PLANT HEALTH CARE
& integrated pest management

have a landscape you
can feel good about

healthy landscapes
healthy living

Kamloops

Canada's Tournament Capital

We all want attractive surroundings, and for those of us who have a yard, we also want it to be a source of enjoyment. The best place to start is with soil. Good soil supports healthy life and is the preferred way to prevent weed growth and deter insect pests and plant disease.

Plants need soil for support, air, water and nutrients. The important characteristics of soil for growing plants are:

Texture: the relative proportion of sand, silt and clay. Most plants do well in loamy soil containing all three minerals. The soil texture in Kamloops varies significantly.

Organic Matter: the non-mineral component of soil that was once alive. Kamloops soils are usually low in organic matter.

Soil Life: includes things we can see (earthworms, insects, rodents, reptiles), and things we can't (bacteria, fungi, nematodes). Healthy soil is full of life - a handful of soil is likely to contain billions of organisms and relatively few are detrimental. Most are necessary for transforming organic matter into nutrients that can be absorbed by your plants.

pH: the measure of acidity or alkalinity. Acidic soils are lower than pH 7.0. Alkaline soils are higher than pH 7.0. A good average range is pH 6.0-7.5. Kamloops soils are usually neutral to alkaline.

Drainage: the rate at which excess water drains from a soil. Sandy soils drain faster than silt or clay soils.

Salinity: the level of potentially harmful salts, usually high in arid areas or poorly drained soils.

Fertility: the available nutrients for plant growth, generally low in Kamloops soil.

A healthy landscape depends on knowledge of your soil conditions. It is recommended you have your soil tested before making any changes.

The ideal soil depends on what you are trying to grow, as different plants have different needs. It is easier to grow something appropriate for your soil type, than it is to significantly change it. Still, you can make improvements to soil structure and texture, as well as nutrient and water holding capacity. The goal should be to feed beneficial organisms and deter harmful ones.

Amendments which can be used to improve soil include:

Organic Material:	compost, aged manure, decomposed sawdust, and peat moss improve moisture holding capacity in sandy soils and loosen clay soils.
Sand:	improves drainage in clay soils and the structure of light organic soils.
Lime:	raises the pH of acidic soils.
Sulphur:	slightly reduces the pH of alkaline soils.
Fertilizer:	adjusts soil nutrients to the requirements of proposed plants.
Leaching:	uses water to reduce salinity.

Now that you have read about the basics of soil, you can start designing the layout for placement of plants in your yard. Select a variety of plants and ensure the right plant for the right site. Doing so provides an advantage over pest problems.

Consider the following factors:

Water Requirements: In our semi-arid climate, drought tolerant plants thrive. There are many beautiful trees, shrubs and flowers with low water requirements. *(See the Creating a Kamloops Xeriscape brochure.)* Plants which have adapted to our climate are usually more pest resistant.

Cold Hardiness: Most plants are given a hardiness rating according to temperature zones, with Zone 1 being the coldest to Zone 8 being the mildest (in Canada). Our Kamloops climate ranges between Zone 3 at its highest levels, to Zone 6 at the valley bottom. See the zone map on pages 5 & 6 for details.

Within these zones there are areas known as micro-climates, where the climate differs from the surrounding area. Hedges, walls, and fencing may offer protection that can alter growing conditions.

Exposure: Whether an area is sunny or shady, windy or protected, exposure will determine what plants will flourish where.

Landscape Value: Try to plan for year round interest and enjoyment by considering more than just flowers. Think about the colour and texture of leaves, bark and fruit, along with overall branching and shape of various plants.

