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## Organic Food and Agriculture



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### Synonyms and Related Terms

[Agroecology](#); [Biodynamic agriculture](#); [Sustainable agriculture](#)

### Introduction

Organic food is produced without the use of synthetic fertilizers and pesticides. Four further exclusions in organic production are: genetically modified organisms (GMOs), irradiation, prophylactic antibiotics, and engineered nanoparticles. These six exclusions differentiate organic agriculture from chemical agriculture.

Agriculture and food harvesting and production date back millennia, and until about a century ago that history is de facto organic. The Industrial Revolution ushered in an era of novel production strategies. Agriculture was not immune to new views of industrialization and reductionism. Advances in chemistry enabled some implementation of such views.

Early in the diffusion of chemical farming practices, the Austrian mystic Rudolf Steiner

(1865–1924) called for a differentiated agriculture free of these new synthetic chemical inputs (Paull 2011a; Steiner 1924). The terminology, theory, and practices of biodynamic agriculture evolved (in the 1920s and 1930s) from Steiner’s Agriculture Course of 1924. It was a guided evolution, coordinated by Ehrenfried Pfeiffer (1899–1961) in Switzerland.

The UK agriculturist, Lord Northbourne (1896–1982), invited Pfeiffer to lead a conference on biodynamics at his farm in Kent (in 1939). The following year Northbourne published his manifesto of organic farming, “Look to the Land.” In that book, he coined the term “organic farming” and wrote of a contest of “organic versus chemical farming” (Northbourne 1940; Paull 2014).

The ideas and ideals of organic farming quickly proliferated internationally off the back of Northbourne’s (1940) book. Organic farming is now practiced in at least 179 countries, accounts for 50.9 million agricultural hectares, and a market value of US\$ 81.6 billion (€75 billion) (Willer and Lernoud 2017).

### Chemical Disruption

After multiple millennia of de facto organic agriculture, the Industrial Revolution, prompted speculation about revolutionizing agriculture. One British commentator boldly predicted that “we may abolish the old practices and replace them by simpler agriculture, more manageable and

more remunerative. Instead of, by great care and precaution, maintaining the fertility of the soil, we reconstitute it ... The soil is merely a medium of production, in which we convert at pleasure the four agents in the formation of plants into this or that crop as suits us" (Riddle 1868, p. 13).

Through the nineteenth century, such reductionist views of chemical advocates remained little more than a thought bubble. It remained so until 1909 when two German chemists Fritz Haber (1868–1934) and Carl Bosch (1874–1940) demonstrated a method of "fixing" nitrogen from the air, that is converting atmospheric nitrogen ( $N_2$ ) into ammonia ( $NH_3$ ). The Haber–Bosch process was promptly ramped up to industrial scale production and produced explosives throughout World War 1 (and thereby prolonged it). Once the war was over, the industrial output of synthetic nitrogenous chemicals was repurposed as new cheap fertilizer.

## Pushback

The intrusion, on a grand scale, of synthetic fertilizers into agriculture was swiftly met with a pushback from some, including a group of German farmers who convinced Dr. Rudolf Steiner (1865–1924) to throw some spiritual light on the subject. Steiner presented a series of eight lectures on what his philosophical movement, which he called "anthroposophy," had to say on the subject of agriculture. He characterized a farm as an "organism." Steiner outlined his suggestions for a differentiated nonchemical-dependant agriculture. At those lectures at Koberwitz (now Koberzyce, Poland), Steiner founded an Experimental Circle of like-minded farmers to test, progress, and publish his ideas.

This Experimental Circle of Anthroposophic Farmers and Gardeners was the world's original organic agriculture research institution. There were three tangible outcomes from the group: the term "biodynamic farming" was coined to describe this new differentiated agriculture; a certification mark "Demeter" was developed to distinguish biodynamic produce; and Pfeiffer's book "Biodynamic Farming and Gardening" was

published simultaneously in five languages (English, German, Dutch, French, and Italian) in 1938 (Paull 2011c).

