BIODYNAMIC AGRICULTURE: A PARADIGMATIC ANALYSIS

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Abstract

Biodynamic agriculture is the world's oldest alternative agricultural movement. It is not well-known, however, in the United States. This article provides a basic foundation for practitioners and professionals to develop a comprehensive framework and understanding of the paradigm for biodynamic agriculture. It compares ontological, epistemological, and methodological beliefs about traditional, industrial, organic, and biodynamic agriculture. A paradigmatic model for inquiry developed by Egon Guba was used in analyzing biodynamic agriculture. As the industrial paradigm of agriculture is increasingly challenged by environmentalists an understanding of alternative agricultural paradigms becomes more important. This basic understanding should be based on disciplined analysis rather than on emotion, myth, and superstition.

Biodynamics is the oldest organized alternative agricultural movement in the world. From the beginning, biodynamics has been an approach that addresses the biological, technical, economic, and social aspects of farming and gardening. The biodynamic movement has
developed methods of organizing farms and methods of plant and animal husbandry; it also revived elements of traditional approaches that have proved to be sound. Beginning in 1928, the biodynamic movement pioneered the marketing of certified food; this innovation has since been taken up by many other groups (Koepf, 1989, p. 17).

Although biodynamic agriculture is the world's oldest alternative agricultural movement, it is not well-known in the United States. It is referenced in the USDA's annotated bibliography Tracing the Evolution of Organic/Sustainable Agriculture (Gates, 1988). When the authors have mentioned biodynamic agriculture in conversations with extension agents and teachers of agriculture around the United States, most have not heard of it. With the passage of the 1990 Farm Bill which includes the regulation and certification of organic produce, however, more agents and teachers can expect questions about this worldwide movement. Primary sources on biodynamic agriculture are not easy to find. Furthermore, these books use language and describe concepts that are outside most agricultural educators' frames of reference. The problem is to describe biodynamic agriculture in terms that are accessible to extension agents and teachers of agriculture.

**Purpose**

The purpose of this paper based on Lorand's (1996) doctoral thesis was to provide a basic foundation for practitioners and professionals to develop a comprehensive framework and understanding of the paradigm for biodynamic agriculture. The specific objectives were to describe:

1. The beliefs about the nature of reality with regard to agriculture (ontological beliefs).

2. The beliefs about the nature of the relationship between practitioners and agriculture (epistemological beliefs).

3. The beliefs about how the biodynamic practitioner should go about working with agriculture (methodological beliefs).

**Method**

The need for a systematic, explicit presentation of the essential principles underlying a set of agricultural practices was articulated. The elements of such a presentation need to reflect the rigors and standards of systems thinking. Such an analysis of biodynamic agriculture was accomplished using Guba's (1990) model. Guba maintains that paradigms (the set of beliefs that guide action, whether they are everyday actions or action taken in connection with a disciplined inquiry) can be best analyzed by answering three specific questions: (a) what is the nature of reality (ontology), (b) what is the nature of the relationship between the knower and that reality (epistemology), and (c) how should the knower (the practitioner) use that knowledge concerning that reality in practice (methodology)? (pp. 17-18).

The authors reviewed the literature about biodynamic agriculture asking these three questions. To create a frame of reference as a guide for the reader, they compared biodynamic agriculture with the better-known paradigms of traditional, industrial, and organic agriculture. In addition, the descriptions of biodynamic agriculture in the literature were interpreted to systematically link and clarify key concepts and principles of biodynamic agriculture with those of traditional, industrial and organic agriculture.

**Results**

The review of literature answered the three questions of importance to this study and met the study's objectives. Critical concepts emerged in all three areas of inquiry.

**Ontological Beliefs**

The core concept in the inquiry of the ontology of biodynamic agriculture is the concept of a "spiritual-physical matrix." This term was developed by Lorand (1996) to capture a unique
concept that has widespread theoretical and practical implications for the study of biodynamic agriculture.

