CHAPTER

8

Organic food and agriculture

John Paull

School of Land & Food, University of Tasmania, Australia

OUTLINE

Food and Society
https://doi.org/10.1016/B978-0-12-811808-5.00008-8

8.1 What is it?

The premise of organic agriculture is that we cannot poison our way to prosperity. Organic food is produced without the use of synthetic fertilizers and pesticides. The German supermarket chain, Aldi, describe organic food as: "grown as nature intended with no chemicals or additives, altogether a better way to eat" (Aldi, 2007).

As new intrusive chemical food technologies have developed so too has the definition of organic grown. Organic food production now excludes not only synthetic fertilizers and pesticides, but also food irradiation, genetically modified organisms (GMOs), and engineered nanoparticles.

The word "organic" has multiple meanings. The Oxford English Dictionary lists six meanings for "organic' as an adjective: "**1** relating to or derived from living matter"; "**2** not involving or produced with chemical fertilizers or other artificial chemicals"; "**3** Chemistry relating to or denoting compounds containing carbon and chiefly or ultimately of biological origin"; "**4** relating to or affecting a bodily organ or organs"; "**5** (of the elements of a whole) harmoniously related; "**6** characterized by natural development" (COED, 2007).

When the terms "organic agriculture," "organic farming," and "organic food" are used, it is the second meaning of "organic" that applies: "not involving or produced with chemical fertilizers or other artificial chemicals." This usage is a twentieth century development and nineteenth century dictionaries do not mention it. With this meaning it was first used in the 1940 book 'Look to the Land' by Lord Northbourne in which he wrote of the contest of "organic versus chemical farming" (1940).

Organic agriculture is now recognized internationally. The United Nations' Food and Agriculture Organization's definition of "organic agriculture" in *Codex Alimentarius* is "Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system" (FAO, 2001, p.1).

8.1.1 Who cares?

Around the world, there are lots of consumers who care. A global survey of more than 23,000 consumers in 17 countries revealed that "organic" was important to 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 "It is organic or made from organic ingredients" as "very important" or "extremely important." "Organic" was rated as an important selection criterion by 22% in the Netherlands and 24% in the United Kingdom and rising to 52% in Russia and 58% in China (Fig. 8.1) (GfK, 2017).

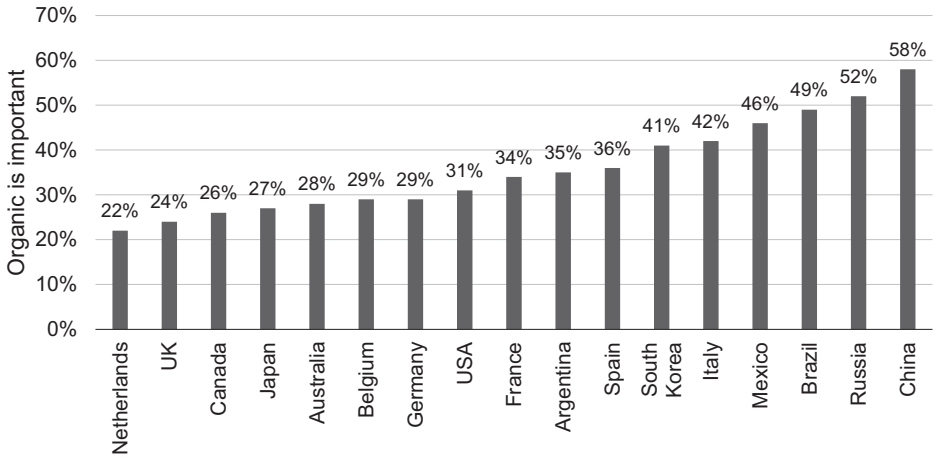

FIGURE 8.1 Percentage of consumers who rated "organic" as important for their food choices. *Source: John Paull.*

Ten decision factors were presented to consumers. For respondents in China, the two leading decision factors nominated were GM-free ("It is free from GMO (genetically modified) ingredients) and organic (Figs. 8.1 and 8.2). There were some variations and trends across demographic factors but also strong consistencies. Organic was equally important for men and women (45% and 44% respectively). Importance of organic peaked for the 30–39 age group (at 50%). The importance of organic ramped up from 41% to 50% with rising income bands.

Consumers purchase organic food for reasons of health, environment and animal welfare (Nielsen, 2005). A study of 21,261 consumers in 38 countries, reported that 72% of consumers purchase organic food, either "regularly" or "sometimes" (Nielsen, 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%) (Nielsen, 2005).

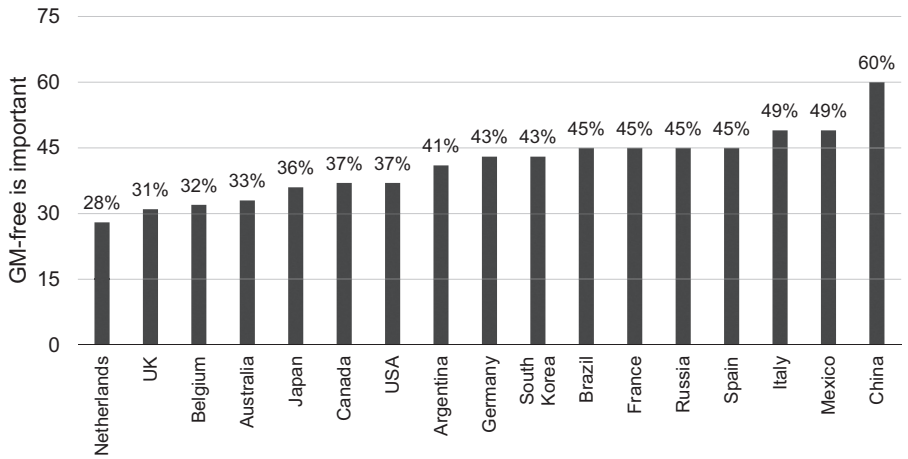

FIGURE 8.2 Percentage of consumers who rated "GM-free" as important for their food choices. *Source: John Paull.*

Farmers care for organics because (i) it is healthier for them and their family, (ii) it is better for the farm, it does not poison their soil, and (iii) they receive a premium price for their produce. Premiums for certified organic most typically range between 0% and 100%, but for a variety of reasons they may be outside this range. Price premiums depend on availability, seasonality, provenance and what the market will bear. The premium paid by the consumer may be quite different to the premium achieved by the producer who may be a price-taker rather than a price-maker. Some examples of price premiums are: 15% premium for bananas, 29% for raisins, 40% for apples, 106% for pears, and 139% for carrots (PANUK, 2017).

8.2 Organics by the numbers

Organics has been described as the fastest growing food sector (e.g., Brumby, 2007, p.1) The global organic sector has a market value of €75 billion (US$82 billion) with the United States as the largest single market, followed by Germany and France.

Farmers all over the world are growing organic produce (Fig. 8.3). One hundred and seventy-two countries report statistics of organic production. There are 51 million hectares of certified agricultural land globally, with Australia as the largest host of such land, followed by Argentina and United States. In addition, there are 40 million hectares of certified wild culture land, with Finland as the largest host of such land, followed by Zambia and India. There are 2.4 million organic producers, led by India and followed by Ethiopia and Mexico. Each year the numbers creep up a little or a lot; however, certified organic agriculture accounts for just 1.1% of the world's agricultural land so there is no cause for complacency.

