NB Chg
Gardening for change
Lets Get Growing With Winter Warmups!

NB Community Harvest Gardens inc.

Strategies in an Era of Growing uncertainty

- Climate Change
- How can we do our part
- Seasonal eating
- What is regenerative gardening?
- Steps to achieve a resilient garden thru regenerative practices
- Cover cropping

Causes of Climate Change

- Human activity is the main cause of climate change. (Burning fossil fuels and converting land from forests to agriculture).
- **Burning fossil fuels** produces carbon dioxide and a "greenhouse effect" warming the earth. (ex. Industry, mining, transportation, food production, modern farming practices)
- **Loss of forest to farming** cuts the natural ability of forests to remove carbon dioxide from the air
- Even worse, modern farming practices add to the problem (livestock concentrated in modern farms produce emissions, the soil's ability to work properly is reduced, equipment needed)
- **At home**: transportation, heating, lights, single use items (bags, packaging), clothing, electronics, what you eat and your garbage.

Climate Change

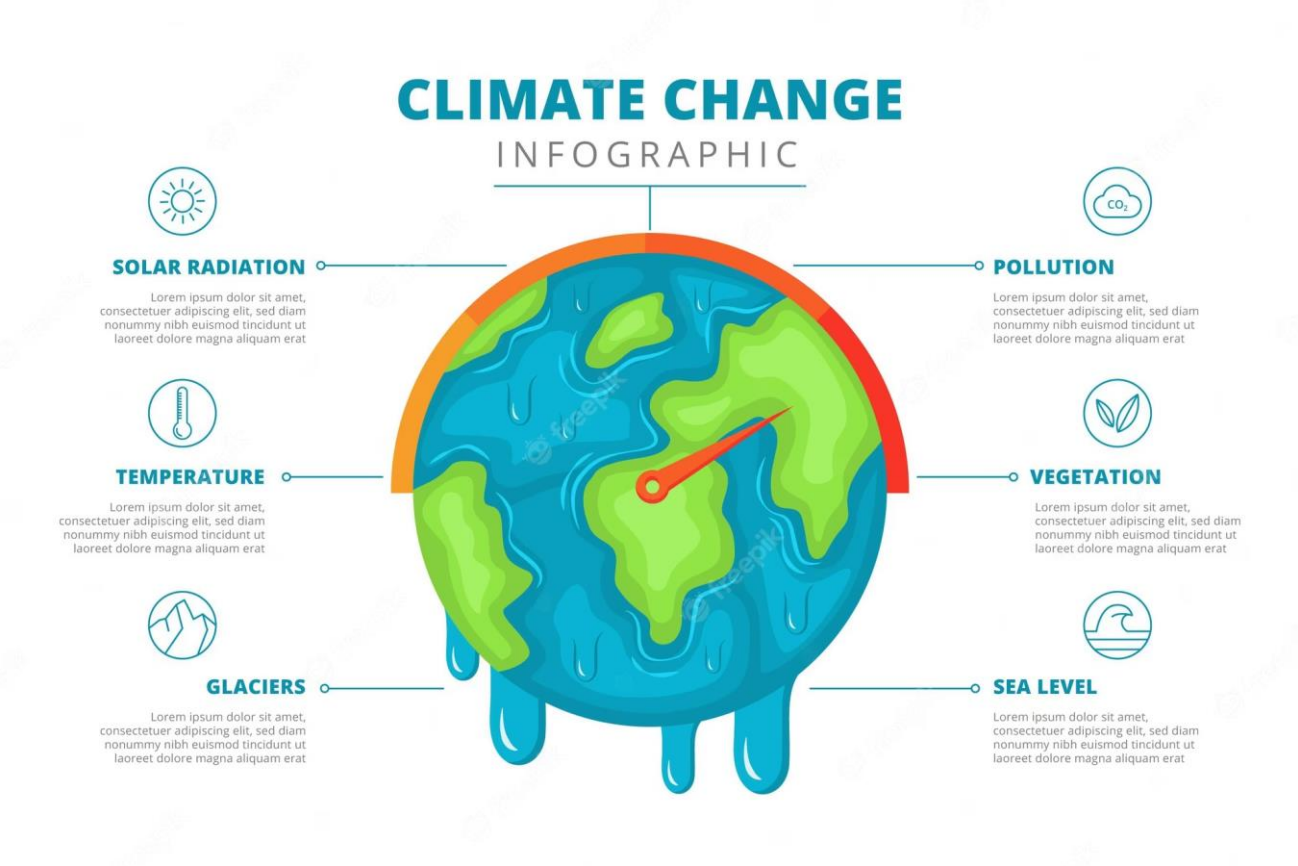
- Climate change in Canada: temperatures rising two times faster than the global average.
- New Brunswick we have seen increases in the number of hot days, rainfall amounts, storm severity, and a rise in sea level.
- Steps to take:
  - ❑ **reduce** our greenhouse gas emissions
  - ❑ **prepare** our communities for climate change impacts, adapt practices, prepare for emergencies, become less dependant on outsourcing day to day needs
  - ❑ **champion** the need to take action