The majority of current scientific study in academia has been restricted primarily to the quantifiable material/physical realm. The ontology of biodynamic agriculture is far more expansive, according to Rudolf Steiner (1925, 1929), an early 20th century philosopher and scientist, whose work was the foundation for biodynamic agriculture. In addition to physical properties, biodynamic agriculture consists of elements, principles, and forces that cannot readily (or not at all) be seen, touched, weighed, measured or counted. Steiner identified the components of this additional dimension as “spiritual.” These spiritual elements and forces are for the most part intangible, invisible and qualitatively different from the elements and forces in the material/physical realm. Steiner observed that contemporary language lacks the appropriate descriptors, terminology and science to readily and accurately observe and describe this spiritual dimension of reality.

The concept of a spiritual-physical matrix of elements, forces and principles includes both the material/physical dimension and the spiritual dimension. What is real (the ontology) is the integration of all of the forces. For the biodynamic practitioner, the task is to perceive and analyze phenomena based on this expanded reality. Steiner recognized the physical/material world of traditional science. However, he believed that although disciplined, these scientists only perceived part of a much larger whole, and therefore were inaccurate in many of their assumptions and inferences.

These interwoven, interdependent spiritual and physical dimensions described by Steiner, exist and function as a consistent, interactive whole, a matrix of interwoven substances, forces, rhythms, trends and tendencies. According to Steiner, the elements and forces of the spiritual dimension are observable directly by those individuals especially trained through a rigorous path of knowledge targeted at expanding the capacities of thinking and perception to include the spiritual dimension.

The path to enable anyone to perceive spiritual phenomena directly was described by Steiner in several books and hundreds of lectures. In many respects, the path Steiner describes parallels similar paths of knowledge described by philosophers of many other cultures throughout history (Buddhism, Hinduism, the Yaqui and other Native American spiritual leaders). According to Steiner, the more advanced the individual is in his/her knowledge and discipline, the more he or she is capable of perceiving the spiritual dimensions directly and understanding their effect in the physical/material realm. In some ways Steiner's ideas appear as a synthesis of many ancient, spiritual traditions. However, he added distinct and original insights.

The effects of these spiritual elements and forces can be perceived in the material/physical world, directly and by inference, by people without specialized training, if they have an open mind to such phenomena and use a guided observation. Whether the practitioner has developed his/her insight through following a path of knowledge or not, all agricultural practitioners can put Steiner's suggestions to practical use. However, mastering biodynamic agriculture would include a serious effort at mastering additional perceptive capacities.

The basic principles of the ontology of biodynamic agriculture are:

1. The earth is a living being in a living universe characterized by a spiritual-physical matrix.
2. Substances are carriers of forces that create life.
3. Celestial rhythms directly affect terrestrial life.
4. Animals and humans emancipate from celestial rhythms.
5. The farm is a living, dynamic, spiritual individuality (spiritual perspective).

**Epistemological Beliefs**

A crucial core concept emerging from the inquiry into the epistemological relationship between the practitioner and agriculture is the diagnostic-therapeutic relationship between the farmer and the farm totality. In biodynamic terminology, farm totality is called "farm individuality", a term that connotes and presupposes a comprehensive picture of farm health. Steiner makes the analogy between clinical farm practice and clinical human medical practice. Human health is far more complex than mere physical health. In the same way, farm health is not just the physical aspect. Thus, the role of a competent biodynamic practitioner is that of perceiving the spiritual forces at work through the material/physical aspects of the farm, and establishing practices that establish, sustain, and when necessary, restore balance and integration of both the spiritual and physical aspects. This leads to a strong preventative, immunologically-oriented practice similar to the practices of holistic medicine. Plant, animal and human immunological health form a central pillar of concern in the biodynamic paradigm.

**Methodological Beliefs**

Biodynamic agricultural methods were observed to be divided into two categories. However, the inquiry into biodynamic methods demonstrates how both of these categories lie consistently within the frame of reference established by the ontology and epistemology.

The first category of methods used by competent biodynamic practitioners is described as the "biological" methods. These are well-known to agricultural educators and include mulching, raised beds, companion planting, carefully selected crop rotations, inter-cropping, green manures, water conservation and revitalization, diversity of domestic animals and manures, diversity of field crops, biological pest control, and integrated diversified farming systems, such as gardening, dairy farming, and orcharding together (Koepf, 1993; Pfeiffer, 1977; Philbrick, 1971; Remer, 1986; Storl, 1979).