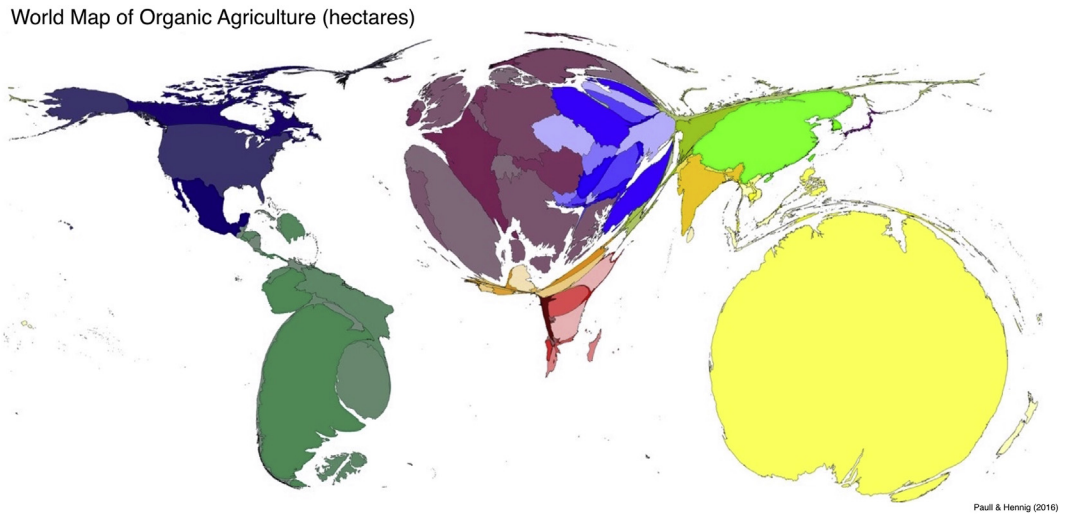

FIGURE 8.3 World map of organic agriculture: a density-equalizing map (a cartogram) with countries sized according to their reported organic agriculture hectares. *Source: John Paull.*

8.3 Organic pioneers

Organics advocacy has been the work and the passion of many. From the outset, the development of organics has been an international affair. There was US Professor Franklin King reporting favorably on the agriculture of China, Japan and Korea (in 1911). There was the New Age Austrian philosopher, Dr. Rudolf Steiner, lecturing, in what is now Poland, to an audience from six countries (Germany, Poland, Austria, Switzerland, France and Sweden) and calling for an agriculture differentiated from chemical agriculture (in 1924).

A German chemist, Dr. Ehrenfried Pfeiffer, was coordinating research in Switzerland and managing a farm in Holland (in the 1920 and 1930s). There was the Oxford lecturer in agriculture, Lord Northbourne, hosting a conference of continental advocates of biodynamics at his estate in Kent (in 1939). When WW2 broke out Northbourne published his manifesto of organic farming pitting organics in contest with chemical farming (in 1940).

There was US entrepreneur, Jerome Rodale, who took up the ideas and terminology of Northbourne and published his periodical "Organic Farming and Gardening" (in 1942). There were the Australians, including the pastoralist Harold White, who founded the world's first association devoted to the promulgation of organic agriculture (in 1944).

There was US biologist, Rachel Carson, who harnessed the work of two New York biodynamic farmers, along with advice from Ehrenfried Pfeiffer, to write "Silent Spring" giving worldwide impetus to the fledgling organics movement (in 1962). Later came Frenchman, Roland Chevriot, President of the French national farmer organization, Nature et Progres, who brought together delegates from France, South Africa, Sweden, United Kingdom, and United States, to form an international organics advocacy group (in 1972).

8.3.1 Franklin King, China, Japan, Korea and "permanent agriculture"

An American professor of agriculture and United States Department of Agriculture (USDA) chief, Franklin Hiram King (1848–1911) was disillusioned with the direction that US agriculture was taking. He took off, in 1909, for an extended trip to study the time-proven farming practices of Asia where soil fertility had been maintained over centuries.

King's account, "Farmers of 40 Centuries or Permanent Agriculture in China, Korea and Japan" was published posthumously (1911). King reported favorably of the agricultural practices that he witnessed, and which he termed collectively "permanent agriculture." His book was cited by the earliest advocates of organic agriculture in continental Europe, United Kingdom, United States, and Australia (Paull, 2011c).

8.3.2 Rudolf Steiner at Koberwitz, and anthroposophic farming

An Austrian mystic and New Age philosopher, Dr. Rudolf Steiner (1861–1925), delivered a 10-day course on agriculture to farmers at Koberwitz (now Kobierzyce in Poland) in 1924. Steiner taught that "the farm is an organism" and a decade and a half later this characterization spawned the term "organic farming." Steiner taught that synthetic fertilizers were unnecessary. He urged attendees to put his ideas to the test, and to extend by experiment, the ideas espoused in his course (Steiner, 1924).

During Steiner's agricultural course at Koberwitz, he founded the world's first organic agriculture research entity, the Experimental Circle of Anthroposophical Farmers and Gardeners (ECAFG). Anthroposophist's, followers of Rudolf Steiner, around the world including Europe, United Kingdom, United States, Australia, New Zealand, India, South Africa, took up the challenge and signed on to the ECAFG.

Just a few months after the Agriculture Course, Steiner retired from all public life due to ill health. It was said that he had been poisoned by adversaries. Steiner died in early 1925. He had never repeated the Agriculture Course and he stepped aside from the Experimental Circle at the outset. Over the next decade and a half, the work of the ECAFG led to the formulation of "biodynamic farming." The work of advancing Steiner's ideas of agriculture fell to the Experimental Circle coordinated in Dornach by Ehrenfried Pfeiffer.

8.3.3 Ehrenfried Pfeiffer in Switzerland, and biodynamic farming

Dr. Ehrenfried Pfeiffer (1899–1961) was the leading exponent of biodynamic agriculture until his death. Pfeiffer had studied under the tutelage of Steiner, although he did not attend the Koberwitz course. In the 1920 and 1930s, Pfeiffer was the director of the Bio-chemical Research Laboratory of the Natural Science Section at the Goetheanum in Dornach, Switzerland. This was at the headquarters of Steiner's Anthroposophical Society.

Pfeiffer developed a biodynamic farm in Holland to test, refine and progress the ideas of Steiner. Pfeiffer's experimental farm was also used to showcase these new ideas in agriculture. Visitors from Britain included Viscount Lymington (The Earl of Portsmouth; 1898–1984), the author of "Horn, Hoof and Corn: The Future of British Agriculture" (Lymington, 1932) and Sir Albert Howard (1873–1947), the co-author of "The Waste Products of Agriculture: Their Utilization as Humus."

Steiner set the Experimental Circle the task of putting his ideas from the 1924 Agriculture Course to the test. Then, when the results were in, to publish a coherent account of this no-synthetic-chemicals approach to agriculture. Pfeiffer published his book "Bio-Dynamic Farming and Gardening: Soil Fertility Renewal and Preservation" in 1938. The book appeared simultaneously in five languages: English, French, German, Dutch and Italian (Pfeiffer, 1938a,b,c,d,e). It was Pfeiffer's book that took the terminology "biodynamic" to the world and beyond Anthroposophic circles (Paull, 2011a,b). The vision of Steiner was that this was to be an agriculture for all farmers (Pfeiffer, 1956).

8.3.4 Lord Northbourne and his manifesto of organics "Look to the Land"

A British agriculturist, Lord Northbourne (birth name Walter James; 1896–1982), coined the term "organic farming." His manifesto of organic agriculture "Look to the Land" (1940) argued that: "We must remember that food of better quality is food which has vitality, individuality, freshness; food which is grown right, not only food that looks right; food which is effective as a vehicle of life and is not either mere stimulant or mere filling" (p.129).

Northbourne was an early advocate of localism and local production: "It is ludicrous to cart stuff about all over the world, so someone can make a 'profit' out of doing so, when that stuff could much better be produced where it is wanted" (p.104).

