

An Introduction to This Journal

In mathematical chaos theory, the butterfly effect is the concept that a *very small* difference in the initial state of a physical system can make a significant difference to that state at some later time. What can this theory offer to the communities in which we live? We think it offers a lot. The cumulative effort of individual actions can positively impact the local ecosystems that comprise our lakes, streams, wetlands, yards, gardens, recreational areas, open spaces, roadsides, schools, and places of worship. Margaret Mead's powerful idea, "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has," informs the articles you will read in this journal.

Neighborhood Greening, a non-profit organization dedicated to environmental education and stewardship, publishes *The Butterfly Effect* four times each year. In the journal, we celebrate community successes, examine small but impactful changes we can make to become better stewards of our local ecosystems, and tell the stories of those who are striving to green their neighborhoods. By harnessing the spirit of community, we believe focused efforts will make our neighborhoods better places to live for both humans and wildlife. There is much we can do to positively impact our shared environment—together. House by house. Block by block. Neighborhood by neighborhood.

We hope you enjoy *The Butterfly Effect* and that you look forward to receiving this free publication in your inbox four times per year. You can sign up by visiting www.neighborhoodgreening.org.

Cover photo: Female black swallowtail butterfly. **Right:** Black swallowtail caterpillars feeding on a host plant, heartleaf golden Alexander (*Zizia aptera*), a member of the carrot family. Only Mother Nature could conjure up patterning and coloring as wildly beautiful as black swallowtail "cats." Who could guess that the larvae shown on this page would turn into the butterfly in our cover image? Carrots, parsley, dill, fennel and many of their "plant relatives" are host plants to the black swallowtail. **Photo credits:** Vicki Bonk.



Feed the Soil. Not the Grass.

John Coatta, of <u>Green Core Organic Lawn Care</u>, explains how homeowners can have lush lawns that don't rely on weed killers and synthetic fertilizers.

Q. Everyone loves a lush, green lawn. But what happens when we fertilize?

A. When I talk about lawns, I often make analogies to the human body. Synthetic fertilizers are to grass as steroids are to humans. When we take a steroid, our muscles react to it. They become pumped up and begin to rely on steroids to maintain that unnatural state. Grass that is kept lush and green with fertilizers relies on chemicals to maintain a state, too. We "pump up" the grass artificially. Our lawns are not being sustained by healthy soil. Our lawns are being unnaturally sustained by artificial inputs.

Q. Fertilizers and other chemicals, such as herbicides, affect grass. Do they affect soil, too?

A. Yes, keeping with the analogy of the human body, our bodies are made up of all kinds of healthy bacteria and microbes, which are a necessary part of human function. This is true for soil, too. Soil is filled with microbes: bacteria, fungi, protozoa, nematodes, mites, and microarthropods. These invisible, beneficial creatures are integral to good soil health. Applying synthetic chemicals such as fertilizer, herbicides, fungicides, and pesticides, kills off these healthy microbes. Chemicals—including chlorine from our hose water—kill 90 percent of healthy soil microbes, the very microbes that are the key to lawn health.

Q. Do synthetic chemicals affect what is growing in that soil?

A. Grass, as well as the food we grow and eat, are impacted by soil quality. For example, soil microbes break down twigs, leaves, grass clippings, and branches and recycle nutrients naturally back into the soil. This results in nutrient-rich soil. Healthy soil impacts plant health. This nutrient recycling is part of the natural circle of life. If we destroy microbes, we destroy soil health.

Q. People often think that organic lawn care means weeds and ugly grass.

A. I think the issue is having patience to let a yard transition from chemical care to organic care. We start with a soil analysis to understand the unique characteristics of a particular lawn. Based on the soil profile, we know what amendments need to be made. The "tools" in our toolkit are natural amendments. For example, kelp provides minerals and vitamins. Soybean meal is a protein that provides nitrogen, a key element of chlorophyll production. Iron can be added to lawns to dehydrate weeds. We even introduce microbes into a lawn that destroy chlorine from hose or sprinkler water.

Right: A yard managed by Green Core Organics, three years after being converted from traditional lawn care to organic lawn care. The lawn was aerated and overseeded with a fescue mix to create a thicker, healthier lawn. The deeper roots in this lawn require less water.



