Landscape Guide to Water Efficiency

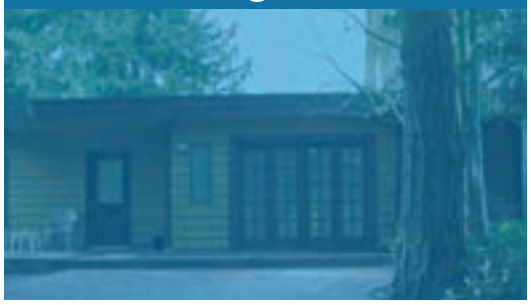
Homeowners in the RDN may use up to 600 mm (24") of water in a season to keep their lawns green - almost enough to swim in. With the good practices introduced in this brochure, we can create beautiful landscapes and easily reduce that outdoor water use by 30% or more.

- Joe Stanhope, Chair, RDN Board

Now that's Water Smart!

team watersmart
because every drop counts

Step 1:
Smart Design



Step 2:
Smart Soil & Plantings

Step 3:
Smart Irrigation

Step 4:
Smart Maintenance

Landscape Water Use & The Environment

Why Reduce Landscape Water Use?

- Less than 1% of the total water supply on earth is fresh water. 2/3 of it is ground water, and 1/3 is surface water.
- Water use in the Regional District of Nanaimo is on average two and a half times greater in the summer months.
- Audits of RDN residential landscape installations reveal many errors in design and operations that are leading to inefficient water use.
- Residential water use far exceeds use by institutions, commercial and industry.
- Increased water use increases the demand for costly infrastructure - water conservation could allow the deferral of infrastructure investments.
- Using less water saves you money.
- Better landscape techniques can reduce needs for fertilizer, pesticides and maintenance.
- Reduced water use leaves more water in aquifers and streams, and supports the ecosystems that depend on it.

Purpose

This brochure has been designed with one goal in mind; to reduce the impact of poorly designed, installed, and maintained landscape irrigation. While not encouraging irrigation as a solution for everyone it does recognize that people may choose to use irrigation to assist in the beautification of their property. By following the suggestions in this brochure you can help reduce the impact irrigation has on the region's water supplies.

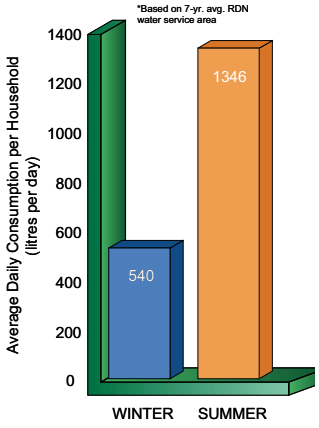
Our Natural Environment

The Nanaimo Lowland lies in the rainshadow of the Vancouver Island mountains and receives little rain in summer and fall months. Native plant communities in this region have evolved over thousands of years in response to the local climate, soils and terrain and are well suited to these seasonally dry conditions. The best way to live within the means of RDN's local ecology is to mimic the low water demands of this native vegetation when designing, planting and maintaining a garden.

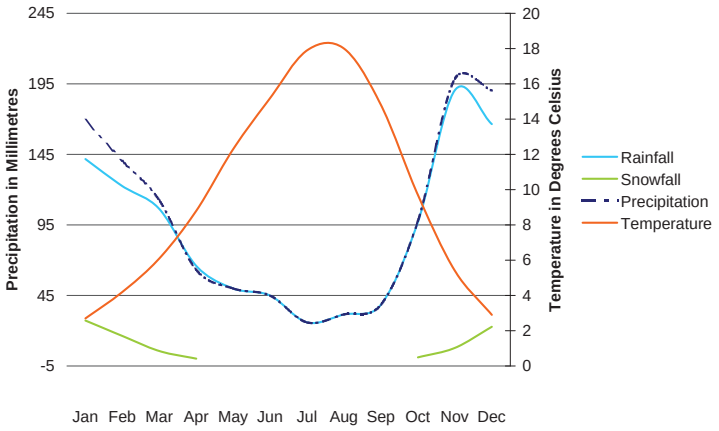
Water Use & Seasonal Peaks

It is perceived on the East Coast of Vancouver Island that we have an abundance of water due to the amount of rainfall. Unfortunately, the majority of our rain falls in the winter months, and not in the summer months when landscapes need it for growth and survival.

