

REGENERATIVE GROWING: NO-TILL AND MULCHING



2023



WHAT IS COMMUNITY ROOTS?

Community Roots: Local Food for Climate Action is a project of the Western Environment Centre that highlights the vital connections between ecosystems, food, and people. Through workshops and community programs, Community Roots brings people together to gain knowledge and skills to build a more regenerative, nature-based local food system for the sustainability of our communities and our planet.



Regenerative growing is about creating self-sufficient natural gardens that work with the ecosystem rather than against it. A regenerative garden aims to actively restore the health of the soil and the ecosystem, support diversity, and restore habitat through nature-based growing practices. A regenerative food system produces food on land and at sea in ways that work in partnership with the world around us.

Through hands-on food skills workshops led by local knowledge holders, and interactive neighbourhood programs, the Community Roots project highlights the vital connections between our ecosystems, our food, and our people.

ABOUT WEC

Western Environment Centre is dedicated to engaging our community in food and climate action through impactful, educational initiatives. Since 1998, we've grown from a small citizens' group to a thriving environmental organization in western Newfoundland.

What we do:

- Create and run hands-on, interactive community programs; and
- Engage in public dialogue and policy

Our two main areas of focus are:

- Sustainable local food systems; and
- Climate action



LOCAL KNOWLEDGE HOLDERS

Lauralee and Mark Ledrew

Lauralee and Mark are the owners of Upper Humber Settlement farm. They started their homesteading journey working on a 6 acre plot in Cormack in 2015.

Lauralee explained, "While travelling abroad in New Zealand we lived with a family and experienced a zero-waste management project, permaculture, organic herbal greenhouse operations, and more. This experience has ultimately impacted our homestead development and future plans. In 2020, we implemented a new way forward following no-dig methods, [using] perma-culture techniques, and integrating water harvesting systems. We absolutely love our lifestyle and are happy to open our doors to... visitors."

This manual was inspired by Lauralee and Mark's Regenerative Growing workshops and developed by Western Environment Centre.