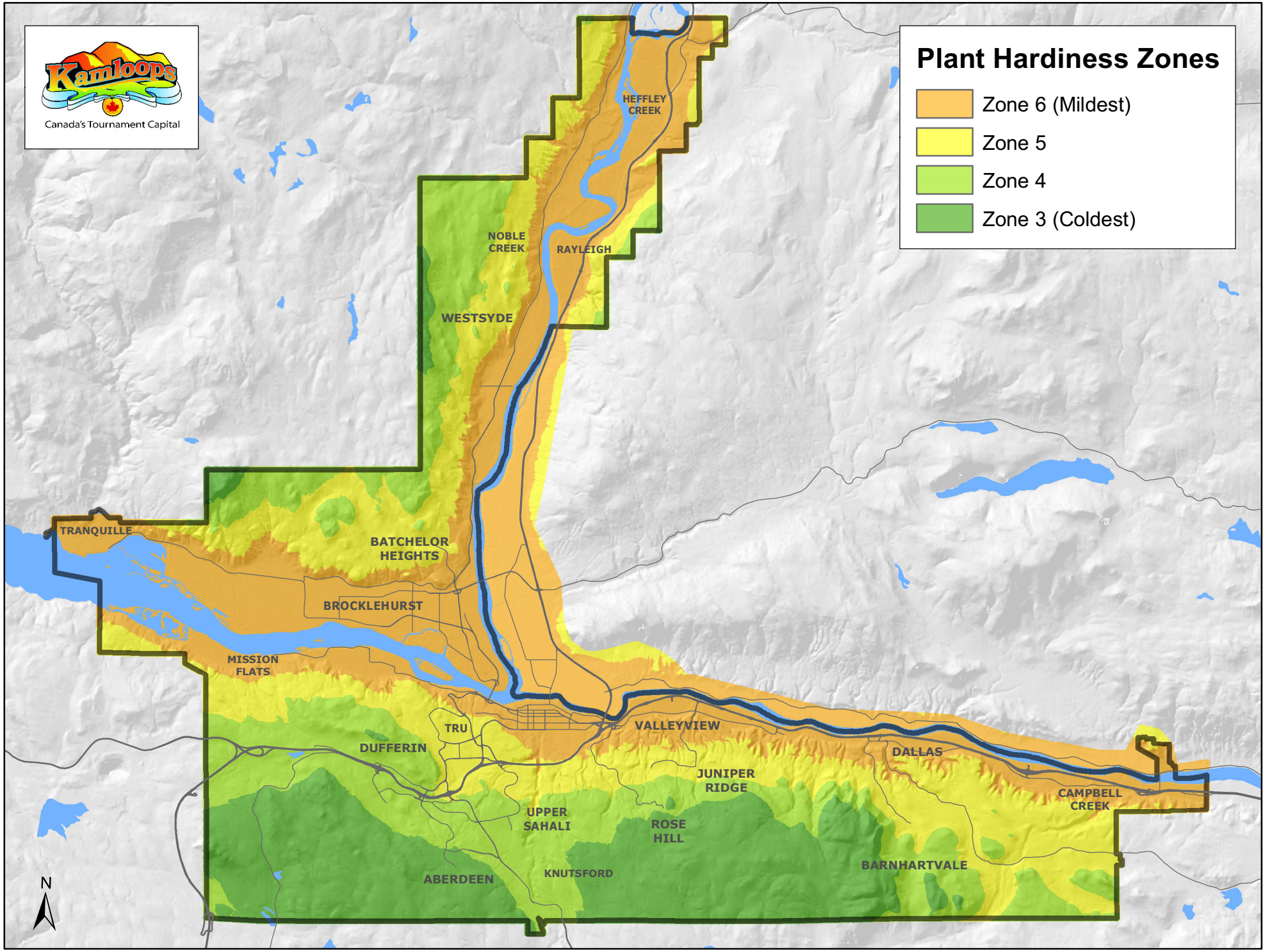
Maintenance: Plants vary in the amount of care required to keep them looking attractive. Select plants that realistically meet your gardening time constraints.

Size: Plant for mature size, do not prune for size.

Just as a healthy person has a strong immune system, healthy plants have good defenses. And, just as thought and care go into maintaining a healthy body, proper establishment and maintenance of a landscape are critical for its well being. To help build the defenses of your landscape and prevent problems from starting, try the following tips.

