

GARDEN IN-A-BOX

— by the —

Minnesota State
Horticultural
Society



Your Guide to Growing Veggies & Herbs in Small Spaces

This guide was originally created by Marty Bergland in 2015 and updated in 2022 by Courtney Tchida for the Minnesota State Horticultural Society's Garden-in-a-Box program.

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The Garden-in-a-Box Program

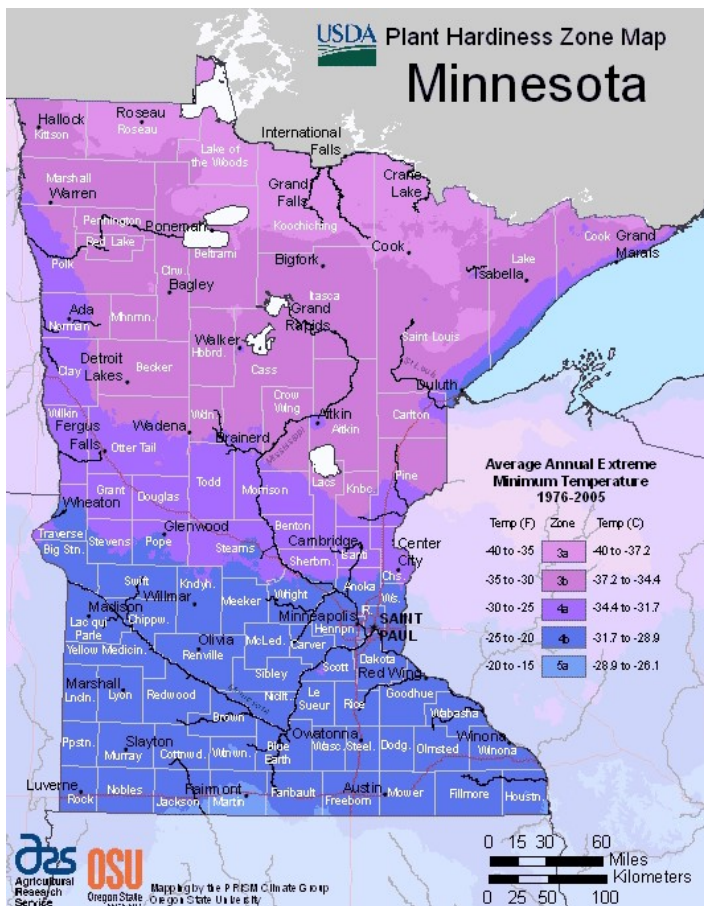
A signature Minnesota State Horticultural Society (MSHS) community outreach program, Garden-in-a-Box (GIAB) distributes more than 500 gardening kits—including plants, soil, fertilizer, raised beds and growing resources—to 80+ organizations throughout Minnesota every year. Created in 2008, GIAB gives thousands of children, adults and families the opportunity to learn how to garden and grow fresh food. MSHS distributes kits to nonprofit and community organizations, childcare centers and schools. Participating groups receive free plants, seeds, soil, educational materials and support.

What is MSHS?

The mission of MSHS is cultivating a healthy, diverse and sustainable community of northern gardeners. Serving members and the general public, MSHS publishes *Northern Gardener* magazine and provides resources and

educational opportunities for gardeners in USDA Plant Hardiness Zones 3, 4 and 5.

North America is divided into 10 cold-hardiness zones by the U.S. Department of Agriculture. (It's also divided into 12 heat zones, but those are not usually a concern in northern climates.) The hardiness zones are based on the lowest low temperature an area is likely to experience. So, if you live in Rochester, MN, your lowest low, according to the USDA map, is between -20 and -25 degrees F. If you live in Cook, MN, the lowest low will likely be between -35 and -40 degrees F.



What do GIAB kits include?

Each spring, MSHS distributes garden kit materials throughout Minnesota. Participating organizations receive:

- Garden Circles raised bed (s), 3 feet wide and 1 foot tall, made of polypropylene fabric and a metal mesh frame
- Enough soil and compost to fill the box (approximately 7 cubic feet) with growing medium—this is the basis of all life and provides the support needed for plants to grow and thrive
- A variety of vegetable, herb and flowering plants to grow in the raised bed(s)—may include tomatoes, peppers, onions, kale, collards, basil, parsley, marigolds and more.
- Access to MSHS' *Ready, Set, Grow* webinar series, chock full of the basics on garden planning, starting seeds and growing vegetables.
- And this handy guide!



An Opportunity to Grow

This is a chance for you to garden in a small space, whether as a first-timer or seasoned pro. Even with busy schedules and/or limited resources, you can enjoy the rewards of fresh, local and healthy food. Keep reading for suggestions about what to grow in a small space and how to do it successfully. Included are plans for getting started to produce the best yield, basic information on plants, choosing what will work in this space, as well as tending and harvesting your crops. A paper grid or visual layout of the box is provided (p. 22) to guide in selecting, planting, and tending. Garden-in-a-Box is basically an intensive gardening system in an 12” raised bed frame. The result is about 7 square feet of gardening space.

