



Saskatchewan Vegetable Gardening Manual

A BEGINNER'S HANDBOOK

Saskatchewan Vegetable Gardening Manual

Everything you ever wanted to know about basic gardening, including how to manage some common concerns and issues.

HEALTHY EATING TEAM – NHCP

A Basic Gardening Handbook by the
Healthy Eating Team of the Northern
Healthy Communities Partnership



Contents



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Saskatchewan Vegetable Gardening Manual

Growing your own food is an excellent way to increase you and your community's access to fresh and tasty vegetables and fruits throughout the growing season and beyond. Gardening connects us to the land, and many natural elements that balance and sustain life. Many gardeners celebrate the health benefits of gardening since it increases strength and fitness while also being a source of enjoyment and relaxation. Gardening provides an excellent opportunity for the exchange of knowledge, problem solving, connecting with others and a creative outlet, all of which contribute to the mental, emotional, social and cultural benefits of gardening.

Gardening can be done in small containers, raised garden beds, in-ground gardens, or shared community plots. Whatever method you choose, this basic gardening handbook aims to help you get started with basic gardening in Saskatchewan, and will help you to understand everything from preparing your garden site, to growing and harvesting your own food.

This manual can help you to:

- * Learn about all the elements needed to successfully garden in Saskatchewan
- * Start seeds indoors, transplant, grow and maintain garden plants with basic gardening techniques
- * Select the type of garden and a great location for the garden

SASKATCHEWAN VEGETABLE GARDENING MANUAL

- * Learn how to improve the garden soil and adapt to the growing conditions to improve success
- * Extend the growing season where colder climates and shorter growing seasons make growing difficult
- * Learn tips about harvesting the garden



Figure 1: Flying Dust First Nation Market Garden



Climate

**“THERE ARE NO GARDENING MISTAKES,
ONLY EXPERIMENTS.”**

Janet Kilburn Phillips

Natural ecosystems like the forest and plains have long played an integral role in supporting the lives of those relying on them to meet their physical, cultural, spiritual and material needs for thousands of years. Saskatchewan has many ecoregions with a variety of climate considerations. Plant and seed selection will depend on plant hardiness and the number of frost free growing days in the region you live.

The growing season is the period of time that the weather conditions are best for plant growth. The length of the growing season is limited by things like air temperature, frost free days, rainfall and daylight hours. The plant hardiness zones help us to understand which plants can tolerate the average temperatures in any particular region. Saskatchewan can be divided into 4 major ecozones. Each ecozone can be divided further yet. We can use this information in addition to information about frost free days, and average precipitation to help us understand which plants will thrive in certain locations.

Did you know
that climate change is increasing the number of frost free days?

Knowing the plant hardiness zone in your particular area is helpful for planning a garden:

- * Taiga Shield ~ zone 0a-1a
- * Boreal Shield ~ zone 1a-2a
- * Boreal Plains ~ zone 2a-3a
- * Prairie ~ zone 3a-5a

The number of frost free days is an indicator of the length of the growing season. The last frost in spring is the expected date that you could safely plant and the first frost in fall date indicates when the garden harvest should be completed so that frost won't kill the desired produce. The more frost free days there are in your area, the longer you have to grow your food each season.

Of all the things that impact our gardens, we have the least control over the climate. For this reason, try to select plants and growing methods that will lead to a successful harvest.

[Climate Atlas of Canada](https://climateatlas.ca)

climateatlas.ca

Location in Saskatchewan	Date of Last Spring Frost 2021-2050	Date of First Fall Frost 2021-2050	Frost Free Days 2021-2050
Far North			
Black Lake	May 10-June 8	Sept 8-Oct 10	97-142
Fond Du Lac	May 7-June 5	Sept 11-Oct 14	103-148
North West			
La Loche	April 28-May 28	Sept 14-Oct 17	114-161
Buffalo Narrows	April 26-May 27	Sept 14-Oct 19	116-163
Île-à-la-Crosse	April 27-May 27	Sept 14-Oct 19	115-162
Meadow Lake	April 26-May 28	Sept 9-Oct 12	109-157

Location in Saskatchewan	Date of Last Spring Frost 2021-2050	Date of First Fall Frost 2021-2050	Frost Free Days 2021-2050
North East			
Sandy Bay	May 2-May 30	Sept 16-Oct 20	115-158
La Ronge	May 1-May 31	Sept 12-Oct 15	108-155
Cumberland House	April 25-May 24	Sept 14-Oct 21	118-165
South Central			
Lloydminster	April 20-May 22	Sept 8-Oct 14	114-164
Prince Albert	April 25-May 28	Sept 12-Oct 12	111-158
North Battleford	April 19-May 20	Sept 15-Oct 15	122-167
Kamsack	April 25-May 31	Sept 8-Oct 15	108-158
Saskatoon	April 17-May 19	Sept 17-Oct 18	125-171
South West			
Swift Current	April 18-May 25	Sept 15-Oct 19	119-169
Maple Creek	April 16-May 24	Sept 15-Oct 18	118-169
Assiniboia	April 20-May 27	Sept 15-Oct 19	116-167
South East			
Yorkton	April 22-May 24	Sept 11-Oct 18	117-165
Fort Qu'Appelle	April 22-May 27	Sept 14-Oct 18	114-165
Regina	April 21-May 28	Sept 14-Oct 18	114-166
Weyburn	April 18-May 28	Sept 15-Oct 20	117-170



Figure 2: Saskatchewan's Plant Hardiness Zones

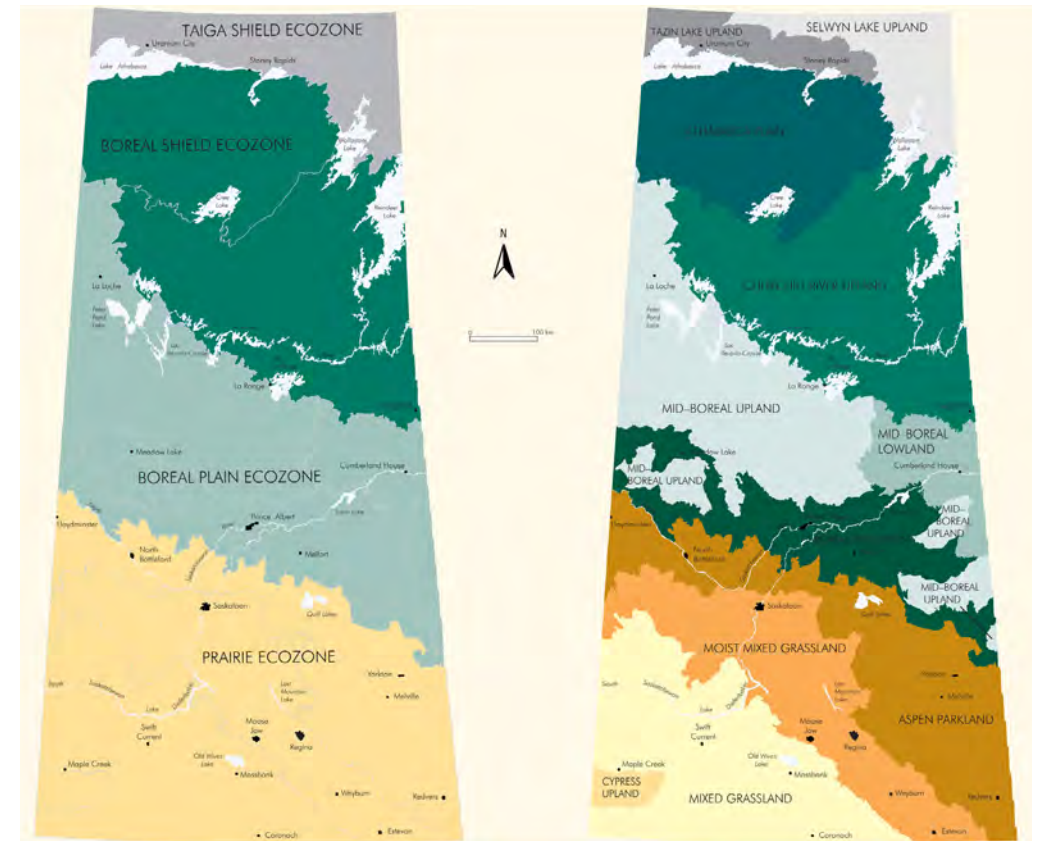


Figure 3: Saskatchewan's Four Main Ecozones and Saskatchewan's Ecoregions



What Plants Need to Grow

Without plants, the world we know would not exist. Many plants begin life as seeds, then go on to develop roots, stems, leaves, flowers and fruits. We grow these plants so that we can harvest the stems, leaves, fruits, roots or seeds for eating or to use for planting again. Any garden plant will produce the best when it is healthy. A healthy plant needs enough protection, sunlight, water, air and healthy soil for it to thrive.