In the UK, perennialist and agriculturist Lord Northbourne was impressed with Pfeiffer's work. Northbourne invited Pfeiffer to present a biodynamics conference to farmers in Britain. One of Pfeiffer's lectures was titled "The Farm as a Biological Organism." The nine day Betteshanger Conference was held at Northbourne's farm in Kent. The audience comprised farmers, gardeners, and academics (Paull 2011b).

The Betteshanger Conference came to a close in the shadow of WW2. The outbreak of war shut off the immediate opportunities for further close collaboration with these continental biodynamics advocates. War with Germany also meant that the British taste for Germanic ideas evaporated. Nevertheless, Northbourne was enthused with these new ideas and his enthusiasm was in no way dampened. He probably also realized that Pfeiffer, while an inspired agriculturalist and speaker, was not an inspired writer.

Northbourne published his own book "Look to the Land" (1940). It was a ground-breaking book, his best and clearest, a manifesto of what he coined as "organic farming" (extrapolated from Steiner's expression "the farm as organism"). Northbourne made a powerful and eloquent case for his "organic farming," and he presented that advocacy in the context of a contest that he termed "organic versus chemical farming."

## Values

From the outset, advocacy for organics was driven primarily by values rather than agronomics. The decades of advocacy that have followed since "Look to the Land" first appeared, have been underpinned by the foundational ethic that we cannot poison our way to health and prosperity.

Northbourne was an articulate advocate for organics. He argued in his book against monocultural agriculture, preferring biodiverse farming. He argued against a chemical reductionist approach to farming. He asserted that "No chemist has ever analysed or described in chemical terms a

living creature, however humble; and there is not the slightest chance that he ever will” (1940).

“Look to the Land” argued for engaging the precautionary principle. Northbourne argued for a holistic view. He warned: “Farming cannot be treated as a mixture of chemistry and cost accountancy, nor can it be pulled into conformity with the exigencies of modern business, in which speed, cheapness, and standardizing count most. Nature will not be driven. If you try, she hits back slowly, but very hard.”

## Traction

Northbourne published his organics manifesto in the early years of World War II. Violent conflict and destructive forces were engulfing the globe. And yet, he offered this gentle message for agriculture: “We have tried to conquer nature by force and by intellect. It now remains for us to try the way of love.” Northbourne’s views were swiftly taken up as far away as USA and Australia.

In the USA, publishing entrepreneur Jerome Rodale (1898–1971) embraced Northbourne’s ideas and launched a new magazine “Organic Farming and Gardening” (in 1942). It was the world’s first periodical to champion organic agriculture. Over more than eight decades and through multiple iterations of format and name variations, Rodale’s periodical has been the world’s most successful organics publishing venture.

In Australia, grazier Colonel Harold White (1883–1971) and colleagues founded the Australian Organic Farming and Gardening Society (1944–1955). This was the world’s first association dedicated to promoting organic agriculture. The society published their own periodical “Organic Farming Digest” drawing on both local and international sources.

Associations dedicated to promoting organic agriculture generally struggled to stay afloat in the early decades. Their financial underpinnings were insecure until the advent of organic certification (developed mostly from the 1980s onward). Certification provided customers with an assurance that what they were

purchasing really was organic. It enabled the internationalizing of a validated organics trade between nations. Certification also laid an economic foundation for organics advocacy groups. Globally, there are now hundreds of organics certifiers, with many countries having multiple certifiers.

## Price Premium

When you purchase organic food you probably will pay more than for a comparable product of chemical agriculture. And when you purchase organic food you are paying for some things you do not get. In particular, you do not get the sequelae of synthetic fertilizers, pesticides, GMOs, irradiation, antibiotics, and engineered nanoparticles. To avoid these things, you will have paid a premium, most typically a premium of somewhere between 10% and 100%.

The price premium for organic food is an impediment to the growth of the sector. Some consumers are seeking food options with the cheapest price tags, perhaps because their budget is tight, while for others the production methods are matters beyond their concern.

