# A revitalisation of European farming and the promise of the biodynamic worldview

#### Wright, J.

Published PDF deposited in Coventry University's Repository

#### **Original citation:**

Wright, J 2022, 'A revitalisation of European farming and the promise of the biodynamic worldview', Chemical and Biological Technologies in Agriculture, vol. 9, no. 1, 64. https://doi.org/10.1186/s40538-022-00317-z

DOI 10.1186/s40538-022-00317-z

ISSN 2196-5641

Publisher: SpringerOpen

This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

REVIEW Open Access

## A revitalisation of European farming and the promise of the biodynamic worldview

Julia Wright\*

#### **Abstract**

In 2020 and amidst the upsurge in discourse around de-industrialisation, a consortium of sixteen indigenous leaders and organisations released a briefing statement that urged change amongst modern regenerative farming movements. Called 'Whitewashed Hope', the critique encouraged these movements to go deeper than simply taking indigenous practices out of context, but rather to encompass the worldviews they represent and in doing so to enable the cultural and relational changes needed for humanity's collective healing. This paper takes a critical analysis approach to address the question of whether the critique of regenerative agriculture holds true for biodynamic agriculture in particular. This is explored using the hypothesis that there is no evidence of a synergistic relationship between the biodynamic worldview and the indigenous worldview as characterised in the document Whitewashed Hope. Drawing from the works of Rudolf Steiner as well as from other biodynamic texts, the paper uncovers synergies that exist between biodynamic and indigenous worldviews and explores the implications for regenerative farming systems. The aim of this paper is to instigate further debate and enquiry around the underexplored topic of how our worldviews impact our farming systems and of ways to develop an expanded worldview for more revitalised farming in the European context.

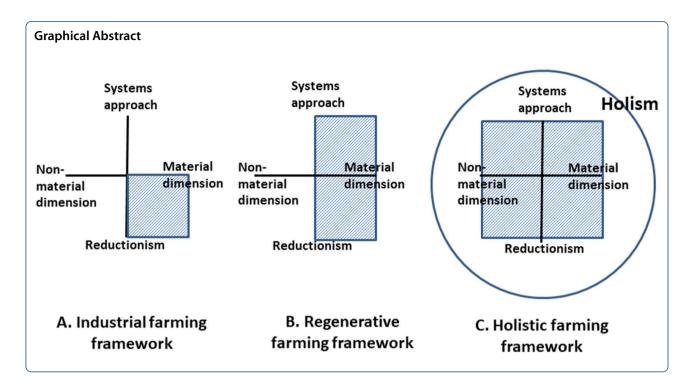
Keywords: Biodynamic, Indigenous, Regenerative, Farming, Europe, Agroecology, Organic, Steiner, Worldview

Centre for Agroecology, Water and Resilience, Coventry University, Ryton Organic Gardens, Coventry CV8 3LG, UK



<sup>\*</sup>Correspondence: j.wright@coventry.ac.uk

Wright Chem. Biol. Technol. Agric. (2022) 9:64 Page 2 of 9



#### Introduction

Contemporary regenerative farming, here taken to include biodynamic and organic farming, permaculture and agroecology, offers sustainable food production approaches that arose over the last century as rational alternatives to the industrial model. Various authors contrast the characteristics of industrialised production—of yield maximisation, the use of chemical inputs, and ecosystem suppression and control—with the ecological production approach of yield optimisation, species and landscape diversification and the synergistic integration of natural processes (e.g., [1-3]). While industrial production systems may thus attain high yields and profits over the short term, they are dependent on high costs and energy inputs and are associated with long term economic losses associated with soil fertility, biodiversity and crop nutritional quality [4].

