

Living Farms

The magazine of the Section for Agriculture

Enhancing Crop Productivity and Carbon Sequestration with Basalt Rock Powder in the Egyptian Western Desert

Tarek R. Elsayed, Hamed Hosny, Sameh Shadad, Weikert Visser
Faculty of Organic Agriculture – Heliopolis University – Egypt
Presented by: Henda Hany (EBDA)

Abstract:
This study explores the application of basalt rock powder to agricultural fields in the Egyptian Western Desert, evaluating its impact on crop productivity and carbon sequestration. Three treatment levels were tested (27%, 5%, and 0% basalt by weight) in combination with compost, applied at rates of 15, 2, or 0 tons basalt/ha per season. Eight crops were grown over a total area of 10 hectares for five months. Results show up to a 10% increase in crop volume, a significant rise in plant growth promoting bacteria, and basalt dissolution rates of 20-50%, potentially sequestering up to 2 tons of CO₂ per hectare during the test period.

Introduction:
Weathering is a process that captures atmospheric CO₂. Many soil organisms secrete organic acids that chelate cations from basalt minerals, thereby generating mineral dissolution and promoting their release into the soil.

Results:
Soil health indicators were monitored at the end of the first season. Bacterial counts differ based on the treatment. Total bacteria and fungi reflect soil fertility, N₂-fixing bacteria indicated soil functional diversity.

Microbial count: Total Bacteria, Total Fungi, Phosphate solubilizing (NRBP), Nitrogen fixing bacteria, Phosphate solubilizing bacteria.

The use of scanning electron microscope (SEM) images to investigate the structure of basalt provided valuable insights into the dissolution process. Pores created as the bacteria colonize and grow on the rock material, secreting extracellular organic acids that dissolve or erode the surface.

Bar charts showing crop yield (kg/ha) for different crops (Amaranth, Bean, Corn, Cucumber, Eggplant, Fava, Lentil, Onion, Pumpkin, Tomato, Zucchini) across treatments (Basalt 27%, Basalt 5%, Compost, Sand) for different seasons (1st, 2nd, 3rd).

Conclusion:
The buildup of soil health and beneficial microbial populations (total bacteria and fungi, phosphate-solubilizing bacteria, and diazotrophs) increased significantly through the continuous application of basalt dust powder, particularly phosphate-solubilizing bacteria, which can play a major role in the dissolution of basalt dust particles.

Additional findings:
Over the course of the experiment, the proportion of PGPR increased markedly, particularly with basalt at phosphate-solubilizing bacterial count. These bacteria produced extracellular organic acids, as confirmed by scanning electron microscopy of basalt dust surfaces. The 5% basalt treatment as a sustainable amendment to improve soil fertility, support beneficial microbial

Soil strategies against climate stress

Findings from the DOK long-term trial

Biodynamic maize breeding

Revolutionary plant-microbe partnerships

Biodynamic cucumbers have the greatest vitality

Proven by a stress storage test

Wanted: New economic models

The international 'Biodynamic Economy' project

Connectedness as a principle

The biodynamic food organism

You never farm alone!

Invitation to the Agriculture Conference 2026

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Editorial



Dear readers

In this issue, we focus on two fundamental topics in agricultural work: research and communities for the future. Both are of central importance to the biodynamic movement – they shape our thinking and actions amid the challenges and opportunities of our time.

Research is at the heart of biodynamic agriculture. It does not only take place in laboratories, scientific articles or specialist circles – it happens every day on the farms: walking through the fields, working with the animals, working in the garden. It arises from experience, through tried and tested methods and open exchange with one another. Every observation, every question and every intuition is part of an ongoing exploration of life. By attentively perceiving, interpreting and responding to our environment, we develop an inner image of the living earth and our interaction with it. This process is research in itself. Biodynamic farmers are also spiritual researchers – they follow Rudolf Steiner's call to observe living relationships through the insights of anthroposophy.

There are many ways to understand what is revealed on the farm and in the field. Some rely on soil analyses or scientific measurements. Others cultivate qualitative approaches such as Goethean observation or explore the

workings of etheric forces to understand how life expresses itself on the farm. This diversity of approaches is what defines biodynamics. Experience and discovery are the keys to developing new perspectives and finding solutions to current challenges.

At the beginning of September 2025, the third international conference on biodynamic research took place in Britain, which resulted in several articles in this issue of the magazine. It was open to anyone involved in research. Participants included farmers, students, teachers, researchers, artists, economists and many other professionals. One insight became particularly clear: when we welcome different perspectives, new communities and networks emerge – and with them new social dynamics.

This spirit of collaboration will carry us forward – to our next Agriculture Conference entitled 'You Never Farm Alone. Living Communities for the Future', which will take place at the Goetheanum in Dornach from 4 to 7 February 2026.

Eduardo Rincón

Co-head of the Section for Agriculture at the Goetheanum

A look back at the research conference

Photos and collection of the research contributions





Soil strategies against climate stress

Impressive findings from the DOK long-term trial

The DOK field trial has been running in Therwil, Switzerland, for 45 years – and is providing answers that are crucial for the future of agriculture. In an interview, trial manager Hans-Martin Krause explains why patience is essential in agricultural research, how biodynamic agriculture is reversing the global trend of declining soil fertility, and why living soils are the best insurance against climate stress.

Lukas Maschek: *The DOK field trial is regarded worldwide as one of the most important long-term studies on organic farming. What distinguishes it from other research projects?*

Hans-Martin Krause: What makes it special is its history: the trial was not initiated by authorities or universities in the 1970s, but by farmers themselves. It was a bottom-up movement. The initiators wanted to know how different farming methods affect the soil, yield and ecosystem in the long term. That is why we have been comparing biodynamic, organic and conventional cultivation plots ever since – with an unfertilised and a mineral fertilised control group.

You talk about 'long term'. How long did it take for the first differences to become apparent?

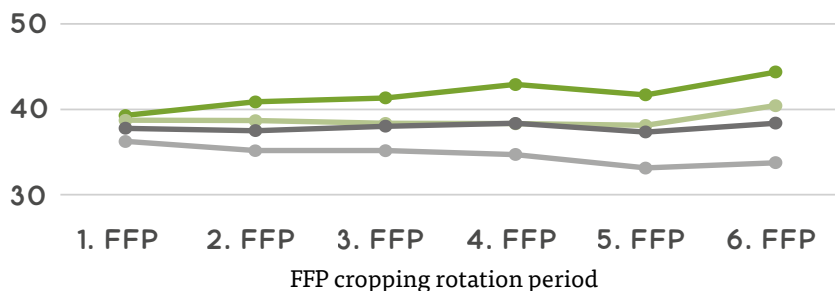
Much longer than many people might think. It took 22 years of observation before significant differences in the organic carbon content of the soil could be detected with the same fertilisation intensity. This is an impressive example of how slowly soil systems respond to different agricultural practices and how important patience is in agricultural research. Short-term studies would never have revealed these effects.

What is the most significant result that emerged from the comparison of the three cultivation methods?



Dr. rer. nat. Hans-Martin Krause (right) is head of the DOK trial at the Research Institute of Organic Agriculture (FiBL) in Frick.

Lukas Maschek (left) is a research assistant in the Section for Agriculture.



Organic carbon stock

Tons of carbon per hectare

- D biodynamic (Demeter)
- O organic (Bio Suisse)
- K conventional, with manure (IP-Suisse)
- M conventional, mineral fertilised

The most impressive finding is that the biodynamic method, in which we use manure and compost, shows a clear increase in the carbon content of the soil, i.e. an increase in soil fertility. Globally, we are seeing the opposite trend: arable soils are losing fertility and thus quality over the years. The fact that we can reverse this trend through targeted agricultural practices is encouraging – not only for Switzerland, but for global agriculture.

How does biodynamic practice affect soil quality?

