News&Views

In focus

DOWN TO EARTH

Soil produces 95% of our food, so we all have a stake in a growing movement to improve its health, writes Anna-Marie Julyan

In her 1943 book *The Living Soil*, Lady Eve Balfour wrote: "Society, like a house, does not start at ground level, but begins quite literally beneath the surface of our planet, within the soil itself. For out of the soil are we fashioned, and by the products of the soil is our earthly existence maintained."

Her book inspired the founding of the Soil Association three years later and, almost 80 years on, that link endures between the dirt we dig – a combination of minerals, organic matter, air, water and living organisms – the food we eat and our health.

Soil produces 95% of our food. It also contains more than three times the amount of carbon in the atmosphere and four times the amount stored in all living plants and animals. As soil degenerates, it releases that carbon into the air, making healthy soils crucial to tackling the climate crisis.

"It's often overlooked, but healthy soil is also pretty much the only thing that stops most of the world's rainwater simply washing back into rivers," explains Compassion in World Farming CEO Philip Lymbery. "It holds water against gravity to make it available to our crops, creating drought and flood resistant landscapes."

Philip's latest book, *Sixty Harvests Left: How to Reach a Nature-Friendly Future*, gives soil a starring role. And little wonder. Globally, soil is being lost 10-40 times faster than it's formed and one third of arable soils are degraded. A 2020 review estimated that only 30-40% of Europe's soils are healthy. The UK has 700-plus soils, varying across type, region, geography and weather – a complexity and variability that can make them difficult to monitor and protect.

But strides are being made to encourage solutions that enable our soils to thrive. These include the growing regenerative farming movement, new government legislation that incentivises landowners, and public commitments from companies such as the John Lewis Partnership, which promises all of its supplier farms will be net zero by 2035 – its own Leckford Estate is on track to achieve this by 2024.

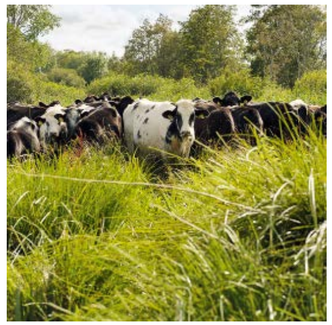
When he spoke at the John Lewis Happier World conference last autumn, Philip called for us to 'bring back the elephant'. He wasn't suggesting that the world's largest land animal should arrive, hot on the heels of beaver reintroductions, and thunder through the British countryside.

"I'm not talking literally about elephants," he explains. "But about the weight of life that should be in a single hectare of healthy soil. Treat it right and a hectare of arable land – little more than a football pitch – can hold as many as 13,000 species of life with a weight of five tonnes, about the same as an elephant."

As for how we get there, he describes a three 'Rs' approach: Regenerating the countryside, Rethinking protein and Rewilding. "The big rewilding opportunity is on farmland, which occupies 70% of our land surface in the UK," he says. "Regenerating the countryside relies on the restoration of farmed animals to the land as part of mixed, rotational farms, while balancing our diets with more ingredients from plants and alternative proteins. There would be far fewer animals overall but you're keeping them in the right way."

At the Waitrose farm on the Leckford Estate in Hampshire, for the past three years cattle have been brought onto the arable land as part of a 12-year mixed arable and livestock rotation, which involves grazing animals and growing crops on the same piece of land in sequence. Cattle graze on fields planted with herbal leys (temporary grasslands made up of diverse legume, herb and grass species), which might then be sown with cereal crops such as barley or wheat, followed by winter cover crops which keep soil covered and can also be grazed.

The cattle therefore move around the whole farm helping increase organic matter in the soil, explains Partner and Leckford Farm general manager Andrew Ferguson. Their muck and the nutrients they cycle help contribute to a thriving soil food web. "We're getting the fundamentals right, which leads to a build-up of bacteria, fungi, nematodes, protozoa, earth worms, beetles and spiders. A healthy soil is full of life – soil health is about diversity at all levels."



FIELD GOALS Crops growing (above); Sarah Langford (top right); cows grazing at Leckford (right); Philip Lymbery (below)

With our own diet, diversity is important, too. A key example is scientist Dr Tim Spector's 30 plants a week diet – nuts, seeds, grains, herbs, spices, fruit and veg all contribute, as outlined in his book *Food For Life: The New Science of Eating Well*.

