

FDI Feature Interview

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Dr Maarten Stapper: The Link Between Healthy Food and Biological Farming – Part Two

Christopher Johns

Research Manager, Northern Australia and Land Care Research Programme

Key Points

- There is an increasing body of scientific research that supports the concept of a relationship between healthy food and biological farming.
- Biological farming sits between opposite approaches to agriculture; industrial farming and organic farming and takes best practice from both areas to achieve healthy soils and biodiverse landscapes.
- In healthy soils, plants have a symbiotic relationship with soil microbes.
- Plants cannot get the minerals to make nutritious food, nor chemical compounds for protection against adverse environmental conditions and attacks by insects and diseases, without active soil microbes.
- Microbes are the link between healthy soils and healthy people, as both humans and soils depend on them to maintain their health.
- Biological farming greatly increases soil carbon and decreases greenhouse gas emissions and thus is mitigating climate change.

Introduction

As stated in the introduction to Part One of this FDI Feature Interview, the concept that human health is linked to nutritious food is gaining increasing attention. This coincides with a time when 25 per cent of the world's arable land is degraded, with a continuing annual loss of one per cent. At the same time, water resources are declining, global warming is influencing production and demand continues to increase due to an expanding population.

Dr Maarten Stapper is internationally acclaimed for his work on the relationship between healthy food and biological farming. He believes that the natural, self-organising ecosystem, with healthy soils that have provided food for millennia, is increasingly being disrupted by industrial farming practices and changing climates. In his words, the Green Revolution seems to have reached its limits, with yields plateauing and the widespread use of synthetic inputs contributing to land degradation, water pollution and biodiversity loss.

At the same time, chronic diseases are escalating and are increasingly being associated with industrially produced food across the world.

He further observes that high-input agriculture, including genetic modification, produces 30 per cent of global food and fibre, using 70 per cent of industrial resources. He then poses the question: can we really feed the world with this industrial approach and still have a healthy population?

The UN Food and Agricultural Organization promotes an alternative approach and encourages a debate on the potential of agroecology. The outcome of an agroecological approach would be the regeneration of degraded soils and landscapes to produce healthy food, while using the increasingly scarce resources of fresh water, arable soil and energy more efficiently.

Interview

FDI – Is there a sense that some diseases, or a lack of health generally, are directly attributable to the food we eat?

Dr Maarten Stapper – Food quality is more than the sum of its parts. Science generally cannot yet quantify this synergy and basically denies it exists. Chemicals interfere with this process. Animals have an inbuilt food quality sensor. They know what they need to stay healthy, or to self-medicate a health problem. Given a choice, a cow, sheep or horse will pick the biological rather than the industrial feed and the industrial rather than GM. Hippocrates said around 400BC, ‘Let food be thy medicine and medicine be thy food’. Aboriginal peoples around the world have kept following that principle out of need.

Today, nutrition-related 21st century chronic diseases are mounting. We now have the fourth generation eating the refined processed foods, with artificial additives that have been produced with more chemicals. Most medications prescribed are treating the symptoms rather than the cause. Medical beliefs and public perception still deny the connection between health and chemicals in and on food.

The public is not being alerted about epigenetics either. This science explains how genes in an organism’s DNA adjust to prevailing conditions by activating and deactivating parts of the genetic DNA code. Our food processing organs, for example, will stop working overtime to process all those chemicals for excretion. This, in effect, would declassify toxins and allow them to remain in the body. This would negatively affect cell quality, [microbiome](#) diversity and the immune system, leading to poor health and infertility. This changed gene expression is then passed on to the next generation. Hence, each new generation starts at a lower health level. This explains the current prevalence and multitude of diseases affecting primary school children. You don’t have to wait, however, until you are sick to get healthy, however!

Children need the tools to build their body. Food affects growing children’s bodies, brains and genes for better or for worse, starting in the womb. Fresh food from healthy soils, contact with nature by playing outside and avoidance of chemicals, could reverse the epidemic of chronic childhood illness and start changing gene expression back to a healthier setting. There are profound [connections between food, nature \(e.g. microbes\) and children’s health](#). (Healing illness works both from the inside out and the outside in. [Recent research describes successful dietary intervention for Autism, which has produced improvements in the cognitive function, gastrointestinal symptoms, speech, hyperactivity, sociability and more.](#)

FDI – What soil characteristics and associated farming practices result in healthy food?

Dr Maarten Stapper – Healthy food is produced on healthy soils, using biological farming practices that maintain soil health and ecosystem functionality with minimum use of synthetics. When required, synthetics

of choice can be used in small amounts that will not break the threshold. The food produced will then remain healthy.

Characteristics of a healthy soil are efficient mineral and water cycles, with an active soil biology. The topsoil has a crumb structure, with stable soil aggregates that are good for aeration, water infiltration and root growth. Plant residues and manures are recycled in the field, which releases soil carbon and minerals for new production cycles. Earthworm activity is high and they do the natural soil tilling and make worm cast, which is new soil. Soil carbon is like a sponge; it stores, retains and makes available water and nutrients; it is the home for soil biology. The more carbon, the bigger the sponge. Such soils are resistant to disturbance and are resilient as they can, aided by soil biology, recover from big changes.

Farming practices need to maximise soil health and stop reliance on synthetics. Such practices need biologically friendly inputs, which keep soil biology active. Examples are: soil stimulants, inoculants and mineral and biological fertilisers; all of which are present in a good, humified compost or compost extract. Soil disturbance should be minimised and the soil surface covered by a mulch of litter. Days of full green ground cover need to be maximised, for example, with cover cropping, pasture cropping or time-controlled rotational grazing. Biodiversity is important in pastures and cover cropping works best with species of grasses, herbs and forbs having different root patterns and bringing different minerals from the subsoil to the surface. Microclimate should be improved for plants and grazing animals with windbreaks and shelterbelts; such zones are also important in providing homes for insect predators and pollinators.