Soil quality cannot be reduced to a single value. Organic activity is the decisive factor. In biodynamic plots, we measure the highest microbial biomass, the highest organic carbon content and greater biodiversity – from soil microbes to the number and diversity of insects. Such active soils are more resistant to stress and ensure long-term stable production.

Conventional systems are generally more productive. How do you assess the tension between yield and ecological quality?

It is a classic conflict of objectives. Conventional systems deliver higher yields in the short term and are economically attractive for many farms. Ecological systems, on the other hand, offer clear advantages in terms of soil quality, biodiversity and climate protection – the latter because they cause lower soil-bound greenhouse gas emissions. The big challenge in the coming years will be to reward these ecological services financially. If they generate income for farmers, there will be a real incentive for more sustainable farming.

What does this mean in concrete terms for political decisions?

We need instruments that reward benefits for the ecosystem. This is already happening in Switzerland, for example when a farmer converts to IP, organic or Demeter. Payments for proven increases in soil fertility or for the promotion of certain species might be considered. Only if such benefits are reflected in the business model can we implement more ecological food production on a broad basis.

How do you assess the significance of the DOK trial for the future? What are the upcoming questions?

Adaptation to climate change is one of the most pressing issues. We are already seeing significantly more extreme years: 2023 was exceptionally dry, while 2024 was very wet. These extremes put pressure on all farming systems. Our data from the coming decades will show which farming methods are best able to cope with such fluctuations. Initial indications suggest that organic systems – thanks to higher organic matter and better soil structure – can store water for longer and are better able to withstand at least moderate heat waves.

A diverse soil microbiome acts as a buffer. It stabilises the nutrient cycle, improves water storage and promotes resilience to disease. We cannot artificially replace this 'organic insurance'. That is why maintaining a living soil is one of the most important strategies against climate stress.

What are your personal wishes for the future of agriculture?

If we manage to combine ecological and economic goals, we can make agriculture climate-proof and future-proof.

Video – 45 years of the DOK trial





The future potential of biodynamic maize breeding

How plant-microbe partnerships are revolutionising agriculture

A research project by Walter Goldstein and his team at the Mandaamin Institute in Wisconsin, USA, shows that maize is much more than just a high-yield grain. Under biodynamic conditions, maize plants develop that are not only more nutritious, but also work together with bacterial communities, bind nitrogen from the air and genetically renew themselves. These dynamic holobionts could drastically reduce the use of fertilisers and pesticides – and fundamentally change agriculture.

From sacred plant to corporate grain

Corn, the sacred plant of the indigenous peoples of America, has conquered the world thanks to its enormous adaptability and productivity: today it is the most widely grown grain on earth. In modern agriculture, maize is increasingly coming under the control of a few powerful corporations that are optimising it for industrial cultivation and genetically modifying it. The result: on the one hand, yields are increasing, especially with dense planting and intensive use of fertilisers and pesticides. On the other hand, quality is deteriorating – protein and mineral content is declining, panicles are becoming smaller, pollen production is decreasing, plants appear uniform and are losing flavour. In addition, the risk of transgenic contamination, soil erosion and environmental pollution increases, while agriculture

and national economies become increasingly dependent on maize.

There is a tension between the mindset of indigenous peoples and industrial agriculture, which is reflected in maize. Traditional varieties impress with their exceptional properties: they are rich in nutrients, can flexibly adapt their genome thanks to ‘jumping genes’ (transposons), and form close partnerships with microorganisms. Conventional lines, on the other hand, are highly productive, stable varieties that grow reliably under optimal conditions.

Combining the best

Our approach was to combine the best of both perspectives. This combination of tradition and innovation results in maize that is not only high-yielding, but also adaptable, nutrient-rich and ecologically valuable.



Dr. Walter Goldstein, MSc and PhD in agronomy, worked at the Michael Fields Agricultural Institute for 25 years and founded the Mandaamin Institute in the USA in 2011. He has been growing biodynamic maize since 1989



Two conventionally bred commercial hybrids

Two plants from the Mandaamin Institute inbreeding

Both were harvested at the same time and dried in the sun for the same length of time.



Bacteria penetrate the epidermal cells of the root. A cloud of bacteria can be seen where intracellular colonisation takes place.

We selected maize under biodynamic conditions for biodynamic and organic farms and observed the plants closely. The research was conducted primarily at the Mandaamin Institute in Wisconsin and on several organic and Demeter farms in collaboration with James White's team at Rutgers University, agricultural universities in Illinois, Iowa, Wisconsin and Puerto Rico, and several companies.

After 14 years of research with open populations, breeding shifted to inbred lines, hybrids and improved synthetic populations – mostly crosses between traditional landraces and conventional lines. The aim was to develop plants that are robust, high-yielding and adaptable.

Surprising results: more minerals and microbes

One of the first spectacular results of the breeding programme was the mass occurrence of soft-kernel seeds. These mutants are not only easier to process, they also contain significantly higher amounts of essential amino acids such as methionine, lysine and cysteine, as well as more minerals. Organic poultry farmers could thus dispense with synthetic methionine and at the same time reduce their use of soya by around 9 per cent.

plant responds with its own defence substances. They are not only passed on via the seeds, but are actively absorbed via the root system, multiplied in root hairs and stored in special cells. The partnership between plants and bacteria is reminiscent of Rudolf Steiner's concept of 'living nitrogen'.

The inbred lines showed significantly higher vitality and stress tolerance than conventional lines, very dark green, chlorophyll-rich leaves, better mineral uptake and greater competitiveness against weeds. Isotope studies suggest that some lines bind significant amounts of nitrogen from the air with the help of their bacteria.

It was particularly noteworthy that large, soft seeds occurred exclusively under biodynamic conditions. Initial tests with biodynamic herb seed baths indicate that these enhance microbial colonisation of the plants and further promote growth. The intense bacterial presence could also increase the plants' ability to generate genetic variation by activating 'jumping genes'. True clonal stability of the inbred lines was difficult to achieve – an exciting but challenging aspect for official variety approval.

Revolutionary research potential – biodynamic holobionts

The results open up a completely new field of research: holobiome breeding, which takes into account the interactions between the plant, the microbiome and soil life. This approach could help solve climate, environmental and health problems in agriculture, reduce fertiliser requirements, control weeds naturally and, at the same time, produce more valuable products. If taken seriously, this vision has the potential to fundamentally change biodynamic, organic and even industrial agriculture.

"The partnership between plants and bacteria is reminiscent of Rudolf Steiner's concept of 'living nitrogen'."

In addition, the most efficient inbred lines and hybrids were densely colonised with bacteria – from the seeds to the roots to the leaves, chloroplasts, pollen, stigmas and embryos. These microbes generate dynamic movements in the cell plasma and produce nitrate, ammonium and nitric oxide, while the

More flavourful apples thanks to eurythmy

Eurythmy gestures influence the growth and ripening of plants

Perhaps you have already experienced eurythmy on stage or in a Waldorf school? Or as a form of therapy for illnesses? The ArteNova Institute has been investigating another application for 25 years: how eurythmy gestures affect plants. Many years of research show that eurythmy not only influences the growth of seedlings, but also the taste of apples.

Eurythmy was developed as a movement art by Rudolf Steiner. The sounds of the alphabet correspond to the etheric forces. If one could speak all the sounds at the same time, this would correspond to the human etheric body. Each eurythmy gesture is like a focus on a specific etheric force: the B focuses on a centre; it is an envelope and protection like our skin. The L flows, rises and sinks like the water cycle, an archetype for our blood circulation. Thus we find the archetypal forces of plant growth in the eurythmy gestures. With eurythmy treatments, we want to enter into a dialogue with plants on the etheric level.