https://www2.gnb.ca/zx

- Global warming can cause winters to be colder and more severe.
- A 2021 study: **warming in the Arctic causes a disruption in the stratospheric polar vortex**. linked to unusual extreme cold in parts of North America and Asia

https://climatekids.nasa.gov/harsh-winter/

Greenhouse effects



- The burning of fossil fuels releases more carbon dioxide into the atmosphere than is used by photosynthesis.
- there is more carbon dioxide entering the atmosphere than is coming out of it.
- Greenhouse effect, light can come in through the CO2 emissions (like through a greenhouse glass) but the energy in the CO2 cannot leave so heating occurs
- The oceans are absorbing more CO2 than ever, becoming more acidic

https://www.freepik.com/vectors/climate-change

https://youtu.be/6cRCbgTA_78

Video from conversation council, why 2 degrees raise in the earth’s temperature is significant, excellent, simply presented, even for children

What you can do

- Waste generates about six percent of Canada's total greenhouse gas emissions. (including rotting food in landfills, fossil fuels to make plastic used for packaging)
- 90 per cent of plastic in Canada is not recycled
- Plastics take more than 400 years to degrade (leach toxic chemicals, harm/kill wildlife, contaminating land/ oceans.
- Reduce plastics use by buying unpackaged goods and re-using plastics.
- National changes to single use plastic bags, plastic utensils and straws, tiny part of the problem
- Encourage recycling of all plastics
- Compost everything you can

What you can do:

Recycle Hazardous waste

Fredericton Region Solid Waste at 1775 Alison Blvd.

Recycle NB

Common hazardous waste includes:

- Pesticides
- Paint stripper
- Medicines (pharmacies)
- Paint, thinners, stains and finishes
- Propane tanks
- Bleach
- Car batteries and Used car oil
- Rug shampoo, Floor wax, Upholstery cleaners
- Oil
- Gas, and gas containers
- Furniture polishes, Metal polishes
- Pool chemicals
- Look for symbols indicating the product is corrosive, toxic, reactive or flammable or look for the words “Danger”, “Poison”, “Caution”, and “Warning”.
- Fluorescent light bulbs, / batteries

What you can do: Recycle electronics

- Display devices (such as televisions and monitors)
- Desktop printers, computers and peripherals (such as keyboards)
- Home theatre in a box (HTB) systems
- Cellular devices
- Non-cellular telephones
- Audio and video systems

Drop off locations in the Fredericton area are:

- Best Metal Bottles
- Northside Redemption Center
- SouthSide Redemption
- Tri R Redemption

What you can do: Compost

- **Don’t need fancy compost system, even 1 pile works, just slower**
- **Did some compost materials right into your garden**
- **Save, save your fallen leaves spring/ fall**
- **Follow up workshops in summer**

https://youtu.be/bqDQD8cvO5Y

Kiss the ground compost story

What you can do

Energy and transportation

- household cars contribute a large part of a families greenhouse emissions.
- Flying is next followed by space heating, water heating, appliances, and lighting.
- Have a ‘stay-cation’ or avoid flying to do your part for the planet.
- Consider car pooling, cycling, walking, or using public transit.
- Use energy efficient appliances and light bulbs.
- Plan day carefully: fewer trips

https://www.conservationcouncil.ca/citizens-can-do-their-part/

What you can do

- ❑ Buy local (less transportation fossil fuels), eat seasonal (less imports and fossil fuels, eat organic (less farming harm to the environment
- ❑ Waste less food and compost what you waste(exp. dates, flash food, day olds)
- ❑ Eat less meat (non regenerative meat production produces lots of emissions)
- ❑ Try plant based proteins (ie legumes)
- ❑ Cut back on dairy (like meat, produces emissions)
- ❑ Grow your own produce

What you can do

Grow a Climate Victory Garden

- Earth's ecosystems are damaged enough, simply sustaining them is not enough
- We must rebuild what we have damaged.
- Using regenerative gardening techniques can help rebuild our soil and in turn help plants withstand changes in climate, pest damage, and disease.

