

Digging Deeper into Common Gardening Advice:

A How-To Guide to a Healthy Yard



UNIVERSITY OF SASKATCHEWAN

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Gardening can be a rewarding activity for people of all ages and abilities.

As gardeners—both new and experienced—we rely on various sources of information to guide our gardening practices. We ask our friends and family for advice, visit garden centres, and read books, blogs and magazines. This helps us improve our gardening skills, troubleshoot problems, find inspiration, and understand what’s possible in our yards and gardens.

While much of this knowledge can be very useful, sometimes it can be difficult to know if we’re getting gardening advice that we can trust. Here are some tips to help you get started:

- **Consider location:** Advice that comes from geographic areas with different soils and climates may not work well on the Prairies.
- **Consider the source:** Has the information been researched and tested? Is the information from informed subject experts? If searching the internet, add the terms “.edu” or “.gov” to your search term to find research-based sources.
- **Consider the audience:** Is the information intended for commercial growers or for home gardeners? The needs of commercial growers differ from home gardeners.
- **Consider local research:** Contact your nearest university, horticultural association, or local experts for information and advice. In Saskatoon, visit gardening.usask.ca for free, well-researched, local gardening information.

USING THIS GUIDE

In this guide, we examine whether common gardening knowledge is providing gardeners with the best advice by comparing it to what research recommends. Some of the common practices we use in our gardens have been tested very thoroughly. While much of what we do is both safe and effective, you may be surprised to know that some approaches are not! Each section of this guide explores whether “conventional wisdom” has really stood the test of time.

Maintaining healthy soil in Prairie gardens

Healthy soil is key to having healthy plants. The old saying “feed your soil, not your plants” still holds true.



WHAT GARDENERS HAVE BEEN TOLD

Rototill your vegetable garden to mix in organic matter and soften the soil before planting.

Does it work?

Rototilling your garden is **not recommended**, as there is a lot of evidence that tilling can harm your soil. Take your cue from farmers—they rarely till their fields.

Rototilling destroys the aggregate structure of soil, which can make it difficult for nutrients to be taken up by plant roots. Over time, rototilling pulverizes soil, making it hard and crusty. Tilling also exposes weed seeds, which only encourages them to germinate.

If you've been gardening in the same space for a while and you're a faithful tiller, the first couple of years of switching to a no-till system may be more difficult than tilling simply because your soil structure is still repairing itself. Giving up tilling may seem wrong at first, but the results will amaze you.

Exception: If you have significant underground pest issues in your vegetable garden, it is useful to till the soil in the late fall to expose the larvae to our harsh winters. Just make sure that if you do till, you never till when the soil is wet or you will do considerable damage to your soil.

Is there a better way?

Consider taking a no-till approach by:

- Adding organic matter, such as compost, to the top of your soil. There is no need to dig it in.
- Adding mulch to protect your soil from erosion, improve its biological life, retain moisture and naturally increase organic matter. Over time, mulched soil becomes soft and crumbly to the touch. Mulching also suppresses weeds which means a lot less back-breaking work for gardeners.

WHAT GARDENERS HAVE BEEN TOLD

Add sand to clay soil to make it easier to work.

Does it work?

Adding sand to prairie soils is **not recommended**. The danger of adding sand—especially in small amounts—is that large sand particles mixed with tiny clay particles will result in a concrete-like mixture.

It takes the addition of 50% of total soil volume to significantly change the texture of clay soils. That means adding a truckload of sand to a small garden patch to change soil texture.



The problem with clay soil is not the texture, but the lack of aggregate structure. Adding sand will not fix this.

Is there a better way?

Clay soil is nutrient-rich, but tends to be slow to drain, poorly aerated, easily compacted and extremely hard if it lacks good aggregate structure.

Instead of adding sand:

- Use mulch to improve the aggregate structure of clay soil. No need to dig it in, just lay mulch on top of the soil. Give it time and you won't believe the difference!

WHAT GARDENERS HAVE BEEN TOLD

Add Sulphur or lime to change the pH of your soil.

Does it work?

There are many factors that can limit plant growth but, in the Prairies, pH is rarely a problem. Applying lime or Sulphur—apart from being unnecessary—is expensive and temporary at best. As such, large scale pH adjustments to yards and gardens are **not recommended**.