Steps for Planting Success

1. Purchase healthy, pest-free plants.
2. When holding plants for later planting, keep them in the shade and water them regularly.
3. Water plants thoroughly before planting to saturate the root ball.
4. When planting a tree or shrub, dig the planting hole two to three times wider than the root ball.
5. Place the plant in the hole so the top of the root ball is level with the soil surface.
6. Remove any wire or cord from around the stem of ball-and-burlap plants. Pull back or remove the burlap from the root ball if possible. (Exposed burlap will wick moisture away from the root ball.)
7. Backfill with at least 70% native material and no more than 30% composted material.
8. Shape a small ring of soil along the perimeter of the planting hole. This helps direct water to the roots and prevents runoff.
9. Immediately after planting, water thoroughly to settle the soil and to eliminate air pockets that can dry out roots.
10. Apply mulch to the soil surface to conserve moisture, to reduce weeds, and to regulate soil temperature.
11. Water as necessary during the establishment period. Keep the soil uniformly moist -- not too wet or too dry. All plants will require more supplemental watering for the first year or two while they are becoming established.


Kamloops
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Plant Hardiness Zones
Zone 6 (Mildest)
Zone 5
Zone 4
Zone 3 (Coldest)
HEFFLEY CREEK
NOBLE CREEK
RAYLEIGH
WESTSYDE
TRANQUILLE
BATCHELOR HEIGHTS
BROCKLEHURST
MISSION FLATS
TRU
DUFFERIN
VALLEYVIEW
DALLAS
JUNIPER RIDGE
CAMPBELL CREEK
UPPER SAHALI
ROSE HILL
ABERDEEN
KNUTSFORD
BARNHARTVALE
N

Mulching:

In nature, plants drop leaves, twigs and branches onto the soil below them. This layer of matter protects plant roots from heat, cold, and drought. It also enriches the soil and controls weeds. If we mimic nature and apply a layer of mulch to the surface of our soil, our landscapes can benefit in the same way.

Depth of Mulch: Generally create a layer of mulch about 7.5 cm (3") thick, slightly less for smaller particles, up to 10 cm (4") for larger pieces. Too much mulch will limit the air flow to the plant's roots. And too little won't control weeds. To prevent disease problems, keep mulch away from trunks of trees and stems of shrubs.

Time to Mulch: It is best to mulch in the spring after the soil has absorbed winter moisture, but before summer temperatures rise high enough to start pulling the moisture back out from the soil.

Organic Mulch: Organic mulch must be renewed periodically, as it breaks down after a period of time. It adds nutrients to the soil and improves soil structure as it decays. *(See Weeding on page 10 for facts on landscape fabric.)* Types of organic mulch include:

- Bark – coarse or fine grades
- Compost
- Composted sawdust
- Leaf litter – pine needles, shredded leaves
- Grass clippings
- Shredded newspaper
- Wood chips

Inorganic Mulch: Inorganic mulch, depending on the colour, can cause heat buildup in the soil and around plants, which can then increase water requirements. It should be used carefully for this reason. Avoid plastic or other impermeable materials which restrict the flow of water into the soil. Types of inorganic mulch include:

- Crushed gravel
- Lava rock
- River rock
- Pea gravel

Watering:

Over-watering contributes to: rapid weak plant growth, fertilizer leaching, insect and disease problems, and weed growth. To encourage deep rooting and drought-resistance, water deeply, thoroughly, and less often.

- Let soil moisture be your guide for watering frequency. Squeeze a handful of soil, if soil is too dry to form a ball then you've waited too long, if it forms a crumbly ball, it's time to irrigate. If it forms a ball and is slick, there is no need to irrigate yet.
- The amount of water required for your landscape will depend on several factors: soil type, weather, location, wind exposure and type of plant material. Remember to group together plants with similar water requirements, and always water lawn separately.

Fertilizing:

Proper fertilizing is an essential component of plant health care in the landscape. There are not always enough nutrients in the soil for a plant to grow well. On the other hand, excessive fertilizing will promote fast, but weak growth, actually increase a plant's water needs and intensifies problems with aphids and other pests. A soil test will determine if fertilizing is required.

