

# Environmentally Sustainable Baha'i Properties

## Spiritual Reflections, Scientific Information and Practical Ideas

By Christine Muller, based on her 2014 report made for the US Baha'i Property Office, and revised/expanded for general use in June 2021

### Reflecting Baha'i Spiritual Principles

Baha'i properties have the potential of reflecting the spiritual teachings of the Baha'i Faith. Spiritual principles can be applied in landscaping, in the construction and maintenance of buildings, and in the activities happening in and outside the buildings.

Reflecting the application of both science and ethics/religion, Baha'i properties can create beauty and a healthy and attractive environment, exemplify stewardship of Creation and be an example that humans can live in harmony with nature; they can affirm the importance of diversity in every aspect of our lives including in nature, and serve as a reminder that the well-being of present and future generations is more important than convenience or misguided societal expectations (as in the case of monoculture lawns).

Baha'i properties can also serve as a wonderful educational experience for every visitor. For example, at a Baha'i school when children go on a nature walk during children's class, they can observe real nature and healthy ecosystems with a rich diversity of native plants that attract and provide a home for wildlife. Adults may become inspired to implement environmentally responsible practices in their own homes.

There are both spiritual and scientific reasons for environmentally sustainable Baha'i properties. That is why, in many places of the world, Baha'is have started to adopt some practices that are environmentally sustainable, such as solar panels at the House of Worship in India, greywater collection at the House of Worship in Wilmette, and beautiful natural lawns and meadows at the House of Worship in Germany, but, of course, there is an urgent need for more sustainable practices almost everywhere.



Image Credit: <https://www.planetcustodian.com/lotus-temple-goes-green-with-tata-power-solars-120-kwp-solar-power-plant/8456/>

Below are some ideas about what kind of changes are needed to make Baha'i properties more environmentally sustainable, why they are necessary, and how to implement them. These suggestions will be categorized and discussed as follows: A. Landscaping and the Outdoors, B. Buildings, and C. Daily Living Practices.

## A. Landscaping and the Outdoors

'Abdu'l-Baha often uses the diversity of colors in a flower garden as a metaphor for the beauty of human diversity. In the Baha'i teachings, diversity is very much valued on all levels. Baha'u'llah said "*Nature in its essence is the embodiment of My Name, the Maker, the Creator. Its manifestations are **diversified by varying causes, and in this diversity there are signs for men of discernment.** Nature is God's Will and is its expression in and through the contingent world. It is a dispensation of Providence ordained by the Ordainer, the All-Wise.*"<sup>1</sup>

Science also recognizes the importance of diversity: The more diverse an ecosystem is, the healthier it is. If one or more species diminish or disappear, this can have ripple effects and cause the whole system to get out of balance. The loss of biodiversity is one of the two greatest threats to all life on Earth including to humanity. (The other threat is climate change.) Humanity has already destroyed about half of all plants and 83% of wild mammals. One million animal and plant species are threatened with extinction.<sup>2</sup> The web of life, in fact the very foundation of all life - including that of humans - is threatened.

Therefore, **protecting and restoring native vegetation** are among the most beneficial actions that can be taken on Baha'i properties. Such actions in multiple settings will look very different depending on the geographical area as well as on the situation and needs of the local community.

One example is the restoration of **forests** or afforestation with native trees. A forest will not only create habitat for wildlife and absorb carbon which is vital to fight climate change, but it can also provide natural resources for people such as fruit, nuts, mushrooms, wood, and even water because forests have a higher water retention rate and tend to have greater rainfall than non-forested areas.

**Natural diverse lawns** will likely have more widespread applications on Baha'i properties. Abandoning monoculture lawns is probably the most urgent action because of their far-reaching harmful impacts.

