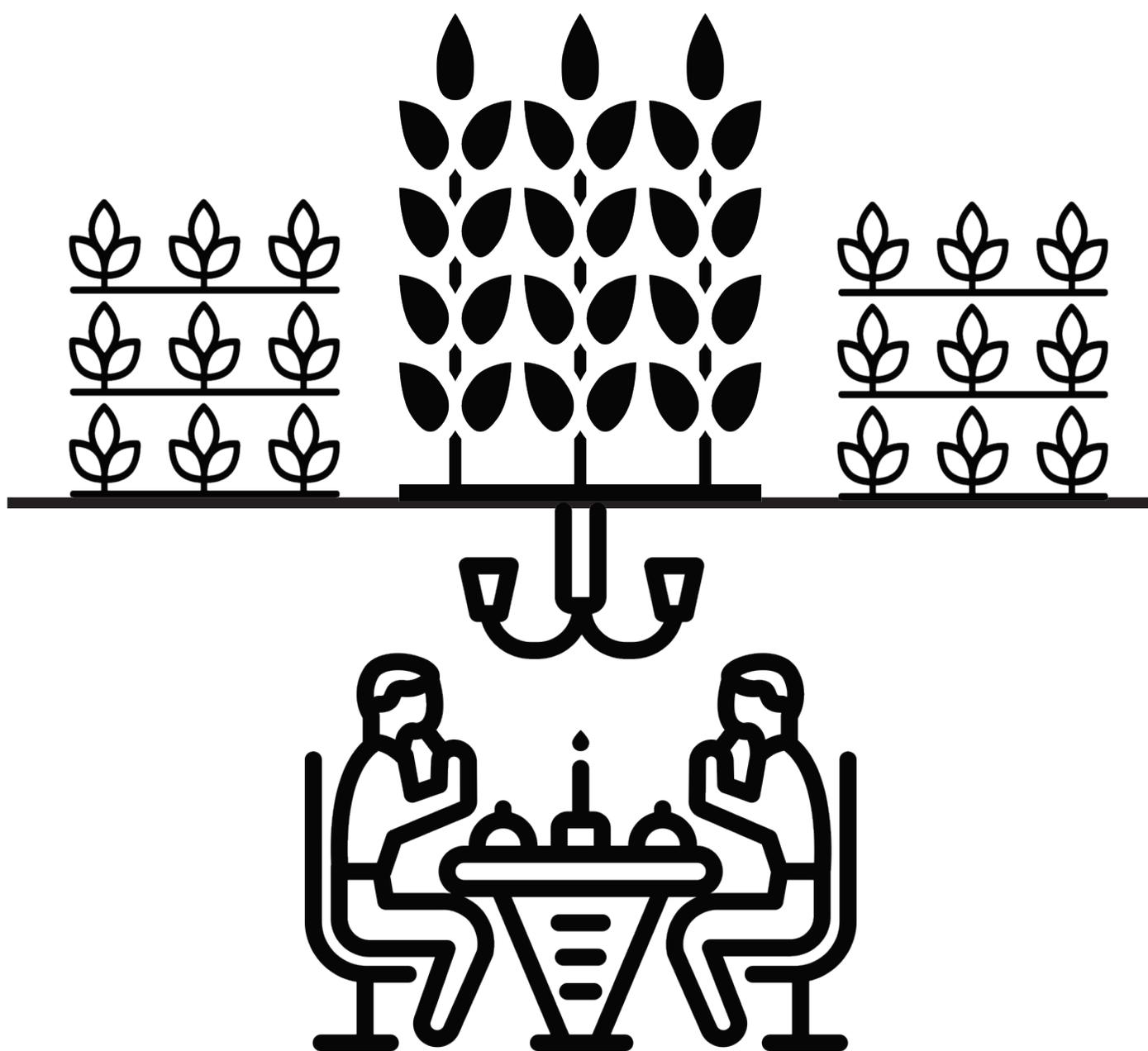


Green Roof Growers Guide



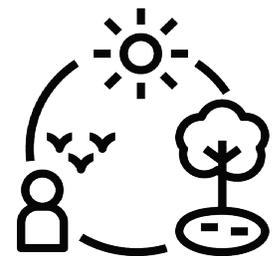
Everything you need to know before you grow

Why Green Roofs?

