CLIMATE CRISIS

Here's a collection of the many pages within *The Green Handbook* dedicated to Climate Change/the Climate Crisis. These excerpts are pulled from chapters brimming with more information you need to know. Also the 20-page Section II, dedicated entirely to the Climate Crisis's connection with the food supply is included for you to read. See below.

P.S. This material looks a lot better in the actual Book!

Pesticides Chapter

CODE RED CLIMATE CRISIS

Not only do pesticides contribute to the development of many diseases, they also harm the planet, contribute to climate change and deterioration of the earth's ozone layer. During a time when nations are striving to control effects of climate change, shouldn't everything be done to reduce the use of substances that contribute to it? The Montreal Protocol[1] was established to phase out ozone damaging chemicals like fumigants—nonetheless some remain in use. Fumigants are still used to prep soil for crops like strawberries as well as permitted on stored grains, nuts and dried fruit.[2] Here's a look at some of the chemicals used in farming:

SULFURYL FLUORIDE: According to MIT Sulfuryl fluoride contributes *4,800 times more* to global warming than carbon dioxide[3]. Even more troubling, it causes brain lesions and vacuolation[4]—in other words, it causes holes in the brain's white matter. Within the white matter lie the nerve fibers that connect nerve cells. With loss of the white matter, what horrible diseases develop? Think of the spike in Alzheimers and dementia, could this be because of sulfuryl fluoride use in food storage, landscaping, and residential pest control? If a chemical like this isn't banned, what further harm may come to our health & our planet?

METHYL BROMIDE: Methyl Bromide accumulates in the atmosphere, where it destroys the earth's protective ozone layer. It's linked with increased risk of prostate cancer[5], damages to DNA, lungs and liver, and can cause neurological complications. Through the Montreal Protocol, most nations phased out methyl bromide by 2005. However, the United States approved the continued use of the fumigant under the "Critical Use Exemption" clause. Over 4,000 exemptions were granted; most to strawberry and grape growers. Just in 2015, 376 metric tons were used to grow strawberries.[6] Also used when sealing shipping containers. [7]

CHLOROPICRIN: about 10 mill lbs. used annually, often with sulfuryl fluoride[8]

NITROUS OXIDE: In conjunction with synthetic fertilizer, fumigants appear to alter soil biota and release nitrous oxide,[9] which is perhaps the most potent greenhouse gas of all. Nitrous

oxide stays in the atmosphere for over 100 years and remains in the soil for decades. According to the EPA, "Nitrous oxide molecules stay in the atmosphere for an average of 114 years before being removed by a sink or destroyed through chemical reactions. The impact of 1 pound of N2O is almost 300 times that of 1 pound of carbon dioxide."[10] Chances are fumigants worsen toxic runoff and water pollution caused by synthetic fertilizer.

ANTIBIOTICS AS PESTICIDES: Citrus growers in Florida struggling to combat citrus greening, a disease spread by an invasive insect known as Asian citrus psyllid. Growers resorted to using 2.23 million pounds of oxytetracylcine and streptomycin to combat the disease- this is 36 times more than that used by humans each year![11] How will this impact agricultural runoff? to antibiotic resistance? What wide-scale destruction could result from this? Does anyone know? Studies show these antibiotic/fungicides have a drastic effect on soil as well as animals.[12] Could using natural means like predatory wasps, the phyllid's natural predator be a better idea?

RESISTANT WEEDS Caused by overuse of pesticides. We're starting to see resistant fungus now from overuse of fungicides. Clearly, the overuse of toxic chemicals is making us very vulnerable; pesticides no longer work, antibiotics can be ineffective. We're on a slippery slope.

GMOS Chapter

CODE RED CLIMATE CRISIS

Let's look at GMO's contribution to Climate Change.

- GMO Farming requires incredible amounts of pesticides to cope with the persistent super weeds its herbicides have created. This creates an endless loop of toxic exposure.
- Land change for monocropping has devoured countless acres—often land that was once forest, prairie or meadow causing massive shifts in habitats and loss of stored carbon
- Synthetic fertilizer and monocropping cause grave harm to soil life, waterways, people, to countless species and to the planet as we know it.
- Monocropping requires farmers to apply more synthetic fertilizer per acre in attempt to replenish the depleted soil[13]. The nitrous oxide emissions and toxic runoff from fertilizer radicalize climate change, cause toxic algae blooms and are a factor in red tides.
- The deathly use of all these toxic substances terrorizes waterways, air quality, and all creatures including pollinators and beneficial insects, wild animals, pets and people.
- Killing Animals in Waterways: oceans, streams, lakes. rivers, and groundwater are drastically affected by agricultural runoff that not only contaminates drinking water, but also causes dead zones, toxic algae, red tides[14], & warming oceans. When the algae die bacteria take over releasing carbon dioxide & contributing to ocean acidification.
- GMOs and factory farm animals are interlinked, these animals are force fed GMOs rather than the food they'd eat naturally.

GMO & ITS PLANET HARMING FACTORS:

- Overuse of pesticides causes weed resistance
- Toxic herbicides are prone to drift (see page 24, *Hawaii, birth defects & pesticide drift*)
- Toxic pesticides are killing pollinators, beneficial insects, and threatening wildlife.
- Synthetic Fertilizer use has exploded and is a major nitrous oxide (N2O) emitter. N2O is considered "the most potent greenhouse gas"[15], 300x worse for climate than CO2.
- Monocropping & deforestation cause habitat loss, erosion, and loss of carbon storage.
- When soil is sickened, erosion & runoff are promoted, and soil emits carbon dioxide
- Farming chemicals toxify runoff causing lethal toxic algae, algae blooms, dead zones, red tide & ocean acidification
- GMO Soy is likely causing factory farm animals to produce more methane

This anti-earth, anti-life farming practice is not slowing down. Instead our government is subsidizing these farmers and their deadly use of toxins. Our own government encourages other nations to follow our lead, to abandon their traditional ways of growing food for this one. When farmers sign up to try GMO seeds, they enter a binding contract; they're not allowed to replant seeds, the seeds have to be bought every year. The seeds only grow with the herbicides designed to grow with the seeds. Because of the widespread weed resistance that's developed, farmers must keep buying more herbicides to combat them. Though GMO farming was supposed to use less herbicides than all other types of farming, that is far from true. Without sight of common sense, these farming styles and our governments' encouragement of them is misleading us all far away from any climate recovery.

Factory Farms Chapter

CODE RED CLIMATE CRISIS

Animal factory farms push all the climate change buttons and cause significant health problems. Here's some facts from the Food and Agricultural Organization of the United Nations (FAO), the Humane Society, and from the University of Iowa School of Public Health.

Manure and Waste at Factory Farms Emit Significant Air Pollution:

- **Methane** (CH4): 37% of emissions of methane, more than 20 times the GWP (Global Warming Potential) of Carbon Dioxide (CO2)
- **Carbon Dioxide** (CO2) emissions (Source FAO, Livestock's Long Shadow):
    - Gmo feed requiring vast amounts of synthetic fertilizer. Producing fertilizer for feed crops emits nearly 41 million tons of CO2 around the world each year.[16]
    - Giant facilities need to vent, cool, heat facilities, operate machinery to grow feed crops amounts to 90 million tons of CO2 globally.
    - Transporting, processing and slaughtering, packaging animals produces "tens of millions of tonnes" of CO2 annually.
    - Deforestation and clearing land for pasture, grazing and growing feed crops eliminates carbon sinks and produces 2.4billion tons of CO2 yearly worldwide.
    - Working the crops and land creates 28 million tons of CO2

- Over grazing exhausts the land and provokes erosion. This may apply moreso to ranchers, but it emits close to 100 million tons of CO2 yearly.[17]

- **Hydrogen Sulfide** (H2S): Levels as high as 1,000 ppm have been reported following the perturbation of manure lagoons, and levels greater than 100 ppm are considered immediately hazardous to life and health. Exposure to these elevated levels of H2S can cause rapid loss of consciousness, H2S has been implicated in a number of deaths when encountered in confined environments in agricultural settings.[18]
- **Ammonia** (NH3): animal agricultural operations are responsible for almost three fourths of ammonia air pollution in the United States that can lead to pulmonary disease, scarring of upper and lower airways, lung inflammation, high concentrations can be fatal.[19]
- **Nitrous Oxide (N2O)**: 65% of nitrous oxide emissions worldwide are produced by animal farm operations, this number includes emissions from producing feed crops. N20 is 300 times the GWP of CO2 & it can last in the atmosphere for 150 years.[20] Global farm animal production, including growing feed crops, accounts for 65% of global N2O emissions."[21]

METHANE: While we often hear of methane emissions from cows at factory farms, let's explore a little more. The methane results from the manure lagoons as well as when the cows are digesting food. The majority of GMOs grown in America, particularly GMO corn and soy are provided as feed for the factory farm animals. The farm animals—cows, sheep, goat, buffalo, camels are known as Ruminants. "They have a compartment in their stomach called a rumen where food is broken down through fermentation. This process produces methane gas, which the animals belch out. Enteric fermentation accounts for 18 percent of all anthropogenic methane emissions."[22] Apparently though, the harder food is to digest, the longer it stays in the rumen, and hence more methane is produced. There's evidence that GMO soy is harder to digest[23] than traditional soy. If this is the case, then GMO feed could be contributing to increased methane. "Between 1990 and 2006, methane emissions from pig and dairy cow manure in the United States increased by 34% and 49%, respectively. This increase, according to the U.S. Environmental Protection Agency, is a result of the shift toward confining pigs and cows in larger facilities using liquid manure management systems."[24]

FACTORY FARM HEALTH AND CLIMATE PROBLEMS[25]

MANURE	OVER 300 MILLION TONS,
HYDROGEN SULFIDE	ACID RAIN, SMOG
AMMONIA	RESPIRATORY PROBLEMS,
PARTICULATE POLLUTION	ASTHMA, HEART ATTACKS
VOCs Volatile Organic Pollutants	HEADACHES, NAUSEA, RISK OF CANCER
METHANE	CLIMATE CHANGE
NITROUS OXIDE	CLIMATE CHANGE
CARBON DIOXIDE	CLIMATE CHANGE