Seasonal Water Use / Household



30 Year Average Climate Normals
(Environment Canada)



Winter water use in RDN is 540 litres per household per day. In the summer this more than doubles to 1346 litres per household per day. Almost all of the increase is for outdoor watering of landscapes. It is estimated that as much as 50% of outdoor water use is over and above that necessary to meet the objective of an attractive household yard.



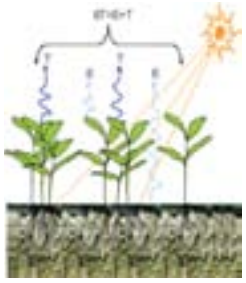


Climate Pattern & Irrigation Needs

Precipitation rates are high in the winter and low in the summer and fall in the RDN. Much of the stream and groundwater supply comes from winter rainfall and spring snow-melt from higher elevations. Summer irrigation needs are driven mainly by the lack of summer rain combined with higher temperatures and relatively sandy and rock-filled soils that do not hold water.

Evaporation and Evapotranspiration

Most of our heavy winter precipitation runs off to the lakes, streams and sea. Evapotranspiration from forests, grasses and crops quickly removes water from our sandy local soils. Any water that is used for agriculture or garden irrigation is quickly taken up by the plants and then by the surrounding air through transpiration. Minimal amounts of irrigation water infiltrates to the ground.

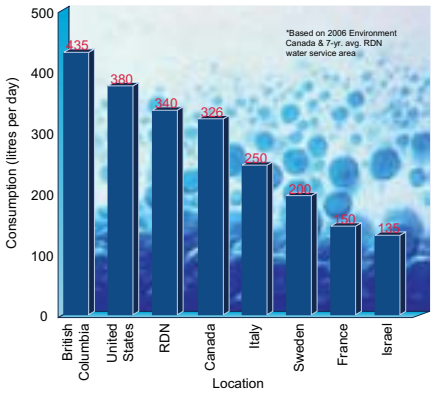


Slopes and Soils

The region has many areas that are sloped with uneven landscape. The majority of undeveloped land occurs on hillsides or rocky areas. Care must be taken when designing gardens and irrigation systems for sloped landscapes. A terraced design is preferred and irrigation zones with pressure regulation devices are needed to prevent downslope water losses.

Soils in this region are well-drained and relatively nutrient poor. When designing gardens it's important to include a deep layer of absorbent soil with organic material that will help retain water and nutrients for plants. Good soil texture with organic matter both in the soil and on the surface will also provide erosion control.

Average Daily Domestic Water Use / Person



The average daily water use per person in litres is 380 in the USA and only 135 in Israel. In the RDN it is 338 litres per person per day. Some European countries pay more than double what Canadians pay and use half as much.

Targets for Outdoor Water Conservation

In new developments, a reduction of 30% or more in outdoor water use can easily be achieved through a combination of good design, plants and soil, irrigation and maintenance practices.

Water is a resource worth protecting.

During the summer water supplies are stressed by both ecological demand and increased use resulting from human activity.

For water conservation, our gardens need a deep "sponge" of topsoil and organic matter over our natural sand or rock subsoil.

Landscape Design for Water Conservation

1 Step 1: Smart Design

The design of landscapes is the starting point for water conservation. Landscape design, whether generated by a landscape architect, contractor or homeowner, involves:

Site analysis:

Identify existing vegetation that could remain. Determine where slopes or drainage conditions will influence the site use and design. Be aware of the sun/ shade exposure of different areas. Dig holes and analyze the native soil. Determine if you need to import growing medium – a mix of weed-free soil, compost and other additives.