What you can do

"It's incredibly healthy for your body and mind to get your hands in the soil and interact with natural systems. Just like going for a walk in the woods, having a garden and growing your own food changes your psychology. It's so important to feel that connection with cultivation."

- Convert your lawn into a meadow by planting native wildflower seeds to attract pollinators and create a beautiful, regenerative low care . (or clover instead of grass)
- Use regenerative farming techniques even in a small garden (a lasagna no till garden, minimize digging, support a healthy soil structure). Digging only helps brings up old weed seeds to the surface to germinate.
- Yearly, feed your soil by applying a layer of compost on the surface. Leaf mulch or straw on the soil surface to conserve water, keep weeds down & protect your soil.
- No land: try a community garden, or grow food in containers

https://ecologyst.com/blogs/field-notes/regenerative-farming-practices

What you can do: Buy local/ Seasonal Eating

A sustainable way of changing your eating habits by eating food that is available in season in your area.

- Support local economy
  - ❑ Farmers, local stores, you know how it was grown
  - ❑ Lower prices if purchased in peak season
- Reduces Carbon footprint
  - Less fuel used for transportation
- Nutrition and taste
  - Foods travelling less km will lose less nutrients and tend to be picked at peak ripeness.
  - provide greater freshness, flavour and nutritional content.

Seasonal Eating

Benefits

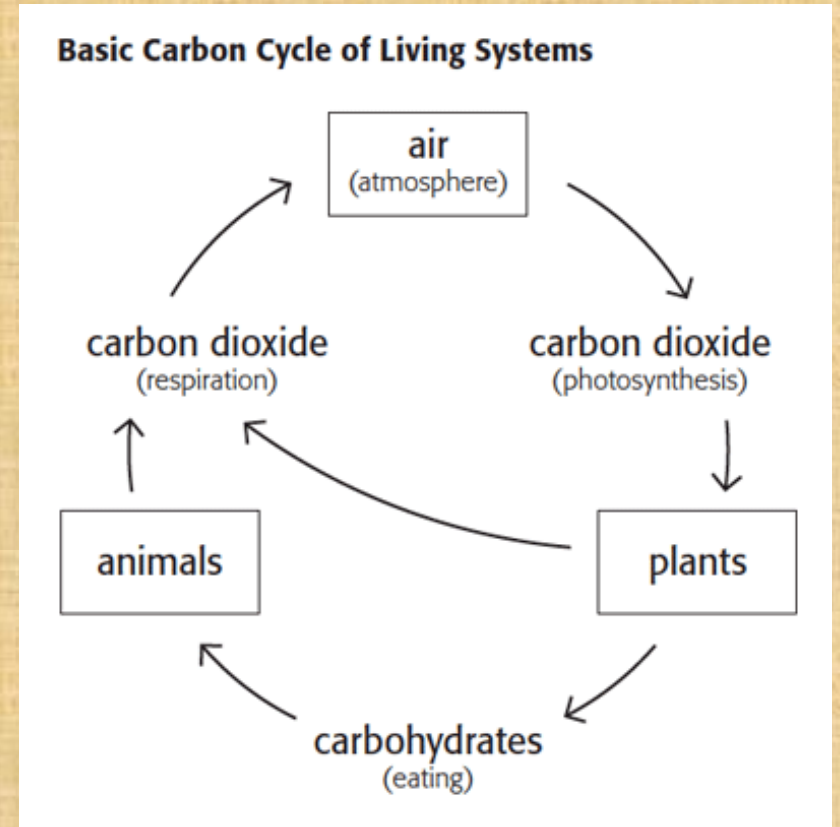
- Eating seasonal vegetables (some you may not usually eat) can provide nutrients you may not usually get from ‘the same foods every day’
- Eating the way nature intended, abundant fall vegetables are easily stored for winter use
- Helps your microbiome stay in balance.
  - abundance of good bacteria that resides in our digestive system that helps your overall health (immune health, digestive health, skin health, blood sugar balance, weight management)

Seasonal Eating

- The Seasons
  - Winter vegetables offer comfort and are used for hot meals, stews, soups, casseroles, etc. Heavier and denser, helps fortify us against colder, harsher weather.
  - Spring vegetables are natures way to help after a harsh winter. Vegetables like as artichokes and asparagus, help support detoxification, and help lose that 'winter weight gain'
  - Summer foods provide us with extra nutrients (stone fruits) that help protect us against sun damage. Summer foods tend to be hydrating to help with heat (cucumbers, watermelon, high water content), and sweeter to help with energy.
  - Fall foods are rich in beta-carotene, which is converted to vitamin A and helps protect against colds and flu.