A plant's roots absorb the water and the needed nutrients from the soil that help the plant to survive and grow. The stems of the plant transport water and nutrients, provide support for the plant, and store the plant's energy. The leaves of plants are unique in that they produce oxygen and are able to harness energy from the sun, turning it into sugar, which fuels the plant's needs. Many of the vegetables and fruits we eat require a plant to flower first in order to produce and grow.

When we eat healthy and nutritious garden produce we receive all the benefits of the growing environment, so it is especially important that we ensure all of the plant's needs are easily met by carefully selecting the garden location and controlling the elements needed for it to thrive.

Sunlight

The amount of sunlight a garden receives is one of the most important elements for its success. Vegetable gardens need at least 8 hours, or more, of direct sunlight each day. This is especially important for any of the vegetables that produce flowers such as cucumbers, tomatoes, peppers and more. If your garden area has less sunlight, consider growing



Figure 4: Sunlight on Raised Beds

plants that have a higher tolerance for shade such as leafy greens (kale, Swiss chard, spinach and lettuce). Planning the location of the garden can help ensure that your garden has the ideal sun exposure. Consider positioning your garden on the south side of any major building or other obstruction to the light. Remember that trees, buildings, fences or any tall object can block sunlight. Pay attention to the shadow that these obstructions cast on the ground in the summer and then place your garden away from these shadows. Remember that if you plant small shrubs or trees near your garden that you must consider how tall and wide they will be when they are mature and full-sized. This will ensure that your garden continues to get the light that it needs.

Water

Having easy access to water will make gardening much easier and more successful. Consider locating your garden near a water source such as a water tap or rain barrel with a spigot. Before planning any new garden consider how you will efficiently water it.

Germination occurs when a seed becomes a plant. Seeds need to be kept moist in order to germinate and they may need daily watering until this happens. After a plant germinates, it is referred to as a seedling. Seedlings also need to be kept moist so that they develop roots, but the soil should dry just slightly between watering for the best results. Pay close attention to the soil moisture during the first 3 weeks after planting. Once plants are established most will produce best if they are watered deeply and infrequently. This could mean watering about once weekly, depending on the conditions, and allowing the water to penetrate to about 12 inches deep. This encourages deep roots to form. The amount of water will vary depending on the type of soil you have. To test if the soil is dry,

insert one finger into the soil to the knuckle. If it is dry, the garden is in need of water. Water will move more quickly through sandy soil and then dry out more quickly, while clay soil holds moisture for longer. You will need to water sandy soils more often than clay soils. It is best to water early in the day while dew is still on the leaves so that the leaves and plants will dry off by evening. If not early in the day, then it is okay to water in the evening as long as there is time for the plants to dry off. Avoid watering during the heat of mid-day since much of the water may evaporate away.

Consider the drainage of water after rainfall. Ideally the garden site will be relatively flat or have a gentle slope. This is called the grade of the soil. Having a level ground or planting space ensures the garden will not have low spots that pool with water during heavy rainfall, and that it is not so steep that water drains away too quickly. This will help you avoid excessive drying or excessive water in the soil which can kill plants.



Figure 5: Water Supply



Figure 6: Watering Can

Air & Wind

Plants need oxygen, or air, to survive. A gentle breeze can strengthen the stems and stalks of plants however, garden locations that are very windy can dry out the plants and soil. Extreme wind also makes it difficult for delicate plants to thrive. Finding a sheltered location, that still offers enough sunlight, for the garden; or selecting plants that tolerate wind are a few of your options.

Soil

Soil is made up of rocks that have been worn down over time into smaller particles. All soil is made up of these small mineral particles, air, nutrients and water; plus the living animals inside of it and some decaying plant materials. All the living animals found in soil help to keep the soil health and plants depend on them for their nutritional needs. Creating a habitat for soil creatures is part of creating a healthy soil for your plants to grow in. In just one handful of soil there is a great variety of living organisms that make up part of the soil food web.

Did you know?
There are more soil microorganisms in a teaspoon of soil than there are people on the earth! (USDA Soil Health Nuggets)

Soil Texture

Soil is made up of particles such as sand, silt and clay. When we talk about soil texture, we are referring to how much of each of these particles we find in the soil. The soil texture affects how well the soil drains water. Each soil texture has pros and cons. Knowing how to improve your soil will depend on understanding its texture.

Clay: Clay soil is very hard and is made up of very small particles of mineral. Clay soil holds water and does not drain easily. Because the particles in the soil are so small, they easily pack together and this can make it difficult for plant roots to get through the soil. Since roots need air and water to live, a heavy rainfall can saturate the soil and suffocate the roots. Clay soils also take longer to warm up in spring.



Figure 7: Soil Textures: Sand, Loam, Clay (front to back)

Sand: Sand is the opposite of clay. The particles in sandy soil are very loose and large. Water and nutrients easily wash away making it difficult to keep plants watered, especially in hot weather. Sandy soils warm up quickly in spring.

Silt: Silt is the solid, dust-like sediment that water, ice and wind transport and deposit in our soil. Silt is made of rock and mineral particles that are larger than clay but smaller than sand.

Loam soil is a perfect blend of sand, silt and clay. Loam is usually made up of 40% sand, 40% silt and 20% clay. Loam is a good mix of both large particles and very small particles of mineral. This type of soil also has a lot of organic matter or decomposing plant life, and is ideal for growing gardens.

Soil Texture Pros & Cons

Clay and Fine Textured Soils	Sandy and Course Textured Soils
* Generally, are more fertile	* Generally, less fertile
* Contain more organic matter	* Low in organic materials
* Holds moisture and nutrients well	* Low in ability to hold moisture and nutrients
* Poor drainage	* Dries out quickly
* Difficult to break apart	* Best suited to deep rooted plants
* Can be very hard	* Poor to adequate productivity

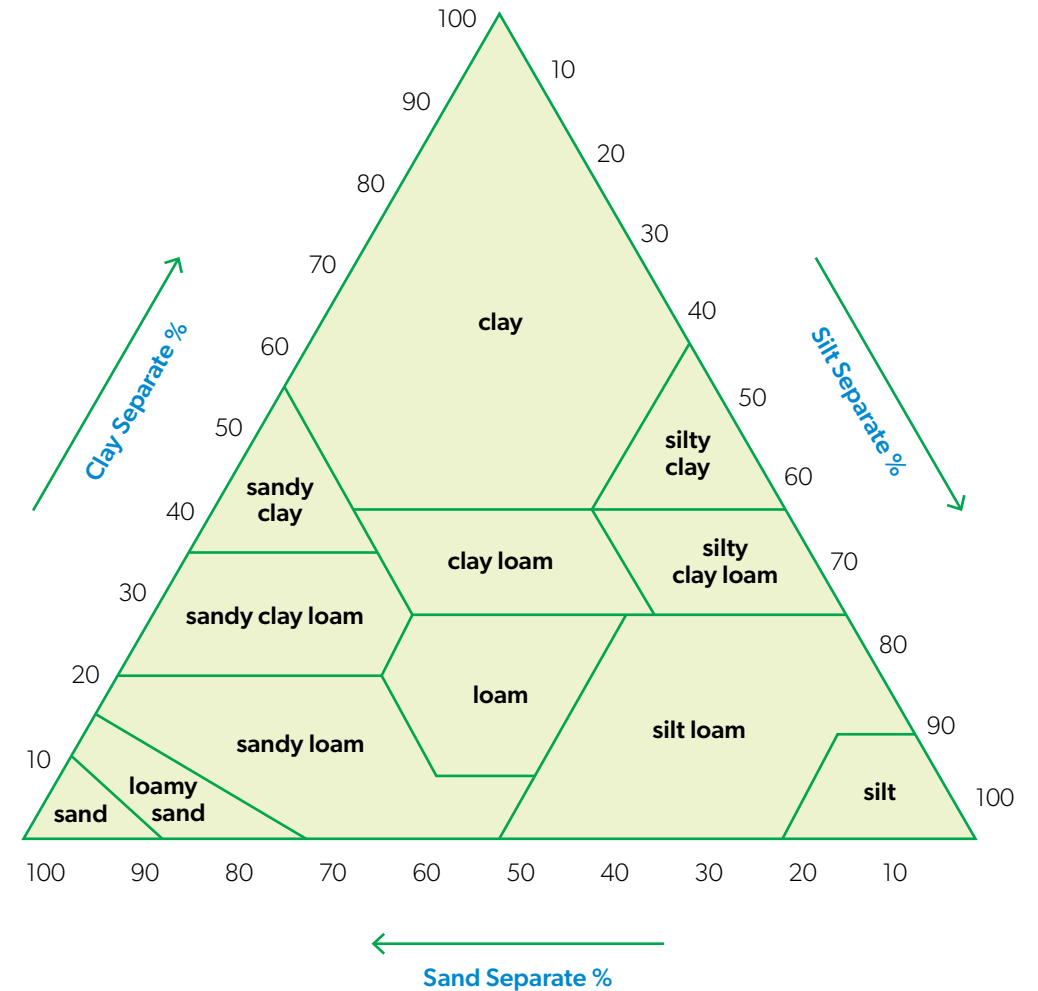


Figure 8: Soil Textural Triangle



Figure 9: Determining Soil Texture: Clay, Loam, Sand (left to right)

Determining your soil texture:

1. Thoroughly wet a patch of soil in your garden and then leave it to absorb for the day.
2. Then, pick up a small handful of the soil and squeeze it in your fist.
 - a. If the soil forms a ball that has a slippery consistency, you have clay-type soil.
 - b. If the soil won't hold its shape, and crumbles apart, you have sand-type soil.
 - c. A loamy soil will hold together as a loose ball but will be slightly crumbly.