Site Schematic Concept:

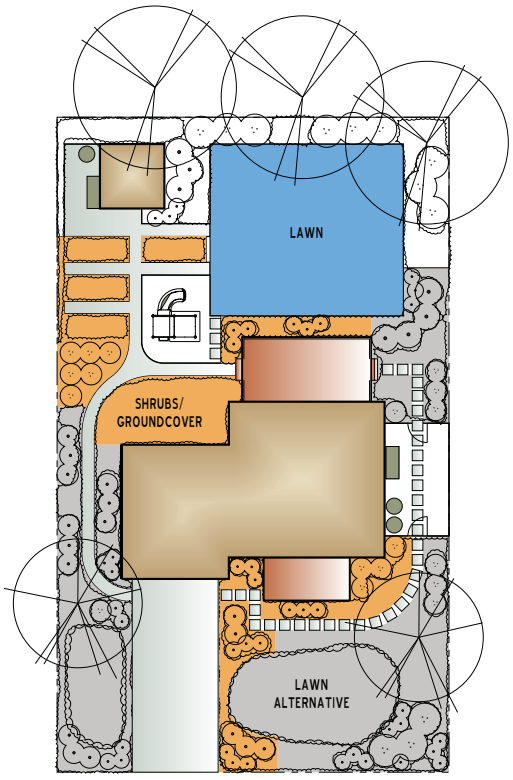
Prepare a diagram of proposed use areas like existing plants to remain, driveways, decks, plazas, play areas, utility areas, and proposed planted areas. Identify required walkway connections. Be aware of underground utilities and required grading or terracing.

Hydrozone, Planting and Soil Concept:

Group planting areas into 'hydrozones' as you develop your plan. A simple diagram of zones of the yard with different watering needs is the key to effective outdoor water conservation.

Hydrozones

Hydrozoning divides a landscape into areas based on water needs: high, medium or low. Highly ornamental areas may warrant high water use. Areas of native plants may need no watering at all. When starting a landscape design, produce a sketch of the planned hydrozones. Group plants according to their water requirements, with consideration also of sun and wind exposure. Once hydrozoning has been planned, watering systems can be designed to match.



HYDROZONE PLAN

HYDROZONE LEGEND	
SYMBOL	CATEGORY
	HIGH WATER USE ZONE
	MEDIUM WATER USE ZONE
	LOW WATER USE ZONE
	UNIRRIGATED

High Water Use Areas

High water use areas include lawns and ornamental plants, perennials and annuals. These areas require more water and maintenance to keep them looking their best throughout the summer.

- Reserve highly visible areas for 'high impact' planting.
- Owners with children or pets may desire lawn space to accommodate running and playing - but do not over-plant lawn. Minimize manicured lawn areas and water use will fall dramatically.

Medium Water Use Areas

The plants in medium water use areas require less water during times of drought.

- Plants in these areas consist of shrubs or ground covers that require less water to keep them looking their best year round.
- This 'xeriscape' landscaping can be attractive, both in the front yard and less visible areas.
- Only low water use irrigation is needed for these areas such as low volume or drip.

Low Water Use/Unirrigated Areas

These areas require little or no supplemental water once established. These include unplanted areas and places where native vegetation is established.

- Save areas of existing native vegetation.
- Preserve and protect natural features of the site like streams, natural drainage areas, riparian areas, landforms, rock outcroppings, hilltops, ridgelines and shorelines.
- Plant native vegetation or low-water need plants - water only for the first growing season until roots are established.
- Use permeable surfaces for driveways, walks, decks/patios and utility areas to allow natural seepage and filtration of surface water.
- Consider materials such as stone or organic mulch, pervious pavements or spaced wood deck rather than plants requiring water.





1

By creating a landscape plan, you will be able to plan your garden use and your water use at the same time.

2

A sloping site will have different drainage capacity than a flat surface.

3

Rather than large expanses of lawn, creative use of other hard and soft surfaces can create an appealing 'water smart' space.

Minimize Turf Areas

Lawn areas are the highest water user in the landscape and a manicured lawn requires far more time and effort to maintain than other forms of planting and ground cover. There are many alternatives to turf that can have an appealing appearance and reduced maintenance - and require little or no watering.

Slopes & Drainage Conditions

The slope of the property will let a homeowner know where water will collect or run-off. The tops of slopes are inherently drier than the bottom. Depending on the drainage of a site this may effect the landscape design and plant selection. Slopes also affect the exposure to the heat of the sun. Areas sloping to the north will be cooler and more shady than slopes facing south.