First of all we need to consider their adverse impact on *human health*. Lawn chemicals contribute to the overall load of toxins humans are exposed to in the modern world where cancer is all too common. Children are especially harmed by these toxins. In a detailed [report](#), the American Academy of Pediatrics, writing about the serious effect of these chemicals on children, states: "Epidemiologic evidence demonstrates associations between early life exposure to pesticides and pediatric cancers, decreased cognitive function, and behavioral problems."<sup>3</sup>

*The Environmental impacts of lawn chemicals* are also extremely serious and numerous. The widespread use of herbicides and pesticides in agriculture and on lawns is very likely connected to the decline of bees. In addition, lawn chemicals kill the rich life in the soil that is a prerequisite for healthy plants. These toxic chemicals can also find their way into the groundwater and rivers causing further pollution.

Chemical fertilizers are made from fossil fuels which are extracted in increasingly more dangerous areas (for example off shore drilling), in more environmentally sensitive areas, and/or with more dangerous technology (hydraulic fracturing). The environmental impacts of these extractions harm people both directly and indirectly. Moreover, nitrogen fertilizers (N<sub>2</sub>) increase greenhouse gases in the atmosphere thereby contributing to global warming.

In addition, a huge amount of water is wasted when watering monoculture lawns.

Overall, major causes of the decline of biodiversity and species extinction are the loss of habitat, toxic chemicals, and climate change. Monoculture lawns aggravate all three of these causes.

On the other hand, an organic and diverse lawn provides habitat for healthy soil life, for native plants, and for pollinators and other wildlife; it sequesters carbon and is beneficial to human health.

### **Natural Lawns – Appreciating Diversity**

The practical aspects of creating and maintaining an organic lawn are quite easy to carry out, but the real obstacle is in one's mind. The United Nations Educational, Scientific and Cultural Organization (UNESCO) motto is: "Since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed."<sup>4</sup> The metaphor of war is not too far fetched as the herbicide 2,4-D commonly used on lawns was developed during World War II to starve enemy troops.<sup>5</sup> Thus, lawn chemicals are effective weapons in a war on nature. This attitude of war seems to be the underlying problem. Killing nature eventually kills humanity. Humans are part of nature and are dependent on it. Wild flowers and native grasses are not human enemies. They are beautiful and useful with many of them being edible or having medicinal value. In addition, they provide food and habitat for wildlife.

The monoculture lawn is a relatively new human invention driven entirely by fashion and the lawn care industry. It is a scientific fact that the more diverse an ecosystem is the more resilient it is to adverse conditions such as drought and pests. Monocultures are not natural; therefore, their maintenance requires much effort and lots of chemicals. The more diverse a lawn, the healthier it is. One example might be dandelions attracting insects that eat the grubs that can negatively affect lawns.

Both, spiritual principles and science (medical and environmental science) support natural lawns that include numerous native plants and wildflowers. There is only one argument against them: fashion. Baha'is do not compromise spiritual (or scientific) truth because of fashion or misguided cultural expectations. 'Abdu'l-Baha showed this by example insisting on racially integrated meetings, although this was socially an unacceptable practice in the United States during His time.

### **The Soil**

"Soil consists of rock particles (sand, silt, or clay, in descending order of size) plus organic matter, as well as the air and water that move in the pores between these solids, and perhaps most important, the animals, microbes, and fungi that live in the mixture. Most of us do not think of the dirt beneath our feet as living, yet it supports an extraordinary array of living creatures. It is these living creatures within the earth, from earthworms to micro-organisms, that help to decompose organic matter and thus make soil capable of supporting life above the earth."<sup>6</sup> The goal of organic lawn care is to restore healthy microbial organisms in the lawn that make the lawn much more resilient.

### **Practical Steps for Lawn Renovation**

1. Mow short
2. Power rake with a dethatcher
3. Rake it all up and put into compost
4. Top dress with nearly 1 cm (1/3 inch) compost
5. Overseed with a slit seeder (no raking necessary) or a broadcast seeder (raking necessary)
6. Water, or overseed before rain

## **Seed Mix**

Use seed blend containing fescues, rye, and a small percentage of Dutch White Clover. Be sure to use Dutch White Clover and not the larger, forage types.

Clover, a legume that fixes nitrogen, is very valuable for a lawn, and grass is a heavy nitrogen feeder. Until the 1950s most grass-seed mixes included clover. Once the clover is well established, the lawn will not require any fertilization anymore. If you sow too much clover it can overtake the grass. Of course that does not have to be a problem; it depends on how it is viewed. The bluegrass will recede as the clover grows making the lawn look different but nice and green.

