episode 48 show notes and advice

On today's episode we have entomologist and author, Dave Goulson, who Sarah deeply admires. She wanted to interview him especially for this New Year podcast because his books about pollinators are so inspiring and motivating, full of practical things we can all do in our gardens to help make a difference. His latest book, *Silent Earth: Averting the Insect Apocalypse*, is about how essential insects are to life. Dave charts the shocking decline of insect populations and what we can all do to help reverse this. It is a galvanising call to action Sarah and Arthur want to share with you.

In this episode, discover:

- How Dave discovered bumblebees have kind-of smelly feet, or certainly leave an aroma which shows that they've been there.
- Why earwigs are your garden friends not foe.
- A wildflower success story in Stirling.
- Dave's top tips for what we can start doing in our gardens now to make a difference.
- Sarah's New Year message – if we all club together, our gardens combined, we can all help turn things around.

Episode 48 advice sheet

How Dave got into insects

Dave was fascinated by insects from an early age. He starts *Silent Earth* with a memory of being five or six years old at his primary school. It was lunchtime and he saw yellow and black caterpillars on some weeds. He put them in his empty lunch box, took them home and figured out how to rear them. They turned into beautiful red and black moths, cinnabar moths, brightly coloured to show birds they are poisonous, and he was hooked from there.

Lots of kids have an insect phase then lose interest but Dave never did. He feels lucky to have made a career chasing after insects.

Don't call them creepy crawlies

He reminds us not to call insects creepie crawlies or bugs. This does them a disservice. We should look at insects with wonderment, and throughout the chapters of his book, he tells lively and gripping stories about his favourite insects and their amazing colony existence. As the topic is serious, Dave worried his book would be too depressing, he tried to lighten

things by showing how fascinating insects are, to coax people to read to the end, where his positive 'what we can all do to help' message is.

Bumblebees have smelly feet

Dave has spent years studying the smelly feet of bumble bees. He was idly watching some bees in a patch of comfrey flowers, observing how they flew about, quite often veering off suddenly just as they got to a flower. If you spend some time watching bees, you will see this for yourself. He wondered why they were avoiding certain flowers and decided to find out why. The reason is, when bees fly up to a flower, they give it a sniff and, if they detect the smelly footprint of a recent bee, they know the pollen is gone, so they save themselves the bother of landing. Bees might visit 10 000 flowers a day - if they can skip a few it can make quite a difference. Bees don't actively mark flowers, the cuticle of the bee has oily hydrocarbons, accidentally leaving a little smelly footprint when it lands.

Bumblebees are seen as a sort of flagship insect species and Dave says that is has been great, in recent years, seeing more public recognition for how important they are. Despite this enthusiasm many people are misinformed and think there is only one stripy yellow and black, hive living bee when actually there are 20 000 species, and only one domesticated species - the honey bee.

It is also important to not forget about other insects, lots of others are pollinators and insects have important role in our ecosystem aside from pollination.

Earwigs are garden friends too

Dave was first person to get Sarah to love earwigs. Gardeners know lace wing and lady bird larvae will eat up greenfly. Earwigs are good because they will munch through aphids. They do a tiny bit of damage nibbling blossom but they do more good than harm in the garden.

Dave finds it terribly sad to see shelves of pesticides with pictures of earwigs on the labels. He advocates that none of us should use pesticides, they are so harmful.

Sarah asks about a trial in Kent, where they imported earwigs into one orchard and not into another. The one with earwigs had the largest harvest. Dave recalls this trial found that the predation of orchard pests done by a healthy earwig population is the same as spraying three times with pesticides. Earwigs breed slowly, one generation a year, so if you do spray

you will wipe them out and, it takes them so long to re-establish, you create a vicious circle where you have to keep spraying.
They do nibble dahlias, so Sarah encourages using earwig nests - straw on top of bamboo cane, a very good earwig trap. Then relocate them anywhere you may have aphids, like the greenhouse with tomatoes.

Some insects are hard to like but we don't have to kill them

Arthur has very little time for vine weevils. He used to blame earwigs for decimating his dahlias but, after investigating at night with his iphone, he found these little rhino-like tank beetles were the culprits. Dave says there are some insects that are annoying, there is no getting away from it. He often gets asked what is point of slugs, aphids, mosquitos – usually they have some positive role in ecosystems. We need to be more tolerant and there are creatures not useful for us, they may even be harmful, but we shouldn't try to eradicate them from the planet.

Insects have weird lives

Some insects are quite dark and sinister by human standards. Even bumblebees – it is very common for a queen to eat her grandsons.

One of most peculiar insects is the emerald cockroach wasp. This predator of cockroaches pounces and stings, paralysing the cockroach. Then it stings again, this time damaging the cockroach's brain. When the first sting wears off and the cockroach can move again, it has lost its free will. The wasp chews off a bit of antenna and uses the stub to lead the cockroach, like a dog, to the wasp's nest where it lays an egg on it. The cockroach is then slowly devoured alive by the wasp's growing offspring.