Meeting a Water Conservation Target

To meet a target of 30% or more water use reduction compared to 'normal' outdoor practice, follow or combine these examples:

- Design 30% of the landscape area to not require watering – e.g. native landscape or non-plant mulch.
- Design to minimize turf areas – try less than 30% of the landscape.
- Use large areas of low water use plants.
- Use quality soil with adequate depth and top with mulch.
- Use high efficiency irrigation and weather-based controllers.

These ideas are detailed in the following pages.

Image Credits:

1. *Site Plan* by Arborealis arborealis.com/ConstructionDrawings/L1-Site-Plan.gif
2. *South Hill Garden* www.myenglishgardener.com/tours
3. *Greenhill Propagation Nusery* by Vivid Design www.melbflowershow.com.au/highlights_2005_garden.asp

Plants & Soil for Water Conservation

2
Step 2: Smart Plants

Group Plants by Growing Requirements:

All plants have an ideal growing situation. Group plants together with similar soil, light and water requirements. This will result in more vigorous plant material that requires less maintenance and water.

Soil is the Secret:

There is nothing more important to the success of a landscape than the soil. The combination of the mineral soil, soil organisms and organic matter – or 'growing medium' as the combination is called in the landscape trade – will determine almost entirely the performance of the lawn and plantings in terms of survival, health, rate of growth and water needs.

Good growing medium can double the rate of plant survival and growth, and cut the water need by 50%. And yet growing medium is often one of the first things to be sacrificed to save money – that's NOT Water Smart!

For more information see the National Sustainable Agriculture Information Service of the National Center for Appropriate Technology

Website at: www.attra.ncat.org/attra-pub/soilmgmt.html

Living Soil and Organic Matter

A Water Smart soil is a living soil. In a typical suburban lot, good quality living topsoil contains approximately 90 pounds of earthworms, 240 pounds of fungi, 150 pounds of bacteria, 13 pounds of protozoa, and 89 pounds of arthropods and algae. This soil life and its foodweb cultivate and aerate the soil, improve its structure and increase the availability of water and nutrients for plants. If the organic matter in a growing medium is less than 1%, all this life will die. Optimum amounts of organic matter in a living growing medium provide a garden soil that:

- feels soft and crumbles easily
- drains well and warms up quickly in spring
- does not crust after planting
- soaks up heavy rains with little runoff
- produces healthy, high quality plants
- stores moisture for drought periods
- has few clods and no hardpan
- resists erosion and nutrient loss
- supports high populations of soil organisms
- has a rich, earthy smell
- does not require increasing fertilization

LANDSCAPE PLAN

LANDSCAPE LEGEND	
SYMBOL	DESCRIPTION
	TREE
	SHRUB/ GROUNDCOVER

Topsoil and Organic Matter Quality

Growing medium is often a mix of topsoil and organic matter, and sometimes sand. Common problems to avoid when purchasing growing medium include:

- Topsoil that is too coarse (no silt or clay) or too heavy (no sand). A sandy loam is the optimum texture.
- Topsoil that is weed infested. Seeds can lay dormant in topsoil for years. Look for a topsoil source that is relatively weed free.
- Compost that is weed infested or compost that is not yet decomposed, which robs the soil of nitrogen. Livestock manure often has both these problems. Both weed seeds and decomposition problems can be avoided with a proper composting process.

Purchase growing medium from reliable suppliers and contractors who can certify that the products meet the specifications of the BC Landscape Standard and local bylaws.





Growing Medium Depth

Adequate soil depth plays an important role in storing and retaining water and nutrients for vigorous root growth - provide a minimum of 150mm (6") for lawn areas and 300mm to 450mm (12"-18") for shrubs.

Plants

There are many plants available at nurseries that are drought tolerant. Native plants are accustomed to the local environment and often require less frequent watering. In some cases these plant selections will not require any additional water once established.

Plant Selection Guide

The plants listed on the right, while not an exhaustive list of water conserving plants, offer a reliable starting point for homeowners.

Grass Species & Sod Mix

Where lawn is planned for functional purposes, there are varieties of grass that have been developed for drought resistance, high traffic and colour variations. Allowing the lawn to go dormant in the summer does not reduce the grass vigour. Summer dormancy mimics the grass natural cycle. Ask your contractor or grass supplier for seed or sod with low water needs. Often these varieties will include a high percentage of tall fescue, sheep fescue, slender red fescue, creeping red fescue, and hard fescue. New drought tolerant varieties of these and other species are increasingly available.