As cities are growing they require more resource to maintain the flows of the cities. As the threat of climate change becomes more and more prevalent, it is becoming more difficult to produce food at the rate we need in certain parts of the world. This means cities must be more self-sufficient, and part of that is supplying its own food. Urban agriculture has the potential to feed individuals that otherwise could not afford fresh produce, reduce transportation emissions, and create job opportunities. Green roofs used for agriculture also have the ability to be an educational space for inner-city kids that otherwise might not ever step foot on a farm.



Green roofs are vital for providing adequate ecosystem services to the neighbourhood the roof is in. Green roofs can provide clean air, water, recreation space, and if you choose, food! Studies show that spending time outdoors can lower stress, and improve overall health. This makes green roofs on workspaces, schools, and homes important to improve overall quality of life and the city itself.



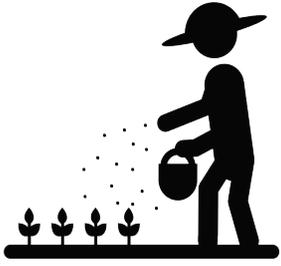
One of the biggest challenges for older cities is battling storm water, as it can overflow combined sewage systems, dumping untreated sewage into waterways. This is a threat to marine life, and those who utilize these waterways for food, recreation, etc... Green roofs are an effective way to absorb the storm water, that otherwise would drain off the roof and into the sewer.



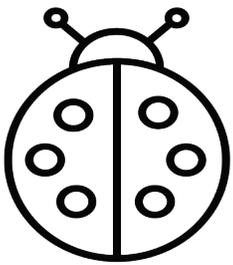
Cities are home to hundreds of species that have adapted to urban living. However, most of these species are birds and small mammals, which leaves a huge proportion of species excluded. Green roofs can mimic "natural" environments, depending on the plants and amount of management, which can attract more species such as insects and migrating birds. A diverse set of plants can house a larger number of species, as there will be less competition for resources. An increase in biodiversity can make the green roof stronger and more resilient, which then promotes more ecosystem services.



Soil Health



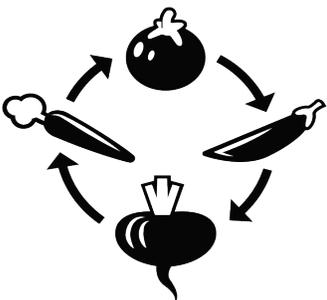
Fertilizers have potential to make your crops extremely productive, but at a cost. Not only are synthetic fertilizers extremely expensive, but they also emit massive amounts of green house gases during production, as well as add to nutrient run off into waterways. Alternatives to synthetic fertilizer are applying your compost that you make at home directly onto your soil. You can also create a "compost tea" but seeming your food waste, and watering your plants with the cooled-to-room temperature compost tea.



Chemical pesticides can damage your soil because the chemicals can harm the microbiota community that keep your soil in tip-top shape! However, it is important to combat pest that would otherwise eat all the food you are growing on your roof. A great natural pesticide can include ladybugs, spiders, and other carnivorous insects.



Tilling your soil can make the planting season easier, however can cause soil erosion. Tilling damages the soil structure and breaks up established microbiota communities. Tilling can also cause compaction to your soil, which makes it harder for your crops to establish roots. Instead, in-between planting season, plant a cover crop. Then about a month before growing season, cover your cover crop with about 1 foot of mulch. This will breakdown your cover crop so it will not compete with the crop you intent to grow that season, as well as create a healthy layer of soil that does not need to be tilled.



Some crops are more nutrient heavy than others. Every growing season it is important to rotate where you grow your crops in order to keep the nutrients in your soil diverse. In between planting season, crop covers that can replenish the soil of nutrients, such as legumes are always a good idea, and they protect your soil from erosion. This will ensure that you do not have to replace your soil every couple years, and that your crops stay as productive as possible.

Medicinals



Motherwort (*Leonurus cardiaca*, Lamiaceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

1 month

General Description:

Medicine, and amazing ability to attract butterflies, bees, and hummingbirds. Medicinally to treat infections and digestive issues, such as gas and bloating. Wild bergamot is antimicrobial, anti-inflammatory, and diaphoretic (brings on a sweat to break a fever).

Growing Notes:

The seeds of motherwort must first be stratified for several weeks. They can be sown outside after the spring frost or sown in pots or seed trays late winter. Seeds should be planted 1/4 deep. Transplant into pots until they reach about 6 inches tall and then plant into garden. Plant 15 inches apart. Cut back to 3-5 inches after flowering. Once established, plants can self sow. Divide and replant clumps in early spring or fall.



