

# Throwing in the trowel

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## **Digging over your patch could do more harm than good. Helen Glazeley meets the experts who say we should down spades**

At Green, the Garden for Research, Experiential Education and Nutrition, in Stroud, Gloucestershire, three charities are reassessing centuries of practice by examining the effect of digging on nutrient levels in crops.



Idle hands: Matthew Adams with no-dig potatoes

Information appearing on telegraph.co.uk is the copyright of Telegraph Media Group Limited and must not be reproduced in any medium without licence. For the full copyright statement see [Copyright](#) Matthew Adams, director of the charity the Good Gardeners Association (GGA), says: "There is constant discussion between the Food Standards Agency and the Soil Association as to whether organic is better or not. But the organic sector is concerned with what is not added to the system - chemicals. Just because something is organic, it doesn't guarantee its mineral and vitamin content. It's time to look beyond organic."

And, for the GGA, which has promoted no-dig gardening for 40 years, looking "beyond organic" means starting at ground level. The theory behind the research is that digging disrupts the relationship between soil micro-organisms and plants. This then reduces the flow of nutrients between them, resulting in lower levels of minerals reaching your vegetables.

"In a teaspoon of good soil, there can be six million bacteria, thousands of protozoa and fungi and hundreds of nematodes," says Adams. "When organisms live in balance, soil structure is enhanced and the flow of nutrients increased. When a plant is put into disturbed or dug-up soil, it's harder for it to obtain what it needs."

In the four-year experiment, carrots, potatoes, leeks and spinach are being grown on three plots. Each receives the same amount of compost, but one is single-dug (turned over every year to one spade-depth), one double-dug (turned over to two spade-depths) and the third is not dug at all. On the no-dig plot, compost is spread on the surface in autumn, leaving worms and other organisms to incorporate it into the earth at their own pace.

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Each year, the resulting crops are sent to Surrey University to be analysed for 22 minerals. "We chose minerals rather than vitamins because minerals are found in the soil, while vitamins are not," explains Adams.

Among the micro-organisms under examination, special attention is paid to mycorrhiza, the invisible fungal network that penetrates plant roots and allows them better access to nutrients, while also conferring a degree of drought and pest resistance. "Modern gardening methods destroy mycorrhiza by turning its world upside down, drying it out and ripping it apart," says Adams. "Adding chemicals makes this worse."

As mycorrhiza grows only 15-20 cm (6-8in) per year, annual digging never allows it to become properly established.

Adams won't divulge which plots to date have produced the most nutritious vegetables, but admits that there have been some surprises. One is that although Green has been organic for years and produces vegetables with a high nutritional value, there has been as much as a two-fold difference in the mineral levels of potatoes from different plots.

Another surprise is the significance of micro-organisms, rather than mineral levels, in predicting the nutrient levels in the vegetables. "Soil biology provides a more accurate prediction for nutrient uptake than soil chemistry," says Adams.

This research comes at a time when concerns are growing over the nutritional value of our food. Comparisons of vegetables grown in 1991 with those grown in 1940 indicate that mineral content has diminished. Carrots, for example, contain 75 per cent less magnesium and 48 per cent less calcium. Such changes raise worries for our long-term health, and understanding the way vegetables obtain their nutrients is a step towards addressing the problem.

Green was set up two years ago in conjunction with the Hiram Trust, a local educational charity that owns the garden, and the Biodynamic Agricultural Association (BDAA). Bernard Jarman, of the BDAA, thinks that different methods of cultivation might benefit different crops.

"This research should give some interesting insights into how one should handle the soil," he says. "In my experience, some crops benefit more from one method than another. This could clarify what benefits which.

"Double-digging breaks down the soil and activates it, releasing what's there. No-dig doesn't activate anything but retains what's there. My personal feeling is that perennial crops probably benefit from no-dig, whereas deep roots will benefit more from the soil being dug, so releasing nutrients."

The results are due in 2009. Perhaps then we gardeners will be able to stare out of the window with a clear conscience all winter.

Good Gardeners Association (01453 520322; [www.goodgardeners.org.uk](http://www.goodgardeners.org.uk).)

Hiram Trust (01453 764065; [www.hiramtrust.org.uk](http://www.hiramtrust.org.uk))

Biodynamic Agricultural Association (01453 759501; [www.biodynamic.org.uk](http://www.biodynamic.org.uk).)