

Organic research – driven *and* directed by funders?

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Well of course it is! “He who pays the piper calls the tune”. At least since the days of the lady with handbag, but it has probably always been so. Certainly for mainstream, “conventional” research and why should organic research be any different?

But are things more complex and subtler than that truism assumes?

Researchers are not wont to falsify results – at least not for the kind of money available in most types of agricultural research – but they can be directed or encouraged to look in particular directions, to take certain approaches and ignore others. Indeed, they would be foolish not to respond to such stimuli. Few researchers are rich enough to fund their own research and are, therefore, obliged to follow the direction of those who do have funds.

This is as true for those researchers working for charitable and non-governmental funders as it is for those working for government or corporate interests. But is this a problem for organic research? It can be argued that it is, because it skews the focus of research too much towards the short-term goals of policy, technology or the market and away from seeking to understand fundamental drivers and establishing long-term conceptual coherence and validity.

Having been both funder and funded, I believe that there is a problem here but it is not simply a question of money. This is indeed a complex problem where cultural and political perspectives, the limitations of researchers and of research itself are all factors.

Is the focus of organic research unbalanced?

It is a matter of fact that ever since the 1920s, private and publicly funded research into organic food and farming has been carried out in some way in many countries. The vast majority of this work has been undertaken using mainstream, reductionist methods (1,2). There is now a large body of literature reporting on this work in the form of peer-reviewed papers, government reports, conference proceedings, as well as a vast amount of so-called “grey” literature, which has proved to be one of the best routes for technology transfer (3).

Yet despite the increase of interest in organic research and the number of projects, we have barely progressed our understanding neither of how an organic system works nor of the validity of its underlying concepts. Although reasonable progress has been made on specific technical or organisational applications.

Much has been made of the need for a holistic methodology to enable these investigations to proceed successfully. Unfortunately, this approach is rather like the first cuckoo in spring – much talked about but rarely seen. The fact is the development of a “holistic approach” by and large remains more of an aspiration than a reality. William Lockeretz, for more than ten years editor of the *American Journal of Alternative Agriculture*, summarises the situation as follows:

“Organic research is hardly different from conventional research. Few papers in the field can honestly be called holistic or system-oriented. And very few are even slightly multidisciplinary. The main difference compared with conventional research is what gets studied - some aspects of organic farming - not in how one studies it.....Neither in the kinds of questions posed nor in the ways they are answered do I find any clear, systematic distinction between research on organic and on conventional systems.” (2)

Lockeretz does acknowledge that there are some exceptions and particularly mentions work in the area of food quality assessments. This is notable because the arguably essential concept of the organic movement is that health, food quality and the nature of the agricultural system are inextricably linked. It is on this that organic agriculture was originally built and still shapes its development today.

With that exception a glance at any list of organic research projects reveals a predominately short-term catalogue of single factor comparisons, input studies and technical development work arising from short-term policy or marketing concerns. That is not say these things are unimportant or unnecessary. But investigation and validation of the concepts that underpin organic agriculture is, for the most part, absent.

These concepts are found in three schools of thought, which originated in the first three decades of the twentieth century. The Biodynamic or anthroposophical school, of Steiner; the Organic-Biological school of Muller and Rusch and the Organic school of Howard and Balfour. Also important is the work of Schuphan and Voisin who promulgated the idea of the “biological value” of soil, plant and food in the early 1960s. (4,5,6)

There are some highly significant differences between them. For example the anthroposophical perception of “ethereal and astral forces” is unique to the biodynamic school (6). But there is an essential core of agreement which (although battered and shabby in parts) remains at the heart of the organic movement. This has four aspects:

- 1) The concept of the farm as a living organism, tending towards a closed system in respect of nutrient flows but responsive and adapted to its own environment.
- 2) The concept of soil fertility through a “living soil” which has the capacity to influence and transmit health through the food chain to plants, animals and man. And that this can be enhanced over time.
- 3) The notion that these linkages constitute a whole system within which there is a dynamic yet to be understood.
- 4) The belief in science and an insistence that whilst these ideas might be challenging orthodox scientific thinking, they could be explored, developed and eventually explained through appropriate scientific analysis.