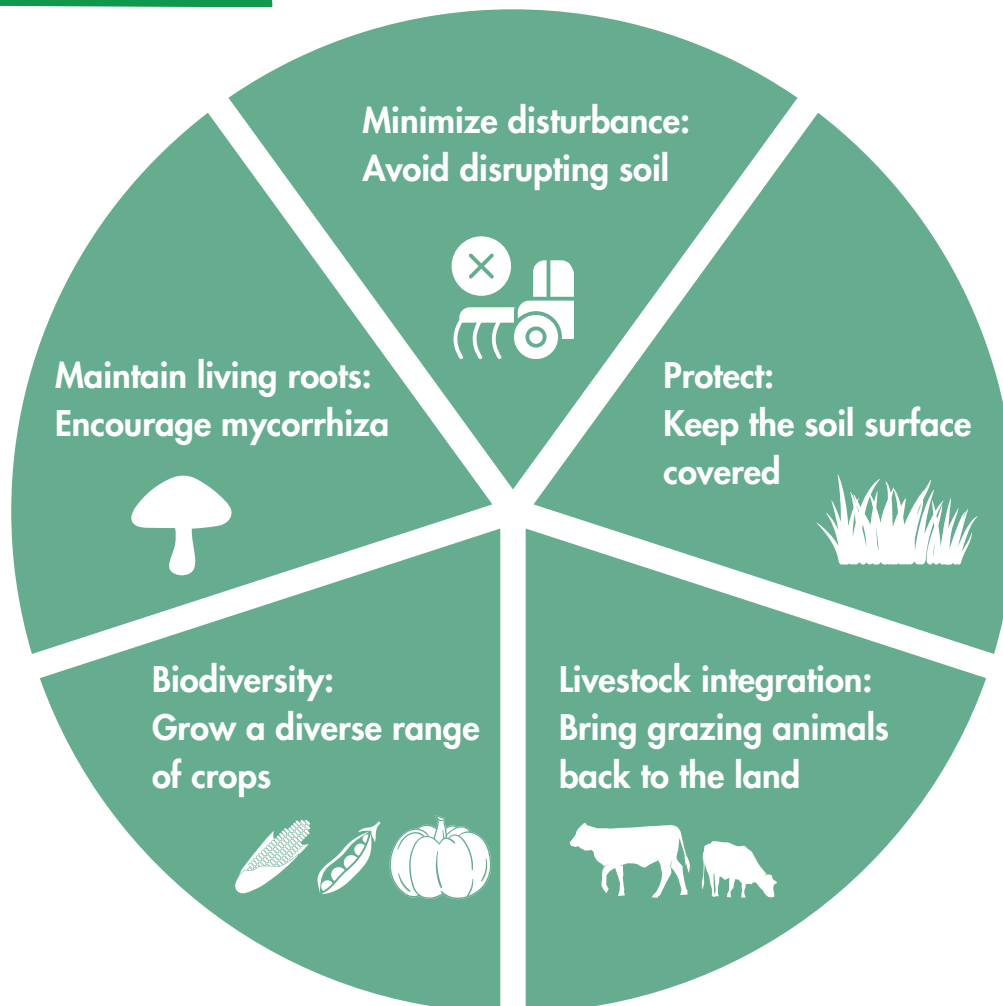


WHAT IS REGENERATIVE GROWING?

Definition

Regenerative growing focuses on natural methods that use the wisdom of nature to build a vibrant and resilient garden or farm ecosystem. Over time this method can save you both time and money, while creating amazing soil fertility.

Key Principles



NO-TILL

Definition

No-till is a method of growing plants without disturbing the soil through tilling. Instead, plants are grown directly in untilled soil or in a layer of organic mulch or compost on the soil surface. Transitioning to a no-till gardening approach may require changes to planting techniques, weed management, and soil fertility practices. No-till gardening offers a sustainable and environmentally friendly approach to growing plants while preserving soil health and productivity.



Benefits

- Preserves soil structure: helps maintain soil structure, allowing for better water infiltration, root development, and nutrient retention.
- Reduces soil erosion: minimizes erosion caused by wind and water. This helps prevent the loss of valuable topsoil, which is rich in nutrients necessary for plant growth.
- Conserves soil moisture: helps conserve soil moisture by maintaining a protective layer of organic matter on the soil surface, which reduces water loss through evaporation.
- Promotes soil health: fosters a healthy soil ecosystem by preserving soil microorganisms and organic matter, which are essential for nutrient cycling and plant health.
- Sequesters carbon: contributes to carbon sequestration by increasing soil organic matter levels. This helps mitigate climate change by removing carbon dioxide from the atmosphere and storing it in the soil.
- Saves time and labor: requires less time and labor compared to traditional tilling methods. Once established, no-till systems often require minimal soil preparation and maintenance, allowing gardeners to spend more time on other tasks.

BUILDING A NO-TILL GARDEN

1

Spread a layer of compost

Spread a 2-inch layer of compost on top of bare soil. Do not turn the soil over. No tilling, no digging. Just spread this out.

2

Dig holes

Dig holes to plant your seedlings, basing spacing and depth on the needs of the plants.

3

Mulch the garden

Use a natural mulch such as wood chips, leaves, or straw to cover the garden soil between the plants. Mulch helps protect from weeds.

4

Leave the roots in the ground

At harvest at the end of season, do not pull out the vegetables or herbs by their roots. Instead, cut their stems at the base of the soil and leave the roots in the ground to rot. Compost the plant matter.



Adapted from <https://gardentherapy.ca/no-till-garden>

BUILDING A NO-TILL GARDEN

5

Spread more compost

When you are ready to plant again next spring, cover the garden with another 2-inch layer of compost. Do not till or turn the soil.

6

Do not pull roots

When planting new seedlings, only pull out roots left over from last year if they're blocking planting. Rotate crops so that plants are not planted in the same location as the previous season.

7

Annual soil care

The instructions above cover the first 2 years. For year 3 and beyond, follow this schedule:

- Year 3: add a layer of mulch instead of a layer of compost
- Year 4: add a layer of soil instead of a layer of mulch
- Year 5: add a layer of rotted manure instead of a layer of soil
- Year 6: add a layer of compost instead of rotted manure

Continue every season layering up the compost, mulch, soil, and rotted manure without ever turning over the soil.