With time, native grasses and wildflowers will happily settle in a natural lawn and make it more diverse, beautiful, and resilient!

## **Maintenance of the Lawn**

Once a healthy lawn is established, worms and birds pecking at your soil will aerate it for free! Generally, a lawn should be kept at approximately 8cm (3 - 3 ½ inches). Mowing high allows the grass to develop deeper, drought-resistant roots systems. For the first and last cut of the season, mow to 3.6 cm (2 inches). Generally, do not mow more than 1/3 of the grass blade at a time. It is also a good idea to keep mower blades sharp to prevent the development and spread of fungal disease.<sup>7</sup>

Fertilize the lawn with compost or organic fertilizer in the spring and the fall for a few years (for attractiveness). If the lawn clippings are left on the ground, the lawn is a soil builder. This means that in a few years fertilization will no longer be necessary.

In areas where it is important to have a more perfectly looking lawn such as the Baha'i House of Worship, it is recommended to give the lawn a good watering before the beginning of winter.

## **Fertilization**

When buying organic fertilizers, make sure that they are really all organic. "Organic-based" products frequently contain synthetic materials which are highly toxic to the microorganisms in the natural materials.<sup>8</sup> Compost is an ideal soil conditioner, adding the much-needed organic content to the soil, and suppressing many turf pathogens. In the fall and spring, preferably after aerating, spread a 0.6 cm (¼ inch) layer of organic or naturally-based compost over the lawn. Compost tea and worm castings are also great additions.

## **Cost**

The long-term cost of natural lawns is substantially lower than maintaining a monoculture lawn. The first year will likely be more expensive because of the work of overseeding and the purchase of seeds and compost/natural fertilizer. In fact, natural fertilizers may cost as much as 25 to 50% more than their synthetic counterparts.<sup>9</sup> However you will not have to pay for herbicides, pesticides, and fungicides. Also, there will only be two applications of fertilizer a year (instead of four with monoculture lawns) which saves labor cost. In addition, it may only be necessary to fertilize twice a year for the first two or maximum three years. After that, it may be beneficial to fertilize once only in the fall for one or two more years. By then the clover will hopefully be firmly established and the soil rebuilt by the lawn clippings left after cutting thereby requiring no further fertilization. So, the lawn will basically be maintenance free except for cutting.

## **Time**

If there is no hurry to have a beautifully diverse organic lawn, overseeding can be skipped and

care for the lawn begun organically by using only organic/natural fertilizers and management products. It will just take longer for the lawn to become beautiful.

Getting the actual biology of the soil back to what is considered natural may take some time depending on how long it was treated with herbicides and pesticides and what kind of chemicals were used. Getting beneficial bacteria and natural organisms back into a depleted soil can be sped up with many soil amending products from seaweed extracts to kelp, which are available.

### **More Information about Natural Lawn Care**

[Organic Lawn Care 101: A three page summary Lawns and Landscapes](#)

### **Reduce the Size of the Lawn**

Many people who are aware of the multiple problems with lawns are reducing its size. There are various ways to do this. If the lawn is not used by people to walk, to sit, or to play on, another cover crop or perennial flowers and bushes could be planted. Another possibility would be flower beds with native perennial and annual wildflowers to provide habitat for these plants and for many animals. In addition, with an increasingly erratic climate and unstable social conditions, growing plants that supply food should always receive high priority.

A good option for extensive areas of lawns would be reverting the area to prairies/meadows. See paragraphs below.