Prairies soils, especially prairie garden soils, are often rich in nutrients and organic matter, which tend to be “basic” or slightly alkaline. Basic soils are favorable for the uptake of nutrients. Prairie soils are also very resistant to changes to pH because of the presence of free lime and their soil buffering capacity. Soil buffering capacity is the soil's ability to resist change—if you try to adjust it, the pH will not move much at first but once you exceed the buffering capacity, it will suddenly begin to change dramatically with little effort. It is very easy to damage your soil permanently if you exceed your soil's buffering capacity.

Exception: A few plants (e.g. azaleas, rhododendrons, blueberries) must grow in acidic soil. You can temporarily change the pH in an individual planting hole by adding a large amount of peat and incorporating elemental Sulphur before planting. Test the pH frequently and apply the acidifier as needed to maintain the pH. It may be simpler to grow these plants in a container of soilless potting mix instead.

Is there a better way?

Large scale changes to soil pH are not necessary on the Prairies.

If your plants are not growing well and you suspect a nutrient deficiency or pH issue, contact Gardenline for advice: gardening.usask.ca.



WHAT GARDENERS HAVE BEEN TOLD

Plants will not grow under spruce trees because the fallen needles make the soil too acidic.

Is it true?

While it is true that nothing seems to grow under spruce trees, needles are not the problem. Plants fail to grow because the soil is depleted (lacking organic matter) and because the plants lack sunlight and moisture. Both shallow and exposed tree roots may also interfere.

While spruce needles themselves are somewhat acidic, the soil beneath evergreens is not much different than the rest of the soil in your yard. This is because free lime, discussed above, is already in our soils and the buffering capacity of Prairie soil actively resists changes in pH.

Is there a better way?

Avoid planting under conifer trees and leave them in their natural shape including low branches. This is best for the tree long term. If you really must plant under your conifer, a few ways to improve your chances include:

- Mulch under the trees to improve the existing soil (take care not to cover exposed roots or the base of the tree trunk).
- Consider removing some lower branches to let in more sunlight.
- Select plants which like dry shade and plant in groupings in prime growing locations, leaving the less ideal areas unplanted but well mulched.
- Regularly water plants until they're established (continue watering periodically to maintain adequate soil moisture).
- Set out containers of shade-loving plants. Water by hand.

WHAT GARDENERS HAVE BEEN TOLD

Use landscape fabric under mulch to prevent weeds from germinating.

Does it work?

Landscape fabric is great for agricultural weed control (where the fabric is replaced often). However, it does not work well in home landscapes, so is **not recommended**.

Landscape fabric tends to break down, allowing weeds to germinate and grow. Pulling weeds out of landscape fabric is difficult because weed roots become tangled in the fabric.



Is there a better way?

Weed control is better managed by:

- Applying a thick layer of mulch with no landscape cloth underneath. The few weeds that emerge in mulch are surprisingly easy to pull with a gentle tug.

WHAT GARDENERS HAVE BEEN TOLD

Speaking of mulch, doesn't mulch tie up nitrogen in the soil?

Is it true?

There is a nitrogen deficiency at the thin topmost layer of the soil just beneath the mulch. This thin deficient layer inhibits weed seed germination.

The nitrogen deficiency does not impact the roots of plants. In fact, nutrients in mulched soil actually increase in the root zone and in the plant foliage. Since mulch also provides protection from extreme temperatures, reduces pest and disease issues, and reduces watering needs, it is **highly recommended**.

Is there a better way?

Applying natural mulches, such as wood chips, leaves, or shredded bark (not bark chunks) will benefit your soil and plants. Simply water your soil, spread your mulch 4-5 inches deep, and water it again. Mulch must not be mixed in to your soils or it is no longer considered mulch. Once you mix it into your soils, it is now considered a soil amendment. Mixing wood chips and bark into your soil is not recommended as this will tie up significant amounts of nitrogen in your soil.

WHAT GARDENERS HAVE BEEN TOLD

Put a layer of gravel or other coarse materials in the bottom of containers to improve drainage.

Does it work?

Everyone knows that containers need a hole in the bottom to allow excess water to drain from the pot. It also seems sensible to add gravel to improve drainage. But is it?

In reality, it is known that water does not move easily between finely-textured material (soil) and coarsely-textured material (gravel). Because of this, water tends to saturate the soil above the gravel inside containers—exactly the opposite of what is required for plant roots. As such, adding gravel, rocks or other coarse materials to your containers is **not recommended**.