Pioneering research

In 2000, eurythmist Tanja Baumgartner began researching the effect of eurythmy on plants. First, she spent almost ten years working with Stephan Baumgartner from the Hiscia Institute to investigate the basics: duration and frequency of treatment, distance from the seed or plant during treatment, influence of the person performing the treatment, influence of the phases of the moon, and more. In 2007, the 'ArteNova Institute for Eurythmy in Research and Art' was founded to provide an institutional framework for the research work. Since then, over 80 different research projects have been carried out. Since 2012, the focus has shifted to the targeted application of eurythmy: how can certain effects be achieved that are desired in agricultural, horticultural or breeding work? This expanded the spectrum of eurythmy treatments to include water, soil, animals and food.

The influence of treatment duration

The number 40 has a special meaning in the Bible, which is why we wanted to investigate this period as a treatment duration. Tanja Baumgartner treated water with the sounds L and W over the following periods: one day, seven days and forty days. We then germinated cress seeds in two repetitions with this water.

After the treatment, the longitudinal growth was measured and the water was examined using formative forces research. In terms of the total length of the seedlings, the W plants were significantly longer than the L plants after one day of treatment. After seven days, the effect was reversed: the L plants were significantly longer than the W plants – a result that was consistent with our previous experience. There were no differences between the plants treated for 40 days and the untreated control plants.

The influence of the moon phases

Due to striking results in previous experiments, we investigated the interaction between eurythmy treatments and the phases of the moon. To this end, water was treated by four people using different gestures and then given to cress seeds on three new moon and three full moon dates, and the longitudinal growth was examined again. It was found that in all three repetitions, the sprouts were significantly longer at new moon than at full moon. In the

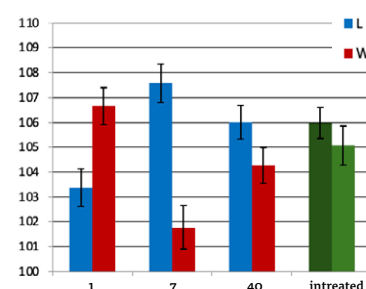


Tanja Baumgartner is the founder of the ArteNova Research Institute and an eurythmy therapist.



Eckart Grundmann studied agricultural sciences at the University of Kassel-Witzenhausen and conducts research at the ArteNova Institute.

Influence of treatment duration



Vertical: Length of cress seeds in mm
Horizontal: Treatment duration in days



Differences in the water were found in seven of the eight methods. In particular, a grouping of sounds with similar results became apparent. When the results of the individual tests were sorted according to their value, two groups emerged: one with W, B and 'movement' and one with K, S and L. These groups were also identified in the research into formative forces.

From the results, we conclude that the changes brought about by the eurythmy treatments can be demonstrated at various levels. Groups of sound

gestures showed a comparable effect in this water experiment.

Sweet and crisp apples

One of the questions we were asked from the field was whether apples can become sweeter and crisper through eurythmy treatments. To this end, Tanja Baumgartner treated apple trees seven times for ten minutes at a time from blossom to harvest. Initial tests in the laboratory of the Research Institute of Organic Agriculture (FiBL) already showed an increase in sugar content in apples that were treated with the aim of increasing sweetness.

In a follow-up experiment, we then had two treated varieties tested in a blind taste test in a taste laboratory. Here, too, the treatment resulted in an increase in sweetness. Above all, however, the value in the 'overall assessment' parameter was significantly higher for the treated variant of both varieties than for the untreated ones. This shows that eurythmy treatments can influence the quality of food. This offers great potential for biodynamic agriculture!

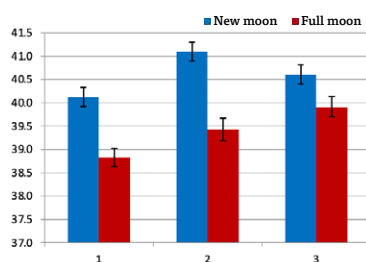
interaction of the moon phases with the individual sound gestures, the effect was that at new moon the effect of the sounds could not be distinguished, while at full moon there were clear differences between the sounds.

We can therefore assume that the forces of the moon interact subtly with the etheric forces, which should be taken into account when using biodynamic preparations or potentised remedies, for example.

Water as a storage and transmission medium

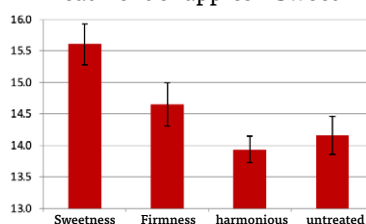
In terms of the practical application of eurythmy treatments, we investigated the extent to which water is suitable as a medium – i.e. as a means of storage and transmission. To this end, water was examined, using eight test methods, for differences after eurythmy treatments with five different sounds and a variant with 'non-eurythmy movement'. The investigations ranged from the physical level, for example with UV spectroscopy, via tests on living organisms (cress and algae tests) and picture-forming methods, to formative forces research.

Influence of the moon phases



Vertical: Length of cress seeds in mm
Horizontal: Repetitions of treatment

Treatment of apples – Sweet



Vertical: Brix value
(sugar content or sweetness)



Biodynamic cucumbers have the greatest vitality

This is proven by a stress storage test

How does the cultivation system influence the vitality and shelf life of our food? Jens-Otto Andersen, Marjolein Doesburg-van Kleffens, Jürgen Fritz and Carsten Gründemann found answers to this question by conducting a stress storage test on cucumbers. In their study, published in 2025, they compared conventionally, organically and biodynamically grown cucumbers. The result: the biodynamic samples achieved particularly good results in the stress test. Anna Storchenegger spoke with Marjolein Doesburg-van Kleffens and Carsten Gründemann.

A. Storchenegger: *Compared to organic and conventional cucumbers, biodynamic cucumbers performed best in terms of three parameters: antimicrobial properties, colour behaviour and healing of cut surfaces. How clear-cut is this result?*

C. Gründemann: We examined almost 900 cucumbers – a large sample size. The difference between conventional cucumbers and the two organic varieties was statistically significant. However, there were differences within the groups. Theoretically, this could be related to the microbiome, but it is very complex to work that out.

M. Doesburg-van Kleffens: We saw a clear trend in favour of biodynamic cucumbers, but not every single one was automatically better. Factors such as soil, weather, farm management, seed quality, transport and storage play a major role.

The stress test is suitable for plants from the Cucurbitaceae family – cucumbers, courgettes, certain pumpkins, and presumably also watermelons.

Do biodynamic cucumbers have a better microbiome and therefore stronger defences?

M. Doesburg-van Kleffens: We have not proven this directly; that would require a separate microbiological study. Our investigations are primarily phenomenological: we observe the better properties and interpret them. It is conceivable that greater microbial diversity or certain beneficial bacteria that enrich the microbiome and make it more diverse are promoted by biodynamic methods. Conventional cultivation with pesticides, on the other hand, can strongly select and reduce microbes, thus weakening the microbiome.



Marjolein Doesburg-van Kleffens is a research assistant in the field of translational complementary medicine at the University of Basel.



Carsten Gründemann is professor of translational complementary medicine at the University of Basel.

Stress storage test

For the study, 865 cucumbers from conventional, organic and biodynamic cultivation were sliced, then reassembled and packed in airtight cling film. After two weeks of storage at 23.5°C, the previously defined vitality parameters were examined.

There were clear differences between the three cultivation methods. The regeneration of the cut surfaces was particularly remarkable; in the case of biodynamic cucumbers in particular, these grew back together firmly.



conventional

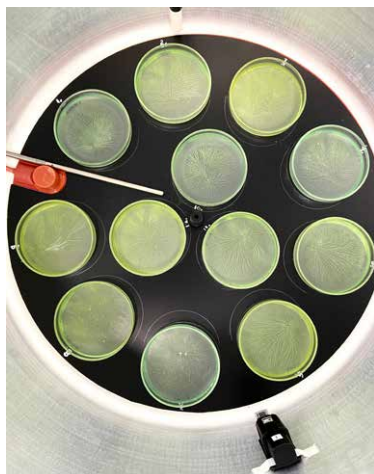


organic



biodynamic

One possible explanation for this is the higher concentrations of secondary plant substances in organically and biodynamically grown cucumbers. These substances strengthen the plants' stress resistance and support the healing processes of the cut surfaces.



