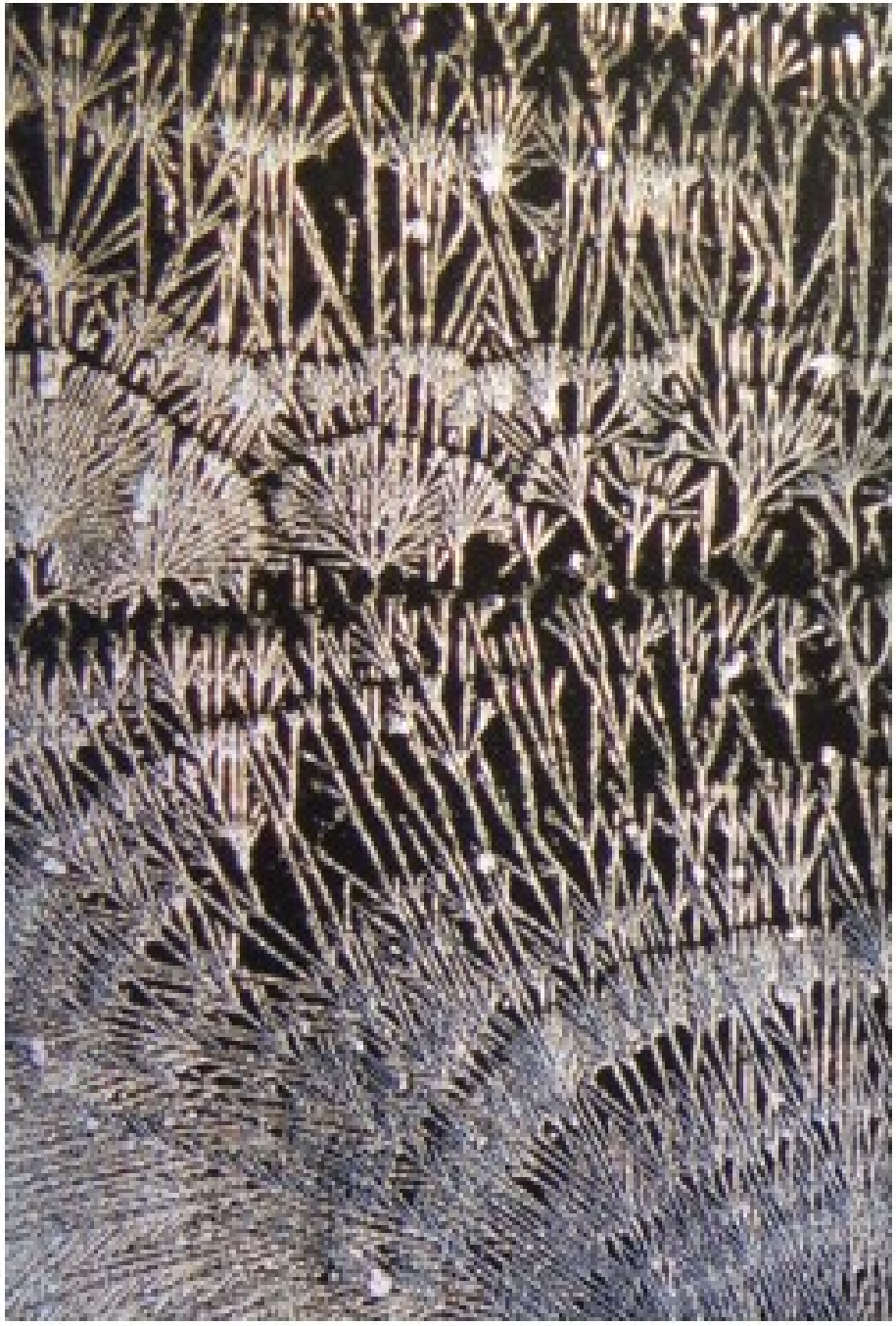

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The invisible power within food. A.W.Danzer

Find out more about soil biology from Elaine Ingham

https://www.soilfoodweb.com