Adapted from <https://gardentherapy.ca/no-till-garden>

MORE APPROACHES TO NO-TILL

Food Forest

- Method: Integrating trees, shrubs, and perennial plants into a garden setting to mimic a natural ecosystem.
- Benefits: Builds a diverse and resilient ecosystem, improves soil structure, and provides long-term sustainability.

Hugelkultur

- Method: Building raised beds by layering wood logs or branches with other organic materials.
- Benefits: Promotes water retention, enhances soil fertility, and provides aeration as the wood decomposes.

Sheet Mulching

- Method: Layering organic materials like newspaper, cardboard, straw, and compost to create a thick mulch.
- Benefits: Suppresses weeds, retains soil moisture, and provides a gradual release of nutrients as the organic materials decompose.



FOOD FOREST

Definition

A food forest is a diverse, multi-layered agroecosystem designed to mimic the structure and functions of a natural forest while emphasizing the production of food, medicinal plants, and other useful resources. In a food forest, plants are strategically arranged into different layers, such as canopy trees, understory trees, shrubs, herbaceous plants, ground covers, and root crops, to maximize productivity, biodiversity, and ecosystem services.



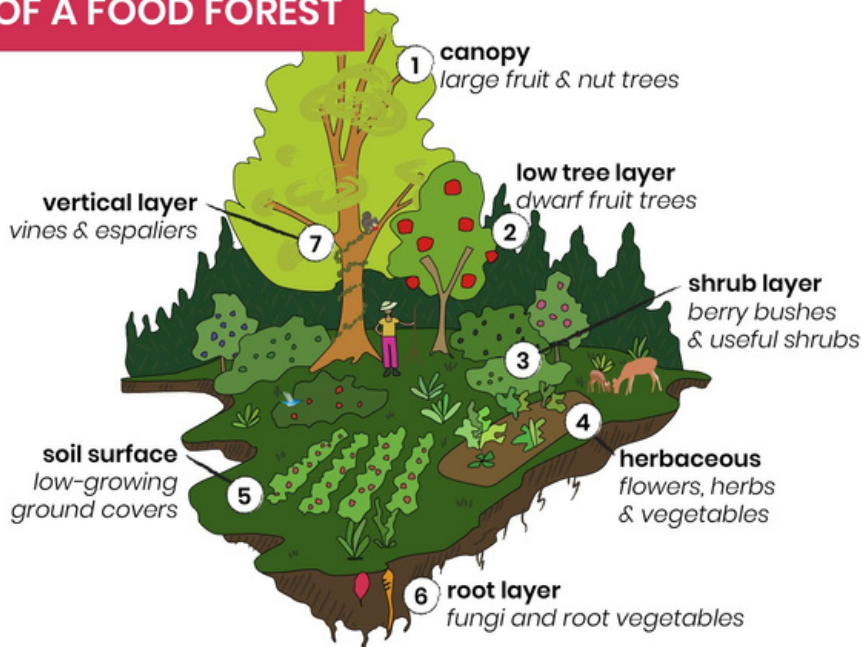
Source: www.growingwithnature.org

Benefits

- Enhances biodiversity: supports a wide range of plant species, which creates diverse habitats for beneficial insects, birds, and other wildlife. This biodiversity promotes ecological resilience, enhances pollination and pest control, and fosters a more balanced and sustainable ecosystem.
- Improves soil health: contributes to the improvement of soil structure, fertility, and microbial activity. As plants with different root depths and functions grow together, they help prevent erosion, promote soil aeration, and increase nutrient cycling, leading to healthier and more productive soils.
- Conserves water: captures and retains water through various techniques such as mulching, swales, and the selection of deep-rooted plants.
- Sequesters carbon: The perennial nature of many plants in food forests, combined with their ability to accumulate biomass above and below ground, makes them effective carbon sinks.
- Provides food security and resilience: Provide a diverse and abundant supply of nutritious foods year-round, including fruits, nuts, vegetables, and herbs, without the need for extensive inputs of fertilizers, pesticides, or irrigation.

PLANTING A FOOD FOREST

LAYERS OF A FOOD FOREST



Source: greendealfoodforestproject.org

1

Determine location and size of forest

Think about what you want to grow to decide how large the forest area should be and where to locate it.