You can make improvements to any soil texture by adding organic matter. As organic matter decomposes it releases nutrients into the soil that are then used by the living creatures and plants in the soil. The waste and remains of these animals is called hummus. Hummus binds with the soil minerals. In clay, this forces the soil particles apart; and in sand, it fills the large spaces between the soil parts. This means that adding organic matter can be an easy solution for any soil texture problems you may have.

Adding Organic Matter

You can add material, such as organic matter, to your soil before the growing season starts. Compost and well-rotted manure can be added to improve soil using a variety of methods. It can be added as a mulch and tilled in each year at the end of season, it can be added to rows before planting or it can be tilled or hand trowelled in before the planting season begins.

How much organic matter you add each season depends on what type of soil you have.

- * For clay or sand-like soil, add about 4–5 inches of organic matter to the surface and mix it in.
- * For loamy soil, add 1–2 inches of organic material each season to keep the soil healthy.

pH and Nutrient Test Kits

Many garden centres have pH and nutrient testing kits available leaving gardeners to wonder if they should be testing their soil. Store bought pH and nutrient analysis kits cannot be verified for their accuracy, so any advanced gardener truly wanting specific information about their soil, should arrange to have a soil sample analysed by a soil lab. However, it is important to remember that the basic steps that any gardener can take, to improve their soil, remain the same. Adding organic matter to your soil is a key step to improve the texture and health of your soil no matter what the type, so lab testing of soil

Organic Matter: Is made up of the living plants and creatures in the soil in addition to their waste and the broken down or decomposing parts of the plants and creatures. Organic matter is very complex and is made up of a wide variety of material both living and dead.



Figure 10: Adding Peat Moss

Organic Materials:

- Peat or Sphagnum moss
- Muskeg
- Leaf litter
- Grass clippings
- Compost (peels, and compostable kitchen waste)
- Composted Manure
- Straw

is not necessary to improve your garden soil. Over time, the addition of organic material will support a healthy, growing soil food web.

Compost

Kitchen scraps such as vegetable and fruit peelings and waste can be used to make compost. When these plant materials break down with the help of oxygen and other microbes (very small live creatures), they make a rich organic material called compost. This is one of the simplest and cheapest ways to improve your soil. The leftover nutrients found in food scraps become available to help all the garden plants grow.

Compost can be made in a pile, wooden box, compost bin or trench. If you do not wish to make your own compost, it can be purchased from most garden centres. However composting is not a complicated process. A pile of kitchen scraps, grass clippings and fall leaves will eventually break down if simply left alone.

The best way to make compost is to layer the 'brown' plant elements and



Figure 11: Compost by Saskatchewan Waste Reduction Council

the 'green' plant elements and then stir them up about once per week. You can add a small amount of soil and moisture to the pile which will help the plant materials to decompose more quickly. It is important to avoid adding any meat, cheese, animal, fish materials, or greasy foods to the pile.

The following is a list of 'green' and 'brown' plant materials:

Green Plant Elements	Brown Plant Elements	Avoid These Foods
* Kitchen scraps (vegetable, and fruit peelings and waste)	* Dry leaves	* Meat
* Grass clippings	* Used potting soil	* Fish
* Soft shrub cuttings	* Wood chips	* Bones
* Breads, and cereals	* Sawdust	* Cheese, milk, yogurt
* Coffee grounds and paper tea bags (staple removed)	* Straw (not hay)	* Oil, butter, lard or other fats
* Dried egg shells		* Eggs
		* Weed seeds (including hay)
		* Diseased or pest-ridden plants
		* Already rotten produce, plants

Active Composting Tips:

- * Arrange the compost pile in layers inside the compost area which can even include a trench, a hole dug in or near the garden. Any container can also be used for composting.
- * Layer brown material, then green material to start, then add a shovel full of soil or compost (to introduce beneficial soil microorganisms) and repeat.
- * Add enough moisture to keep the pile moist but not soaking. Consider leaving the lid of the compost bin open during a rainfall.
- * A well-aerated compost pile generates a lot of heat which speeds up the decomposition. To aerate the pile, turn the pile over or poke holes in it with a pitchfork every week or two.

- * Avoid adding diseased or pest-ridden materials to the compost pile. If the damaging organisms are not destroyed, they could spread throughout the garden.
- * When the material at the bottom of the pile starts to resemble soil and has an earthy smell it is ready to add to the garden. Depending on the method used, it can take anywhere from 1 month to 1–2 years to fully break down.
- * To learn more about composting, visit the Saskatchewan Waste Reduction Council: saskwastereduction.ca



Figure 12: Trench Compost



Choosing a Location

The location of any garden is an important decision. The best location will be the one with the best overall growing conditions.

Here are some tips for choosing the ideal garden location:

- * **Choose a sunny location:** Most vegetables need at least 8 hours of direct sunlight so be sure the garden space gets 6–10 hours daily.
- * **Ensure good access to quality water:** It is nice to rely on rainfall alone, however in dry conditions, the garden will need to be watered. Having access to a water tap, rain barrels with spigots, hoses, pails and watering cans can all be useful tools for watering the garden.



Figure 13: Sunny Garden Location near Meadow Lake

- * **Ensure good drainage:** Avoid low spots or too much slope so that excess water does not sit on top for long periods, nor drain away too quickly.
- * **Be sure to select a site with good soil:** Plants prefer loam soil. Enriching your soil with compost or other organic material can improve your soil. Additionally where soil conditions are poor, container or raised bed gardening can offer good solutions.
- * **Plant in stable environments:** Avoid areas prone to flooding, strong winds or in areas that will dry out too quickly. Consider a fence if you are concerned about wild or domestic animals.
- * **Ensure convenient access:** Be sure the location of the garden is near by the equipment, tools and storage areas needed for managing your garden. Additionally be sure that the garden itself is located in an area you find convenient to access on a regular basis.

- * **Consider expansion:** Allow enough space for the plants you want to grow and consider how you may want to expand your garden in the future.



Figure 14: Poor Drainage: low area with clay soil



Garden Design

“IT IS BETTER TO BE PROUD OF A SMALL GARDEN THAN FRUSTRATED BY A LARGE ONE.”

Orchid Horticulture

A good-size beginner in-ground vegetable garden is about 8 x 8 feet and features crops that are easy to grow. The rows should run north and south to take full advantage of the sun.

For some gardeners, container gardening is more suitable. You can grow one or two types of vegetables in a single large pail or pot; or you can even try raised garden beds.



Figure 15: Large Garden Design with Mulch Trails near Meadow Lake



Figure 16: Garden Design with Well-Spaced Rows near Meadow Lake

Most container or raised bed gardens should be no wider than 4 feet across so that you can easily reach into the center from any side. The length and shape of the raised garden bed can vary depending on your priorities, however many people want it to be visually appealing, and convenient. Consider how you will move around while harvesting, and managing your garden by including paths between beds.