### **Interconnectedness and Interdependence - Composting**

*“Reflect upon the inner realities of the universe, the secret wisdoms involved,...the inter-relationships, the rules that govern all. For every part of the universe is connected with every other part by ties that are very powerful and admit of no imbalance, nor any slackening whatever.”<sup>10</sup>*

'Abdu'l-Baha

In nature, there is no waste. Garbage does not exist. All systems are circular. As the human population has grown and economic activities have increased, more of the Earth's resources are now being used than can be replenished. “Today humanity uses the equivalent of 1.6 Earths to provide the resources we use and absorb our waste. This means it now takes the Earth one year and eight months to regenerate what we use in a year.”<sup>11</sup>

Kitchen and yard “wastes” are valuable resources that ought to be composted. In the past, at Green Acre Baha'i School, all kitchen scraps and food waste were composted. There are two arguments against re-introducing this practice. The first is fashion – composting supposedly is not a practice that belongs to a modern well-kept establishment. As shown before, this argument does not hold up for Baha'is; on the contrary, composting is an essential part of an environmentally sustainable civilization. An understandable argument against composting is that there is not enough staff to transport the kitchen scraps to the compost pile. However, this problem could easily be overcome by integrating this task into the service participants render after each meal.

### **Community Gardens – the Importance of Agriculture**

The Baha'i teachings say “*Special regard must be paid to agriculture*”. (Tablets of Baha'u'llah, p. 89)

There is a widespread movement now to create community gardens and to encourage individuals to grow some of their own food. Many churches have started community gardens, which often

provide food for the poor in their community. As the current unsustainable global food production system is becoming increasingly fragile, decentralized food production is one measure to mitigate future food shortages. Moreover, gardening work is healing for the soul. It provides a perfect opportunity for collaborative service among people from different backgrounds, therefore contributing to community building in the neighborhood. It is also an educational tool for children and youth to see and experience how food is grown - that it does not just come out of a box.

A garden project can start very small, perhaps with some perennial herbs and then gradually expand as human resources allow. As an example, at the Baha'i Center in Ranson WV, some friends have created a meditation garden as well as a community vegetable garden and are experimenting with "edible landscapes". See the 5 minute video about this effort:

<https://www.youtube.com/watch?v=ECKQPStt8Nk>

### **Meadows and Prairies: Wildlife-Friendly Alternatives to Lawn** <sup>12</sup>

"There essentially are two types of meadows or prairies: annual and perennial. Annual meadows grow rapidly the first year, providing an abundance of color quickly. This is the type of meadow you encounter when you buy and plant packaged or canned meadow mixes.

"Perennial meadows are the second type. Because perennial plants and prairie grasses take hold more slowly, a perennial meadow usually requires two or three years to establish properly. These plants have very deep root systems and spend the first year directing their energies into root growth. In the second year, perennial meadow and prairie plants extend their roots and begin to grow and spread aboveground as well. By the third year, your meadow or prairie garden is fully established. An established meadow is virtually maintenance free.

"By creating a meadow or prairie you provide habitat for a variety of wildlife species. Some flowers provide nectar and larval food sources for butterflies and nectar for hummingbirds. Others supply seeds for songbirds to eat and shelter for insects. Insects in turn provide additional food for birds and small mammals. Rabbits build nests at the base of grass clumps and feed on tender shoots of grass."<sup>13</sup>

For creating/restoring of prairies/meadows at Baha'i properties it would be best to not only use a seed mix containing many native perennial plants, but also some annuals. While the perennial plants will need time to establish, the annual flowers will already look beautiful the first year.

In the case of Green Acre, because of its historical significance, the ideal goal would be to restore the meadows with native species as close as possible to the way they were during the visit of 'Abdu'l-Baha.



*Baha'i House of Worship, Frankfurt, Germany  
2014, Image C. Muller*

Meadows require very little maintenance relative to turf lawns, but the plantings must be cared for during the first year to ensure that their root systems develop properly. If seeds have been planted, the meadow must be watered with a sprinkler at least once a week (or more depending on conditions) until the young plants have reached approximately 15 cm (6 inches) in height. After that, they only need to be watered during dry spells.

Once the meadow is established, everyone will enjoy a picturesque, useful, and sustainable landscape with very little work.

“Since a meadow is an early successional habitat, its natural trajectory is to slowly become a woodland. The seeds of woody species that are brought in by wind and animals, germinate under the protection of grasses and wildflowers, and they eventually overtake the landscape. Mowing your meadow once a year will ensure that young tree and shrub seedlings are suppressed.”<sup>14</sup>

Local farmers can manage a hayfield, which is commonly done these days. Farmers obtain the hay free of charge, but they invest all the work.