HEALTH EFFECTS PEOPLE

- headaches and depression, brain damage[26]
- shortness of breath, wheezing, diarrhea, coughing, sore throats,

- seizures and miscarriages, blue baby syndrome.
- cancer, childhood cancers, reproductive cancers
- high blood pressure, heart problems
- antibiotic resistance, chronic illness
- early puberty, depression

HEALTH EFFECTS ANIMALS

- infections and disease, antibiotic resistance
- depression, anxiety,
- pain, sickness
- vitamin and mineral deficiencies

HEALTH EFFECTS PLANET

- air pollution, acid rain, smog, ammonia pollution, climate change
- toxic runoff, water pollution, nitrate in water,
- antibiotic resistance, harm and cruelty to animals

***METHANE CAPTURE:** Some farms are finally taking action and converting methane for use. Biogas digesters capture methane and convert it to electricity! "Farm digesters are big tanks that contain manure and other waste from barns that house livestock such as cows and pigs."[27] As Farm Journal's MILK magazine reports, in 2018 "Land O'Lakes, Inc. (LOL) and California Bioenergy LLC (CalBio) launched a first of its kind collaboration this summer to finance, build, operate and manage methane digesters on California dairy farms. The project is designed to capture methane from cow manure using on-farm digesters and then compress it into a natural gas pipeline where it can be used by commercial forms of transportation like city buses or heavy trucks in metropolitan areas such as Los Angeles.[28]

P.S. This material looks a lot better in the actual Book!

Pollinators Chapter

CODE RED: POLLINATORS

The food supply depends on Bees and Pollinators—they are essential for producing most of the foods we love to eat. These little creatures are the food makers, pollinating the plants and bringing us all the delicious foods we love. Pollinators include: Bees, Bats, Butterflies, Birds, Beetles, Moths, Pollen Wasps, and even some varieties of flies. These wondrous animals do their work generously and by instinct; work that no man can do. In return for their selfless service, we receive unlimited fruits and vegetables and bounties of food for harvest. Yet today, the survival of the bees and pollinators is uncertain.

The soaring use of pesticides on the very foods they pollinate has made pollinators the casualties of the front line. Unlike any other time in history, bees, birds and bats are dying in record numbers. This is directly related to modern chemicals used in farming. Bees are succumbing to

colony collapse disorder, bats are dying off from white nose fungus, and monarch butterfly numbers are dwindling due to loss of the milkweed plant they so vitally depend on during migration. Bats are one of nature's best pest control critters, gobbling up mosquitoes and crop damaging insects. For their pest control skills alone, unless bats are saved North America could experience agricultural losses up to 53 billion/year.[29] As far as bees go, the loss would be insurmountable. "Seventy out of the top 100 human food crops, which supply about 90 percent of the world's nutrition are pollinated by bees."[30]

We truly are in the midst of a crisis. Disease, habitat loss, parasites, fungicides, wind turbines, and exposure to pesticides are all threatening pollinators. Of them all, however pesticides may be the ultimate trigger raising the risk and likelihood of disease. The numbers speak for themselves: US beekeepers lost 40% of their hives last year[31], and nearly 7 million bats have been lost since 2006.[32] Pesticides are lethal to non-targeted species, especially when exposure includes not just one but multiple pesticides. Greenpeace reports that bee pollen can contain as many as 150 different chemical residues.[33] The most dangerous pesticides for bees appear to be neonicotinoids; when combined with fungicides, neonicotinoids kill bees even more swiftly. Equally troubling is that the bees bring the toxins back to their hives where it has multiple effect—One is that more bees get effected; secondly the hive's community instinct to clean out dead and sick bees fades allowing conditions like brood to fester; and lastly in these conditions the director of the hive, the queen bee, is more likely to leave or die leaving a hive without the ability to reproduce.[34] Birds are affected as well. "Forty percent of the world's bird populations are in decline. Agriculture has the biggest impact of all human activities on birds, threatening 74 percent of the 1,469 species at risk of extinction."[35]

WITHOUT BEES WE'LL LOSE: Apples, Avocadoes, Almonds, Alfalfa, Blueberries, Cherries, Apricots, Raspberries, Strawberries, Grapes, Coffee, Coconut, Chocolate, Watermelon, Lemons, Limes, Oranges, Peanuts, Lentils, Legumes, Olives, Onions, Broccoli, Grapefruit, Watermelon, Melons, Carrots, Kiwi, Cucumbers, Cranberries, Celery, Cauliflower, Macadamia Nuts, Peaches, Sunflowers, Tangerines, Pumpkins, Squash, Peas, Cotton, Soybeans, Beets, Tea, Figs, Vanilla and all the foods and drinks made with these wonderful magical foods like chocolate and wine. Without bees, crop yields can be reduced by more than 90%.[36]

WITHOUT BATS WE'LL LOSE: "Over 300 species of fruit depend on bats for pollination including mangoes, bananas, guavas as well agave, the source for tequila."[37]

WITHOUT BIRDS WE'LL LOSE: Wildflowers, biodiversity, balance in ecosystems, birds help pollinate many plants,[38] without birds, insects will become more obnoxious. [39]

NEONICOTINOIDS: Like other pesticides and toxic chemicals neonicotinoids are allowed

to be used widely today despite their danger. Two new studies completed in 2017 confirm that neonicotinoids do in fact harm and kill bees. Exposure results in "decreased survival and immune response, especially when co-exposed to a commonly used agrochemical fungicide." Further, exposure "reduces overwintering success and colony reproduction."[40] As described below*, this dangerous class of pesticides are known neurotoxins that interfere with brain function and harm the nervous system.

HEALTH EFFECTS: "Neonicotinoid toxicity affects the thalamus gland and "has been found to play a role in several central nervous system disorders, including Alzheimer's disease, Parkinson's disease, schizophrenia, and depression. In the developing brain, this subtype is involved in neural proliferation, apoptosis, migration, differentiation, synapse formation, and neural circuit formation. Other studies have found adverse reproductive as well as developmental effects in mammals including reduced sperm production and function, reduced pregnancy rates, higher rates of embryo death, stillbirth, and premature birth, and reduced weight of offspring...."[41]

COLONY COLLAPSE ORDER

"Neonicotinoids act on insect nervous systems. They accumulate in individual bees and within entire colonies, including the honey that bees feed to infant larvae. Bees that do not die outright, experience sub-lethal systemic effects, development defects, weakness, and loss of orientation. The die-off leaves fewer bees and weaker bees, who must work harder to produce honey in depleted wild habitats. These conditions create the nightmare formula for bee colony collapse." www.greenpeace.org

GLYPHOSATE

Researchers studying bees report of fatalities related to glyphosate exposure. "Exposing bees to glyphosate alters the bee gut community and increases susceptibility to infection by opportunistic pathogens. Glyphosate exposure of young workers increased mortality of bees."[42] If glyphosate disturbs the natural balance of their gut bacteria so much as to weaken their immune systems, how many more animals are affected and vulnerable to infection after exposure to the world's most common glyphosate product?

In addition to messing with our gut bacteria, glyphosate disturbs soil health and chelates minerals, which undoubtedly trigger yet more troubles. Dr. Don Huber, explained in his letter to the USDA, "glyphosate promotes soil pathogens and is implicated with the increase of more than 40 plant diseases; it dismantles plant defenses by chelating vital nutrients; and it reduces the bioavailability of nutrients in feed, which in turn can cause animal disorders."[43]

FUNGICIDE THREAT

Though long assumed to be harmless to insects, fungicides are now known to be dangerous to bees and other nontargeted species, including people. Big surprise! Fungicides are endocrine disruptors, neurotoxins, and reproductive toxins. Beyond Pesticides reports, "Hazardous fungicides thiram, ziram and ferbam are teratogens, neuro, reproductive and thyroid toxins, mutagens, and skin sensitizers. These fungicides are used on food crops (strawberries, apples, and peaches) and for seed treatment. Prolonged occupational exposure to thiram increased the incidence of hypertension & diseases of the heart, liver, thyroid and gastrointestinal tract. Ziram causes thyroid cancer in rats and lung and lymph gland cancer in mice."[44]Regarding bees,

researchers discovered fungicides interfere with their ability to metabolize and detoxify insecticides thus impacting their energy.[45] Furthermore, fungicides are now found throughout bee pollen samples, and are a suspect in weakening bees to die from nosema fungus.[46] Coincidentally, many species of bats are dying from white nose fungus. Is it the exposure to fungicides that's ultimately weakening bees' and bats' immune systems? What might these substances be doing to us? More troubling news, researchers have found that bees actually are attracted to food tainted with fungicides, [47]which may be why more is found in hives. Exposure to one of these chemicals causes enough trouble, yet pollinators and people are exposed to many of them simultaneously when we're eating. How does this mixture of toxins affect our health?

GMO ALFALFA: In 2014, alfalfa became the first perennial plant approved for GMO.

- Alfalfa is one of the most important crops in the world and it's pollinated by bees[48]
- Cross contamination will occur. Once nongmo crops are affected it's impossible to reverse.
- Most US Honey is derived from alfalfa pollen
- The USDA Animal and Plant Health Inspection Service did not analyze the effect of RR alfalfa on animals and plants before approving of this GMO.[49]
- How might this alfalfa harm animals, cows, horses? Certainly, it can't be good for Bees!

BYE BYE BUTTERFLIES?

Yet more bad news for pollinators-- glyphosate threatens the survival of the monarch butterfly. This is largely because these butterflies rely on milkweed, yet milkweed habitat is vanishing. As caterpillars, monarchs rely exclusively on the milkweed. As GMO fields of corn and soy spread throughout the Midwest, the use of glyphosate has caused milkweed to disappear. Similarly the monarch population has experienced a steep decline. Researches identified both monarch and milkweed losses to run congruent with the increase of glyphosate use between the years of 1996 and 2011. "Glyphosate use on soybeans went from 1.4 million kg in 1994 to 41.7 million kg in 2006; on corn from 1.8 million kg in 2000 to 28.5 million kg in 2010."[50]

Butterflies have existed for 200 million years, they're members of the ecosystem of Earth, plants need them. To think that man's use of chemicals within just the last 30 years could be responsible for making them vanish forever is quite disturbing. What else is at risk of extinction from our use of this chemical? As with all plants and species, losing one forever affects the balance of the planet and can be a striking loss for our own health as well.