Much of the information provided below is consistent with ideas expressed in Mel Bartholomew's book *All New Square Foot Gardening* as well as other sources and is in reference to the transplants and seeds provided by MSHS. Look for a list of additional resources for further information at the end. Recording your results will help you and MSHS continue an ongoing gardening learning process. Enjoy!



Getting Started:

Choosing Plants

To plan for the best outcome, consider the following:

- Which vegetables and herbs do you use most often?
- Which ones are favorites?
- How much of this herb or veggie would you like?
- How much time can you spend planting, tending and harvesting?
- Who will be responsible and/or helping?
- Do you like a theme (salsa, herb, veggie) or just growing a variety?
- Any other considerations unique to your situation?



You can also grow things like herbs and greens in small pots and other containers near your Garden-in-a-Box. Large yogurt containers or gallon milk jugs with holes poked in the bottom for drainage work well.

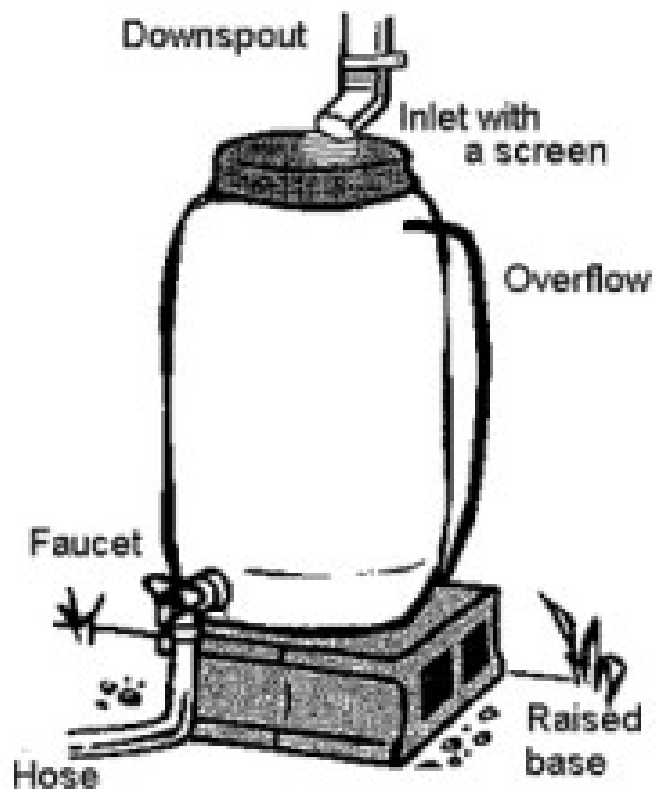
Picking the Best Location

A location providing adequate sun and availability of water is most important to your choices and outcomes. To maximize sun availability, sketch your residence on paper and indicate directions (N, S, E, W). Then, find the place where the box would receive maximum sun from June through August. Note any obstructions creating shade such as fences, buildings, or trees. Most fruiting plants (tomatoes, peppers, etc.) will require a minimum of 6-8 hours of full sun daily and will produce a greater yield with more hours. Greens and root crops can produce on as little as 3-5 hours, depending on the individual plant.

Reliable Water Sources

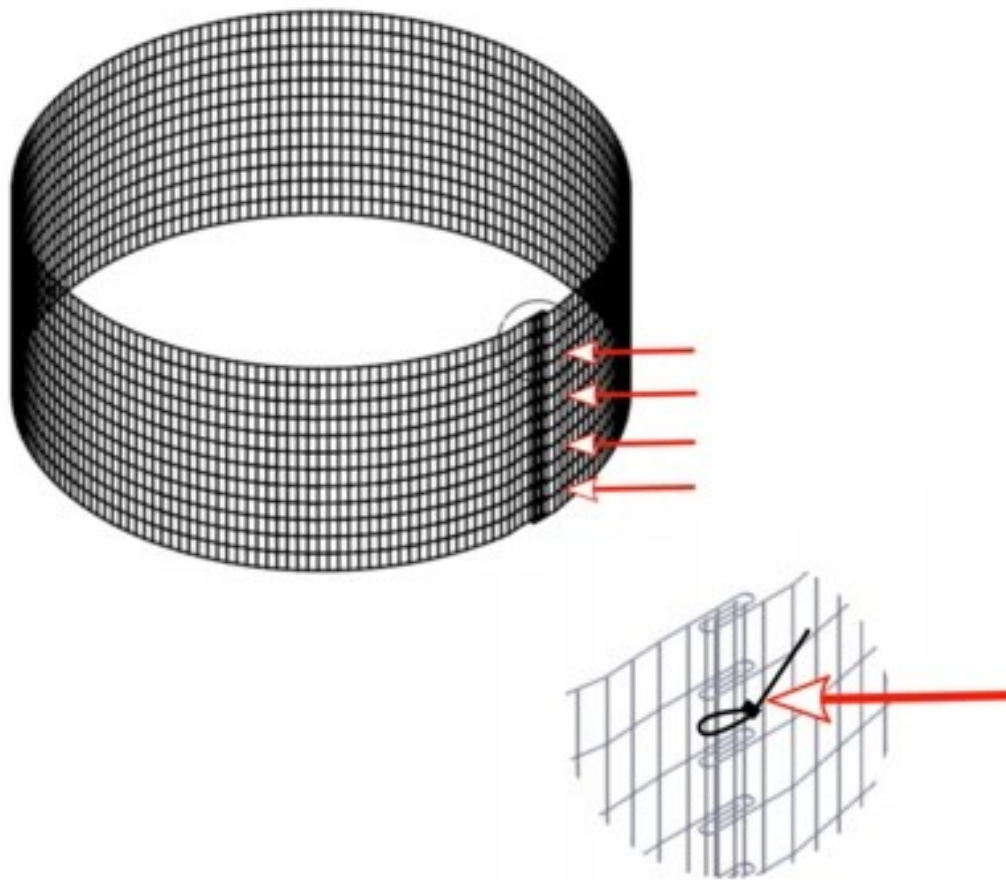
An advantage of small space gardening is that water can be provided by an exterior hose, watering cans (several trips, but very possible) and/or a rain barrel as well as natural rainfall. Rain water is excellent, considered higher in nitrogen, and free. Expect to water daily or twice daily when temps are over 80, rain has been sparse, or when conditions are windy for a day or more.