Slow-release fertilizers feed plants from 6-12 months with one application. They generally cost more than general-purpose fertilizers, however, fewer applications are required. There are many **organic fertilizers** to choose from that serve as soil conditioners – they feed soil organisms and plants. For **general-purpose fertilizers**, use light applications for newly planted ornamentals during the first growing season. When broadcasting fertilizers over the top of the foliage, be sure the foliage is dry, and water soon after application. Follow application guidelines on the label.

Pest Control:

The best way to control pests is to provide the essentials for good plant growth: good soil, adequate light, and only the required amounts of water. *(See Integrated Pest Management for Your Trees, Plants & Garden on pages 21 & 22)*

Pruning:

Proper pruning can keep plants healthy and vigorous. Over-pruning stimulates excessive growth, increasing a plant's water use. The result is lush, weak growth that attracts insect pests (e.g. aphids). Allowing plants to achieve their natural growth produces a better appearance and reduces the amount of pruning that is necessary.

Why prune:

- To produce more / better blooms
- To rejuvenate older or neglected shrubs – removing overcrowded stems encourages vigorous new ones
- To remove dead or diseased wood
- To repair injury – damaged wood is an open invitation to disease-causing organisms
- To train a young plant – encourage balanced open growth

When: There are many variables that dictate the best time to prune. Consider the following: the condition of the plant, the length of its growing season, when it flowers, and whether it blooms on new growth or only on older wood.

How: Use clean, sharp, quality tools suited to the job. Prune back to a branch or bud, otherwise a stub is left that will die back and promote decay and disease. Make cuts no more than 64 mm (¼") above a bud or side branch. Consult pruning manuals for plant specific requirements.

Weeding:

Pull weeds as soon as you notice them. It is easier and most effective when the soil is moist. Try to remove as much of the root system as possible.

Many people look to landscape fabric as a solution; however, it has limited weed control effectiveness. It is most useful for keeping inorganic mulch from mixing with the soil. Here are some points to keep in mind if you are considering landscape fabric:

- It doesn't allow the spread of groundcover plants.
- A layer is created (from decomposing material) that will grow weeds on top of the fabric.
- Fabric prevents decomposed material from mixing with the soil and enriching it.

There's more than one way for your lawn to be healthy. Reducing or eliminating pesticides is definitely a healthy option for your family, pets, and neighbours. However, your lawn itself needs to be healthy and a healthy lawn is achieved by feeding the soil not the grass. Nourish the soil and most weeds will be crowded out over time.

Healthy Lawn care tips:


As mowing height decreases, depth of rooting decreases and maintenance increases.

Mow high: Leave grass 5 - 7 1/2 cm (2-3") tall (about a finger length) and avoid mowing more than 1/3 of the grass blade. (e.g. If grass is 9 cm, only remove 3 cm, leaving 6 cm.) Longer grass shades the roots and helps prevent evaporation. It also helps your grass grow deep and strong roots that can overpower weeds and retain water. Leaving mulched grass clippings on your lawn can provide about one-third of your lawn's nutrient needs and are a valuable source of organic matter.

Dethatch: Thatch is a tough mixture of dead grass and roots that accumulate and form a layer at the soil surface. Excessive watering, nitrogen or pesticides may contribute to a situation where the thatch exceeds 1 cm (0.4"). Excess thatch can be removed using a stiff rake or specialized de-thatching equipment.

Aerate: Aeration is the process of removing plugs of soil from your lawn, or making holes in it with a tool like a pitch fork. This creates spaces for air, water and nutrients to penetrate into the soil and promotes the growth of beneficial microorganisms. It also increases water absorption and reduces surface runoff.

Topdress: Topdressing involves spreading good quality topsoil or compost on top of your lawn. This adds organic matter and improves the condition of the soil. Topdressing is essential on bare areas and on lawns with little topsoil. Add 0.6 – 1.2 cm (¼ to ½") of topsoil or compost. Don't smother the grass blades.

Overseed: Overseeding is the process of adding grass seed to your lawn. Use a high quality mix suited to the area. Topdressing and seeding can be done together.