These pioneers sought to examine, test and develop their ideas scientifically. However, from a modern perspective a good deal of their research seems inadequate. Some experiments are poorly reported, some are badly designed and some suffer from the limitations of the equipment and methodology of the time (5).

This is not surprising. What is though, is that the theory of holism, which underpins these concepts and is so often talked about, has been so little developed. Amazingly, Smuts' definition written in 1929, remains the most cogent:

“Holism is the theory which makes the existence of “wholes” a fundamental feature of the world. It regards natural objects, both animate and inanimate, as wholes and not merely as assemblages of elements or parts. It looks upon nature as consisting of discrete, concrete bodies and things and not as a diffusive homogeneous continuum. And these bodies or things are not entirely resolvable into parts; in one degree or another they are wholes which are more than the sum of their parts, and the mechanical putting together of their parts will not produce them or account for their characters and behaviour. The so-called parts are in fact not real but largely abstract analytical distinctions, and do not properly or adequately express what has gone to the making the thing as a whole.” (7)

“Organisms or biological wholes are not isolated unitsand they do not exist apart from their surroundings (which are themselves complexes of wholes) but on the contrary are in close contact with them, and evolve and vary partly in response to the stimulus which comes from them. The evolving wholes are in close and responsive relation to their environment, the influence of which on them is in part temporary, and confined to the individual duration of each whole, and in part.... perpetuated through generations of wholes” (7)

This theory has to a small degree survived and can be seen in the emerging discipline of organic plant breeding. According to the seminal report on the subject “The most important conviction that unites theorganic production chain is that products, production methods and processing methods should respect the wholeness of the living entity as much as possible, to ensure that living entities – the farm organism, the plant organism and the human organism – retain their self-regulating ability.

But in general it is not understood; it is not applied in most areas of organic R&D; it is largely absent from practical application on farms; it forms no part of what is now called the supply chain; and policy makers do not have a clue about it. So does it matter?

Emphatically, yes. Without these concepts there is no intellectual justification for organic food and farming; without them much of the standards is nonsense; many of the health claims are as hollow as the antagonists argue they are; the organic perspective on life is really as hazy, as vague and as bizarre as it sometimes seems to be. Without these concepts there is no validity for the existence of organic agriculture as a separate and discrete entity – except of course as a marketing gimmick.

It has been and continues to be a monumental folly that these concepts remain undeveloped, lacking coherence and little more than cliché: Folly for all parts of the organic sector but especially so for researchers. Because without a grasp of those concepts we cannot understand the nature of our subject nor whether we have the appropriate tools. And as some of the papers presented at this conference will show, we do not have that grasp and we do not have the tools.

Is this due to the funders?

Yes and no. In the UK government departmental research spending is now almost entirely geared to policy objectives that have at most a five- year timeframe. One can criticise the wisdom of the project and policy choices and the effectiveness of the

programme but it is unrealistic to expect departmental funds to be anything other than policy driven. Nor could government departments be reasonably expected to fund research into concepts that remain well outside mainstream understanding.

However, what was once “blue-sky” research and is now refocusing to become “horizon-scanning” is another matter. Once we had an Agricultural Research Council and it was supposed to give attention to fundamental concepts. The ARC discovered food and became the AFRC just in time for the salmonella crisis and BSE. It was then modified or engineered to become the Biotechnology and Biological Sciences Research Council, thus demonstrating clearly that world-views and science do indeed go hand in hand. The problem is that their world-view is a genetically engineered, corporate one where the notion that the “health of soil, plant, animal and man is one and indivisible” does not get a look in.

And who can blame them? If my world-view was the one that was predominant, I would be chary about letting in another one that is in total opposition. It seems to me to be reasonable to expect any movement that is challenging the mainstream to fund at least some of its fundamental conceptual development for itself. Or at least it is unrealistic to expect either the state or the market to do so until such time as there is a degree of understanding and acceptance of those concepts.

Which leads to another problem. The so-called peer review process. Many of you will know, some will have experienced, a travesty of this process in EU research funding. But it can be found elsewhere. Clearly, if the peers in question have no knowledge or understanding of the concepts that underpin a piece of research, with the best will in the world – and often it’s a lot less than that – they cannot fairly review that research. In fact they are no more peers than the one in Wigan. And the process, in practice is as much of a joke.