Fertilizer Chapter

CODE RED CLIMATE CRISIS

Of all the agricultural chemicals, synthetic fertilizer contributes the most to climate change and it's deathly for people's health. It's also used for sinister purposes such as making bombs, which creates unquantifiable damage to people, places and planet. Further, scientists have discovered that continued use of synthetic fertilizers compromises soil's ability to store carbon, which is essential to mitigate climate change. Excess amounts weaken soil's ability to retain water, increases need for irrigation, worsens agricultural runoff and risks greater erosion. As more synthetics are used on soils, more is needed to make plants grow. It's an endless loop that is devastating for people and planet, yet makes great money sense for the fertilizer industry.
Here are the problems resulting from synthetic fertilizer:

- Nitrous Oxide (NO) Emissions: one pound of nitrogen oxide has a greater effect on climate change than 300 pounds of carbon dioxide.[51] SO2 causes smog & acid rain.
- Sulfur dioxide creates acid rain and has a dire impact on warming the atmosphere, "Large volumes of SO_2 erupted frequently appear to overdrive the oxidizing capacity of the atmosphere resulting in very rapid warming!"[52]
- Methane emissions from fertilizer faciltities are 100x higher than reported[53]
- Fertilizer facilities emit toxic gases: nitrous oxide, ammonia and urea dust, sulfuric acid.
- Ammonia volatilizes from fertilizer on fields & facilities to form particulate matter.[54]
- Fertilizer Runoff and Pollution causes nitrate & phosphorous pollution, causing toxic algae blooms and deadzones, as well as worsens red tides and ocean acidification.
- Fertilizer causes high levels of nitrate in drinking water, causing many types cancer, nitrate transforms to carcinogens upon ingestion and inhibits thyroid function[55]
- Synthetic fertilizer makes soil sick, causes soil acidification, and CO2 emissions[56]
- Phosphate mining creates severe pollution problems: mounds of radioactive gypsum[57] poisoning waterways[58], causing sinkholes and notorious air pollution: radon, sulfur dioxide & fluoride gas (which gets collected & used to fluoridate water), the pollution from these facilities is also a major factor in red tides, killing millions of animals.
- Nitrogen fertilizer facilities have grown significantly in the U.S. due to the expansion of fracking and lower natural gas prices.[59] Fracking processes emit vast quantities of pollutants, greenhouse gases, and their wastewater contaminates waterways and food.
- The Koch Brothers produce fertilizer, now they're moving into the factory farm slaughter business.[60]Already just a few companies control global seeds, pesticides, plastics & pharmaceuticals. Is fertilizer the silent member? Or is the growing cartel of fossil fuel, factory farms, and fertilizer coming next?

NITROUS OXIDE[61]

- Agricultural soil management is the largest source of N_2O emissions in the United States, accounting for about 73.9 percent of total U.S. N_2O emissions in 2017.
- Nitrous oxide is also generated from treatment of domestic wastewater
- "Nitrous oxide is released from bacteria in soil. Modern agricultural practices — tilling and soil cultivation, livestock waste management, and the use of nitrogen-rich fertilizers — contribute significantly to nitrous oxide emissions. A single nitrous oxide molecule has 298 times the global warming potential of a carbon dioxide molecule."[62]

Soil Chapter

CODE RED CLIMATE CRISIS

"Man sets about his desert-making in various ways. He alters the texture of the soil by using up humus and failing to replace it—by failing to feed the soil with organic matter; livestock are the great converters of otherwise unwanted organic matter to a form in which it can be used by plants. Stockless farming, understocking, burning straw, etc., are all cases of failure to observe the "**Rule of Return**" which is the essence of farming. Only by faithfully returning to the soil in due course everything that has come from it can fertility be made permanent and the earth be made to yield a genuine increase." Lord Northbourne in *Look to the Land*, 1930

To defeat climate change we must protect our allies: healthy soil and healthy forests. The chemical warpath endorsed by the giant industrial farms and biotech has the capacity to destroy both of these. The pollution we're creating from farming is from the chemical inputs and poor land management practices endorsed by conventional and GMO farming standards. Most of our croplands are used to grow GMO feed for animals, while more and more of the food we eat tends to be imported from other countries. Is this a foolish policy? Wouldn't we be wiser to be forging a future where we can be self reliant rather than dependent on other countries to feed us? Currently Russia[63] is determined to be the world's greatest producer of organic food. That's a stand America should consider. Converting to sustainable farming methods not only improves soil health, but it also minimizes carbon and other climate disrupting outputs.

Threats to soil and land include:

- Chemical intensive farming
- Synthetic fertilizer
- Pesticides, fumigants, fungicides
- Unsustainable land management
- Over tillage
- Soil compaction
- Monocropping
- Erosion, Desertification
- Sealing soil, paving over

CO2: Carbon dioxide releases from unhealthy soil, when land is cleared or burned
Methane: when soil from forests and peatland is burned and cleared, methane is released
Nitrous Oxide: when soil is saturated with synthetic fertilizer, nitrous oxide is released
Ammonia: when soil is saturated with synthetic fertilizer ammonia is released
Working soil with heavy machinery: soil compaction, releases CO2, fossil fuel emissions,
Monocropping: demands more pesticides, fungicides, fertilizer causing less soil productivity
Runoff: Unhealthy soil can't hold water, more farming chemicals wash away into waterways
Toxic Algae, Water contamination: Results from excessive farm nutrients in waterways
Excessive pesticides: kill off good fungi & cause harmful soil fusarium to dominate soil
Excessive pesticides & fertilizer: Reduces beneficial soil microorganisms and bacteria
Excessive pesticides & fertilizer: sickened soil loses nitrogen-fixating power to help plants
Glyphosate & Roundup: disrupts shikimate pathway, plants lose ability to take up water.

Fungus Chapter

FUNGUS RESISTANCE

Fungicide use on crops and soil has increased dramatically over the years. This is threatening our food supply and our health. The overuse of fungicides causes imbalance and harm to vital soil life, and it perturbs the planet. Such use has resulted in a new breed of horrors: antibiotic-resistant fungus. Within the past five years the resistant funguses, Candida Auris, have spread slowly around the globe.[64] The CDC recently listed this as an urgent threat!

The azole fungicides may be the root cause for the increasing resistance of the fungus, Aspergillus species. "Similarities between medical and agricultural azoles, and extensive azole use in crop protection, prompted speculation that resistance in patients with aspergillosis originated in the environment. Aspergillus species & Aspergillus fumigatus, are the largest causes of patient deaths from fungi."[65]

These fungal infections are not to be taken lightly. The UK's Independent reports, "Common fungal infections are "becoming incurable"[66] with global mortality exceeding that for malaria or breast cancer because of drug-resistant strains which "terrify" doctors and threaten the food chain."[67] People, animals and crops are all threatened. The most at risk are those with compromised immune systems. CNN reports, "There's not a single vaccine against any fungus at the moment."[68]

Fungicides are used chiefly on:

Soil and crops such as corn, wheat, peanuts, grapes, grains, sugarbeet, potato, strawberries, rice, tomatoes, soybeans, beans,[69]lettuce, apples, almonds [70]

- Golf courses and turf[71], Forest maintenance

Fungicides imperil:

- Bees and Bats, Pollinators, Animals (pollinators make direct contact with plants and fungicides applied to them). Bees are defenseless now against Nosema fungus, bats are dying from white nose syndrome.[72]
- Soil Health
- People!

Despite these dangers, the fungicide market is growing steadily. The triazole class of fungicides leads their competitors. *Market Research Future* reports, "The primary reason for the growth of triazoles is their extensive use for the prevention of soybean rust, which is considered to be a fungal pathogen."[73] Almost all the soybeans grown in the US is GMO soy; is GMO soy more prone to fungus disease? If the soil was healthier would the plants have this disease? Do GMO plants in general need more fungicides than regular crops? Another reason to abandon GMOs!

SOLUTIONS:. If we hope to curtail this unraveling disaster, we must quickly cease using, or at the very least greatly reduce use of toxic fungicides. Scientists state, "significant investment in fungal research, including fungal biology, human and plant pathogenicity, therapeutic agents, diagnostic tools, and vaccines, has the potential to avoid a global catastrophe."[74] Wash hands often with soap and water. Many hand sanitizers actually break down skin defense barriers.

P.S. This material looks a lot better in the actual Book!

TWO

PLANET + PEOPLE IN DANGER

"We have an obligation and a privilege to preserve
and maintain our planet
and the species we share the planet with."
Ted Turner

CLIMATE CRISIS

Cause and Effect

Monocrops
Land conversion
Overuse of toxic fertilizer
Overuse of herbicides,
Overuse of fungicides
Overuse of pesticides
Resistant weeds
Agicultural runoff
Water pollution
Nitrate pollution
Nitrous oxide (N2O)
Toxic algae blooms
Eutrophication, dead zones
Ocean acidification
Ammonia pollution
Smog
Greenhouse gas emissions
Deforestation
Habitat loss
Loss of wildlife
Pollinator loss
Fungus resistance

Synthetic Fertilizer
NitrousOxide (N2O)
Ammonia (NH3)
Natural Gas
SulfuricAcid (H2SO4)
Acid rain
Smog

Pesticides + Forest Fires

Loss of forests makes air pollution worse

Animal Farming
Methane (CH4)
Water Pollution
Air Pollution
Confinement
Drug Overuse
Antibiotic Resistance
Daily antibiotic
GMO feed = More methane
Manure mismanaged
Zero Grazing
Contaminated water

Wildlife in danger

Tropical Deforestation
10% of Global Climate Change Emissions

What's lost when a forest burns?