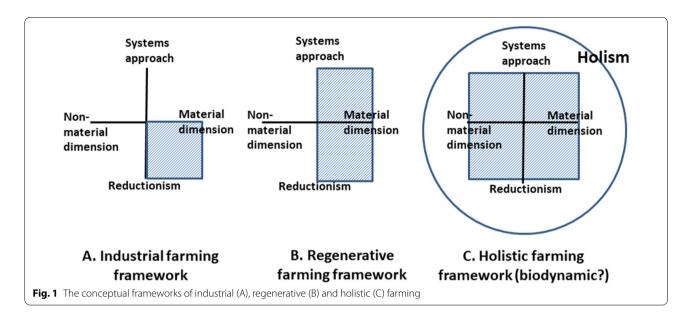
As part of their offer, the common narrative of regenerative approaches is their provenance in traditional farming systems and their application of indigenous knowledge which they combine with modern scientific advances. Thus the early organic farming pioneer Albert Howard (1873–1947) and others in the organic movement were heavily influenced by observing sustainable farming practices in other regions of the world [5]. Similarly, Miguel Altieri, Professor of Agroecology at the University of California, describes agroecology as a "culturally acceptable approach as it builds upon traditional knowledge and promotes a dialogue of wisdoms with more

Western scientific approaches" [6], p. 599). Permaculture's co-founder, Bill Mollison, attributed much of what he developed as 'permaculture' to what he learned from the indigenous people of Tasmania and others around the world [7].

It is such narratives that have led, in 2020, to a critique by a consortium of 16 indigenous leaders and organisations. Called *Whitewashed Hope*, the critique argues that regenerative agriculture and permaculture offer only narrow solutions to current crises as long as they take indigenous practices out of context. It encourages these farming movements to go deeper and encompass the worldviews they represent so as to enable 'the deep cultural and relational changes needed for humanity's collective healing'. The critique identifies six key areas of divergence between the worldviews of what it terms Western cultures and those of indigenous cultures. The aim of this paper is to instigate further debate and enquiry around the underexplored topic of how our worldviews impact farming systems and of ways to

I @CulturalSurvival/Galina Angarova, Māori Waitaha Grandmothers Council & Region Net Positive/Tanya Ruka, NEN, NorthEastNetwork/Seno Tsuhah, Society for Alternative Learning & Transformation & African Biodiversity Network / Simon Mitambo, Center for Indigenous Knowledge and Organizational Development/Bern Guri, @EarthIsOhana @LoamLove/Kailea Frederick, RegenAgAlliance.org/Reginaldo Haslett-Marroquin, @Linda.Black.Elk/Tatanka Wakpala Model Sustainable Community, @GreenstoneFarm\_LA/Greenstone Farm and Sanctuary, @CulturalConservancy/Melissa K. Nelson PhD, @NatKelley, @GatherFilm, @AGrowingCulture, @Terralingua.Langscape, @FarmerRishi, @KameaChayne.

Wright Chem. Biol. Technol. Agric. (2022) 9:64 Page 3 of 9



develop an expanded worldview for revitalising farming in the European context.

## The materially focused worldview of regenerative agriculture

Of the modern regenerative farming approaches, the agroecology movement in particular has positioned itself as representing small-scale, indigenous farmers and their knowledge systems worldwide [8, 9], and laudably defends the need for a plurality of epistemologies to embrace local cultural and ancestral knowledges [10]. This movement includes many farmers' organisations whose indigenous community members live according to their cultural worldviews that embrace the existence of a sentient, non-material reality as well as a material one. Pimbert, for example, describes the respectful relationship between such communities and their seed which they see as "sisters, mothers and living sentient beings rather than anonymous, inert commodities" [11]. Nevertheless, the science, education and practice of agroecology, as well as of the permaculture and organic farming movements, adhere to the materialist worldview, one that holds matter to be the fundamental substance in nature [12]. Acclaimed neuropsychiatrist Iain McGilchrist is more critical of this materially-based worldview, explaining that it rates as low priority issues of culture, nature, spirituality and the soul, and has historically lacked any substantial consideration for the impact this way of thinking and living in Western societies has on the health and well-being of the life-systems of this planet [13]. In attempting to contrast the different worldviews or conceptual frameworks of industrial farming, regenerative farming and a more holistic approach that embraces both matter and non-material dimensions, Wright [14] depicts a transition (see Fig. 1). In this transition, an industrial farming worldview may typically focus on the visible, material dimension as well as on reducing the farming system to its component parts (termed reductionism in Fig. 1A). A regenerative farming worldview considers both the components of the system and the whole sum of the farming system, yet still largely with a focus on visible, tangible matter (Fig. 1B). A more authentic holistic framework or worldview could be said to include both reductionism and systems thinking, yet also - significantly - both matter and non-material dimensions (Fig. 1C).