FDI – How confident are you that farmers understand what is required and how quickly are they likely to adapt to a change that will lead to better soil health? What do we need to do to achieve this?

Dr Maarten Stapper – Farmers could make, within current annual budgets, a gradual transition over several seasons towards resilient biological farming in functioning ecosystems (agroecology). This would lead to lower costs for inputs and more profitability with less risk. Every paddock is different, and the length of transition usually varies across a farm. The farmer can learn by doing and be guided by monitoring and observations, while connected with like-minded people in a local group. Test strips and split-paddocks can be used to enhance learning and decision making. Biological farming is caught not taught, as you have to learn to see, learn to interpret and to be flexible. The farmer needs to be bio-sensitive and learn to sense nature using the ‘green thumb’, gut feeling, intuition, third eye or simply by having a hunch.

Incentives for change are, and have been, the awareness of the personal and environmental harm caused by chemicals, increasing difficulties with costs of inputs, plus meagre returns. The price for change is not money, but a mental effort. It requires a break from the known, the familiar, farming procedures and learning something that depends on our own observations and knowledge. The personal rewards are: less chemical use, less stress and gaining ecological insights and knowledge of how the system really works. It means standing back and steering the system, rather than forcing it. This usually results in more production from a given property, thus lessening the need to buy more land. This process was well described in a recent [book about regenerative farming](#). Experiences of farmers who have achieved such a change are described in detail for some 21 properties across Australia by [Soils for Life](#).

The most difficult decision is the first step, as with every major change. Carbon farming can now earn ERF [carbon credits from soil carbon](#) when you start with a new management practice. This can be a good incentive to start the transition to biological farming and earn carbon credits as a bonus to the larger returns expected through productivity gains. The process starts with measuring the soil carbon baseline for depths of 0 to 300 and 300 to 1000mm across the farm. Measuring the progress of change in carbon profiles from topsoil to

depth over time, provides a stimulus and motivation to continue with biological farming, while adjusting the process as required.

Changes in science, education and appropriate policy are all needed to create enabling environments for a move away from a linear to a holistic approach in agricultural management. The change will involve recognising that a farmer is not only a producer of agricultural goods, but also a manager of an agroecological system that provides several public goods and services, such as water, soil, landscape, biodiversity and recreation.

Prices of biological produce will rise as the demand for healthy food increases. Taste, composition and shelf life are attracting consumers through their sensory experiences. More will follow, when the effects of better nutrition and a decline in illness can be quantified. The other driver in the market place will be the ecological goods and services delivered. Guidelines will be needed to verify that it is, in fact, biological produce; this will help to achieve higher prices.

FDI – What do we need to do to inform food consumers of the advantages of eating healthy food?

Dr Maarten Stapper – Presently, consumers who are willing to find out more about eating healthy food can find information about healthy diets that use healthy foods; those that are low in sugars, refined carbohydrates and processed meats and high in antioxidants. Demand by the public for ethical, ecological, chemical-free food of quality is increasing. Slowly, more scientific evidence is emerging to support the recommendations of the early leaders and to satisfy demand from the public, who are the tax payers. Science is now able to identify at low cost, through DNA, the make-up of microbial communities; microbiomes, in gut and soil. In these complex systems, we are now on a path to find out the cause of chronic diseases and ill-health. Quantification of healthy food factors with ecological outcomes will be important and all opportunities to disseminate such information and educate the public must be used.

Conclusion

The real key to our life on planet earth is the soil. The soil is the skin of planet earth, and that skin, that soil, provides us with the living plants that give us the food, clean water and fresh air. This skin of our planet earth is being decimated and has been for decades. Biological Farming or Regenerative Farming is the way to sustainably feed the world in the future with quality food from soils regenerated by and with soil carbon under much reduced needs for synthetic inputs. The process, as the third way of farming, a step-by-step transition from Industrial (input-output) to biologic-organic (soil health) farming systems. By taking a step-by-step approach we allow the agro-ecosystem, including the soil, to adjust in nature's timing during successive seasons. By taking a step-by-step approach we allow the agro-ecosystem, including the soil, to adjust in nature's timing, during successive seasons, resulting in sustainable land management.

About the Interviewee: Dr Maarten Stapper is a farming systems agronomist whose main focus is helping farmers improve the profitability of their operations, by harnessing the power of natural healthy soil processes.

Maarten believes that by improving the use of inputs and understanding those practices that negatively impact on soil health, farmers can have a positive impact on their land and production.

Through Maarten's research work, discussions with Landcare groups and with a wide range of farmers, he has come to the belief that science must take a broader view to achieve the sustainable development of

agricultural industries. To achieve this, it must look at the whole farming system - where everything is linked to everything else.

Harnessing over 40 years experience as a scientist and farming system's agronomist, Dr Maarten Stapper now works as a private consultant, assisting farmers in the transition from industrial to biological farming systems. Maarten speaks regularly across the continent and provides a range of consulting services to groups and individuals.

Any opinions or views expressed in this paper are those of the individual interviewee, unless stated to be those of Future Directions International. The views of the interviewee are his personal view as author of the book and are not of his current and past employers.

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80 Birdwood Parade, Dalkeith WA 6009, Australia.
Tel: +61 8 9389 9831 Fax: +61 8 9389 8803
E-mail: info@futuresdirections.org.au
Web: www.futuresdirections.org.au