Water Deeply: A Kamloops lawn doesn't need to be watered every other day. It only requires about 2.5 cm (1") per week to keep it green. Water one to two days per week depending on weather and soil conditions (sandy soils drain faster than silt or clay soils). An empty tuna can is approximately 2.5 cm deep.

- Place several cans at different distances from your sprinkler
- Time how long it takes to collect an average of 2.5 cm
- Water this length of time about one to two times per week in the summer
- Reduce this time by up to half for spring and fall-time

Try this test to determine when to water for YOUR lawn:

Step on your grass

- If readily bounces back - no watering required
- If it takes awhile to recover - it's time to water
- If it lies flat - you've waited too long

Fertilize: Fertilizing is important for overall grass health and is a very effective way to prevent weeds. Fertilizing provides the nutrients for a healthy, thick lawn that out-competes weeds. Choose slow release fertilizers that are much less likely to 'burn' the lawn. Check the package labeling to make sure the product is slow release and carefully follow the instructions. Steer clear of weed and feed and try feed and seed instead.

Grass alternatives: Many people are recognizing that there are beautiful and ecologically important alternatives to grass lawns. White Dutch Clover is one of the most popular choices due to its many benefits. See *Clover - Friend or Foe?* brochure. For other ideas see the *Creating a Kamloops Xeriscape* brochure.

Pest Control: See Integrated Pest Management for Your Lawn on page 19 & 20.

Take a few minutes one afternoon, grab a refreshing beverage and sit quietly in your yard. Watch your plants (this is not like watching paint dry). You may be amazed at how much life exists.

Most of the insect life you observe (and a lot you can't even see) is helping your plants to grow in numerous, unseen ways. In fact, 95-99% of all insect species we encounter are beneficial or harmless to human life or efforts.

Let's put the insect world aside for the moment and consider other critters that are helpful. (Some are more lovable than others.) There are birds, bats, toads, snakes, spiders and earthworms to name a few. The relationship within this community and with the insect world is mind-boggling.

In nature, pests and plant diseases do exist, but rarely get out of hand. Problems start to arise where there is an imbalance. Indiscriminate pesticide use contributes to imbalance by killing more than the target. We should take our cue from nature and strive for balance by encouraging biodiversity.

Biodiversity: the presence of a diverse collection of plants and animals (flora and fauna).

Invite some wonderful garden helpers over by:

- Avoiding use of toxic sprays or dusts as you may end up causing accidental injury or death to beneficials
- Selecting a variety of plants – try using native species
- Planting trees and shrubs for shelter
- Planting a border of companion plants rich in pollen and nectar as a food source for adult stages of beneficial insects
- Using a windbreak (e.g. hedge) to reduce dust since beneficial insects dehydrate easily
- Providing a source of water for birds and insects. (Fill a shallow bowl or birdbath with stones and water so beneficials can land and drink without drowning).

Beneficial insects fulfill different roles. There are four main job descriptions: predator, parasitoid, pollinator and soil builder/garbage collector.

OUR FRIENDS THAT PREY ON OUR FOES


Ladybug


Lacewing


Hover Fly


Parasitic Wasp


Dragon Fly

Ladybugs	Eat aphids, spider mites, mealy bugs, scale insects
Lacewings	Larvae stage eat aphids, whiteflies, leafminers, mites
Hover Flies	Larvae prey on aphids, scale insect nymphs, mealy bugs, thrips, leafhoppers.
Parasitic Wasps	Eat whiteflies, aphids and some pest caterpillars
Dragon Flies	Eat mosquitoes
Nematodes	Microscopic worms that feed on larva & grubs of many pests
Beetles	While some are pests, others are great pest-fighters
Birds	Consume insect eggs, beetles and grubs
Spiders	Help keep insect populations in balance
Toads	Can consume 3000 grubs, slugs, beetles and other insects in a month
Bats	Can eat 1000 bugs in one night

Some predatory insects can be purchased to supplement your garden's biodiversity. Before ordering, be sure to identify the target pest and consult suppliers for relevant information. Once you receive your hired destroyers, carefully follow all instructions for proper handling and releasing.