Anna Storchenegger is responsible for communication and public relations in the Section for Agri-culture.

Can we conclude from your results that eating biodynamic cucumbers has a positive effect on health?

M. Doesburg-van Kleffens: We cannot make any direct statements about this. Clinical studies would be needed to prove this, which is a different field of research. In theory, foods with higher vitality or a more diverse microbiome could be better utilised by the body.

C. Gründemann: It has long been my wish to combine medicine and agriculture, as I see great therapeutic potential in working with the earth. The cucumber project provided an ideal opportunity to pursue this interest and to explore how different cultivation methods can affect the vitality of our food — and, potentially, our health.

Are you planning further projects to demonstrate the vitality of food?

M. Doesburg-van Kleffens: Together with Paul Doesburg, we are currently developing a portable crystallisation chamber – a 'miniature laboratory' for copper chloride crystallisation (see pictures on the left). This will allow researchers to see for themselves which crystal patterns are produced by different cultivation methods.

C. Gründemann: This method shows a different form of expression of vitality than the cucumber stress test that was carried out. Until now, the image-cre-

ating crystallisation method has only been possible at great expense in terms of infrastructure and money. We want to change this and offer a practical, scientifically sound solution.

What advice would you like to give our readers, i.e. farmers and consumers?

C. Gründemann: Anything that damages the soil and microbes reduces the vitality of the earth and plants in the long term – and thus also our own vitality. There are technical tricks for extending shelf life, but regional, seasonal production is best: not everything has to be available all year round.

M. Doesburg-van Kleffens: I think it's important to change our mindset: to understand what cultivation and nutrition mean. If consumers pay more attention to origin, season and cultivation methods, quality and shelf life will automatically come to the fore.

Find out more:



When cows have no horns

Effects on social behaviour, metabolism and milk quality

When we think of a cow, a familiar image often comes to mind: a calm, horned cow in a green pasture – an open sky, the grass lush. It is an idyllic image, but one that also expresses the deep connection between animal and landscape. But what happens when a cow's horns are removed? Recent studies and observations provide interesting insights.

What purpose do a cow's horns serve?

The obvious answer: horns are weapons for defence and for establishing the hierarchy within the herd. But hornless cows also fight and communicate. So the function seems to be more comprehensive. Recent observations suggest that horns also influence a cow's perception and metabolism.

Horns, hair and teeth are skin appendages – criss-crossed by nerves and blood vessels. Their shape and blood supply could be related to the way a cow perceives its environment. Rudolf Steiner spoke about the way that horns 'conduct energies inwards' – that they not only have an external effect, but are also part of a comprehensive physiological and psychological perception system.

Connection to digestion

Cows with large, wide-spreading horns are found where they have to make do with lean, raw fibre-rich feed – i.e. roughage with low nutritional value.

Observations on biodynamic farms, such as the Sekem Farm in Egypt, suggest that when cows are switched to a hay diet (and in hot climates), the next generation develops larger horns that point more upwards. This correlation suggests that horns are not merely a relic of evolution, but are linked to metabolic processes, heat regulation and possibly also to the animal's consciousness.

Social function

In the wild, a clear pattern emerges: large grazing animals in open grasslands usually have horns and live in social herds. Smaller, more forest-dwelling species are hornless or have small, backward-facing horns. Some of them live alone. Horns therefore also seem to be related to social behaviour and the environment.

Humans have changed this natural pattern through domestication. Hornlessness has recently been preferred in breeding – for practical reasons of stable housing. But this has also changed the nature of the cow itself. It has gone from being an alert grazing animal to a stable dweller with limited perception and less social herd differentiation. What does this mean for them – and for the milk we drink?

Inflammation tendency in dehorned cows

Several studies have found increased inflammation markers and signs of subacute ruminal acidosis (over-acidification of the rumen) in dehorned cows – especially when the cows were fed energy-rich concentrated feed. This suggests that dehorning and intensive feeding can reinforce each other – to the benefit of performance, but at the expense of the animal's structural and health stability.



Dr. Jenifer Wohlers works at KWALIS Qualitätsforschung Fulda GmbH, where she combines modern analytics with holistic thinking to develop new quality parameters.

"This correlation suggests that horns are not merely a relic of evolution, but are linked to metabolic processes, heat regulation and possibly also to the animal's consciousness."



Heat regulation and metabolism

Horns are translucent, and the mucous membrane inside is richly supplied with blood. It stands to reason that the incoming light stimulates biochemical processes linked to perception and metabolism. The horns also enable heat regulation. If this organ is missing, the balance in the organism changes – not only externally, but possibly also as far as into the milk.

Metabolism and milk quality

Over the last two decades, various studies have been conducted on the importance of horns. These studies have shown that:

- **Horns and hay feeding have a similar effect:** Horned cows have a slightly higher body temperature and lower heart rate – typical signs of a calmer, more efficient metabolism.
- **The composition of the milk changes:** The milk of horned cows contains fewer short-chain fatty acids but more alpha-linolenic acid (ALA) – an indication of a more balanced, ketogenic metabolic state in which energy is obtained from fat metabolism rather than carbohydrates – a resilient metabolic type, as microbiome research also shows.

- **The internal structure of the milk changes:** Studies using methods such as copper chloride crystallisation or delayed fluorescence showed a more pronounced internal structure of the milk in horned cows – similar to that of animals fed purely on hay.

In biodynamic research, this structure is understood as an expression of formative forces – an interplay of light, heat and life processes. It manifests itself both at the molecular level (for example, in proteins such as beta-lactoglobulin, which can have an anti-inflammatory effect) and in the sensory quality of the milk.

Horns as the key to sustainable agriculture

Research shows that horns are more than just a tool or ornament. They are an expression of the cow's field of consciousness – a living organ that influences metabolism, perception, and both the composition and structure of milk. At a time when animal husbandry is becoming increasingly technologised and de-individualised, the question arises again: do we want cows without horns – or are horns part of their integrity, their health? Perhaps an understanding of horns presents us with a key – not only to the nature of the cow, but also to an agriculture that once again is in harmony with life.





Wanted: New economic models

The international 'Biodynamic Economy' project

How can agriculture and food systems be made fairer, more ecological and more sustainable? This is the question addressed by the collaborative 'Biodynamic Economy' project. Participants include the Justus Liebig University Giessen, the Demeter Association Poland and the Warsaw University of Life Sciences. The collaboration is coordinated by the Forschungsring research institute.

The project team, consisting of researchers Pawel Bietkowski, Christopher Brock, Lara Herrlich, Christian Herzig and Mariusz Maciejczak, is investigating biodynamic farming from a socio-economic perspective. The central question is: How can the common goods provided by agricultural businesses be recorded and evaluated economically in order to develop an appropriate remuneration system based on this?

Making the performance of agriculture visible

Ecological and, in particular, biodynamic farms do much more than just produce food. They promote soil fertility, sequester carbon, protect biodiversity and contribute to the development of rural areas. This so-called environmental performance is socially valuable, but remains invisible in traditional farm accounts.

They become visible and measurable thanks to the Regional Value Calculator*, which monetarily evaluates the ecological and social contributions of agricultural businesses. The aim is to include this added value in the economic balance sheet and create a transparent basis for fair remuneration. At the same time, the assessment helps farmers to take the common good into account in decisions about cultivation, investment or resource use.

Surprisingly high levels of common good

The '1000 Farms Project' aims to highlight the common good provided by 1000 different agricultural businesses. The interim report revealed services



Pawel Bietkowski is head of the Demeter Association Poland.



Dr. Christopher Brock is research coordinator for Demeter e.V., board member of the Forschungsring research institute and member of the Circle of Representatives of the Section for Agriculture.

* Hifß, C. (2019). What does agriculture really achieve? Ecological Management – Trade Journal, (1), 11–13. <https://doi.org/10.14512/OEW340111>, <https://www.regionalwert-leistungen.de/leistungsrechnung/>



Lara Herrlich has a master's degree in sustainable food economics and is a doctoral candidate in the 'BD Economy' project.