Northbourne spoke out for attention to biodiversity: "Large scale monoculture (the growing of one crop only) upsets the balance of factors in the soil in many ways. There is no give and take between crops. Disease spreads easily. Nature always provides a mixture of plants, and of animals; only so can living matter be kept constantly in circulation without wastage" (p.21).

"Look to the Land" introduced Northbourne's view of the contest of "organic versus chemical farming." He was making the strong case for organic agriculture but he recognized that the triumph of organic farming would be no quick or easy romp: "It is a task for generations of concentrated effort, slow and laborious, needing all available skill and resources … A combination of cooperation and individual effort … And those engaged will be fighting a rearguard action for many decades, perhaps for centuries" (p.115).

Northbourne's ideas were foundational in launching the worldwide organics movement and defining the terminology for the movement. He was a very shy man and his advocacy mostly was via his writings and his example. The book was a turning point in his own life. He was a graduate and lecturer in agriculture of the University of Oxford, a talented artist, a capable linguist, a keen sportsman, an Olympic silver medalist (in rowing), a lifelong farmer, he was profoundly spiritual, and an accomplished author (Paull, 2014).

Northbourne's interest in biodynamics led him to visit Switzerland in 1939 to visit the leading advocate of the times, Dr. Ehrenfried Pfeiffer. He invited Pfeiffer to present the first conference on biodynamic farming in Britain, the Betteshanger Conference at his estate in Kent. The following year "Look to the Land" appeared.

Rather than the mechanics or the agronomic practices of organics, Northbourne's book presents the philosophy, the rationale, and the imperative of organic farming. The ideas of his organics manifesto were quickly taken up as they spread globally. Jerome Rodale was an early adopter in the United States (from 1942). The Australian Organic Farming and Gardening Society (founded 1944) was the first association in the world to be founded with the express purpose of proselytizing for organic agriculture.

Northbourne's Betteshanger Conference was held in July 1939. It is the link between biodynamic and organic farming. The week-long biodynamic conference was held at Betteshanger on the estate of Lord Northbourne. Lectures were presented by Ehrenfried Pfeiffer and other biodynamics instructors from continental Europe. Talks included Pfeiffer's accounts of "The Soil as a Living Organism" and "The Farm as a Biological Organism" (Paull, 2011a,b). Shortly after the Betteshanger Conference, World War II broke out. Interactions with Pfeiffer were then limited during the course of the conflict and the appetite in Britain for Germanic-originating ideas evaporated. Northbourne took Steiner's idea of "the farm as organism" and crafted the term "organic farming" from it. He secularized the ideas of Steiner and Pfeiffer and presented a clear philosophy of "organic farming" in well-crafted language in "Look to the Land."

8.3.5 Jerome Rodale in the United States and "Organic Farming and Gardening"

American entrepreneur Jerome Irving Rodale (1898–1971) was the first to realize the commercial opportunity, and perhaps also the ecological imperative, presented by Northbourne's

"organic farming." Rodale brought a decade of successful entrepreneurial publishing experience, and his considerable marketing verve, to the task.

Rodale had no farming experience but he was by then well experience with mining, "uplifting" and repurposing ideas, jokes, and stories from Britain. Rodale transformed the idea of "organic farming" into a publishing empire which is still with us as Rodale Inc. and the Rodale Institute based in Pennsylvania, USA.

Rodale's first move was to launch a new magazine "Organic Farming and Gardening" (in May 1942). It was the world's first organics periodical. He at once sought to broaden the audience appeal by extending "organic farming" to "organic farming and gardening." It was to prove a masterful stroke of marketing.

Rodale promptly found that US farmers were slow on the uptake of his ideas (and his magazine). In contrast, there were many more US gardeners (than farmers), and he discovered that they were a receptive audience. He quickly switched the magazine name around to read "Organic Gardening and Farming." For some of its publishing history the "farming" was dumped altogether from the title and the magazine became simply "Organic Gardening."

Rodale spent the remaining three decades of his life as the most prominent North American advocate of organics. He has been described as: "one of the earliest and loudest advocates of organic farming," and as one who: "enjoyed a reputation as both a genius and a crackpot" (Feldman, 2004, p.1060). He built the world's largest organics publishing house, Rodale Press.

The "New York Times Sunday Magazine" ran a story titled: "Guru of the Organic Food Cult" (Smil, 2001). Rodale was the subject of that story. According to his son Robert, he was: "particularly pleased by the cover story" and he was: "at last riding the crest of a growing wave of acceptance" (Rodale, 1971, p.37).

Rodale's pleasure, at being mainstreamed after 30 years of intrepid advocacy for the organics cause, was short lived. Just the day following the publication of the "New York Times" account that had hailed him as a guru of organic food, he died (Toma, 1967).

Jerome Rodale had founded the world's first "organic" periodical: "Organic Farming and Gardening." It had the longest run of any organics periodical (from 1942 to 2017) and it has now spawned "Rodale's Organic Life."

Rodale had written presciently in that first edition in May 1942 that: "One of these fine days the public is going to wake up and will pay for eggs, meats, vegetables, etc., according to how they were produced. A substantial premium will be paid for high quality products such as those raised by organic methods" (Rodale, 1942a,b, p.4).

In his "Autobiography," Rodale (1965) recalled the founding of&G: "What did I know about farming and gardening - practically nothing. But I began to read and I began to practice" (p.42–43). Inspired by his vision for organics, he purchased a 63 acre farm for US$7000 (Gross, 2008).

Rodale took a commercial view from the outset, and additionally he was an accomplished and prolific wordsmith, as well as a successful publisher and entrepreneur. He recalled: "Little did I realise what I was touching off - that I would be the one to introduce this great movement into the United States "(Rodale, 1965, 42).

8.3.6 Harold White and the AOFGS, Australia

The Australian Organic Farming and Gardening Society (AOFGS; 1944–55) was the world's first association to style itself "organic." It was founded 2 years before the UK Soil Association. The AOFGS was the first organization in the world to develop a set of organic farming principles. The first of their 10 principles of organic farming stated: "The Society holds that overstocking, over cropping, monoculture and the excessive use of chemical fertilizers, poisonous sprays and dusts have resulted in erosion and serious loss of soil fertility in Australia. The Society associates with these unwise land practices, the destruction of bird life, the denuding of forests by over-exploitation and bushfires, and the pollution of rivers and streams" (Paull, 2008a, p.155).

The AOFGS was founded during WW2. At the time there were unprecedented constraints and war-time controls on resources by the government. The AOFGS could not get a release of paper to publish its proposed journal. They had to wait 2 years until peace once again prevailed before their quarterly journal appeared. The "Organic Farming Digest" (1946–54), was the first organics periodical to be published by an association. Two leading contributors to this Australian venture were Ehrenfried Pfeiffer and Jerome Rodale.

New South Wales (NSW) grazier, Colonel Harold White, was a leading contributor to the Organic Farming Digest. He wrote 20 articles, beginning with two articles in the first edition (1946), (White, 1946a,b) and finishing with the 29th and final issue.

White's article "The Why of it" appeared in the first issue of "Organic Farming Digest." He stated that: "We have been lured from the sound practices of our ancestors and are wandering in a maze; we must get back to the narrow path laid down by Nature for our safeguard and well-being." He added: "We appeal to all land holders that they hold the health of the community in their hands, for the way the food is grown makes all the difference to the health of the persons eating it" (White, 1946b, p.6).

White was an experienced NSW farmer and he predicted that: "the time is not far distant when England will demand that imported foods be grown by organic methods" (White, 1946a, p.6). That has not yet come to pass but he was right in that exports have come under closer and closer scrutiny for pesticide residues and GM-free status.