We know from multiple studies that consumers purchase organic food for reasons of health, environment, and animal welfare (e.g., ACNielsen 2005). A study of 21,261 consumers in 38 countries reported that 72% of consumers purchase organic food, either “regularly” or “sometimes” (ACNielsen 2005). The main reasons consumers nominated for purchasing organic food were: “healthier for me” (51%), “healthier for my children” (17%), “better for the environment” (15%), “kinder to animals” (7%), and “other” (10%) (ACNielsen 2005).

We know that “organic” is an important food selection criteria for a substantial number of consumers (e.g., GfK 2017). A global survey of more than 23,000 consumers in 17 countries revealed that “organic” was important for many in making their food choices (GfK 2017). Respondents were asked “When deciding which food or beverage product to eat or drink, how important are the following in making your decision?” Globally,

44% of respondents rated “organic” as “very important” or “extremely important.” The Netherlands, UK, and Canada reported the lowest percentages of consumers rating organic as very or extremely important (22%, 24%, and 26%, respectively). China, Russia, and Brazil reported the highest percentages of consumers rating organic as very or extremely important (58%, 52%, and 49%, respectively) (Fig. 1) (GfK 2017).

## Externalities

It is generally claimed that organic production costs more than chemical agriculture. The productivity of organic agriculture may be between 0% and 10% less than that of chemical agriculture (although the micronutrients will be denser in organic food). Labor input costs may be more for organics (for example, because of manual or physical weeding rather than applying herbicides). Chemical input costs are expected to be higher for chemical agriculture (the bill for agrochemicals may be for pesticides including herbicides, fungicides, insecticides, rodenticides, bactericides, etc.).

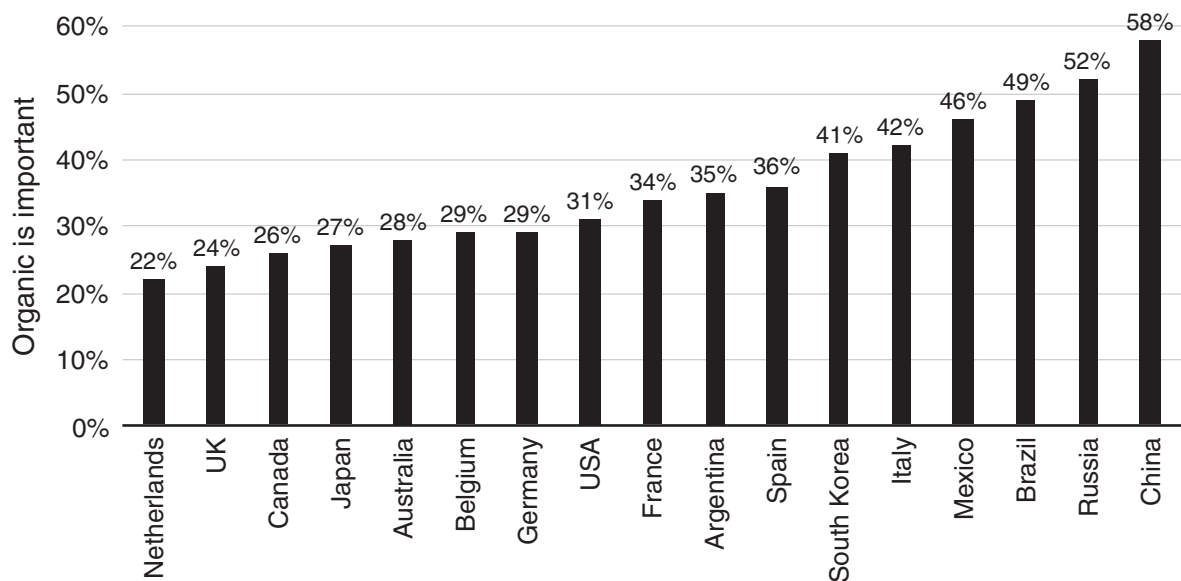
However, some costs of chemical production are not included in the shelf price of the food item.