Carbon Cycle

- Carbon is one of the most common elements found in living organisms and are part of carbohydrates, proteins, and lipids (important to our health).
- Carbon is constantly cycling between living organisms and the atmosphere.
- In the atmosphere, carbon is in the form of carbon dioxide gas (CO_2).
- plants capture the carbon dioxide and convert it to sugars through the process of **photosynthesis**.
- We cannot make our own carbon. By eating plants, or eating animals that eat plants, we gain the carbon from those organisms
- Using oxygen from the air, and the sugars from the plants/animals, we return carbon(dioxide) to the air, completing the cycle
- Globally we are returning more CO2 to the air than our plants can remove from the air, the cycle is off balance, resulting in global warming.

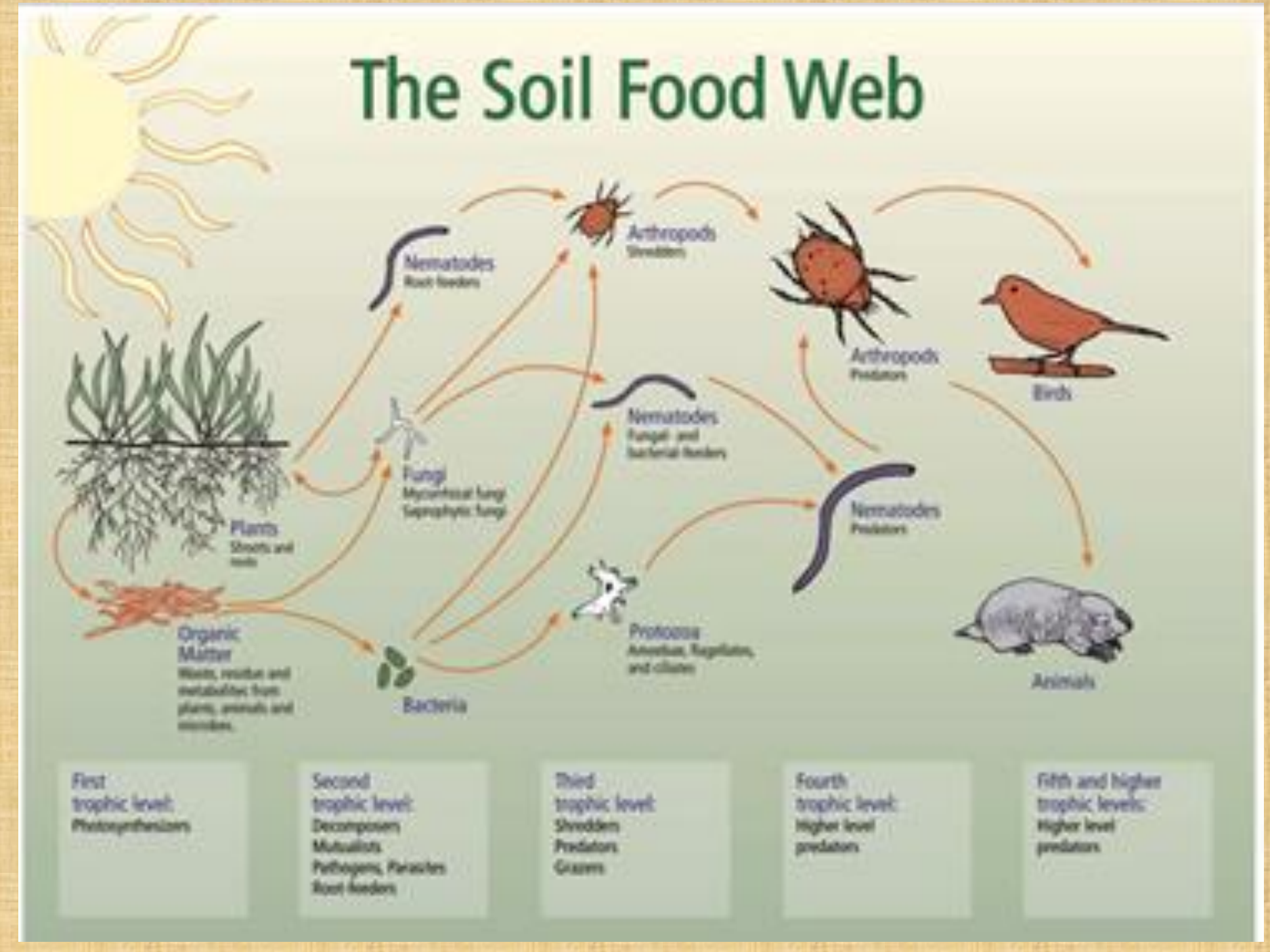


The Nitrogen Cycle

- nitrogen is also repeatedly recycled through our biosphere just like carbon.
- Nitrogen common in all living organisms, used to create proteins and nucleic acids, like DNA.
- The air we breathe is mostly nitrogen gas ($N_{2,}$)(78%)
- Animals and plants are surrounded by nitrogen in the air, can't use it in gas form. Plants die from a lack of nitrogen.
- **Special plants/ trees have nitrogen fixing abilities**, take the nitrogen gas in the air, change it with the help of special bacteria to nitrogen in a form plants can use.
- human activity impacts the nitrogen cycle, burning fossil fuels, releases nitrogen oxide into the atmosphere
- Leads to problems like **acid rain**.