The Living Soil Association of Tasmania (LSAT; 1946–60) adopted the AOFGS's quarterly periodical, the *Organic Farming Digest*, as its official journal and distributed it to its members. The LSAT adopted a social inclusion policy of recruiting government agencies, farming bodies, and civil society organizations onto its council. It was the first organics advocacy group to allow for junior members and groups (Paull, 2009).

Both societies, the AOFGS and the LSAT, ultimately folded. They failed to get themselves onto a sustainable financial footing. These were the days before organic certification (that came decades later) and so before certification was available as a money-stream. Unlike Jerome Rodale in the United States, the early proponents of organics in Australia were enthusiasts rather than business entrepreneurs. And unlike the Soil Association in the United Kingdom, they did not achieve charity status.

In the end, the AOFGS acknowledged that: "The Society has always operated under a financial handicap, and for this reason the Digest fell short in some respects. However, the principles of organic farming have been sufficiently publicised for the work to continue,

and the supporters of the organic movement can best promote it by their own example of wise land use" (The Executive Officers, 1954, p.1).

At the close-down of the AOFGS, its officers were correct in stating that that: "Although the termination of this magazine will be regretted by many, there is solace in the fact that it has performed a service in publicising organic farming principles in Australia" (The Executive Officers, 1954, p.1). The AOFGS had folded after more than a decade of advocacy. They left footprints of their organic's advocacy in the printed media of the period. Coinciding with the life and fortunes of the AOFGS, mentions in the Australian printed media of "organic farming" were zero in the 4 years before the AOFGS. Then mentions ramped up quickly from 1944 and further in 1945. Media mentions of "organic farming" peaked in 1946 and subsequently trailed down to just a sole mention in 1955 (Paull, 2017a,b).

This first chapter of Australian organics advocacy was demonstrably successful in promoting their agricultural ideas. They were not successful in finding a sustainable business model, and not successful in passing the baton on to a next group of advocates. Theirs's was an early start, and now Australia leads the world in certified organic hectares, accounting for 22.69 million hectares which is 45% of the global total.

8.3.7 Eve Balfour and the Soil Association, United Kingdom

Eve Balfour (1899–1990) published her compendium "The Living Soil" (1943) in the United Kingdom. Her book extensively quoted contemporary agricultural authors, mostly British. "The Living Soil" borrowed a large slab of text, over four pages, of Northbourne's book "Look to the Land" (1940). Despite her clear familiarity with Northbourne, Balfour's book lacked any mention of the term "organic."

Balfour had studied agriculture at the University of Reading, graduating just after WWI. Her family put in the start-up capital in 1919 for the New Bells Farm, in Suffolk. She then struggled to make a go of farming during the Great Depression at this farm. Balfour was a founding member of the UK Soil Association (1946 to present).

Balfour proposed the so-called "Haughley Experiment" to compare various farming styles (1940). This enterprise was supported by donations raised by the Soil Association which was registered as a charity. The exercise was ultimately wound up with little to show for the substantial expenditure of time, money, and the goodwill of donors (Hall, 1962).

Both Balfour and the Soil Association were very slow to take up Northbourne's term "organic farming." The foundational documents of the Soil Association make no reference to "organic" farming, agriculture or gardening. The objects of the Soil Association were stated as: "1. To bring together all those working for a fuller understanding of the vital relationships between soil, plant, animal and man; 2. To initiate, co-ordinate and assist research in this field; and 3. To collect and distribute the knowledge gained so as to create a body of informed public opinion" (Soil Association, 1947, p.1).

Once the flagship project of the Soil Association, the Haughley Experiment, folded, not to say failed, the raison d'être and the finances of the Soil Association were uncertain.

The publication of Rachel Carson successful blockbuster book "Silent Spring" (1962) generated fresh interest as well as controversy. The appearance of Carson's book served to breathe new life into the Soil Association (Reed, 2010). The formalization of organic certification then created a funding stream for the Soil Association which continues to this day. The Soil Association is the largest organics certifier in the United Kingdom.

8.3.8 Marjorie Spock, Mary Richards, Rachel Carson, and "Silent Spring"

In a US government campaign to eradicate an insect, the gypsy moth, three million hectares of north east United States were aerially sprayed in the late 1950s with DDT. "Aircraft pilots were paid according to the number of gallons sprayed." So there was little or no incentive for restraint nor "from spraying the same areas more than once" (Kögel and Prskawetz, 2001, p.257).

Two biodynamic farmers with a farm on Long Island took exception to having their farm and their produce (and themselves) sprayed with DDT in this ill-considered government program. Marjorie Spock (1904–2008) and Mary T. Richards (1908–90) had both studied at Rudolf Steiner's Goetheanum at Dornach, Switzerland. They were passionate about Anthroposophy in general and biodynamics in particular. They were taking guidance from Ehrenfried Pfeiffer who by this time had moved to the United States (Paull, 2013a).

Spock and Richards were about to be impacted by: "one case that borders on the surreal, the New York state and federal departments, citing an implausible threat from the gypsy moth to New York City and environs, announced plans to spray densely populated Nassau County, Long Island, with DDT in fuel oil" (Kögel and Prskawetz, 2001, p.257).

A group of six residents, and swelling to 13, of Long Island, took legal action against the government (Murphy v. Benson, 1957; Murphy v. Benson, 1959). The prime movers of the group were Spock and Richards (Brooks, 1972). The group included organic gardener and past president of the National Audubon Society, Richard Murphy (Ladejinsky, 1943, p.43). From the United Kingdom, the Soil Association sent a $100 cheque to Spock in support of the campaign (Spock, 1960) but most of the funds in the fighting kitty were from Richards.

The Long Island Spray Trial ran from 1957 to 1960. Spock and Williams corresponded with experts around the world and collated a massive file of data and contacts. First, they applied for an injunction to stop the spraying. That was denied. The case went to trial in the District Court. It ran for 22 days. They lost. They appealed. The Court of Appeals upheld the original decision. They then took the case to the Supreme Court, again with no success. Spock and Williams had generated over 2000 pages of scientific documentation on pesticides and toxic spray programs and spent US$100,000 in the process (Paull, 2013b).

What was a notable failure in the courts of the land was about to be retested in the court of public opinion? And with a different outcome. Although, it must be admitted that Long Island and the biodynamic farm of these two warriors was sprayed with DDT. They sold up and purchased a farm elsewhere.

The trial documentation was shared with biologist and author Rachel Carson. She had contacted Spock and Richards after the initial injunction to stop the spraying was lost (Murphy v. Benson, 1957) and while the District Court case (Murphy v. Benson, 1958) was in preparation (Carson, 1958a,b).

Carson wrote to Spock and Richards: "I am most grateful for all the material you have sent me … I am delighted there is so much sound material" (1958). She wrote "I am undertaking to do a small quick book … You have been so enormously helpful to me, and apparently are so familiar with a vast amount of material on the subject" (1958).

The challenge as Carson saw it was how to get traction with this story which had failed so miserably in the courts. Carson wrote: "It is a great problem to know how to penetrate the barrier of public indifference and unwillingness to look at unpleasant facts that might have

to be dealt with if one recognised their existence. I have no idea whether I shall be able to do so or not, but knowing what I do, I have no choice but to set it down … I guess my own principal reliance is in marshalling all the facts and letting them largely speak for themselves" (1960).

Against the Spock-Williams-Carson view was the countervailing view expressed in "Pesticides: the Price of Progress" (Time, 1962). Readers of Time magazine were assured that: "many insecticides are roughly as harmless as DDT" (p.46). A dash of DDT should be of no concern to citizens:

> "Dr Wayland J. Hayes, chief of the toxicology section of the U.S. Public Health Service in Atlanta says that every meal served in the U.S. probably contains a trace of DDT, but that is nothing to worry about" ***Time (1962), p.45.***

Carson's book "Silent Spring" appeared in 1962 to acclaim and ridicule. "Chemical Week" (1962, p.5) declared that:

> "Her technique in developing this theme is more reminiscent of a lawyer preparing a brief, however, than a scientist conducting an investigation … the industry is facing a hostile and to some extent uninformed prosecuting attorney. Her facts are correct, her conclusions less certain, and her innuendoes misleading." They were unaware of her informants.