Prof. Dr. Christian Herzig is managing director of the Institute for Business Administration in Agriculture and Food Economics (IBAE) at JLU Gießen. He heads the Master's programme in Sustainable Food Systems (NEWI), the Research and Practice Network for Cooperative and Collaborative Management in the Agricultural and Food Industry (ForWerK), and is a member of the board of the Centre for Sustainable Food Systems (ZNE) at JLU.



Prof. Dr. Mariusz Maciejczak is a professor of economics and head of the Institute of Economics and Finance in Warsaw.

Save the date:

19th and 20th of March
2026 Juchowo, Poland

✓ ✓ ✓
The Associative Economy of Biodynamic Practices:

THE SECOND SEMINAR ON COLLABORATIVE SUSTAINABILITY

worth between 404 and 84,281 euros per hectare (!); the average value was 2,641 euros per hectare*. Organic farms performed significantly better than conventional farms. Most farms provided mainly environmental performance, while socio-economic aspects such as social engagement or regional networking were less pronounced. Although the '1000 Farms Project' has not yet provided separate figures for biodynamic farms, there is much to suggest that, thanks to their structure and high level of social engagement, they are above average in terms of providing common good.

The common good provided by agricultural businesses is currently only funded by the European Union's agricultural subsidies to a small extent and, for competitive reasons, cannot be fully reflected in higher product prices in the traditional market. This circumstance underlines the importance of cross-value-chain engagement.

Cooperation instead of competition

In his 'National Economy Course', Rudolf Steiner proposed the model of the 'associative economy' as an approach to an economic system oriented towards the common good.

The idea is that all actors involved in the value chain – farmers, processors, traders and consumers – sit down together at a 'round table', make their needs transparent and develop fair solutions on this basis.

Successful practical examples include the Oikopolis Group in Luxembourg and the Sekem Initiative in Egypt, where trust, partnership and transparency have replaced anonymity and price pressure. Through networked corporate structures, both involve the entire value chain in price formation and thus ultimately in value creation.

They show that economic cooperation not only creates fairer conditions, but also ensures stability and resilience. Building human relationships between the different stages of the value chain is a crucial factor here.

Between ideal and reality

However, the transformation remains a challenge. Although environmental performance is taken into account in the European Union's agricultural subsidies, it is not to an extent that could have a real steering effect. Against this backdrop, private-sector approaches that seek to promote production systems with a high common good are gaining in importance. Interest in associative economic forms such as 'community-supported agriculture' and alternative food networks is growing. Nevertheless, there have been few links to Rudolf Steiner's concept in research to date. The question is therefore to what extent the concept of associative economics fits into the picture of alternative economic activity and how it can be implemented in practice.

In addition to competition from non-associative value chains, financing difficulties and the introduction of democratic decision-making processes can also pose challenges. The social context is also crucial. Organisations such as the Club of Rome and the United Nations, with their sustainability goals, make it clear that food systems play a key role in solving global crises. However, progress is stagnating in many places. This makes new, multidimensional approaches that bring together ecological, social and economic issues all the more important. Here, holistic biodynamic agriculture and the concept of associative farming can play a pioneering role in the urgently needed transformation.

* <https://www.regionalwert-leistungen.de/ergebnisse-1000-betriebe-projekt/>

Towards a new research culture

Biodynamics is transdisciplinary and international

Biodynamic agriculture is more than just an ecological practice. It is a trans-disciplinary, international field of praxis that combines science, philosophy, spirituality, traditional knowledge systems and agricultural practice. At the third international conference on biodynamic research at the Royal Agricultural University in Cirencester, Great Britain, it became clear how diverse and global the movement is and how different disciplines come together in this field.

From megalithic monuments to monocultures

English researcher Julia Wright opened the conference with a historical look at Great Britain, a country with deep spiritual roots. As early as the Neolithic period (4500 to 2500 BC), megalithic monuments and sacred sites were created that attracted people from near and far to learn esoteric knowledge.

But over the millennia, people became increasingly alienated from the land – through colonisation, social upheaval and industrial revolutions. The scientific and industrial developments of the 17th to 19th centuries gave rise to agriculture that was geared towards mechanisation, monocultures, chemical fertilisers and maximising yields. These structures led to a separation between humans, nature and the cosmos, which biodynamics now seeks to reunite.

Knowledge as a key resource

In this context, knowledge plays a key role as a resource for sustainable agriculture. While traditional and practical knowledge is still not taken as seriously as scientific knowledge in industrialised regions, farmers in many countries of the Global South have become active contributors to research. Projects such as the Network for the Study of Indige-

nous Knowledge Systems (2000–2012) showed that knowledge from spiritual, social and ecological dimensions is just as legitimate as scientific knowledge.

The approach of ‘cognitive justice’ – i.e. that different knowledge systems exist side by side on an equal footing – is of central importance to biodynamics. It allows the development of transdisciplinary forms of research that integrate science, philosophy, traditional practices and spiritual knowledge.

Transdisciplinary cooperation

Biodynamics is historically ahead of its time. As early as 1924, Rudolf Steiner called for close cooperation between farmers and researchers. Today, global networks such as the Conscious Food Systems Alliance (Co-FSA) and the Inner Development Goals (IDGs) enable the kind of transdisciplinary cooperation that Steiner called for back then. These networks promote the connection between people, communities and nature and provide a framework for international cooperation. Biodynamics also incorporates the fields of art, philosophy, social research and alternative sciences in order to place them in new contexts and develop innovative research approaches.



Dr. Julia Wright is an associate professor at the Centre for Agroecology, Water and Resilience at Coventry University, UK.



Binita Shah is a biodynamic farmer and researcher in India.



Practical research using India as an example

Indian farmer and researcher Binita Shah combines biodynamics with the ancient Indian knowledge system (IKS). Her work with small-scale farmers shows that biodynamic practices not only promote ecological sustainability, but also strengthen the livelihoods of farmers. The introduction of composting and farm-made preparations led to healthier soils, higher yields and increased productivity.

“ Even in industrialised regions, there is a rediscovery of nature-based, spiritually and metaphysically inspired knowledge systems.”

Rudolf Steiner, the founder of biodynamics, was strongly influenced by Eastern philosophy in his work. His insights into cosmic and earthly forces, and the harmonious interaction between humans, animals, plants and the earth, reflect central concepts of Indian philosophies. In his 'Agriculture Course' and in the book *The Bhagavad Gita and the West*, Steiner combined

Western scientific knowledge with intuitive knowledge inspired by the Vedas and the Bhagavad Gita.

Cosmic rhythms and agricultural cycles

At the heart of biodynamic agriculture are the preparations that are made and buried at specific times of the year. The horn manure preparation and the compost preparations are placed in the earth after the autumn equinox (21 September) and remain there throughout the winter months. They are dug up again after the spring equinox.

Astronomically speaking, this time is significant: after 21 September, the earth's spiral movement slows down, while after the spring equinox it accelerates. In this phase, the earth breathes in – the life forces draw into the soil and the forces of nature work underground. That is why the earth-related preparations are buried during this time. After spring, the earth begins to exhale, the forces rise – then the horn silica preparation, which promotes the forces of light, is made and buried.

This understanding coincides with the rhythms of the Indian calendar. In autumn, during the Sharad Ritu, the sacred time of Navratri takes place

in the month of Ashwin – nine days and nights dedicated to inner, spiritual growth. A second Navratri period falls in spring, in the Basant Ritu, when the earth reaches its highest cosmic speed. This time represents outward growth and renewal. Both periods reflect the idea that humans and the cosmos are connected in a breathing rhythm – a thought that is central to both Indian spirituality and Rudolf Steiner's cosmology.