"Somewhere along the way we decided to convert most of our living and working spaces into huge expanses of lawn. So far we have planted over 62,500 square miles, some 40 million acres, in lawn. Each weekend we mow an area eight times the size of New Jersey to within one inch and then congratulate ourselves on a job well done."

-Doug Tallamy, Ph.D., from the book Bringing Nature Home

All lawns are different so there is no one formula we use. We start with five applications that are designed for a specific lawn. We shift to three as a lawn stabilizes. It takes time to wean a lawn off of its "chemical dependence" to lawn care that uses organic inputs and relies on natural nutrient recycling. The key to good organic lawn maintenance is the timing of these organic applications.

Q. How else do you care for lawns?

A. We aerate by removing a 2 ½" soil core and dropping the plug onto the lawn. Oxygen can then better penetrate roots so that they grow deeper. Longer roots require less water. We wean grass off of water dependency and the need for timed sprinkling. Watering becomes necessary only in the most severe conditions.

We also overseed after core removal. We usually do this in the fall so that grass can germinate over the winter. Fresh grass emerges in the spring. This means denser grass and less space for weeds to germinate in the spring.

We use a mix of 7-10 varieties of grass, including fescues. We have weather extremes in Minnesota. It can get very hot and very cold here, with wide fluctuations in temperature as well. And those fluctuations can happen quickly. Our yards can get very dry. Likewise, they can get very wet. No single grass is resilient enough to handle all these conditions. With a mix, we have a range of grasses that "come to life" as others may be going dormant or have yet to emerge. For example, red rye in our mix thrives in temperatures that are too cool for Kentucky blue grass (the type of grass that is predominantly used in most Midwestern lawns). No mow and slow grow grasses are great for slopes and hills, as well as areas that are hard to mow. These grasses are also wonderful for a more natural "meadow" feel in certain areas in a yard.

Q. And, the question everyone has: is organic lawn care more expensive than traditional lawn care?

A. At the beginning, it might be. However, we have found our pricing to be comparable with traditional chemical lawn care firms. As the soil begins to heal over time, costs decrease. Grass starts to grow more slowly, which means less mowing. Nutrient inputs are reduced. Roots grow deeper, which in turn requires less watering. And, our products are all natural and safe—kids and pets are always welcome.

To learn more about Green Core Organic Lawn Care, visit <u>www.greencoreorganics.com</u>. John Coatta can be reached at <u>info@greencoreorganics.com</u>.

For a full list of resources for rethinking grass, see page 34.



House of Hope Helps Feed Those in Need

As told to Neighborhood Greening by House of Hope gardener, Terri Mattila

"The church garden was started in 2011 as a way for our church to help feed the hungry in our community. We never intended it to be used by church members. Our sole focus was to donate the produce to a local food shelf. We chose to work with Neighborhood House, a non-profit located on the west side of St. Paul. We always try to have 'staple items' as well as produce that ethnic communities who use Neighborhood House's food shelf would enjoy. We grow at least six different kinds of herbs as well as a wide variety of lettuce, and over 20 different types of fruits and vegetables.

Food shelves mainly provide nonperishable items, so it's nice to be able to contribute fresh food. Our garden was intentionally placed in a visible location on Summit Avenue as a reminder to passersby that not everyone is fortunate enough to buy all the food they need. One could say another purpose of the garden is to remind people of this fact.

My favorite part of this project is bringing donations to the food shelf. Patrons are so delighted when they see us come in with a delivery of fresh garden produce. The food we deliver is taken off the shelves almost immediately. We also appreciate the positive comments from passersby while we work in the garden. It is a beautiful garden and our community seems to value it. The strawberries that we grow are on the outside of the fence for anyone to take. It's rewarding to see people picking some strawberries to eat as they walk by. We believe this builds community.

Many of the volunteers who work in the garden say it fills them with a sense of peace which comes from the feeling that they are doing something good to help our community. While we have about 20 volunteers, sometimes it's hard to get everything done. During harvest season, we are incredibly busy. Most of us have full-time jobs or young children. I personally am not a gardener. I have learned a great deal over the years, however, from the volunteers in the group who have deep knowledge about gardening.

Maintaining the garden can be challenging. But the rewards far outweigh our challenges. The main reason I am a member of House of Hope is that this church has a strong commitment to help those in need. The garden is one important way this mission is fulfilled."

Above, right: One of the church's youngest gardeners displaying late season bounty of delicata squash and a carrot. **Below, right:** A purple cabbage.