The "Conservation News" hit out: "In any large-scale pest control program … we are immediately confronted with the objection of a vociferous, misinformed group of nature-balancing, organic gardening, bird-loving, unreasonable citizenry that has not been convinced of the important place of agricultural chemicals in our economy" as quoted by Soraci in 1962 (Jezer, 1987, p.169).

The journal "Science" informed readers that: "Mankind has been engaged in the process of upsetting the balance of nature since the dawn of civilization … modern agriculture and modern public health, indeed modern civilization, could not exist without an unrelenting war against a return to a true balance of nature" (Baldwin, 1962, p.1043).

Nevertheless, despite (or was it because of) a well-orchestrated campaign against Carson and her book, it was the book that prevailed. Carson died of cancer in 1964, living long enough to see her book send great waves of disquiet through governments and populations. Governments had been in thrall of chemical companies, and populations were largely in the dark about chemical harm and contaminations.

The US Environmental Protection Agency (EPA) was founded in December 1970. It canceled all Federal registrations of DDT products on 14 June 1972, and from 31 December 1972 usage of DDT was banned in the United States. The EPA has largely adopted the approach of examining pesticides on a case-by-case basis. So, the list of available pesticides operates as a revolving door, and as old chemicals exit, new ones enter the arsenal of registered toxins. In August 1972, the "Australian Agricultural Council recommended that all existing registrations for DDT should be reviewed as a matter of urgency, with the view to withdrawing all uses for which acceptable substitutes exist" (Harrison, 1997).

What had failed in the courts worked as a powerful and effective narrative in the hands of Rachel Carson. At no time did she publicly acknowledge the organics and biodynamics movements, she did not align herself with them, and nor did she give any public credit to her sources, Spock and Williams, nor to Pfeiffer. She recorded her debt to Spock and Williams

in her private correspondence (Paull, 2013a,b). She was very particular to let her book stand alone as a testament against pesticides in general and DDT in particular.

Carson fueled a debate that organics advocates had been trying to kindle for two decades. The Chairman of the House of US Representatives' Appropriations Subcommittee for Agriculture, US Congressman and lawyer, Jamie Whitten was alerted: "I became aware that there was a sizable movement at work aimed at severely curtailing or even eliminating the use of pesticides … This made me afraid that an aroused public opinion might stop the use of materials that I had become convinced are absolutely essential to our health and prosperity. And so I began to speak out in defense of the role of pesticides" (1966, p.vi).

As Reed has observed: "After Silent Spring, no public discussion of pesticides could be held without her critique being invoked" (Reed, 2003, p.167). Carson's book gave fresh impetus to the organic's movement worldwide. Carson herself always publicly stood at a distance from the organic's movement. Her message was not news to the organics sector, it was their story after all. What was new is the publicity, the dispersion of the narrative, and the public discourse generated, and that Carson mainstreamed the issues.

8.3.9 Roland Chevriot in France, and IFOAM

Parisian engineer, Roland Chevriot, was the President of the French national farmer organization, Nature et Progres, when he called a meeting of likeminded organizations. His vision was of a "federation respecting all particularities and individualities" (Chevriot, 1972). He sent out over 50 invitations. A meeting was convened at Versailles, France, in 1972. Five organizations from five countries attended: his own Nature et Progres, the Soil Association (United Kingdom), the Soil Association of South Africa, the Swedish Biodynamic Association, and Rodale Press (USA) (Paull, 2010).

As Denis Bourgeois of Nature et Progres states: "We created a federation of 'movements' at a time when organic agriculture was weakly organised and needed activists and volunteers to push the idea" (1997). The name of the new organization, the "International Federation of Organic Agriculture Movements," appeared in the initial invitation to meet. The group of five founding members adopted the proposed name (in English) with the acronym IFOAM. None of these five organizations bore the term "organic" in their title. Nevertheless, the choice of name acknowledged "organic" as the term to signify their common cause. It secured "organic" as the core narrative term and as the international descriptor of what is now a clearly identifiable and differentiated segment of the global food and farming sector.

The formation of IFOAM created an entity which united the aspirations, the philosophies and the hopes of disparate groups around the world. From the outset "biodynamic" was accepted as a special case of "organic." The headquarters of IFOAM was relocated to Bonn, Germany. IFOAM remains the global umbrella advocacy group for the organics sector.

There are now 848 "affiliates" of the federation from 121 countries (IFOAM, 2017). The name "IFOAM" has always been somewhat ungainly. In 2015 the name was changed to "IFOAM - Organics International" which some will consider even more cumbersome. The organization hosts an International Congress every 3 years in a location that is announced 3 years in advance.

8.3.10 Pawan Chamling in Sikkim, India

The Chief Minister of Sikkim, Pawan Chamling, declared, in 2003, the "goal of making Sikkim entirely organic" (Chief Minister's Office, 2016, p.23). This trail-blazing goal was achieved in 2016 and the northern Indian state of Sikkim is now 100% organic (Paull, 2017a,b).

Chamling's ambitious objective was for a "Total Organic State." The vision was backed up with policy interventions. An action plan "Going for Organic Farming in Sikkim" was prepared. Four points of the action plan were "(1) promotion of on-farm production of organic manures; (2) capacity building; (3) establishment of bio-fertilizer production units; and (4) establishment of soil testing laboratories" (Chief Minister's Office, 2016, p.392).

The Sikkim State Organic Board (SSOB) was established to oversee the implementation of the plan. The implementation began with 100 villages which were declared as "bio-villages" and farmers were trained in organic practices. The success of the inaugural bio-villages was a proof of concept for Sikkim villages and it attracted other farmers. By October 2009 there were 396 bio villages.

Under the Sikkim Organic Mission of 2010 farmers were provided with seeds, manure and training. In 2014 the Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act banned the use of synthetic fertilizers and pesticides. By 31 December 2015, 75,000 ha of agricultural land were certified organic (Chief Minister's Office, 2016, p.23).

These innovations culminated in 2016 with acclaim from the Prime Minister of India, Nahendra Modi, who declared that: "Sikkim has paved its way into history and has set an example for the entire world that nature needs care and protection" (Chief Minister's Office, 2016, p.387).

Multiple states of India have expressed aspirations of replicating Sikkim's success. They include: Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Rajasthan, Tamil Nadu, Uttar Pradesh, and Uttarakhand (Paull, 2017a,b).

If Sikkim can do it, others can do it. The message from Sikkim is: "Let us work together to recreate a world that is Totally Organic" (Chief Minister's Office, 2016, p.636). As a mission statement this injunction carries the authority of one who has actually achieved it for his own state of Sikkim, India.

8.3.11 Vladimir Putin in Russia

Under President Vladimir Putin, Russia has acted to close down GMO farming and ramp up organic farming. The share of GMO in Russian food reportedly declined from 12% to 0.01% in the decade top to 2014. At that time there were only 57 registered food products containing GMO ingredients. Agriculture Committee of the State Duma decided that Russia needs a ban on the registration and sale of GMOs The Ministry of Agriculture supported "a complete ban on growing and using genetically altered organisms in the country, with the exception of those used in scientific research" (RT, 2014).