Echinacea (*Echinacea purpurea*, Asteraceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

3 years to
harvest

General Description:

Roots, seeds, and fresh flowers are all medicinal, and can be made into a tingly tasting, immune-stimulating tea or tincture

Growing Notes:

Plant in spring or fall, making sure the soil is well drained and they are located in full to partial sun. This plant is relatively easy to grow from seed, but must be stratified in order to germinate. Sow seeds in fall, covering lightly. Seeds are very popular among Gold Finches and other birds, so make sure to keep an eye on them through their vulnerable period. Water young plants often to help establish roots. Once established, they are low-water plants. Seeds will germinate in the spring (about 2-3 weeks), but will most likely not bloom until the second year. For this reason, if you need the plant to develop at a faster rate, transplants are recommended.

Medicinals



Wild Bergamot (*Monarda fistulosa*, Lamiaceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

3 weeks to
germinate

General Description:

Medicine, and amazing ability to attract butterflies, bees, and hummingbirds. Medicinally to treat infections and digestive issues, such as gas and bloating. Wild bergamot is antimicrobial, anti-inflammatory, and diaphoretic (brings on a sweat to break a fever).

Growing Notes:

Growing wild bergamot from seed is a slow process. It is recommended to grow from root cuttings. Divide the roots, anytime from early spring until late fall, remove any blackened or woody parts, and plant runners 18 inches apart. Prime bloom time is July. Grows quickly and gets bushy, growing up to 3 or 4 feet.



Holy Basil (*Ocimum sanctum* syn. *O. tenuiflorum*, Lamiaceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

8-14 days to
germinate, 2-3
weeks later to
harvest

General Description:

Holy basil is highly aromatic and antimicrobial; the leaves and flowers are used as a medicinal tea for colds, coughs, asthma, bronchitis, sinusitis, headaches, arthritis, diabetes, stress, and anxiety. Its adaptogenic effect offers an uplifting energy and helps with mental clarity and focus. Culinary uses: fresh leaves can be added to salads and are used as a more pungent version of basil. Holy basil pesto is divine!

Growing Notes:

Plant directly into garden after the final spring frost. Place seeds ¼ deep into soil, deep enough so they do not float away when watered, but not too deep as the bottom needs heat to germinate. Cover seeds with soil and water. When the plant reaches 3 inches tall consider spreading coarse mason sand 2 inches over soil around plants to reduce weeds / control moisture. Clip central stem 6 weeks after seedlings sprout, leaving two leaf sets per stem to allow leafy branch growth. Harvest some when leaves become plentiful and continue trimming to allow further growth. Pinch buds before flower to keep plant productive. Thrives in summer months. Cut back the mature plant to 8 inches and it will re-grow quickly.

Medicinals



Meadowsweet (*Filipendula ulmaria*, Rosaceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

3 months to
germinate

General Description:

Inflammation, fevers, heartburn, and peptic ulcers. Meadowsweet is a wonderful tonic for arthritis with its anti-inflammatory salicylates.

Growing Notes:

Start seeding indoors. Sprinkle seeds on 4in of soil then cover with perlite, misting the seeds lightly with water. Place the pot in a sunny location. Keep balanced moisture - if soil is too dry, mist the top. Seeds will take up to 3 months to germinate. Make sure to keep plants inside until 2 weeks before the last frost. Plant the seeds in a sunny location outside to continue growing.



Spilanthes (*Acmella oleracea*, Asteraceae)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

1/2 weeks to
germinate

General Description:

The tingly numbing sensation affords relief to toothaches, and is used in many tooth and gum formulas, as it is anti-microbial, stimulating, and acts as an oral anodyne.

Growing Notes:

After the final spring frost, plant seeds ¼ deep. Plant 4-6 seeds together 6 inches apart. It's best to wait until plants are several inches tall before harvesting leaves. Continue harvesting leaves during and after bloom. Spilanthes easily transplants and will self-sow if you don't mulch too heavily. Does not respond well to cold climates and will die if exposed to frost. Tip: keep away from slugs. One to two plants will yield over a quart of tincture.

Alliums



Garlic (*Allium sativum*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

180 days to
harvest

General Description:

Garlic is a species in the onion genus, allium, and can be used as a bold aromatic flavoring as well as a medicine, due to its anti-bacterial properties. It is known to lower risks of cancer and treat the common cold, and wards off vampires.