GMO soy + cattle
Deforestation
Rainforest lost
fertilizer overkill
Methane
Factory farms

Waste
Food Waste
Packaging Waste
Plastic + Paper
Manure

Pollinators in danger

Palm Oil
Deforestation
Extinction of animals
Native people forced out
67 million acres
forests burned
peatland
Methane
Greenhouse gas emissions

Conventional Farms
Overuse of fertilizer
Overuse of pesticides
Overuse of fungicides
Overuse of fumigants
Greenhouse.gas emissions
Ozone depleting
Water contamination
Monocropping
Deforestation

Water pollution

Deforestation
Removal of forests
Land converted to farmland
Expands air pollution
Greenhouse gas emissions
Carbon sink loss
Disposable Paper Products

Fish + Waterways
Water pollution
Synthetic Fertilizer
Fungicides
Pesticides
Fertilizer Facilities
Endocrine disruptors

Ocean Health: Algae Blooms, Red Tides, Dead Zones, Ocean Acidification, Plastic, Oil Spills, Overfishing

9. CLIMATE CRISIS

If we're serious about helping the planet and turning the tide on climate change we need to honestly examine Big Agriculture. Most of the tragedies we see occurring in the environment, the planetary reactions—are resulting from crimes against nature. A great percentage of these crimes can be traced back to how we grow and produce food today.

Big Ag contributes abundantly more to the climate crisis than traditional and small farms. In the U.S. 42% of greenhouse gas emissions come from Animal Agriculture, globally it accounts for 14.5%.[75] But the damage goes far beyond that. For instance, the chemicals and methods chosen for growing foods are causing soaring numbers of bees and wildlife species to plummet, escalating rates of human disease, plant disease, soil disease, water degradation, and planetary upheaval. Unless we wake up and choose differently, we have little chance to rebound.

Ultimately, we have to stop supporting land use and agricultural methods that promote harm to the planet. Making some modest adjustments can greatly reduce agriculture's contribution to climate change and planetary stress. As an example, nitrogen fertilizers can be scaled back—right now nitrous oxide emission account for roughly 60% of total agricultural emissions.[76]

The companies dominating farming chemicals along with the big conventional and GMO farms—their methods are destructive to the earth, to ecosystems, to pollinators, to animals, to our water and to our air, and to us. Even the farmers themselves are endangered. These methods are destroying the planet and tipping the scales. Their argument that only with their chemical concoctions can we feed a growing population flies right out the window, for surely no one will be eating if the planet is in ruins. The time has arrived--we must adapt to sustainable farming methods.

What's wrong with Big Agriculture?

- Greenhouse Gas Emissions-Agriculture sector emits most nonCO2 emissions globally[77]
- Industrial farming processes—monocropping, factory farming & GMO farming—play a significant role toward furthering planetary distress, habitat loss and climate change.
- Toxic chemicals—fertilizer, fungicides, pesticides, herbicides, insecticides, fumigants—they're outdated and responsible for the collateral damage to the planet and to our health.
- Industrial farming contributes to: sick soil, erosion, deforestation, ozone layer depletion, methane & nitrous oxide emissions, loss of soil carbon toxic agricultural runoff, water pollution, aquatic dead zones, toxic algae, pollinator loss, antibiotic resistance, and more.

Snapshot of Agriculture Emissions Since 1990 interpreted by IATP[78]

CO2	+16.2%	Monocropping, Industrial Farms, GMO
CO2 Urea Fertilizer	+109%	Synthetic Fertilizer
Methane	+14.4%	Factory Farms: waste lagoons + digestion
Manure Emissions	+66%	Factory Farms
Methane Pig Manure	+29%	Factory Farms
Methane Cow Manure	+134%	Factory Farms
Nitrous Oxide	+7.3%	Synthetic fertilizer, manure on fields

From the EPA Report: Inventory of Greenhouse Gas Emission and Sinks 1990-2017[79]

CLIMATE CRISIS + FARMING

"In a time of increasing population growth, climate change and environmental degradation, we need agricultural systems that come with a more balanced portfolio of sustainability benefits. Organic farming is one of the healthiest and strongest sectors in agriculture today and will continue to grow and play a larger part in feeding the world. It produces adequate yields and better unites human health, environment and socioeconomic objectives than conventional farming." *John Reganold, Professor of Soil Science & Agroecology at Washington State University.*[80]

If we're serious about helping the planet & halting climate trends, we need to take a good look at these methods. It all comes down to choices. Some methods make sense, others don't. Let's get real. Industry, government, and those with capabilities have to join in and help resuscitate earth. In helping the planet we truly help improve our own condition. Looking at big agriculture's link with planetary distress, there's tremendous room for improvement:

- **ANIMAL FARMS**: The majority of meat and dairy products come from factory farms--large industrial farms that confine animals to small cages indoors their entire lives. There are approximately 50,000 farms with 1000 confined animals or more, and 400,000 with 999 or less confined animals on site. "The U.S. Environmental Protection Agency defines CAFOs or AFOs (Animal Feeding Operations) as agricultural enterprises where animals are kept and raised in confined situations. Feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland."[81] "Corn and soy that most cows eat makes them especially gassy, so feeding them alfalfa and supplements could reduce how much they belch."[82]
- **CONVENTIONAL FARMS**: This type of farming needs ever more synthetic fertilizer & herbicides, harming the whole planet in the process. Now seeds coated in neonicotinoids are used widely. As more herbicides are applied, life in the soil withers, weeds resist, pollinators die. This is an endless war against nature. Who's winning?
- **GMO FARMS:** Most rely on *Roundup Ready* seeds that have been genetically modified to withstand unconscionable amounts of *Roundup*. Other seeds used for GMO contain the bt toxin that unlike common bt sprays, which can be washed off, GMO Bt infiltrates the plant and remains forever in the food that comes from it.[83] GMO and conventional farming methods involve ungodly amounts of chemicals, pesticides, fungicides, toxic fertilizer, as well as monocropping and other practices that harm ecosystems, destroy habitat, and bring harm and disease to people, animals and pollinators.
- **PALM OIL FARMS**: The lust for palm oil causes massive deforestation and extinction of animals. This is costing the world 500 million tons of CO2 yearly,[84] not to mention methane emissions and terror to ecosystems. For the sake of the future of the world, we must realize we need the forests more than the forests need us. Any corporation contributing to or profiting from their loss must be held accountable.
- **LAND COVERSION:** "Heavy tilling, multiple harvests and abundant use of agrochemicals have increased yields at the expense of long-term sustainability. In the past 20 years, agricultural production has increased threefold and the amount of irrigated land has doubled. Over time, however, this diminishes fertility and can lead to abandonment of land and ultimately desertification."[85]

FARMING METHODS

There are two types of farming styles: those that lean toward traditional natural methods, and others that lean heavily toward chemical methods. Farming operations range from small family farms and niche urban growers to giant industrial operations and confined animal farms. The more ecological type of farming uses organic-type methods that strive to avoid toxins while endorsing traditional methods such as crop rotation and symbiotic pest control.

GMO and conventional farming methods, on the other hand involve lots of chemicals, pesticides, dangerous fertilizers, as well as monocropping. These methods harm people, animals, pollinators, and ecosystems. They cause super resistant weeds, toxic water pollution, lower yields, less profits and higher costs for farmers. If it weren't for the subsidies they receive, maybe many of these farmers would switch to sustainable methods and actually be more prosperous.

US Total Farmland	911 million acres[86]
Total Cropland	389 million acres
GMO cropland	182 million acres
Organic Farms	5 million acres
Total pasture	415 million acres
Government owned pasture	155 million acres[87]
Confined Animal farms in US	450,000 farms without pasture[88]

The majority of meat and dairy products in the US come from factory farms—large industrial farms that confine animals indoors their entire life. There are approximately 50,000 farms with 1000 confined animals or more, and 400,000 with 999 or less. "The U.S. Environmental Protection Agency (EPA) defines AFOs as agricultural enterprises where animals are kept and raised in confined situations. AFOs congregate animals, feed, manure, urine, dead animals and production operations on a small land area. Feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland."[89]

GMO farming relies on "*Roundup Ready*" seeds that have been genetically modified to withstand unconscionable amounts of *Roundup*. Other seeds used for GMO contain the bt toxin that, unlike common bt sprays, they can never be washed off.[90] Conventional farmers use seeds coated in neonicotinoids—pesticides largely implicated in colony collapse disorder. Without bees and pollinators, what kind of food supply can we have? On top of this, their monocropping methods require vast amounts of synthetic fertilizer, leading to who knows how many victims of disease. All in all, these methods of farming cause endless harm, perhaps nearly irreversible. As more herbicides and fertilizer are applied, life in the soil withers and weeds resist, plants get weaker and prone to disease, pollutants in water increase. Yet the corporations and manufacturers' solutions, as if they have blinders on, is more and more chemicals. In this scheme there is no end, it's an endless war against life. The Union of Concerned Scientists confirms, "Monsanto's Roundup Ready system, which involves applying glyphosate herbicide to crops genetically engineered to tolerate it, was supposed to decrease herbicide use—and for a while, it did just that. However, this has changed drastically in recent years."[91]

Methods taking us further away from nature

Methods of farming can either benefit the planet or harm the planet. The following methods contribute the lion's share of pollution from agriculture that's affecting the atmosphere and the climate (not to mention our health!) As long as these farming methods are kept in use, attempts to mitigate climate change will be futile.