Whether your garden is in-ground, in a container or in a raised bed, here are some tips to designing a great garden area:

- * **Space your crops properly:** Follow the directions on your seed packages in order to space your plants properly. Some very tall plants such as corn need more space so that they do not overshadow shorter vegetables. Each plant should have the space required so that it won't compete for sunlight, water or nutrients.
- * **Use high-quality seeds:** Select and use seeds that are not too old and from stock grown in a climate similar to yours. This way, you will ensure your seeds are more likely to germinate and survive in your particular climate.
- * **Have easy access to water:** Watering the garden can be labour intensive. Planning how you will conveniently water the garden will save you time and energy. Ensure the water source is close to the garden. Plan how the water can easily be moved from the source to the garden using hoses, gravity, spouts, watering cans or other methods.
- * **Plan the garden itself:** Planning the garden design includes thinking about which plants should be located where. Some plants are tall and narrow. Others are short and wide. They grow at various rates. Consider how each plant will gain access to sun or shade requirements in proximity to the other plants. Since the sun tracks east to west across the sky, the hours of sunlight falling on various parts of the garden can be predicted. Use this information to plan you garden layout to permit more or less sun based on the needs of the plants. Check the seed packages to understand more about what each plant will require for space and ideal growing conditions.
- * **Companion planting:** This means that some plants that are smaller, fast-growing can use the space between slower-growing larger vegetables and don't interfere with each other's harvest times. Additionally, two plants can often benefit from the features of other plants. For example flowers planted with herbs and vegetables may attract

pollinating insects. Some companion plants discourage certain types of pests for example marigolds deter aphids.

- * **Rotate your vegetables:** To keep vegetables healthy and limit the risk of disease or pests, rotate your vegetables on a 4 year rotation so that you are not planting the same vegetables in the same location each year. For example, potatoes, peppers and tomatoes share common diseases and require similar nutrients. When rotating crops, be sure to move the location of all three in the garden to let the soil adequately recover between plantings.

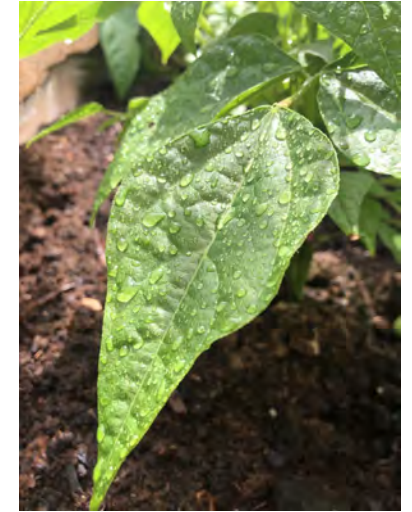
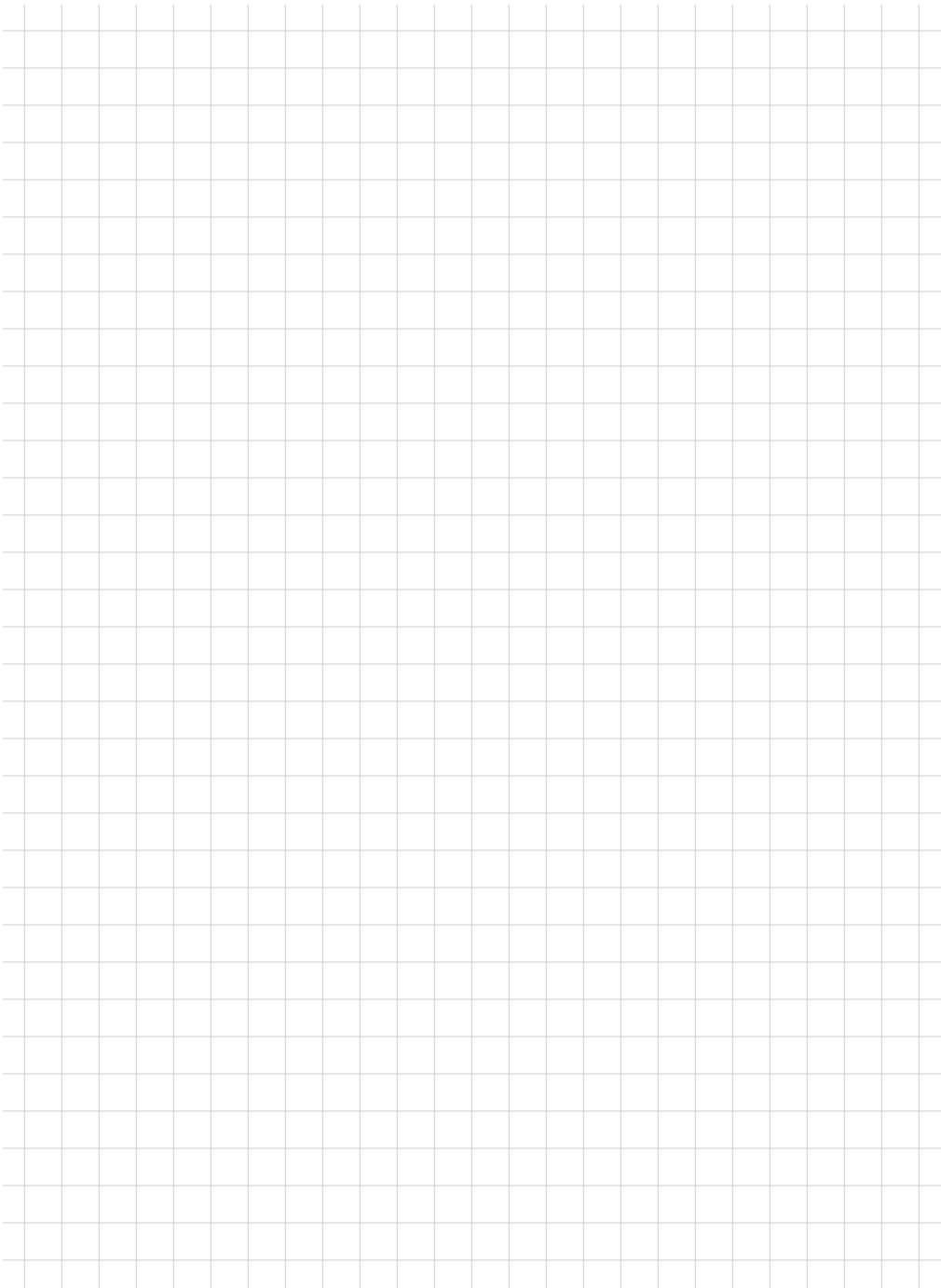


Figure 17: Bean Leaf after Rainfall

- * **Plan a minimum soil depth:** Most plants can grow in 6–12 inches of soil, however there are some plants (like tomatoes, potatoes and squash) that prefer 12–18 inches. A garden that is 12 inches deep will give you the flexibility to grow most things, and the ability to add a few inches of compost each year to enhance the depth and quality of the soil over time.
- * **Plan an area for compost:** At the end of the growing season you will have many spent plants that can be composted. If you plan to use a designated composter, compost pile or trench, be sure it is close enough to your garden to be convenient and that the size and style suits your gardening methods. Many gardeners simply till in this plant material in the fall or spring as long as it is not diseased or containing unwanted seeds.



Selecting Plants

When making plant selections it is important to consider that some of your plant selections will die at the end of the growing season (annuals) and some will live through the winter from one year to the next (perennials).

Perennials: Perennials are plants that come up year after year in a particular plant hardiness zone. Examples of perennials include: fruit trees, berries, rhubarb or asparagus. When purchasing perennials, check the zone ratings on the plant tags. Knowing your growing zone will help you select perennials that will most likely survive the winter in your area

Annuals: Many garden plants are annuals, including vegetables. Annuals are grown from seed and die at the end of the season. Generally, the farther north you live, the shorter the growing season and the more likely it is that your area will experience frost which shortens the growing season.

Fresh garden vegetables are a perfect example of annuals. If you've never tasted garden fresh vegetables, you will be amazed by the sweet, juicy flavours and exciting textures. There's absolutely nothing quite like fresh veggies, especially if you have grown them yourself! Here are some tips on selecting seeds and plants that are popular, easy to grow and even some that have edible flowers!

- * **Easy to grow:** Spinach, lettuce, beans, tomatoes and cucumbers are the easiest to grow and make great plants for beginner gardeners.



Figure 18: Potato Crop at La Plonge First Nation



Growing Plants

Many gardeners start some of their own seeds indoors while the snow is still on the ground, and then transplant them to the garden when the danger of frost has passed. In Saskatchewan, where growing seasons vary and can often be quite short, this is especially important. Starting seeds indoors allows them more time to mature before frost kills the plants in the fall. If you have plants that take more than 75 days to mature you might want to start them off indoors or buy them as seedlings, ready to plant in the garden, from greenhouses or garden centres.



Figure 20: Seed Starting Workshop at Flying Dust First Nation

Starting from Seed

To see a tiny seed germinate and grow to a mature plant is one of the most gratifying and magical experiences for a gardener.

