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Where have all our earthworms gone?

Chris Hill chris.hill@archant.co.uk @ChrisHill75

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More than 40% of farm fields don't have enough earthworms, according to a "citizen science" survey. PICTURE: Ian Burt

More than 40pc of farm fields don't have enough earthworms because of "widespread, historical over-cultivation", according to a citizen science survey.



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Dr Jackie Stroud of Rothamsted Research.

The #60minworms project was the first comprehensive worm survey concentrating solely on agricultural land – and more than half the farmers taking part said they would

change their soil management practices after seeing the results, said researchers.

Biologists categorise earthworms by ecological role, with surface-dwelling and deep-burrowing worms being the most sensitive to farming practices, while the topsoil worms are generally unaffected by over-cultivation.

The “citizen science” project found most fields have good earthworm biodiversity – meaning an abundance of all three types were seen in spring 2018, with the average field containing nine earthworms in every spadeful of soil.

However, the study also revealed that 42pc of fields had poor earthworm biodiversity – meaning either very few or none of the surface-dwelling and deep-burrowing worms were seen.



Ed Bramham-Jones of Norfolk Rivers Trust. Picture: Mark Bullimore

The scientist behind the survey, Dr Jackie Stroud, at Rothamsted Research, said the absence of deep-burrowing worms on 16pc of fields is a particular concern, as they are “drainage worms” which aid water infiltration and help combat waterlogging.

“Decisions made above the ground, whether by farmers or policy-makers, influence the billions of earthworms that are engineering the soil ecosystem below the ground,” she said.

“Earthworms influence carbon cycling, water infiltration, pesticide movement, greenhouse gas emissions, plant productivity, the breeding success of birds and even the susceptibility of plants to insect attack.”

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However, Dr Stroud added that earthworms are sensitive to farming practices including tillage, rotations, cover cropping, organic matter additions and pesticides, so more needs to be done to look after them.

Ed Bramham-Jones, head of farming and water at the Norfolk Rivers Trust, took part in the survey by digging soil pits on nine fields at Swanton Morley, near Dereham, and South Pickenham, near Swaffham.

“We certainly found reduced numbers,” he said. “Some of that was down to dry conditions and some of it was around the lighter soil types, but where there had been deep tillage or plough systems behind vegetable production we saw numbers reduced as well.

“If farmers have to use deep cultivations it is about using something like cover crops in between and using a longer rotation so you have got ways to alleviate any soil damage. The worms will come back, but if your system is not allowing it they will find it difficult to breed.

“If you are looking at tillage you need to be doing it at the right time, and a shallower cultivation will help, especially with deep-burrowing worms. Some will burrow down to two or three metres, which is really helping the rooting of plants and drainage.”

Mr Bramham-Jones said earthworms were a good indicator of soil health and also helped water quality, by improving soil structure to help reduce run-off and erosion, and recycling nutrients to help build organic matter, which aids water storage.



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