



SAFE ROOTS

*A Guide to Gardening
in the City*



**GRASSROOTS
GARDENS WNY**



Visit grassrootsgardens.org/saferoots to download copies of this guide in other languages or call Grassroots Gardens WNY at **716-783-9653** if you would like copies for your community.

Copyright 2022.





Purpose of This Guide

This guide provides information about preventing illness while growing produce in potentially contaminated urban spaces. Many people are not aware of the soil contamination in the city of Buffalo, caused by a long history of industrial and residential pollution. Newcomers to Buffalo, especially those used to growing food at home, may be unaware that the city's ground soil may contain lead and other toxins that could hurt them or their children. Included in this guide are best practices for urban gardening such as using containers and raised beds. We've also provided information on where to build your garden, safe watering and fertilizing practices, and how to harvest in the healthiest way possible.

Grassroots Gardens WNY is Buffalo's community gardening organization. If you are unable to grow in raised beds or containers at home, we can help you locate a community garden near you, to join at no cost. Please contact us at **716-783-9653** for more information.





In This Guide...

Helpful Definitions	1
Buffalo's Soil History.....	3
Toxins and Soil Absorption.....	5
Community Gardens	7
Benefits of Raised-Bed Gardens	9
Building Raised-Bed Gardens.....	11
Garden Site Selection.....	13
Choosing Seeds	15
Watering Your Garden.....	17
Synthetic Fertilizers	19
Organic Fertilizers.....	21
Harvesting Safely	23





Grassroots Gardens of WNY is a dedicated group of community gardeners and activists. Our mission is to share knowledge, power, and resources to grow healthy food, heal systemic harm, and strengthen neighborhood connections through community gardens.



Our vision is to create a lasting network of land and people growing healthy communities. We currently have over 100 community and school gardens in the cities of Buffalo and Niagara Falls, New York in our network.



Helpful Definitions

The following terms are underlined throughout the guide, and their definitions are below for your reference.

Community Garden

a public garden where neighbors garden together

Compost

decayed organic material (vegetable scraps, leaves, etc.) used as natural plant fertilizer to build soil vitality and composition

Contaminant

something that makes a substance harmful or unusable

Contamination

containing harmful substances

Cross Contamination

passing harmful substances from one thing to another

Edibles

something that can be eaten; food

Fertilizer

any substance that adds nutrients to soil

Humus

the dark, organic material in soils, produced when vegetable material breaks down and makes the ground fertile.

Nutrient

any substance that provides benefits to something organic

Organic

derived from nature; in relation to gardening, organic means that no synthetic chemicals are used in the growing or processing of seeds, soils, or crops

Ornamental Plants

plants that cannot be eaten





Pathogen

any disease-producing, living thing

Pollutant

any substance that makes air, soil, water, or other natural resource harmful or unsuitable for a specific purpose

Raised Bed

soil enclosed in a frame above ground; usually made of wood or stone.

Remediate

to reduce or remove pollutants

Synthetic

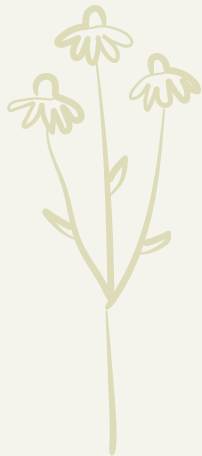
human-made

Toxin

anything that can be poisonous or harmful



CORBIS OUTLINE NORTH LTD. WELLS PHOTOGRAPHY CO. CORBIS OUTLINE PHOTOGRAPHY CO.



Buffalo's Soil History

There are a growing number of Buffalo residents who have taken interest in growing their own food in their backyards, front yards, or in **community gardens**. This is a great way to access healthy fruits and vegetables for a lower cost. However, there are precautions that must be taken when growing food in urban areas.

Buffalo is an old American industrial city. It was a transportation center for railroads and waterways. Steel plants and other manufacturing jobs were a driving force of its economy. The regulations on these industries in the past were not as strict as they are today. **Pollutants** and **toxins** such as lead, arsenic, and other harmful substances leaked into the ground and nearby rivers and lakes. To this day, the city is still remediating **contaminated** land.

For several decades, Buffalo saw its population decline as people moved to other areas for jobs. As a result, much of the housing in the city fell into disrepair and some houses had to be demolished. It was common practice until the 1980s to bulldoze debris from housing demolitions into the land. This means that if a house had lead paint or other toxins, as most houses built before the 1970s did, that lead or those other **toxins** could be trapped in the soil in your front or back yard.





Toxins and Soil Absorption

Toxins such as lead, asbestos, petroleum products or pesticides may be in city ground soil and can be absorbed through the roots of plants. These substances make their way through the plant and into the parts we eat. They can be harmful and cause illness if large amounts are ingested.

There is no way to know if the soil around your home is safe to grow food in without having it professionally tested by a special laboratory. The safest way to grow **edibles** at home is in **raised beds** or containers with clean soil purchased from a garden center. This ensures you and your family are not eating food that could be **contaminated** with **toxins**.