You can order seeds from seed catalogues during the winter to prepare for the coming season. Many grocery stores and garden centers bring in seed packages in the late winter and spring as well. Since the cost of starting your own seedlings is low it can be a great way to save money even if many of the plants you start at home do not survive. Starting seeds does take some additional time and energy as well as sufficient space. There is a lot of learning when it comes to starting seeds indoors, but it can be very rewarding. A big part of gardening is the learning we take from both our 'success' and our 'failure'. Keep trying and learning new ways of doing things and eventually you will get the hang of it.

Seeds can be germinated (begin growing from the seed) in a warm spot or on a sunny south or west facing windowsill. Seeds do not need bright, direct light to germinate. Once germinated, plants left on the windowsill may become thin and leggy as they reach toward the light. Leggy seedlings may not perform as well when transplanted into the garden, so it is ideal to supplement the natural light through your windows with artificial light until it is time for the plants to go outdoors.

In order to start seeds indoors, you will need the following supplies:

- * **Containers:** An ideal container is about 3 inches deep and has drainage holes in the bottom of it. You can repurpose



Figure 21: Starting Seeds in Egg Cartons

Germination: Germination is the sprouting of a small plant from a seed. When a seed fills with water, it activates an enzyme needed to sprout a root. The plant then begins to grow a stem and leaves. This is how new plants begin to grow.



Figure 22: Containers Ready for Seed Starting at Flying Dust First Nation

containers such as water bottles, milk cartons, and yogurt or margarine containers. Garden centers sell plastic pots, cell-packs divided into sections, and compostable containers such as peat pots as well as peat pellets which can also be used to start plants. If you are reusing pots, be sure that they are cleaned with soapy water each season to prevent the spread of plant diseases from one season to the next.

* **Drip Tray:** Since your containers will have holes in them to permit water to drain out, you will want to place each container in a tray of some sort to catch excess moisture. Garden centers sell large flat trays, however you can also use heavy cardboard boxes, lids from plastic storage bins, cookie sheets lined with plastic wrap, or the lid of the margarine/ yogurt containers to catch this extra moisture. Some drip trays purchased in garden centers also come with domes to capture moisture and keep a consistent moisture during germination and early growth.



Figure 23: Drip Trays

* **Potting Mix:** The potting mixture used for seed starting should hold moisture but still allow good drainage. Mixtures containing equal parts peat moss, perlite and vermiculite work better than simply using garden soil. Garden centers sell what is called 'potting soil' for this purpose. If you do not have access to potting soil, you can sterilize your own garden soil by heating it to 82°C (180°F) for 30 minutes in your oven (or BBQ if you'd

like to keep the mess and odors outside). This will kill any weed seeds, or other diseases in the soil that will may harm the growth of your seeds.

* **Seeds:** The seeds you start indoors will be the plants that take longer to mature. After deciding what you want to grow in your garden, go through the seed packages taking note of the seeds that will take longer than 75 days to germinate. These will be the seeds you may want to start indoors, or purchase seedlings from a greenhouse, depending on your zone.

* **Flat surface to keep trays of seedlings:** You will need a surface to keep your drip trays and planting containers on. The amount of space you have may limit the number of seeds you are able to start indoors. You can use any table, stand, homemade shelves, portable greenhouse or shelving unit to hold the seed trays.

* **Source of Light:** The light from a south facing window may not be enough since seedlings need about 10 hours of direct sunlight daily. In low light areas, or where the days are shorter, you may need to purchase a grow light to provide



Figure 25: Seedlings in Trays



Figure 24: Potting Mix

Germinate the following seeds indoors before the last spring frost:

- Brussel sprouts:
4–6 weeks before
- Basil, broccoli,
cabbage, cauliflower,
celery and tomatoes:
6–8 weeks before
- Onions:
10–12 weeks before



Figure 26: Seedlings in Grade 5 Classroom



Figure 27: Watering Newly Planted Seeds

supplemental light. If using artificial light to grow your seedlings, you will need to be able to adjust the light height as the plant grows, keeping the light distance 4 inches above the plant. Using artificial light can also help you grow plants in otherwise dark spaces such as basements. Grow lights are available at many garden centers. A cost saving option is to purchase a shop light fixture and then use a cool and a warm florescent bulb.

* **Water:** You will need access to tap water or bottled water to keep the seeds moist while germinating and growing. If water quality or access are an issue, you can use melted snow. Lightly water or mist the soil to be sure the potting soil is never too wet or too dry.

Steps & Tips for Starting Seeds Indoors

- * **Timing:** Consider saving containers through December and January, ordering seeds in January or February and then start seeds indoors in February to March.
- * **Containers:** If you are repurposing household containers, you will need to thoroughly clean them and poke small drainage holes in the bottom of the containers to allow for good drainage of excess moisture.
- * **Soil:** Next you will fill your containers with potting soil and place them into your drip trays, cardboard boxes or on lids. Moisten your planting soil a few hours before you begin planting. Use the eraser end of a pencil to make small shallow planting holes

for the seeds at the depth recommended on the package. Some seeds will only need a light soil covering while others may be planted more deeply. Generally the bigger the seed, the deeper it is planted.

- * **Light and Heat:** Seeds prefer warm environments in order to germinate. Be sure that the growing area is at least room temperature (21°C). If your growing area is particularly cold, you can place the seed trays in warm areas such as the top of the fridge, or near a wood stove or heating vents in your home. If you prefer, you can also purchase electric heating pads that can be placed below the drip trays. These are available at garden

centers. Until seeds germinate, they do not need any light. Once the seeds make their first leaves, they will need a source of light. You can move your seed starting trays to a source of light (south facing window) or use artificial light sources like growing lights. If you use an artificial light source be sure to keep it about 4 inches above the growing seedlings, by raising it higher as the plants continue to grow. Once plants begin growing they don't mind a cooler environment so don't worry about continuing to use a heat pad or other heat source.



Figure 28: Planting Small Seeds into Compostable Pots



Figure 29: Grow Lights Hung Over Seedlings

* **Watering:** Your newly planted seeds will need a consistent amount of moisture in order to germinate. You can water the seeds by pouring water directly into the drip tray to be soaked up from the bottom or you can mist the soil or water gently from the top. You may need to moisten the seedlings each day. It is important to ensure that they do not dry out. Any clear material (like plastic wrap) can be used to trap moisture acting as a dome. If using a tray with a plastic dome, be sure to increase air circulation if water begins dripping from the top or sides of the dome. Any dome can be removed once germination occurs and leaves begin to grow. As seedlings get bigger they can go longer between watering, but should be watered deeply to encourage root growth.

* **Air:** Air circulation using a simple household fan can help strengthen plant stems, prevent too much moisture from building up, and prevent diseases in the soil. You can also help create air circulation by ensuring that your seedlings are well spaced and have plenty of room to grow.

* **Transplanting:** If the seedlings get too big for their containers before you are ready to plant in your garden, you may have to transplant them to larger pots to prevent them from becoming root-bound. Being root bound means that the roots are taking over the container, creating a dense web of roots. Seedlings are ready to be transplanted when their third true leaf has appeared. Transplanting too early can be hard on young seedlings. You can use a spoon to gently lift the root bundle of the seedling to carry the seedling to its new pot. Be sure to create a space for the root bundle in the new pot. Be careful with the stem and leaves as damage at this step will prevent the seedling from continuing to grow. Gently press the seedling into the soil, ensuring that all the roots are covered and the stem is supported.



Figure 30: Newly Transplanted Tomatoes

Hardening-Off Transplants

Hardening-off is a term used to describe the way indoor seedlings are prepared to be strong enough to handle the transition to the outdoor environment. When grown indoors, plants are protected from harsh elements since they receive consistent temperatures, light, air movement, humidity and moisture. By moving the plants gradually outdoors, it helps to build the plant's tolerance, and strength. To harden off your seedlings, start gradually. Follow these tips to help harden off your plants:

* Move your tray(s) of seedlings outside for only an hour on the first day. The first day of hardening off seedlings can occur about 7–14 days before the last frost date, and when days are getting closer to 10°C. This should be a location free from wind and direct sunlight.

* Use easy to move containers like growing trays, shallow cardboard boxes or plastic bins to make it easier to move plants in and out.

* Plants kept outdoors use more water. Be sure to check the moisture in all your trays when you set them out each morning and again when you take them in at night.

* Do this every day starting with an hour and increasing the time spent outside by about an hour each day.

* As the plants adjust to the outdoor environment you can move them into more windy and sunny locations. This process can take 1–2 weeks.



Figure 31: Hardening-off Lettuce Grown Indoor



Figure 32: Hardening-off

- * Ultimately, you will leave the seedlings outside overnight as you prepare for transplanting them in late May or early June after the risk of frost has passed, and the soil has warmed up.

Transplanting Seedlings Outdoors

Once the danger of frost has passed (as late as mid-June), and your plants have been hardened-off, you can begin transplanting your seedlings to an outdoor location.