Interested in Starting a Vegetable Garden at Your Place of Worship? Some Tips from the House of Hope Gardeners.

Favored source for organic seeds: Johnny's Seeds

Favored source for purchasing plants locally: Mississippi Market

Plan ahead for irrigation. Don't install a garden without considering the proximity of your water source. House of Hope has a built-in irrigation system.

Garden planning: Territorial Seed Company online garden planner

House of Hope invested in the professional services of Paula Westmoreland of <u>Ecological Design</u>, a permaculture design company, to help with the initial layout of the church's high production garden.

If you have a community garden in a prominent area, be prepared to answer a lot of questions from passersby. Also be prepared to receive compliments!

What Grows in House of Hope's Garden?

- Kale
- Lettuces
- Peppers
- Radishes
- Squash
- Strawberries
- Swiss chard
- Tomatillos
- Tomatoes
- Turnips

- Beans
- Beets
- Cantaloupe
- Carrots
- Collards
- Cucumbers
- Eggplant
- Herbs
- Watermelon
- Zucchini

Be sure to look for Part II of The Farmers Among Us in the Fall 2018 issue of The Butterfly Effect, featuring a "high production" backyard garden as well as an amazing schoolyard garden.

Above, left: People walking by the House of Hope garden are encouraged to enjoy the strawberries planted outside the garden's fencing. **Below, left:** A handful of the church's gardeners pose proudly in the garden. From left to right: Elizabeth Karre and her son, Elizabeth Ihrig, Terri Mattila, Larry Nelson, and Mary Senkbeil. **Photo credits:** Nel Pilgrim-Rukavina.

The Farmers Among Us

Open Farms With Open Arms: A Local Non-Profit Grows Fresh, Organic Food for Clients in its Meal Program

Open Farms may be one of the most innovative high production organic farms in the Twin Cities metro area. Initially established in 2011 as a collaboration between the non-profit Open Arms and the Prairie Oaks Institute located in Belle Plaine, Open Farms eventually moved its farming operations to the heart of the Twin Cities. Today, Open Farms has expanded to four Minneapolis- and St. Paul-based urban locations. With each farm given a formal name—Compassion Farm, Joy Farm, Abundance Farm, and Hope Farm—it's clear that Open Arms has a deep emotional connection to its farming operations.

The core of Open Arms' mission is to prepare and deliver nutritious meals to clients: individuals living with life-threatening illnesses such as HIV/AIDS, cancer, MS or ALS. With the help of more than 6,000 volunteers, as well as on-staff professional chefs, Open Arms prepares (and delivers) nearly 600,000 meals each year, at no cost to the client.

Open Arms considers making food for people "an act of love"—love that is reflected in the wide variety of nutritionist-prepared menus it offers clients: African-style, gluten free, vegetarian, flavor-neutral, renal care, nausea care, heart-healthy, meat and potatoes, "variety pack," and Latino-style. Meals are also prepared with a sensitivity to client allergies, or religious beliefs. Love is also reflected in the non-profit's growing some of the nutrient-dense, organic fruits, herbs, and vegetables it uses in its prepared meals. Last year Open Arms grew a total of 15,000 pounds of produce on its four farms—enough for nearly 18,000 meals.

The individual at the center of Open Farm's successful farming operations is Kelly Wilson. She manages the farms using organic methods and permaculture principles in order to work with nature, rather than against it. In describing her very large







job description, Wilson simply explains she is responsible for "all things farm-related" including, but not limited to, farm volunteers, interns, and staff. And recordkeeping. And the farm's Community Supported Agriculture (CSA) program. And more.

The number of professionally managed urban farms, community farms, schoolyard and backyard gardens, as well as gardens at places of worship, has grown dramatically over the past decade. Combined with the increasing interest in urban beekeeping and chickenraising, CSAs, and farmers markets, locally produced food is clearly more than a trend. Evidence of growing interest in local farming, for example, is reflected in the city of Minneapolis' Locally Grown webpage.

According to Wilson, one of the most challenging aspects of urban farming is land access and permanence. "Land that is available for urban farming one year may not be the next," she explains. "This turnover is challenging for farmers because we are trying to create healthy ecosystems in order to grow nutrient-dense food. This does not happen overnight—it can take years to build up healthy soil on a previously vacant or abandoned lot." Another challenge is soil contamination. "Luckily, in the Twin Cities we have many resources for professional soil testing. All of our Open Farms sites have been tested and approved."