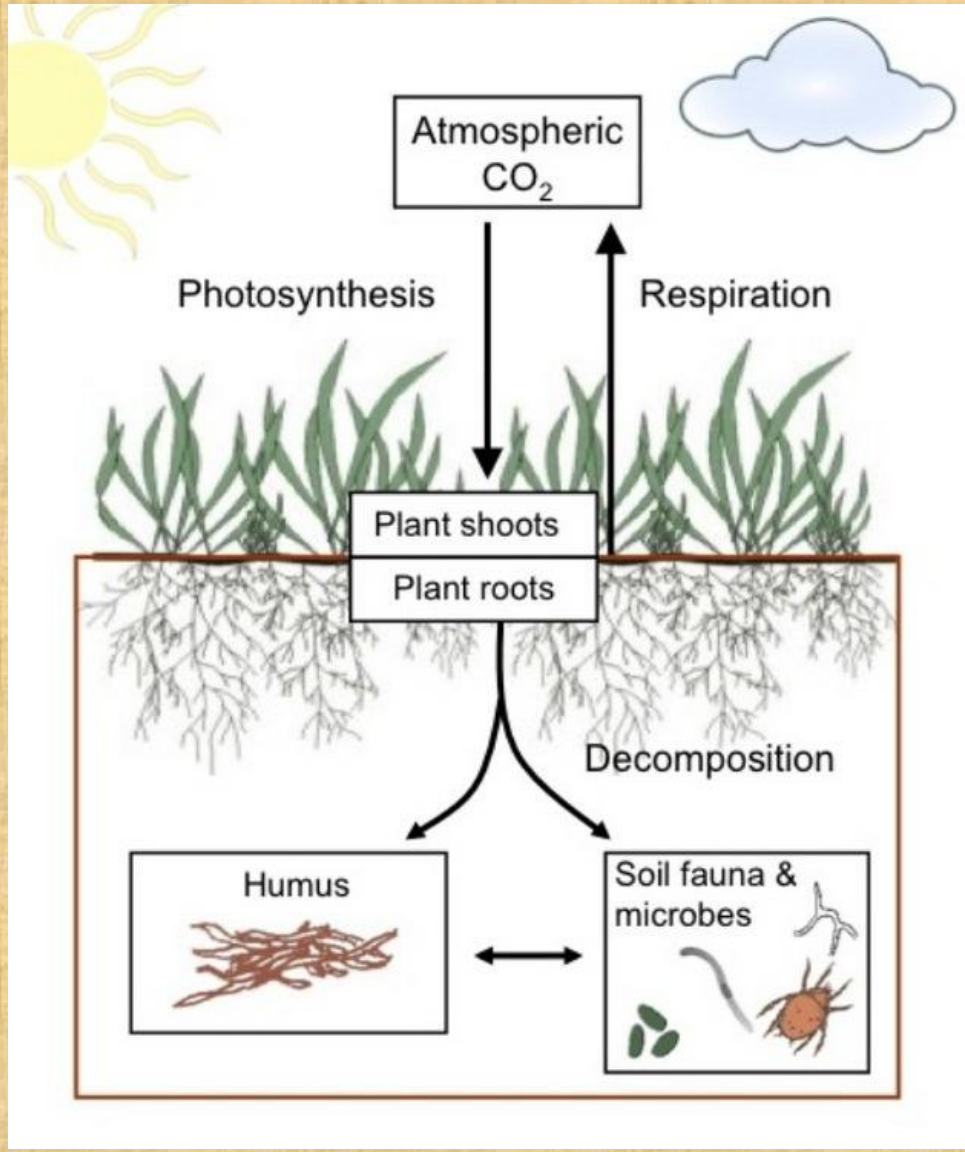
Regenerative gardening: Why

- ‘Over the decades, much of our soil has been depleted through the use of conventional agricultural practices such as deep tilling, repeated monoculture cropping, and the use of man-made agricultural chemicals and fossil fuel and salt-based fertilizers.’
- Regenerative gardening is a system that replicates nature, growing in harmony with the land and nourishing the soil naturally.
- Not a new concept. First Nations have been using farming practices focused on replenishing the land far before our modern farming practices took hold.
- Healthy soil with healthy microorganisms within the soil creates healthy nourishing food and helps the environment.