- * Plan where you will be planting each of your seedlings so that the plants will have ideal growing conditions, light, drainage, shelter and space for their mature size, in relation to the other nearby plants.
- * Water the seedlings and the garden site thoroughly the day before transplanting.
- * Consider the climate on the day of transplanting. If it is extremely hot or windy this can be stressful for new transplants. Choose a mild, cool or cloudy day if possible and transplant in the early morning or late evening.
- * Offer protection to new transplants by placing wind shields or covers for young seedlings. You can use milk jugs cut in half, yogurt containers with bottoms removed or coffee grind containers to block the wind and act like a small greenhouse for the seedlings. This added protection is especially important if the seedlings were not hardened-off as long as you would have liked.



Figure 33: Transplanting Tomatoes to Outdoor Growing Spaces

Planting Directly Outdoors

Seeds planted directly into the garden may take longer to germinate than those planted indoors due to cooler soil temperatures, but the resulting plants will be stronger.

When planting outdoors, be sure to plan the garden layout before preparing your soil. Not all plants require the same planting methods. Be sure to check the seed packages for all the information you will need about how far apart your rows should be, the depth to plant the seeds and how far apart each seed should be from others.

- * Create a smooth planting surface
- * Make small furrows or channels in the soil using a rake, hoe or stick at the recommended depth. Planting inside these rows will help the seeds to remain in place even if there is a heavy rainfall.
- * Larger seeds are typically planted deeper than small seeds. A good guide is to plant the seed to the depth of the seed diameter.
- * Align each row in a north-south direction for maximal sunlight or use square foot gardening techniques with recommended plant spacing.
- * Space the rows at the recommended distance apart. The larger the mature plant is, the more space is recommended, to permit enough sunlight to reach each plant.
- * Sprinkle the seeds inside the rows being sure to follow the recommended spacing for each seed.

Sow the following vegetable seeds directly in the garden:

Beans, beets, carrots, corn, collards, corn, cucumber, kohlrabi, lettuce, onion sets, parsnips, peas, mustard greens, potatoes, radishes, spinach, zucchini, swiss chard and turnips

Square Foot

Gardening: an intensive planting technique that maximizes the use of space in small gardens by planting in grids or squares.



Garden Maintenance

Soil Maintenance

Begin your soil preparation in late spring once the soil has warmed. Control any persistent weeds, and remove rocks and other foreign matter. Any soil amendments such as compost or manure should be added in the spring.



Figure 37: Weeding at Flying Dust First Nation Market Garden

Weeding

A weed is typically a plant that grows where it is not wanted and can often compete for resources such as space, light and water with the plants that we do want to grow. For this reason, weeds are frequently removed before they become a problem.

Did you know that some plants, considered to be weeds, are edible and very nutritious? Some commonly eaten weeds include: Lamb's Quarters (*Chenopodium album*), Stinging Nettle (*Urtica dioica*), Red Clover (*Trifolium pratense*), Chickweed (*Stellaria media*), Plantain (*Plantago major*), and Dandelion (*Taraxacum officinale*).

It is important to be certain that weeds are safe if you plan to eat them. Some weeds are poisonous, and some have poisonous look-a-likes. Be sure that you have correctly identified these weeds and are familiar with the parts that are edible and during which season they will be most tasty. Be sure that the "weeds" that you are going to eat are not poisonous (e.g. hemlock and nightshade). Avoid picking plants from private property without permission. Additionally, be sure you always pick in clean areas, away from roadways.

Before planting, you may want to take some time to remove perennial weeds such as quack grass, brome grass and dandelions. Some weeds have extensive underground root systems and take time and effort to control.

The best approach to remove weeds throughout the season is by hand – pulling, or digging. Be sure to remove as much of the root as possible as many weeds spread through their root systems and will continue to grow if left in the soil. Since new seeds can be on the surface of your soil, it is important to weed often to catch new weeds while they are still young and not well established. Mulching is also a great way to suppress weed growth.



Figure 38: Onions in Straw Mulch

Be sure the soil has had a chance to thaw and drain before tilling it, or working it, in the spring to avoid making compaction worse. Never work soil when it is wet. Additionally avoid driving, walking or stepping on wet soil as this can also cause soil compaction. Fortunately, the freeze-thaw cycle we experience in Saskatchewan helps alleviate compacted soil. If the soil in your area is excessively compacted, consider using garden paths or try container or raised bed gardening.



Figure 41: Fruit Trees with Mulch Paths at Black Lake First Nation

Friends & Foe in the Garden

Gardens are excellent habitats for a variety of diverse insects, and animals. This diversity is a sign of a healthy living environment. Some of these creatures improve the garden (friends) while some may cause damage or become annoying (foes). There are a variety of ways to encourage beneficial animals and insects while also limiting the damage caused by the more destructive ones.

Many gardeners use barriers such as fencing, covers, guards, netting, screens or cages to keep animals out. Other pests can be deterred by scaring them with noisy or shiny objects, limiting their resources, breeding and feeding opportunities; and encouraging competitors or prey.

Some examples of beneficial insects include: ants, bees, earthworms, hoverflies and some birds that eat destructive insects. Some examples of insects or animals that can cause damage include: aphids, cut worms, cabbage looper, cabbage worms, potato beetle, squirrels, rabbits, mice, voles, birds, deer, domestic animals and porcupines.



Figure 42: Garden with Framed Cage to Deter Wildlife

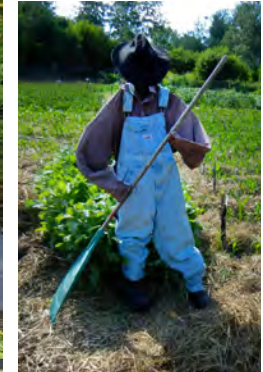


Figure 43: Garden with Scare Crow to Deter Wildlife

Extreme Cold

Many plants will not survive as temperatures begin to drop below 0°C in late August to October. You can extend the growing season in a number of ways:

- * Cover plants with blankets or thick plastic overnight, and uncover again later in the day when the temperatures rise above 0°C again.
- * Build cold-frames or hoop-houses (greenhouse-like garden covers) that can be fixed on top of raised beds to extend the growing season by using them in the spring and fall.



Figure 42: Raised Beds in Snow



Above Ground Growing: Containers and Garden Beds

There are many reasons why you may choose to grow your garden in a container, or raised garden bed, including:

- * Limited access to good quality soil.
- * Avoid tilling.
- * Extend the growing season.
- * Improve access to the garden by those with limited mobility.
- * Desire to grow only a select few items or to start small with gardening.
- * More convenient location or ability to have portable garden.



Figure 45: Vegetable Garden Pots

Container Gardening

Containers are useful everywhere in the garden and can play a role in beautifying your garden while also limiting the amount of space you need to grow food.

- * Any container that holds soil and has drainage will work. A container as big as a 5 gallon pail will need at least 3–5 drainage holes drilled into the bottom

- * Add soil to fill your containers.
 - * If your container is particularly deep you do not need to fill the entire container with soil. You can use compostable and organic materials like shredded leaves, or muskeg materials to fill the bottom of containers and save money. These materials will break down and permit good drainage.
- * Be sure that the depth of the container is suitable for what you plan to grow. For example you will need 12–18 inches depth for tomatoes to grow.



Figure 46: Tomato in a Pail

- * Plants growing in containers dry out more quickly. Check them often, and water them regularly.
 - * Add a layer of mulch like shredded leaves or moss to the top of the soil to help keep moisture in the soil.
 - * If the soil is dry 2 inches below the surface it needs more water. Fully saturate your pots when you water them.
 - * If your soils is too wet, plant leaves may turn yellow. To fix this problem, ensure there are holes in the bottom of the pot, or water them less often.
- * Place pots in a south facing location to take better



Figure 47: Herbs in Livestock Mineral Buckets

advantage of the sun and heat that’s required for growth. If you have consistent problems with soil moisture, consider moving the container.

Raised Beds

A raised garden bed is a large container that sits above the ground that contains the soil and compost needed to grow a garden.

- * The containers can be built using a wide variety of new or re-purposed materials such as: wood, stone, cement, bricks, large tubs or basins, logs or can be dug out of an in-ground garden as you create pathways between beds.
- * They can vary in shape, size, and depth.
- * **Depth:** Some plants like zucchini or tomatoes, will need up to 18 inches of depth, but other plants may only require 6–12 inches.
- * **Width:** A bed that is 4 feet wide allows for easy reaching into the center of the bed for ongoing care and maintenance
- * **Shape:** Shapes are typically chosen for their convenience and visual appeal.
- * **Contents:** Raised beds are best filled with topsoil. Topsoil can be purchased or taken from your yard, and is best when enhanced by adding organic materials such as layers of compost, peat, moss or shredded leaves, and composted manure.
- * **Height:** Can be chosen for visual appeal, or root depth needs, but also for ease of access by the gardener. The higher the garden, the less stooping is required in order to tend to the garden.