But even with these challenges, Wilson sees incredible opportunities. "The urban agriculture community in this area is thriving and there are incredible benefits from urban farming and community gardening." Among the benefits are the ecosystem services organic farms produce such as increased pollinator habitat and green space, carbon and nitrogen sequestration, decreased storm water runoff, air filtration, and increased biodiversity. Urban farms offer opportunities for learning and exploration. Their community presence encourages people to interact with their environment, creates a sense of belonging, and helps strengthen relationships between people and the land.

"I think there is an understanding that when we come together, the more resilient we become as a society," says Wilson. She also recognizes the profound effects farming has had on her as well as those she works with. "In my 10 years of farming, I have had some of the most life-changing experiences, while covered in dirt, hands pulling weeds. Perhaps there is something that connects us to our ancestors in those moments. The hustle of daily life fades away. The satisfaction I see in people after they harvest the first crop they have ever grown is deeply humbling."

Interested in volunteering for Open Farms? <u>Learn more</u>.

For Kelly Wilson's words of wisdom and favorite resources for those interested in high production gardening, see page 34.

Left: Open Farms would not be possible without volunteers' labor of love. **Photo credit:** Open Farms.

Round About Our Communities

Where's this? When was the photo taken? (See answer on last page)



The Living World Beneath Your Feet

Article and images by Kassandra Brown, founder of <u>Renaissance Soil</u> and a graduate of the College of Agriculture and Life Sciences at the University of Wisconsin, Madison. Renaissance Soil was formed to spread excitement and knowledge about our underground ecosystem through classes, demonstrations, and citizen science research.

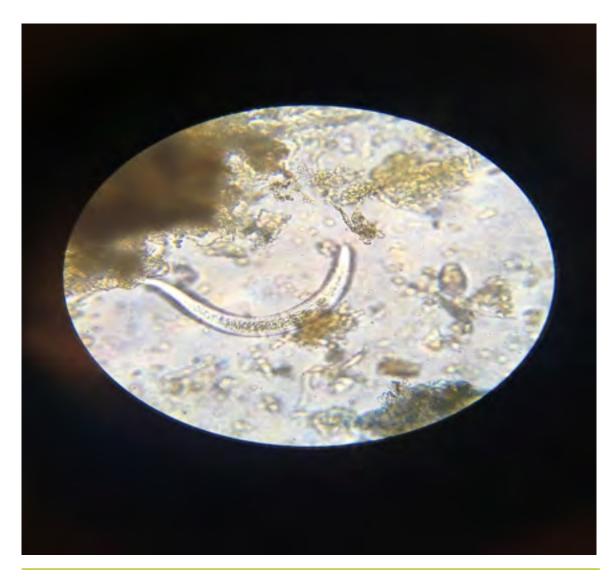
Did you know that dirt is dead soil? Dirt is "parent" material: rocks, minerals, silt, clay. Soil is dirt formed by innumerable living micro-organisms, organic matter, and abiotic factors such as wind and water. Soil is a complex, living, breathing ecosystem.

Unfortunately, many human actions (such as applying synthetic fertilizers and pesticides, plowing/tilling) transform soil into dirt. By destroying the <u>essential microbes that live in soil</u>, the world beneath our feet loses its life-generating abilities. Once dirt exists, plants require a human-supplied chemical cocktail. In dirt, plants become sick. They are exhausted by pumping a lot—up to 50 percent—of their energy into the soil, calling to their microbe friends for help without reply.

When soil is transformed into dirt, the complex systems that grow healthy plants, filtrate water, store carbon, and prevent erosion, are destroyed. Plants then rely entirely on artificial chemical intervention for their survival. We're poor substitutes for the millennia-old partnerships that exist between plants and the soil.

Right: The two brown strands, as seen under the microscope, are beneficial fungal hyphae from healthy forest soil. They are small parts of the web-like network through which fungi eat, grow, and build relationships with each other and plants.





Above: This beneficial, bacteria-eating nematode swims around the microscope slide. In soil, these predators eat bacteria and excrete plant-available nutrients.



Above: A single teaspoon of rich garden soil can hold up to one billion bacteria, several yards of fungal filaments, several thousand protozoa, and scores of nematodes, according to Kathy Merrifield, a retired nematologist at Oregon State University. **Photo Credit:** Open Farms.