You can even make your own rain barrel out of a large plastic garbage container, or large tub, some old screen, and a minimal amount of hardware.



Preparing the Box

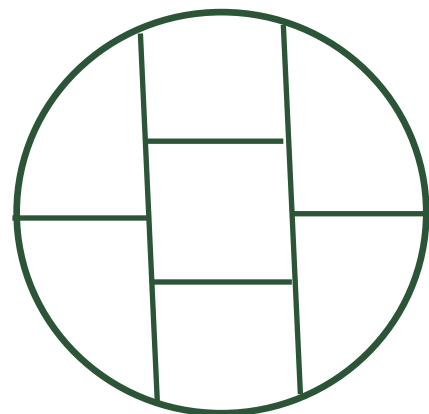
A big advantage of planting in the box is ease of preparation and use. Basic assembly consists of opening up the rolled polypropylene garden circle, straighten the tightly rolled end out enough to make a well formed circle, form into a smooth circle and link the folded ends like a clasp and using zip ties to connect the two edges of the circle together. Detailed instructions are available here: <https://youtu.be/fPBvbA-6ur8>.



The bottom will be covered with the landscaping fabric. If you are placing it on sod (grass) you can cover the area underneath with cardboard or several layers of newspaper, this will help suppress the grass from growing through the soil in the GIAB.

Use the full 7 cubic feet of the soil (4 cubic feet) and compost (3 cubic feet) provided with the box. Ideally alternate the soil and the compost as you are filling the garden circle. As soil compacts, it will sink below the top rim. Before and after adding the soil and compost, moisten the soil gently and thoroughly before planting seeds or plants. Use enough water to hold the soil together in the palm of your hand but stop adding water before it becomes soggy and dripping. Do not step on the soil or press it down; roots need air space.

An additional wooden grid to mark off each foot can be laid on top but is not necessary. Simple twine or string can be added across the box top indicating square feet (7 total) to assist in placement of plants.



Selecting Vegetables and Herbs

Plants or Seed

Both veggies and herbs will be available as seed or started plants depending on germination (seed sprouting) and time required for harvest and/or maturity. For Garden-in-a-Box recipients, tomatoes, peppers, or selected greens, are given as plants due to the length of time taken for them to mature from seed to edibles. For plants with a shorter growing period, such as lettuce and others, seed can be selected.

Basics and the Fine Print

Increasingly, new varieties suitable for small space gardening are available. Learning as much as possible about the characteristics of these and existing market plants will save time, money, and effort. See page 22.

Annual, Biennial or Perennial

Most plants (e.g., tomatoes) suggested for Garden-in-a-Box are annuals or grown as annuals in our climate, meaning that they will live for one season or year only. Others such as parsley, are biennials and will grow the first year, winter over and then return a second year, produce seed and die. A few vegetables and herbs, referred to as perennials, will live for several years in our climate.

Cool and Warm Season Plants

Plants such as turnips, spinach, Swiss chard, kale, carrots, peas, and others are cool season plants that can be planted in early to late spring and may also be able to withstand cooler fall temperatures and can be replanted later in the season for fall use. Warm season types, usually those bearing fruits, e.g., peppers, require warm soil and air temperature to survive and produce. This and other information (as listed below, source - State Climatology Office) is usually indicated on the plant label or seed packet.