	Late Winter February to March	Early Spring Early April to Late April	Spring May and June	Summer July and August	Late Summer Early September	Fall Late September to November	Early Winter December to January
Lawn Care	• Try to stay off frozen grass • If it has been a dry winter and the ground is thawing, all plant material may need a drink. (lawn, trees, shrubs, etc.)	• Inspect for dead areas and determine the cause (e.g. Salt, insect, disease) • Rake to remove debris and brown patches and compost if insect and disease free • Repair areas of winter-kill • Spread grass seed and top-dress entire lawn with a seed mix suited to sunlight conditions for each area • Use lawn aerator to help soil breathe • Fertilize properly • Try Corn Gluten meal after snow melts **if** you haven't over-seeded • Water as needed in the early morning • Identify weeds and hand pull when soil is moist • Sharpen lawn mower blade • Confirm mower height is at a minimum of 2", but preferably 3"	• Evaluate pest problems and decide on action • Hand-pull weeds • Confirm mower height is at a minimum of 2", but preferably 3" and cut less than 1/3 of the grass height each time • Cut lawn before weeds go to seed • With a mulching capable mower, leave grass clippings on your lawn through the growing season – it saves you one fertilizer application • Fertilize properly with a summer fertilizer in June, but it may not be necessary if lawn is treated with Corn Gluten, top-dressed or grass clippings are left • Water as needed in the early morning	• Most lawns in Kamloops have Kentucky Blue Grass in the mix which may naturally go dormant, turning brownish • Monitor for heat stress, insects and disease and decide on action • Hand-pull weeds • Confirm mower height is at a minimum of 2", but preferably 3" • Leave grass clippings on your lawn • Water deeply, but infrequently: 2.5 cm about 1-2 days per week	• Confirm mower height is at a minimum of 2", but preferably 3" • Leave grass clippings on your lawn • Evaluate pest problems and decide on action • Aerate lawn if necessary • Over-seed and top-dress entire lawn, if necessary • Apply Corn Gluten **if** not putting down grass seed • Fertilize properly with a fall/winter fertilizer in mid to late September	• Evaluate pest problems and decide on action • Hand-pull weeds • Apply Corn Gluten in October **if** grass seed was used in September • Mulch your leaves right into your lawn with a mulching-capable mower • Clean and winterize lawn equipment	• Try to stay off frozen grass
Garden Care	• Avoid piling snow containing salt shoveled from driveways on root zone of shrubs and other sensitive planted areas • Plan your coming season • Don't forget your house plants • Learn about plant health care • Learn about integrated pest management • Get all your garden tools ready	• Gradually remove winter protection • Prune summer flowering shrubs to improve air circulation and remove winter kill • Learn about invasive plants and noxious weeds • Learn about composting • Think about choosing the right plant for the right spot • Get pots ready with insect and disease free soil • Clean-up perennials	• Add compost and work into soil • Prune spring flowering shrubs once blooms are finished • Plant beds and containers • Monitor for pests such as dandelions and aphids • Start acclimatizing indoor plants for outdoor use	• Remove dead flowers to encourage longer and more numerous flowering and to contain enthusiastic spreaders • Add mulch to bare soil areas • Monitor for pests such as black medic • Water wisely • Fertilize as needed	• Monitor for weeds and disease damage • Any changes wanted for next year? Never too early for planning. Maybe some higher water use plants could be replaced by more drought tolerant ones.	• Divide perennials • Plant spring bulbs • Move indoor plants back in after inspecting for and managing pests • Good time for planting • Leaving leaves in beds gives winter protection • Poor performing plants could be removed and noted for future reference • Winterize your tools	• Shake heavy snow off plants to prevent breakage. Plant wounds invite pests in.
Tree Care	• Avoid piling snow containing salt shoveled from driveways on root zone of trees • Ensure proper pruning is used • Plan an eco-friendly dormant oil application	• Monitor for pests such as leafrollers • Good time for planting/transplanting • Fertilize properly	• Monitor for pests such as tent caterpillar, tussock moth, and aphids • Protect trees from construction and lawn equipment	• Ensure trees (especially young ones) are watered adequately • Monitor for pests such as fall webworm and aphids • Fertilize up to the end of July	• Keep monitoring for pests • Transplant Evergreens	• Tree roots can be protected by fallen leaves • Good time for planting • Some pruning may be done • Clean and sharpen pruning tools	• Avoid piling snow containing salt shoveled from driveways on root zone of trees