That is not to say that more holistic ontological underpinnings cannot be found within modern regenerative farming movements, but that they are the exception rather than the norm [14], while the impact of different worldviews has been vastly underestimated and underexplored in sustainable food systems discourse in general. A recent paper [15] proposes that worldviews and paradigms have the most causal linkages with unsustainable food system drivers, and converseley they also have the biggest leverages on potential mitigation strategies. This is why the message of the *Whitewashed Hope* critique is so important.

## Biodynamic farming—an exception to the whitewashing of regenerative agriculture?

This paper takes a particular interest in one of the modern regenerative farming approaches, biodynamic farming, and considers whether—given its different ontological underpinnings—there is a case for differentiation, whether biodynamic farming bucks the alleged

'whitewashing' trend? Paradoxically, rather than claiming to draw from indigenous cultures, the knowledge base of biodynamic farming—primarily one set of lectures called The Agriculture Course—was transmitted by the Austrian philosopher and polymath Rudolf Steiner (1861–1925). Steiner was openly influenced by German mysticism, theosophy, Gnostic Christianity, the Cathars, alchemists, Buddhism and Hinduism, amongst other traditions [16], and in particular the works of Johann Wolfgang von Goethe. Yet he primarily explored the spiritual worlds [17] and his lectures were based on his insights and inner visions from these spiritual exercises. "I bore a content of spiritual impressions within me. I gave form to these in lectures, articles, and books. What I did was done out of spiritual impulses." [18], p. 316).

Steiner proposed a path of knowledge which he called Spiritual Science and through which he claimed one could engage in one's own journey of discovery to explore the existence of an objective, intellectually comprehensible spiritual world, accessible to human experience [19]. As a highly developed seer, the concepts resulting from his own spiritual investigations he called 'Anthroposophy', meaning 'wisdom of the human being'. Biodynamic farming arose from this context, the biodynamic conceptualisation of the farm being of a holistic entity, a microcosm in physical form of the macrocosm of the physical, ethereal, and astral forms of the spiritual universe [20].

#### Materials and methods

This paper takes a critical analysis approach to address the question of whether the critique of regenerative agriculture holds true for biodynamic agriculture in particular. This is explored using the hypothesis that there is no evidence of a synergistic relationship between the biodynamic worldview and the indigenous worldview as characterised in the document Whitewashed Hope. Potential synergies were explored through a 3 stage process of critical analysis. In the first stage, the document Whitewashed Hope was broken down into its six component concepts or categories, as shown in column 1 of Table 1. Then, for each of the six categories, key literature written by or about Rudolf Steiner and his worldview was reviewed for evidence that may refute or corroborate synergies, and thirdly this evidence was documented in the final column of Table 1 to substantiate the enquiry being made.

#### Results

The six key areas of divergence between Western materially focused and indigenous worldviews, according to Whitewashed Hope, are categorised as: the contrast of dualism versus monism, dead matter versus the consciousness of all life, the notion of good and bad versus

a relational striving for balance, the limitations of languages, the need to consider the historical relationship of people to land, and the interconnectedness of human-Earth healing cycles. Table 1 presents these six categories and provides summarised versions of the ways in which materially focused worldviews diverge from indigenous ones, according to the critique. These are presented in the first 3 columns of Table 1.

It was not difficult to find relevant material from Steiner's collections; he was a prolific writer and orator with over 300 volumes to his name [21]. In fact the challenge was to select the most pertinent texts from within this huge body of work. Twelve texts written by Steiner or by other authors about his work were inspected for evidence which is displayed in the final column of Table 1. This evidence indicates that for each of the six broad characteristics of indigenous worldviews, clear synergies exist with the philosophy underpinning the biodynamic farming approach and these are displayed in the form of quotations and summary points. The selection was subjective and a larger amount of relevant information could also have been included. As such, the evidence presented indicates synergies in philosophy rather than identical phrases or the same exact meanings.