Average last frost date for:

Duluth (airport) is May 20

Minneapolis/St. Paul is May 1

Rochester is April 21

Average first frost date for:

Duluth (airport) is September 21

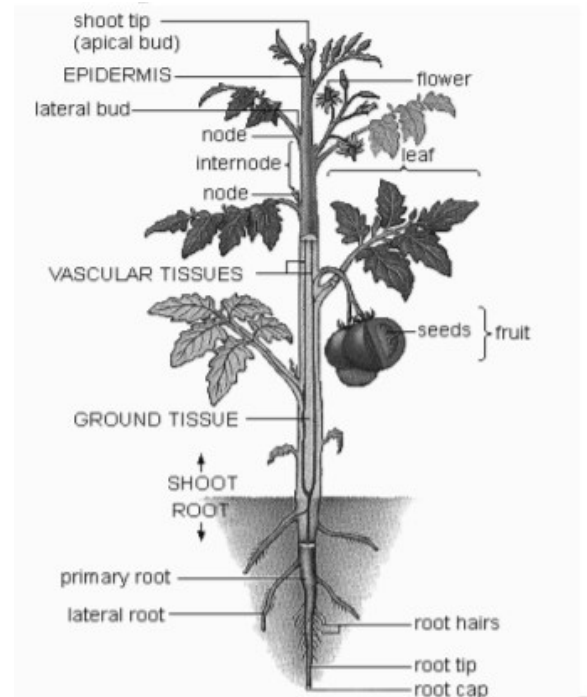
Minneapolis/St. Paul is October 1

Rochester is October 10



Plant Height, Width above Ground, Root Depth and Width

When choosing a veggie or herb consider the size of the plant growing above ground when mature and the root space required beneath the soil. This will help determine the number and types of plants per square foot and positioning of plants so full sun or some shade can be provided for the box.



Seed or Plant Germination and Maturity Time

Germination is the time required for seeds to sprout and develop leaves and maturity is the time plants take to produce a fully developed plant or fruit following germination. This information is helpful for planting successive or fall crops. Following the directions on plant labels and seed packets is essential for best results.

Continuous Harvest or Pick When Ripe

Some plants (e.g., Swiss chard) can be harvested continuously throughout the season while others such as carrots are harvested once. Knowing these plant characteristics will help maximize harvest and garden yield.

Fast Maturing and/or Smaller Size Varieties

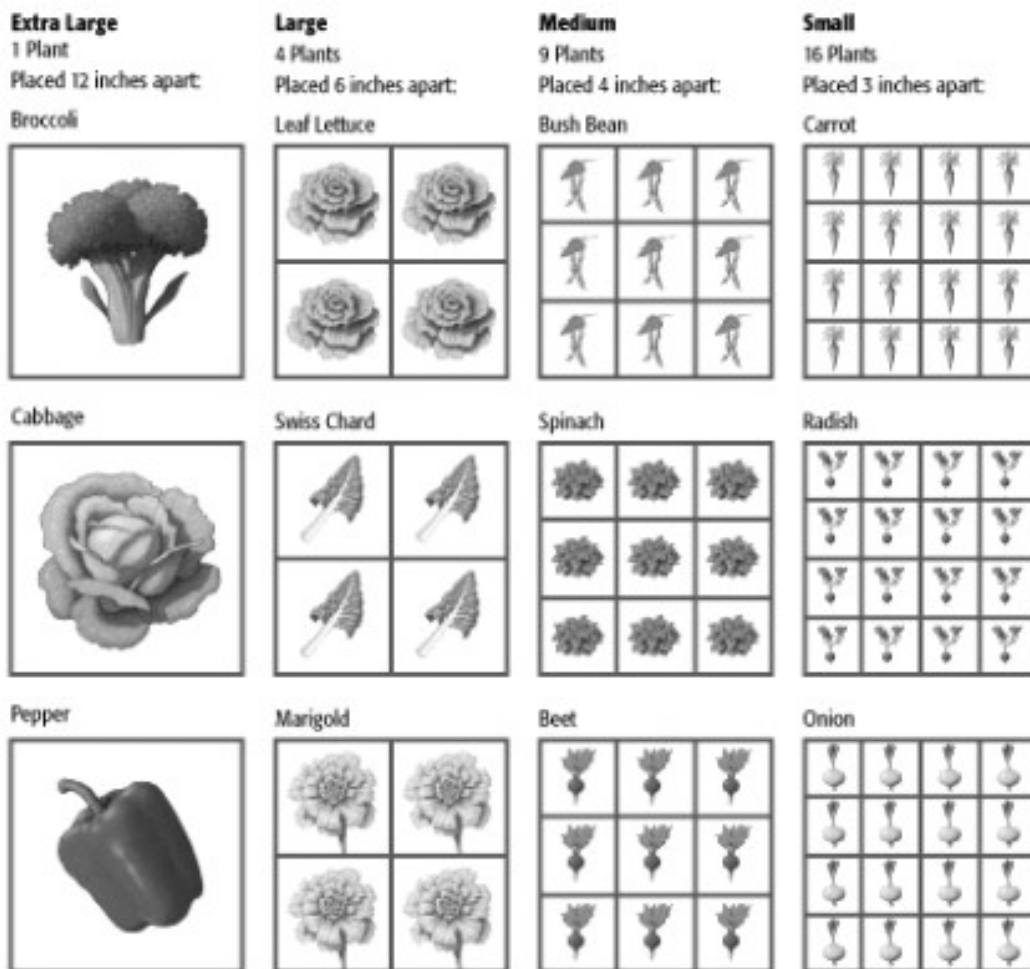
Generally, fast maturing plants are usually those of the greens and roots (e.g., radishes). Increasingly, other plant types (e.g. tomatoes) are being developed with faster growth and maturity times. Likewise, plants of a much smaller size, identified as dwarf, mini, compact etc., are now on the market. These may vary in characteristics such as taste and immediate yield, but they can also increase total yield over the entire season by way of re-plantings and greater variety.