- **Synthetic Fertilizer** causes cancer,[92] damages soil & destroys its ability to store carbon, and makes plants unhealthy and less vigorous. Nitrate and excess phosphorous contaminate our water sources triggering cancer and disease, toxic algae blooms, dead zones, red tide, and ocean acidification. Fertilizer manufacturing is also a huge problem emitting sulfur dioxide, ammonia, nitrous oxide, fluoride, and methane.
- **Pesticides, Herbicides:** These toxic substances are designed to kill bugs and plants yet they're harming people and animals. They're used abundantly in both GMO and conventional farming. The more we're exposed to them, the more damage can be done. Health effects can be immediate if exposure is significant, or health effects can slowly appear if exposure is minimal yet continuous. Pesticides are killing off bees, bats, and pollinators, this alone could cause our entire food supply to collapse.
- **Fungicides:** Overuse of fungicides is leading to deadly antibiotic-resistant fungus.
- **Fumigants:** Fumigants are pesticides injected into the soil. The most widely used fumigants endanger our health and damage the earth's protective Ozone Layer, thereby increasing climate warming effects. Ozone depleting substances are banned worldwide through the Montreal Protocol. Nonetheless a few remain in use on certain crops.
- **Factory Farms: "**The reality is an increasing number of livestock are "zero graze", spending all or almost all of their time indoors in large warehouse-type facilities."[93]
- **GMO Animal Feed:** Factory farm animals are victims fed only GMO soy and corn.
- **Deforestation, Desertification:** land loss and catastrophic conversion
- **Erosion—** overuse of land, infertile, not replenishing soil, using too many chemicals
- **Monocropping** methods of farming contribute to loss of significant portions of native forest, prairie and grasslands. Monocropping refers to the practice of growing the same crop over and over in a large area of land, year after year. This is devastating for the environment and the atmosphere, for often forests and grassland habitats, home to flora and fauna plus serving as carbon sinks get cleared to make room for these crops.
- **Soil loses ability to store carbon:** With excess exposure to toxic chemicals as well as land transformation—the soil loses its ability to store carbon and store water. This leads to greater greenhouse gas emissions as well as more severe agricultural runoff decimating our health, animals, the waterways and habitats for years to come.
- **Conventional & GMOs**: Whether you believe these foods are safe or not, the methods by which they must be grown are not. These farms combine all the above: synthetic fertilizer, monocropping, deforestation, excessive amounts of pesticides, herbicides, fungicides. "Over 70% of harvested GE biomass is fed to food-producing animals, making them the major consumers of GE crops for the past 15 plus years."[94]

STATUS OF THE WORLD'S SOIL RESOURCES

Report by the UN, **TOP TEN THREATS TO SOIL**[95]*:*

- Nutrient Balance: insufficient nutrients or excess
- Soil Acidification: pH lowered, leaching or removal of minerals, imbalance
- Soil Biodiversity Loss: decline of soil micro- and macro-organisms
- Soil Compaction: Too much pressure on soil reduces soil porosity
- Soil Contamination: Pollutants, chemicals causing adverse soil health
- Soil Erosion: removal of soil from the land by water, wind, or tillage
- Soil Organic Carbon (SOC): loss of organic carbon stored in the soil
- Soil Salinization: salt accumulation occurring within soil
- Soil Sealing: When soil, earth is permanently sealed over, i.e. with roads, parking lots
- Soil Waterlogging: excess water reduces soil oxygen content, harms plant roots

Methods bringing us back to Nature

ORGANIC and SUSTAINABLE ECO-FRIENDLY FARMING

Growing foods can be done without deadly herbicides and toxic fertilizer. We can grow food and farm without contributing to climate change. We can provide food for an ever-growing population. Farms can convert to organic methods; the USDA has programs to assist farmers making the switch plus there are organic farming mentors available through your State's extension services.

Since most of our farmland is occupied by Big Ag, we're importing most of our organic food. "With demand outpacing domestic supply, the country imported more than $2 billion in organic food last year, and likely significantly more—USDA tracks only 40 imported foods. Organic corn is at the top of that list, with imports jumping more than 200 percent in 2015, according to USDA; the vast majority of that is to feed animals raised for organic meat or dairy operations."[96]

Shouldn't we start planting more organic so we can be self-reliant? Unlike conventional and GMO, organic and biodynamic farmers use sustainable methods, they're ecologically minded and more aligned with nature, striving to prevent harm by avoiding use, minimizing use of toxins. This style endorses use of natural methods that benefit the planet including:

- Soil conditioners and natural fertilizers—ones that produce healthy strong plants
- Such fertilizers include compost and trace minerals, stone meal, biodynamic preps
- Pest and weed control is more strategic with less toxic solutions and outcomes
- Soil is cared for, so beneficial microorganisms flourish rather than get defeated
- Pollinators are cherished, not poisoned
- Farmers rotate crops and plant cover crops to help soil recover in down time.
- Farmers do their best to not contaminate or harm sources of water
- Energy-minded farmers use drip irrigation to use water most efficiently

Simply put, farmers who have a passion for the environment specialize in providing nourishing food without harming the planet in the process. At least they strive to do their best. Many farmers all over the world utilize natural methods such as these. It can be done, and in today's world with its growing population we can use these methods to maximize the land to grow the most

without exhausting the land in the process. Of all the sustainable farming styles using soil, organic and biodynamic involve the least harmful pesticides; therefore, foods grown this way will contain less pesticide residue than others. Close to organic farming is IPM—Integrated Pest Management techniques. Also, it's worth noting that sustainable farms are apt to employ more people since many tasks like weeding require people, not chemicals.

- **ORGANIC & BIODYNAMIC FARMING:** "Organic farmers are permitted to use just 20 pesticides, derived from natural ingredients including citronella and clove oil, but only under very restricted circumstances. This means that organic farms are a haven for wildlife and these toxic pesticides can't make their way into the food chain and into us. Organic farming reduces disruption to the natural environment. By rotating crops and selecting crop varieties with a natural resistance to particular pests and diseases, organic farmers are able to reduce or avoid disease problems and the need to control them with chemical inputs."[97] Source: The Soil Association
- **IPM:** Integrated Pest Management: farmers and growers evaluate pest problems that arise and determine the best earth-friendly solution involving the least toxic remedies.
- **URBAN GARDENING:** There is a renaissance of growers bringing life to rooftops, vacant lots and under-used areas of cities across the country. They're usually small plots where neighbors gather & grow their own food. Typically, less chemicals are used.
- **VERTICAL FARMS, HYDRO & AQUAPONICS:** These growers use water rather than soil to grow plants. Farms are usually indoors and protected from the elements. Really don't have to worry about toxic chemicals with these farms.

Earth Friendly Farming	**or**	**Conventional, GMO, CAFO**
Soil Protection and nourishment		Sick soil, Soil depletion, loss of carbon
Nontoxic pest management		Toxic poisonous pest management
Natural fertilizer, compost		Synthetic fertilizer, chemicals
Healthy soil makes plants healthy		Unhealthy soil makes plants weak
Healthier soil holds water, less erosion, runoff		Unhealthy soil, erosion and runoff
Moderate tilling		Burn down tilling killing
Wholesome Animal Rearing		Animals confined & mistreated
Animals eat in the fields, pasture		GMO feed, no outdoors
Sustainable		Nonsustainable
Does not harm habitats, land and water		Harms habitats, land and water
Minimal greenhouse gas emissions		Major contributor to climate change
Doesn't contribute to deforestation		Causes deforestation
Helps soil store carbon		Makes soil release carbon
Decreases greenhouse gases		Increases levels of greenhouse gases
Doesn't harm wildlife		Harms wildlife
Food is full of nutrients		Nutrient quantity compromised
Little or no residues		Lots of pesticide residues

"Overall, organic operations must demonstrate that they are protecting natural resources, conserving biodiversity, and using only approved substances." USDA[98]