Looking to other literature, relatively little has been written about synergies between biodynamic farming and indigenous forms of agriculture, whether by the scientific or the farming community. A thoughtful account is provided by Devon Strong, a biodynamic farmer and bison rancher in California who had studied Lakota traditions for 30 years before being adopted by a Lakota family [22]. His work involved merging the Lakota buffalo ceremony with biodynamic livestock management practices. When discussing animal consciousness, Devon explains "This ceremony is much like Steiner's approach with the biodynamic preps,<sup>2</sup> a way to give the people access to the spiritual element in the ways of plants and animals (via prep materials) that will attract them to our farms for agricultural use..... Native people had a way of life that was intimately connected to the spiritual nature that Steiner regularly addressed." (22 p.16). Another example of the practical synergies between indigenous farming and biodynamics is Vanaja Ramprasad's historical account of soil management in India in relation to Vedic literature, in which she directly identifies a synergy with the biodynamic approach: "With its emphasis on cow dung, the balancing of elements, the tapping of cosmic forces, and its close attention to solar and lunar cycles, Homa farming shares much in common with

 $<sup>^2</sup>$  The biodynamic preps or preparations are natural concoctions of specific plant, animal and mineral that are ceremonially prepared and applied in order to bring balance and harmony to the farm.

**Table 1** Six key areas of divergence between modern regenerative and indigenous worldviews as identified in Whitewashed Hope, and evidence of synergies with Steiner's worldview that underpins biodynamic farming

| Six key areas of divergence (from<br>Whitewashed Hope) | Worldview of modern regenerative cultures (from Whitewashed Hope)   | Worldview of indigenous cultures (from Whitewashed Hope)   | Worldview of Steiner (based on analysis of 12 key texts)   |
|--|---|--|--|
| Where is Nature?                                       | Nature is viewed as separate, outside, ideal, perfect. Human beings must practice 'biomimicry', because we exist outside of the life of Nature  | We are Nature. As cells and organs of Earth, we strive to fulfil our roles as her caregivers and caretakers. We often describe ourselves as 'weavers', strengthening the bonds between all beings  | Steiner proposes that we are an integral part of the evolving natural world from which we arise. This world surrounds us, and we can rediscover ourselves within it, just as we can find all of nature transformed within us [37]. In their overview of biodynamic farming, Leiber et al. [38], describe it as trying to actively shape the unique interaction between crops, livestock and farmer   |
| Death doesn't mean dead                                | Maintain the 'dead' worldview of Western science: of rocks, mountains, soil, water, wind, and light. Believe that life only happens when these elements are brought together in some specific and special way   | View the Earth as a communion of beings and not objects. All matter and energy is alive and conscious. Mountains, stones, water and air are relatives and ancestors. Earth is a living being whose body we are all a part of. No 'thing' is ever dead; life forms and transforms | Steiner spoke about the existence of non-material beings. "When speaking about the four elements of earth, water, air and fire it must be stressed that everything of a solid, earthen nature has as its foundation an elemental spiritualitywhen knowledge is no longer obtained by means of combining abstract, logical thoughts, but by uniting ourselves through our thinking with the world rhythm, then we shall rediscover the elemental beings contained in everything of a solid earthy nature." [39] "Truly, the farm is a living organism." [40], p. 7) |
| From judgemental to relational                         | Maintain overly simplistic binaries through subscribing to good and bad. We must do only the 'good' things to reach the idealized, 99.9% biomimicked farm'garden, though we will never be as pure or good 'as Nature', because we are separate from her | Often share the view that there is no good, bad, or ideal—it is not our role to judge. No one is tainted by our touch, and we have the ability to heal as much as any other lifeform   | Steiner proposes a conscious equilibrium with nature whereby we are not entitled simply to exploit the Earth, but neither should we view ourselves as devastating irritants on the Earth's surface [37]  The Agricultural Course was given as an approach of healing or spiritual renewal in response to farmore devictions about the depletion of soils and a general deterioration of crops and livestock [41]   |
| Our words shape us                                     | Use English as their preferred language no matter the geography or culture. The English language judges and objectifies. English also utilizes language like 'things' and 'fts'   | Every language emerges from and is, therefore, intricately tied to place. To know a place, you must speak her language. There is no one-size-fits-all, and no words for non-living beings, because all life has equal value  | Steiner wrote about what he called The Genius of Language' (48). He felt that German was more useful to put across esoteric meaning than English. He wrote about the relation of a people's language to its soul life, and of differentiations of language according to geographical conditions  |

