

Editorial

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Evolving Agriculture and Food – Opening up Biodynamic Research

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Biodynamic farming is a growing movement with a high reputation among farmers and consumers. It is rooted in anthroposophy, an ontological system introduced by Rudolf Steiner (1861-1925) in the early 20th century. As such, biodynamic farming has a strong spiritual component, and both processes and effects are assumed to occur not only on the physical, but also on a metaphysical level. For example, the effect of the biodynamic preparations -defined natural remedies that are considered a core element of biodynamic farming- is explained by a facilitation of cosmic forces. Physical effects of the preparations can be measured with scientific methods, but the presumed mode of effect is not comprehensible with natural sciences until now.

The situation of research in biodynamic farming therefore has much in common with the situation of research on traditional ecological knowledge: In both cases, physical traits and effects are comprehensible by the western scientific knowledge system, while the explanation for the effects is provided by a particular or *indigenous* knowledge system. The epistemological differences between the two knowledge systems usually prevent an integrated application, but it is possible to co-produce knowledge in a complementary way (Berkes 2009). This is what is

done in biodynamic food and farming research since the emergence of that production system. The examination and assessment of biodynamic food and farming with methods from the scientific framework of natural sciences is only one part of the research landscape, while the other part is connected to a particular, *indigenous* epistemology of anthroposophy. It is important to note that the epistemology of anthroposophy does not exclude, but include the methods of natural sciences. In other words: the epistemology of natural sciences is fully comprehensible by anthroposophy, but anthroposophy is not fully comprehensible by natural sciences. The co-production of knowledge with scientific and ‘indigenous’ knowledge systems is well-established in the biodynamic sector.

However, it is not surprising that scientific research in biodynamic food and farming has usually addressed physical traits and effects until now, even though there have been successful attempts to elaborate methods that both allow for a more holistic assessment of effects, and meet the requirements of scientific methodology.

In this special issue, we present papers based on contributions to the first international conference on research in biodynamic food and farming held in Dornach, Switzerland, from Sept 5th to Sept 8th 2018.

Altogether, twelve papers have been accepted for publication.

Four papers (Vaitkevičienė et al.; Goldstein et al. (1); Rodas-Gaitán et al.; Juknevičienė et al.) study effects of the biodynamic preparations on physical traits of soils, compost and/or crops. All papers found significant effects of the preparations at least in single parameters. Further, Grundmann and Baumgartner examined the effects of eurythmic movements on apples, and found significant differences in some sensorical parameters.

Stolz et al. introduce the measurement of delayed luminescence by Fluorescence Excitation Spectroscopy as a new method for the analysis of sample traits on a more holistic level. According to this paper, the method can capture differences between samples that must not show up in chemical analyses.

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Further, van Diest discusses the role of intuition in farmers' decisions making and speaks up for an appreciation of intuition as a key factor in the sustainable management of farms. The author points out that intuition is not an unchangeable personal talent, but can be trained and developed as other abilities.

Another important issue not only in the biodynamic sector, but in the whole organic farming community is to adapt breeding of plants and animals to the conditions and requirements of organic farming systems. Goldstein *et al.* (2) present achievements in this field from a maize breeding programme in the Midwestern USA.

Three papers do not explicitly address biodynamic issues, but issues that fit into the larger picture of biodynamic management. The paper of Babalola underlines the benefit of compost application for soil health and crop yield in an organic tomato production system in Nigeria. Singh *et al.* show how a farm as a whole can benefit from mindful water management, which can be seen as a collateral study of the farm as an organism. And, Zeise and Fritz show that homeopathic treatments are effective against bovine mastitis.

Last, Brock *et al.* sum up scientific research in biodynamic food and farming between 2006 and 2018 based on a review of papers that have been published in peer-reviewed journals.

Altogether, the papers in this special issue show that scientific research in biodynamic food and farming is evolving to examine the proposed effects of this production system, being aware of the fact that the epistemological approach of natural sciences cannot capture the ontological system and the corresponding assumptions.

We are looking forward for research in biodynamic food and farming to bridge this gap in the future.

References

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