Designing the Box on a Grid

Using the paper grid provided (see page 24), consider the edibles you want to grow and fill in each square, while keeping the following in mind:

- Plant size and height (taller plants in back)
- Sun exposure
- Identify fast maturing and/or continuous plant types
- Estimate the number of plants or seed per square
- Fill each of the seven shapes with your choices.

PLANT SPACING



Each large shape represents one square foot in your box. These are suggestions for plant spacing using the square foot gardening method.

Planting and Seeding

When to Plant

Following instructions on labels and seed packets is essential. These generally include: temperatures and when to plant (early, mid, or late spring, summer, etc.), soil temperatures, seed depth, spacing, and soaking or other pretreatments. Germination (sprouted seed) times and time to maturity or harvest are also listed.

How to Transplant

Transplants or already growing young plants should be hardened (exposed gradually to outdoor conditions to prevent transplant shock) and moistened before planting. Prepare a hole in the soil approximately the size of the potted transplant. Gently press sides of pot inward to loosen, place stem between index and middle fingers, turn pot upside down while holding the stem and remove pot (holding plant upside down). Then gently place transplant in soil, pull soil around the plant, pat soil around stem/roots, and water thoroughly. Planting on a cloudy day or in early evening works best so the plants are less stressed.





How to Sow Seeds

Seeds should be planted only 2 times as deep as they are big. For most seeds this means making a very shallow furrow only 1/4" deep. Most seeds should be covered lightly with soil. Lettuce is the one exception to this, lettuce needs light to germinate so scatter lettuce seeds on the surface and don't cover them. Bigger seeds like corn, peas and spinach can be pre-sprouted in a wet paper towel for a day or two before planting. Beets, carrots, parsley, spinach and peas can also be pre-soaked in water for an hour or two before planting. Watering the seeds and soil after planting is important to start the germination process.

Winter Sowing

Starting seeds outside in mini-greenhouses made out of milk jugs and salad greens containers is a great way to start seeds for your GIAB. More information available at: <https://northerngardener.org/seasonal-guide/>



Maintaining Plants

Water

Consistent watering is essential for healthy plants and produce. Water in the morning, if possible, as this is best for plant management. Amounts may vary with weather conditions. Try to maintain an even amount of moisture around the plant. Usually, plants require about an inch a week, but more frequent watering may be needed in small spaces and on extremely hot or windy days.

Fertilizer

Most quality potting mixes usually do not require fertilizing. GIAB participants are provided with Sustane Compost Tea Bags. To use these you add the teabag



to 1 gallon of warm water (ideally between 60-100 degrees Fahrenheit). Allow the compost tea to sit (or steep) for at least 12-24 hours.

This allows time for the microbial populations to multiply and breakdown the organic nutrients. Apply water to plant leaves and roots. Apply the normal amount of water as you would when watering the plant.

Use the compost tea brew within 36 hours of placing the teabag in the water. The brew will become anaerobic once the microbes have consumed all of the oxygen in the water. Use Compost Tea before plants begin to set fruit.

Do not spray Compost Tea Brew directly onto existing fruits and vegetables. After all of the Compost Tea is used, the compost inside the Compost Teabag may be placed in the garden to continue to benefit from the compost fertilizer or place the used Compost Tea pouch into an existing compost pile to jump-start the composting process.

Compost

Compost is a mix of soil and decayed brown and green organic matter such as clean straw, grass, leaves, etc. Recipes for making your own are available in the resources listed. Prepared compost is available at garden centers. Compost is provided to you with the Garden-in-a-Box program to enrich your soil.