2

Plant fruit trees

To start, plant semi-dwarf fruit trees with the recommended spacing (approximately 12 ft). You can also alternate canopy trees and semi-dwarf trees so that more sunlight can reach the ground.

3

Add shrubs

Add berries and other shrubs around the fruit trees. Use shade-tolerant shrubs on the shady sides of the trees. Add sun-loving shrubs on the sunny sides of the trees.

Adapted from www.growingwithnature.org

PLANTING A FOOD FOREST

4

Add herbaceous plants

Add some non-woody (herbaceous) plants around the shrubs. These can be your vegetables, edible ground covers, root crops, and/or culinary herbs. You can also mix in native flowers or medicinal plants to support local pollinators and other beneficial insects.



Source: grocycle.com

5

Cover with mulch

Add a good layer of mulch and some woody debris in the form of logs or snags. This helps reduce water needs, suppress weeds, and build soil fertility.



Adapted from www.growingwithnature.org

HUGELKULTUR

Definition

Hugelkultur is a gardening technique that involves creating raised beds by layering organic materials such as logs, branches, leaves, grass clippings, and compost. These layers gradually decompose over time, creating a nutrient-rich growing environment for plants. The word "hugelkultur" comes from German, where "hugel" means hill or mound, and "kultur" means culture or cultivation.



Benefits

- Fertilizes soil: as the organic materials decompose, they release nutrients into the soil, enriching it with organic matter and micronutrients.
- Retains water: the organic matter acts like a sponge, absorbing and holding moisture in the soil.
- Improves soil structure: the beds develop a loose, crumbly soil texture as the organic materials break down. This improves soil aeration and drainage, creating optimal conditions for root growth and nutrient uptake by plants.
- Sustainable long-term: the beds require minimal maintenance and inputs. The gradual decomposition of organic materials provides a continuous source of nutrients for plants, reducing the need for external inputs such as fertilizers and soil amendments.
- Resilient to climate change: well-suited to withstand extreme weather conditions, including heavy rainfall and drought.
- Enhances biodiversity: create a diverse habitat for soil organisms such as earthworms, beneficial bacteria, and fungi.
- Reuses organic waste: allows gardeners to make use of woody materials such as branches, logs, and tree trimmings that might otherwise be considered waste.

BUILDING A HUGELKULTUR GARDEN

1

Place the large wood

Place large pieces of wood on the ground. Try to use a mix of fresh and rotten wood. Keep the width of the wood a bit smaller than the finished width of the bed. Leave small gaps (2-3 inches or 5-8 cm) between the wood.



Source: www.growingwithnature.org

2

Add the first soil layer

Put soil on the wood, and fill in all the small spaces between the pieces of wood. Cover with 1-2 inches (2.5-5 cm) of soil. Nitrogen-rich material like composted manure or finished compost can also be used.

3

Add the medium wood

Add medium pieces of wood to the soil-covered mound created in Steps 1 and 2.



Adapted from www.growingwithnature.org/build-hugelkultur-bed/

BUILDING A HUGELKULTUR GARDEN

4

Add a second soil layer

Add soil to the bed following the same general guidelines from Step 2. Optional: Add another layer using small pieces of wood, and top that off with soil. The top layer of soil should be 4-6 inches (10-15 cm) deep.



5

Top with mulch

Add a mulch layer at least 2 inches (2.5 cm) thick.

6

Plant

Planting a hugelkultur bed involves understanding its microclimates and choosing crops accordingly:

- Sunnier and drier slope (south)
- Shadier and moister slope (north)
- Drier at the top of the mound (and provides more depth for deeper rooted plants)
- Wetter at the base of the mound (especially on the shadier side)



Source: www.growingwithnature.org

Adapted from www.growingwithnature.org/build-hugelkultur-bed

SHEET MULCHING

Definition

Sheet mulching, also known as lasagna gardening or layer gardening, is a gardening technique that involves layering organic materials directly onto the soil surface to create a nutrient-rich growing environment for plants. This method mimics the natural process of decomposition and soil building, resulting in improved soil fertility, moisture retention, and weed suppression.