“The best time to mow the meadow is in very early spring, just before new growth emerges. Although some may prefer to mow the dead stems in late fall, leaving them in place over the winter provides many benefits for wildlife. The dried flower heads contain seeds for wintering birds, and the thick masses of dead stems provide much-needed shelter for small mammals, birds, and overwintering insects like butterflies. In addition, the brown seed heads contrast beautifully against white winter snow. Some people may harvest seed heads for use in winter decorations, blending the unusual shapes and textures.”<sup>15</sup>

### Green Acre Baha'i School – A Special Case



*Image Credit: greenacre.org*

Green Acre Baha'i School in Maine, USA, has profound spiritual and historical significance which can be honored by preserving the remaining open space between the main road and the inn. In this spirit, it would also be fundamentally important to restore the meadows/prairies on both sides of the long entrance road up to the first houses. Of course, this would still allow a cut natural lawn close to the inn and other houses including a sports field where there used to be one. It may also be useful to cut the grass

along the road on both sides for passengers to walk safely.

Probably the highest priority is to stop the spraying of lawn chemicals and to **transition to natural lawns and meadows**. In this regard, please, see the information about restoring meadows above.

Formerly, there was a **Vegetable Garden** behind Staples at Green Acre. Perhaps sometime, it could gradually be recreated. The following information and historic picture about this site are from Diane Brandon:

“The garden was behind Staples (the former office) and the garage next to Staples (now torn down and gone). If



*Vegetable Garden in Green Acre, 1970s, Image Credit: Diane Brandon*

you stand in front of the new maintenance building, with the building to your back, you would be looking at the garden area. In the old photo below, Staples would be to the right between the garden and the road, and the house on the left is still there (but looks very different) and belongs to Jill and John Ury. What was the Dixon house in the background, the Ury family bought it in about 1995, and put on additions, so it looks very different now.”

## **B. Buildings**

*“Every choice a Baha’i makes ... leaves a trace, and the moral duty to lead a coherent life demands that one’s economic decisions be in accordance with lofty ideals, that the purity of one’s aims be matched by the purity of one’s actions to fulfil those aims.”*

Universal House of Justice, 1 March 2017

### **Buy Clean Energy from the Electric Company**

Much of the electricity consumed comes from burning coal, gas, and oil, which releases harmful air pollutants, heats up the planet, and disrupts the climate. In many countries, it is possible to buy electricity that is produced in more environmentally responsible ways, such as with wind and solar energy or small hydropower. Such environmentally sound production costs a bit more, but this action will support clean energy resulting in cleaner air, cleaner water, less damage to the climate, and, for all of these reasons, healthier people.

### **Insulate Buildings**

Insulating buildings saves much energy! At a time when humankind must quickly and significantly reduce carbon emissions to avoid the worst consequences of global warming, using less oil, gas, or electricity to heat and cool buildings is important. Adding more insulation to a loft, attic or flat roof is very effective. Caulking and weatherstripping will further weatherize a house by air sealing it. An energy audit may help to identify areas of the building that are leaking. Overall, better insulation will significantly lower heating/cooling bills and should pay for itself many times over.<sup>16</sup>

### **Install Renewable Energy – Solar**

Many people these days install solar power merely for its economic benefit. People of faith have a deeper motivation: Love for creation and humankind. Generating electricity from coal, oil, and gas causes emissions of carbon dioxide and methane. To avoid catastrophic climate change, both of these emissions must be reduced very quickly and substantially. It makes much more sense to use energy that the sun provides naturally without pollution and without cost. However, there are two prerequisites: The roofs of buildings need to be sunny and in good condition. In many places, there are government incentives for solar power which can help alleviate the up-front costs.

### **Save Energy**

Using less energy will save money, but more importantly, it reduces environmental pollution and greenhouse gas emissions that contribute to climate change, and therefore lessens human suffering. Options to conserve energy include:

- Buying energy efficient appliances;
- Installing LED light bulbs;
- Turning off heat, air-conditioning, and lights when not being used. Tools to aid this include a programmable thermostat and an automatic light turn off.