The Soil Food Web
Arthropods
Nematodes
Root feeders
Arthropods
Predators
Birds
Nematodes
Fungal- and bacterial feeders
Fungi
Mycorrhizal fungi
Saprophytic fungi
Plants
Shoots and roots
Nematodes
Predators
Organic Matter
Waste, residue and metabolites from plants, animals and microbes
Protozoa
Amoebae, flagellates, and ciliates
Bacteria
Animals
First trophic level:
Photosynthesizers
Second trophic level:
Decomposers
Mutualists
Pathogens, Parasites
Root feeders
Third trophic level:
Shredders
Predators
Grazers
Fourth trophic level:
Higher level predators
Fifth and higher trophic levels:
Higher level predators

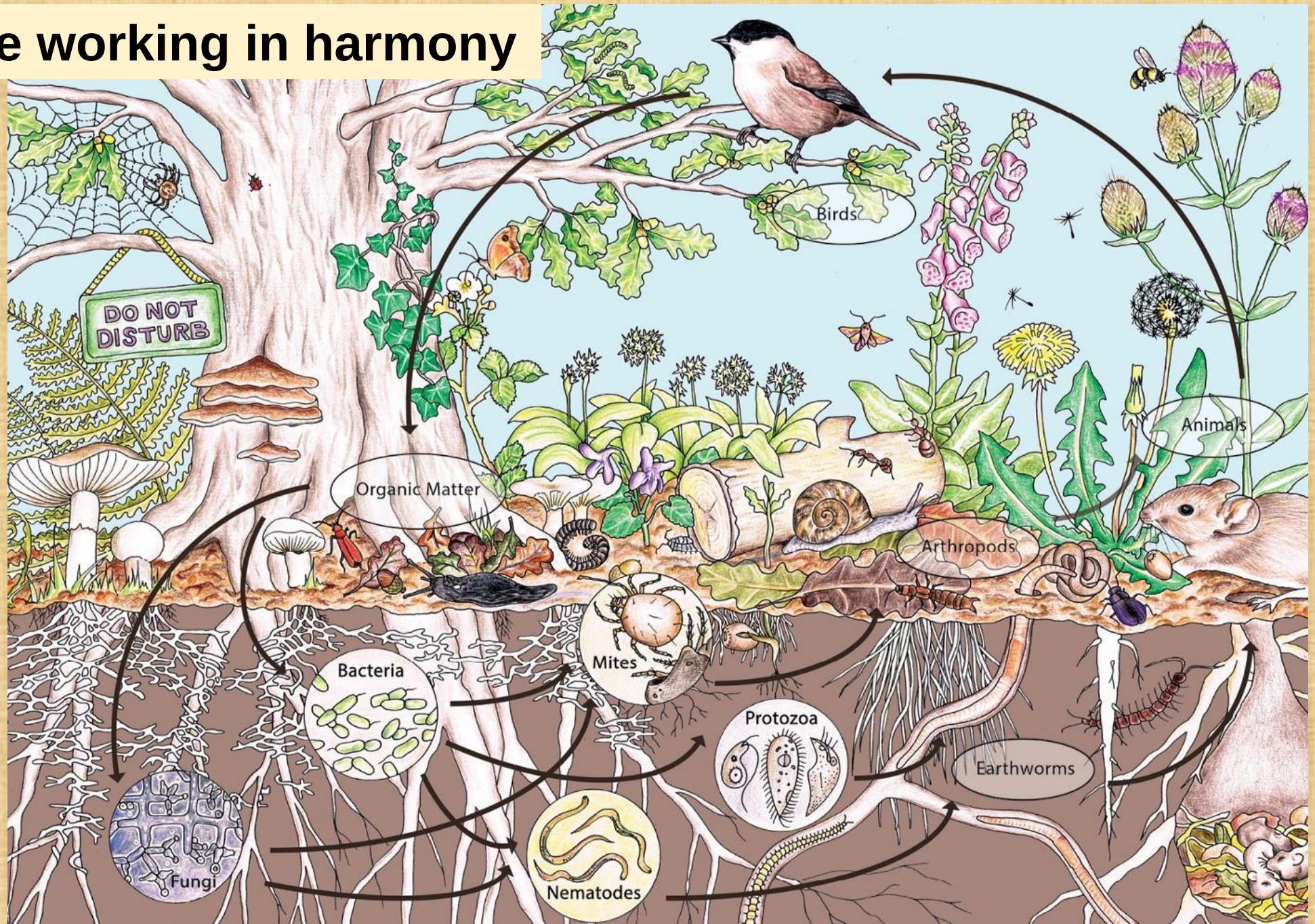
How it works:

In healthy soil, plants pull in carbon dioxide (CO2) from the air, and exchange some of their carbon with fungi and other microbes in the ground. These microorganisms, in turn, send out proteins, carbon and other substances which stick to soil particles and create loose, fertile humus. Plants in healthy soil get about 90 percent of nutrients they need through this carbon exchange with soil microbes. The goal is to build humus. Humus contains the needed nutrients for natural fertility in your garden. Humus also sequesters carbon in the soil, as long as it interacts with growing plants.



Regenerative practices depend on the land and operation in question.

Nature working in harmony



What is involved in regenerative growing

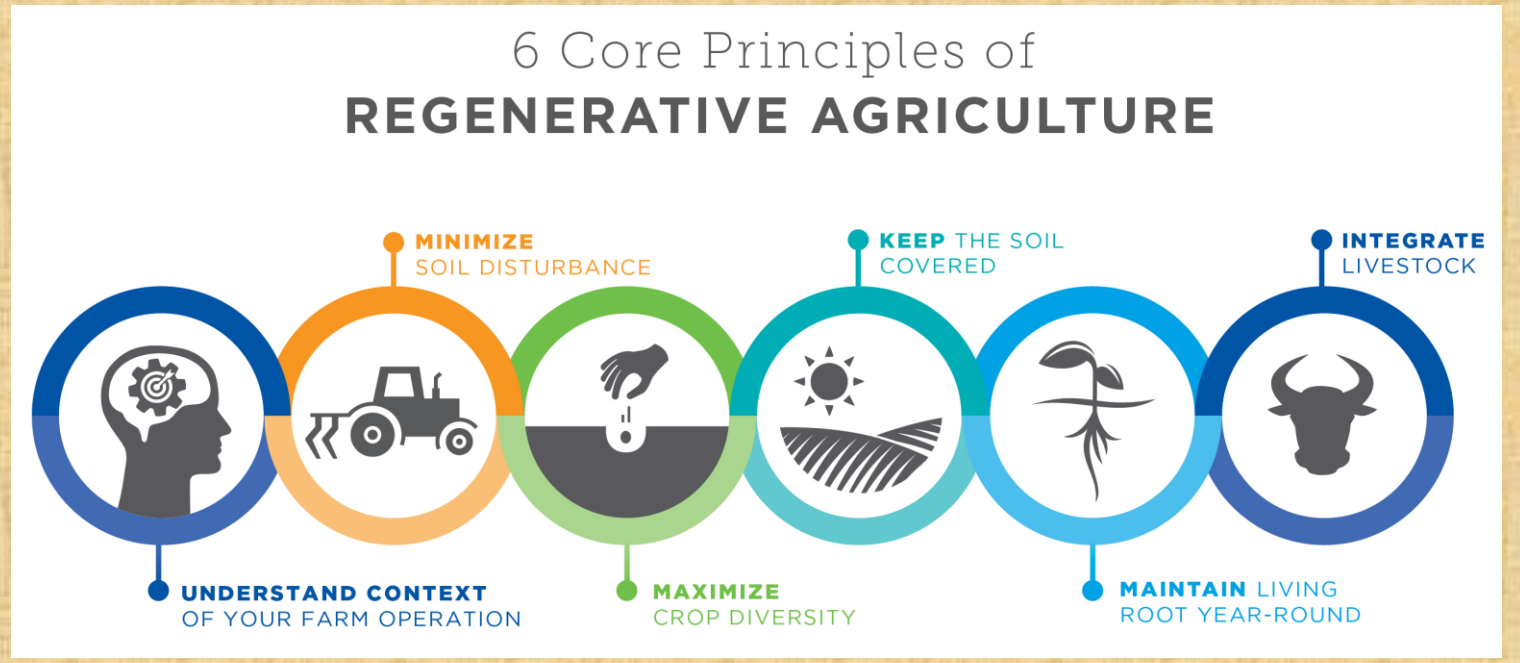
Practices include

- composting,
- cover cropping,
- growing leguminous green manures,
- crop rotation,
- mixed farming,
- shallow and reduced cultivation, and
- enhanced biodiversity.

Regenerative farming is knowledge-intensive rather than input-intensive. Understand insect life cycles rather than spraying “pests” and building soil health over the long-term rather than fertilizing plants with nutrients for the short-term.

Steps to a resilient regenerative garden

- Minimize Tilling (no till method)
- Keep Something Growing / Don’t Leave Bare Soil
- No Synthetic Fertilizers (use compost or natural amendments)
- No Pesticides
- Use Plant Diversity to Build Resilience (also companion planting)
- Include Native Plants
- Create Microclimates
- Save Seeds



Minimize Tilling (no till method)

Digging, plowing, and rototilling break up underground fungal networks, and exposes the soil to air, releasing carbon dioxide (CO2) and nitrous oxide. (emissions global warming).

Preserve these underground networks of microbes by disturbing the soil as little as possible (practice no-till gardening).

No-till means gently loosening only the top few inches of soil with a fork or by hand without turning the soil. Leave rotting remains of previous crops where they are

- Plant thru the mulch or pull aside mulch and replace when plants growing..
- Pull weeds and leave on ground to compost.

COVER CROPS

- There are three main ways to improve soil:
  - grow cover crops
  - mulch the surface with biodegradable mulches
  - and/or add organic soil amendments (such as compost, grass clippings, rotted manure or wood chips).
- Many cover crop plants can become weedy, so they should almost always be taken down before they set seed.