| <b>Table 1</b> (continued)                          |   |   |   |
|---|---|---|---|
| Six key areas of divergence (from Whitewashed Hope) | Worldview of modern regenerative cultures (from Whitewashed Hope)   | Worldview of indigenous cultures (from<br>Whitewashed Hope)   | Worldview of Steiner (based on analysis of 12 key texts)  |
| People are Land. Holistic includes history          | People are Land. Holistic includes history Claim to be holistic in approach, however, tends to People belong to land rather than land belong-energy exclude history exclude history exercises and processing of people and vice versa. Recognizing and processing the emotional traumas held in complete as descendants of assaulted, enslaved, and implementable of assaulted, enslaved, and implementable of assaulted in complete and increased in the pealing of peoples is necessary to the healing of land. Returning our rights to care for, harvest from and relate to the land that birthed us is part of the recognition. | People belong to land rather than land belonging to people. Healing of land must include healing of people and vice versa. Recognizing and processing the emotional traumas held in our bodies as descendants of assaulted, enslaved, and displaced Peoples is necessary to the healing of land. Returning our rights to care for, harvest from, and relate to the land that birthed us is part of this recognition | In the Agricultural Course of 1924, Steiner emphasised that agriculture touched on every aspect of human life [42]. He proposed three ideals expressed through three social spheres of equality, freedom and cooperation. Biodynamics emerged in the context of this threefold vision of social justice that included the decommodification of land. Steiner also wrote and lectured extensively on human health and healing, e.g., [43, 44], and m any biodynamic farms also include social elements around therapy and therapeutic education [16] |
| Composting  | Offen share the environmentalist message that the world is dying and we must 'save' it. Towards this mission, we must put Nature first and sacrifice ourselves for 'the cause'  | See Earth as going through cycles of continuous transition. We currently find ourselves in a cycle of great decomposition. As in any process of composting there is discomfort and a knowing that death always brings us into rebirth. Recognizing and healing all of our own traumas is healing Earth's traumas, because we are one  | In The Cycle of the Year as a Breathing Process of the Earth [45] Steiner writes of the Earth's cycle of inbreathing and outbreathing. In Dying Earth and Living Cosmos—The Need for New Forms of Consciousness [46] he reflects on the Earth's transition and speaks of extending and deepening our connection with the world and the cosmos as conscious and fully human co-creators. Steiner also wrote extensively about human reincarnation and soul evolution, e.g., [47]   |

Wright Chem. Biol. Technol. Agric.

biodynamic farming as developed by Steiner in Europe in the 1920s. Indeed, biodynamic farming methods are now widely followed across the Indian subcontinent." [23]. Ramprasad explains how the ancient practice of applying Panchakavya, a concoction of five products of the (sacred) cow, not only has proven benefits as a biofertiliser, a biopesticide and for restoring soil fertility, but also has medicinal applications and is used in ceremonies and rituals, for example to provide a link between 'earthly and heavenly forces' [23].

Such synergy does not necessarily mean that all biodynamic farming practitioners hold, or concur with, the philosophy proposed by Rudolf Steiner; a study by Paterson [24], for example, showed that only 25% of a cohort of biodynamic farmers in New Zealand were motivated by its philosophical and spiritual basis. Nor does this affinity mean that all biodynamic farming practice demonstrates the underpinning concepts, as far back as 1928 (4 years after the Agriculture Course was delivered), a decision was made to separate the biodynamic method from its underpinning Anthroposophical origins in order to attract a broader range of farmers to its practice [25]. Yet there remains today a strongly held, familial relationship between national and international Anthroposophical and biodynamic farming organisations, with the global biodynamic movement being coordinated by the Section for Agriculture at the headquarters of the School of Spiritual Science and the General Anthroposophical Section in Switzerland [26]. That is to say, there is a consciously held relationship between biodynamic farming practice and a worldview that embraces a greater spiritual and cosmological reality.

#### Discussion

## Ways forward for revitalising regenerative farming systems in Europe

Both Steiner and the authors of *Whitewashed Hope* argue for a more holistic worldview, not for its own sake but in order to both heal and maintain balance and harmony in the world. Does this mean that the regenerative farming movements should look to contemporary indigenous cultures for a more appropriate philosophical framework or worldview than the one they hold at present? The contributors to *Whitewashed Hope* invite these movements to ground their daily practices in ancestral ways and jointly move toward collective healing, encouraging them to "Learn whose lands you live on, their history, and how you can support their causes and cultural revitalization."