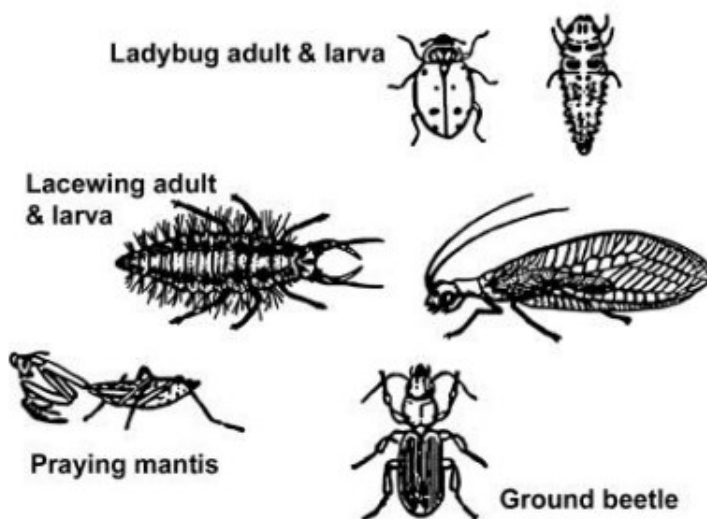
Mulch

Clean (with no seed or pesticide exposure) brown (leaves, etc.) or green organic matter can be applied around the plant at an inch or two deep to help prevent weeds and promote moisture retention. Leave an inch or more distance from stems and leaves to prevent decay of the stem.

Disease and Pests

Few insect or disease problems are an advantage of using small space gardens; however, they can occur. A

problem with tomatoes, such as blight, can occur since it may be present in the plant, soil, or carried in the wind from other gardens in the area. If present, remove infected leaves and discard in outgoing trash. Fruits may still be eaten, but yield will be reduced or the plant lost.



Beneficial insects such as ladybug beetles and others will not harm your garden and often are helpful in eating harmful insects. Pests such as squirrels, rabbits, moles and occasionally deer can eat part or most of a plant. Small fences or cages will offer protection. If disease, insects, or pests are suspected due to discoloration or extensive damage, contact a Master Gardener in your county to assist with diagnosis and treatment. See resource list for Yard & Gardener phone line.

Flowers

Flowering herbs such as chives and marigold (*Tagetes tenuifolia*) flowers can be eaten or added to dishes or used for color or visual effect. Flowers also attract bees which pollinate some plants and increase yield.

Weeds

Remove any unwanted vegetation, including their roots, when first noticed. Although not an extensive problem for the box, if left in the box, they take nutrients from edibles and decrease yield.



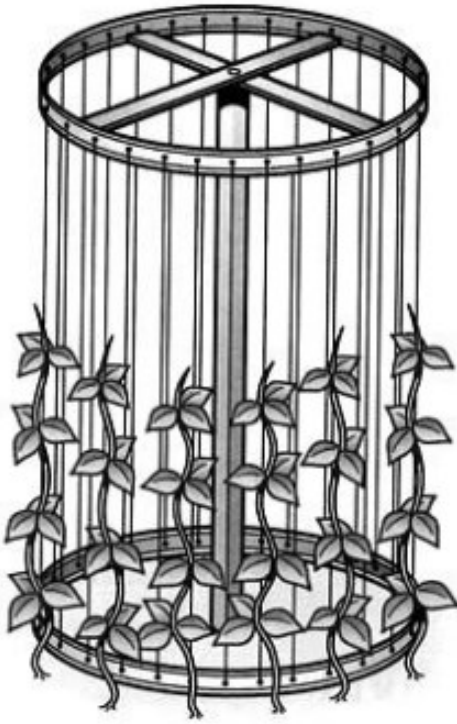
Maximizing Yield and Space

Plant for Your Preferences: Small and Fast

Choosing smaller and faster maturing edibles will increase yield and allow for more plantings of the same or a wider variety of other plants.

Vertical Spaces: Trellis Types

Many structures, new or recycled, can be used provided that they can support the intended plant weight. These can include old fencing, metal supports, small tree branches, or even a string twine attached to pvc piping or other frame types. Use soft cotton or wide plastic strips (not wire) to prevent tearing stems. Old bike rims can even be made into a trellis for beans and other climbing fruits and vegetables. You can also use yard twine and string it between several poles.



Trellising options.



Continuous Planting

Fast maturing plants, such as ‘cherry belle radishes’ can be planted and harvested continuously throughout the growing season.

Succession Planting

After final harvests, a different plant, ideally from a different plant family can be placed in the location of the crop just harvested. Allow time for germination and harvest before planting. Also consider height and size as before.

Planting for a Fall Harvest

With planning, several edibles (usually cool season or very fast maturing types) can be planted for fall harvest. Combine germination time and days to maturity or harvest and count backward from the first frost date and plant accordingly. For example, in Zone 4 the first frost is approximately October 7. ‘Purple top white globe’ turnip greens germinate in 5 to 10 days and roots are ready to harvest in 50 to 60 days. Planting at the end of July or the first week of August will allow for the time needed for turnips to mature and harvest before a hard frost.

Harvesting All Useable Plant Parts

Using all edible parts of veggies and herbs is another way to enhance yield and to try some parts and/or flavors you may not have eaten before. Use caution. If not listed below; make certain that the part is not toxic before eating. To allow re-growth when picking green leaves, take no more than one-third of the plant. Regular harvest of tomatoes and peppers prompts new flowering or growth and continued harvest. Use a scissors or clipper when removing tomato, peppers, etc. to prevent breaking a plant branch and limiting production.