Samkhya philosophy and alchemical principles

Rudolf Steiner was greatly inspired by Samkhya philosophy, one of the oldest Indian systems of thought. Samkhya teaches that the universe arises from the union of two eternal principles: Prakriti, the material primordial substance, and Purusha, the pure spirit. Their interaction gives rise to the great elements – air, fire, water and earth.

This concept finds a parallel in biodynamic practice: the animal components used in the preparations embody the principle of Prakriti, while the cosmic-symbolic plant components represent Purusha. When both are united at the right time and under the right conditions, new life is created – an alchemical act of creation.

The sacred cow and cosmic resonance

The horn manure preparation, which is buried in cow horns, illustrates the synthesis of earthly and cosmic forces: the cow absorbs the cosmic energies of plants in its digestion and releases them again in concentrated form. In Indian tradition, the cow is considered sacred, a medium of divine forces. Biodynamics is thus linked to ancient Indian ideas about life, creation and spirituality.

Towards a new culture of research

The combination of Western and Eastern knowledge systems shows that

biodynamic research is international, interdisciplinary and transdisciplinary. It combines findings from the natural and social sciences with philosophy, cosmology, practice and spirituality, thus opening up new forms of collaboration.

Biodynamics does not stand alone in its worldview. A community of like-minded disciplines, organisations and practitioners is growing worldwide, asking similar questions and seeking similar paths. Particularly in the arts, humanities and social sciences, a fruitful dialogue with biodynamic research is emerging, broadening our understanding of life, nature and knowledge.

Even in industrialised regions, there is a rediscovery of nature-based, spiritually and metaphysically inspired knowledge systems. The approach of a 'Biodynamic Agricultural Knowledge System (BAKS)' could build a ground-



“The combination of Western and Eastern knowledge systems shows that biodynamic research is international, interdisciplinary and transdisciplinary.”

breaking bridge here – between modern scientific methods, indigenous forms of knowledge and new forms of intuitive, experience-based cognition. Perhaps this is precisely where the future of biodynamic research lies – by promoting an open scientific culture and combining ecological and spiritual dimensions, it is considered a method for future-oriented agriculture.



Connectedness as a principle

From an abstract food system to a living organism



Dr. Jasmin Peschke heads the Nutrition Department at the Section for Agriculture.

The food system is under pressure. It must change if climate change is to be slowed down, soil fertility preserved, biodiversity protected and healthy food secured for all. We can achieve this if we think of the abstract system as a living organism.

What exactly is meant by the much-cited term 'food system'? A food system encompasses everything that shapes our diet – from production, processing, trade and preparation to disposal. Cultural practices, eating habits and social rituals are also part of it. The so-called post-farm sector, that is everything that happens after production, is particularly crucial. Nutrition is therefore not only a question of agriculture, but also of society, the economy – and ultimately our way of life.

A food system is organic if it relies on organically produced food. It is sustainable if it remains viable in the long

term. And it is global if it takes into account the nutrition of the entire world population. This is exactly where the 'Conscious Food System Alliance (CoFSA)' comes in: it aims to consciously design food systems – and, above all, to strengthen the relationships between their elements. A systemic view shows that no actor stands alone. The success of a food system depends on how well the relationships work. The actual purpose must not be lost sight of: food systems exist for people. They should ensure health and quality of life – today and, above all, in the future.

A biodynamic food system consistently takes this approach further. Based on biodynamic agriculture, the central guiding principle here is associative management, which takes into account the needs of all those involved and puts people at the centre. Through conscious consumption and the careful



preparation of high-quality, diverse food, it lays the foundation for health, joie de vivre and performance.

What constitutes an organism

Living beings are organisms, and life shapes them. The individual organs are closely connected and form the whole that shapes them. It is a unity that distinguishes itself from the outside world, absorbs and transforms impulses – and thus initiates its own further development. The connection to the environment, i.e. the correspondence with the surroundings, is specific to an organism. It can maintain its integrity despite all external influences. This is made possible by the close interconnection of all organs, each of which contributes in its own way to the overall identity.

Rudolf Steiner describes the organism as an external manifestation guided by an internal principle – and the whole is at work in every organ. An organism only functions when its organs serve the whole, perceive each other and adjust to each other. Let us take this image as a symbol and apply it to the food system: this creates a food organism in which agriculture, processing, trade, culinary skill and consumption are interconnected as organs. With an interest in

the well-being and further development of those involved, a system emerges in which human beings are at the centre as the organising principle. They carry the idea and shape the development of the whole.

This requires connectedness – an ability that only we humans can develop. Nature thus becomes culture because

“A systemic view shows that no actor stands alone.”

something new is created that would not exist without humans. In agriculture, this manifests itself as agri-culture; in the culinary skills and table culture, it equally comes to life and can be experienced.

Biodynamic food organism

In the biodynamic food organism, everything begins in the field. This is where plants grow and animals thrive – carefully bred, both the seeds and the breeds. The harvest is processed, traded and finally transformed in kitchens. Cooking here is not a mere manual

“Through conscious consumption and the careful preparation of high-quality, diverse food, it lays the foundation for health, joie de vivre and performance.”

task, but a creative act: only humans can create something new by preparing meals. Knowledge, skill, training and further training accompany every step – from the field to the plate. Everything is interconnected, forming a circle that is open to its surroundings, like a living organism in constant communication with the world.

The organs of this system act independently, but they serve the whole. Humans are the overarching principle, the designers who hold everything together. Through them, all elements are connected: agriculture provides the ingredients, processing and trade bring them to the kitchens, and guests complete the cycle when they enjoy the meals. Everyone contributes their part, but it is the interaction that brings the whole to life. The biodynamic food organism is created by humans for humans – and it is not only the result that is decisive, but also the attitude with which they act. In this system, sustainability comes to life. It manifests itself in agriculture, in social responsibility, in health. The result is a coherent, practical model that not only produces food, but also imparts knowledge, culture and sustainability.

Constitutional elements

From an anthroposophical perspective, an organism consists of constitutional elements, each of which is effective in every organ. There is a physical level also in the food organism. This refers to physically existing structures and facilities. In the case of the processing and trade organs, for example, these

are the facilities and equipment. Then there is the living stream: this is where production and transformation take place. This is the flow of goods between the participants. Products are created and reworked, used for new creations. A third level represents the way in which people work together. This refers to the inner attitude, but also to the attention and interest shown in each other. And finally, a living organism serves an idea to which everyone contributes in their own way and which makes it unique.

Transformation begins with ourselves

The crises of our time are diverse and complex – they require joint responses and new ways of acting, especially in the food system. Progress in implementing sustainable goals, such as the Sustainable Development Goals (SDGs), often falls short of expectations. Pure knowledge is not enough to enable real change. A rethink is needed – and above all, the typically human abilities that go beyond the material: spirituality, connectedness, empathy, mindfulness, love.

Transformation begins with ourselves, with our inner development. When our heads and hearts are connected, our actions can be fruitful – not only for ourselves, but for all life. It is about the one life we all share, our one future. This requires a change in attitude: our abilities should serve the well-being of all elements and living beings. Biodynamics and anthroposophy show us ways in which we can develop these skills and live them in our everyday lives. To paraphrase Thich Nhat Hanh: every way out begins with the way inwardly. Only those who cultivate clarity, compassion and responsibility within themselves can bring about real change in the outside world.





Sustainable development as the art of becoming

A new vision emerges from the crisis

After decades of political programmes and economic strategies, efforts towards sustainable development are in crisis. Between greenwashing and global climate challenges, people around the world are searching for a deeper, more holistic orientation. At the World Goetheanum Forum in Sekem, a meeting between the World Goetheanum Association, the Section for Agriculture at the Goetheanum and twelve partner organisations gave rise to a new understanding: sustainable development combines energetic action with spiritual sources and inner training.