Community Gardens

Buffalo's **community gardens** are a safe alternative to home growing. The majority of the city's gardens are part of the Grassroots Gardens network. All of our member gardens in the city of Buffalo sign a membership pledge to grow safely, including growing only in tested soil, mounded soil, or in raised beds above ground. We never use ground fill for raised beds; instead, we deliver organic soil from a trusted vendor who tests it each year. We also provide all of our member gardens with access to untreated, natural wood (primarily cedar) and the landscape fabric necessary to create a barrier to the ground soil. Furthermore, each garden can access wood chips or mulch to act as an additional barrier on their lot to reduce the risk of lead dust.

Each member-garden is managed by the community members growing there, and Grassroots Gardens routinely visits each garden site, at least twice per season, to ensure safe growing practices are followed. There is no cost to joining or starting a Grassroots Garden. Call us at 716-783-9653 to be connected to the community garden nearest you or to learn about starting a community or school garden.

Whether you are growing at home or growing in a community garden, the information in this guide should be considered best practices in urban gardening.





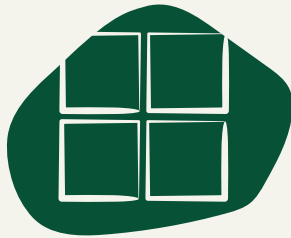
Safer



Easier



Organized



Benefits of Raised-Bed Gardens

A **raised bed** is soil enclosed in a containment unit or frame, usually made of wood or stone, that serves to raise the added soil above ground level. **Raised beds** are helpful in preventing plant **contamination**. They provide a barrier between soil that might have **pollutants** in it, and the plants' roots.

Raised beds are great for gardening for many reasons, not just preventing vegetables from taking in **pollutants**. They make gardens look neat and organized and can make gardening easier for many people. Much of the soil in Buffalo contains a lot of clay. This happens in places close to rivers and water bodies. Having too much clay in the soil can make it difficult to dig into the ground. Building **raised beds** makes it easier to plant with new soil.

If you are gardening with children, **raised beds** can bring the plants up to their eye level. Older aged gardeners can benefit from raised beds as well. **Raised beds** elevate the plants, so there is less bending over to harvest and weed.



Building a Raised-Bed Garden



Raised beds are usually framed by some type of barrier such as wood or stones. Do not use wood that has been treated with chemicals, such as rail-road timber, pressure-treated wood, painted wood, or wood from pallets because it may have **contaminants** in it. Use sturdy, untreated lumber, such as untreated pine or cedar, at least 12-18 inches tall, to build the frames of the bed. Line the bottom with a permeable barrier to allow water to drain and prevent contact between new soil and ground soil. Fill the bed with clean, **nutrient**-rich soil purchased from a garden center or trusted company. Do not use soil from your yard or fill from other places, as it may be **contaminated**.

In Buffalo, Urban Roots Cooperative Garden Market at 428 Rhode Island Street is a good place to purchase bags of soil or **compost**. You can also purchase food-safe growing containers if you want to grow food in pots.







Garden Site Selection

If you are starting a new raised-bed or container garden, you'll want to choose a good site to keep your plants free from **pollutants**. Build your garden away from railroads or heavily trafficked streets. Before you put the **raised bed** down on the ground, cover existing soil with mulch, cardboard, or grass. Then make sure you have a barrier, like permeable fabric, at the bottom of your bed.

Make sure the site you choose for your garden has sunshine and good drainage. It is important to make sure that water does not collect where you are growing food. Also think about how far you will have to carry water from its source. Know your garden's history, even if you are planting **ornamentals**. Former parking lots can have oil and gasoline in the soil. Sites that housed old buildings might have lead and asbestos in the soil. Wherever you are gardening, take care to not track dirt into the house. Remove shoes before going inside.





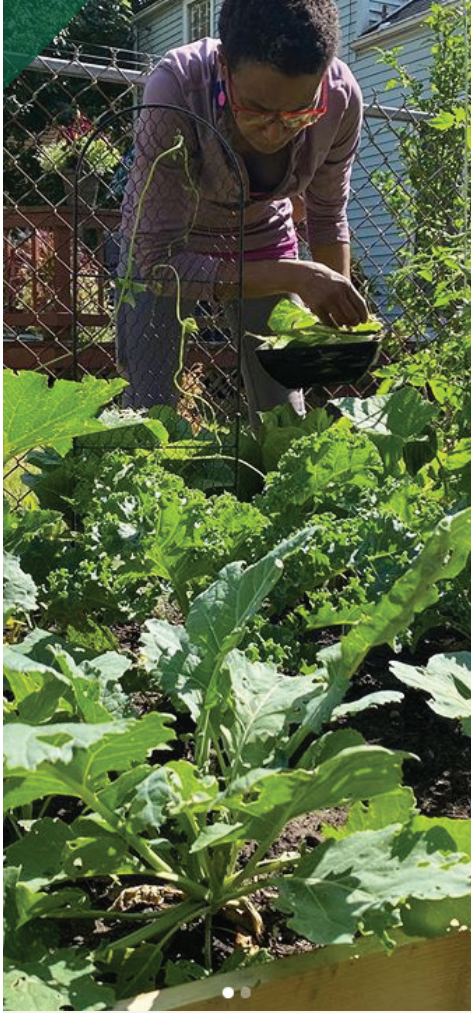
Choosing Seeds

The healthiest seeds will produce the healthiest produce. Choose **organic** seeds when available.