### **Conserve Water**

In many areas of the world, fresh water is becoming increasingly scarce because of climate



change. To help alleviate this scarcity the following can be employed:

- Install low-flow toilets or compostable toilets;
- Install low-flow shower heads;
- Repair any leaks in the water system quickly;
- Install rain barrels and other water catchment devices;
- Plant drought resistant trees, crops, and ornamental plants;
- Only irrigate as needed, such as plants grown for food or newly planted plants;
- Use water saving irrigation techniques;
- Use greywater (used water from bathroom sinks, showers, tubs, and washing machines) for irrigation.

## C. Daily Living Practices

*“ . . . strive that your actions day by day may be beautiful prayers.”* 'Abdu'l-Baha

### Food

#### *- Avoid food waste*

According to Project Drawdown, reducing food waste is the third most effective action to reduce greenhouse gas emissions.<sup>17</sup> Leftovers can be creatively used, for example in soups.

Encouraging guests at Baha'i properties to only put on their plates what they are confident they can eat can also help.

#### *- Provide a vegetarian option and avoid serving beef*

*“The food of the future will be fruit and grains. The time will come when meat is no longer eaten.”*<sup>18</sup> 'Abdu'l-Baha

To feed a person, beef production requires about ten times more land area than a plant-based diet. In addition, it takes about 2,500 gallons of water to grow the grain for one pound of beef. Moreover, greenhouse gas emissions from cows are a very significant factor in global warming. Reducing the quantity of cheese served would also be beneficial.<sup>19</sup>

#### *- Serve organically grown food when possible*

These days, global food production is geared for profit and not for human well-being. It is essential to support organic agriculture because it helps soils stay fertile for future generations and contributes to the mitigation of climate change. Organically grown food is not only healthier for the planet, but also for people. Eating organically means avoiding the dangerous toxic chemicals that are applied in “commercial” food production. Factory produced meat is especially harmful.

#### *- Serve food that is local and in season*

*- Compost kitchen scraps* (see section about composting under A. Landscaping and the Outdoors)

### Waste Management

#### *- Electronic waste*

The mining of resources needed in electronics results not only in serious environmental pollution, but, for example in the case of cobalt, in terrible human rights violations. It is best to keep electronic equipment for as long as possible. At the end of their life, the best option would be to find an organization that up-cycles electronics; that is they repair them and sell them for a second use. If that is not possible, bring any broken computers, cell phones, TVs etc. to an e-waste collection or recycling location.

### - Recycle

Provide recycling bins for everything that is recyclable which varies in different locations. Encourage visitors to use these recycling bins making sure to only put materials into the bins that will be recycled and that bottles are empty.

### Heat and Cool Only as Necessary

Use air conditioning with moderation. Heating and cooling are responsible for the largest share of the environmental footprint of a building. There should be no need to put on a sweater or long sleeves in July, and it is fine to wear an extra sweater in the winter.

### Avoid Disposables, Especially Plastics!

Most disposables are not recyclable and end up in a landfill – or in the ocean. However, the worst environmental impact of disposables happens before they are even used. Extracting the resources such as oil for plastics and cutting trees for paper have the largest environmental impact. The amounts of energy and water used in manufacturing and the transportation involved in all the steps - from extraction to production to the store and to the place of use – are also significant. Utilizing reusable instead of single-use dishes lessens the depletion of natural resources, reduces the impact on global warming, and does not contribute to the mounting waste problem.

### Provide Potable Water

Where the water is unsafe or strongly chlorinated, provide filtered water for staff and visitors to refill their water bottles, thereby eliminating the need for throw-away water bottles.

### Use Non-toxic Cleaning Materials

*God loveth those who are pure. Naught in the Bayán and in the sight of God is more loved than purity and immaculate cleanliness...He indeed desireth that under all conditions, all may be adorned with such purity, both inwardly and outwardly, that no repugnance may be caused even to themselves, how much less unto others.<sup>20</sup>*

Selections from the Writings of the Bab (Excerpts from the Persian Bayán p. 80)

Ingredients in common household products have been linked to asthma, cancer, reproductive disorders, eye and skin irritations, hormone disruption and neurotoxicity. There are no laws that regulate what companies can put into cleaning products as long as they are labeled. Many of these chemicals will persist in the environment – in the water, air, and soil.