Become a Citizen Scientist

You may not be aware of the vast role citizen volunteers—people just like you—play in scientific research collaborations. Throughout Minnesota, as well as the country, citizens collect data, monitor, count, observe, listen, measure, and more. Public participation in scientific research is crucial to help fill the gaps: There are more needs for data than there are scientists to collect it. No science background is required. Most programs offer training and detailed instruction for participation. Programs abound for citizen involvement. Consider participating. You are desperately needed.

For links to citizen science programs, visit Neighborhood Greening's resource page at: https://neighborhoodgreening.org/resources/

A Sampling of Programs that Rely on Citizen Scientists. Get involved!

- Audubon "The Great Backyard Bird Count" (every February)
- Bumblebee Watch
- Christmas Bird Count
- Citizen Lake Monitoring Program
- Citizen Stream Monitoring Program
- Dragonfly Pondwatch Project
- Frog and Toad Calling Survey (MN DNR-statewide opportunities)
- Frogwatch USA
- Journey North Monarch Sightings
- Lake Ice Reporting Program
- Lake Level Minnesota Program
- Loon Watcher Survey
- Lost Ladybug Project
- Minnesota Bee Atlas
- Minnesota Bumblebee Survey
- Monarch Larva Monitoring Project
- Wetlands Health Evaluation Program (WHEP)
- Zebra Mussel Monitoring Program

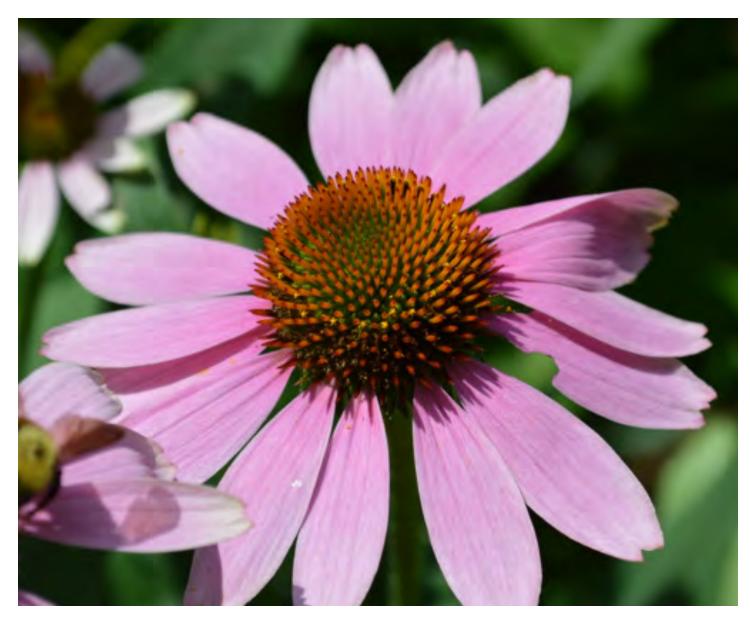
Left: The Monarch Watch program "engages citizen scientists of all ages in large-scale research projects involving the tagging and tracking of migrating monarchs." Monarch Watch's citizen led wing-tagging program produces significant data on monarch migration and related conservation issues. The program has inspired schools, places of worship, homeowners, and cities and municipalities across the state to install native plant Monarch Waystation gardens as places to conduct citizen science, create habitat, observe, enjoy, and engage the public. **Photo credit:** Vicki Bonk.



Above: A lakeshore homeowner monitoring LeMay Lake in Mendota Heights. One of the tools used to measure water clarity is a Secchi disk, shown in the photo above.



Above: Birding enthusiast, Liz Stanley, has participated in <u>Audubon's annual Christmas Bird Count</u> for over 10 years. "It's a fun way to get outside, connect with friends, and meet new people. It helps the community become aware of and get involved in citizen science, which ultimately contributes to conservation of habitat and wildlife."





Consider the Consequences of Your Purchases at the Garden Center This Spring

This spring, as you pore over all the wonderful things your favorite garden center has to offer, remember to be a conscious consumer. Some of your potential purchases may deserve to be scrutinized. Here are a few examples.

When buying flowers: The more a plant is manipulated, the less attractive it becomes to wildlife. Changing a plant's natural traits such as color, size, shape, bloom time, leaf variegation, leaf color, structure, and even scent, can diminish its wildlife value. One example: native *Echinacea purpurea* (above, left) has been cultivated into a floral oddity (below, left). The dense and deep structure of the ironically named "Butterfly Kisses" probably keeps most pollinators away. This cultivar's seedhead has virtually vanished so that it offers few winter seeds for birds.