Hand in glove with the close down of GMOs in Russia is the ramping up of organics. Russia has aspirations of becoming a major exporter of organic food. The government news agency has reported that: "Putin vows to make Russia a major supplier of organic food to Asia–Pacific Region" (RT, 2017). Putin stated that "Russia is one of the world's

leaders in exports of grain, vegetable oils, fish, and a number of other foods. We expect to become the leading supplier of ecologically clean food to our neighbors in the Asia–Pacific region" (Putin, 2017, p.3).

Russia's Deputy Agriculture Minister, Aleksandr Petrikov, is reported as stating that "the ban" could afford Russia large economic gains if the country chooses to become a major global producer of GMO-free products. With anti-GMO sentiments sweeping multiple continents, Russia could be looking to position itself to meet international demands as a major supplier of organic foods and ingredients" (Coatney, 2014).

There are several prongs to Russia's rejection of GMOs. There are the uncertain long-term health impacts of GM food. Public sentiment is against GM food with 80% of Russians reportedly against GM food (Voice of Russia, 2014). There is the not unimportant issue that profits from GM seed are mostly repatriated to the United States. Petrikov makes an economic point that the "introduction of GMO cultures carries economic risks – Russia cannot compete with foreign producers when it comes to costs, but still can position itself as a producer of high-quality, GMO-free agricultural goods. Thus, any use of GMO cultures would harm the national export potential" (RT, 2014).

President Putin is reported as stating that "Russia should become the world's largest supplier of organic food" (Interfax, 2015). Russia already exports organic buckwheat (grechka), wheat millet, alfalfa, flax, berries, mushrooms, cedar nuts, and herbs.

In a message to the Federal Assembly, Putin states that "We not only can feed ourselves but taking into account our land and water resources - which is especially important - Russia can become the world's largest supplier of healthy, environmentally friendly, high-quality food that has long been lost to some Western producers. Especially as the demand in the global market for such products is constantly growing" (Interfax, 2015).

Putin is spearheading a bold vision for Russia as a GM-free zone for food production and a major producer of organic food. It is much easier for organics to prosper in a GM-free zone. This avoids the problems of contamination such has been experienced in Australia (Paull, 2015). It avoids the costs of segregation and the consequences of segregation failures. It is also reassuring for export markets and consumers, and it positions Russia as a high-quality premium quality food producer.

For the moment, the organics sector in Russia is modest and the certified organics sector is in its infancy. Russia made a serious bid to host the triennial Organic World Congress for 2020, unfortunately without success. The future for organics looks bright in Russia with public support, ministry support, and presidential support.

8.4 Pesticides and externalities

The great uncoated externality of chemical farming is the pollution-load on the environment, producers, and consumers. This pollution is a cost of production which in chemical agriculture is thus externalized and is not reflected in the market price. The cost is instead dispersed over time and space, over the whole community and environment.

Some pesticides are foliar (they are applied to the foliage) and some are systemic (they are taken up by the plant and incorporated into the cells). In any event they are designed not to wash off but rather to bind to the plant. Agricultural chemicals cannot be confined to the farm. They percolate through the supply chain and some quantities reach the consumer.

A study of fruit and vegetables supplied to British school children under a government scheme, the School Fruit and Vegetable Scheme (SFVS), reported the presence of 123 different pesticides. They reported the presence of 62 different insecticides, 50 different fungicides, five herbicides, as well as insect growth regulators, plant growth regulators, and microbicides. These contaminants include carcinogens, endocrine disruptors, neurotoxins and developmental toxins (PANUK, 2017).

Of the fruit supplied into the Department of Health's £40 million school children program, one sample of apples contained 11 different pesticides. One sample of pears contained nine different pesticides. Overall, 84% of the produce tested positive for at least one residue, and 66% tested positive to multiple residues. Almost all the apples (97.5%) contained at least one pesticide residue, and 67.7% carried residues of multiple pesticides. There were 64 different pesticides identified in the apples sampled. Of the children's raisins tested, 100% tested positive for multiple pesticides. None of the produce was organic (PANUK, 2017).

Converting to an organic SFVS was estimated to add 14% to the cost of the program (PANUK, 2017). Organic produce generally is sold at a premium of somewhere between 0% and 100%. Converting to an organic diet is an effective way of reducing children's exposure to pesticides(Göen 2016).

8.5 Certification and the organics hinterland

Statistics of organic agriculture do not tell the whole story. For starters, they underestimate the size and achievements of the organic's movement, simply because they report certified organic agriculture (rather than both certified and uncertified organic). The statistics are seductively precise but they are merely the countable manifestation of a larger phenomenon, perhaps much larger.

Just how large is the uncounted "world of organic agriculture," as compared to the counted world of certified organic agriculture? It is a matter of speculation. A study in India compared the experience of organic farmers (N = 350) and chemical farmers (N = 200). All of the organic farmers lacked certification (Sudheer, 2013). Reasons given for the absence of certification were the cost of certification, the lack of information to achieve certification, and the size and scale of the operation (Sudheer, 2013). It may be that there are more uncertified organic producers than certified ones. There may be more uncertified organic agriculture hectares than certified hectares. While these hypotheses seem likely, the relevant statistics (or estimates) are not available.

There are reasons to be organic and there are reasons to be certified, and they are different reasons. Early pioneers such as Rudolf Steiner and Lord Northbourne make no mention of certification. Organics certification generally postdates the 1972 founding of IFOAM. In Australia, active advocacy of organic agriculture dates from the 1944 founding of the Australian Organic Farming and Gardening Society (AOFGS) but organics certification in Australia dates only from the founding of organics certifiers beginning in 1987 (Paull, 2013a). Certified organic food and agriculture is a subset of organic food and agriculture.

The viability of organics certification relies on the availability of a premium price for the certified produce. If a premium price cannot be achieved in a particular market then it is

difficult to justify the cost of certification. There is a multitude of other reasons why organic producers are not certified, including: they cannot afford it, the scale of their operation does not warrant it, there is no suitable certification scheme available, they agree with the philosophy of organics but not of certification, they want to avoid the intrusion into their affairs.

The hinterland of Certified Organic includes not only noncertified organic, but also like-minded production methods. In the United States, there is "Certified Naturally Grown" founded in 2002 by organic farmers in reaction to the USDA taking control of US organic standards and certification. The coupling of USDA with certified organic has been a cause of disquiet considering the track record of the USDA in championing pesticides and GMOs and its long prior history of unfriending the organics sector. As a response to the disenfranchisement of the grassroots organics movement there has been "a backlash against the federal takeover of the organic program … Certified Naturally Grown has expanded over the past decade to include more than 700 farms in 47 states" (Reighart, 2013).

China has developed a certification scheme, Green Food, which is a step-down from organic but a step-up from chemical agriculture. Green Food production is a reduced input agriculture opting for a balance between health and environment, and economics and productivity. Green Food products are sample tested for pesticide residues, and annual inspections are conducted (Giovannucci, 2005, p.12).

Green Food is a Ministry of Agriculture initiative: "In 1991, the MOA began to implement the strategy of 'Green Food' in agro-food production in order to improve the health and environmental safety and market competitiveness of Chinese food products, as well as agricultural environmental sustainability" (Lu, 2005, p.17).

For Green Food certification the area should conform to four criteria: the area meets the highest grade of air standards in China; heavy metal residues are restricted in irrigation, water and soil (with tests for mercury, cadmium, arsenic, lead, chrome, etc.); processing water meets the National Drinking Water Standard; and chemical applications are restricted and regulated, with some of the most poisonous pesticides and herbicides banned (Giovannucci, 2005, p.12).

Of the certified food eco-labeling schemes in China, certified organic is reported as accounting for 9%, Green Food accounts for 29%, and Hazard-Free accounts for 62% (based on hectares certified). These eco-certifications account in total for 28% of China's cultivated land (Paull, 2008b). These certification schemes provide levels of reassurance to consumers.