This is because there are externalities of chemical agriculture that are not sheeted back into the shelf price of products but rather they are borne by the community. The “tragedy of the commons” is that pollution and damage to the commons is often not billed to the polluter (rather than polluter pays).

Chemical production degrades and depletes the soil (in contrast, organic production enriches it). Chemical inputs are not contained within the farm. Fertilizer runoff can pass into streams and rivers and ultimately into the ocean. This can lead to fertilizer-induced eutrophication and algal blooms, and then, as the oxygen is depleted, to dead zones. (The biggest dead zone is in the Gulf of Mexico, where agricultural nutrient runoff carried in by the Mississippi River has created a massive hypoxic zone of over 20,000 km<sup>2</sup>).

Pesticides escape from farms. Some remain on food, and some of that pollution is consumed. Some pesticides damage nontarget species. Biodiversity is reduced under chemical-intensive monocultural agriculture.

In chemical agriculture, the costs and harms of pollution are distributed across the commonwealth. The noncontainment and the ingestion of pesticides damage the health of consumers, farmers, wildlife, and the environment. If such externalities (uncosted harms) are included into



**Organic Food and Agriculture, Fig. 1** Percentage of consumers who rated “organic” as important for their food choices (Data source: GfK 2017)

the production financial matrix then organic production is demonstrably less than chemical production (Seada et al. 2016).

## War and Equipoise

Chemical agriculture advocates are fond of invoking a “war on pests and weeds” and issuing calls to “help us to win the war” (e.g., Joyce 2016). Such a war is a perpetual war, with no possible end in sight, a war that is in no way winnable. An extermination of “pests and weeds” would herald an ecological catastrophe. A healthy ecosystem relies on biodiversity and a myriad of interactions and interdependencies. An invoked “war on pests and weeds” is not a war that we need to wage, and it is not a war that we would want to win.

Organic agriculture offers a viable alternative to agricultural warfare. It advocates biodiversity and complexity rather than monoculture and ecosystem simplification. Biodiversity is an insurance policy for ongoing global food security. Organic agriculture offers the well-being of the commonwealth, as an alternative to corporate enrichment at the cost of an impoverishment of the environment and the degradation of the commonwealth.

Organic agriculture has always focused on giving consideration to the environment. Yes, it has valorized “natural.” And yes, it has, on occasion, anthropomorphized nature; an example is the UK Soil Association journal “Mother Earth.”

Organic farmers have fought the US government to halt the indiscriminate aerial spraying of DDT and three of them informed Rachel Carson’s “Silent Spring” (Paull 2013). Organics advocates have regarded the view that we can poison the planet with impunity and without adverse and perverse consequences as a grand delusion. Organics advocates have sought equipoise with nature rather than war with nature.

## IFOAM: Organics International

Organics advocate Roland Chevriot, President of the French “Nature et Progrès” proposed in 1972, an international umbrella organics advocacy

group. From a broad mail drop of invitations to a meeting that he convened in Versailles, France, five organizations attended.

It was an international congregation with five countries represented (France, South Africa, Sweden, UK, and USA). None of the five organizations that came together in Versailles had “organic” in their title. Nevertheless, the name (in English) proposed by Chevriot in his letter of invitation to delegates, the “International Federation of Organic Agriculture Movements” (IFOAM) was adopted.

The Versailles meeting cemented “organic” as the key term uniting these disparate groups and collectively differentiating them from others. The founding of IFOAM reiterated that organic agriculture was an international endeavor, that there was an embrace of diversity under the umbrella, and that biodynamics was a fully fledged variety of organics. (One of the five founding members was the Swedish Biodynamic Association).