Products from all natural ingredients can either be purchased (read labels and beware of false claims called “greenwashing”) or self made. It is easy and cheap to make cleaning products with natural ingredients such as white vinegar, baking soda, and essential oils; and they do work! Here are some ideas: [19 Natural Cleaning Tips \(+ Easy Recipes\)](#)

### Concluding Thoughts

In this day, environmentally sustainable practices, including outdoor landscaping, building renovations, and daily living practices, have become more and more crucial in decision-making processes. This article provides some assistance to meet those needs. Nevertheless, all the above information and ideas will not be applicable everywhere. Baha’i institutions and individuals may like to consider them in their consultations about how they can minimize their impact on the Earth and how they can restore a healthy natural environment in their local communities.

- 1 Tablets of Baha'u'llah, p.142
- 2 The Guardian, 21 May, 2018, <https://www.theguardian.com/environment/2018/may/21/human-race-just-001-of-all-life-but-has-destroyed-over-80-of-wild-mammals-study>
- quoting The biomass distribution on Earth, Yinon M. Bar-On et al., PNAS June 19, 2018
- 3 <http://pediatrics.aappublications.org/content/early/2012/11/21/peds.2012-2757.full.pdf+html>  
For more information about the effect of pesticides on children see here: <http://www.beyondpesticides.org/lawn/factsheets/Pesticide.children.dontmix.pdf>
- 4 [http://www.unesco.org/archives/multimedia/index.php?s=films\\_details&pg=33&id=265#.U9fkeYBdWHY](http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=265#.U9fkeYBdWHY)
- 5 "American Green – The Obsessive Quest for the Perfect Lawn" by Ted Steinberg, p. 45
- 6 <http://www.planetnatural.com/organic-lawn-care-101/perfect-lawn/>
- 7 <http://beyondpesticides.org/pesticidefreelawns/resources/Read%20Your%20Weeds-Organic%20Lawns.pdf>
- 8 Organic Lawn Care Manual by Paul Tukey, p. 117
- 9 Organic Lawn Care Manual by Paul Tukey, p. 107
- 10 Selections from the Writings of Abdu'l-Baha, p. 156
- 11 Ecological Footprint <https://www.footprintnetwork.org/our-work/ecological-footprint/>
- 12 Penn State Agricultural Sciences  
<http://extension.psu.edu/natural-resources/wildlife/landscaping-for-wildlife/pa-wildlife-5>
- 13 Meadows and Prairies: Wildlife-Friendly Alternatives to Lawn <https://extension.psu.edu/meadows-and-prairies-wildlife-friendly-alternatives-to-lawn>
- 14 Duke Farms <https://dukefarms.org/making-an-impact/stewardship-at-home/perennial-meadow/>
- 15 ibid
- 16 For more information, see [https://energy.gov/sites/prod/files/energy\\_savers.pdf](https://energy.gov/sites/prod/files/energy_savers.pdf) and <https://energy.gov/energysaver/air-sealing-your-home>
- 17 Project Drawdown <https://www.drawdown.org/solutions/food/reduced-food-waste>
- 18 'Abdu'l-Baha Compilations, Baha'i Scriptures, p. 452
- 19 Chart: Food: Greenhouse gas emissions across the supply chains  
<https://ourworldindata.org/grapher/food-emissions-supply-chain?country=Beef+%28beef+herd%29~Cheese~Poultry+Meat~Milk~Eggs~Rice~Pig+Meat~Peas~Bananas~Wheat+%26+Rye~Fish+%28farmed%29~Lamb+%26+Mutton~Beef+%28dairy+herd%29~Shrimps+%28farmed%29~Tofu~Maize>
- 20 Selections from the Writings of the Bab (Excerpts from the Persian Bayan) p. 80