Growing Notes:

Plant in early spring or mid-fall for best spring yield. Separate clove and plant 4-6" apart, with 1 ft between rows, 1-2" into the ground. Cloves should be planted with pointed end up and blunt end down.



Scallions (*Allium Cepa*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

60-80 days to
harvest

General Description:

Scallions are a mild cultivar of the bulbing onion. They are simple to grow, and provide a fresh flavor and garnish to many dishes.

Growing Notes:

Store bought scallions can be planted directly into the ground, and need very little soil to grow! They enjoy remaining moist in well draining soil, mulch can be used to help with moisture retention!

Fungi



Wine Cap Mushrooms (*Stropharia rugosoannulata*)

zone

Use



Sun



Moisture



Annual/
Perennial

Soil pH

Days to Mature

relative

General Description:

Commonly known as the "Garden Giant", wine cap mushrooms can be found in many home gardens world wide because of their ability to maintain healthy soil. Wine cap mushrooms were first cultivated in Germany in the 1960's, and now can be found in the United States, Europe, Asia, and more recently; Australia, New Zealand, and parts of South Africa. Wine Cap mushrooms are best cooked with the tops of them are burgundy-red and just forming their round, folded over shape.

Growing Notes:

Take a piece of cardboard and lay a about 2 inches of wood chips on top. Distribute spores on the woodchip bed, and then cover again with more wood chips. Give the area a nice "shower" everyday for about two weeks. It will take about 6-12 months before you see growth. Add wood chips every year to promote more growth. Once planted you will not have to go through the re-growing process for many years as long as they are maintained well.



Shiitake Mushroom (*Lentinula edodes*)

zone

Use



Sun



Moisture



Annual/
Perennial

Soil pH

Days to Mature

16-18 months
to harvest

General Description:

Shiitake mushrooms are native to Southeast Asia, and are high sought after due to their high nutritional content. Shiitake Mushrooms are also known to have a wide range of health benefits, including weight loss and anti inflammation. Because of their woody-earthy taste, their culinary uses can be limited, but you can typically find them in soups, stir fries, and as an additive to many other "high-flavor" dishes.

Growing Notes:

Cure logs 4-8 inches diameter and 3-4 feet long for 4 weeks in shaded, dry environment (a garage or shed floor is ideal) so the antifungal agents in tree sap can dissipate. Drill holes (after curing) using a 5/16" drill bit, making sure each hole is about 1 1/4" deep and no more than 3-4" apart in offsetting parallel rows. Insert plugs into holes, tap in with mallet or rubber hammer immediately. Seal the cut ends of each log with melted beeswax to avoid competition. Let logs rest in a moist-shaded area for 6-12 months. Water for 10 minutes during weeks without rain. In a dryer climate, water 10+ minutes twice a week.

Legumes



Lentils (*Lens culinaris*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

80-110 days to
harvest

General Description:

An edible species of the legume family, lentils are known for their lens-shaped seeds. Lentils have been used as a protein supplement for over 10,000 years, typically in Asian countries. Try these legumes in curries, soups, or just with some rice!

Growing Notes:

You may choose to either sprout the seeds first, or plant them directly. Plant 1in apart (for seedlings, 4in-5in apart) 2 inches deep. Keep even moisture until pods become dry. Once pods have dried, add organic compost before sowing. Lentils can be supported with a low trellis, and with row covers to avoid pest



Lima Beans (*Phaseolus lunatus*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

60-90 days to
harvest

General Description:

As these beans were imported to the United States, they began to take their name as lima beans because all the boxes were label "Lima, Peru", as that was their main country of origin. Once they're cooked their taste resembles butter so much they are often referred to as "butter beans". These beans are a staple in everyone's diet!