Insects on the telly

Arthur watches a lot of nature biopics and has noticed there are more documentaries about insects these days. Dave agrees insects are definitely televised more which is great. 20 years ago he wrote to David Attenborough to say 'what about the little things?'
Attenborough wrote back saying he agreed and was trying to persuade BBC but they felt no one wanted to watch insects. Attenborough later only agreed to do Life of Mammals in exchange for something on insects, which became Life in the Undergrowth. There are millions of insect species with the most weird and amazing lives so its good that interest in smaller things is growing.

Schools should teach Nature Studies

Arthur asks, should schools do more to educate children about the importance of insects? Dave would love to see Nature Studies on the curriculum and talks about this at the end of his book. A big stumbling block is currently very little is taught about nature in schools. Children should be learning about the wildlife all around us in our gardens and parks. Teachers should be able to attend Field Studies courses to learn more.

Dave uses an example of taking his first-year ecology students on a field trip. Many couldn't identify common garden birds like wrens or trees like sycamore. It is shocking how little people know these days about the natural world, even students of ecology! Basic identification skills are not taught. There is an expression - nature deficit disorder – that describes the current state of things.

With 80% of British people now living in cities and not having much access to nature, it would be great if there was a policy for green spaces to be twinned with schools. Or for schools to twinned with a farm, so children can learn about where food comes from. We all depend on healthy ecosystems to feed us - but people don't understand what this even means.

Could supermarkets help?

Arthur suggests a brilliant idea - supermarkets could have labels on produce that needs pollinators to grow – a pollinator label on apples for example. Dave feels supermarkets have huge influence and control and could do so much more to encourage local, seasonal produce and more sustainable or more pollinator friendly means of production. In his view supermarkets are not environmentally responsible at all, pushing us to buy cheap flown-in food. He questions their ethics and feels strongly they should be much better than they are.

Wildflowers on verges

Sarah asks about the Stirling research Dave's PHD student Lorna Blackmore did on verges and wildflower patches. This story started with local campaign group who heard Dave talk about the decline of bumblebees, on the verge of extinction. They named themselves 'On the Verge' and badgered the local council to let them dig up council-owned boring grassland to sow with wildflowers. There are now more than 90 patches of wildflowers around Stirling thanks to this scheme, from roundabouts and road verges to a primary school field, rugby

pitch and even a women's prison. Lorna carried out insect counts to evaluate the results and documented a huge increase in pollinators in the wildflower patches – 50% more bees and hoverflies compared to other council green spaces. It would be great if this could be replicated across the UK.

Call to action – what we can do in our gardens

What is so positive is, unlike a lot of big environmental issues, people can easily and quickly help increase insect and pollinator numbers and make a visible difference. If you plant bee-friendly flowers, you will see lots of bees appear and feed from them, which is so rewarding. Sarah reminds us that it is better for pollinators if we grow single not double flower varieties. In doubles, the anthers mutate into extra petals so there less or no pollen and insects can't get in as obscured by too many petals.

Dave's top tips

1. Grow more of the right kind of flowers to attract pollinators - get advice from sarahraven.com, Dave's books and YouTube channel.
2. Try to include native wildflowers – Dave grows betony and viper's-bugloss. Wildflowers are fantastic for pollinators and look great even in a neat ornamental garden.
3. Garden organically – please don't use insecticide. Sarah Raven and Dave have plenty of eco-alternatives you can try.
4. Consider how you manage your lawn – if you mow less, you use less petrol and most lawns are full of flowers just waiting for a chance to appear. Sarah suggests, mow a path – makes it look tidier and is a good option for local authorities managing parkland. Sarah also mows narrow strips along the edges of her lawns, which feels intended not left, people are sympathetic to this and can take it on board more readily.
5. Remember the power of letters and petitions – this is Arthur's New Year's resolution. Write to your local authorities to ask for wildflower meadows – write to encourage them then remember to thank them if they do it.
6. If you have room, a pond is fantastic for wildlife – it is amazing how much insect life will turn up.
7. Make or buy a bee hotel – they work well for solitary bees. In Dave's garden, his bee hotel has mason bees which are great for pollinating apple trees.

Sarah's end of year message.

At Perch Hill, Sarah wants to make her gardens absolutely full of colour and beauty, but to make just as sure that they provide habitats and food for birds, butterflies, bees, other insects and important creatures. The more she gardens, the more she realises, our own back yards can make a difference to the way the world is going — and because our gardens cover such a large area, if we all club together, there is a chance of slowly turning things around.

Every New Year we have a moment to make a new start, to ensure our own small part of the world is even better.

Sarah ends the podcast with an appeal – if each of us tells two of our friends a couple of things we've learnt from today's podcast, we can easily build this into a movement.

With Dave's book, research and information on YouTube, there are lots of easy things we can start doing in our gardens now to protect insects and pollinators. All of us can and should make a difference.