Green

Bell peppers and tomatoes are just a few of the edibles that can be eaten green. Peppers, when ripened, will eventually turn red, yellow, orange, etc. Tomatoes picked just as they have begun to lighten from a dark green color may be used in various “green tomato” recipes.

Mature and/or Ripe

Generally, mature edibles are fully developed for type but some may not have the preferred taste of ripeness. For example, green peppers may have reached their typical size but will not have the sweetness and red, yellow or orange color that will result when fully ripe. Allow these edibles to reach full color but pick before softening of fruit or rot occurs.

Roots, Leaves and Stems

Harvest root crops as they reach full size as indicated by label or days to maturity. All parts of beets and turnips are edible. Eat leaves when young for best flavor. In hotter weather, more mature leaves and stems can quickly become pungent or bitter.

Herbs

Typically grown for leaves, stems and seeds, herb flavor and harvest varies by type. For best flavor, harvest continuously and before flowering. Cool season cilantro, for example, matures quickly and flowers in warmer temperatures. Basil, however, prefers warm weather and leaves and stems can be picked longer, but are better before flowering. Onion or garlic chives provide leaves when harvested regularly—pick about 1/3 of the leaves so they continue to grow for continual supply.

Flowers

Many herbs have edible flowers as indicated on the seed packet. Chives, both onion and garlic types, have tasty flowers with a somewhat stronger flavor than chive leaves. When plants are left unharvested, flowers will form.

Seeds

Pumpkin, squash, and many herb seeds can be eaten after dried. Cilantro, for example, is a cool season plant and will rapidly flower and produce seed. When harvested and dried, the seeds are the common spice coriander.

Edible Plant Parts

Fruits

Cucumber, Eggplant,
Okra, Pepper,
Pumpkin, Squash,
Tomato

Tubers

Ginger, Potato,
Sunchoke (Jerusalem
artichoke)

Seeds

Beans, Corn, Lentils,
Peas, Sunflower Seeds

Flowers

Artichoke, Broccoli,
Cauliflower

Roots

Beets, Carrots, Celeriac, Jicama, Parsnips, Radish,
Rutabaga, Sweet Potato, Turnip

Stems & Shoots

Fennel, Asparagus,
Celery, Kohlrabi

Bulbs

Chives, Garlic, Leeks,
Onions, Shallots

Leaves

Beet Greens, Bok
Choy, Brussels
Sprouts, Cabbage,
Chard, Collards,
Dandelion Greens,
Endive, Escarole, Kale,
Lettuce, Mustard
Greens, Parsley,
Romaine Lettuce,
Spinach, Turnip
Greens, Watercress

Record Keeping

Good records can make the difference between repeating the same mistakes and success. Important information you may want to keep track of:

Information about Seeds & Plants:

Crop	Variety or Cultivar	Source (seed company or Nursery)	Days to Maturity

Planting information:

Date	Crop	Where	How Much

Harvesting information:

Date	Crop	Yield	From Where?

Scouting:

Date	Crop	Symptoms	Pest, Disease, Nutrient Deficiency	Action taken:

Other Observations:

Date	Observation: rainfall, soil temperature, compost temperature

Resources

Minnesota State Horticultural Society: northerngardener.org

Resource Hub: northerngardener.org/resource-hub

Community Resources: northerngardener.org/community-resources

Classes: northerngardener.org/classes

Member discounts: northerngardener.org/current-discount-partners

UMN Extension / Master Gardeners: extension.umn.edu/yard-and-garden

What's wrong with my plant: apps.extension.umn.edu/garden/diagnose/plant

Minnesota Landscape Arboretum: arb.umn.edu

Companion Planting: www.almanac.com/companion-planting-chart-vegetables

School Gardening in Minnesota: sites.google.com/view/school-based-garden-f2s/home?authuser=0

Urban Gardens and Soil Contaminants: www.misa.umn.edu/publications/cropsandsoils/urbangardens

Lettuce Network: School Gardening in MN Facebook group: <https://www.facebook.com/groups/mnschoolgardening>

Smaller Vegetables for GIAB

Suggested varieties for small raised garden beds:

Bok Choy:

Toy Choi

Broccoli:

Calabrese

DeCicco

Green Sprouting

Bush Beans:

Beautiful

Blue Lake

Contender

Roma II

Royal Burgundy

Tendergreen

Cauliflower:

Romanesco

Snowball

Cucumbers:

Spacemaster

Eggplant:

Black Beauty

Green Onions:

Evergreen bunching

White Lisbon
bunching

Sweet Peppers:

Mini Bell

California Wonder

Red Mercury

Hot Peppers:

Habanero

Hungarian Yellow
Wax

Jalapeño

Serrano

Sweet Banana

Kale:

Dwarf Blue Curled
Vates

Lettuce:

Bibb

Black seeded Simp-
son

Buttercrunch

Lolla Rossa

Prizehead

Royal Red

Tennis Ball

Peas:

Alaska

Frosty

Lincoln

Little Marvel

Wando

Summer Squash:

Early White Bush
Scallop

Yellow Scallop

Tomatoes:

Ace 55

Abe Lincoln

Beefsteak

Better Boy

Bonnie Best

Early Girl

Independence Day

Lemon Boy

Mortgage Lifter

Patio vf

Pixie II

Red Cherry Large

Roma

Saladette

Siletz

Sungold

Sweet 100 Patio

Tiny Tim

Thanks to these generous funders for their support:

Cargill

Bachman's Idea House

Saint Paul Garden Club

Forest Lake Lion's Club

Hennepin County Horticultural Society

USDA Community Food Program Grant with
the Food Group

As well as other garden clubs and individuals

And to these garden partners:

[Garden Circles](#)

[Creekside Soils](#)

[Sustane](#)

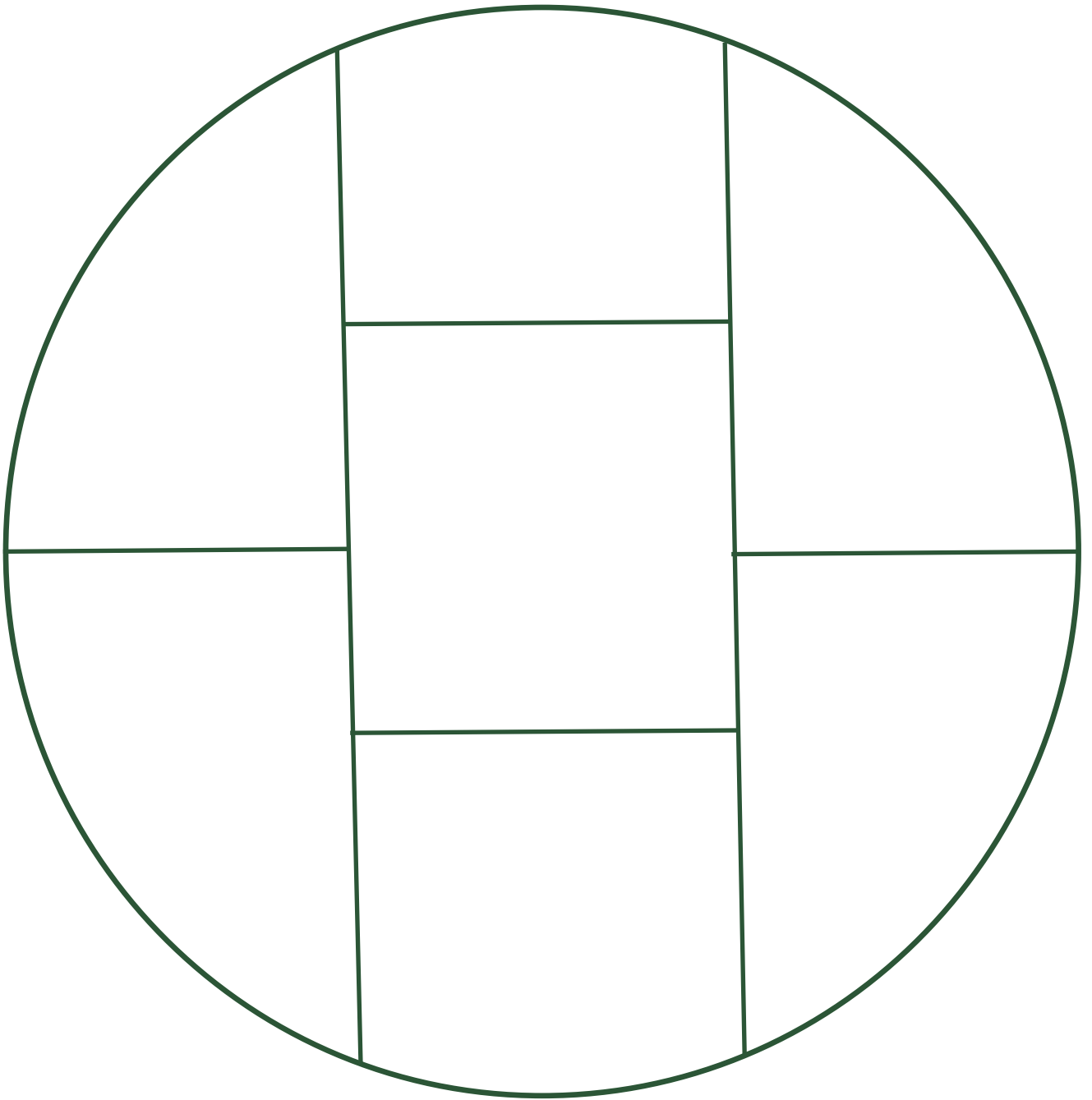
[Wagner's Greenhouses](#)

[North Circle Seeds](#)

[Seed Saver's Exchange](#)

[True Love Seeds](#)





Date	Crop	Where	How Much