Is there a better way?

Don't bother adding a layer of gravel to the bottom of your containers. Simply fill your containers with soil-less medium and then plant your plants.

Maintaining healthy trees and shrubs in Prairie gardens

Trees and shrubs are the most expensive and significant features of a home garden, so caring for them properly pays off. Many problems leading to the decline or death of trees and shrubs are not caused by pests or diseases, but by unsuitable gardening practices.

WHAT GARDENERS HAVE BEEN TOLD

Add organic matter and compost to the planting hole when planting a tree or shrub.

Does it work?

In the short term—yes, it does work. What plant would not like being planted in high quality soil? Unfortunately, once the roots reach the boundary of the amended soil, they tend to circle or girdle rather than expanding out. Over time, a constricted root mass stresses the plant, leading to restricted growth and other problems. Therefore, adding amended soil to a planting hole is **not recommended**.

Is there a better way?

In the long term, trees and shrubs do better when they are planted in your yard or garden's original soil (without amendments).

WHAT GARDENERS HAVE BEEN TOLD

Securely stake a newly planted tree.

Does it work?

Staking of newly planted trees is **not recommended** unless the tree is significantly unstable. Sometimes temporary staking is necessary for new trees, especially bare root plantings. However, problems result when trees are staked too high, too tightly, and for too long.

Movement of the trunk in light breezes is needed to strengthen the trunk. Constriction of the trunk can cause problems with water and nutrient uptake.



Is there a better way?

To support newly planted trees:

- Follow the University of Saskatchewan's planting directions at the gardening.usask.ca Gardenline—How To area.
- If staking is needed, be sure to place the stakes as low as possible and use flexible ties to allow some trunk movement. See gardening.usask.ca for a recommended tying pattern.
- Remove ties and stakes once the roots have established—keep in place for no longer than one growing season.

WHAT GARDENERS HAVE BEEN TOLD

For newly planted trees, water well for two weeks and then only once in a while.

Does it work?

This might keep your tree alive for a couple of weeks, but it doesn't ensure long term health. It takes two to three years for a new tree to become firmly established in our climate. Therefore, under-watering newly planted trees while they are becoming established is **not recommended**.

Is there a better way?

Here are some tips for watering newly planted trees:

- Water your new tree frequently during the first year, sporadically the next year and as needed the third year.
- Ensure your tree is mulched generously (top up the mulch as it ages). Do not place mulch directly against the tree.
- By year four, you should stop providing extra water and fertilizer to your tree for the rest of the life of the tree. Why? Because trees will start to find available resources on their own.
- Once your tree is established, water only in times of drought.

Providing nutrients in Prairie gardens

All plants need nutrients to grow, including macronutrients like nitrogen, potassium and phosphorus, as well as micronutrients. Most of these are already present in Prairie soils but sometimes the plant isn't able to access these nutrients due to poor soil health or other factors. Occasionally, plants need supplemental fertilizing if a nutrient is deficient.

WHAT GARDENERS HAVE BEEN TOLD

Use Epsom salts as a fertilizer for garden tomatoes—it even says so on the package.



Does it work?

We don't know how to break this to you, but Epsom salts are bad for your soil and are **not recommended**. Epsom salts contain magnesium and salt. Many plants suffer from excess salt in the soil.

A form of Epsom salts are used as a supplement in commercial agriculture where magnesium is deficient. While magnesium deficiency is an occasional problem for tomatoes in intensive agriculture situations, why supply extra magnesium if it is not needed? Epsom salts do not supply a complete fertilizer for tomatoes.

Is there a better way?

So what can you do to grow healthy tomatoes?

- Plant tomato seedlings in healthy soil once all danger of frost has passed. Tomatoes can be planted deeply—roots will sprout from the stem and develop a strong root system.
- Apply a 1" topdressing of compost and then top with 4" of mulch.
- Water regularly and deeply.
- If there is a nutrient deficiency, apply compost or a fertilizer for tomatoes or vegetables, according to the directions on the package.
- If you're planting your tomatoes into potting mix, there will always be a nutrient deficiency unless there is a fertilizer or compost added. Potting mix isn't soil and has very few nutrients.

WHAT GARDENERS HAVE BEEN TOLD

Add bone meal to the planting hole to stimulate root growth.