Benefits

- Improves soil health: helps build healthy soil by adding organic matter and nutrients directly to the soil surface. As the organic materials decompose, they release nutrients into the soil, enriching it and improving its fertility over time.
- Suppresses weeds: smothers existing vegetation with layers of cardboard or newspaper and organic mulch, creating a barrier that prevents weed seeds from germinating and competing with desired plants for resources.
- Conserves water: acts as a natural moisture barrier, helping to retain soil moisture and reduce water evaporation.
- Controls erosion: provides a protective cover that prevents soil particles from being washed away by rain or wind.
- Enhances biodiversity: creates a diverse habitat for soil organisms such as earthworms, beneficial bacteria, fungi, and insects.
- Reuses organic waste: allows gardeners to make use of organic materials such as cardboard, newspaper, leaves, and grass clippings that might otherwise be considered waste.

SHEET MULCHING YOUR GARDEN

1

Preparation

Begin by mowing or trimming any existing vegetation in the area where you plan to create your garden bed.

2

Layering

Layer various organic materials directly onto the soil surface in alternating layers. Common materials used in sheet mulching include cardboard or newspaper (to smother existing vegetation), straw, leaves, grass clippings, compost, manure, seaweed, and other organic matter.

3

Watering

After each layer is added, thoroughly water the materials to help them settle and initiate the decomposition process.

4

Planting

Once the sheet mulch bed is constructed and sufficiently moistened, you can plant directly into the mulch layer. Simply cut through the mulch and plant your seeds or transplants into the underlying soil.



ADDITIONAL RESOURCES

BOOKS

No-Dig Gardening: Raised Beds, Layered Gardens, And Other No-Till Techniques by Bella Linde and Lena Granefelt

No Dig: Nurture Your Soil to Grow Better Vegetables with Low Effort by Charles Dowding and Jonathan Buckley

No Dig Organic Home & Garden: Grow, Cook, Use, and Store Your Harvest by Charles Dowding and Stephanie Hafferty

No-Till Gardening: The Organic Method for Richer Soil, Healthier Crops, and Fewer Weeds by Caleb Warnock

No-Till Intensive Vegetable Culture: Pesticide-Free Methods for Restoring Soil and Growing Nutrient-Rich, High-Yielding Crops by Bryan O'Hara

No-Till Vegetable Gardening: Harness the Power of Nature to Grow Highly Nutritious and Great Tasting Vegetables by Eugene Zellwood

Practical No-Till Farming: A Quick and Dirty Guide to Organic Vegetable and Flower Growing by Andrew Mefferd

The Ecological Farm: A Minimalist No-Till, No-Spray, Selective-Weeding, Grow-Your-Own-Fertilizer System for Organic Agriculture by Helen Atthowe

The Organic No-Till Farming Revolution: High-Production Methods for Small-Scale Farmers by Andrew Mefferd

ADDITIONAL RESOURCES

PODCAST

The No-Till Grower's Podcast Network: <https://notillmarketgardenpodcast.libsyn.com/>

WEBSITES

Discover the Joy and Ease of No-Dig: www.charlesdowding.co.uk/

No-Till Gardening: An Easier Way to Grow:
www.growveg.com/guides/no-till-gardening-an-easier-way-to-grow/

No-Till Gardening: Create a No-Till Garden and Retire Your Tiller Forever:
<https://gardentherapy.ca/no-till-garden/>

VIDEOS

How to Build a No-Dig Bed and the Benefits of Composting:
www.youtube.com/watch?v=laBXwOdbOlw

How to Make a No-Dig Garden Bed: www.youtube.com/watch?v=MACArjSim00

How to Make a No-Till Garden: www.youtube.com/watch?v=ZErovOnP8QI

How to Start a No Till Garden with Free Materials [The ONLY Way to Grow]:
www.youtube.com/watch?v=ZbuVU36WPD0

No-Till Gardening for Beginners: Step-by-Step Guide with Cardboard and Compost:
www.youtube.com/watch?v=0LH6-w57Slw

Super Easy No-Till Garden Method to Use Right NOW!:
www.youtube.com/watch?v=fW92eOvDSuE



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