The term 'sustainable development' is overused, underdefined and often misunderstood. Sustainable development is not a 'nice to have', a reporting obligation, a tool for manipulation or a 'Western invention'. It explores the question of the becoming of humanity and the earth – a question that biodynamic agriculture also addresses. After

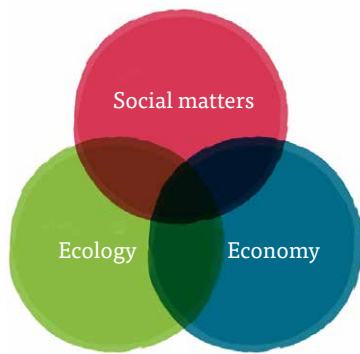
50 years of institutionalised use, but also due to its poor reputation caused by greenwashing tendencies and empty words, the call for the integration of the inner and spiritual dimensions into the concept of sustainable development as an emerging 'meta-discipline' is growing louder.

Global upheaval – a turning point

In 2025, what had been brewing beneath the surface for a long time came to pass: the so-called turning point. A geopolitical upheaval changed the world order – accompanied by massive rearmament and a new focus by governments on national self-interest. In this climate, NATO countries decided to allocate five per cent of their gross domestic product to defence. This happened despite almost eight decades of intensive efforts to promote universal human rights and global responsibility – despite initiatives such as the WWF,



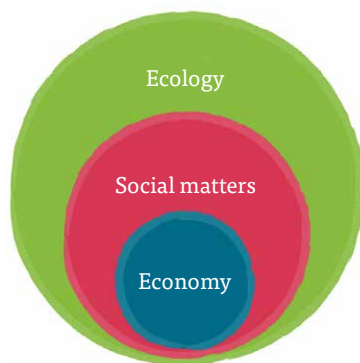
Johannes Kronenberg heads the 'Sustainable Development' department at the Section for Agriculture.



Three pillars of traditional sustainable development according to Felix Müller, 2014

Each area is considered equally important and equally significant.

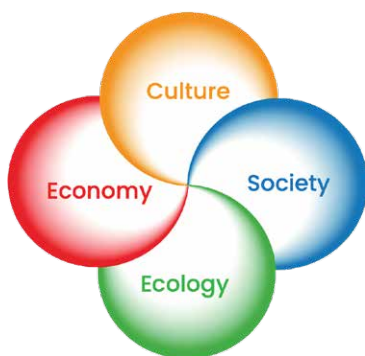
Statement: Sustainability can only be achieved if equal consideration is given to all three areas.



Priority model of sustainability

Individual areas are viewed in terms of their relationship and interdependence.

Statement: No economy without society, no society without ecology.



Sekem's sustainability flower

Rachel Carson's ecological wake-up call, Greenpeace, the Club of Rome's report *The Limits to Growth* and the Brundtland Report *Our Common Future*. The new turning point seems to be pushing aside everything that generations have achieved in terms of ecological and social insight. To say that it came as a surprise would be to ignore the signs that had long been visible – and yet it came as a shock to many.

This change particularly shook the social, green and pacifist movements that had been building their foundations since the 1960s. Ingolfur Blühdorn, a sociologist and professor of social sustainability from Vienna, even posits that this 'eco-emancipatory project'^{*} ultimately failed – due to its own inconsistencies and because it did not reach the whole of society: the project remained exclusive to a few. As a result, people and organisations working with socio-ecological challenges and sustainable development are more or less forced to realign their understanding of this discipline and their tools for transforming society.

The three pillars of sustainable development

Sustainable development is not a new concept. Even in ancient Greece, guiding principles such as 'know thyself' – as a call for inner development – and 'nothing in excess' – as a reminder to treat the world in a balanced way – were already in place. Later, in 1801, Alexander von Humboldt – younger brother of Wilhelm von Humboldt and close friend of Goethe – warned of the destructive greed of humankind, which not only threatened the Earth but could potentially even conquer other stars.^{**}

^{*} Blühdorn, I. (2024). *Unhaltbarkeit: Auf dem Weg in eine andere Moderne (Unsustainability: Towards a different modernity)*.

^{**} Wulf, A. (2015). *The invention of nature: the adventures of Alexander von Humboldt, the lost hero of science*: Costa & Royal Society Prize Winner.

Rudolf Steiner wrote another groundbreaking chapter. In view of the growing power of capitalism and technology, he devised the threefold social order: freedom in intellectual life, justice in social life and the life of rights under law, and brotherhood in economic life. For Steiner, nature was the basis of all economic activity – a perspective that even then touched on the core elements of what we now understand as sustainable development.

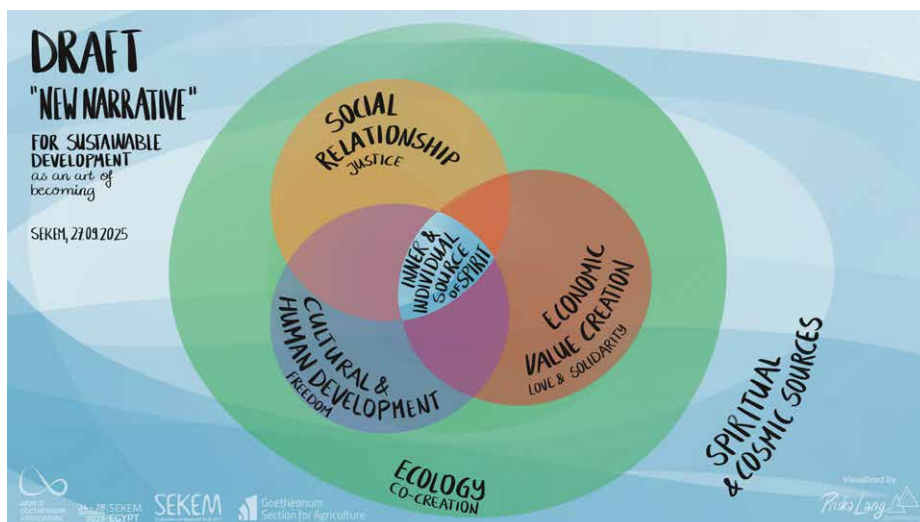
With the world population quadrupling since 1945 and the massive strain on the earth caused by human activities, sustainable development was finally institutionalised. Three main pillars were established worldwide: ecological, social and economic. The guiding principle was 'to meet the needs of the present without compromising the ability of future generations to meet their own needs'^{***}. To date, this is the only generally accepted definition – although there are around 200 other academic definitions, none of which have achieved comparable acceptance.^{****}

A new vision of sustainable development

Ibrahim and Helmy Abouleish, together with many others, founded the Sekem Initiative and the Heliopolis University for Sustainable Development in Egypt – with a clear focus on sustainable development. Their approach was both radical and visionary: they separated human and cultural development, guided by freedom, from the traditional social pillar, guided by equality. This is because justice in the life of rights under law and freedom in the cultural and intellectual

^{***} Brundtland, G. H. (1987). *Our common future* world commission on environment and development.

^{****} Ametepey, S. O., Aigbavboa, C. O., Ansah, S. K., Gyadu-Asiedu, W., & Boamah, L. (2023). *Meaning, evolution, principles, and future of sustainable development: a systematic review*.



New narrative for sustainable development (World Goetheanum Forum 2025, Sekem)

spheres should be independent, equal dimensions.

This gave rise to four pillars of sustainable development, supplemented by Rudolf Steiner's threefold social order: the ecological pillar (nature as the basis of human activity), the social pillar (guided by justice), the cultural pillar (guided by freedom) and the economic pillar (guided by solidarity), represented in the sustainability flower.

On this foundation, after almost five decades of pioneering work, Sekem was awarded the UN Environment Programme's 'Champion of the Earth 2024' prize and the 'Gulbenkian Prize for Humanity 2024' – two of the world's most prestigious environmental awards.

Expansion to include the spiritual dimension

Within the framework of the World Goetheanum Forum (see box), a new understanding of sustainable development emerged – an expansion to include the spiritual dimension. At the centre of the Sekem sustainability flower is now the 'inner and individual source of the spiritual'. According to the participants' understanding, every external development needs an inner life, conscious training and a spiritual foundation.