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When prevention hasn't been enough, gardeners use Integrated Pest Management to deal with pests. It is an approach that takes you through a process to effectively control weeds, damaging insects or disease, and other nuisances. Five steps for handling pests are:

Identify:

Identify the plant that is afflicted, then identify whether or not there is a pest. Often plant damage is more likely to be caused by environmental conditions such as drought, overwatering, sunscald, frost or wind burn. Then identify the pest. Make sure you are not looking at a beneficial insect or other natural enemy. (*See the Beneficial Life in Your Garden page to identify friend from foe.)*

Monitor:

Make regular inspections or counts, note environmental conditions and keep records. This helps to make decisions about whether treatments are needed, and if so, when.

Determine Acceptable Injury Level:

A few aphids on a shrub, or a weed or two in a lawn are not a problem. At some point though, the numbers could reach an intolerable level. This might be determined by the pest involved and the location of the plant in the landscape.

Select and Implement Treatment:

In determining what action to take, select methods that are: least hazardous to human health, least toxic to non target organisms, least damaging to the environment, most likely to produce long-term results, and most cost effective over time. Try the following strategies in this order (or in combination if necessary) and stop when control is achieved:

- Cultural controls (e.g. growing pest resistant plant varieties)
- Physical controls (e.g. pulling weeds, pruning out infestations, and installing pest barriers or sticky traps)
- Mechanical (e.g. using machines or devices such as mowers and line-trimmers)
- Biological (e.g. using natural enemies of pests such as ladybugs and birds, or bacteria such as Btk)
- Chemical (always use the least toxic option and only as a last resort)

Evaluate:

Evaluation is essential since it helps determine what worked, and what didn't.

Step 1
What's With My Lawn?
Sample local pests

Step 2
Monitor
Make regular inspections / counts

Step 3
Tolerance Level
Decide how many are tolerated

Step 4
Cultural Action
Anything that produces healthy plants and prevents pest problems

Physical and Mechanical Action

Biologicals & Lower-risk Control Products *

Higher-risk Chemical Control Products

Step 5
Evaluate

Dandelion

Counting weeds in your lawn may simply involve counting the number of weeds you step on over a specific distance.

Dandelions grow in areas with thin grass, low soil fertility and as a result of low mowing height.

Decide how many weeds are tolerated.

You may decide that few weeds are acceptable in your highly visible front yard, but you may tolerate higher numbers in the back.

- Overseed
- Topdress
- Water
- Aerate
- Fertilize properly
- Raise mower height if necessary
- Mow before weed goes to seed

Hand-pull the entire weed if possible. Moist soil makes weeding easier.

Cut off flower heads before seeds are dispersed.

Try Corn Gluten Meal - a by-product of corn that prevents the germination of seeds, but does not control established weeds. Caution: Only use if grass seed has not been recently applied.

Try a Vinegar Spray Caution: Vinegar works by burning the plant. Spot spray only as it will burn grass also.

Resident must abide by any relevant regulations or restrictions.

Keeping notes is helpful in determining effectiveness of methods.

Plantain

Plantain grows in areas of compact soil, low soil fertility and as a result of low mowing height.

White Grubs

White grubs are the larvae of insects such as June beetles. Adult beetles prefer laying their eggs in short grass.

8-10 grubs per square foot (26-33 per square metre) can damage a lawn

- Raise mower height to 3 inches (8 cm)
- Water deeply but infrequently
- Dethatch if necessary
- Topdress
- Aerate

Hand pick adult beetles or vacuum with a disposable bag

Certain parasitic wasps and flies can help. Bird houses attract natural predators like starlings and blackbirds.