The headquarters of IFOAM is now in Bonn, Germany. There are 833 affiliates (members, associates, and supporters) from 121 countries (Willer and Lernoud 2017). IFOAM recently revised its somewhat cumbersome name and discordant acronym to rebrand itself as “IFOAM – Organics International.” It thereby retains a vestigial link to the original vision of an “International Federation of Organic Agriculture Movements.” The web address of IFOAM – Organics International is “[www.ifoam.bio](http://www.ifoam.bio)” which reflects that “organic” is known as “bio” in many European markets.

## Peri-Organics

There are production systems that are organics fellow-travelers which do not necessarily meet the requirements for organic certification. Green Food in China is a certification system that is many times bigger than certified organic in China. Green Food is a certified production system of reduced chemical inputs. It can offer a stepping-stone for Green Food farms to convert to organic.

There are pesticide free (or nearly so) production systems that are monocultural, hydroponic,

and with controlled atmosphere (e.g., tomato production at Sundrop Farms in Port Augusta, South Australia, and expanding to Portugal and USA). Under the prevailing organic standards, organic certification is not available to such a production system although it may meet many consumer expectations of organic produce.

The Slow Food movement champions local production, local varieties, local food culture, traditional agriculture, and traditional cuisine. Organic production is a favored methodology within Slow Food without being mandated.

All organic production is GM-free, but not vice versa. GM-free is a necessary but not sufficient criterion for organics certification, but it remains a suitable stepping-stone to organic conversion for those who want to make the additional commitments.

## Growth

Organic agriculture is a niche agriculture aspiring to be the dominant agriculture of the world. The reality-check is that certified organic agriculture accounts for just 1.1% of global agricultural land. To this modest statistic, uncertified organic agriculture might be expected to add several additional percentage points, perhaps to double, triple, or quadruple it. However, there are no statistics for this notional uncertified organic agriculture sector. Food producers may be uncertified for a spectrum of reasons, particularly, because of the small scale of their operation and/or the cost and availability of certification

For the past two decades, organic agriculture has been growing at 12% per year (measured by certified organic hectares). Nevertheless, the sector is a long way short of the 100% that it aspires to. The path to that “otopia” of 100% organic is an unformed untrod track.

The north eastern Indian state of Sikkim provides a roadmap for achieving 100% organic. The state set the ambitious goal, in 2003, of converting to all-organic agriculture. This goal was achieved in 2016. At least four other states of India have expressed their goals of following Sikkim’s lead. The nearby country of Bhutan has stated its

ambition to be the first country to be 100% organic (Paull 2017).

## Conclusion

Organic agriculture has always been presented as an ethical solution to the great task of feeding the world in a healthy and sustainable manner. It has never been seen as a “quick fix.” Organic agriculture is in active contestation with chemical agriculture. This has always been an asymmetric contest of big and aggregated chemical company interests and profits versus the values and ethics of broadly dispersed concerned citizens and farmers.

The reconquest of global agriculture by the organics movement was always foreseen as a long campaign. Northbourne was under no illusions when he declared that: “It is a task for generations ... for many decades, perhaps for centuries” (1940).

The dharma of the food production system is to provide healthy nutrition for the community. The core message of Northbourne in his manifesto of organic agriculture is that “Farming cannot be treated as a mixture of chemistry and cost accountancy.” That would be a false path and a wrong ethic on which to base community health and well-being. Organic agriculture is a proven solution for meeting the brief of providing healthy nutrition for the prosperity and well-being of the community.

## Cross-References

- ▶ [Biodynamic Agriculture](#)
- ▶ [Buddhist Perspectives on Food and Agricultural Ethics](#)
- ▶ [Chinese Agriculture](#)
- ▶ [Christian Stewardship in Agriculture](#)
- ▶ [Fair Trade in Food and Agricultural Products](#)
- ▶ [Food Labeling](#)
- ▶ [GMO Food Labeling](#)
- ▶ [Islam and Food and Agricultural Ethics](#)
- ▶ [Nanotechnology in Agriculture](#)
- ▶ [Natural Food](#)
- ▶ [Permaculture](#)

- ▶ [Slow Food](#)
- ▶ [Sustainability of Food Production and Consumption](#)

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