

Science in the allotment gardens



On an allotment garden in Peterborough, among the cabbages and potatoes, the plot holders are doing serious science and contributing to a scientific debate.

Many people believe we ought to treat our finite Earth with respect. We depend on the soil and what grows in it. If we want to sustain it, we need to ensure the soil stays healthy. But what is a healthy soil and how can we measure it? We could perform complex, expensive and time-consuming chemical analysis on soil samples, but how do we relate the mixture of chemicals to health? We could identify and count the species of earthworms, nematodes, molluscs and insects. The macro-invertebrates are difficult to identify, but the fungi and microbes, which are essential to how a soil functions, are even more difficult. We need a cheap and cheerful method to assess soil health. One suggestion is to try to measure the biological activity in the soil, assuming that more activity means more soil health.

Some people suggest using bait lamina strips to measure the biological activity. The strips look like long, thin plant labels drilled with small holes that are filled with bran and other material which earthworms and springtails like. Push a block of nine strips into the ground and leave them for a fortnight. When you pull them out you can easily see how active the soil is by how many holes are empty. Sceptics say the strips are indirectly measuring the weather and not soil health, because earthworms are so sensitive to moisture and temperature. Who is correct?

Allotments are an excellent place to test the strips because on the same soil type we have many types and styles of land management. Plots vary from the pristine to the unkempt. The frequency and intensity of soil disturbance varies: some plot holders rely on machinery, others hand dig, some pull weeds, others hoe, and a few small patches are never cultivated. Holders use a variety of fertilisers, composts, manures, mulches, herbicides and pesticides. As a first trial, we set out 18 blocks of

Richard Wadsworth gets down and dirty testing a new way to measure soil health on some Peterborough allotments.

Bait lamina strips in action; simple, small and cheap.

bait lamina on six allotments to see whether we could interpret the differences between the plots.

We found a considerable variation in the percentage of bait the soil organisms consumed, from over 85% to under 3%. The most active soil was under traditional management of hand digging in winter, letting the frost break up the soil and forking in liberal applications of compost. The least active soil was rotavated regularly and received only a few spent grow-bags as compost. On average, undisturbed soils (growing strawberries, tayberries, apples or lying waste) had more activity than regularly cultivated soils, but there was considerable overlap. The combination of hand digging, manure and mulch leads to greater activity than machine cultivation and artificial fertilisers; the low activity around cabbages indicated that soil compaction could be the critical factor.

Now we have some more questions. For example, the importance of organic matter versus soil density, are the results replicable and how does the level of activity vary over the year? One of the most important things we learned is that many plot holders are closet scientists. Every year they go through a cycle of observing, thinking, acting, observing and formulating a new plan or idea; they believe in cause and effect. Therefore we hope this is the start of some rigorous community-based science.

Thanks to the Mountsteven Avenue allotment plot holders, especially those who took part, or would have if we'd had more strips. Thanks to Peter Hankard for introducing me to bait lamina strips and for providing the materials and to John Keatley who filled them.

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