Fairy Ring

Fungus that lives on organic matter and repels water, causing drought and resulting in turf death.

Over-watering and over-fertilizing cause thatch, this in turn contributes to fairy ring.

May have to learn to live with them as there is no easy way to get rid of them.

- Dethatch
- Aerate deeply
- Water deeply
- Fertilize correctly to minimize the differences in grass vigor between the ring and the rest of the lawn

To prevent spread:
- avoid walking over area
- clean mower after each use
- pick mushrooms and destroy

Remove and replace contaminated soil to a depth of 45cm (18") and re-sod or re-seed.

** Keep in mind lower-risk products may adversely affect more than what you target. Always wear recommended personal protective equipment.*

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Step 1 ***What's With My Plant?*** Sample local pests	Step 2 ***Monitor*** Make regular inspections / counts	Step 3 ***Tolerance Level*** Decide how many are tolerated	Step 4 ***Cultural Action*** Anything that produces healthy plants and prevents pest problems	***Physical and Mechanical Action***	***Biologicals & Lower-risk Control Products****	***Higher-risk Chemical Control Products***

Aphids
 
	Found on undersides of leaves and on tender shoots and tips of branches.	Presence is not always a problem.	• Encourage flora and fauna diversity to keep infestations in check.
			• Plant resistant varieties of plants.
			• Try these 'companion planting' techniques:
			  • Use host plants like Nasturtiums to attract predatory insects.
			  • Use host plants as traps to distract or draw pests away. (e.g. Rose enthusiasts use Geraniums)
			  • Use repellent plants like Marigolds to drive pests away
			• Water adequately.
			• Don't over fertilize. Too much fertilizer promotes succulent weak growth that attracts some pests.
				• Wash off with a strong stream of water	• Attract predators
					• Spray dormant oil to kill overwintering eggs
					• Try orange zest or garlic spray
						Residents must abide by any relevant regulations or restrictions.

Leafrollers 	Green caterpillars that are usually noticed once rolled inside leaves. Watch for them on known host plants prior to leaf rolling.	Small infestations are not usually a risk to ornamental plant health.		• Scrape egg masses from branches in winter • Handpick caterpillars weekly	• Attract native parasitic wasps • Try a garlic spray • Apply Btk* to larvae before leaves roll	
Cherry Fruit Flies 	Larvae feed on fruit and overwinter as pupae in soil.	Probably little tolerance since most people don't like little worms in their cherries.		• Hang sticky traps • Pick up and destroy fallen fruit	• Attract natural predators like ground beetles	
Tent Caterpillars & Fall Webworms 	Hairy caterpillars that spin silk webbing in branches and feed on leaves.	Small infestations are not a risk to overall plant health.		• Remove egg masses from branches in winter • Prune out infested sections and destroy.	• Attract native parasitic flies and wasps • Try a garlic spray • Spray Btk* while larvae are small	
Tomato Hornworms 	Large green caterpillars that consume leaves and sometimes fruit.	Probably little tolerance as caterpillar feeding can kill young plants.		• Handpick	• Attract native parasitic wasps • Try a garlic spray • Spray Btk* while caterpillars are still small	
Powdery Mildew 	Fungal disease that produces white to grayish powdery growth on a wide variety of plants. Keep eye out for first signs – small white powdery spots on leaves.	Weakens plants but doesn't always kill them.	• Plant resistant varieties. • Allow good air circulation. • Avoid excess fertilizer.	• Prune off infected parts and destroy	• Try orange zest, milk, or garlic spray	

Step 5
Evaluate

Keeping notes is helpful in determining effectiveness of methods.

* Btk - Bacillus thuringiensis var. kurstaki

*Keep in mind lower-risk products may adversely affect more than what you target. Always wear recommended personal protective equipment.

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For more information on Integrated Pest Management (IPM), contact:

City of Kamloops
Sustainability Services
(250) 828-3888 | healthylandscapes@kamloops.ca
kamloops.ca/ipm

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