

Nürnberg, Germany 12.– 15.2.2020

BIOFACH2020

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“Organic delivers!”...and helps fight climate change

Climate change is making the shift to a more sustainable agriculture and food system unavoidable

Interview with Professor Andreas Gattinger

Under the heading “Organic delivers!”, the main congress theme of BIOFACH 2020 explores the positive impact of organic production methods. We will be starting the BIOFACH interview series on this topic by looking at the positive effects of the organic system on the climate in an interview with Professor Andreas Gattinger.

In its report published at the beginning of August 2019, the UN Intergovernmental Panel on Climate Change, IPCC, (www.ipcc.ch/report/srccl) warns of the massive impacts of the climate crisis on agriculture and forestry. At the same time the report makes clear that arable farming, livestock farming and forestry are major contributors to global warming and calls for these economic sectors to finally assume responsibility and initiate changes to stem climate change. Professor Andreas Gattinger, agricultural and soil scientist, has been dealing with climate issues even as an undergraduate, then as Head of Climate Research at the FiBL Research Institute of Organic Agriculture, and in the course of a great many national and international projects. In particular he conducts research into the impact on the climate of organic farming and other farming systems. As an organic farmer on his parents’ farm, which he converted in 2006, he faces the pressing issues of climate change at a very practical level. On the farm, and in his capacity as Professor of Organic Farming with Focus on Sustainable Soil Use at Justus Liebig University Giessen (JLU) and as scientific director of the university’s teaching and research farm Gladbacherhof, he strives to develop suitable solutions.

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Professor Gattinger, in Germany and all over the world, especially in recent years, we are experiencing the alarming effects of climate change, which is progressing faster than expected and predicted. Agriculture and forestry are responsible for a quarter of man-made climate-damaging emissions, which have almost doubled in the last 50 years. The main reasons for these are intensive livestock farming – including resource-intensive animal feed production – and the manufacture and excessive use of nitrogen fertilisers. By comparison, does organic farming contribute much less to CO2 emissions, or can it even deliver solutions to meet the Paris climate goals?

Even organic cattle emit climate-damaging gases, primarily CH₄ (methane). This is a completely natural process. The harmfulness for our climate is a question of the volume of emissions and whether elsewhere in the animal-based food production system there are opportunities to reduce or compensate for greenhouse gases. In this context, the integrated approach of organic farming offers significant benefits over conventional industrial farming. Its climate-friendly aspects include the strict adaptation of livestock numbers to land size, and in crop cultivation the systematic use of CO₂-absorbing green manure with nitrogen-producing legumes and the build-up of humus. In the Thünen Report 65 by the German Federal Research Institute for Rural Areas, Forestry and Fisheries, the Johann Heinrich von Thünen Institute, we calculated that more precisely. We found that German agriculture currently emits around 66 million metric tons CO₂ equivalent per year. And this does not even include the energy-intensive production of nitrogen fertilisers. Our meta studies show that in the event of 100% organic farming, the complete greenhouse gas emission from agricultural soils would be largely reduced, corresponding to around 25 million metric tons CO₂ equivalent per year! That is a huge reduction. The only drawback is that the production output of foodstuffs would be likely to drop by a quarter to a fifth. But there are solutions for dealing with this.



What solutions do you envisage for reconciling the decline in crop yields, the growing world population and the shift to sustainable agriculture? There is a lot of talk about an “agricultural turnaround”.

Yes, there is a lot of discussion about an agricultural turnaround, but that won't be enough on its own, that much is clear. There absolutely needs to be a corresponding shift in the way we eat, as agricultural production is part of an overarching food system. Every one of us needs to question our eating habits. Our diet needs to be more plant-based. However, meat consumption is increasing on a worldwide basis and we use 2/3 of our crop yields to keep livestock instead of using them to feed ourselves. This doesn't mean that we all have to become vegans. Ruminants are important for agriculture as efficient converters of grasslands, providers of animal protein but also of natural fertilisers, and for landscape conservation. But we must not abuse animals in industrial production systems. That's not only damaging to our climate but also unethical. Of the around 5 billion hectares of agricultural area worldwide, 3.5 billion hectares are permanent pasture that are not in direct competition with the production of human food; 1.5 billion hectares are arable land. If we were to use these areas in a smarter and more efficient way we would help towards decarbonisation. If we were to feed ruminants from permanent pasture and keep pigs and poultry on a healthy scale again as scavengers, we could save a large amount of CO₂ from the targeted 50% (Paris Climate Accord). This would not only allow us to curb global warming at 1.5 degrees, but also maintain a healthy lifestyle. Other aspects like animal welfare would perhaps even resolve themselves in the foreseeable future. We need to make the entire agricultural system more sustainable and align it to the common good to a much greater extent.



The fact is that we also need to look at global climate change from a global perspective. You have worked a lot internationally. How much do we need to differentiate when considering different eco-systems, and which organic farming methods deliver measurable reductions in high, climate-damaging CO2 concentration and as a result reduce global warming?