The native flower's unaltered open structure (above, left) offers pollinators easy access to nutrients. If you want plants that offer the greatest ecosystem value to your garden, buy native plants. If you include cultivars in your purchases, realize that the more manipulated the plant, the less value it will have for the wildlife in your garden.

When buying mulch: Leave the cypress mulch at the store. Cypress forests are rarely replanted after they are harvested. And because large swaths of mature cypress forests have been harvested, mulch manufacturers are starting to harvest immature trees. Best to leave the cypress mulch behind and consider other options. When buying mulch, ask which mulches are the most sustainable products available, and why. "Wood from the hood" types of mulch-mulch from local city trees trimmed or downed from storms—are among the most sustainable sources.

When buying peat moss/compost/soil amendments: Leave the peat moss at the store. Peat bogs are seen by some scientists to be as important and fragile as rainforests, and that's where the concern lies about the use of peat moss by gardeners. "Peat companies are destroying these fragile, unique, and valuable bog ecosystems by removing the peat. Peatlands store a third of the world's soil carbon, and their harvesting and use releases carbon dioxide, the major greenhouse gas driving climate change ... For horticultural use, the extraction of peat requires the removal of a bog's living surface to reach the partially decomposed layers beneath. It grows at a mere sixteenth of an inch a year, and its mining removes layers that take centuries to develop. Peat is the best vegetative carbon sink we have on the planet," Highland said. "Why dig it up?" (from *The Washington Post*).

Alternatives to peat moss: Good old-fashioned compost is a sustainable way to build soil health.

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Notice Nature Everywhere



"We live in Eagan and our backyard borders Burr Oaks Park. When I cut the grass in early summer, I always have several small toads in the yard. It takes me just a little while longer to cut the grass because I always stop to move these little guys out of the way."

-Max Saucedo

Left: American Toad, which average 2-3 inches long. **Photo credit:** Max Saucedo.

'It's the action, not the fruit of the action, that's important. You have to do the right thing. It may not be in your power, may not be in your time, that there'll be any fruit. But that doesn't mean you stop doing the right thing. You may never know what results come from your action. But if you do nothing, there will be no result.''

-Mahatma Gandhi

Did You Enjoy This Edition of The Butterfly Effect?

Don't miss the next journal! Sign up to receive your free e-version of *The Butterfly Effect* at www.neighborhoodgreening.org/the-butterfly-effect. Be sure to "friend" Neighborhood Greening on Facebook to keep learning how to help green your neighborhood throughout the year.

Do you have a story or idea to share about how you or someone you know is making your neighborhood greener, more environmentally sustainable, or wildlife friendly? Please send your ideas to <u>Green@neighborhoodgreening.org</u>.

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And thank you to this issue's contributors:

Carole Arwidson, John Coatta, Terri Mattila, Kassandra Brown, Liz Stanley, Nel Pilgrim-Rukavina, Kelly Wilson, and Max Saucedo



Knowing is not enough; we must apply. Willing is not enough; we must do."

-Johann Wolfgang von Goethe, 18th century philosopher

66 I said you wanna be startin' somethin'. You got to be startin' somethin'. **?

-Michael Jackson, 20th century music artist

Resources for Rethinking Grass:

Green Core Organics Lawn Care

Organic Bob Lawn Care

Flowering Bee Lawns for Pollinators, University of Minnesota Bee Lab

<u>Cornell Turfgrass Program</u>: a series of how-to videos for homeowners who prefer a traditional lawn but want to care for it as an environmental asset.

<u>Beautifully Sustainable</u>: A comprehensive field guide to converting your landscape into a sustainable ecosystem that will utilize the natural resilience and beauty of native plant communities. By Douglas Owens-Pike

Rethinking the Traditional Lawn, an article by Angie Hong

About No-Mow Lawn Seed Mix

Replacing Your Lawn with Ecograss

Fleur de Lawn, a flowering eco-lawn seed mix that thrives in the midwest.

Resilience Seed Mix, a lawn seed mix of 28 species of graminoids and 36 forbs

Kelly Wilson's Words of Wisdom and Favorite Resources for Those Interested in High Production (Bio-Intensive) Gardening:

Learn some of the principles of permaculture. Through permaculture, a beginning farmer will learn to interact with the land in a much healthier way.