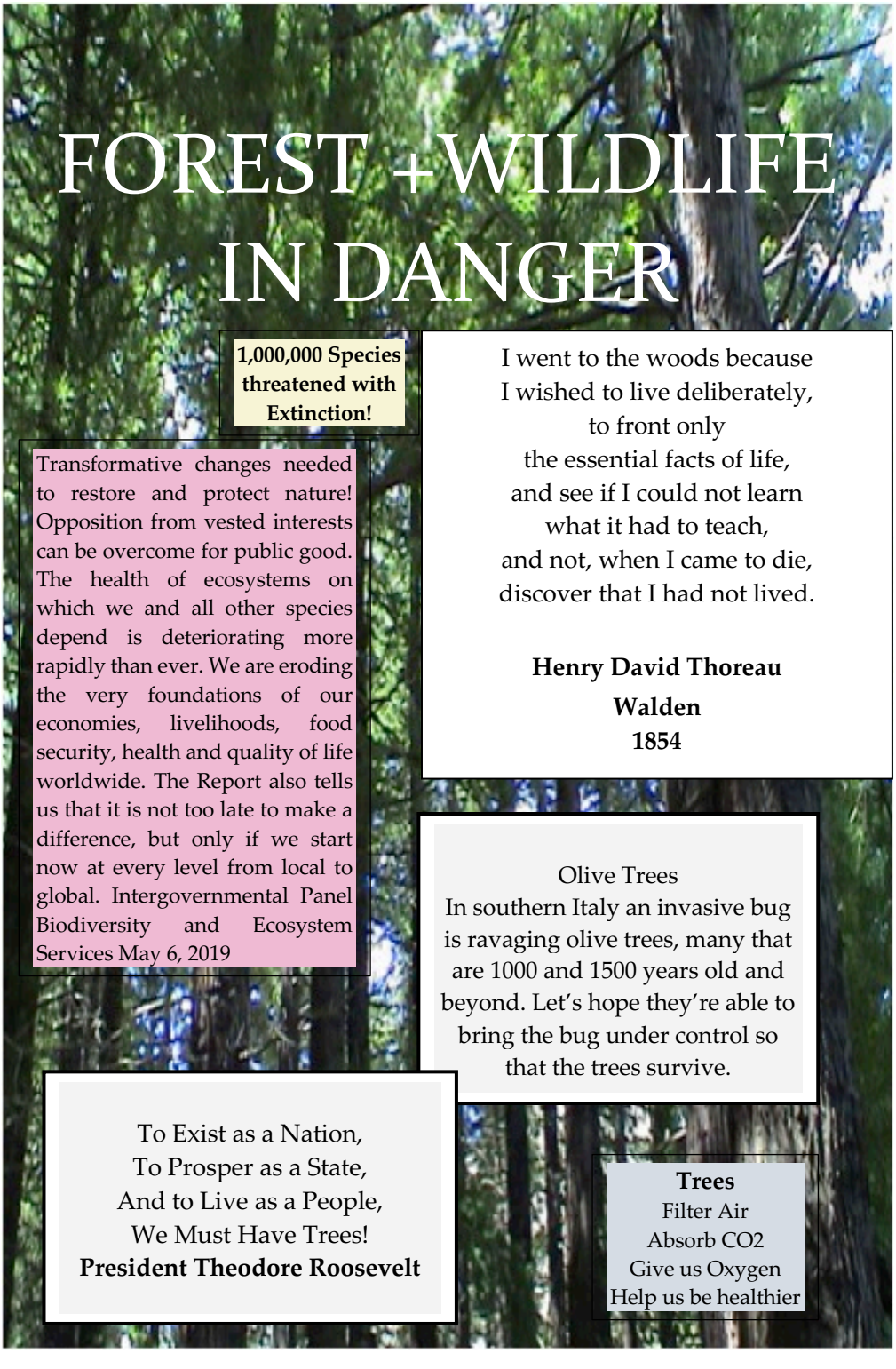
CLIMATE CRISIS + FARM SUBSIDIES

The Farm Bill, 2018: "The U.S. Department of Agriculture (USDA) uniquely touches the lives of all Americans daily, through the food they eat."[99] The Farm Bill is decided by Congress. The time has come to embrace sustainable farming and move away from the chemical intensive model. "Better alignment of agricultural and nutritional policies may potentially improve population health."[295] Currently, the overwhelming bulk of U.S. Government farm subsidies go to mega farms and wealthy ag corporations. Very little is directed to the small farms and organic farms because the subsidies are largely pinned for crops grown on the most land: corn, soy, wheat, rice, cotton. These corporations work on an industrial scale using intensive toxic chemicals and planet-harming methods. This is the sector responsible for farming's contribution to climate change. They are the monocroppers, the conventional farmers, the GMO farmers, and the industrial animal factory farmers who use: synthetic fertilizer that's depleting soil and water, toxic unfriendly pesticides that kill pollinators and harm children, GMO seeds & monocropping methods that ruin land, release greenhouse gases and cause massive water pollution problems as well as ocean acidification. Synthetic hormones and misuse of animal drugs cause antibiotic resistance, and now we have fungus resistance to worry about. Is this really the farming model the government should be supporting?

Open the Books' recent study exposes the misdirection of funds to the wealthiest of farmers, most of whom are millionaires. Money also goes to their relatives who may not have anything to do with the farm. As the Balance reports, "Subsidies act like a regressive tax that helps high-income businesses, not poor rural farmers. Most of the money goes toward large agribusinesses. Between 1995 and 2017, the top 10 percent of recipients received 77 percent of the $205.4 billion doled out. The top 1 percent received 26 percent of the payments. That averages out to $1.7 million per company. Fifty people on the Forbes 400 list of the wealthiest Americans received farm subsidies. On the other hand, 62 percent of U.S. farms did not receive any subsidies."[100]

Subsidies were originally created by President Franklin Delano Roosevelt to help farmers struggling during the Dust Bowl and Great Depression.

- The government awarded $13.2 billion in farm subsidies to 957,109 recipients in FY2017.
- 389 recipients received $1 million or more in FY2017 farm subsidies. These top recipients ranged from Pinion Farms in Iowa ($9.9 million) to Pushed & Pullen Farm in Missouri ($1M)
- $626 million in farm subsidies flowed to urban areas with populations of 250,000 or more (FY2015-FY2017). Affluent cities such as Aspen, Colorado ($278,000); Palm Springs, California ($310,420); and Park City, Utah ($1.8 million) reaped large amounts of subsidies.
- Nearly one quarter of all FY2017 farm subsidies ($3 billion) went to just 5,952 recipients who received $250,000 or more each. The top recipients: Pinion Farms in Iowa ($9.9 million); Heard Family Farm in Georgia ($8.9 million); and Hader Farms[101]
- Former USDA Secretary Tom Vilsack received subsidies for his farm in Iowa while in office.
- Should wealthy corporations receive subsidies? "In 2011-2012 Riceland Foods sales were 1.16 billion, their fifth consecutive year of billion-plus revenue. Between 1995 – 2012 they collected $554,343,039 in subsidies."[102]



FOREST + WILDLIFE IN DANGER

1,000,000 Species threatened with Extinction!

Transformative changes needed to restore and protect nature! Opposition from vested interests can be overcome for public good. The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever. We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide. The Report also tells us that it is not too late to make a difference, but only if we start now at every level from local to global. Intergovernmental Panel Biodiversity and Ecosystem Services May 6, 2019

I went to the woods because
I wished to live deliberately,
to front only
the essential facts of life,
and see if I could not learn
what it had to teach,
and not, when I came to die,
discover that I had not lived.

Henry David Thoreau
Walden
1854

Olive Trees
In southern Italy an invasive bug is ravaging olive trees, many that are 1000 and 1500 years old and beyond. Let's hope they're able to bring the bug under control so that the trees survive.

To Exist as a Nation,
To Prosper as a State,
And to Live as a People,
We Must Have Trees!
President Theodore Roosevelt

Trees
Filter Air
Absorb CO2
Give us Oxygen
Help us be healthier

10. DEFORESTATION

RAINFORESTS + GMOs + CATTLE

While forests are vital for our survival, they continue to be treated as disposable commodities. Forests are home to thousands of species of animals, insects, plant life, and indigenous people. At least since the 1960s tropical rainforests have been targeted for massive clearing and deforestation. Today these trends continue. Annually, deforestation of tropical rainforests costs the world 15% global greenhouse gas emissions. This is more than from all of the cars, trucks and buses worldwide combined![103]

Some of the Forests in Danger[104]:	**Cause**
▪ Amazon Rainforest, South America	Agriculture, cattle
▪ Atlantic Forest, Brazil, Argentina, Paraguay	Agriculture, cattle
▪ Boreal Forest, Canada	Toilet paper[105]
▪ Borneo and Sumatra Forests, Indonesia	Palm Oil
▪ Cerrado Forest, Brazil	GMO soy, cattle
▪ Choco-Darien, Ecuado, Panama, Columbia	Mining and oil
▪ Tonga's Temperate Rainforest, Alaska	Clearcutting

Rainforests cleared to make room for:

- Grazing cattle
- GMO soy crops

Trees are logged to make:

- Toilet paper, tissues
- Paper
- Fabric (rayon, viscose)
- Cellophane

Effects of Deforestation

- Harm to animals, plants, native people
- Loss of forest habitats, ecosystem imperiled
- Harm to waterways,
- Loss of biodiversity
- Loss of soil carbon

The Soy Moratorium[106]

In 2006 Greenpeace helped show the world that the beef they were eating was raised on soybeans grown on former rainforest land. This led to the Soy moratorium, a pact involving people, industry and government that restricted further deforestation.

SOLUTIONS

- Plant Trees
- Avoid supporting companies whose products conflict with saving forests
- Recycle all things paper: paper and paper bags
- Avoid paper & tissue products from old growth forests or chlorine-bleached
- Soy Moratorium is an example of how we can bring an end to the reckless deforestation caused by Palm Oil.

PALM OIL + EXTINCTION

Trees and forests are essential for human survival. They're here on purpose, they absorb carbon dioxide, and provide us with oxygen. Right now there are forces intent on taking the world's forests down. Over 27 million hectares (almost 68 million acres) of tropical rainforest have already been cleared to make room for palm oil farms.[107] Countless species and native peoples have been forcibly removed in the process and counter on the brink of extinction. Clearing forests is literally a dead end resulting in ghastly releases of greenhouse gas emissions.

PALM OIL'S COST:

- Kills animals, many species are now on the brink of extinction.
- Indigenous and native people inhabitants have been forcibly driven from their lands
- Corporate domination of what that was once precious rainforest ecosystems
- Greenhouse gas emissions: Methane and CO2

ANIMALS FACING EXTINCTION: Sumatran Orangutan, Bornean Orangutan, Sumatran Tiger, Bornean Pygmy Elephant, Sumatran Rhinoceros, Malayan Sun Bear

WHERE IS PALM OIL HIDING?

As a replacement for trans-fat, palm oil is now found in the majority of all supermarket foods! It's found in: biofuels, detergents, soaps, donuts, pastries, biofuels, biscuits, dough, peanut butter, margarine, popcorn, salad dressing, condiments, shampoo, soap, and detergents.

Its secret names include: Palm Oil Kernel, Ealey's genesis, Panmictic Acid, Palmate, Palmitate, Hydrogenated Palm Glycerides Hexadecenoic, Vegetable Oil, Sodium Lauretha Soleplate, Sodium Lauryl Soleplate, Stearate, SDS Sodium, Nards Sodium, Calcium Sterol Lactylate Stearate, Stearate -20 Emulsifier. [108]

Reckless expansion of palm oil has created severe everlasting damage upon our fragile earth. Merciless methods of clearing and burning forests puts animals at risk of extinction and drastically impacts climate change. To make matters worse, most of these forests sit on peatland, which when burned intensifies the amount of methane and carbon dioxide released. This notably reverses the peat's natural role as carbon sink to a role of carbon outputted. When burned the peat releases thousands of years' worth of carbon.

The good news is palm oil farming can be done considerately and sustainably. Support the shift to sustainably grown by becoming aware of the countless products you come across every day that contain palm oil. Where does that palm oil come from? Does that company earth friendly or not? If you care about forests, about protecting animals and the earth, you must stop supporting corporations that contribute to deforestation.

SOLUTIONS

- SEEK SUSTAINABLE PALM OIL OR AVOID IT IN PRODUCTS
- Certified palm oil is grown on land that is not involved with the deforestation
- Every company that uses palm oil, should ONLY use sustainably grown.
- Use healthy oils and fats for cooking: virgin olive oil, unrefined coconut oil, butter, ghee
- We need to create a Palm Oil Moratorium like the Soy Moratorium in 2006 (prior page

FORESTS + FIRE + PESTICIDES

Forests are the allies that we need to combat the effects of our current climate crisis. Without forests our days are numbered. Forests and trees filter pollution, reduce air pollutants, and make it easier for us to live. Instead of days of old when forests maintained themselves naturally, today men insist on managing forests. And how do they do it you ask? Why, with chemicals of course!