Does it work?

Bone meal contains calcium and phosphorus, macronutrients which are normally in good supply in Prairie soils. While plants do need phosphorus, too much of this mineral inhibits the growth of mycorrhizae fungi. As such, adding bone meal is **not recommended**.

Is there a better way?

No need to go to the expense and trouble of adding bone meal. Instead:

- Plant trees and shrubs in original soil without soil amendments.
- Apply a thick layer of mulch after planting.
- Do not add fertilizer to the planting hole.



Managing diseases and insect pests in Prairie gardens

WHAT GARDENERS HAVE BEEN TOLD

Compost tea (made by soaking a bag of compost in water) is good for suppressing disease.

Does it work?

A number of scientific studies have found that compost tea does not suppress disease and is, therefore, **unnecessary**.

Another concern about compost tea is that it has the potential to contain E. coli or Salmonella. There are serious risks to human health when compost tea containing these pathogens is applied to food crops—especially leafy greens.

Is there a better way?

Instead of making compost tea:

- Apply a thick layer of organic mulch on top of soil to suppress disease.
- Use compost directly to improve the health of your soil and plants.

WHAT GARDENERS HAVE BEEN TOLD

Organic pesticides and pesticides made from plant extracts are safe to use.

Is it true?

‘Organic’ or ‘Plant-Derived’ pesticides may seem safe, but are they really?

Unfortunately many common ingredients in ‘organically derived’ pesticides kill both harmful and beneficial insects, which may magnify your original pest problem. Some of these chemicals, such as pyrethrin (which is made from the chrysanthemum flower), are also toxic to bees, birds, and fish.

This is just one example of how plant-based pesticides are **not necessarily safe**.

Is there a better way?

There are a number of ways to manage pests safely:

- Find out what pest you’re having a problem with and seek a control method designed to manage that specific pest safely. We compile pesticide free control methods for common pests at Gardenline Online at gardening.usask.ca.
- Read the label before purchasing any pesticide. The product will list its environmental hazards, human health hazards, and mammalian health hazards. Recognize that all pesticides, even organic ones, will kill beneficial insects too.

- Focus on prevention. Weak plants get attacked by insects. Ensure your plants get adequate sunlight, water, and fertilizer, preferably in the form of healthy soil rich in organic matter.
- Make peace with the insects in your yard—most of them are not harmful. In fact, many insects will actually help control the “bad bugs” in your garden.

WHAT GARDENERS HAVE BEEN TOLD

Homemade pesticide ‘alternatives’ are safe to use.

Is it true?

Homemade pesticide recipes found on the internet may include ingredients like borax, detergents, vinegar, baking soda, bleach or ammonia to name a few. These ingredients are toxic and are harmful to soil, birds, aquatic life, and insects.

Some have little effect on the pests they are intended to kill, or lead to unintended consequences. For example, borax mixed with sugar is **not recommended** as a pesticide for killing ants. The danger is that if children or pets eat this concoction, it can harm or even kill them. Pesticides made from tobacco are especially toxic and are readily absorbed through your skin.

Homemade pesticides are **not recommended**.

Is there a better way?

Instead of applying homemade pesticides, consider the following:

- Know your enemy. Is this pest actually a problem or is it simply annoying?
- If you are having a pest problem, first identify the pest and assess the severity of the damage. Know its’ life cycle and find out if it has a natural predator. Is there a way to manage the pest without pesticides or homemade alternatives? Check Gardenline Online at gardening.usask.ca for pesticide free control methods for common pests.
- Focus on prevention. Weak plants get attacked by insects. Ensure your plants get adequate sunlight, water, and fertilizer, preferably in the form of healthy soil rich in organic matter.
- Make peace with the insects in your yard—most of them are not harmful. In fact, many insects will actually help control the “bad bugs” in your garden.



WHAT GARDENERS HAVE BEEN TOLD

All insects need to be sprayed or controlled using pesticides.

Is it true?

Insects are a natural part of outdoor spaces like yards and gardens. Healthy yards, gardens, and soils are ecosystems which benefit from a wide variety of organisms including plants, insects, and wildlife.

Sprays contain chemicals which kill target pests, as well as a wide variety of life including beneficial insects, pollinators like bees, birds, mammals, and aquatic life. Natural ecosystems and home gardens can be weakened by the use and over-use of pesticides. As such, this approach is **not recommended**.