- A cover crop is any plant grown for the primary purpose of improving the soil. Since the early 1900s, farmers have used cover crops to restore fertility to worn-out land. In addition to helping bulk up soil with organic matter, cover crops prevent erosion, suppress weeds, and create and cycle soil-borne nutrients using the power of the sun. Recent advances in soil biology have revealed two more ways cover crops can improve soil.

(some information sourced from Mother Earth News)

How to Take Cover Crops Down

- Traditionally, cover crops are plowed under
- Some gardeners chop, cut, or pull them, and use them for mulch or compost. ***wait two to three weeks before sowing crop seeds to freshly cut cover crop residue to allow the crop to decompose.
- Some cover crops die over winter and are easily mixed into the soil, others should be dug in before they get too big in the spring.

Best option for Regenerative Gardening

- Mow or whipper snip to cut down at ground level. After cutting the cover crop down, let it lay on the soil surface as a mulch as it decomposes. This will help with water conservation and weed suppression. This method chops the cover crop into small pieces and will speed up decomposition, but at that it will be several weeks before you can plant.

COVER CROPS

DURING THE SUMMER:

buckwheat

- Chokes weeds.
- growing 2 feet high or more and matures quickly
- Lots of natural mulch and organic matter.

IN LATE SUMMER:

barley

- cover crop to try while the soil is still warm, a fast-growing grain captures excess nitrogen left over from summer crops.
- winter killed in Zone 5 and above. The dead barley residue shelters the soil through winter, and dries into a plant-through mulch in spring in cold zones.

EARLY FALL:

****Hairy vetch**

- Don’t wait too long to plant, hardy to Zone 4 and gives a huge payback in terms of soil improvement.
- kill by slicing just below the crown with a sharp hoe a month before it’s time to plant tomatoes and peppers, you can open up planting holes and plant through the dried mulch, nitrogen to the soil.

****Winter Rye**

- Will sprout after the soil has turned chilly, take it out early in spring.

***Oil Seed Radish or Daikon Radish**

- Fast growth in spring or fall provides quick ground cover to protect against soil erosion and smother weeds.
- Thick, deep taproot can break up compacted soil layers and brings up nutrients from deeper soil layers.
- While decomposing, can help control soil-borne pests, insects, weeds and nematodes.