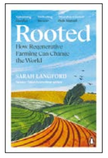
Diversity is the regenerative method that writer and farmer Sarah Langford has come to appreciate most. She trained as a criminal defence and family barrister before taking on her in-laws' farm, which led her to write *Rooted: How Regenerative Farming Can Change the World*. "I wanted to become a defence advocate for farmers, to explain why farmers made the decisions they had and how this regenerative farming revolution was growing, allowing farmers to take control from chemical and fertiliser companies back into their hands," she says.

'Our connection to each other and the natural world is about joy and what it is to be alive'

In its 2021 *Saving our Soils* report, the Soil Association says a drive to farm for high yields and cheap food led to specialisation that disrupts soil's carbon and nitrogen cycles. Moving away from diverse and circular mixed systems meant losing crop rotations featuring legumes, to build soil fertility, or livestock to provide manure to the field. Transporting soya and wheat long distances to feed intensively reared animals became common.

The report names 'seven ways to save our soils' – from monitoring soil health on farms, to encouraging life underground by reducing tillage (ploughing) and chemicals, covering up bare soil with continuous plant cover and increasing the amount of plant and animal matter going back on to fields, as well as calling for national soil strategies.

The message, says Sarah, is that we should remember and marshal our own links to the soil. "Understanding our connection both to each other and the natural world is not just about responsibility. It is also about joy and what it is to be alive."



POWER OF YOUR PLATE

As consumers, we have a lot of sway through our food choices to help make changes for the better

"Eat more plants and less and better meat and dairy, meaning from pasture-fed, free range or organic sources," says Philip Lymbery. "Plant-based meals are getting better all the time at replicating the taste and convenience of meat."

To get more plants into your diet, Tim Spector's suggestions include swapping half the meat in a bolognese, stew or curry for beans, lentils or tofu, embracing Meat-Free Mondays, adding seeds and toasted nuts to salads and experimenting with grains such as barley, spelt, bulgur and quinoa.

Eating or growing more pulses will help the soil. There's a wide variety to explore, including peas, beans and lentils, all of which fix nitrogen and boost microbial activity and diversity. They will also help other crops access more nutrients as part of rotations which benefit the soil.

TASTY Waitrose PlantLiving Moroccan Style Falafels

Photographs: Getty Images, CIWF + Richard Dunwoody, Richard Allenby-Pratt/ The Suffolk Project

In my opinion

FI GLOVER

The journalist and broadcaster has her say

Would you like to be augmented by a robo appendage or an exoskeleton? You'd be forgiven for not really knowing what I mean, but both of these incredible things are here to stay. No longer are we just humans, dealing with the world in the bodies we were born with. We're now being given the opportunity to make ourselves truly bionic.

The latest exoskeleton is a game-changer for anyone who needs to lift heavy stuff. The Cray X, made by German Bionic, is a wearable device which powers the way you lift. With fixings around the top of your thighs and lower back, the power-assisting pack acts as a mini hydraulic lift, which means you can pick up or move heavy items more safely and carry them for longer. For nurses and care workers who need to lift or turn over patients, it could be groundbreaking stuff.

It's one of many ways our bodies are hosting new technology. This month's American Association for the Advancement of Science conference in Washington DC was full of scientists showcasing extraordinary augmentations using wings, tentacles, extra fingers and thumbs. The powers we once gave ourselves in our dreams are becoming realities.

How do these things work? Let's take the thumb, which has been developed by scientists at Cambridge University. It's a robotic device worn opposite the user's own thumb, near the little finger, and its actions are controlled through pressure sensors attached to the user's feet. Tamar Makin and Dani Clode, the scientists behind this, have been testing the futuristic digit with remarkable results. Participants in their trial found that, within days, their brains had adjusted to the new demands and they were able to use their thumbs to pick up multiple balls or wine glasses with one hand. One worry for the researchers had been that the human brain might lose its ability to send signals to existing limbs if you popped a new one in it, but this doesn't seem to have happened.

'No longer are we just dealing with the bodies we were born with, we're now being given the opportunity to make ourselves truly bionic'

The capacity to pick up more wine glasses is not the world's most pressing problem, but the idea that our brains can adapt to new limbs is the stuff of magic. There are so many possibilities for these robo appendages – serious and daft. You could have a tail to bring you greater balance or to flick around as a display of emotions – like a fed-up cat. I wouldn't mind a couple of fins to see how that helps my swimming. Anyone for a swooshing tentacle to reach those hard-to-get to places? Bring this extraordinary future towards me, and yes, I am using my extra arm to do this.

Fi Glover and Jane Garvey's show runs on Times Radio from 3-5pm, Monday to Thursday. @fifiglover