Buffalo's downtown Central Library hosts a seed library. This is a great place to "borrow" seeds from at no cost, to get your garden started. Grassroots Gardens WNY can also help you find organic seeds as well as culturally-specific seeds.







Watering Your Garden

Make sure the water for your garden comes from a reliable source. Rivers, streams, wells, and ponds might be **contaminated**. Use water that comes from the city's pipelines, which has been purified.

Rain barrels are a great source of sustainable water. They collect rain water from nearby roofs that can be used for your garden. However, there are some considerations when using rainwater collected by roofs. Metallic roofs or roofs with asbestos shingles can **contaminate** rainwater due to the coating that is used on them. If your roof is metallic or has asbestos shingles, use this rain water for **ornamental plants only**, never for **edibles**.





City pipelines



Rain barrels



Organic



Synthetic

Synthetic Fertilizers

A **fertilizer** is any substance that is used to add **nutrients** to the soil. **Synthetic fertilizers** are human-made and contain a lot of **nutrients** but also filler (sand, sawdust, toxic waste) that is used to distribute them. Most **synthetic fertilizers** have high levels of nitrogen as their largest component. Nitrogen encourages top growth, but produces watery, weak celled growth in the plant. Watery cells bring insects and disease to plants. Too much nitrogen creates an imbalance for both plants and soil. It also gets washed away regularly through the soil and into the water system.

Synthetic fertilizers also have “super phosphate” which grabs sand and locks in other minerals, making them unavailable to plants. **Synthetic** potassium is harsh on plants—especially fruit crops. Good **fertilizer** should contain potassium sulfate. Over time, **synthetic fertilizers** cause the soil to lose its **organic** matter and beneficial organisms that help build the soil. It will take more and more **synthetic fertilizer** to stimulate plant growth. Using a lot of **synthetic fertilizer** can also cause a buildup of toxic chemicals such as arsenic, cadmium, and uranium in the soil. These toxic chemicals will eventually make their way into the plants, fruits, and vegetables and into your body.

It is much better for plants and people to stay away from **synthetic fertilizers** and use **organic fertilizers** instead.







Organic Fertilizers

Creating a living soil, rich in **humus** and **nutrients**, is key to growing great crops of fruits, vegetables, abundant flowers, and healthy trees and shrubs. **Organic** materials act as **fertilizers** and improve soil's physical qualities. **Organic fertilizers** have trace minerals that are better than synthetic fertilizers at increasing biological activity in the soil. They are released slowly, which makes it difficult to over-fertilize and harm plants. A good soil provides plants the ability to absorb **nutrients** and water, and develop strong root systems. There is little to no risk of toxic buildup of chemicals and salts. Organic manure is a basic building block and a gentle **fertilizer** that encourages helpful organism development in the soil. By adding **organic fertilizer** to your soil, it will fulfill plants' need for **nutrients**.

Visit the Grassroots Gardens website to learn more about home-composting and how **compost** is a type of **organic fertilizer** you can make at little or no cost.

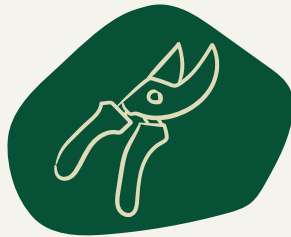




Wear gloves



Wash produce



Clean tools

Harvest Safely

When it is time to harvest your crops, take the following steps to reduce the risk of **contamination** and make sure your food is clean:

- Wear gloves to prevent dirt from getting trapped in cuts on your hands or under your fingernails
- Place harvest in clean containers or bags
- Wash your hands thoroughly when you are finished working in the garden
- Clean your garden tools. This will prevent **cross contamination** between food, as **pathogens** can linger on tools for a few days.
- Peel root crops like carrots and potatoes
- Remove outer leaves from leafy vegetables like cabbage or greens
- Wash produce



This guidebook is intended for both home and community gardeners and is available in multiple languages. It is brought to you by Grassroots Gardens WNY along with our partners at the University at Buffalo Community for Global Health Equity, Urban Roots Cooperative Garden Market, and the Western New York Children's Environmental Health Center.

Special thanks to Dr. Melinda Cameron, Dr. Sarah Ventre, Patti Jablonski-Dopkin, and Joshua Gordon for their contributions. We are also grateful to Rachel Bridges for the graphic design. Translation provided by the International Institute of Buffalo. Funding for this guide has generously been provided by the U.S. Department of Housing and Urban Development Office of Lead Hazard Control and Healthy Homes.



**Learn more about best practices in urban gardening at
www.grassrootsgardens.org**