The second category, the "dynamic" aspects of biodynamic agriculture, is less familiar to agricultural educators. It includes such methods as compost preparations, primary field sprays, teas as foliar sprays and for pest and weed prevention and management, working with celestial rhythms in both plant production and animal husbandry, veterinary homeopathy, and the characterization of each farm as an "individuality." Using these methods appropriately and systematically requires the practitioner to grasp the ontology and his/her role as a diagnostician and therapeutic agent for the farm totality.

The ontological, epistemological, and methodological differences among traditional, industrial, organic, and biodynamic paradigms of agriculture that were observed in this inquiry are depicted in Tables 1, 2 and 3, respectively. A knowledge map of biodynamic agriculture was constructed to translate difficult terms and concepts into a concise, understandable form. This map is presented in Figure 1. A reading sequence of the four most important sources is offered in the recommendations section of this paper for the use of agricultural educators who wish to go beyond the tables explaining the paradigm of biodynamic agriculture.
Table 1
Ontological Differences Among Agricultural Paradigms.

<table>
<thead>
<tr>
<th>Traditional agriculture</th>
<th>Industrial agriculture</th>
<th>Organic agriculture</th>
<th>Biodynamic agriculture</th>
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<td>Traditional agriculture varies from culture to culture, from region to region, sometimes from tribe to tribe within a culture and a region. It is often a complex, living and dynamic web of relationships, in which: the earth is a living being within a living universe; forces are at work in all that is both animate and inanimate; celestial rhythms play a role in health and prosperity; animals and humans are an integral part of the whole; the farm is not considered a distinct being. Although these elements form a whole, the image of health is not necessarily discernible.</td>
<td>Industrial agriculture is an economic enterprise aimed at maximum short-term profit based on the most efficient use of resources and maximization of labor and technological efficiencies, in which: the earth is a relatively unlimited source of exploitable resources; substances are analyzed for a mechanical/ manipulative use; the influences on natural conditions are limited by technology; animals and humans are seen primarily in the context of output and cash flow; the farm is often seen as a machine or &quot;factory&quot; (mechanical perspective).</td>
<td>Organic agriculture sees life as a complex ecosystem in which: nature, on earth, is a living ecosystem, albeit purely material; substances are analyzed for balanced, ecological use; natural conditions are accepted and adjusted to; domestic animals are often excluded for ethical values; the farm is seen as an integral part of a larger ecosystem (ecological perspective).</td>
<td>Biodynamics is a complex, living and dynamic (spiritual) system of agriculture, in which: the earth is a living being in a living universe characterized by a spiritual-physical matrix; substances are carriers of forces (both physical and spiritual) that create life; celestial rhythms directly affect terrestrial life; animals and humans emancipate from celestial rhythms; the farm is a living, dynamic, spiritual, individuality (spiritual perspective).</td>
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Table 2

Epistemological Differences Among Agricultural Paradigms.

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<td>The traditional practitioner stands in a relationship to farming that is characterized by customs, rituals, generational wisdom, tribal rules, superstitions, religious mores and often other external values.</td>
<td>The industrial practitioner stands in an exploitive business relationship with the “factory” farm. Observation, analysis and policy decisions are made on a bottom line basis. A technological framework shapes and restrains the thinking, problem identification and analysis of the practitioner.</td>
<td>The organic practitioner stands in a benevolent appreciation of the complexity of the ecosystem and attempts to work within the framework of this ecosystem towards sustainability (zero-sum net gains or losses).</td>
<td>The biodynamic practitioner stands in both a supportive and remedial relationship to this complex, living, dynamic farm individuality. Observation, diagnosis and therapy development are the central themes of the practitioner’s relationship with the farm.</td>
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### Table 3