Mulching

Use of mulch can reduce water loss through evapotranspiration. It cools plant root zones, which reduces the amount of water plants lose through evaporation. Mulch reduces weed growth and helps control erosion. It also adds a finished look to a garden while adding nutrients to plants. Apply mulches at a minimum thickness of 5 - 7.5 centimetres (2 - 3 inches). Inspect depth seasonally and add as required to maintain minimum depth.

Low Water Use	Medium Water Use	High Water Use
Trees		
• *Albizia julibrissin* Silk Tree • *Cedrus deodara* Deodar Cedar • *Cercis canadensis* Eastern Redbud • *Cotinus coggygria* Smokebush • *Gleditsia triacanthos* Honey Locust • *Juniperus scopulorum* Rocky Mountain Juniper* • *Pinus jeffreyi* Jeffrey Pine • *Rhus typhina* Staghorn Sumac	• *Calocedrus decurrens* Incense Cedar • *Ginkgo biloba* Maidenhair Tree • *Koelreuteria paniculata* Goldenrain Tree • *Liquidambar styracaflua* Sweet Gum • *Magnolia grandiflora* Southern Magnolia • *Pyrus calleryana* 'Aristocrat' Ornamental Pear • *Quercus rubra* Red Oak	• *Acer circinatum* Vine Maple* • *Acer palmatum* Japanese Maple • Corylus cornuta Hazelnut • *Liriodendron tulipifera* Tulip Tree • *Magnolia soulangiana* Saucer Magnolia • *Nyssa sylvatica* Sour Gum Tree • *Populus tremuloides* Trembling Aspen • *Tilia cordata* Little-leaf Linden
Shrubs & Hedges		
• *Berberis thunbergii* Japanese Barberry • *Ceanothus thyrsiflorus* Blue Blossom • *Mahonia aquifolium* Oregon Grape* • *Ribes sanguineum* Red Flowering Currant* • *Sambucus caerulea* Blue Elderberry* • *Rosa nutkana* Nootka Rose* • *Viburnum tinus* Laurustinus	• *Arbutus unedo* Strawberry Tree • *Buxus microphylla* Boxwood • *Escallonia* 'Pink Princess' Escallonia • *Gaultheria shallon* Salal* • *Hydrangea macrophylla* Bigleaf Hydrangea • *Nandina domestica* Heavenly Bamboo • *Pieris japonica* Japanese Pieris • *Spirea japonica* Spirea	• *Rhododendron sp.*, Rhododendron • *Azalea sp.*, Azalea • *Choisya ternata*, Mexican Orange • *Fatsia japonica*, Fatsia • *Prunus laurocerasus*, English Laurel • *Viburnum davidii*, David's Viburnum
Groundcover/Perennials		
• *Arctostaphylos uva-ursi* Kinnikinnick* • *Armeria maritima* Common Thrift • *Cotoneaster dammeri* Bearberry Cotoneaster • *Mahonia nervosa* Longleaf Mahonia* • *Juniperus squamata* Singleseeded Juniper • *Lavandula angustifolia* English Lavender • *Vinca minor* Dwarf Periwinkle	• *Bergenia cordifolia* Heartleaf Bergenia • *Euonymus fortunei radicans* Winter Creeper • *Hemerocallis sp.* Daylily • *Iris germanica* Bearded Iris • *Pachysandra terminalis* Japanese Spurge • *Lithodora diffusa* 'Grace Ward' Lithodora • *Rudbeckia fulgida 'Goldsturm'* Gloriosa Daisy	• *Calluna and Erica sp.* Heathers • *Frageria chiloensis* Beach Strawberry* • *Liriope muscari* Lily Turf • *Oxalis oregana* Redwood Sorrel
** native species*		