For European cultures, their own history and land is (also) deeply scarred, by repeated, ancient waves of colonisation, as well as by being the heartland of more recent scientific and industrial 'revolutions' that ushered in the materially focused worldview of today [27, 28].

Accepting this invitation would thus entail learning from the contemporary indigenous European worldviews and cultures, such as the Samoyeds of Russia, The Crimean Tatars, the Inuits of Greenland, the Saami of Scandinavia, the Basques, and the Sorbian people of Germany and Poland [29]. It could also mean engaging with the contemporary revivals of those indigenous agrarian peoples of Europe who were either wiped out or integrated into the cultures of their colonisers but who have left indelible traces on European landscapes, structures, cultural rituals and stories [30, 31]. For example, in his book The Druid Garden, Luke Eastwood, a practising permaculturalist and Druid, weaves practical guidance on food and medicinal herb production and usage with knowledge and wisdom from Celtic Europe [32].

Combined with the above, Steiner and others propose methods by which one can develop the means of perception beyond the five senses and use these methods to systematically explore and expand one's own worldview beyond the material. As previously noted, Steiner called this Spiritual Science, being inspired by German philosopher Johann Wolfgang von Goethe (1749-1832) who had developed a phenomenological approach (that is, the study of the structures of experience and consciousness) to the natural sciences as an alternative to the rationalist model. In describing this method, Brook explains "it is about a personal engagement and the transformation of your thinking and your being for more responsiveness to the climate, land, people, animals and plants that form the basis of the agroecological vocation." [33], p.237). Other, related methods for sensory development, engagement and transformation of thinking in the agricultural context include the practice of subtle energy awareness in the landscape [34], systemic constellations methods applied to agriculture [35] and the application of intuition for improved on-farm decision making [9].

#### **Conclusions**

There is a clear level of synergy between the characteristics of the worldview expressed in the document *Whitewashed Hope* and that of biodynamic farming as expressed by Rudolf Steiner, and this is corroborated by the scant other works available on this topic. The document *Whitewashed Hope* was produced by a diverse range of stakeholders coming to agreement over a shared set of trans-cultural principles, demonstrating that a more cohesive worldview is possible that combines both material and non-material dimensions. Such shared 'truths' were, for Steiner, the concepts by which we access the world's inner nature, and when combined with our individual perceptions that reflect the outer appearance of the world, we may achieve (and even create) a fuller picture of reality [36].

Wright Chem. Biol. Technol. Agric.

(2022) 9:64

In order to encompass a fuller picture of reality, any such shift in worldview would necessarily impact perceptions on the nature of science, on what is researched and on the way research is conducted, for example hastening the integration of quantum scientific principles into more applied fields. This in turn opens the doors to scientific approaches that may be better equipped to explore both the mechanisms and the broader impacts of biodynamic and other forms of food production that consider the non-material realm. Indigenous, Western materially-focused and biodynamic worldviews, and the their farming systems, are of course more nuanced and complex than portrayed in this paper which only scratches the surface of such a potentially transformative topic that merits far greater study.

#### Acknowledgements

Not applicable.

#### **Author contributions**

The author read and approved the final manuscript.

#### Funding

Not applicable.

#### Availability of data and materials

Not applicable

#### **Declarations**

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable

#### Competing interests

The author declares that she has no competing interests.

Received: 18 March 2022 Accepted: 21 June 2022 Published online: 14 September 2022