**Methodological Differences Among Agricultural Paradigms.**

<table>
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<td>The traditional practitioner practices rote patterns of seasonal preparations, planting, cultivation and harvesting based on convention as handed down by parents, tribal elders and consistent with customs. Innovations are not continually sought out and typically are slow in acceptance. Biodiversity is part of the traditional paradigm, stemming from the farmer's need for self-sufficiency with as much variety as possible.</td>
<td>The industrial practitioner is successful to the extent that economic profit is maximized. Consequently, methods and practices that lead to efficiencies of technology and labor are employed, assessed, and refined. Innovations are constantly sought out, but evaluated on the basis of their contribution to added profit from the business enterprise, which may come from increased output or decreased input. Biodiversity is inconsistent with efficiency, and monocrop production is the rule.</td>
<td>The organic farmer seeks a sustainable subsistence, and restricts his/her activities to non-exploitive practices that “do no harm,” and thus support ongoing sustainability. Innovations are readily accepted to the extent that they enhance sustainability and respect economic limitations. Organic production does not emphasize biodiversity as an essential principle, and monocrop production is common.</td>
<td>From the diagnostic-therapeutic relationship flow the biodynamic practitioner's activities which are divided into supportive (preventative), maintenance and remedial (therapeutic) interventions. In practice, there is a strong focus on balance, biodiversity, and plant and animal immunity. Innovations often evolve from heightened perception of the soil, plant and animal health rather than from the import of technology. All activities are designed to enable the farm individuality to experience maximum long-term health.</td>
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Conclusions

The biodynamic paradigm of agriculture is complex, difficult to understand, and requires substantial study of the pertinent principles and practices. The seminal works (Steiner, 1925, 1929) contain esoteric concepts written originally in German. These concepts are not well connected to the current knowledge and experience base of agricultural educators. A lack of current information on biodynamics was apparent in the literature review.
A second conclusion was that biodynamics is a comprehensive and systematic paradigm of agriculture. It is an integrated whole where the methods are derivative of the ontology and epistemology. Biodynamic agriculture offers many benefits and opportunities for agriculturists today.

The third conclusion was that the paradigmatic model for inquiry developed by Guba provides a useful, if somewhat challenging, model for the systematic analysis of agricultural paradigms. The analysis helps one to understand not only the unfamiliar paradigms of organic and biodynamic agriculture but the familiar paradigms of traditional and industrial agriculture.

Recommendations

Five opportunities emerge where the understanding and communication of biodynamic agriculture can be readily facilitated.

1. The knowledge map should be used for self-study, for presentations on biodynamic agriculture, for seminars or courses, and as a stand-alone exhibit.

2. Supplements to the knowledge map in the form of distributed written material, overheads, reading lists, and experiential learning activities are needed to develop an understanding of biodynamic agriculture.

3. The study of biodynamic agriculture would be better facilitated by a biodynamic dictionary that translates Steiner's terminology into more familiar agricultural and scientific terminology.

4. Those who wish to learn about biodynamics should visit practicing biodynamic farmers. Names and locations of existing farms can be secured from the Biodynamic Farming and Gardening Association of North America, Inc., Kimberton, PA.

5. For additional reading, the references in the thesis (Lorand, 1996) should be consulted. As a beginning, the authors recommend the following sequence of readings: (a) Sattler & Wistinghausen, 1989, Biodynamic Farming Practice, (b) Storl, 1979, Culture and Horticulture: A Philosophy of Gardening, (c) Kolisko & Kolisko, 1978, Agriculture of Tomorrow, and (d) The Biodynamic Farming and Gardening Association of New Zealand, 1989, Biodynamics: New Directions for Farming and Gardening in New Zealand.

Educational Importance

Opportunities for a theoretical breakthrough in agriculture and other fields may come through the rigorous use of paradigmatic analysis. Guba's model provides a form that challenges the student in any field to make explicit basic tenets that are most often left unspoken. Paradigmatic analysis brings to systems thinking a skeletal framework or minimal set of standards to be met in order to assure comprehensive, disciplined inquiry. Further, it provides a powerful and transferable model of disciplined inquiry that may lead to better understanding of agriculture.

As the industrial paradigm of agriculture is increasingly challenged by environmentalists, and as alternative paradigms of agriculture, organic and biodynamic, are considered, this disciplined analysis becomes important to separate facts from emotions, myths, and superstitions.

As agriculturists consider the advantages and disadvantages of different paradigms of agriculture, they will certainly turn to agricultural educators for information and help with analysis. Agricultural consultants working in countries such as those of Central and Eastern Europe which are consciously transforming the agricultural sector particularly need a broad understanding of agriculture and alternative agricultural paradigms.
References

Biodynamic Farming and Gardening