Irrigation Guidelines for Water Conservation

3
Step 3: Smart Irrigation

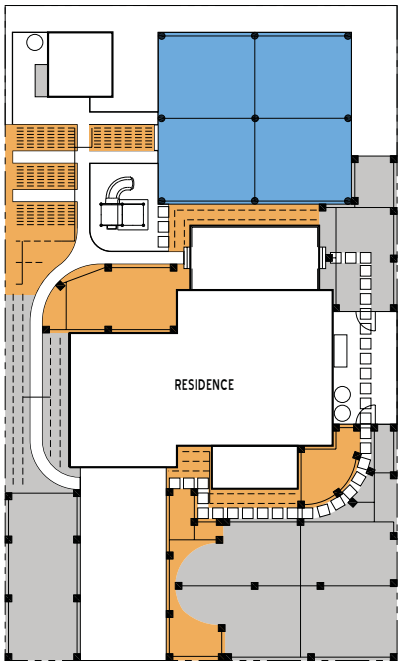
Audits of installed irrigation systems have revealed major problems with design and installation quality. Without proper design and maintenance, an irrigation system will waste water. With proper design, an irrigation system is a water conservation device.

Many problems are due to lack of experience when homeowners or under-qualified contractors work without supervision.

It is possible for a homeowner to design and install an irrigation system. But the level of expertise involved, for design in particular, is usually better left to someone with professional training. Certified Irrigation Designers under the Irrigation Industry Association of BC have the appropriate qualifications.

Hydrozones

Turf zones and shrub planting beds should never be irrigated on the same zone. Water requirements for turf exceed the requirements of most shrubs or groundcovers. If both share a zone, water is being wasted on plants that do not need it. In addition to saving water, designing by hydrozones will result in healthier and more vigorous plant material. Although it will require more zones initially, a hydrozone approach will save water in the long run.



IRRIGATION PLAN

IRRIGATION LEGEND	
SYMBOL	DESCRIPTION
•	ROTOR
■	MPR SPRAY
- - - - - -	LOW VOLUME/ DRIP

Head to Head Coverage

For efficient watering, each sprinkler's spray should reach the next sprinkler head. Under-spray results in dry spots or over-watering in attempt to keep the driest areas green, while over-spray wastes water.

Head To Head Coverage

Match Precipitation Rates

Irrigation manufacturers offer spray heads with matched precipitation rates, providing the flexibility of mixing and matching throw and radius distance. Rotor, spray and drip devices should never share a zone as timeclock settings vary between these forms of water application. Use nozzles that apply water evenly to save up to 30% in water usage. Use drip or low volume nozzles wherever possible to reduce water flow rates.

Follow Site Contours

Avoiding extreme elevation changes in a zone ensures even pressure and watering. It prevents water flowing down to the lowest head and draining out, causing puddling, erosion and wasted water. If elevation changes in a zone cannot be avoided, check valves should be installed to trap the water in the lateral line to prevent water from draining out the lowest head.

A well-designed and managed irrigation system will reduce landscape water use.

Avoid Over-Spray

Irrigation should not over-spray onto adjacent structures, paving and properties. Careful head installation and nozzle orientation will ensure that water is spraying where it is intended.






Watts 007 Double Check Valve Assembly


RSD Rain Sensor


Rainbird PGA-PRS-D Valve


Watts N45B-EZ Pressure Regulator


Hunter ICC Controller


Rainbird ET Manager

Backflow Prevention Devices

Every system should have backflow prevention to help ensure that fertilizers or pesticides used within the yard do not contaminate your water system.

Pressure Regulating Devices

Excess pressure through spray heads and rotors results in misting and fogging. These fine droplets are easily blown away by even the lightest winds, resulting in inadequate coverage and loss of water. This inefficient watering leads to increasing the run time for the zone, which only increases the loss of water. There are a number of pressure regulating devices on the market, including: pressure regulating valves installed at the backflow preventer, pressure regulating spray heads, pressure reducing valves and pressure regulating modules installed on valves. Every 5 psi reduction in water pressure reduces water use by 6–8%.

Automatic Shut-Off Devices

Adding an automatic shut off device can result in 15-20% in water savings. Devices like rain and moisture sensors automatically shut off controllers when it is raining or when sufficient soil moisture has been reached.