#### References

- IPES-Food (2016) From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems. International Panel of Experts on Sustainable Food systems. Available online: http:// www.ipes-food.org/\_img/upload/files/UniformityToDiversity\_FULL.pdf Accessed 14 Aug 2020
- Röling NG, Jiggins J. The ecological knowledge system. In: Röling NG, Wagemakers MAE, editors. Facilitating sustainable agriculture. Cambridge: Cambridge University Press; 1988.
- van der Ploeg JD, Barjolle D, Bruil J, Brunori G, Costa Madureira LM, Dessein J, Drągg Z, Fink-Kessler A, Gasselini P, Gonzalez de Molina M, Gorlach K, Jürgens K, Kinsell J, Kirwan J, Knickel K, Lucaso V, Marsden T, Maye D, Migliorini P, Milone P, Noe E, Nowak P, Parrott N, Peeters A, Rossid A, Schermer M, Ventura F, Visser M, Wezel A. The economic potential of agroecology Empirical evidence from Europe. J Rural Stud. 2019;71:46–61.
- Mäder P, Fliessbach A, Dubois D, Gunst L, Fried P, Niggli U. Soil fertility and biodiversity in organic farming science. Science. 2002;296:1694–7. https://doi.org/10.1126/science.1071148.
- Conford P.The organic tradition: an anthology of writings on organic farming, 1900–50. Cambridge: Green Books; 1988.

- Altieri M, Toledo V. The agroecological revolution in Latin America: rescuing nature, ensuring food sovereignty and empowering peasants. J Peasant Stud. 2011;38(3):587–612.
- Fox JB. Indigenous science. A celebration of Pacific culture. Cult Surviv Q. 2009;33:1.
- Rosset P, Altieri M. Agroecology: science and politics. In: Peter M, editor. Agrarian change peasant studies book 7. Rugby: Practical Action Publishing; 2017.
- von Diest S. Intuitive Farming: Heart-Based Decisions for Harmony in Agricultural Ecosystems. In: Wright J, editor. Subtle Agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 239–46.
- 10. Nieto Gómez LE, Valencia Trujillo FL, Giraldo DR. Pluri-epistemological bases of studies in agroecology. Entramado. 2013;9(1):204–11.
- Pimbert M. Reclaiming diverse seed commons through food sovereignty, agroecology and economies of care. In: Nishikawa Y, Pimbert M, editors. Seeds for Diversity and Inclusion. Cham: Palgrave Macmillan; 2022. https://doi.org/10.1007/978-3-030-89405-4\_2.
- Haverkort B. From the Mainstreaming of Western Science to the Co-Evolution of Different Sciences: Addressing Cognitive Injustice. In: Wright J, editor. Subtle agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 21–38.
- 13. McGilchrist I. The master and his emissary: the divided brain and the making of the western world. New Haven: Yale University Press; 2019.
- Wright J. Re-enchanting Agriculture: Farming With the Hidden Half of Nature. In: Wright J, editor. Subtle Agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 3–20.
- Kretschmer S, Kahl S. Sustainable development goal drivers in food systems. Front Sustain Food Syst. 2021;5:536620. https://doi.org/10.3389/ fsufs.2021.536620.
- McKanan D. Eco-alchemy, anthroposophy and the history and future of environmentalism. Berkeley: University of California Press; 2018.
- 17. Courtney HJ. What is biodynamics? A way to heal and revitalise the earth. In: Courtney HJ, editor. Seven Lectures by Rudolf Steiner. Great Barrington: Steiner Books; 2005.
- Steiner R. The story of my life. London: Anthroposophical Publishing Co; 1928.
- McDermott R. The essential steiner: basic writings of rudolf steiner. New York: Harper Collins; 1984.
- LeVasseur TJ. Biodynamic agriculture. In: Thompson PB, Kaplan DM, editors. Encyclopedia of food and agricultural ethics. Dordrecht: Springer; 2014.
- 21. Turgeniev A. Reminiscences of Rudolf Steiner and Work on the First Goetheanum. Forest Row: Temple Lodge: 2003.
- 22. Strong D. A Lakota approach t biodynamics-taking life seriously. Great Barrington MA: Lindisfarne Books; 2017.
- Ramprasad V. Manure, soil and the Vedic literature: agricultural knowledge and practice on the Indian Subcontinent over the last two millennia. In: Jones R, editor. Manure Matters: Historical, archaeological and ethnographic perspectives. Abingdon: Routledge; 2012.
- Paterson J. Resistance to the agriculture of modernity: the old order Amish, biodynamic agriculture, and small-farming in New Zealand. Occasional Paper Series Number 2, Department of Social Policy, University of Waikato; 2001.
- 25. Paull J. Biodynamic agriculture: the journey from koberwitz to the world, 1924–1938. J Organ Syst. 2011;6(1):27–41.
- Sektion-Landwirtshaft https://www.sektion-landwirtschaft.org/en/ events/past-events/founding-the-biodynamic-federation-demeter-inter national Accessed 10 Mar 2022
- Baring A. The dream of the cosmos, a quest for the soul. 3rd ed. Dorset: Archive Publishing; 2020.
- Clunies-Ross T, Hildyard N. The politics of industrial agriculture. London: Earthscan; 2013.
- 29. Grote R. On the fringes of europe: europe's largely forgotten indigenous peoples. Symposium: lands, liberties, and legacies: indigenous peoples and international law (2006/2007). Am Indian L Rev. 2006;31(2):425–43.
- 30. Greer JM. The Druid Revival Reader. Douglas MI: Lorian Press; 2011.
- 31. Leech M, et al. Human–nonhuman natures: broadening perspectives. In: Conceição P, et al., editors. The next frontier- human development and