'It blows my mind that nobody is talking about this,' said James Steidle, a member of the anti-glyphosate group Stop the Spray B.C."[109]

Researchers from the University of Montana looked at the USDA Forest Service and concluded that in 2010 alone, "1.2 million acres of U.S. federal and tribal wildlands –an area the size of 930,630 football fields was sprayed with 200 tons of herbicides. By far the most commonly used active ingredient was glyphosate –most commonly known to consumers under the brand name Roundup – which is a nonselective herbicide that also kills native grasses and herbs. The U.S. Forest Service, which oversees 193 million acres in the U.S—a quarter of all federal lands declined to share its data on herbicide use. Mike Ielmini, the Forest Service's National Invasive Species Program Manager, told the researchers that he had concerns about his agency's data quality."[110]

The United States is not alone in practicing chemical forestry. In Canada, forests are also targeted. The Canadian Broadcasting Corporation reported in 2018, "It's an annual event — a mass extermination of broadleaf trees mandated by the province. The eradication of trees like aspen + birch on regenerating forest stands is meant to make room for more commercially valuable conifer species like pine and Douglas fir. But experts say it also removes one of the best natural defenses we have against wildfire! When aspen and other broadleaves are allowed to flourish, they form "natural fuel breaks" if their leaves are out, according to Lori Daniels, a professor of forest ecology at the University of B.C. That's why aspen stands are often referred to as "asbestos forests" in wildfire science circles."[111]

Rather than being helpful at all, the use of glyphosate in forests is likely a big factor in the intensity and extent of damage caused by wildfires. As mentioned previously, it's used to intentionally kill young Aspens and Birch trees and other broadleaf species, trees, which serve as a natural fire wall. If that's not bad enough, tree health of those remaining is diminished because the herbicides prevent trees and plants from absorbing and holding water, making them dry as matchsticks. From the Sierra Club: "Glyphosate is a patented desiccant. Its desiccating effects reduce a plant's ability to uptake water. Glyphosate has non-target impacts. Glyphosate use could lead to Sudden Oak Death, Oak Wilt, and a host of Scorch Diseases in which plants can no longer absorb sufficient water and thereby become very flammable. More dry and dead non-target vegetation increases the risk of fire."[112] This is devastating news for not only more risk to habitats results, but wild fires contribute vast amounts of the greenhouse gases and air pollutants: CO2, methane, particulate matter, and nitrous oxide[113]—all crippling climate change instigators. Why are chemicals allowed at all if they can set up forests for failure like this? What people are making these decisions? Back in 2005, whistleblower Doug Parker, who had worked with the USDA Forest Service for over 40 years was fired after reporting misuse of pesticides by Forest Service employees.[114] Why weren't the ones misusing pesticides fired instead?

For anyone who's read *Silent Spring*, this all may sound like deja vu. As is often seen when humans attempt to manage wild places and wild animals, what may have started out with good intentions almost always results in worsened conditions, or people get too much power that they forget the original aim. Read *Sand County Almanac* and *Playing God in Yellowstone* to see what I mean, or read about the USDA's Wildlife Services--a sick branch of government that shouldn't even exist. Regarding the forests, Rachel Carson described an awfully similar situation to what we currently have in the West:

> "This is what happened in some of the western national forests a few years ago, when in 1956 the United States Forest Service sprayed some 885,000 acres of forested lands with DDT. The intention was to control the spruce budworm, but the following summer it was discovered that a problem worse than the budworm damage had been created. In surveying the forests from the air, vast blighted areas could be seen where the magnificent Douglas firs were turning brown and dropping their needles. In the Helena National Forest and on the western slopes of the Big Belt Mountains, then in other areas of Montana and down into Idaho the forests looked as though they had been scorched.
>
> It was evident that this summer of 1957 had brought the most extensive and spectacular infestation of spider mites in history. Almost all of the sprayed area was affected. Nowhere else was the damage evident. Searching for precedents, the foresters could remember other scourges of spider mites, though less dramatic than this one. There had been similar trouble along the Madison River in Yellowstone Park in 1929, in Colorado 20 years later, and then in New Mexico in 1956. Each of these outbreaks had followed forest spraying with insecticides. (The 1929 spraying, occurring before the DDT era, employed lead arsenate). Chemical pest control in the forest is at best a stopgap measure bringing no real solution, at worst killing the fishes in the forest streams, bringing on plagues of insects, and destroying the natural controls and those we may be trying to introduce."[115]

So little has changed. Is the USDA or the chemical industry calling the shots? Is the misuse of herbicides and fungicides also contributing to the spread of tree disease by weakening tree immunity—causing trees to lose their natural resistance to invasive beetles, for instance? Or to white pine blister rust, to aphid infestations, to fungus disease? Is the overuse of these chemicals having an inverse effect by interfering with the beetles' natural predators, in particular killing off birds? Are the massive amounts of herbicides and fungicides used harming soil quality so far as to make the trees not just unable to absorb water, but unable to absorb nutrients as well? This alone no doubt causes sick trees. Without our meddling, would the forests throughout the west be thriving and more fire-resistant today? Nature is after all very capable of surviving on its own, better usually *without* human interference. What on earth are we doing to these majestic places and to the animals that dwell within when we keep using these deadly chemicals?

SOLUTIONS

Help get the pesticides out of our forests before it's too late! www.stopthespraybc.com.
In America urge the USDA Forest Service to cut the use of pesticides in our forest
USDA Forest Service
1400 Independence Ave, SW
Washington, D.C. 20250-1111
Telephone: (800) 832-1355

LAND COVERSION: We're in Critical Times.

Prairies, forests, wetlands, fields, grasslands, public lands, peatlands are all in danger of land grabs and conversion. These irreplaceable ecosystems provide immeasurable benefits to us and to animals: oxygen, water purification, carbon storage, wildlife habitat, peace, and undisturbed oases. Be it for development, cropland, farmland, pasture, palm oil, drilling or fracking—the world cannot afford to lose any more of these irreplaceable open spaces.

Peatlands and Climate change

Peatlands are a type of wetlands which are among the most valuable ecosystems on Earth: they are critical for preserving global biodiversity, provide safe drinking water, minimize flood risk and help address climate change.

Peatlands are the largest natural terrestrial carbon store; the area covered by near natural peatland worldwide (>3 million km^2) sequesters 0.37 gigatonnes of carbon dioxide (CO_2) a year storing more carbon than all other vegetation types in the world combined.

Damaged peatlands are a major source of greenhouse gas emissions, annually releasing almost 6% of global anthropogenic CO_2 emissions. Peatland restoration can therefore bring significant emissions reductions.

Countries are encouraged to include peatland restoration in their commitments to global international agreements, including the Paris Agreement on climate change.

What is the issue?

Peatlands are a type of wetlands that occur in almost every country on Earth, currently covering 3% of the global land surface. The term 'peatland' refers to the peat soil and the wetland habitat growing on its surface.

In these areas, year-round waterlogged conditions slow the process of plant decomposition to such an extent that dead plants accumulate to form peat. Over millennia this material builds up and becomes several metres thick.

Peatland landscapes are varied – from blanket bog landscapes with open, treeless vegetation in the Flow Country of Scotland – a tentative World Heritage site – to swamp forests in Southeast Asia. New areas are still being discovered such as the world's largest tropical peatland discovered beneath the forests of the Congo Basin in 2017.

11. WASTE: PAPER &PLASTIC

PAPER PRODUCTS: Paper products are derived from trees, and too much of it's derived from endangered forests! This is a planetary problem. Trees and forests filter the world's air pollution and they're nature's carbon sinks. When trees and forests are removed to make disposable paper products, humanity and the planet suffer for centuries to come. Right now, the majestic Boreal Forest in northern Canada is being decimated to make toilet paper.[117] This is the world's largest intact forest. What a misuse of resources!

Bleached paper products create yet another problem—dioxin pollution in our waterways. When I worked for Greenpeace in 1989 this was my first campaign —ending chlorine bleaching at the paper mills. Since then paper mills have cleaned up their act somewhat, yet dioxin is a persistent pollutant and remains a big problem. Today you can find advisories against eating fish in many rivers and lakes throughout the country due to dioxin & other persistent pollutants.

PAPER PRODUCTS TO AVOID if from endangered forests or chlorine bleached:

Paper napkins	Paper towels
paper plates	toilet paper
tissue	tissue paper
writing paper	copy paper
wrapping paper	

Thank you
Las Vegas MGM
Hotels for banning
plastic straws!!

PLASTIC and FOOD PACKAGING: Plastic is a huge problem, especially when it doesn't get thrown away or recycled. Plastic packaging leads more often than not to litter and pollution in the oceans. Once in the water, plastic gets swallowed by whales, turtles, dolphins, fish, birds and others who mistake it for food. Any animals that eat plastic will suffer starvation and death. Avoid using these:

Straws	Styrofoam (polystyrene)
plastic cups	plastic utensils fork, knife, spoon
plastic lids, caps	plastic cups
plastic water bottles	six pack rings
plastic bags	single use plastic

New York City + Maine
Thank you for banning
Styrofoam in 2019!

SOLUTIONS

- Don't purchase bleached paper products, or those from endangered forests
- Use cloth napkins, handkerchiefs, dish towels, wash cloths
- Use real dishes, metal utensils, reusable cups
- Avoid using single use plastic and Styrofoam
- Be sure to throw garbage away properly, recycle it, or reuse it. Don't be a litterbug.

Let's go big and encourage all companies to reduce their plastic packaging, as well as bleached paper products. Be part of the solution and reduce or ban your own personal use of each. It's going to take practice, we're so used to getting a straw in our drinks, for instance. We have to start somewhere. Next time you're out, just say no straw please, *unless* it's a paper straw from an *un*endangered forest.