Automatic Controllers with Water Conserving Functions

The objective of efficient irrigation is to provide only enough water to keep the plant healthy. Years of research and technology development have resulted in controllers that can be programmed to ensure the best use of water. Water efficient features include:

- Water Budget Features - Allows the user to change the applied water through the season by changing the watering time by a percentage. For example, setting a watering program for the driest condition (July) would overwater in spring and fall. Programming the controller for varying seasons ensures efficient water use year round.
- 365 Day Clock - Allow settings to vary by day, week or month.
- Multiple Start Times Per Day - Water must not be applied more rapidly than the soil can absorb it. By programming for multiple start times, saturation and runoff is avoided by allowing the water to soak in between watering times.
- Weather or ET (evapotranspiration) Based Programming - These timeclocks use weather data to adjust their settings automatically to meet the needs of the plants. These have been successfully used in a Fairwinds community pilot project.
- Watering during early morning or evening reduces the loss of water to evaporation. Plants are best watered in the morning to avoid disease caused by water sitting on plant leaves overnight.

Maintenance for Water Conservation

4
Step 4: Smart Maintenance

A large portion of unnecessary water use is related to improper settings for the irrigation timeclock. Turfgrass generally requires 25 mm (1") of water per week during the driest part of the year. Natural rainfall should be included as a part of this allowance. The water requirement in spring and fall months is much less than what is required in July.

New weather-based irrigation timeclocks are available that automatically adjust time settings to correspond to historic or current real weather conditions. Installing weather-based controllers provides long-term savings.

If using a non weather-based controller, set the watering time for each irrigation circuit for the driest month (July), and then adjust the time each month using the Water Budget feature or manual adjustments.

A second water-waster is irrigation leaks. Ensure your system passes 'hydrostatic pressure tests' when installed or when digging or renovations affect your piping. Watch your water meter to see if it is running even if all indoor water appliances are not – it could mean a leak in your irrigation lines.

Irrigation Timeclock Settings for the RDN

The table below provides guideline irrigation timer settings for typical conditions. Consult your irrigation professional or website links on page 12 for information more specific to your system.

	May	June	July	Aug	Sept	Other
Rotors - Lawn (precipitation rate assumed at 0.47"/hr, actual will vary)						
Watering minutes/week	33	40	44	39	25	Off
Water budget %	75%	90%	100%	90%	55%	
Sprays - Lawn (precipitation rate assumed at 1.75"/hr, actual will vary)						
Watering minutes/week	5	6	7	6	4	Off
Water budget %	70%	85%	100%	85%	55%	
Low Volume Sprays - Lawn (precipitation rate assumed at .43"/hr, actual will vary)						
Watering minutes/week	18	22	24	22	14	Off
Water budget %	75%	90%	100%	90%	60%	
Dripline - Shrubs (precipitation rate assumed at 0.29"/hr, actual will vary)						
Watering minutes/week	160	190	210	190	115	Off
Water budget %	75%	90%	100%	90%	55%	
Sprays - Shrubs (precipitation rate assumed at 1.75"/hr, actual will vary)						
Watering minutes/week	5	6	6	6	4	Off
Water budget %	85%	100%	100%	100%	65%	
Low Volume Sprays - Shrubs (precipitation rate assumed at 0.43"/hr, actual will vary)						
Watering minutes/week	16	20	22	19	13	Off
Water budget %	75%	90%	100%	85%	60%	

Irrigation Winterization

In freezing climates, irrigation systems are 'blown out' each year so expansion of freezing water in the pipes or heads does not damage the system. Ensure that an experienced contractor is providing winterization, and that they guarantee that they will not damage the system. Be wary of blow-out pressures that are higher than the system design pressure (usually 30 – 50 psi) that can burst pipes or damage heads.

Spring Checklist for Irrigation Start-up

- Wait until threat of frost is past, and dry weather has begun.
- Moisture in good quality soil will carry most plants well into the spring without supplemental irrigation. If your lawn is browning out during early spring, check that your soil depth and quality is adequate, and supplement with organics if necessary.
- Check that your backflow prevention device is working. Test it if required.
- Shut off all other water use in the house prior to opening the irrigation master valve. Open the valve (slowly) and let the main irrigation line pressurize. Watch your water meter to see if it stops running once the mainline is full. If it does not, have a contractor check the mainline for leaks.
- Check and clean or replace your filters, in particular on drip systems.
- Test run each irrigation circuit. Adjust head rotation to avoid overspray. Replace broken heads.
- Check and readjust your timeclock – at startup and at least once / month to adjust for the varied water requirements over the season.