Naturally we have to adapt the practices and/or concepts of sustainable agriculture to climate zones and soils, agricultural traditions, nutritional habits and other local conditions. In respect of farming it is extremely important to take action based on an integrated system approach that always takes account of a whole raft of measures for climate protection and adapting to climate change. Alongside composting and building up humus through deep-rooted plants, these also include biodiversity, animal welfare and social justice. It is not even that difficult to work in a way that conserves resources. The problem is rather the traditions and dietary habits that often compete with the sustainable use of resources. This is where intelligent and above all convincing models are called for. There are enough good examples all around the world: The sadly now deceased Kenyan recipient of the “Alternative Nobel Prize” Wangari Maathai, for example, ensured that millions of trees were planted (www.fembio.org); In Brazil and elsewhere, Swiss national Ernst Götsch campaigns for scalable, practicable permaculture systems, while Geoff Lawton is dedicated to promoting the Food Forest model. Prestigious research institutes like the FiBL, Rodale and various universities are conducting research, sometimes in partnerships with commercial farms, on these pioneering ecological systems. This also includes a resolute reconstruction and stabilisation of forests and revitalising cleared agricultural landscapes with trees, hedges, shrubberies and biotopes. Orchards are also part of this endeavour. Reforestation in silviculture and agroforestry in agriculture have the potential to do more than all other agronomic measures to decarbonise the atmosphere with a view to becoming carbon neutral.



What are the greatest challenges when it comes to stopping the increasingly rapid advance of climate change?

It is high time to act! But firstly, all stakeholders have to acknowledge that climate change is man-made and is not going to fix itself again naturally. There has been more than enough analysis of the climate sins that have been committed; there is great consensus among scientists and plenty of suggestions about how we can counter climate change. From my perspective we have to put climate justice right at the top of the agenda. The countries with the highest level of emissions, primarily the industrialised nations, have to make the biggest contribution, in respect of both financial input and the conservation of resources. To embed this sense of responsibility into government policies and every single one of us is just as much of a challenge as the path from acknowledging the facts to taking action as quickly as possible. It is obvious that countries like Mali or Zimbabwe, whose emissions are miniscule, cannot contribute a lot to resolving the climate disaster. Moreover, many of these countries are the ones that suffer, as they are generally at the mercy of the effects of climate change like hurricanes, drought or torrential rain and flooding. The global community should not accept this any longer.

What short-term and medium-term measures do you suggest?

We have to reduce our emissions by at least 50% to reach the 1.5 degree mark stipulated by the Paris Climate Accord, but it would be even better to be carbon neutral by 2050. This is demonstrably possible. Even the expansion of organic farming to 20-25% of the area in industrialised countries would help a lot, as we have seen. If the political will is there as well as corresponding incentives, we could get a lot closer to the CO₂ reduction goal in the short term, or should at least be able to achieve it by 2030, if we systematically pursue an expansion of organic farming. As well as increasing organic farming, the shift to a more sustainable agricultural and food sector needs to be driven forward at global level. In this context, the organic farming system could be complemented in the medium term by other factors taken from the integrated approach of the organic movement and from regenerative agriculture, agroforestry and permaculture.

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Everything that does the soil good is an asset to us in the fight against climate change: the build-up of humus, mulching, the use of compost and biochar make an important contribution to CO₂ absorption. But digitalisation in the agricultural sector also makes sense. Smart farming with GPS-controlled tractors helps save resources and cuts emissions as a result, as does efficient feeding of animals. What is crucial is that things get done as quickly as possible!

The interview was conducted by Karin Heinze, BiO Reporter International.

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Biography, Professor Andreas Gattinger

Andreas Gattinger, born 7.9.1965 in Selters (Hessen)

Apprenticeship as laboratory assistant

Studied agricultural science and organic farming at Kassel-Witzenhausen and Aberdeen universities

PhD on methane formation in soils at the Technical University of Munich, School of Life Sciences

1997-2006: Research assistant at the Helmholtz Centre for Environmental Research

2007-2010: Project Manager at a start-up in Frankfurt working on concepts to improve water storage in desert regions

2010-2017: Head of Climate Research at the FiBL (Research Institute of Organic Agriculture) in Frick, Switzerland and Frankfurt and as a lecturer at the University of Basel

2015: Post-doctoral tertiary teaching qualification at Justus Liebig University Giessen

Numerous national and international research projects on climate change and adapting agriculture to climate change.

Since April 2017, Professor of Organic Farming with Focus on Sustainable Soil Use at Justus Liebig University Giessen. Scientific Director of the university's Gladbacherhof teaching and research farm. Main research interests are the sustainability of ecological soil-plant-animal systems and the structure and function of microbial communities.

More than 70 peer-reviewed publications in international journals including PNAS, Global Change Biology and ISME Journal. Co-author of Thünen Institute report "Leistungen des ökologischen Landbaus für Umwelt und Gesellschaft" (Benefits of Organic Farming for the Environment and Society). (www.thuenen.de/de/infotehek/publikationen/thuenen-report/)

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