Figure 48: Raised Beds at Missinipe

Advantages and Disadvantages of Raised Beds

Advantages of Raised Garden beds:

- * They have better water drainage
- * They warm faster which helps them produce better
- * They are easier to use for kids, elders, and people with disabilities because they can be reached from a sitting position, and don’t require bending or kneeling down
- * They don’t get compacted from foot traffic. This keeps the soil loose, and makes it easier for the roots to grow deep and for the gardener to weed.

Disadvantages of Raised Garden Beds:

- * They dry out quicker so it is very important to water regularly
- * They require assembly and proper planning, as well as maintenance



Figure 49: Raised Bed at Flying Dust First Nation



Figure 50: Log & Wood Framed Raised Beds

Tips for Building Raised Garden Beds:

- * Choose your building materials
 - * Don't use treated wood or railroad ties as they can leach chemicals into the surrounding soil
 - * Cedar wood resists rot, but can be expensive
 - * Don't be afraid to use bricks, patio stones, rocks or cement pads since these will not rot
- * Consider lining the inside of the beds
 - * Use wire mesh to keep pests out
 - * Staple thick plastic to the sides of the wooden boxes to protect the moisture that may cause the wood to rot.
 - * Do not use any liner in the bottom of the bed including plastic, newspaper, cardboard or landscape cloth.
- * Raised beds can easily be converted to cold frames or hoop houses to extend the growing season



Figure 51: Raised Beds with Mulch Paths & Rocket Stove at Black Lake First Nation



Extending the Growing Season

In colder climates there are fewer frost-free growing days. There are many gardening techniques that will extend the growing season. These techniques involve protecting plants from the cold and ensuring that soil has opportunity to warm up sooner in the spring and stay warm throughout the fall, and during cooler days. Covered growing techniques can increase the growing temperature by 10–20°C during the day and even 5°C at night. This makes it possible to start growing sooner in the spring and continue growing well into the fall with the warmer temperatures that are created using these techniques.



Figure 52: Hoop House at Meadow Lake

- * **Indoor Planting & Growing:** Planting seeds indoors provides an early start on the growing season and extends the growing seasons especially for plants that may need more than 75 days to reach maturity. These plants can then get transplanted outdoors, however many plants can be grown to maturity indoors using sprouting techniques, grow lights, or other equipment such as tower-gardens. Tower gardening or other indoor growing products can conserve space while growing indoors 365 days per year.

* **Covering Plants:** Using plant covers such as milk containers, coffee tins can help protect new plants in the spring, while covering mature plants with bed sheets can protect crops into the fall. These methods can improve the growing environment.

* **More permanent covers:** Hoop houses, cold frames, grow tunnels and greenhouses are more permanent garden structures used to cover crops during the growing season. They can be small or large depending on your needs. These covers can be removed part way through the growing season, or left in place as long as temperatures can be controlled.



Figure 53: Growing Sprouts Indoor

Indoor Planting & Growing

* **Sprouts:** Seeds can be sprouted for eating. Sprouts are usually grown in a dark space and can be grown in almost any container. There are special sprouting containers that can be purchased to make the process easier. Seeds for sprouting can be purchased in garden centers.

* **Growing Lights:** There are a variety of grow light set ups available on the market. As long as you have a bulb, you can start seeds and grow indoors using soil or water as the growing medium. Many leafy greens can easily be grown in this way.

* **Growing in Tower Gardens:** There are a variety of products on the market that allow gardening in a vertical system. These systems can use soil-less growing mediums such as



Figure 54: Soil Tower Garden with Soil at Stony Rapids



Figure 55: Small Hydroponic Garden at Stony Rapids



Figure 56: Hydroponic Tower Garden at Flying Dust First Nation School

water to nourish the plants. This method, called hydroponic growing, usually requires the grower to add nutrients that the plant needs or to balance the acidity of the water. Hydroponic growing can also be done in large scale facilities. Regardless of the growing medium, grow lights are often used to ensure that plants get the light they need. Plants that are easy to grown, tasty and versatile to try include: basil, lettuce, kale, chives, spinach and Swiss chard.

Covering Plants

* **Coffee tins and milk jugs:** When transplanting young seedlings to the outdoor garden, consider using an old coffee tin or milk jug with the bottom and top cut off to enclose your plants. You may need to cut more of the top off to accommodate taller plants. This protects the plants from the wind and cold during the growing season, while allowing moisture, sunlight and pollinators in.



Figure 57: Milk Carton Protecting Newly Germinated Mint

- * **Sheets and blankets:** Occasionally in the fall, frost comes earlier than expected. Many gardeners have been known to cover plants with sheets or blankets to protect plants from dropping overnight temperatures and uncovering them again during the day to take advantage of warm day time growing temperatures.

Using green houses, cold frames or hoop houses can extend the growing season by protecting plants from cold night time temperatures, while also increasing the day time temperatures by trapping heat inside the growing area. When spring daytime temperatures are 10 or 15°C, the temperature inside a hoop house, cold frame or greenhouse can easily be 20 to 35°C. Consider how you will release extra heat from these enclosures when the temperatures are too hot. Whatever method you choose, be sure that pollinators can also gain access to flowering plants if needed. These structures should have a window, or door that can be propped open to allow air flow during hot weather. All plants grown inside structures will need to be watered. This is an important consideration when choosing these growing methods.



Figure 58: Cold Frame at Stony Rapids Grows Herbs & Lettuce



Figure 59: Cold Frame with Plexiglas Lid at Stony Rapids

Cold Frames

A cold frame is an enclosure with a clear roof and solid sides similar to a box that is built over a growing area. The cold frame itself is angled downward toward the front of the box, and placed facing south to take advantage

of the sunlight. The lid is hinged and is made of Plexiglas, glass or an old window. When sunlight enters the cold frame the soil and air heat up and protect the plants from the cold while creating ideal growing conditions on cool sunny days. Cold frames are easy to build and can be built with re-purposed materials. Planting lettuce in late April can mean you are eating plentiful salads before the end of May. One thing to note about this method is that the inside of the cold frame can become too hot. If the interior gets too hot, the lid can be raised for ventilation. Raising and lowering the lid in the morning and the evening will prevent the plants from overheating as outside temperatures rise.

Hoop Houses

A hoop house is basically a much smaller and cheaper version of a greenhouse fitted on top of a raised garden bed. It usually doesn't have ventilation windows or doors to manage the heat. It is made out of a series of hoops fixed to a frame resting on top of the garden box. These hoops are then covered in Polyethylene or 6 mm greenhouse plastic to create a dome that will trap heat while allowing light to pass through. It functions similarly to a cold frame in that the gardener must open and close the hinged top in order to maintain the garden and control the inside temperature. When it is closed the hoop house will trap moisture and heat in the soil and air. When the hoop house becomes too hot, it must be propped open for ventilation, and to permit pollination of any flowering plants inside.



Figure 60: Hoop House Grows Early Spring Crop of Mixed Greens



Harvesting the Garden

In Saskatchewan, freezing temperatures that can kill many of your garden plants may begin in late August or early September in the north, or by mid-September to mid-October in other areas of the province. Using covering techniques can protect your plants during this time extending the harvest for a few more weeks.

Every fruit and vegetable has an ideal time for harvest based on how long it takes the plant to reach maturity. At peak maturity, plants will taste the best, be most nourishing and will have a great color and texture. As plants over-ripen they may become less sweet, tasteless and can become stringy or woody in texture. Check the seed package to have a rough idea of when you will be harvesting each fruit or vegetable in your garden. As you water and maintain your garden, check plants for signs that they are ready to be harvested. Harvesting vegetables in the heat of the mid day sun can be stressful for plants, so consider harvesting during the cooler morning or evening temperatures. The harvested vegetables and fruits should be cooled and stored quickly to maximize their



Figure 64: Potato Harvest at La Plonge First Nation



Figure 65: Fresh Garden Produce

freshness and taste. This can be done simply by putting them into the fridge, or preparing them for the freezer.