Irrigation Trouble Shooting Tips

Local Dry Spots or Local Wet Spots:

- Consider the local terrain, soils, tree cover and sun exposure. Differences may lead to different watering needs.
- Check for head to head spacing and matched precipitation rates of nozzles - adjust head spacing or nozzles if necessary. One way to do this is to replace heads with matched precipitation rate variable radius nozzles like the MPR Rotator - adjusting the radius as required.

Water Bill Too High:

- Have your irrigation system checked for leaks.
- Reduce your timeclock settings using the typical guide above. If your yard survives at the new settings, drop the water budget a further 10% and watch for plant response. Keep lowering the settings until some plant stress shows, and then raise them slightly.
- If local dry spots appear, follow the tips above.
- Check the depth and quality of your soil. If there is less than 150mm (6") for lawn and 300mm (12") for shrubs/ veggies, try adding compost or a compost soil mix to increase water retention and root growth.
- Reduce the area of lawn, or the area watered. Increase areas of your site that are low or no-use hydrozones.
- Replace circuits of your irrigation system with low-volume or drip components.

Topdressing & Mulching

Dig a test hole in typical areas of your yard. If the depth of good black crumbly soil is less than 150 mm (6") under lawn and 300 mm to 450 mm (12" – 18") for shrubs, you are likely using more water than you should. Rather than starting over with new plantings, it is possible to gradually add to your soil depth by topdressing with thin layers of growing medium and well-composted organic matter.

For grass areas:

- Topdressing should not exceed 6mm (1/4") depth at a time.
- Once grass is established, stop removing the grass clippings from the surface. Mow regularly, and allow the clippings to decay into the soil, where they will recycle the organic matter and nutrients back into the soil organisms and the grass.

For shrub and groundcover areas:

- The maximum depth per topdress application or growing medium / organic matter could be as much as 75 mm (3").
- For on-going maintenance once adequate soil depth is in place, use organic mulches like bark mulch to reduce soil evaporation, minimize weed germination, and to provide a long-term supply of organic matter.
- Allow leaf drop to remain – this builds up a 'natural duff' like in the forest, that builds the soil, soil life, and recycles nutrients.

Compost Tea & Fertility

Growing medium with organic matter that meets the BC Landscape Standard will require less water, less fertilizer, and will grow plants almost twice as fast as those in poor soils. The resulting plants will also be much healthier, with fewer weeds and little need for pesticides.

Supplemental fertilization, when necessary, should be done sparingly and always with slow-release fertilizers. Never use a fertilizer with added herbicide – fertilize and let the grass out-compete the weeds, hand pull if there are only a few weeds, and use a spray herbicide only as a last resort.

As an effective alternate to chemical fertilizers, ask your garden centre or landscaper about 'compost tea'. This liquid extract from active compost is extremely effective at increasing nutrients in soils and plants – it's also a natural de-thatcher on lawns.

This publication has been created by Team WaterSmart for the Drinking Water and Watershed Protection Program.

team watersmart
because every drop counts

Toll Free: 1-877-604-4111
www.teamwatersmart.ca

To find qualified help for landscape or irrigation design/construction supervision, look for the appropriate membership and training from the organizations below:

Irrigation Industry Association (IIABC)

IIABC Office
2330 Woodstock Drive
Abbotsford, BC V3G 2E5
Phone: (604) 859-8222
www.irrigationbc.com

Certified Irrigation Designer from the IIABC is a key qualification for irrigation design. They and other professionals accredited as *Certified Irrigation Technician II* are qualified to supervise irrigation construction.

BC Landscape and Nursery Association (BCLNA)

BCLNA Office
Suite #102, 5783 - 176A Street
Surrey, BC V3S 6S6
Phone: (800) 421-7963
www.bclna.com

Certified Horticultural Technicians are qualified to supervise landscape construction, and often offer landscape design-build services for single family homes.

BC Society of Landscape Architects (BCSLA)

BCSLA Office
Suite #110, 355 Burrard Street
Vancouver, BC V6C 2G8
Phone: (604) 682-5610
www.bcsla.org

Landscape Architects are qualified in design and construction supervision of all landscape installations, but should also have qualifications as an IIABC *Certified Irrigation Designer* if their scope is irrigation design/supervision.