Planting seeds in Prairie gardens

WHAT GARDENERS HAVE BEEN TOLD

Heirloom seeds are superior to other types of seeds.

Is it true?

When it comes to planting heirloom varieties—the choice is yours. Basically, heirloom seeds include any seeds that grow into a plant that is like their parent (called “breeding true”) and have been grown by people for a long time with 50 years a common cut off. While we may assume that heirloom seeds have not been genetically modified, all cultivated seed has had some sort of human-influenced breeding. Not even heirloom seeds look like the “original” plant. It might help to think about how different a poodle and a wolf are. Wolves are the “original” ancestors of poodles but they were bred by humans to look and behave differently. Similarly, wild corn looked much like grass, cabbage was smaller than a tiny pea, and watermelon was mostly dense rind.

It’s important to note that while heirloom seeds do tend to have more variety in taste and texture, they tend to be less reliable overall, have lower yields, and tend to be more susceptible to disease when compared to named varieties.

Heirloom seeds are not any more or less organic than other seeds. All seeds are organic unless they have been “treated” with a coating, such as a fungicide to prevent rotting in the soil. Both heirloom and non-heirloom seeds can be treated.

Is there a better way?

If you have the space, plant different kinds of each vegetable, both heirloom and named varieties. Each type will have different characteristics, as well as varied resilience to different insects and diseases. By planting several kinds, you can hedge your bets against which diseases will come around during the growing season.



WHAT GARDENERS HAVE BEEN TOLD

Always buy non-GMO garden seeds.

Is it true?

The term “GMOs” refers to genetically modified organisms, where the modification is made on a cellular level in a laboratory.

It is not legal to sell GMO gardening seeds to the general consumer in Canada. Only farmers and large commercial agencies can buy GMO seeds for commercial use. While some home gardening seeds are labeled “GMO free”, this is simply a marketing tactic, as all garden seeds are GMO free.

In horticulture, selective breeding is used, which is different from creating GMO seed.

Is there a better way?

Buy whatever seeds catch your interest, as all garden seeds are GMO free.

WHAT GARDENERS HAVE BEEN TOLD

You can save vegetable seeds from any garden plant and expect them to breed true year after year.

Is it true?

Yes and no.

Most seeds are likely to produce plants similar to the parent. It’s generally safe to assume that both varieties and heirloom plants will breed true from seed. This means that if you collect seeds from the parent plant, the new plants will look and perform just the same way.

Plants grown from saved cultivar and hybrid seeds are much less likely to breed true. The offspring plants tend to be missing the features that make the cultivar or hybrid plant special or unique. For example, if the cultivar is known for having curly leaves, the seeds saved from this plant are unlikely to produce plants with curly leaves. It is also likely that the offspring grown from cultivar or hybrid saved seeds will produce a selection of many different looking plants (this is increasingly true with hybrids).

Is there a better way?

Have fun and experiment!

You can also try breeding your own plants—maybe you’ll even come up with a special kind of plant that only you have!



Deciphering labels

WHAT GARDENERS HAVE BEEN TOLD

We can only grow things that are labeled for our zone.

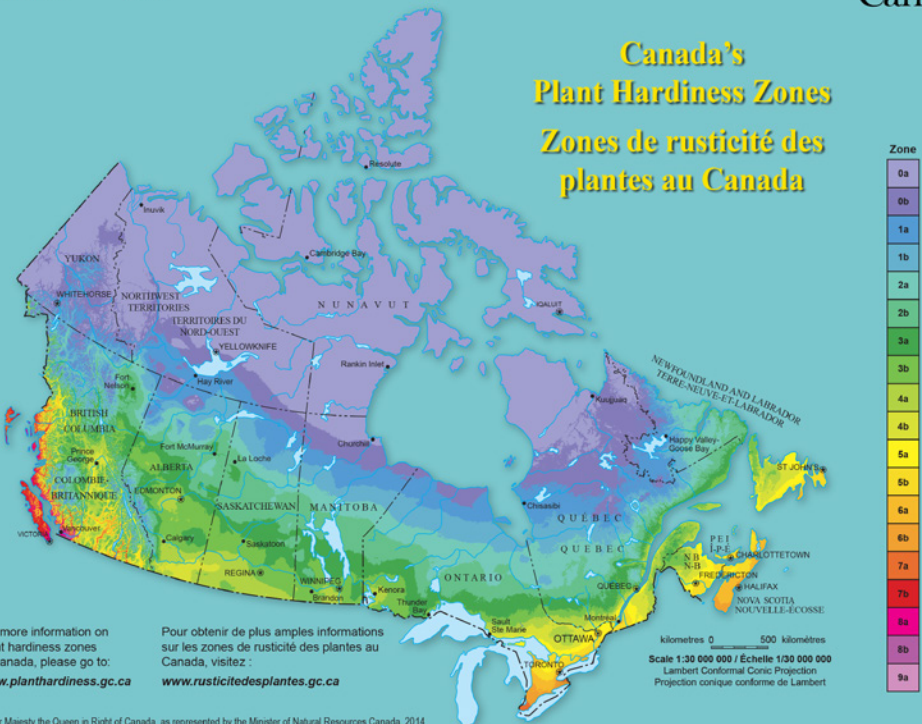
Is it true?