Here are a few tips for harvesting and storing your fruits and vegetables:

- * Harvest before frost damage occurs.
- * Ensure produce is the correct size, and ripeness before harvest. Some root vegetables can be harvested then stored in-doors for long periods, and some foods like tomatoes will ripen off the vine after they have been harvested.
- * Keep harvested produce that looks healthy. Any vegetables that are damaged with cuts, bruises or mould can be composted in the garden; while produce damaged by insects or disease should be removed to prevent the spread of disease or unwanted insect infestations.
- * When harvesting greens, take the mature outer leaves to promote growth of younger inner leaves. If lettuce is plentiful, you can harvest the entire top in areas and let it re-grow while harvesting in other areas.
- * When harvesting produce like cucumbers, peas, beans, peppers, squash, or tomatoes, be sure that the produce reaches the expected size, color and ripeness.

If it grows too large or is under-ripe it won't taste as good. Check the seed package for details.

- * Some vegetables need to be cured after they are harvested and before they are stored. Onions and garlic can hang in a cool dry place until they dry out, while winter squash should be dried until the skin hardens on the outside surface before being stored in a cool, dry and dark location. This will help preserve them for longer use.

- * After harvest, eat and enjoy the produce! Fresh produce can be incorporated into your favorite seasonal meals and snacks. You may consider sharing or donating extra produce to family, friends, schools or other food access programs accepting donations. If you have excess, you will need to decide how you want to store it for future use. Knowing how to store your produce is an important part of gardening. Some produce stores well in a dark, cool location or fridge. Other produce must be processed before storage such as drying, blanching and freezing, pickling or canning in order to be preserved for longer.

- * Always follow recommended storage and food preservation methods. This includes ensuring methods and processes such as using sterile equipment so that food spoilage can be avoided.



Figure 66: Preparing to Pickle Beans, Carrots and Zucchini

There is no denying that gardening can be a lot of work, however, this is balanced by the pride and joy you will feel as you are rewarded by the garden's abundance. Not only does maintaining a garden provide the immediate benefit of tasty, fresh and wholesome and sustainable foods, but it also allows holistic benefits such as the pleasure and connections of spending time in nature and with others.

There are so many possibilities to learn, teach and connect with others while gardening and making food more accessible in Saskatchewan. We hope this manual inspires and informs your gardening experiences!



Figure 67: Community Garden Harvest in La Ronge

Harvesting Vegetables

gardening.usask.ca

Vegetable or Fruit	Signs of Maturity and Storage Tips	Signs of Over-Maturity or Storage Tips	Days to Maturity
Beans	Smoothness and color of the pods. Snap beans will easily snap in half when ready.	When the beans start to become apparent, or the coloring starts to lighten the beans will be tougher.	Bush Beans 50–60 days Pole Beans 60–90 days Limas 80–100 days
Beets	2.5cm (1")–5cm (2") diameter. Tender inner leaves can be used as greens and are excellent in soup.	Beets over 7.5cm (3") diameter can become tough.	
Carrots	7.5–10cm (3–4") long and about 2.5cm (1") diameter.	After reaching 4cm (1.5") in diameter they can become woody.	65–80 days
Swiss Chard and Spinach	Chard leaves are best when they are 15–25cm (6–10") long and spinach is best when 10–12.5cm (4–6") long.	Pull off the outer leaves as they mature especially if they are oversized or damaged.	45–65 days

Corn	3 weeks after pollination, the corn silk turns brown. Test for pollination by peeling down the husks. Pop a kernel 5cm (2") down, and if the juices are watery it's too early, if juice is milky it's just right.	If the juice is like tooth-paste when popping a kernel, then the corn is starchy and would be best suited to use in creamed corn or chowder soups.	65–90 days
Cucumber	7.5cm (3") long for sweet pickles, 15cm (6") long for dill pickles and 20cm (8") long for sliced pickles. Picking 4–5 times per week encourages more production.	Do not leave mature fruit on the vine. Once cucumbers are past optimum they will begin to yellow and form a tough skin and become seedy.	55–70 days
Garlic, Leeks and Onions	Green onions are best when the stem is the thickness of a pencil. Leeks are best when 2–4cm (.5–1.5") in diameter. Garlic is ready to be pulled when 1/3 of the top has died back. Bulb onions can be gathered as needed or when the tops start to bend over and yellow. If onions are still growing in September, bend over the tops to start drying them for storage. Onions should be pulled before any heavy frost.	Onions can be dried by being spread on a warm dry floor with lots of air circulation. Garlic should be cured for 20 days at 20°C or 10–14 days at 27°C.	

Vegetable or Fruit	Signs of Maturity and Storage Tips	Signs of Over-Maturity or Storage Tips	Days to Maturity
Lettuce	Harvest while outer leaves are green. If the stand is thick, then entire plants can be cut off permitting other plants to grow. Head lettuce should be picked when firm. For semi-heading types, harvest when a soft head forms.	Do not eat yellow or browning outer leaves.	40 days for leaf lettuce, 100 days for large heads.
Peas	Harvest the pods when bright green, and just before they appear round when viewed from the end. Snow peas are eaten when the pods are still flat and 4–6.5cm (1.5–2.5") long.	Pods longer than 7.5cm (3") may become too fibrous.	60 days
Bell Peppers	Harvest when the fruit is dark green or red depending on the variety and your preference. Harvest with a sharp knife.		75–85 days for transplants (Allow 6–8 weeks from seed to transplant)

Potatoes	<p>New potatoes can be dug up when there are flowers on the plant. For fully mature potatoes, wait until the top growth starts to die back.</p> <p>Mature potatoes have a firm, hard skin. Harvest before the first killing frost.</p>	<p>Leaving potatoes in the ground for 1–14 days will harden the skin for better storage.</p>
Squash and Zucchini	<p>Green zucchini is harvested at 15–25cm (6–10") long.</p> <p>Yellow types are harvested at 10–17 cm (4–7") long.</p> <p>Patty pan or scallop types are harvested at 7–12cm (3–5") in diameter.</p> <p>Spaghetti squash may be harvested when golden yellow and winter squash are cut with a few inches of stem after the vines die back in late summer or fall. Skins should be hard enough to resist your fingernail. Frequent picking encourages production.</p>	<p>Summer Squash 50 days</p> <p>Winter Varieties 80–120 days</p>



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Images in Order of First Appearance by Author

Figure 1, 37: Flying Dust First Nation Food Skills & Gardening Grant Report. Flying Dust First Nation Market Garden. 2013

Figure 2: Government of Canada. "Canada's Plant Hardiness Zones". *Plant Hardiness*. July 2020: http://planthardiness.gc.ca/images/PHZ_2014_CFS_Map_30M.pdf

Figure 3: University of Regina and Canadian Plains Research. "Saskatchewan's Four Main Ecozones". 2007: https://esask.uregina.ca/tmc_cms/modules/customcode/includes/print_entry.cfm-entryid=7347D82A-1560-95DA-430326DC72EE39D8.jsp

Figures 4, 5, 6, 7, 9, 10, 14, 17, 19, 21, 23, 24, 29, 30, 31, 32, 33, 35, 36, 44, 45, 46, 52, 56, 57, 60, 61: Shakotko, Tammy. Various Titles. 2020

Figure 8: Research Gate. *Best management practices for maintaining soil productivity in the Douglas-fir region*. April 2011. <https://www.researchgate.net/publication/50917086>

Figure 11: Saskatchewan Waste Reduction Council. "Compost by Saskatchewan Waste Reduction Council" July 2020: <https://www.saskwastereduction.ca/recycle/resources/composting/>

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Figure 18, 40, 64: La Plonge First Nation. Food Skills & Gardening Grant Report. Various Titles. 2016

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Figure 67: Boyer, Audrey. "Community Garden Harvest in La Ronge". 2020

Useful Resources

University of Saskatchewan:
Gardenline Online
gardening.usask.ca

Saskatchewan Waste Reduction Council
saskwastereduction.ca/recycle/resources/composting/
phone: (306) 931 3249
email: compost@swrc.ca

Down to Earth Labs

3510 6th Ave. North

Lethbridge, AB T1H 5H6

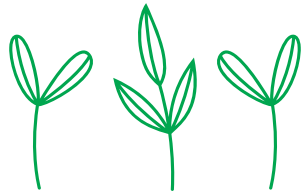
phone: (403) 328-1133

SF2 Soil Test – for basic gardens

email: info@downtoearthlabs.com

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**“GARDENING CAN BE A REWARDING EXPERIENCE
WHEN YOU PLANT VEGETABLES YOU LIKE,
AND SEE THEM COME UP AS DAYS GO BY.
GARDENS ARE SOMETHING TO TAKE CARE OF,
TO LOOK FORWARD TO, AND TO FEEL PROUD OF.
WHEN HARVEST TIME COMES, YOU CAN’T BELIEVE
HOW MUCH YOUR VEGETABLES HAVE GROWN
AND THE MONEY YOU HAVE SAVED.”**

Angelique Sanderson, La Ronge