The organics sector has experienced steady growth over the past two decades (there are no global statistics prior to the year 2000). The annual growth rate of 11.9% per annum is cause for celebration. But any congratulations must be tempered by the realization that the growth is coming off a low base, and organic agriculture remains a niche agriculture that aspires to be the global agriculture.

8.6 Conclusion

Organic agriculture and food meet the expectations of consumers for clean and healthy food. Organic production methods protect the health and welfare of the environment, farmers, farm workers, consumers, and animals.

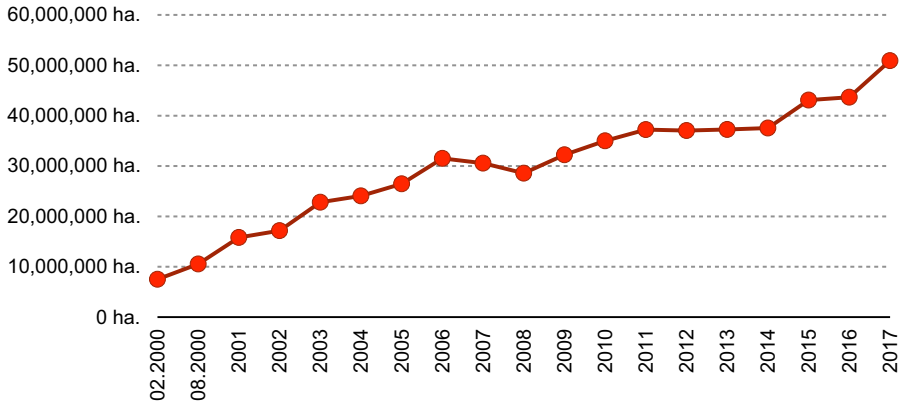

FIGURE 8.4 Global certified organic hectares show steady growth over the past two decades, year reported Growth. *Source: John Paull.*

Organics is a global enterprise—however, certified organic agriculture land accounts for just 1.1% of global agriculture land. Uncertified organic agriculture may account for some (unknown) multiple of certified organics and thereby increase that percentage. Nevertheless, for most of the time, most of the world's population is not eating an organic diet.

The state of Sikkim is the standout example of a success story of conversion to organic production. Pawan Chamling has shown what can be done when there is the will. Sikkim has achieved a 100% organic state in a short period (2003–16). Chamling's vision of a world that is "Totally Organic" (Chief Minister's Office, 2016, p.636) is the vision of the pioneers of organics, and it remains the challenge for every advocate of organics. Only 11 countries report more than 10% of their agriculture land as organic, while 111 countries report less than 1% of their land as certified organic (Paull, 2017a,b).

Some satisfaction can be drawn from the global annual growth rate of organic agriculture of 11.9% compounding over the past two decades (Fig. 8.4). This, however, must be tempered with the disappointment that global certified organic agriculture still only accounts for 1.1% of global agriculture hectares.

References

Aldi, 2007. Weekly News. Aldi Stores, Australia.

Baldwin, I.L., 1962. Review: chemicals and pests. Sci. New Series 137 (3535), 1042–1043.

Balfour, E.B., 1940. The Haughley Research Farms: Proposal for an Experiment in Soil Fertility in its Relationship to Health. East Suffolk County Council. The Haughley Research Farms Trustees, Ipswich.

Balfour, E.B., 1943. The Living Soil: Evidence of the Importance to Human Health of Soil Vitality, with Special Reference to Post-war Planning. Faber and Faber, London.

Bourgeois, D., 1997. How it all began. Ecol. Farming (17), 12–14.

Brooks, P., 1972. The House of Life: Rachel Carson at Work. Houghton Mifflin, Boston, MA.

Brumby, J., 2007. Minister's Forward in Victorian Organic Food Products Directory 2007. Regional Development Victoria, Victorian Government, Melbourne, Australia.

Carson, R., 1958a. MS Typewritten Letter: Dear Mrs. Spock; 14/3/1958. Yale Collection of American Literature, Beinecke Rare Book and Manuscript Library, New Haven, CT.

Carson, R., 1958b. MS Typewritten Letter: Dear Mrs. Spock; 26/3/1958. Yale Collection of American Literature, Beinecke Rare Book and Manuscript Library, New Haven, CT.
Chemical Week, 1962. Viewpoint: The Chemicals Around Us. Chemical Week, 14 July: 5.
Chevriot, R., 1972. Subject: Creation of an International Federation. Typescript Letter, 1 Page, Undated. Nature et Progrès, Paris.
Chief Minister's Office, 2016. Sikkim : Under the Leadership of India's Greenest Chief Minister Shri Pawan Chamling - Sustainable Developmenet through Greening, Organic Farming and Unique Social Enginering. Chief Minister's Office, Government of Sikkim, Gangtok, India.
Coatney, C., 2014. Why Does Russia Plan to Stop GMO Cultivation and Imports? 6 June. Biology Fortified, Stockton, CA.
COED, 2007. Compact Oxford English Dictionary. Retrieved 3 August 2009, from: www.askoxford.com.
FAO, 2001. Codex Alimentarius - Organically Produced Food. FAO/WHO Food Standards Programme Codex Alimentarius Commission, Food and Agriculture Organization of the United Nations, Rome, Rome.
Feldman, J.W., 2004. Rodale, J. I. (1898-1971) Organic farming advocate. In: Krech, S., McNeill, J.R., Merchant, C. (Eds.), Encyclopedia of World Environmental History, vol. 3. Routledge, London, p. 1060.
GfK, 2017. Decision Factors on what to Eat or Drink: Global GfK Survey (October 2017). GfK (Growth from Knowledge), London.
Giovannucci, D., 2005. Organic Agriculture and Poverty Reduction in Asia: China and India Focus. International Fund fot Agricultural Development (IFAD), Rome.
Göen, T., 2016. Greenpeace-Japan-Study of the Effect of Nutrition Change on the Pesticide Exposure of Consumers: Final Report. Erlangen, Germany, Institute and Outpatient Clinic of Occupational, Social and Environmental Medicine. Friedrich-Alexander Universität Erlangen-Nürnberg.
Gross, D., 2008. Our Roots Grow Deep: The Story of Rodale. Rodale Inc, Emmaus, PA.
Hall, J.R.M., 1962. Comment on Haughley. Mother Earth 12 (October), 419.
Harrison, S., 1997. Organochlorides in Australia. In: Proceedings, UNEP Workshop on Persistent Organic Pollutants (POPs). Bangkok.
IFOAM, 2017. Membership E-Directory 2017. IFOAM - Organics International (IFOAM), Bonn.
Interfax, 2015. Цутин Назвал РФ Цотенциально КруЦнейшим В Мире Цоставщиком ЛколоГически цистыч Цродуктовћ Ь Гдвдлбдр. interfax.ru, Moscow.
Jezer, M., 1987. The Dark Ages, Life in the United States, 1945-1960. South End Press, Cambridge, MA.
King, F.H., 1911. Farmers of Forty Centuries, or Permanent Agriculture in China, Korea and Japan. Mrs. F. H. King, Madison, Wisconsin.
Kögel, T., Prskawetz, A., 2001. Agricultural productivity growth and escape from the malthusian trap. J. Econ. Growth 6 (4), 337–357.
Ladejinsky, W.I., 1943. The food situation in a world at war: the food situation in Asia. Ann. Am. Acad. Pol. Soc. Sci. 225, 91–93.
Lu, W., 2005. Trade and Environment Dimensions in the Food and Food Processing Industries in Asia and the Pacific, A Country Case Study of China. Department of Agricultural Economics, Zhejiang University, Hangzhou.
Lymington, V., 1932. Horn, Hoof and Corn: The Future of British Agriculture. Faber & Faber, London.
Murphy v. Benson, 1957. Robert Cushman MURPHY, Mary T. Richards, Marjorie Spock, John C. Homer, Gladys Weeks, and David Kennedy, Plaintiffs, V. Ezra Taft BENSON, Secretary of Agriculture of the United States, Lloyd Butler, Area Supervisor of Plant and Pest Control Division, Daniel Carey, Commissioner of Agriculture and Markets of the State of New York, Defendants. US District Court for the Eastern District of New York, Murphy v. Benson, 151 F. Supp. 786 (D.N.Y. 1957).
Robert Cushman MURPHY et al., and Archibald B. Roosevelt et al., Plaintiffs, v. Ezra Taft BENSON, etc., et al Murphy v. Benson, 1958. Defendants. US District Court for the Eastern District of New York. Murphy v. Benson, 164 F. Supp. 120 (D.N.Y. 1958).
Murphy v. Benson, 1959. Petition for Rehearing: Robert Cushman Murphy et al., Plantiffs-Appellants v. Ezra Taft Benson, Secretary of Agricultutre of the United States, Defendant, and Lloyd Butler, Area Supervisor, Plant and Pest Control Division of the United States Department of Agriculture et al., Defendants- Appellees. US Court of Appeals, Murphy v. Benson, 270, Docket No: 25448 (2d Cir. N.Y. 1959).
Nielsen, 2005. Consumer Attitudes towards Organic Foods, A Global Consumer Survey. ACNielsen.
Northbourne, L., 1940. Look to the Land. Dent, London.