Growing Notes:

Sow soybeans in spring 2 to 3 weeks after last frost date 1.5-2 inches deep. If growing bush lima beans, space 3-6 inches apart, for pole lima beans 6-10 inches apart. Set rows 2-3 feet apart. Make sure soil is evenly moist and well drained. Avoid over head-watering, especially during flowering and pod formation. When average temperature is above 60F, use mulch to conserve moisture

Legumes



Green Beans (*Phaseolus vulgaris*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

60-100 days to
harvest

General Description:

Your worst nightmare as a kid, but now your go-to vegetable. Green beans are unripe, young fruit and protective pods of other common bean varieties. Green beans are high in fiber and can provide some of your daily recommended nutrients. Not only are they good for you but they act as an amazing cover crop to maintain your soil quality

Growing Notes:

Plant Green beans directly in the soil 1-2 inches deep. Bush beans need to be planted about 4-6 inches apart in rows. Pole beans must be plants around 6 inches apart, with 6-8 seeds per teepee. Make sure to water right away, and then regularly until they are sprouted. Be careful not to start planting too early to avoid rot



Soybeans (*Glycine max*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

45-60 days to
harvest

General Description:

Native to Southeast Asia, soybeans are now one of the most widely grown legume on the planet. Soybeans are high in protein, and extremely cheap to grow commercially. Soybeans are actually the most subsidized crop in the United States, as it is widely used as cattle feed supplement.

Growing Notes:

Plant soybeans in early spring about 1/2-1 inch deep 2-3 inches apart, thinning to 6 inches in all directions. DO NOT soak seeds before planting, and do not water immediately after planting. Keep even moisture until seeds have sprouted. Water regularly during flowering and pod formation, avoiding overhead watering to avoid damaging flowers and developing pods. Harvest once green, full, and plump. Avoid handling plant when it is wet to avoid spreading fungi. Keep weed free to keep the soybean's shallow root system competition free.

Microgreens



Mint (Mentha)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

90 days to
harvest

Growing Notes:

General Description:

Mint is a quick growing and often invasive perennial herb which comes in many varieties. It can be used to calm an upset stomach and to relieve muscle spasms. Leaves are used in jellies, sauces, teas and to flavor various candies

Mint can generally grow anywhere in the US and are easy to maintain. They grow well in any soil, yet prefer the sun and can tolerate the shade. Although you can plant mints anytime during the growing season, roots will be established faster if planted on a cool, moist day in spring or fall. Space plants two or three inches apart in rows 18 to 24 inches apart. Regular watering is the only maintenance Mint needs. Mint can grow up to 2-3 inches once fully matured. The plant is shallow-rooted, but the roots spread fast. Once you set them in a corner of the garden they'll quietly take over. Because the roots spread freely, it is best to contain the plant in some sort of pot or physical barrier. It will take mint about 90 days to fully mature.



Kale (Brassica oleracea var. sabellica)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

55-75 days to
harvest

Growing Notes:

General Description:

Kale is a hardy, cool-season green that is part of the cabbage family. It grows best in the spring and fall and can tolerate fall frosts. Kale can be used in salads or simply as a garnish. Kale has a number of health benefits, as it is rich in minerals and vitamins A and C.

Kale can be planted any time of year, except during extreme heat and extreme cold weather conditions. During the fall and cooler months, the plant will develop a sweeter flavor, making the Fall the best time to grow Kale. Kale grows best in full sun, but will tolerate shade as well. Plants that receive fewer than 6 hours of sun daily will not be as stocky or leafy as those that get ample sun, but they will still be edible. Plant seeds Space them 18-24 inches apart; the leaves will grow bigger if given more space. After planting, water regularly; about 1 to 1.5 inches of water per week. Kale generally takes about 55-75 days to fully mature

Microgreens



Basil (*Ocimum basilicum*)

zone

Use



Sun



Moisture



Annual/
Perennial



Soil pH



Days to Mature

35 days to
harvest

General Notes:

Basil is used widely both fresh and dried in a variety of cuisines, particularly important in Mediterranean cooking. Basil comes in a range of varieties, from purple to lime green, curly to ruffled-edged leaves.

Growing Notes:

Basil grows best with moist, well drained, rich soil, organic matter and full sun. Spring and summer months are ideal, but it is possible to grow basil in a pot indoors as well. Because the plant prefers moderate temperature and heat, the first fall frost will kill the plant. It transplants easily and also can be easily grown in a greenhouse. If you grow from seed, sow the seed 1/4 inch deep in rows 18 to 24 inches apart. When the seedlings are growing strongly, thin them to stand 10-12 inches apart. A sunny spot is best, but basil will tolerate shade. Water needed is below average. Basil seeds itself and will often produce good plants if the soil is not disturbed too much in the spring. Once matured, basil can grow as tall as 2 feet. It takes about 35 days for basil to fully mature. Once the plant is established, pick from the top.

Check out our website
for more information and
recipes



www.greenroofsny.com