High production backyard farming (also called bio-intensive gardening) focuses on maximizing production on less land, using less water and resources while simultaneously maintaining soil fertility for continued output.

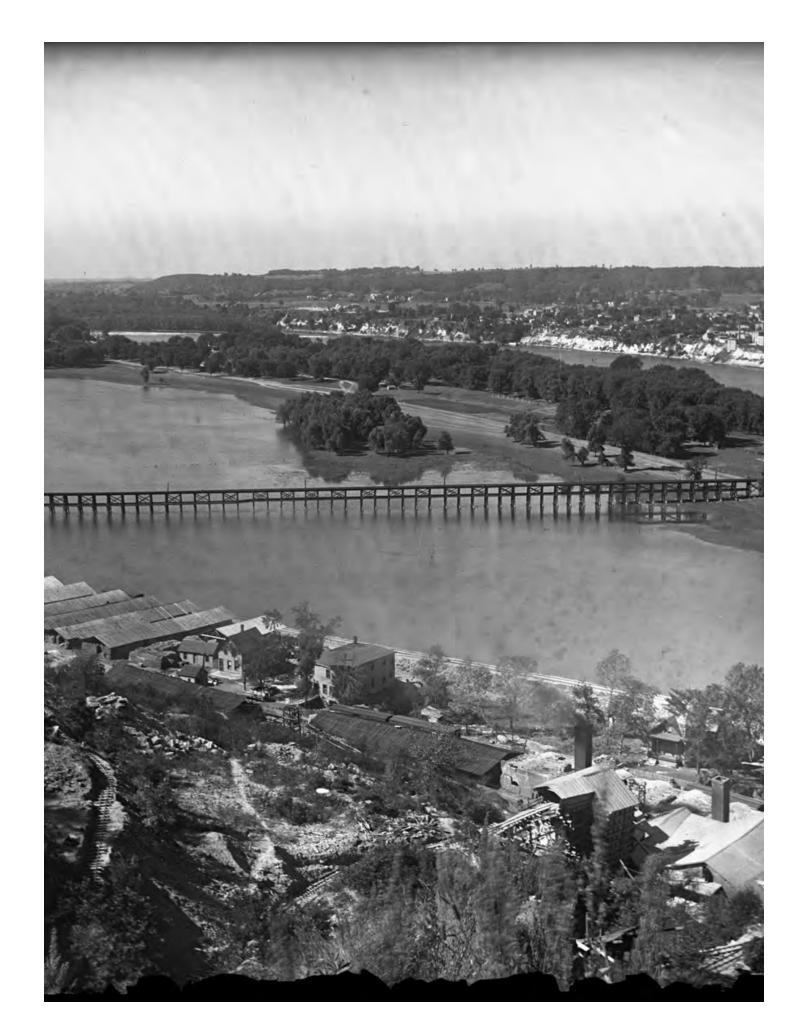
High production farming methods focus on composting, cover cropping, companion planting, and space-saving arrangements (such as non-traditional planting patterns or vertical gardening). It is perfect for the urban dweller with limited space.

How to Grow More Vegetables, by John Jeavon

The Urban Farmer, by Curtis Stone

How Market Gardener, JM Fortier, Farms 8 Acres (Without a Tractor), video

The Market Gardener, by Jean-Martin Fortier



Answer to Round About Our Communities

"View of railroad bridge crossing Mississippi at Lilydale, St. Paul," circa 1925.

This view is hard to reconcile with today's reality. That's because buildings were removed from this soggy floodplain decades ago to make way for Lilydale Regional Park. And, of course, the hills beyond are now dense with urban development. Driving down today's Water Street in Lilydale Regional Park in St. Paul, it's easy to intuit the homes and businesses that must have once existed on these "West Side Flats" on the Mississippi River at the turn of the last century. Looking across what is most likely Pickerel Lake, and St. Paul's Highland Park beyond, this sweeping view takes in a railroad bridge. Trains still run through Lilydale. Passing today under that old trestle bridge on Water Street, one can detect the faded words "River Rats" proudly spray painted underneath a railroad deck. This writer remembers first seeing those bold and rebellious words in the 1960s—back when they were freshly painted.

Photo credit: Minnesota Historical Society