Hardiness zones range from 0a to 9a. How an area is zoned depends on seven factors:

1. Elevation;
2. Average temperature in the coldest month;
3. Average temperature of the warmest month;
4. Length of frost-free period;
5. Total rainfall from June to November;
6. A 'winter factor'; and
7. Average maximum snow depth and maximum wind gust.

The basic premise is that you can plant anything at or below your zone and expect it to live through the winter unprotected. You can still grow plants above your zone, but they are often treated as annuals.

Canada's Plant Hardiness Zones Zones de rusticité des plantes au Canada



Since our climate is changing, hardiness zones are periodically updated (last updated in 2016). Saskatoon has increased to a zone 3b, so we can expect little winterkill on plants labeled zone 0-3.

Hardiness zones are based on what unprotected plants in open areas can withstand. Therefore, if you are able to provide winter protection (i.e. with mulch or ample snow cover) and/or you live in a fairly protected area (i.e. within in a town or city), you can expect plants with slightly higher hardiness zones to make it through the winter with little to no winterkill.

Plants are notoriously labelled with hardiness zones higher than their actual zone. In part, this is due to a lack of cold-climate test plots and because many greenhouses do not want to take on the risk of “over-promising” which plants can reliably grow in their area.

Is there a better way?

To figure out what plants will survive our winters and which ones will simply make nice annuals, speak with reputable local suppliers when deciding what to purchase. You might be surprised to find out that the zone 4 plant you’ve been eyeing up can actually grow reliably in our climate.

It is especially important to find zone-appropriate plants when choosing large perennials, trees, and shrubs that have long lifespans. Before you purchase a new tree, take a look at the Prairie Tested Trees site prairietrees.ca/prairie-tested-trees.

Shopping at locally owned and operated greenhouses can also be a safer bet when looking for plants that are hardy for your area. Be aware when shopping at big box stores, as they often purchase plants for an entire region, regardless of whether the plants are hardy for your specific location. It isn’t uncommon for them to offer perennials that aren’t actually winter hardy.

WHAT GARDENERS HAVE BEEN TOLD

The photos of gardens in magazines are realistic depictions of what your garden can easily look like.

Is it true?

Home magazines often have a budget of tens of thousands of dollars and a team of people to drastically edit the photos. The gardens are also staged with more plants than can grow healthily in that space.

Is there a better way?

To get a good idea of what a lovely yard in your region looks like, join your local gardening society, talk to local gardeners in person or through social media, and participate in your local garden tours. See something you really like and looks healthy in your neighborhood? Ask them what it is!

**For more information on all of these topics (and more!), visit
gardening.usask.ca**



Gardening at the U of S

Gardening at the U of S offers free growing information and diagnostics with Gardenline Online, free and low-cost public workshops and events, and ample ways to connect with local gardeners and gardening communities. All of our information is proven to work, right here. Visit us at gardening.usask.ca

City of Saskatoon

Having a healthy yard and garden benefits you and your community. For tips on water conservation, backyard composting, pesticide reduction, and more, visit saskatoon.ca/healthyyards.

Questions?

Get free, local gardening advice from the University of Saskatchewan's Gardenline at gardenline.usask.ca year round. During the growing season you can contact a horticulturist for personalized advice at gardenline@usask.ca.

Grow a Greener Saskatoon