PANUK, 2017. Food for Thought: Pesticide Residues in the School Fruit and Vegetable Scheme (SFVS). Pesticide Action Network UK (PANUK), Brighton, UK.
Paull, J., 2008a. The greening of China's food - green food, organic food and eco-labelling. In: Sustainable Consumption and Alternative Agri-Food Systems Conference (SUSCONS). Liege University, Arlon, Belgium.
Paull, J., 2008b. The lost history of organic farming in Australia. J. Org. Syst. 3 (2), 2–17.
Paull, J., 2009. The Living Soil Association: pioneering organic farming and innovating social inclusion. J. Org. Sys. 4 (1), 15–33.
Paull, J., 2010. From France to the world: the international federation of organic agriculture movements (IFOAM). J. Soc. Res. Policy 1 (2), 93–102.
Paull, J., 2011a. The Betteshanger Summer School: missing link between biodynamic agriculture and organic farming. J. Org. Syst. 6 (2), 13–26.
Paull, J., 2011b. Biodynamic agriculture: the journey from Koberwitz to the world, 1924-1938. J. Org. Syst. 6 (1), 27–41.
Paull, J., 2011c. The making of an agricultural classic: farmers of forty centuries or permanent agriculture in China, Korea and Japan, 1911-2011. Agric. Sci. 2 (3), 175–180.
Paull, J., 2013a. A history of the organic agriculture movement in Australia. In: Mascitelli, B., Lobo Ballarat, A. (Eds.), Organics in the Global Food Chain. Connor Court Publishing, pp. 37–60.
Paull, J., 2013b. The Rachel Carson letters and the making of silent spring. Sage Open 3 (July-September), 1–12.
Paull, J., 2014. Lord Northbourne, the man who invented organic farming, a biography. J. Org. Syst. 9 (1), 31–53.
Paull, J., 2015. The threat of genetically modified organisms (GMOs) to organic agriculture: a case study update. Agri. Food 3, 56–63.
Paull, J., 2017a. Four new strategies to grow the organic agriculture sector. Agrofor Intl. J. 2 (3), 61–70.
Paull, J., 2017b. Organic farming: the arrival and uptake of the dissident agriculture meme in Australia. In: Etinghoff, K. (Ed.), Sustainable Development of Organic Agriculture: Historical Perspectives. Apple Academic Press, Toronto, pp. 31–52.
Pfeiffer, E., 1938a. Bio-Dynamic Farming and Gardening: Soil Fertility Renewal and Preservation. Anthroposophic Press, New York.
Pfeiffer, E., 1938b. De Vruchtbaardheid der Aarde: haar Behoud en Haar Vernieuwing het Biologisch-Dynamische Principe in de Natuur. Uitgevers-Maatschappij & E. Kluwer, Deventer, Netherlands, N.V.
Pfeiffer, E., 1938c. Die Fruchtbarkeit der Erde Ihre Erhaltung and Erneuerung: Das Biologisch-Dynamische Prinzip in der Natur. Basle. Verlag Zbinden & Hugin, Switzerland.
Pfeiffer, E., 1938d. Fécondité de la Terre, Méthode pour conserver ou rétablir la fertilité du sol: Le principe biodynamique dans la nature. Editions de La Science Spirituelle, Paris.
Pfeiffer, E., 1938e. La Fertilita della Terra come Restaurarla e come Conservarla. La Prora, Milano, Italy.
Pfeiffer, E., 1956. Bio-dynamics: a short, practical introduction. Bio-Dynamics (41), 2–9.
Putin, V., 2017. Article by Vladimir Putin, the 25th APEC Economic Leaders' Meeting in Danang: Together towards Prosperity and Harmonious Development. 8 November. Kremlin, Moscow.
Reed, M.J., 2003. Rebels for the Soil: The Lonely Furrow of the Soil Association 1943-2000. University of West England. PhD, Bristol.
Reed, M.J., 2010. Rebels for the Soil: The Rise of the Global Food and Farming Movement. Earthscan, London.
Reighart, S., 2013. York County Farms Opt Out of Organic Certification. York Daily Record 8 September: http://cumberlink.com/news/.
Rodale, J.I., 1942a. Introduction to organic farming. Org. Farm. Garden. 1 (1), 3–5.
Rodale, J.I. (Ed.), 1942b. Organic Farming and Gardening. Emmaus, vol. 1. Rodale Press, Pennsylvania, pp. 1–16 (1).
Rodale, J.I., 1965. Autobiography. Emmaus. Rodale Press, MA.
Rodale, R., 1971. J. I. Rodale, in memoriam. Org. Gard. Farming 18 (8), 36–41.
RT, 2014. Duma Seeks Moratorium on GMO Production in Russia. 26 February. rt.com, Moscow.
RT, 2017. Putin Vows to Make Russia Major Supplier of Organic Food to Asia-Pacific Region. 11 November. rt.com, Moscow.
Smil, V., 2001. Enriching the Earth: Fritz Haber, Carl Bosch, and the Transformation of the World Food Production. Massachusetts Institute od Technology, Massachusetts.
Soil Association, 1947. Objects. Mother Earth 1 (2), 1.
Spock, M., 1960. Correspondence: the long Island gypsy moth case. Mother Earth 11 (January), 103.

Steiner, R., 1924. Agriculture Course. Goetheanum, Dornach, Switzerland.
Sudheer, P.S.K., 2013. Economics of organic versus chemical farming for three crops in Andhra Pradesh, India. J. Org. Syst. 8 (2) (XXXX-XXXX).
The Executive Officers, 1954. Farewell. Farm Garden Dig. 3 (5), 1–3.
Time, 1962. Pesticides: the price for progress. Time 45–48, 28 September.
Toma, P.A., 1967. The Politics of Food for Peace. University of Arizona Press, Tucson.
Voice of Russia, 2014. 80% of Russians Feel Negative towards GMOs. 13 February. Voice of Russia, Moscow. sputniknews.com.
White, H., 1946a. Organic farming. Org. Farm. Dig. 1 (1), 15–17.
White, H., 1946b. The why of it. Org. Farm. Dig. 1 (1), 4–6.
Whitten, J.L., 1966. That We May Live. D. Van Nostrand Company, Princeton, NJ.