FOOD WASTE

So many people throughout the world are hungry, yet we're wasting so much food. We have to find ways to divert food to those who need it. Globally our food waste problem is pretty severe. Key points from the FAO of the United Nations:[118]

- Roughly one third of the food produced in the world for human consumption every year — approximately 1.3 billion tons — gets lost or wasted.
- Food losses and waste amounts to roughly US $680 billion in industrialized countries and US $310 billion in developing countries.
- Fruits and vegetables, plus roots and tubers have the highest wastage rates of food.
- Global quantitative food losses & waste per year are roughly 30% for cereals, 40-50% for root crops, fruits and vegetables, 20% for oil seeds, meat and dairy plus 35% for fish.
- Large quantities of food are wasted due to standards that over-emphasize appearance.

What's lost when food is wasted?

- All the plant, sun, soil energy and resources used to produce the food
- All the water used to grow and produce the food
- All the human energy and labor to produce the food
- All the energy and fuel used to manufacture and transport the food
- All the packaging that has gone into bringing the food to you
- All the nutrients and energy the food had to offer
- The opportunity to nourish and relieve someone's hunger

Where does food go when it's thrown away:

- **Landfills:** Food rotting at landfills emits methane and carbon dioxide. A good solution at landfills: Anaerobic methane digesters that convert methane to usable electricity.
- **Garbage Disposals:** Throwing food down the drain isn't the best solution. It's not good for our water resources, it demands greater water filtration energy, and takes away the food's opportunity to contribute back to hungry people or to the earth
- **Compost:** convert your dated and left-over food scraps. **Benefits of Composting:**.
  - Encourages beneficial soil organisms that break down organic matter
  - Reduces methane emissions and CO2 emissions from landfills
  - Can replace toxic fertilizers, cut nitrous oxide and greenhouse gas emissions,

SOLUTIONS

- Donate extra food to food pantries, homeless shelters, churches, the poor and hungry
- Conserve how much you purchase, increase your awareness of how much you need to prepare meals at home so you only buy what you really need.
- Freeze foods if you can't use them in time, reduce how much gets forgotten & rotten.
- Instead of tossing food scraps in the garbage, start composting them.

SOLUTIONS CLIMATE CRISIS

- We must stop all the nonsense that's put 1,000,000 species on the brink of extinction! There're other ways we can exist, without harming anyone or any species in the process.
- Avoid products containing palm oil derived from sensitive deforested areas
- If we reinvent animal farms, we can make huge strides toward resolving our climate crisis. This will reduce methane, nitrous oxide, ammonia, hydrogen sulfide, as well as water pollution and toxic runoff, acid rain and smog—helping earth heal.
- If we reduce chemicals used in big ag and other farms, we can help habitats, animals, people, pollinators, and ecosystems recover. Let's help farmers make the switch for their health and ours! Fumigants—do we really need them? "More than 200 million pounds of agricultural pesticide-active ingredients are applied to California fields each year, of which more than 40 million pounds are fumigants."[119]
- Move away from GMO corn and soy for farm animals, it increases methane emissions![120]
- Protect & Nurture soil with compost, plant material, cover crops, natural fertilizers
- Help get pesticides and fungicides out of our forests
- Avoid plastic, Styrofoam, and suspicious food packaging
- Avoid bleached paper packaging, products and tissue & those from old-growth forests
- Choose real organic, biodynamic, or IPM foods when and where available
- Eat less meat and when you eat meat, choose humanely-raised products.
- GMO soy & corn grown for animal feed uses excess fertilizer, pesticides and fungicides!
- Factory farm products put us at greater risk for infections that are resistant to antibiotics

Agriculture's contributions to Planetary Harm & Climate Crisis include:

TYPE	Green House Gas (GHG) EMISSIONS,
Big Farming, Industrial Farming	GHG, CO2, Methane, Nitrous Oxide, Loss of Soil Carbon Storage, fungicides, monocropping, synthetic fertilizer, pesticides, fungus resistance, weed resistance
Factory Animal Farming (CAFOs, AFOs)	GHG, Methane, Hydrogen Sulfide, Ammonia, Air and Water pollution, GMO animal feed, nitrous oxide emissions, antibiotic resistance
Palm Oil Farming	GHG, Methane, Deforestation, Lost Carbon Storage
Monocropping	GHG, Deforestation, loss of habitats, lost carbon storage, increased agricultural runoff, fungus resist
Synthetic Fertilizer	GHG, Nitrous Oxide, soil harm, toxic water runoff
Pesticides and Big Ag	GHG, Ozone layer depletion, harms pollinators
Pesticide manufacturing	GHG, toxic air and water pollution
Synthetic fertilizer facilities	GHG, Nitrous oxide, ammonia, SO2, smog
Industrial Ethanol facilities	Carcinogens, Volatile Organic Chemicals
Corn for ethanol in gasoline	GHG, N2O, ethanol in gasoline ups smog,[121]
Food Waste	GHG, Loss of resources, methane, CO2

SOLUTIONS CLIMATE CRISIS

We have the power, every action counts and builds upon another. Maybe through our actions, we'll mobilize great forces of good energy and great people and accomplish tremendous things.

Problem	Action	Results
Pesticides	Ban Fumigants	Helps soil, reduces nitrous oxide
	Restrict Pesticide use	Reduces superweeds, helps bees
	Restrict Fungicide use	Reduces fungal resistance
	Ban Chlorpyrifos	Helps children, protects brains
	Ban neonicotinoids	Helps pollinators and animals
	Reduce use in forests	Helps forests, reduces fire risk
	Ban most toxic pesticides	Reduces toxic runoff, toxic algae
	Limited pesticide use	Improves water, ocean health
	Ban Chlorpyrifos	Helps children, protects brains
GMOs	Reduce, eliminate GMOs	Reduces herbicide use
	Reduce monocropping	Resuscitates land
	Reduce GMO crops	Reduces synthetic fertilizer use
	Reduce synthetic fertilizer	Reduces toxic runoff
	Ban GMO alfalfa	Protects Bees and food supply
	Plant less GMOs	Reduces herbicide + fertilizers
	Ban GMOs in wildlife refuges	Protects animals, pollinators
Industrial Farms	Reduce pesticide use	Helps pollinators, wildlife
	Reduce synthetic fertilizer	Reduces nitrous oxide
	Reduce fungicides	Stops fungicide resistance
	Reduced pesticides, fertilizer	Reduces runoff, acidification
Synthetic Fertilizer	Restrict synthetic fertilizer	Reduces Cancer and N2O
	Reduce use	Soil rebounds, reduces disease
	Reduce use	Improves plant health
	Reduce use	Reduces toxic runoff, red tide
	Reduce use	Curbs toxic algae, dead zones
	Reduce use	Curbs ocean acidification
Factory Farms	Transform, clean up CAFOs	Cleans water, air, helps all life
	Stop daily antibiotic feeding	Curbs antibiotic resistance
	Stop feeding animals soy, corn	Reduces methane, N2O
	Improve conditions for animals	Reduces antibiotic
	Improved manure mngmt	Reduces pollutants, ammonia
		Protects water, reduces runoff
		Improves food safety

SOLUTIONS CLIMATE CRISIS

Soil	**Restrict use of synthetic fertilizer**	**Soil revives, stores carbon**
	Stop allowing fumigants	**Helps soil microorganisms**
	Restrict use of fungicides	**Reduces toxic runoff, toxic algae**
	Nurture soil, cover, compost	**Helps soil, reduces runoff**
Forests	**Limit, ban pesticides, fungicides**	**Helps forests recover resilience**
Palm Oil	**Ban unsustainable palm oil**	**Helps curb deforestation**
Bees +Pollinators	**Ban neonicotinoids**	**Save pollinators and wildlife**
	Restrict, ban GMO alfalfa	**Saves pollinators and wildlife**
Food Waste	**Wastes less, compost, donate**	**Conserves resources, helps soil,**
Food Packaging	**No more plastic, bleached paper**	**Prevents pollution**
Plastic	**Ban Styrofoam worldwide**	**Prevents water pollution**
	Ban single use plastics	**Helps oceans recover**
Water, Oceans	**Don't litter, don't pollute**	**Helps animals + waterways**
Fish	**Don't support overfishing**	**Lets fish populations recover**
Litter	**Help clean up garbage**	**Prevents pollution in oceans**

The Magic Formula: If we cut the toxins applied to plants, land, soil, as well as those forced unto farm animals, we automatically reduce toxins flowing in runoff, in stormwater, as well as those charging into the atmosphere. Start by reducing synthetic fertilizer and all else gets better. Without question such changes improve our water, air and food which results in reduced exposure to toxins. Do we become healthier? More clear-headed? More at peace? More compassionate and understanding? The planet and animals surely will benefit as will the oceans and forests, and soil microorganisms, kind insects and pollinators. The whole planet could resonate in harmony if we wanted, if we believe. Are we ready to make this happen?

Don't litter, show kids and others that littering is not cool. If you see garbage on the ground on the beach or in parks, anywhere, please help divert it from going in the waterways. Please pick it up and stuff it in the bin so it can get disposed of properly. Then wash your hands.

In other sectors, solutions to curb pollution involve carbon taxes and carbon trading. Considering farming, only modifying the processes can make any true difference. Taxes may incentivize some to cut their emissions, but not necessarily all. What about the other pollutants besides carbon dioxide, are they included in trading or taxes? Only true cutbacks in toxic pollution make a difference. Let's have measurable and effective means starting with no more payouts to Big Ag and the industrial farms using dire amounts of toxic fertilizer and pesticides. Who do these payouts benefit most anyway—the farmers or the chemical companies? These code red times demand a shift in operations ASAP. Government money can be better diverted to people and causes that need it—pollinator protection, climate change prevention, ocean clean up, nourishing school kids, littering education programs, nontoxic food assistance for people in poverty + those less advantaged, protecting animals, back-to-nature programs & urban gardening. I'm sure you have some ideas too, lets pick the best ones and make it happen.

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