With this in mind I read with great interest comments made by David Shannon, recently retired as MAFF/DEFRA Chief Scientist about science and research in the real world. He was speaking after writing a highly informative paper about the role of science and scientists in the FMD outbreak but his comments have much wider relevance.

“.. science is mainly evidence, not fact; that it can change over time; that there’s frequently not just one scientific view – there may well be conflicting views – and that scientific evidence is subject to the weaknesses of all other sorts of evidence: such as the motivation of the provider, funding issues and even competition between disciplines.”

David is much more polite and understated than I am. I would add to the list; hidden agendas and lack of transparency that make a mockery of research contracting; ignorance on the part of funders, steering committees, research contractors; the short term perspectives of policy-makers; and poor review procedures and accountability.

So I do not think that it is lack of money per se that has led to this imbalance in research focus in the organic sector. It is a mixture of all these things. Nor are these factors found only in government, they exist in the private and non-government sector too.

An example is the “Haughley Experiment”, which was set up to investigate these fundamental concepts. Money was always a problem but not the biggest. A bigger

problem was that the funders did not understand what they were doing. They understood the words but not the concepts.

From the beginning the scientific steering group fell out about the priorities that should be given to different research approaches, consequently no clear hypothesis was agreed and established. This fundamentally damaged the work for its whole existence. Within two years one group quit altogether and from then their perspective – a critical one to organic systems – was not included in the work. The inevitable inflexibility of long-term comparative trials was worsened by growing mental rigidity on the part of the scientists in that they failed to keep abreast of methodological developments. After half-a-dozen years the steering committee had changed so much that its members had forgotten the point of the whole experiment and it became a proxy battleground for other fights going in the organisation.

This was a sad end for what as far as I know is still the only attempt to investigate the underlying concepts of organic agriculture using whole farm systems in a mainstream research structure – by which I mean using comparisons.

The point is that it was not simply lack of money that was the problem. It was lack of understanding of the concepts on the part of funders, steering committees and researchers; a failure to develop the rigour of a hypothesis; a failure of communication; the existence of hidden agendas on all sides that wreaked havoc because of the lack of transparency and accountability.

I fear that organic research today is vulnerable to the same mistakes. But it is not all gloom and doom. COR and conferences like this can make a huge difference. They can inform, innovate, cooperate, communicate and , in this way, tackle those factors and reverse those trends.

And the world moves on. A recent medical conference looking at the health implications for research and food policy of the mapping of the human genome considered that “ The discovery of only 35,000 genes instead of the expected 150,000 means that the nutritional environment played a pivotal role in human evolution.....we now know that the key to evolution and the behaviour of human disease is in the environment interacting with the gene and not the other way round.”

One paper by the Director of the Medical Research Council's Haemostasis Research Group at the Hammersmith Hospital was entitled “Genome evolution, blood and soil – a message from deep time”. The abstract stated; “Blood here stands for coagulation and thrombosis, soil for the environment, deep time for the fact that the clotting system hasn't changed in 450 million years but our food has – drastically in the last 150 years.We now know that the way a puffer fish clots its blood in response to injury is exactly the same as the way every vertebrate “upwards” to man clots its blood and has done so for all those ages. Yet in the past 150 years a great epidemic of blood vessel disease and thrombosis – often fatal – has swept through economically advanced human populations. What has changed? Obviously not the blood clotting system. Clearly some environmental change (soil or food production/consumption) has impacted our ancient genomic heritage in unexpected and deadly ways.”

Here is organic agriculture's underpinning concept – scientific or philosophical – that the health of soil, plant, animal and man is one and indivisible brought right up to date by the most modern science.

It would indeed be ironic if the mapping of the human genome, which has been hailed as a breakthrough by reductionist science, were to help kick-start a holistic science that could at last begin to investigate and validate the organic movement's underlying concepts.

Funders do drive and direct research – organic and conventional. Their failure to fund research into the organic movement's basic concepts has also been the movement's failure to convince them that here was something worth looking at. But in a world governed by short-term perspectives, that is not surprising.

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