At the same time, the ecological pillar was reorganised. It now forms the supporting foundation for 'social relations', guided by justice, for 'cultural and human development', guided by freedom, and for 'economic value creation', guided by love and solidarity. Nature is thus understood not only as one of four equal pillars, but as the foundation on which all other dimensions are built.

In addition, the sustainability flower has been expanded to include the comprehensive dimension of 'spiritual and cosmic sources' – a level that, according to environmental activist Paul Kingsnorth, has been largely lost in modern Western societies and whose absence is leading humanity to the brink of disaster*. This expanded view also includes topics such as accompanying old, 'dying' social structures, acknowledging historical shadows, and developing spaces for awareness and the capacity for dialogue in situations where human dignity is violated. A long-standing reference to this new approach can be found in Rudolf Steiner: 'Our Mother Earth has solidified in pain. Our mission is to spiritualise her again, to redeem her,

* Kingsnorth, Paul (2025). *Against the Machine – On the Unmaking of Humanity*.



In November 2025, a compendium was published in which 75 co-authors explore the question of what contribution anthroposophy as a world view and in its practical implementation can make to sustainable development. Twenty-three scientists and 26 companies share their perspectives in the publication. In addition, an expansion of the current understanding of sustainable development is developed, with a specific focus on the inner and spiritual dimensions of sustainable development.

The initiative originated in the Section for Agriculture at the Goetheanum and is anchored in the Section's Department for Sustainable Development. The work is published by Springer Nature Verlag.

It is freely available in digital form and can already be ordered in print from:



Group photo of participants at the
World Goetheanum Forum 2025 in Sekem



by transforming her into a spirit-filled work of art through the power of our hands.”

This gives rise to an ‘appropriate anthropocentrism’ – a positive image

* Rudolf Steiner, Images of Occult Seals and Pillars, GA 284.

of human beings as co-creators of the earth and of the earth as the substance of human destiny. Sustainable development thus becomes not only a political or economic goal, but an ‘art of becoming’ that combines external action with inner training and spiritual responsibility.

World Goetheanum Forum 2025

From 24 to 28 September 2025, around 150 people from 20 countries met in the greened desert of Sekem. They all feel committed to the socio-ecological challenges of our time and used the gathering to take stock of the situation and broaden their understanding of sustainable development.

The event was organised by the World Goetheanum Association and the Section for Agriculture, in collaboration with twelve partner organisations, including Sekem (Egypt), the Club of Rome (Switzerland), the Research Institute of Organic Agriculture FiBL (Switzerland), the Biodynamic

Federation Demeter International (Germany) and the World Future Council (Germany).

What was only plannable to a certain extent nevertheless happened: the participants found common ground – carried by the future-oriented energy of Sekem. This resulted in a diagram, previously only implicitly present, which expands the concept of social development to include ‘inner training’ and a ‘spiritual and cosmic dimension’. The concrete implications of this for the participating organisations and their work will now be explored in further collaboration.

You never farm alone

A warm invitation to the Agriculture Conference 2026

The theme of the annual Agriculture Conference in 2026 is 'You never farm alone – Living communities for the future'. This topic is a reminder that work on the farm is an act of constant interconnecting and interdependence – on various levels. Whether it's working with fellow farmers, building local markets, acquiring land or constructing buildings with the support of friends and family, or in cooperation with the beings of the natural world, we are never working alone.

The topic was first introduced in Belgium by Antoine De Paepe from the biodynamic farm De Kollebloem in Herzele during the Circle of Representatives meeting in autumn 2024. In view of the increasing challenges facing organic and biodynamic practice, 'You never farm alone' highlights ways towards and benefits for the future that new, living communities can create.

Upon a close look, it becomes clear that the well-being of every farm depends on community life. Farm communities are comprised not only of farmers, but also of the consumers of its products, the distributors who are the bridge to the markets, and all other links in the value chain. Social farming creates spaces that support the development of all people, including those with special needs. At the same time, farm communities open up opportunities to shape new educational, social, and economic impulses, and create new ways for the future.

The Agriculture Conference 2026 will focus on exploring the many dimensions of community life that sustain the biodynamic movement, with a view to both the present and the road ahead. Through collaborative work, farms are increasingly places where biodiversity and sustainability are strengthened, responding to a world that often places a higher value on machines than on people.

Exploring the diversity of community

The conference contributions are intended to cover all levels of community, from microscopic soil organisms through the spiritual rhythms of the earth to the economic foundations. As in previous years, the conference programme has been shaped by the proposals of the members of the worldwide biodynamic movement and the Circle of Representatives and will centre on three main aspects:

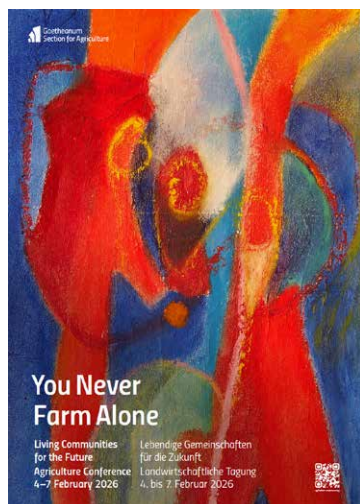
1. Rethinking collaborative economic activity
2. Integrating the art of healing, education, agriculture, and social art
3. Communities of research and knowledge

The opening panel on Wednesday, 4 February, will feature three farm communities showing how social, economic, and agricultural practices can be woven together in innovative ways today. Panel participants include Anna Jones-Crabtree, María Esther Nieto, and Clemens Voigts. They will be followed by lectures from Aonghus Gordon and Tara Gratton, who will explore the potential of the human being and the farm from the perspective of the farm as a living organism.

In the evening lecture, Ueli Hurter will highlight the work of the Section for Agriculture as part of the School of Spiritual Science at the Goetheanum. Here, 'collaboration out of free will' is the guiding principle – much like



Eduardo Rincón is co-leader of the Section for Agriculture.



Agriculture Conference 2026
More information
and tickets



on a farm or within a solidarity-based economic community. His reflections will focus on our shared responsibility for the current and future development of the earth, as well as on the deeper spiritual significance of this year's conference theme. In conclusion we will see and hear "At the turning point of time", the fourth stanza of Rudolf Steiner's Foundation Stone Meditation.

After the opening day, we will begin each day with the reading and deepening study of the Michael Letter "Michael's experience in the fulfilment of his cosmic mission", which serves as the spiritual foundation of the conference. This will be followed by workshops and panels. Morning workshops will engage with the main conference topics and contribute perspectives from around the world, while the afternoon workshops will set artistic impulses and deepen supplementary aspects. Examples of community work will be presented during the afternoon panels, encouraging discussion about biodynamic practices worldwide.

The strength of community

We live in a time of fragmentation and widespread disillusionment. Yet the biodynamic movement remains oriented towards solutions, and this can be a

source of hope and strength. Working together brings support and inspiration, and makes it possible to build a better future. Collaboration creates new communities that are urgently needed to meet the challenges of our time.

Rudolf Steiner wrote about the power of communal action: "If we give ourselves up to mutual help, through this giving up to the community a powerful strengthening of our organs takes place. If we then speak or act as a member of such a community, there speaks or acts in us not just the singular soul only but the spirit of the community. This is the secret of progress for the future of humanity: to work out of communities." (GA 54, World Mysteries and Theosophy)

Calendar of events
of the Section for
Agriculture



The Section for Agriculture at the Goetheanum

Through people in the worldwide biodynamic movement, the Section encounters current issues and challenges. We take these up in projects and create spaces that provide sources of inspiration – for all who are involved in agriculture and nutrition. We work on topics such as associative economics, nutrition, holistic health, the farm organism, climate resilience, the agricultural individuality, sustainability, and animal welfare in a number of professional groups and specialist fields for training, advice, nutrition, research and sustainability development.

Section for Agriculture | Hügelpweg 59 | 4143 Dornach | +41 61 706 42 12
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