- the anthropocene. Human development report 2020. New York: UNDP; 2020
- The EL, Garden D. Gardening for a better future, inspired by the ancients. Winchester: Moon Books; 2021.
- Brook I. Engaging in the Goethean Method, An Approach for Understanding the Farm? In: Wright J, editor. Subtle Agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 229–37.
- MacManaway P. Land whispering: practical applications of consciousness and subtle energy awareness in agriculture. In: Wright J, editor. Subtle Agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 293–304.
- 35. Roussopoulos M. The systemic constellations method applied to agriculture. In: Wright J, editor. Subtle Agroecologies: farming with the hidden half of nature. Boca Raton: CRC Press/Taylor & Francis; 2021. p. 219–28.
- Steiner R. The philosophy of freedom. Forest Row: Rudolf Steiner Press;
   2011.
- Steiner R. Spiritual ecology: reading the book of nature and reconnecting with the world. Forest Row: Rudolf Steiner Press; 2008.
- Leiber F, Fuchs N, Spieß H. Biodynamic agriculture today. In: Kristiansen P, Taji A, Reganold J, editors. Organic agriculture: a global perspective. Wallingford: CABI: 2006.
- Steiner R. The Elemental World and the Future of Mankind. Lecture, Dornach, May 28th, 1922. https://wn.rsarchive.org/Lectures/19220 528p01.html Accessed 12/08/21
- 40. Steiner R. Agriculture Course. 1st ed. Dornach: Geotheanum; 1929.
- 41. Steiner R. What is biodynamics?: a way to heal and revitalize the earth. In: Merryman M, editor. Seven lectures. Hudson: Steiner Books; 2004.
- Steiner R. Agriculture: spiritual foundations for the renewal of agriculture. East Troy: Bio-Dynamic Farming & Gardening; 1993.
- Steiner R. Understanding healing: meditative reflections on deepening medicine through spiritual science. Forest Row: Rudolf Steiner Press; 2013
- 44. Steiner R. Illness and therapy: spiritual-scientific aspects of healing. Forest Row: Rudolf Steiner Press; 2013.
- Steiner R. The cycle of the year as a breathing process of the earth. Hudson: Steiner Books; 1984.
- Steiner R. Dying earth and living cosmos: the living gifts of anthroposophy-the need for new forms of consciousness. Forest Row: Rudolf Steiner Press: 2015.
- Steiner R. Disease, karma and healing spiritual-scientific enquiries into the nature of the human being. In: Barton M, editor. Eighteen lectures held in berlin between October 1908 and June 1909. Forest Row: Rudolf Steiner Press: 2013
- Steiner R. The Genius of Language. Observations for Teachers. Six Lectures. Hudson, NY: Anthroposophic Press; https://www.rsarchive.org/ Download/Genius\_of\_Language-Rudolf\_Steiner-299.pdf
- 49. Whitewashed Hope: a message from 10+ indigenous leaders and organisations. Open source document bit.ly/IndigenousWorldViews Published 24h November 2020. Accessed 12 Aug 2021

#### **Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

## Submit your manuscript to a SpringerOpen journal and benefit from:

- ► Convenient online submission
- ► Rigorous peer review
- ▶ Open access: articles freely available online
- ► High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ▶ springeropen.com